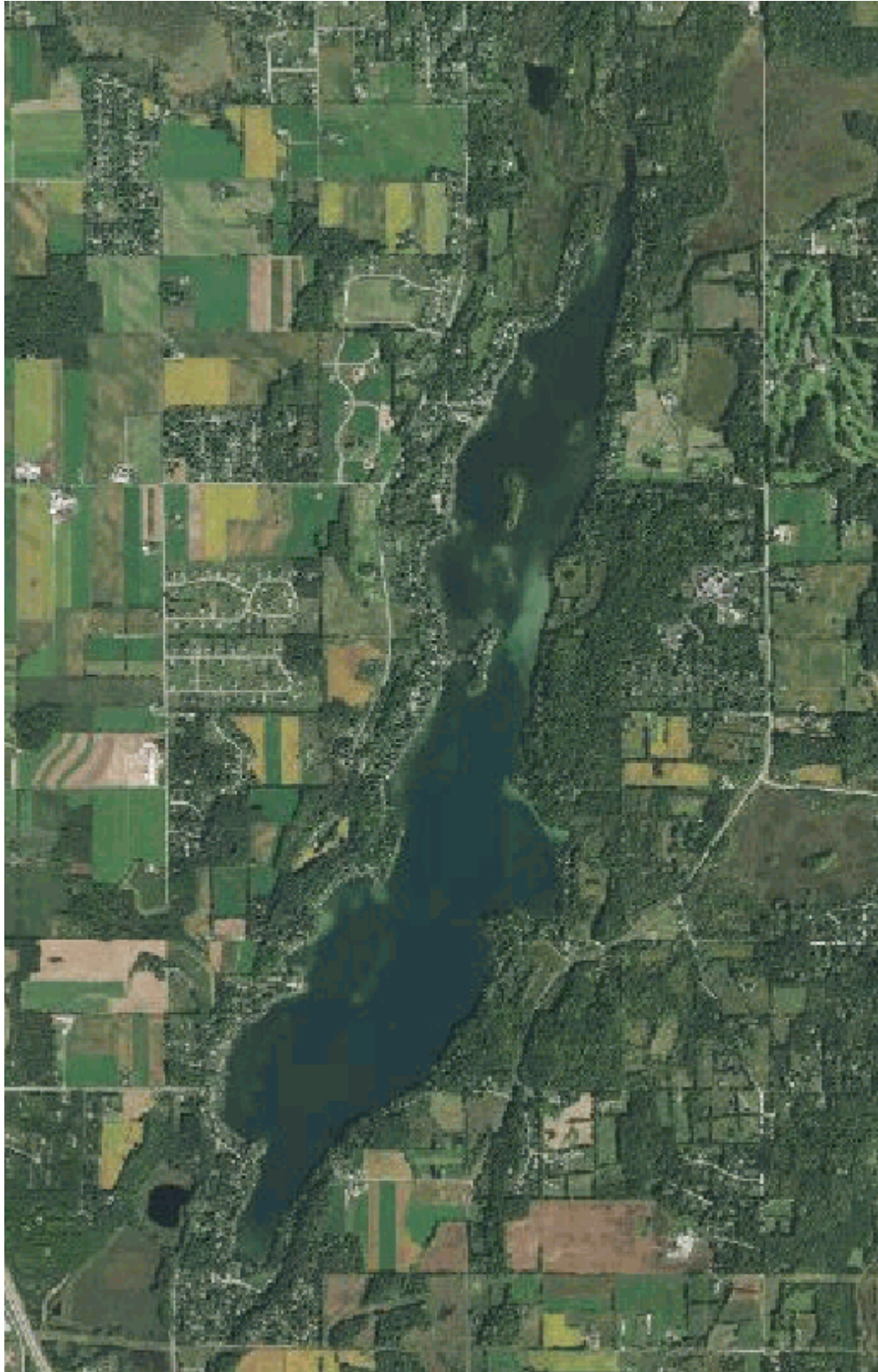


An Aquatic Plant Survey and Management Plan Update
for Big Cedar Lake—Washington County, WI
December, 2018



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

Introduction

Big Cedar Lake is a 932 acre lake located in the Towns of West Bend and Polk in Washington County, Wisconsin. It serves as an important recreational asset to both the lake residents and surrounding community. Public Access is available at two locations, with the primary access (with parking facilities) owned by the Big Cedar Lake Protection and Rehabilitation District (BCLPRD).

The Big Cedar Lake Protection and Rehabilitation District (BCLPRD) is the organization primarily responsible for lake management activities, including aquatic plant management and lake related studies. A rather extensive Historical Record exists for Big Cedar Lake in regards to water quality and the aquatic plant community. Some of these investigations have been conducted by the WI DNR, and others by District volunteers or their vendors, including the United States Geological Services or consultants.

The most recent Aquatic Plant Survey, contained within this Report, was conducted in August, 2018 and was commissioned by the BCLPRD. This is an Update to the survey conducted by Aron & Associates in 2013 for the District and reported in the publication "2014 Big Cedar Lake Aquatic Plant Management Plan". This earlier report, containing data from their 2013 survey, as well as historical data from earlier surveys, serves as the basis in which to compare the aquatic plant community present in 2018.

It is important to note that the aquatic plant survey conducted in 2018 utilized a different methodology than the earlier surveys, a Point-Intercept, rather than Line-Transect used in earlier surveys.

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

Unlike the earlier Aquatic Plant Survey conducted by Aron & Associates, which used a Line-Transect method, current WI DNR Aquatic Plant Survey protocol requires that the Point-Intercept Method be utilized, using a pre-set of data collection “Points” developed by department staff. The sampling map for Big Cedar Lake is found in fig. 1 (following page). It consists of 1124 sampling points, spaced approximately 58 meters (190 feet apart) in general north-south and east-west transects..

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 22 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, if possible. 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 #2.

The aquatic plant survey indicated that the lake contains a diverse aquatic plant community. Figure #3 graphs the relationship between water depth and the number of sites where aquatic vegetation was found. Figure 4 provides the location of sites with aquatic vegetation (native or non-native).

The locations where Eurasian water-milfoil (EWM) and/or Curly-leaf Pondweed) (CLP) were found are shown on Figures #5 and #6. It should be noted that CLP) being an early season plant, typically reaches a maximum biomass in late-May/mid –June, then dies back after the 4th of July. This is the reason for the low number of observations (1) made during the August survey.

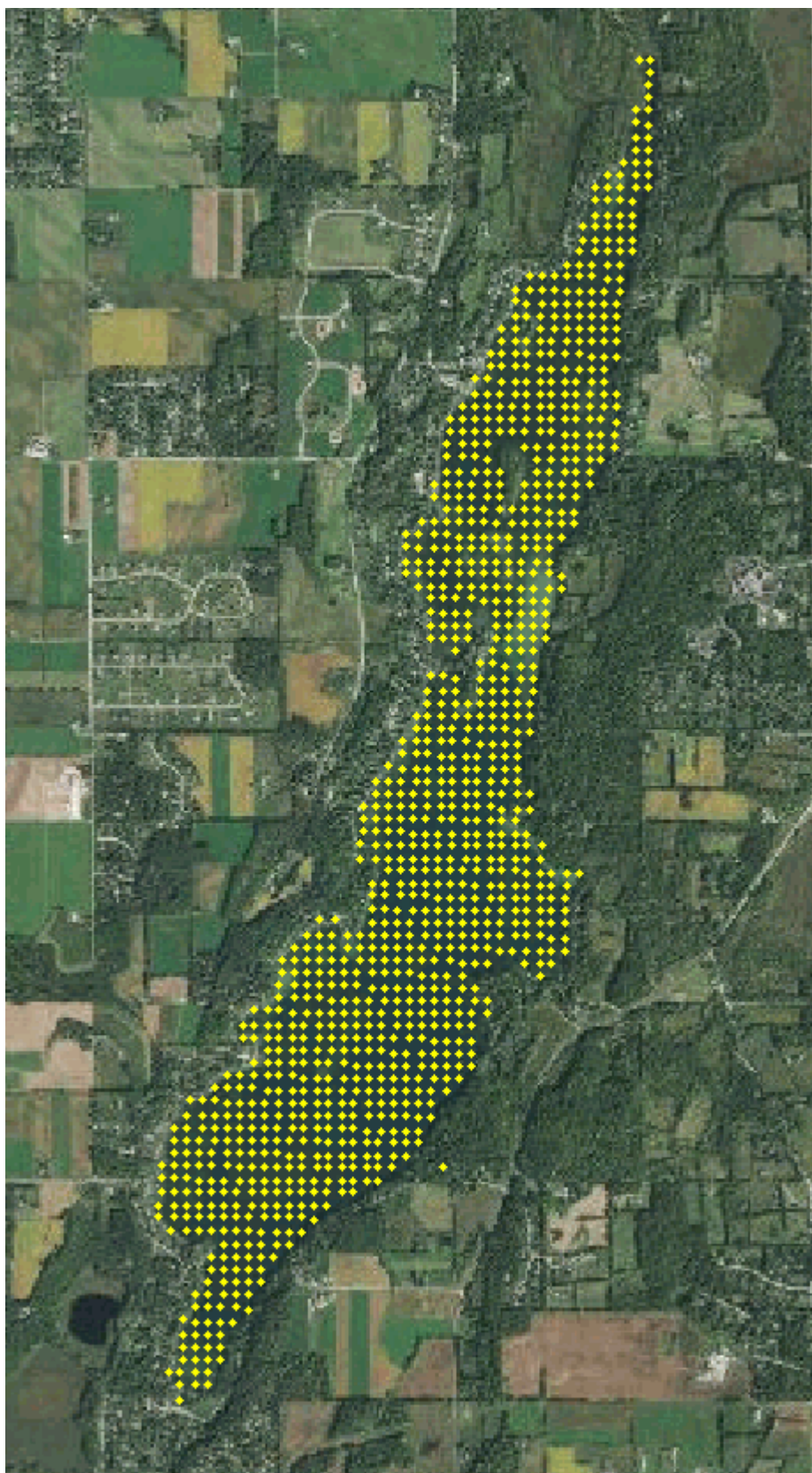
Figures 7-14 are detailed maps showing the location of each of the eight top-ranked native species based upon 2018 abundance (# of sites present). While a different methodology was used for surveying the plant community in 2013, the top five ranked native species (by abundance) reported in the 2014 Plan by Aron & Associates is also provided in the table below, and taken from figures 14-18 (pages 71-75) of the 2014 report.

Table I. Big Cedar Lake—2018 Native Aquatic Plant Rankings by Abundance (# Sites Present) compared with 2013 Survey Rankings by Aron & Associates (top five ranking*)

Scientific Name	Common Name	2018 Ranking/ # Sites Present	2013 Ranking Aron & Associates
<i>Chara, sp.</i>	Muskgrass	1/342	1
<i>Najas flexilis</i>	Slender naiad	2/226	5
<i>Vallisneria americana</i>	Eelgrass	3/159	2
<i>Potamogeton illoensis</i>	Illinois pondweed	4/122	4
<i>Stuckenia pectinata</i>	Sago pondweed	5/117	-
<i>Myriophyllum sibiricum</i>	Northern water-milfoil	6/44	-
<i>Potamogeton zosteriformes</i>	Flat-stem pondweed	7/42	-
<i>Ceratophyllum demersum</i>	Coontail	8/38	-

*Leafy pondweed, *Potamogeton foliosus*, was the third highest ranked species in the 2013 survey

Figure 1
Location of WI DNR Sampling Waypoints
Big Cedar Lake, Washington County, WI



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

Figure 2

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		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.

Figure 3

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

Marine Biochemists Survey, August, 2018

DEPTH BIN (FT)	# SITES (NO ENTRY)
1	5
2	29
3	49
4	60
5	101
6	69
7	34
8	39
9	44
10	19
11	5
12	8
13	3
14	0
15	5
16	3
17	1
18	4
19	4
20	6
21	3
22	1
23	0
24	0
25	0
26	0

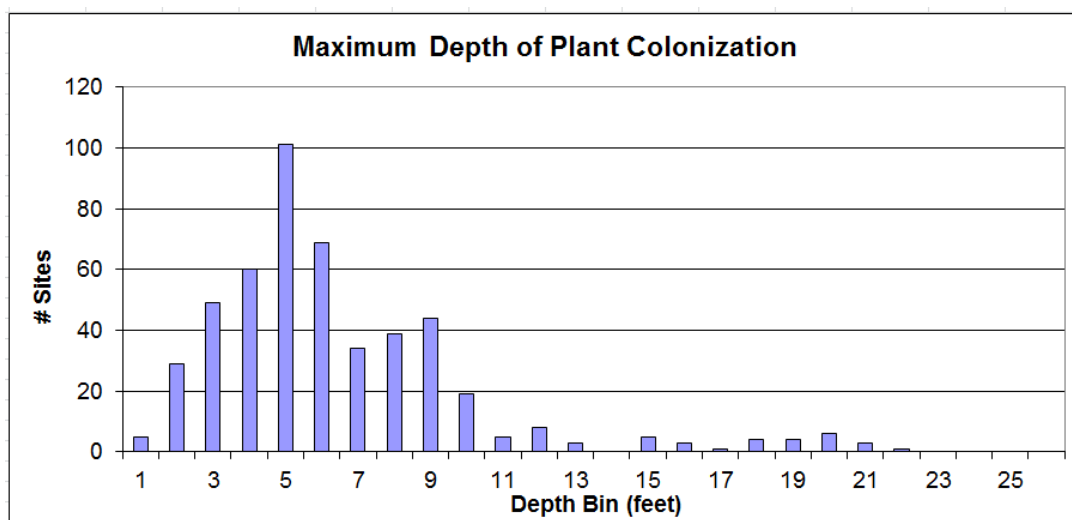
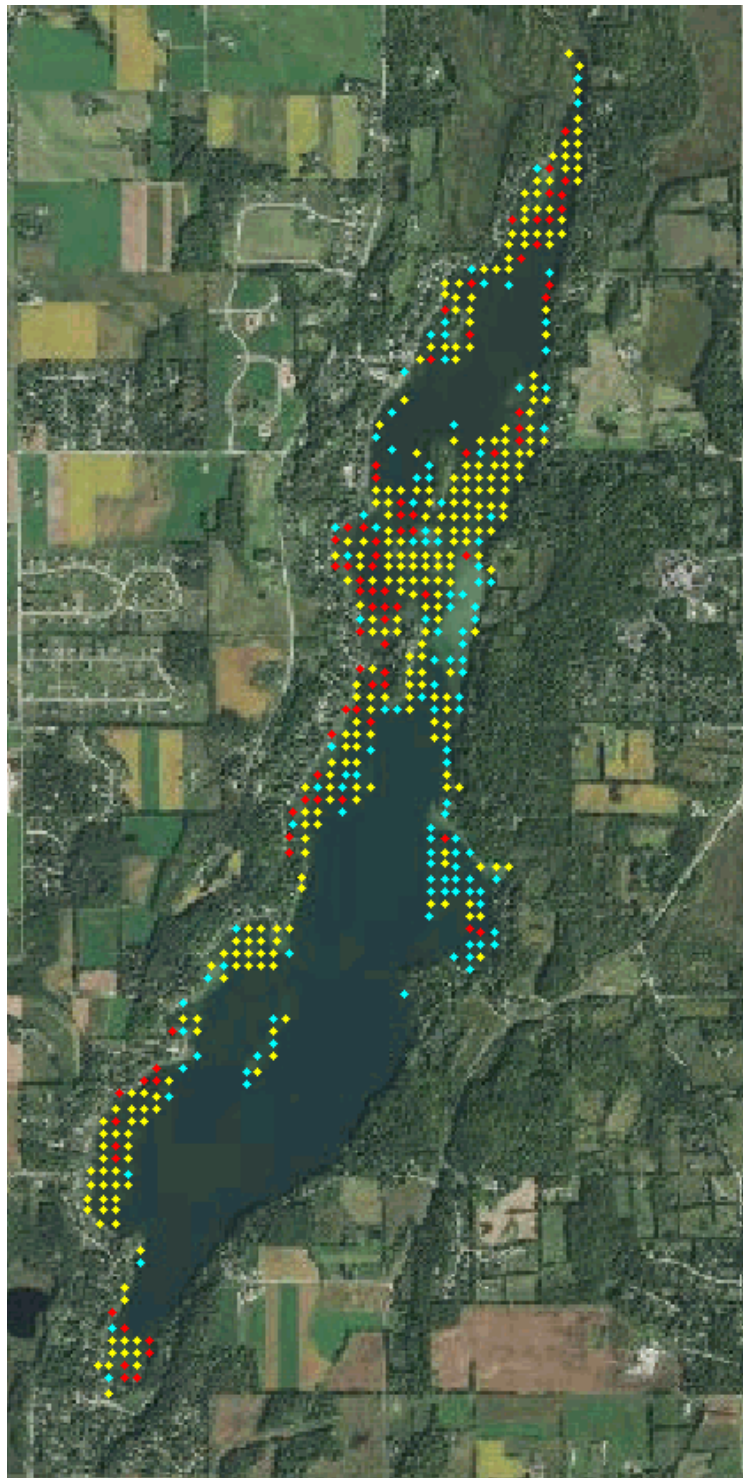


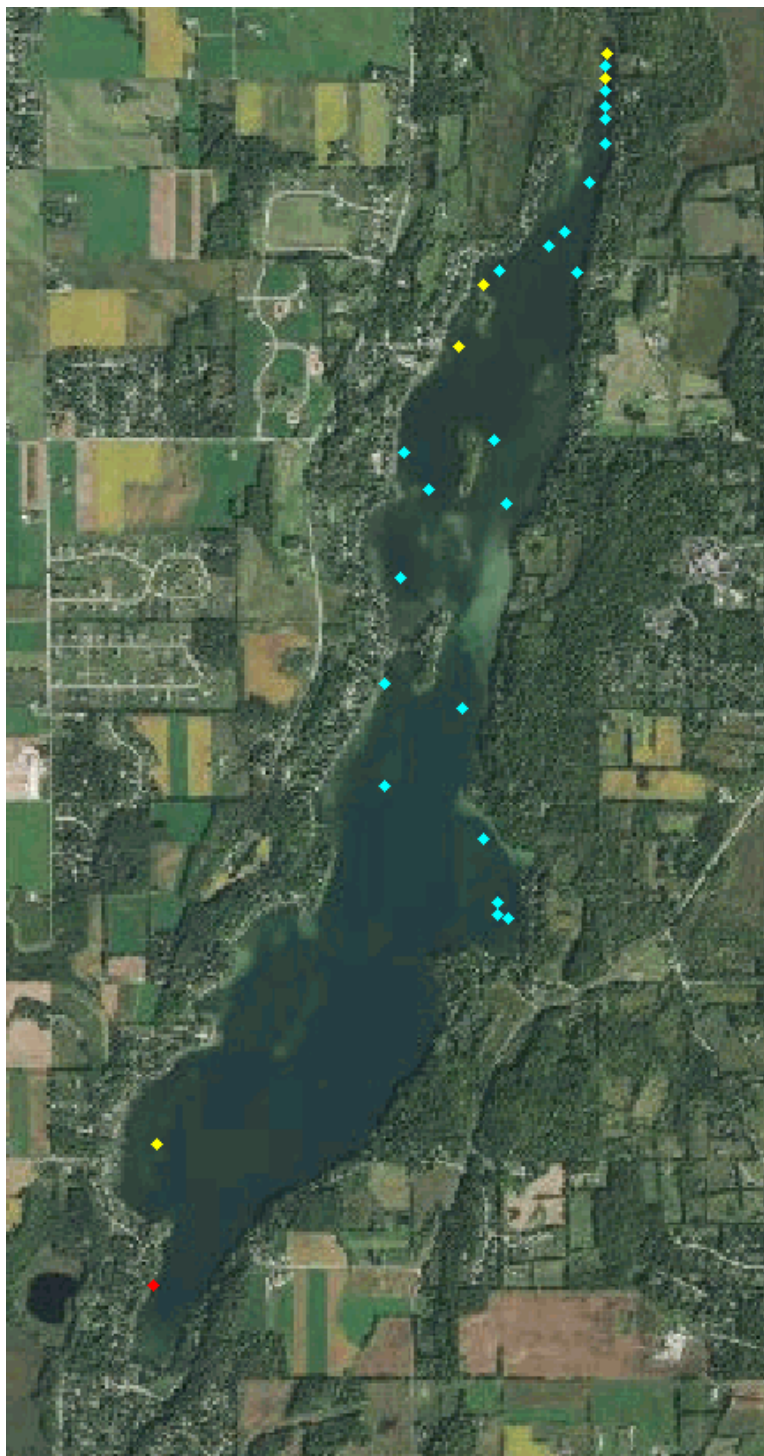
Figure 4
Big Cedar Lake - Washington County, WI
Sites with Aquatic Vegetation (all species) - August, 2018



Rake Fullness: ◆ = 3 Total # Sites Vegetated: 492
◆ = 2
◆ = 1

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

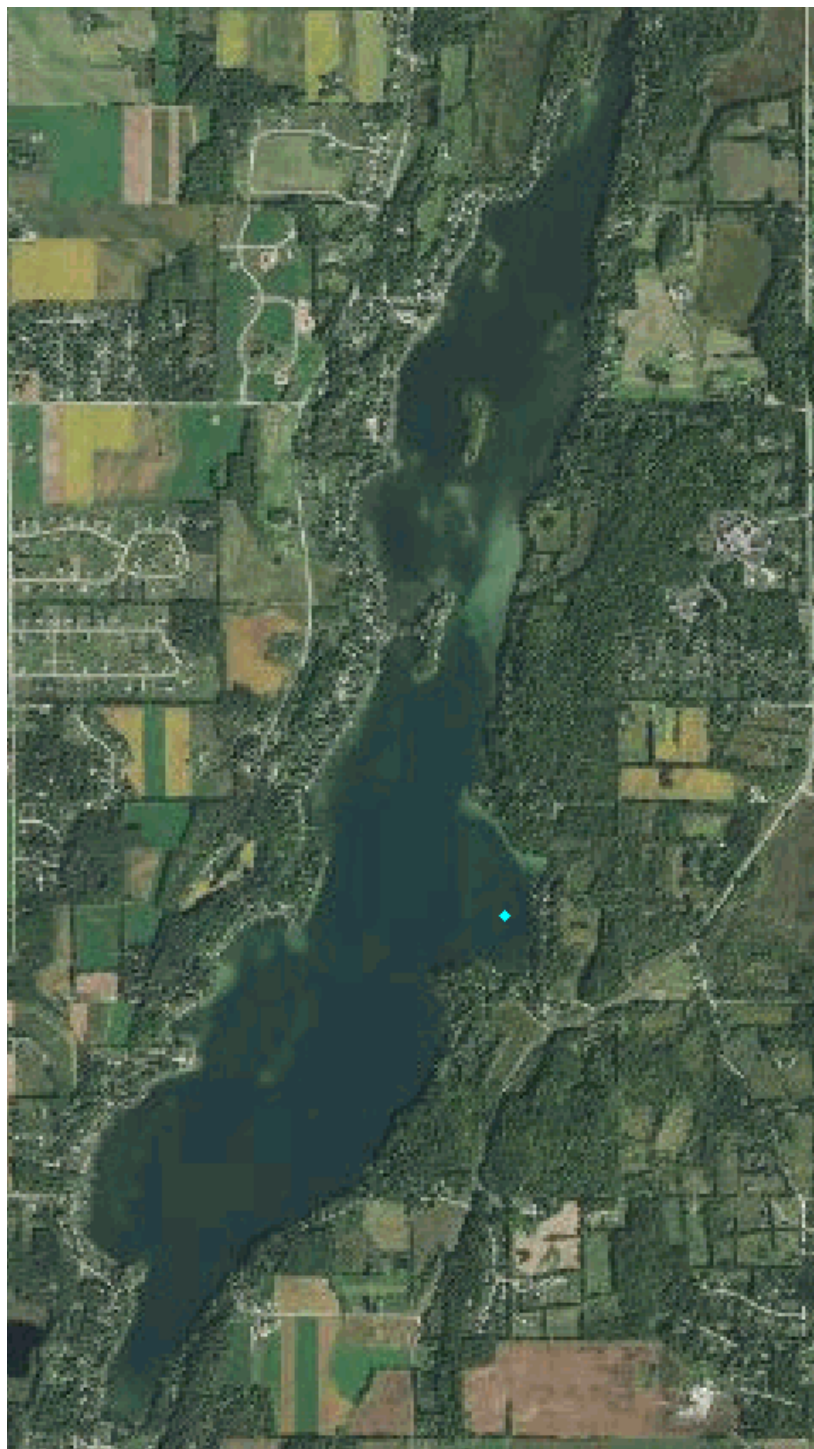
Figure 5
Big Cedar Lake - Washington County, WI
Sites with Eurasian Water-milfoil (*Myriophyllum spicatum*) - August, 2018



Rake Fullness:
♦ = 3
♦ = 2
♦ = 1

Total # Sites Present: 28

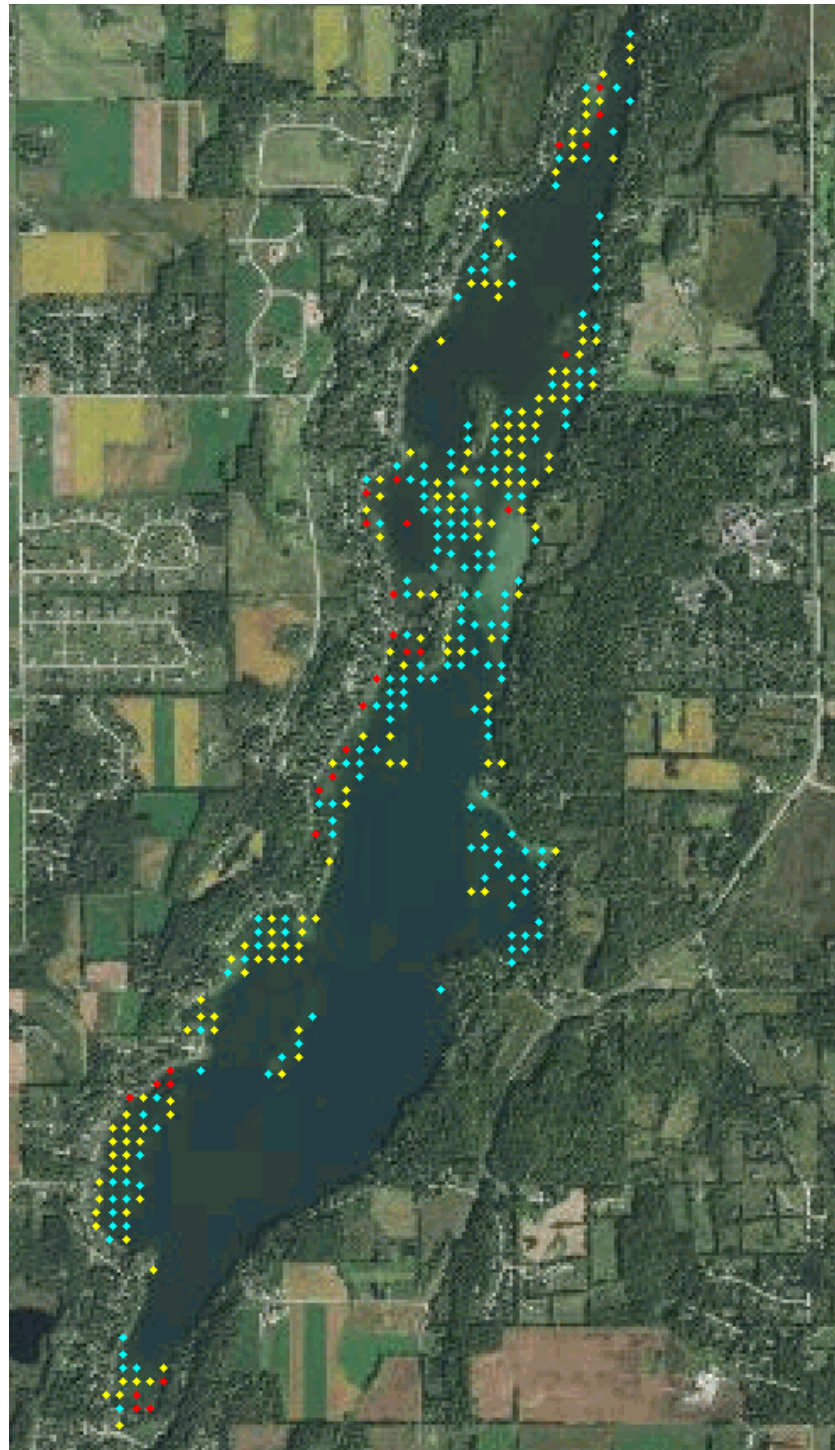
Figure 6
Big Cedar Lake - Washington County, WI
Sites with Curly-leaf Pondweed (*Potamogeton crispus*)



Rake Fullness: ◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 1

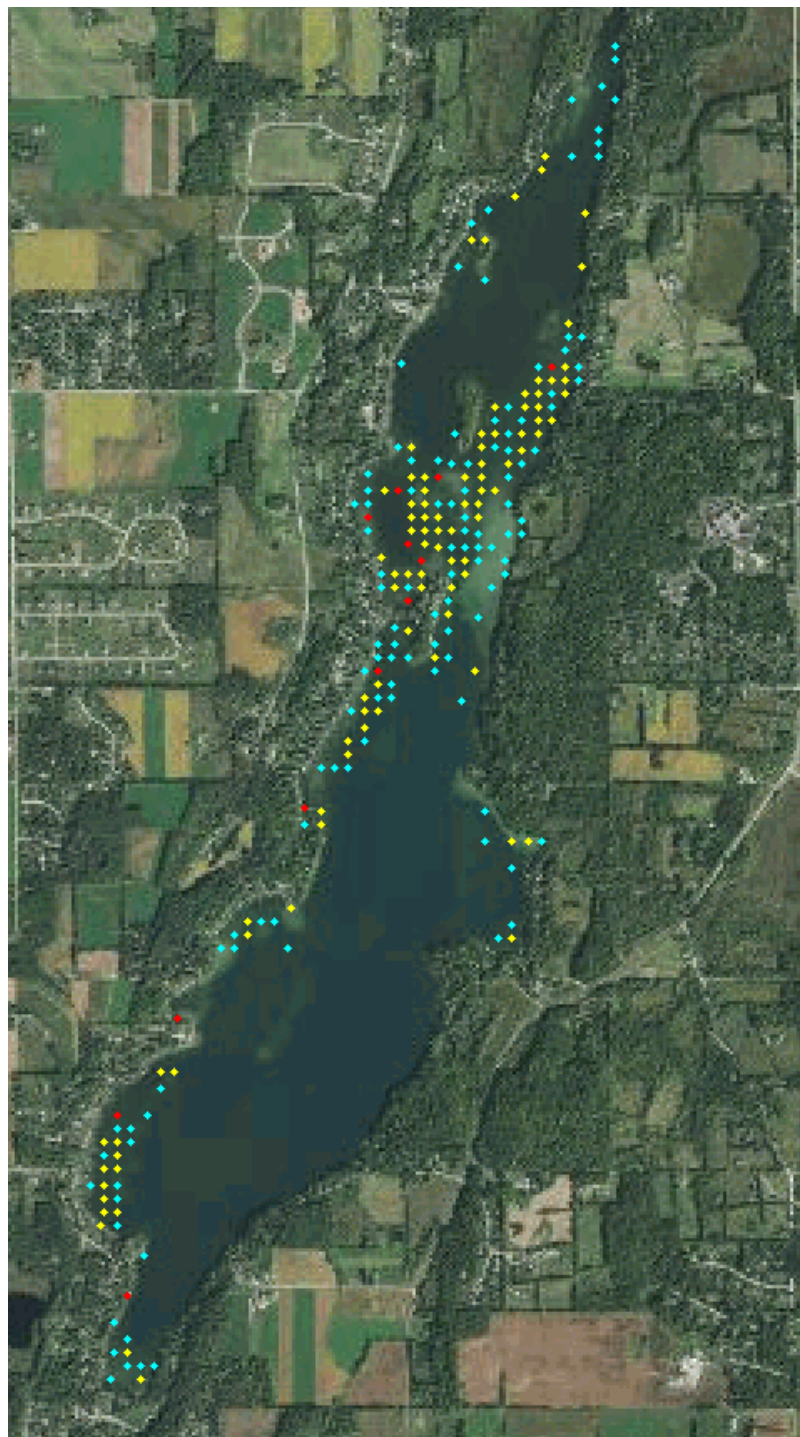
Figure 7
Big Cedar Lake, Washington County, WI
Sites with Muskgrass (*Chara sp.*) - August, 2018



Rake Fullness: ◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 342
Native Species Rank : 1

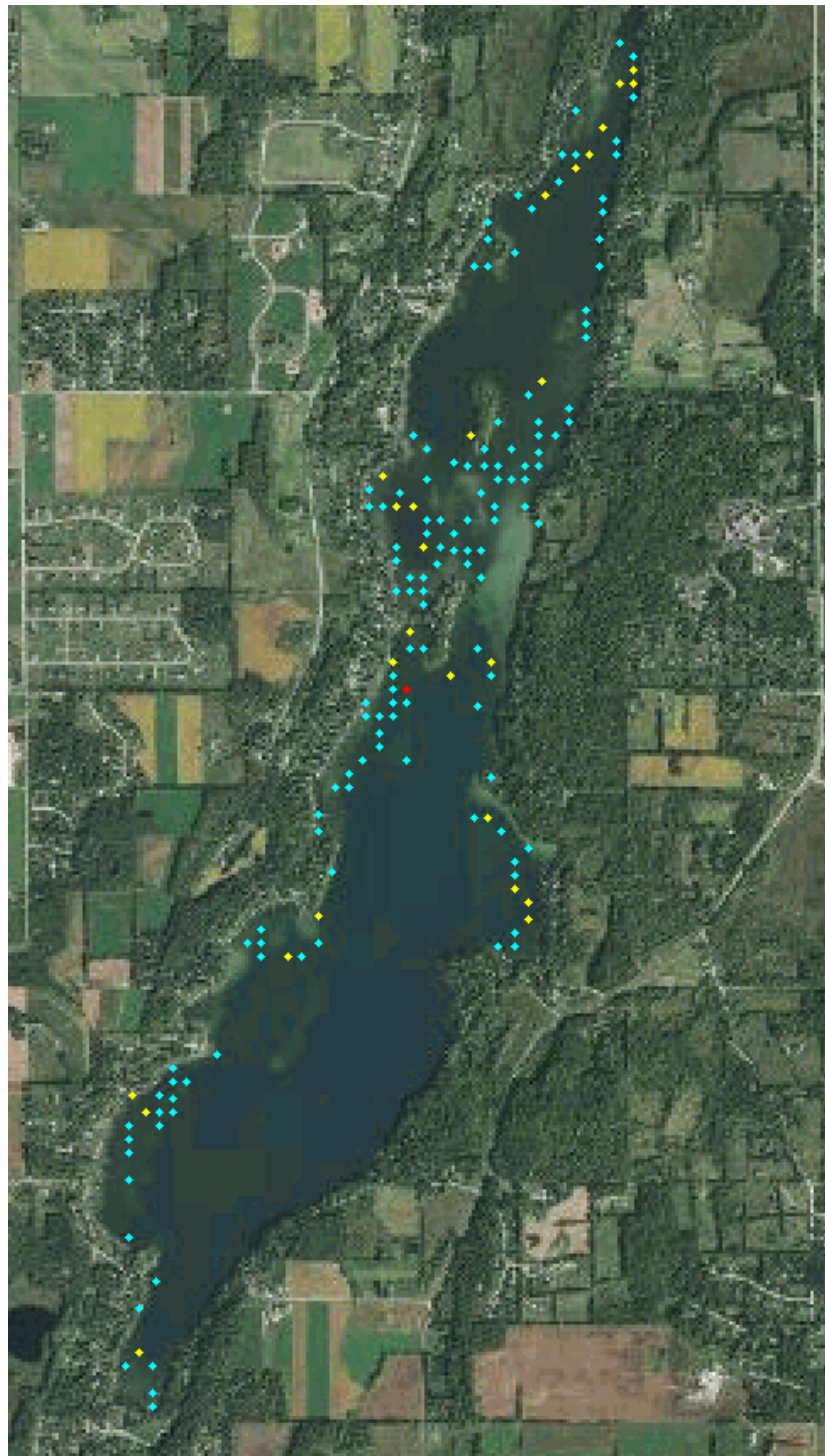
Figure 8
 Big Cedar Lake, Washington County, WI
 Sites with Slender Naiad (*Najas flexilis*) - August, 2018



Rake Fullness:
 ◆ = 3
 ◆ = 2
 ◆ = 1

Total # Sites Present: 226
 Native Species Rank : 2

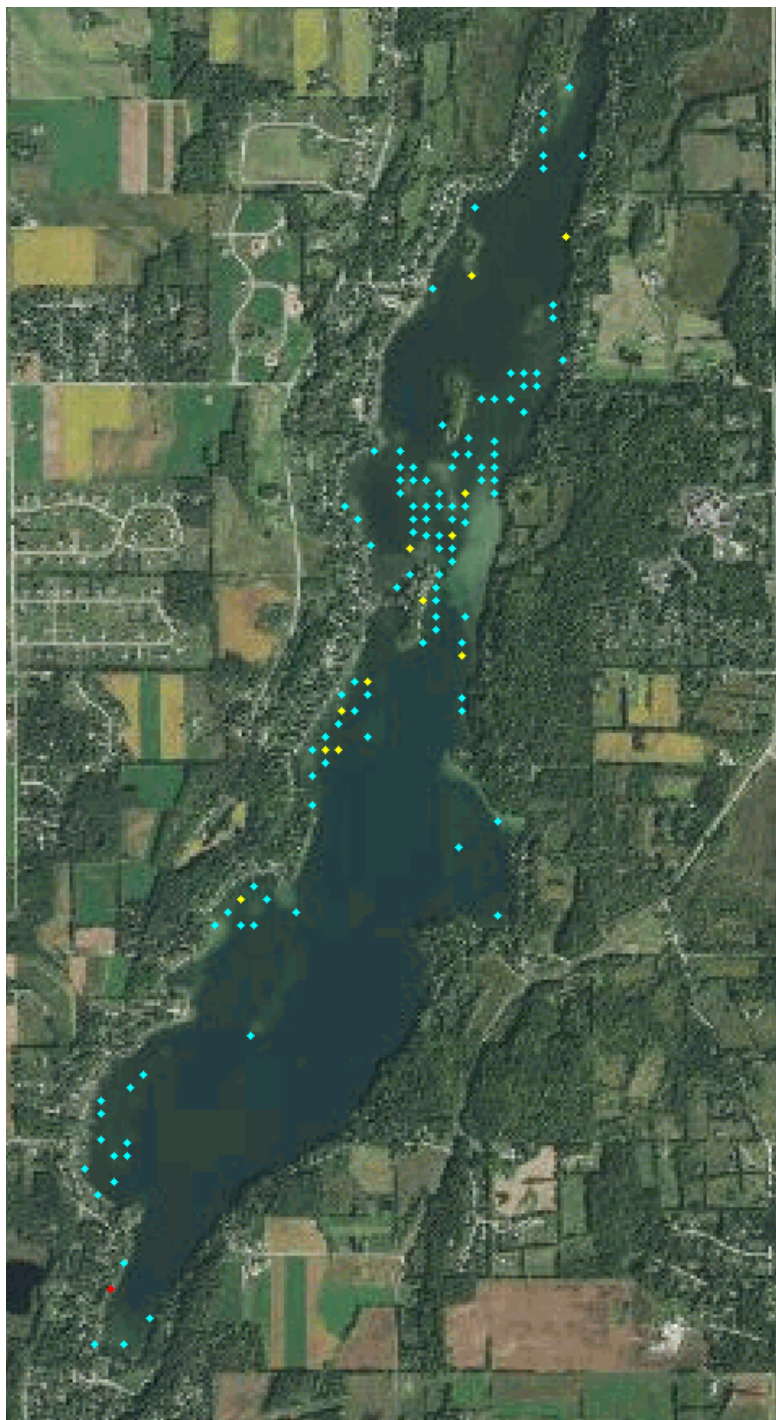
Figure 9
Big Cedar Lake, Washington County, WI
Sites with Eelgrass (*Vallisneria americana*) - August, 2018



Rake Fullness: ◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 159
Native Species Rank : 3

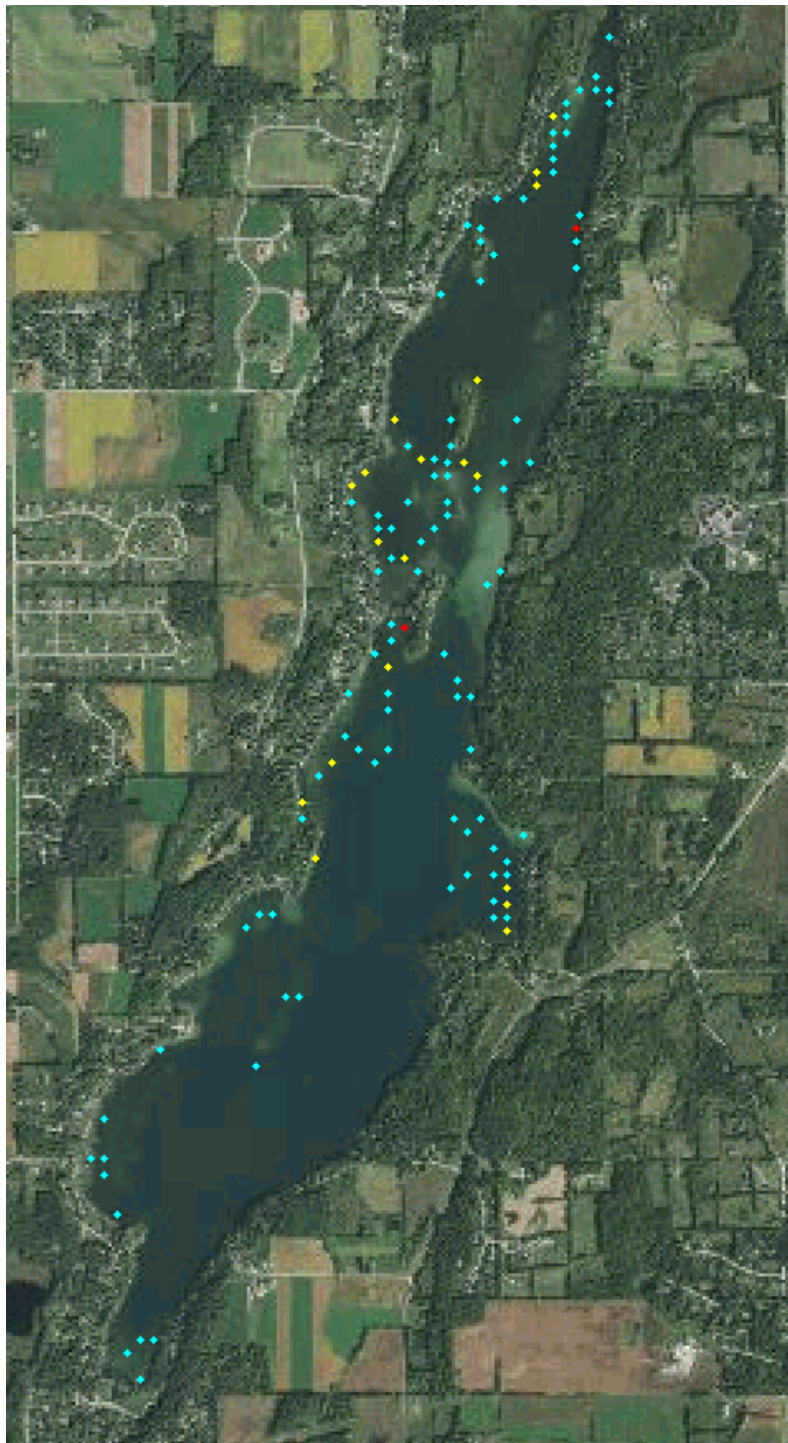
Figure 10
 Big Cedar Lake - Washington County, WI
 Sites with Illinois Pondweed (*Potamogeton illoensis*) - August, 2018



Rake Fullness:
◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 122
 Native Species Rank : 4

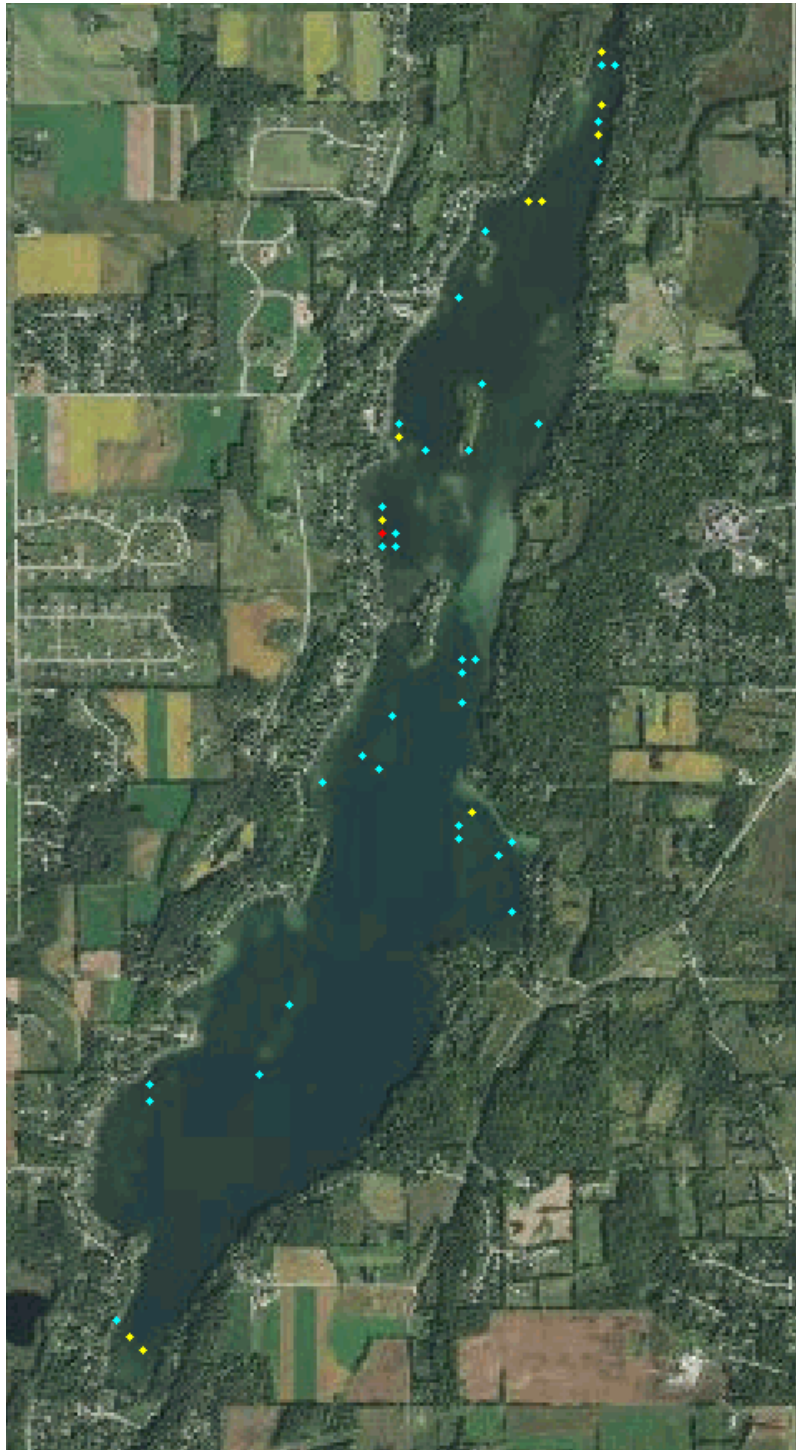
Figure 11
 Big Cedar Lake - Washington County, WI
 Sites with Sago Pondweed (*Stuckenia pectinata*) - August, 2018



Rake Fullness: ◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 117
 Native Species Rank : 5

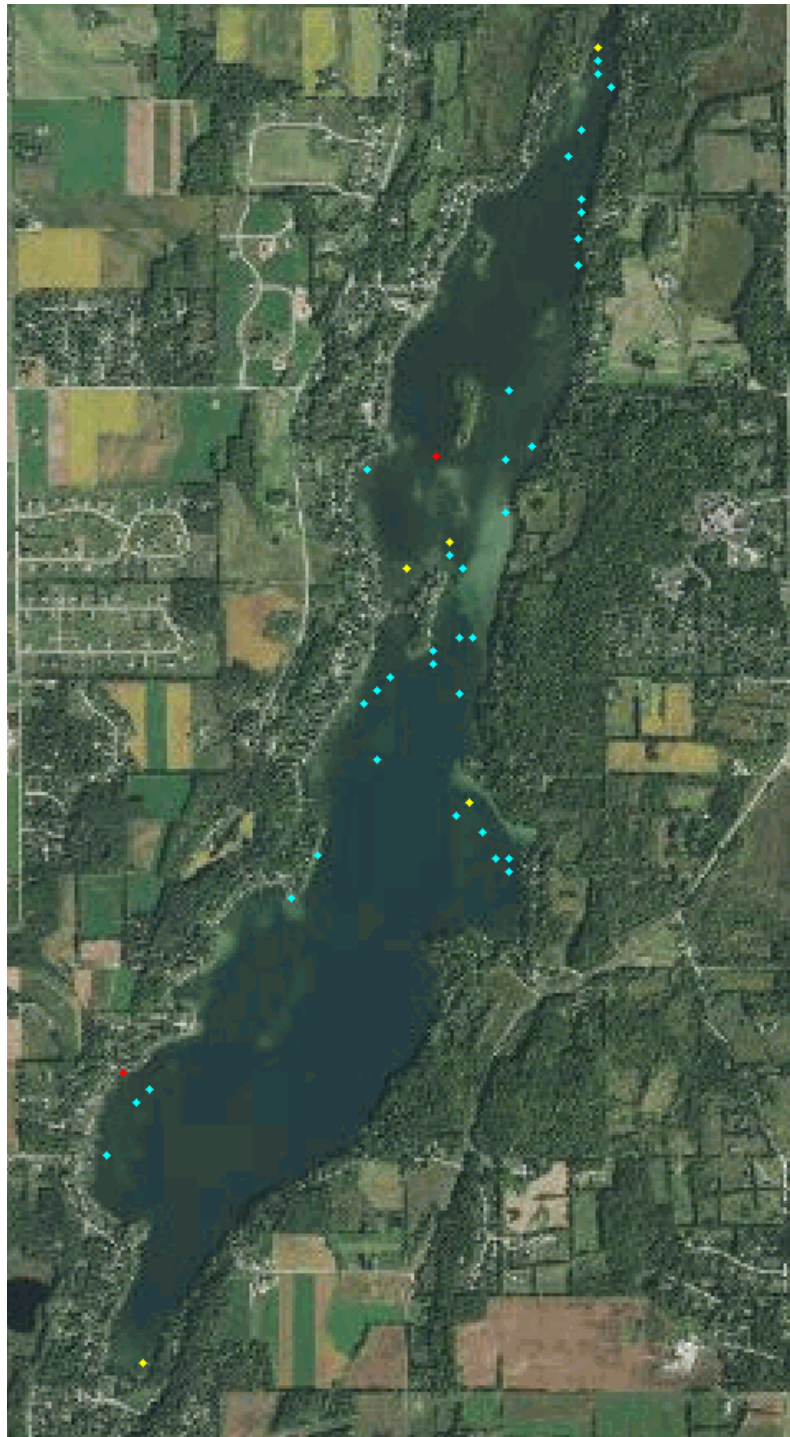
Figure 12
Big Cedar Lake - Washington County, WI
Sites with Northern Water-milfoil (*Myriophyllum sibiricum*) - August, 2018



Rake Fullness: ◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 44
Native Species Rank : 6

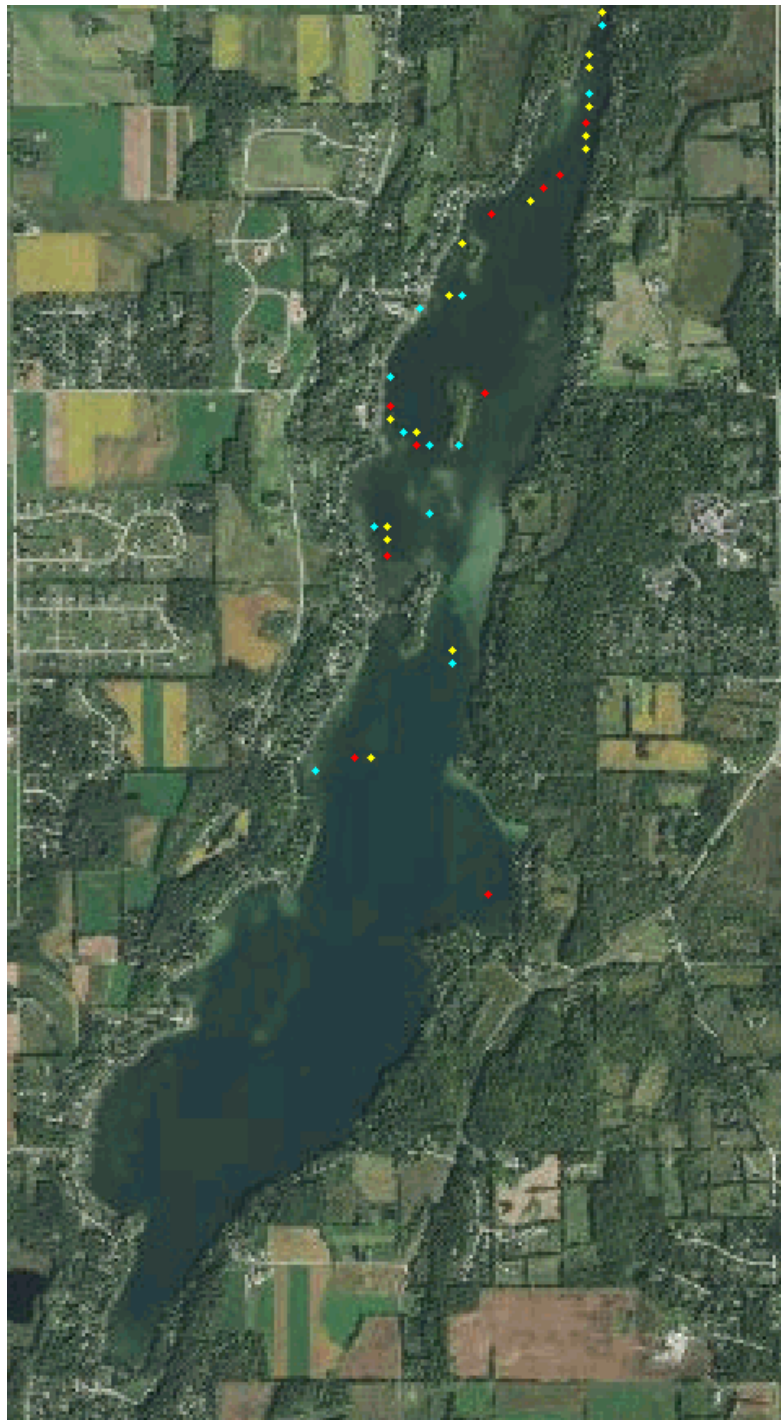
Figure 13
Big Cedar Lake - Washington County, WI
Sites with Flat-stem Pondweed (*Potamogeton zosteriformes*) - August, 2018



Rake Fullness: ◆ = 3
◆ = 2
◆ = 1

Total # Sites Present: 42
Native Species Rank : 7

Figure 14
 Big Cedar Lake - Washington County, WI
 Sites with Coontail (*Ceratophyllum demersum*) - August, 2018



Rake Fullness:
 ◆ = 3
 ◆ = 2
 ◆ = 1

Total # Sites Present: 38
 Native Species Rank : 8

2018 Aquatic Plant Survey Methodology and Results cont'd

The Summary Statistics for the 2018 Aquatic Plant Survey are presented in the Table below, while Table IV. (page 20) provides a Floristic Quality Index (FQI), followed by a listing of all native species observed according to Rank (Table V., page 21). A brief discussion of the importance and meaning of this Data, and a comparison between the three surveys follows.

Table II. Summary Statistics for Big Cedar Lake 2018 Aquatic Plant Survey

Parameter	Aug., '18
Total # Sites Visited	1107
Total # Sites w/vegetation	492
Total # Sites Shallower than Max. Depth of Plants	568
Frequency of Occurrence	86.62
Simpson Diversity Index	0.85
Maximum Depth of Plants	22 ft.
Avg. # Species/Site (Shallower than Max. Depth of Plants)	2.18
Avg. # Species (vegetated sites only)	2.52
Avg. # Native Species/Site (Shallower than max. Depth)	2.09
Avg. # Native Species/Site (vegetated sites only)	2.46
Species Richness (including Visuals, 30)	26
Floristic Quality Index	28.99

Total # of Sites w/ Vegetation

The number of sites having vegetation in Big Cedar Lake was 492. This statistic, alone, has limited value. However, when compared to the total number of sites visited (1107), provides evidence that while being supportive of aquatic plant growth, Big Cedar Lake has ample, deep, or open-water areas as well.

Total # Sites Shallower Than Maximum Depth of Plants

The number of sites shallower than the maximum depth of plants (568) means that roughly one-half of the lake is shallow enough to support plant growth (given adequate soil conditions).

Frequency of Occurrence

Frequency of Occurrence, presented as a percentage, is the number of sites shallower than the maximum depth of plants that contained vegetation. The percentage for the August, 2018 survey was 86.62%. This indicates that a significant majority of the lake bottom has substrate suitable for plant growth. Conversely, it also indicates that the shallow portion of the lake has a relatively infertile substrate as well. This percentage is expected to increase over time as nutrients accumulate in shallows, allowing plants to become established.

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 is 0.85. This indicates that a fairly high level of diversity is found in Big Cedar Lake.

2018 Aquatic Plant Survey Methodology and Results cont'd

Maximum Depth of Plants

Maximum depth of plants was 22 feet in 2018. While the Line-Transect methodology used earlier indicated a maximum rooting depth of 13 feet for the 2001/2008 surveys, and 14 feet during the 2013 survey (Aron & Associates, page 20), this difference has more to do with sampling methodology than any major change in water clarity. While the Point-Intercept Method intentionally includes collection of data at all depths, until a maximum rooting depth has been determined, the Line-Transect method differs in that it focuses upon the depth range where the majority of plants are found.

The Maximum Depth of Colonization Graph and Chart (figure 3, page 5) indicates that while there are some sites having vegetation present beyond depths of 14-15 feet, the majority of sites having vegetation were found at shallower depths. At these greater depths, *Nitella* was most often found, with *Muskgrass* and *Coontail* present as well.

Altogether, the earlier surveys, along with survey conducted in 2018 indicate a fairly consistent pattern of good water clarity, and ample sunlight penetration for plant growth.

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

The values for the 2018 survey were 2.18 and 2.52 respectively. The disparity between these is indicative of the number of sites (shallower than maximum depth) in Big Cedar Lake having little or no vegetation. These include extensive “flats” or “bars” consisting of rather infertile sediments (including sand, gravel) that are not conducive to plant growth.

Lakes having higher number of species per site (above 2) have greater diversity, while those that are lower have lesser diversity. Lakes that are dominated by a single species (whether exotic or native) will have a value closer to 1.

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

The values for 2018 were 2.09 and 2.46. When compared to the values immediately preceding (all species, including exotic) they give an indication of the overall presence, or influence of exotic species in Big Cedar Lake. In 2018, only (28) data collection points in Big Cedar Lake had EWM, and (1), CLP. Thus, while these exotic species are present, their impact upon the native plant community overall is modest.

Species Richness

Species richness is simply the number of species observed in the lake during the surveys. The number of native species found during the survey was 26 (30, including Visuals). Values for earlier surveys, as reported in 2014 by Aron & Associates, are listed in the Table below:

Table III. Big Cedar Lake Aquatic Plant Surveys and Number of Species Identified

Survey Year	# Species Identified
1968	13
1986	26
1989	26
1993	26
2001	33
2008	33
2013	32
2018	26

continued on following page

Species Richness (continued)

The number of species found within a lake can certainly vary from year-to-year, as well as survey-to-survey, depending upon the time at which data was collected (early-spring vs. late-summer or fall). Certain species, such as CLP, develop early in the season, only to die-off by the 4th of July. Other species only begin their growth later in the season.

The method by which data is collected can also affect the number of species identified. Such is the case between the earlier “Line-Transect” surveys and the “Point-Intercept” method used in 2018. Whereas the earlier method intentionally begins at the water’s edge, where many emergent plant species may be found, these emergent species may be “missed” if no data collection (“Point Intercept”) points are located close to shore in wetland areas. While certain emergent species, such as Bulrush or Cattail are still present in Big Cedar Lake, their presence was not in the immediate vicinity of data collection points.

A complete listing of all native species identified during the 2018 survey is located in Table V. (page 21). This is followed by a comparison of all species identified during the seven surveys completed since 1968 (Table VI., page 22- 23).

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 Big Cedar Lake for this survey is 28.99, and is found in Table IV. on the following page.

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 Big Cedar in the highest quartile of all Wisconsin lakes. 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 survey. An Update to the 2014 Aquatic plant Management Plan begins on page 24.

Table IV.
Floristic Quality Index (FQI)
August, 2018 Plant Survey - Big Cedar Lake, Washington County, WI

Species	Common Name	C	species present=1
<i>Ceratophyllum demersum</i>	Coontail	3	1
<i>Chara</i>	Muskgrasses	7	1
<i>Elodea canadensis</i>	Common waterweed	3	1
<i>Heteranthera dubia</i>	Water star-grass	6	1
<i>Lemna minor</i>	Small duckweed	4	1
<i>Myriophyllum sibiricum</i>	Northern water-milfoil	6	1
<i>Myriophyllum verticillatum</i>	Whorled water-milfoil	8	1
<i>Najas flexilis</i>	Slender naiad	6	1
<i>Najas guadalupensis</i>	Southern naiad	8	1
<i>Nitella</i>	Nitella	7	1
<i>Nuphar variegata</i>	Spatterdock	6	1
<i>Potamogeton amplifolius</i>	Large-leaf pondweed	7	1
<i>Potamogeton foliosus</i>	Leafy pondweed	6	1
<i>Potamogeton gramineus</i>	Variable pondweed	7	1
<i>Potamogeton illinoensis</i>	Illinois pondweed	6	1
<i>Potamogeton natans</i>	Floating-leaf pondweed	5	1
<i>Potamogeton praelongus</i>	White-stem pondweed	8	1
<i>Potamogeton pusillus</i>	Small pondweed	7	1
<i>Potamogeton richardsonii</i>	Clasping-leaf pondweed	5	1
<i>Potamogeton zosteriformis</i>	Flat-stem pondweed	6	1
<i>Stuckenia pectinata</i>	Sago pondweed	3	1
<i>Utricularia vulgaris</i>	Common bladderwort	7	1
<i>Vallisneria americana</i>	Wild celery	6	1
<i>Wolffia columbiana</i>	Common watermeal	5	1
N			24
mean C			5.92
FQI			28.99

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>

Table V.
Native Aquatic Plant Species List—By Rank
August, 2018 Plant Survey - Big Cedar Lake, Washington County, WI

Species	Common Name	Freq. of Occurrence (%)	Avg. Rake Fullness	# Sites Present	# Sites Visual
<i>Chara</i>	Muskgrasses	69.51	1.58	342	0
<i>Najas flexilis</i>	Slender naiad	45.93	1.52	226	0
<i>Vallisneria americana</i>	Wild celery	32.32	1.18	159	9
<i>Potamogeton illinoensis</i>	Illinois pondweed	24.8	1.11	122	28
<i>Stuckenia pectinata</i>	Sago pondweed	23.78	1.20	117	3
<i>Myriophyllum sibiricum</i>	Northern water-milfoil	8.94	1.27	44	0
<i>Potamogeton zosteriformis</i>	Flat-stem pondweed	8.54	1.21	42	1
<i>Ceratophyllum demersum</i>	Coontail	7.72	1.89	38	0
<i>Potamogeton gramineus</i>	Variable pondweed	5.28	1.12	26	3
<i>Nitella</i>	Nitella	5.28	1.38	26	0
<i>Potamogeton amplifolius</i>	Large-leaf pondweed	2.85	1.14	14	5
<i>Heteranthera dubia</i>	Water star-grass	1.63	1.75	8	1
<i>Potamogeton richardsonii</i>	Clasping-leaf pondweed	1.22	1.17	6	3
<i>Utricularia vulgaris</i>	Common bladderwort	1.02	1.2	5	0
<i>Potamogeton foliosus</i>	Leafy pondweed	0.81	1.0	4	0
<i>Elodea canadensis</i>	Common waterweed	0.61	1.0	3	0
<i>Potamogeton pusillus</i>	Small pondweed	0.21	1.0	2	0
<i>Najas guadalupensis</i>	Southern naiad	0.41	1.0	2	0
<i>Lemna minor</i>	Small duckweed	0.2	1.0	1	1
<i>Myriophyllum verticillatum</i>	Whorled water-milfoil	0.2	1.0	1	0
<i>Potamogeton praelongus</i>	White-stem pondweed	0.2	1.0	1	0
<i>Wolffia columbiana</i>	Common watermeal	0.2	1.0	1	0
<i>Nuphar variegata</i>	Spatterdock	0.2	1.0	1	3
<i>Potamogeton natans</i>	Floating-leaf pondweed	0	0	0	1
<i>Nymphaea odorata</i>	White water lily	0	0	0	4
<i>Polygonum amphibum</i>	Water smartweed	0	0	0	1

Table VI. Aquatic Macrophytes Identified in Big Cedar Lake, 1968,1986,1989,1993,2001, 2008,2013,2018

(X indicates presence)

Note: 1968-2013 Data courtesy of Aron & Associates

Species	1968	1986-89	1993	2001.	2008	2013	2018
<i>Ceratophyllum demersum</i>	X	X	X	X	X	X	X
<i>Chara sp.</i>	X	X	X	X	X	X	X
<i>Elodea canadensis</i>		X	X	X	X	X	X
<i>Heterantia dubia**</i>							X
<i>Lemna minor</i>		X	X	X	X	X	X
<i>Lythrum salicaria</i>		X					
<i>Myriophyllum exalbescens</i>	X						
<i>M. sibiricum</i>							X
<i>M. spicatum</i>		X	X	X	X	X	X
<i>M. verticillatum</i>							X
<i>Najas flexilis</i>		X	X	X	X	X	X
<i>N. guadalupensis</i>							X
<i>N. marina</i>		X		X	X	X	X
<i>N. minor</i>		X					
<i>Nitella sp.</i>		X		X	X	X	X
<i>Nuphar sp.</i>	X	X	X	X	X	X	X
<i>Nymphaea sp.</i>	X	X	X	X	X	X	X
<i>Polygonum amphibium</i>							X
<i>Potamogeton sp.</i>		X					
<i>P. amplifolious</i>	X	X	X	X	X	X	X
<i>P. crispus</i>		X	X	X	X	*	X
<i>P. friesii</i>			X	X	X	X	
<i>P. gramineus</i>		X	X	X	X	X	X
<i>P. illoensis</i>		X	X	X	X	X	X
<i>P. natans</i>		X	X	X	X	*	X
<i>P. praelongus</i>					X	X	X
<i>P. pusillus</i>		X			X	*	X
<i>P. richardsonii</i>	X	X	X	X	X	X	X
<i>P. zosteriformes</i>		X	X	X	X	X	X

Table continued on following page

Table VI. Continued from preceding page

Species	1968	1986-89	1993	2001.	2008	2013	2018
<i>Ranunculus longirostris</i>		X	X	X	X	*	
<i>Sagittaria sp.</i>	X	X		X	X	*	
<i>Scirpus sp.</i>	X	X	X	X	X	*	
<i>S. acutus</i>		X	X	X	X	*	
<i>S. americanus</i>		X	X	X	X	*	
<i>S. valdus</i>	X	X	X	X	X		
<i>Sparganium eurycarpum</i>	X	X	X	X	X	*	
<i>Stuckenia pectinata</i>	X	X	X	X	X	X	X
<i>Typha sp.</i>	X	X	X	X	X	*	
<i>Utricularia vulgaris</i>		X	X	X	X	X	X
<i>Vallisneria americana</i>	X	X	X	X	X	X	X
<i>Zanichella palustris</i>		X		X	X	*	
<i>Zosterella dubia</i> **		X		X	X	X	X
Total Species Found	14	34	26	31	33	32	28

* Found only in the general survey. ** *Heteranthia dubia* (Waterstargrass, common name) formerly named *Zosterella dubia* in prior surveys

An Update to the 2014 Big 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 Big Cedar Lake and compare it to earlier findings. As indicated by Aron & Associates, the expansion of Eelgrass (*Vallisneria americana*) was noted in 2013 (page 21 of 2014 Plan) as compared to their earlier 2008 survey. Eelgrass is still quite abundant (ranked third) and *Chara*, a bottom growing, attached form of macro-algae is still the most common native species encountered. Others, such as, Illinois pondweed and Slender naiad) still rank high in abundance, while others, still present, may have declined, at least for 2018.

A secondary purpose of this project was to take an opportunity to re-visit the Big Cedar Lake Management District Aquatic Plant Management Plan, completed in 2014 (following data collection in 2013). This Report was quite extensive, and the information it contains remains quite appropriate for the conditions found in 2018.

In the years since completion and adoption of the 2014 Plan by the District, there have been some advances in technology, but in many respects, the basic options for aquatic plant management remain essentially the same. Therefore, the basic Goals and Objectives, along with the components of the 2014 Plan by Aron & Associates may be continued.

The current Goals and Objectives and Aquatic Plant Management Activities for Big Cedar Lake (2014 Plan, Chapter VI, pgs. 47-59) have been placed into the Appendix as a reference. Components that are included that can be reviewed in greater detail there are as follows:

- A. Presentation of, and discussion of District's Goals and Objectives.
- B. Recommendations
 - 1. Water Quality Monitoring
 - 2. Hand Controls
 - 3. Education & Information
 - 4. Watershed Controls
 - 5. Land Use Planning
 - 6. Storm Water Planning
 - 7. Chemical Controls
 - 8. Harvesting

Updates, if any, to the above components are discussed in more detail below:

Hand Controls

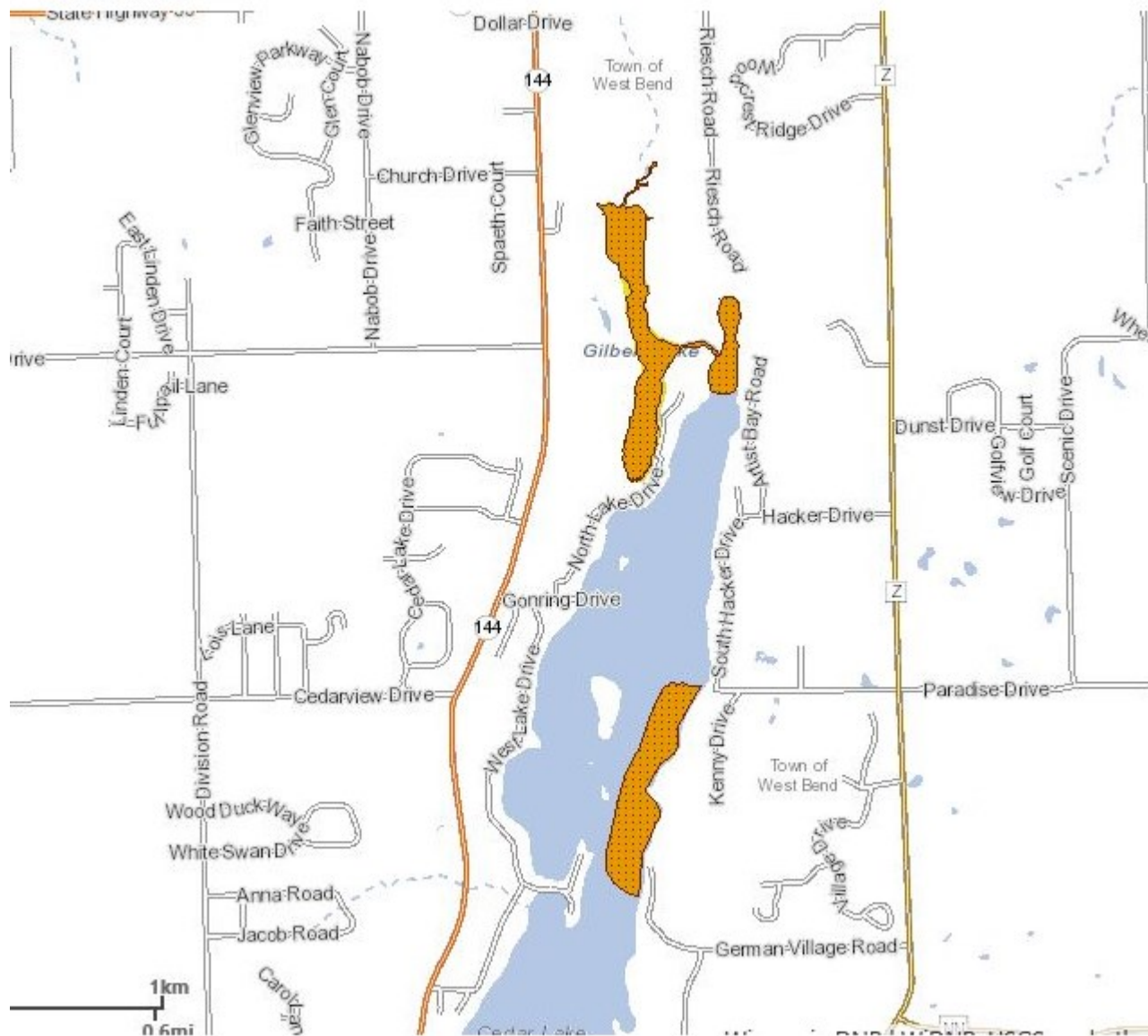
It bears mentioning that individuals still can remove vegetation by hand without a DNR permit *if*:

- 1. The affected area is no more than thirty linear feet in width and is not within a DNR designated Sensitive Area. A detailed map of the DNR designated Sensitive Areas is located on the following page (Figure 15).
- 2. In the event that the affected area is more than thirty feet wide, the primary purpose is for removal of exotic species (CLP and/or EWM).

Conversely, if the area is within a DNR designated sensitive area, or the target vegetation consists primarily of native species and more than thirty feet of shoreline is to be managed, a WI DNR (Chapter NR109) Permit is required. Further detail can be found at the WI DNR website under "Water Permits", and permits can be applied for online as well.

continued on following page 26

Figure 15
 WI DNR Designated Sensitive Areas*
 Big Cedar Lake, Washington County, WI



* Source: WI DNR website

Hand Controls, continued

In addition to removing vegetation by cutting or raking, in recent years the use of Diver Assisted Suction Harvesting (or D.A.S.H.), has become more popular. 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 by hand), 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.

Aquatic plant control using D.A.S.H. requires an approved WI DNR Chapter NR109 permit.

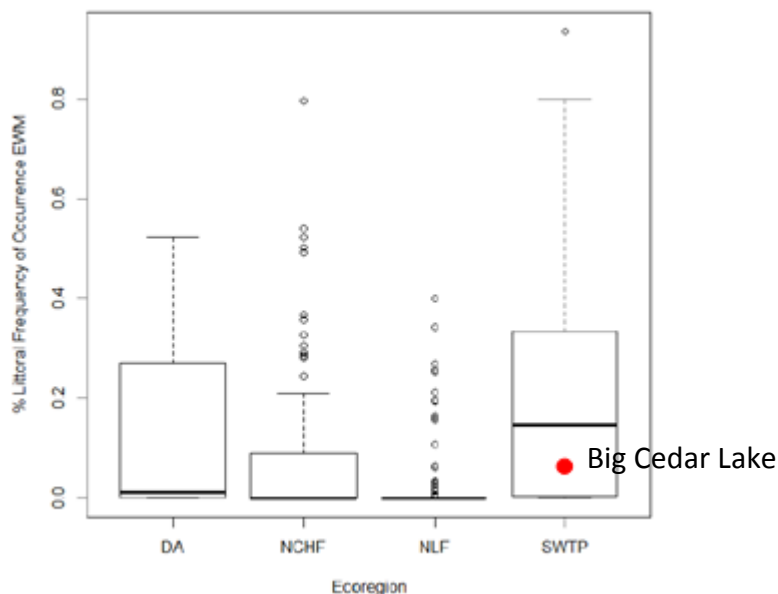
Chemical Controls

The use of chemical controls was discussed in the 2014 Plan, and recommended only for the selective control of exotic species (EWM and/or CLP), or for native species, where densities were severe enough to significantly interfere with navigation, or in areas inaccessible to mechanical harvesting (too shallow or crowded/confined).

While EWM is present in the lake, it's overall distribution was rather limited in 2018. It's Frequency of Occurrence was 5.69%, with only 28 locations having it present. In order to place this in perspective, Figure 16 (below) compares this to other lakes within our region, and other parts of Wisconsin.

Figure 16

Frequency of Occurrence of Eurasian Watermilfoil (2018) —Big Cedar Lake, Washington County, WI
and Comparison with Eco-Regions within State of Wisconsin



Region:

DA—Driftless Area

NCHF—North Central Hardwoods Forest

NLF—Northern Lakes & Forests

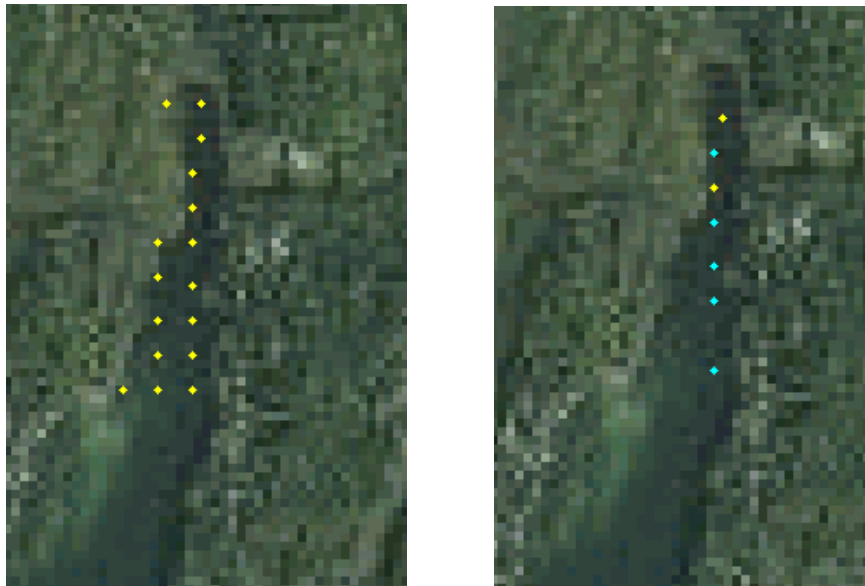
SWTP -- Southwest Till Plains

* Data Courtesy of Nault, et al, WI Dept. of Natural Resources.

This is certainly good news, however, there is one location within Big Cedar Lake that does have a rather high degree of infestation that deserves a closer look. This is the Sensitive Area at the north end of the lake. The location of all sampling sites within this area, along with those with EWM are found on Figure 17 (following page).

Figure 17

Location of All Sampling Locations within Sensitive Area-North End of Big Cedar Lake (left)
Sampling Locations with EWM (right). Aqua = Fullness of 1, Yellow = Fullness of 2



Of the sixteen data collection points within this area, seven had EWM to one degree or another. The most common native species present in this same area were Chara and Coontail (five points each). Below is a Table listing all species present within this Sensitive Area, along with the number of locations where found:

Table VII. Species Present in North End
(Sensitive Area) of Big Cedar lake –2018

Species	# Sites Present
Eurasian water-milfoil	7
Chara	5
Coontail	5
Clasping-leaf pondweed	4
Eelgrass	4
Flat-stem pondweed	3
Northern water-milfoil	3
Sago pondweed	3
Slender naiad	3
Elodea	2
Bladderwort	1
Variable pondweed	1
Waterstargrass	1
White Water Lily	1

Should the EWM infestation worsen, this area is a potential candidate for selective controls given its location (protection from wind), as long as any regulatory requirements could be satisfied.

Chemical Controls, continued

In addition to EWM and CLP, Starry Stonewort (*Nitella obtuse*) has been discovered within nearby lakes, including Little Cedar Lake. While preventing its' introduction into Big Cedar Lake altogether is the best form of control, the logical, next question of, "What if it does" must be considered.

The effort (and expense) required to control aquatic invasive species is most often in proportion to the size of the infestation. Therefore, an early detection program is critical to identify its' presence while the infestation is relatively small. While small infestations, *may* be most effectively dealt with using physical removal, chemical controls should be considered as well. While far from perfect, the control that can be obtained (using chemicals), at least in terms of biomass reduction, is very cost-effective in comparison to more labor-intensive methods.

Mechanical Harvesting

Mechanical harvesting is discussed in great detail in the 2014 Plan. This included the areas to be harvested, what species to harvest, and under what conditions native species were to be harvested, as well as details covering the operation and maintenance of harvesting equipment. This information can be found in the Appendix (Appendix A).

The Big Cedar Lake P & R District requires no modification in the areas to be Mechanically Harvested. Figure 18 (pages 29-31), presents the maps containing areas to be covered by the Harvesting Plan, shown alongside are maps detailing vegetation survey data obtained in August, 2018.

These maps include a detailed map of the areas to be harvested/skimmed within the North Bay Sensitive Area, with the latest revisions (approved by WI DNR on August 19, 2015). These modifications were made to conserve as much of the aquatic plant community as possible, while allowing for navigation in and out of this bay and the adjacent waters of Gilbert Lake.

Other maps provided including the harvesting off-load site, aquatic plant disposal site, and travel routes (Figure 19, page 32), and a detailed map of the Plant Disposal Site showing any adjacent Shore Wetland Floodplain Zoning Boundaries (Figure 20, page 33). The Aquatic Plant Disposal Site is an Update from the 2014 Plan and any future modifications must be approved by the WI DNR.

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 page 34. The Appendix contains the 2014 Aquatic Plant Management Plan (Section VI) adopted by the District and a copy of the approved 2014 Mechanical Harvesting Permit.

Figure 18

Original 2014 Aquatic Plant Harvesting Plan Map by Aron & Associates (left)
and August, 2018 Aquatic Plant Distribution within Big Cedar Lake (right)

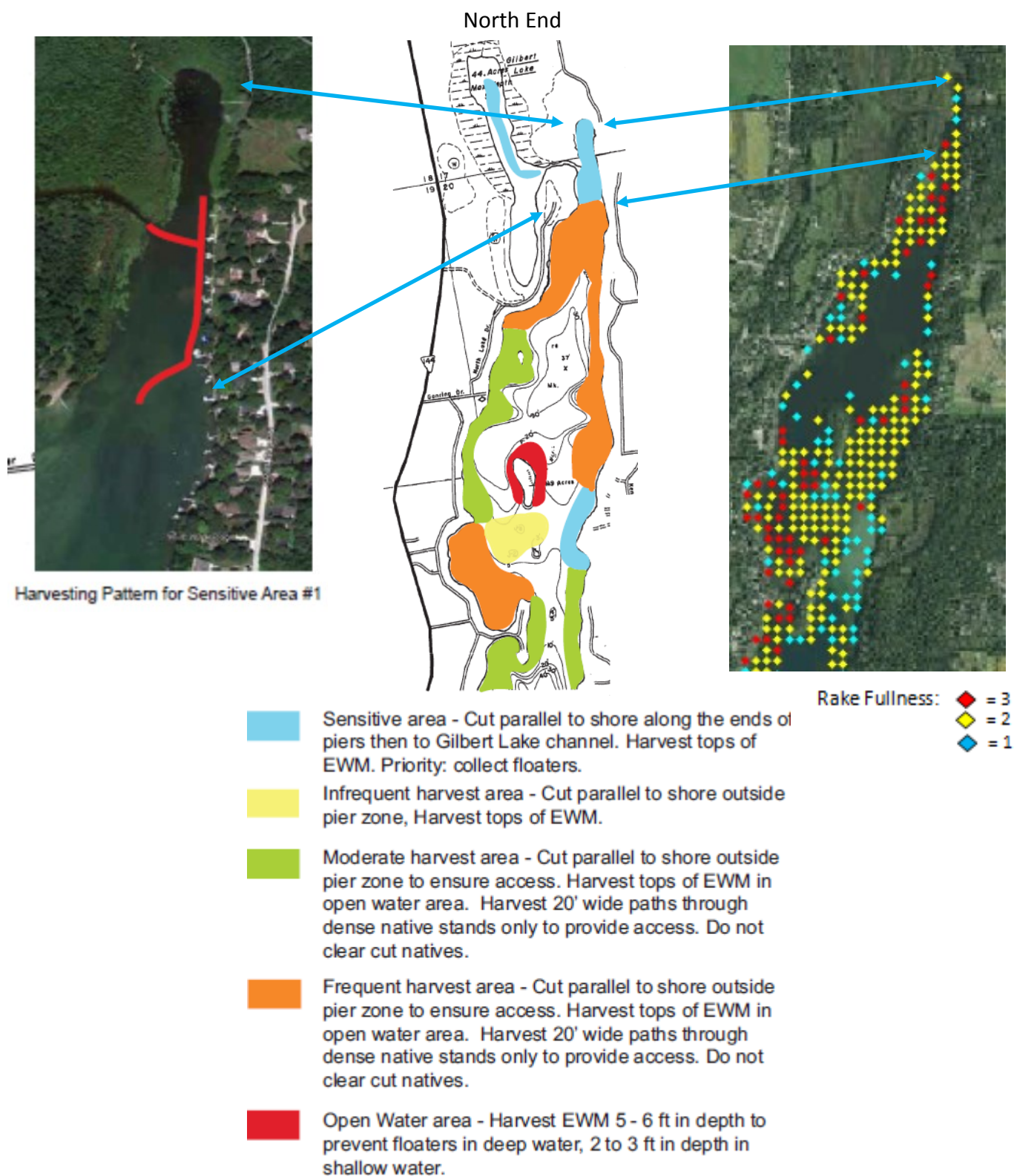


Figure 18, cont'd

Detail of Areas to be Harvested/Skimmed in North Bay (Sensitive Area)

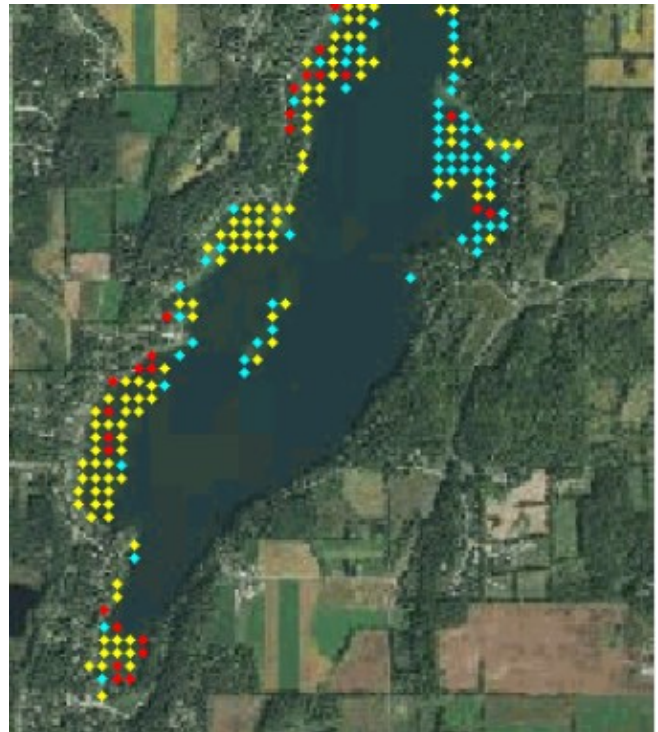
Big Cedar Lake—Revised August 19, 2015



Figure 18 (continued)

Original 2014 Aquatic Plant Harvesting Plan Map by Aron & Associates (left)
and August, 2018 Aquatic Plant Distribution within Big Cedar Lake (right)

South End








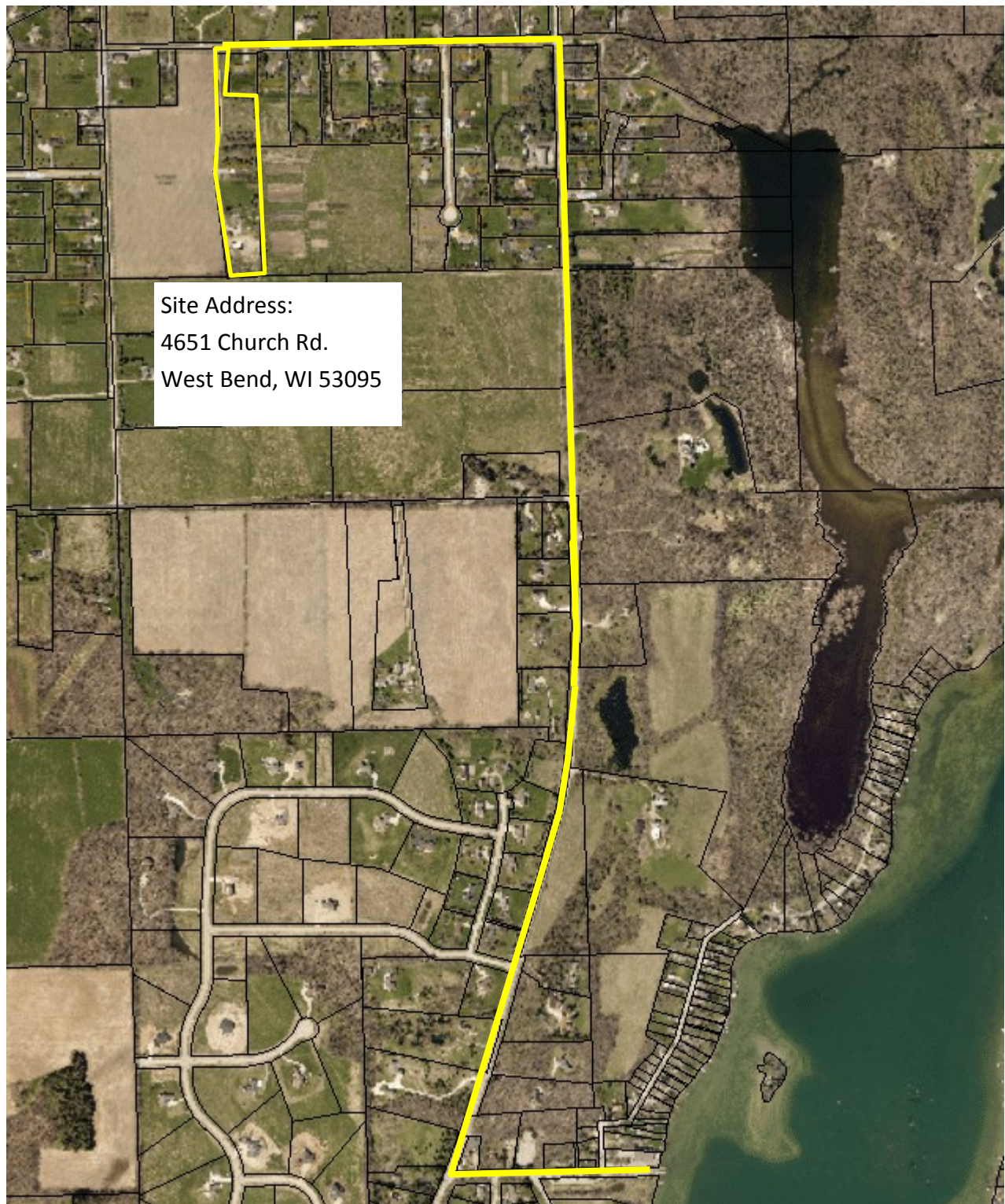
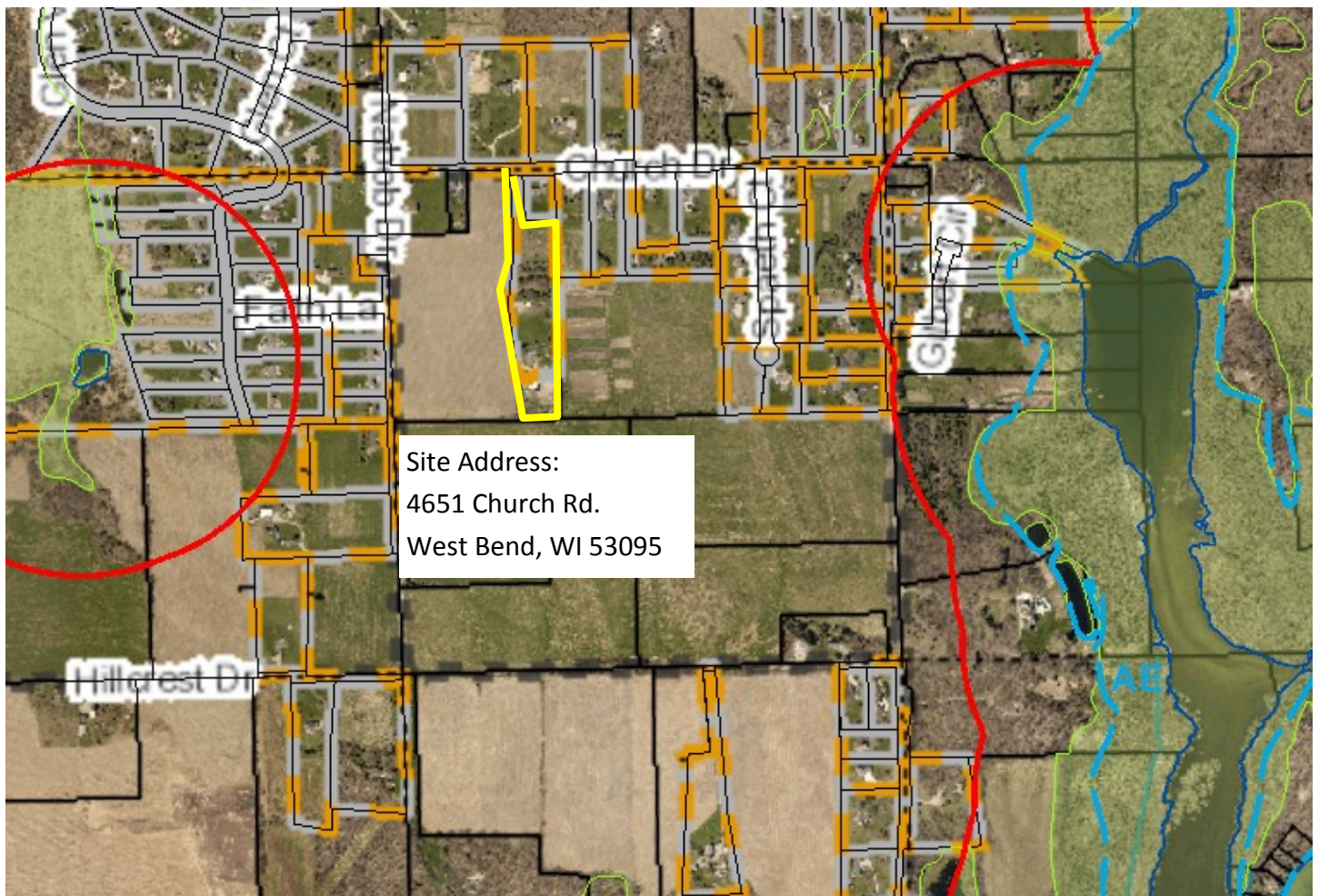
-  Sensitive area - Cut parallel to shore along the ends of piers then to Gilbert Lake channel. Harvest tops of EWM. Priority: collect floaters.
-  Infrequent harvest area - Cut parallel to shore outside pier zone, Harvest tops of EWM.
-  Moderate harvest area - Cut parallel to shore outside pier zone to ensure access. Harvest tops of EWM in open water area. Harvest 20' wide paths through dense native stands only to provide access. Do not clear cut natives.
-  Frequent harvest area - Cut parallel to shore outside pier zone to ensure access. Harvest tops of EWM in open water area. Harvest 20' wide paths through dense native stands only to provide access. Do not clear cut natives.
-  Open Water area - Harvest EWM 5 - 6 ft in depth to prevent floaters in deep water, 2 to 3 ft in depth in shallow water.

Figure 19
Big Cedar Lake P & R District Harvesting Plan
Location of Aquatic Plant Disposal Site and Haul Route (Yellow)



Site Address:
4651 Church Rd.
West Bend, WI 53095

Figure 20
 Detail of Big Cedar Lake P & R District Harvesting Operations
 Plant Disposal Site with Shoreland Wetland Floodplain Zoning Boundaries*



Legend

Red: Shoreland Zoning District Boundary	Light Yellow: DNR Army Corps. Of Engineers Regulated Wetland
Blue: 100 Year Floodplain Zoning District	Light Green Shade: County Regulated Shoreland Wetland

*Source: Washington County, Wisconsin Public GIS Viewer

Figure 19
Summary of the Big Cedar Lake - Washington County, WI
Aquatic Plant Management Plan—Recommended Activities

Water Quality Monitoring	Monitor lake for water clarity and nutrients
Education & Information	<p>This includes, but is not limited to familiarization with aquatic plants (identification of AIS) and the role they play in the lake ecosystem, landscape and shoreline management, the Big Cedar Lake Aquatic Plant Management Plan, and restrictions upon certain management activities.</p> <p>Numerous publications pertaining to lake management are available through the WI DNR website. These resources can be advertised in Newsletters and elsewhere.</p>
Hand Controls	<p>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. Exception: Non-native species. No permit required, no limit on amount of frontage that may be managed.</p> <p>Removal within DNR Designated Sensitive Area requires permit.</p> <p>Diver Assisted Suction Harvesting (D.A.S.H.) either for control of all plant species in high-use riparian areas, or for control of Aquatic Invasive Species. WI DNR permit required.</p>
Watershed Controls	District is encouraged to continue to monitor for changes in the watershed and cooperate with governmental agencies to ensure sound erosion control practices are enforced. Work with WI DNR and County Conservation Department in order to improve participation in Conservation Rehabilitation and Enhancement Program.
Land Use & Storm Water Planning	District is encouraged to actively participate in decision making by local municipalities, as new developments can lead to runoff issues that can impact Big Cedar Lake. This can include working with Town & County to ensure that ordinances designed to protect water quality are developed and enforced.
Herbicide Treatments	<p>Consideration of Spot-Type Treatments for control of Aquatic Invasive Species, where nuisance conditions exist. These may include Eurasian Watermilfoil, which is fairly common in the Sensitive Area at north end, or other species that may become a nuisance in future (Curly-leaf pondweed, and/or Starry Stonewort).</p> <p>Objective: To minimize formation of plant beds dominated by AIS and impacts upon recreation and native plant community.</p>
Mechanical Harvesting	Annual harvesting for Eurasian Watermilfoil and/or mixed plant beds within designated areas in order to maintain navigation, as-needed. Harvesting to be conducted in accordance with Harvesting Component of 2014 Plan, and submittal/approval of, WI DNR Harvesting Permit (5-year) in 2019. Note: Any proposed changes in the location of the plant disposal site must be approved by WI DNR.
Boat Launch Activities	Utilize volunteers or hired help to minimize the amount of floating plant debris in launch area and to inspect trailers leaving/entering the lake. Install/maintain signage to notify public about the importance of preventing transfer of AIS between lakes.
Aquatic Plant Monitoring	Full Point-Intercept Aquatic Plant Survey required every five years. Familiarize District staff and/or volunteers in identification of Starry Stonewort. Monitor boat launch areas to assist in Early Detection/Rapid Response of new species and/or infestations.

REFERENCES

Aron & Associates, 2014. *Big Cedar Lake Aquatic Plant Management Plan, 2014.*

APPENDIX

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

December, 2018

Appendix A. 2014 Aquatic Plant Management Plan (Chapter VI)

Appendix B. 2014-2018 Approved Mechanical Harvesting Permit (revised 8/19/15) and
cover letter from WI DNR.

CHAPTER VI - PLANT MANAGEMENT PLAN

GOALS AND OBJECTIVES

The goals and objectives on Big Cedar Lake continue to focus on balancing the various uses and needs. The difficult task facing those who attempt to manage their lake is that user needs often conflict. Fish and wildlife need aquatic plants to thrive. Boaters and swimmers desire relief from nuisance aquatic plants. Those depending on the lake for "aesthetic viewing" desire an undisturbed lake surface.

The management of non-native plants, specifically, Eurasian watermilfoil (*Myriophyllum spicatum*), and excessive amounts of native plants are of great concern to the District. The invasive plants and very dense native plants restrict boating use in some areas of the lake. Controlling the exotic plant and protecting the diversity of the native plant population is crucial to the ecological balance of the resource.

The District desires to:

- Minimize fragments of aquatic plants that are caused by the high volume of boating traffic and natural processes.
- Control exotic and nuisance plant species and maintain recreation access for lake users by:
 - ◊ Use of selective chemical treatments
 - ◊ Harvesting
 - ◊ Encouraging landowners to protect native species.
- Preserve and enhance the natural lake environment by:
 - ◊ Educating landowners and lake users in lake ecology.
 - ◊ Work with the Town, County and State governments to review existing ordinances, and if necessary, develop and enforce ordinances to protect Big Cedar Lake.
 - ◊ Continue to be vigilant regarding the watershed to protect Big Cedar Lake.
- Identify and expand local educational efforts that the District may undertake to improve the public's understanding of lake issues by:
 - ◊ Distributing at least 2 newsletters per year.
 - ◊ Encouraging community participation in lake management activities.
- Conduct in-lake management activities with the long-range goal of minimizing the management as much as possible by:
 - ◊ Conduct year-end evaluations as to the success of plant management activities and the community reaction to the activities.
 - ◊ Track the annual progress of lake management activities.
 - ◊ Conduct water quality monitoring efforts to assist in the documentation of results.
 - ◊ Develop a plan for quick response to new invasive species.
- Maintain navigational access:
 - ◊ Aggressively treat/harvest Eurasian watermilfoil and curly-leaf pondweed to prevent them from increasing their range in the Lake.
 - ◊ Maintain navigational access by controlling plants as necessary to maintain that access.
 - ◊ Treat filamentous algae mats on shorelines to prevent temperature increases and plant shifts, and to maintain navigational and recreational access.
 - ◊ Control vegetative mats that collect on the surface.

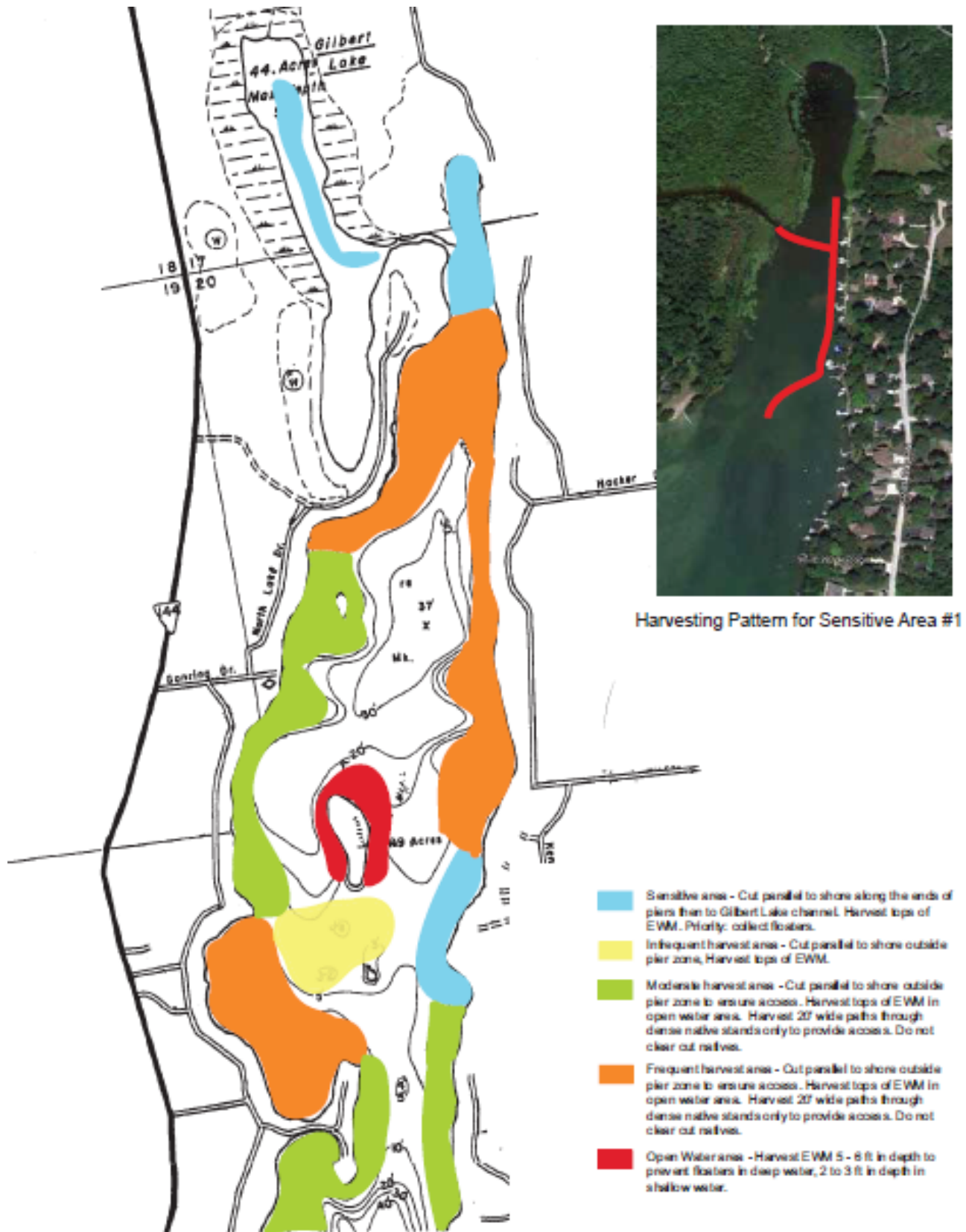


Figure 11 Big Cedar Lake Plant Management Plan, 2014

Appendix A, cont'd.

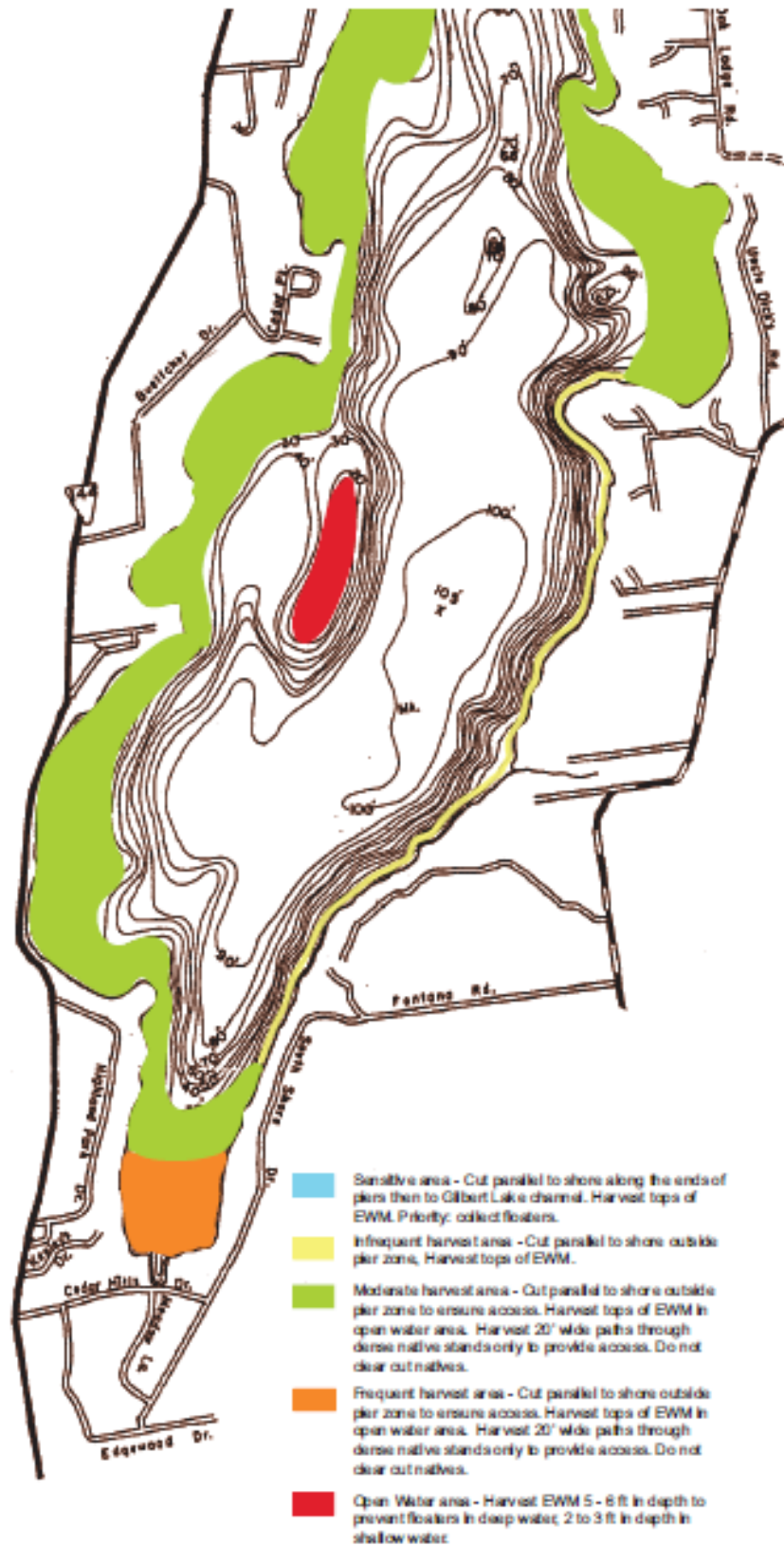


Figure 12 Big Cedar Lake Plant Management Plan, 2014

RECOMMENDATIONS

WATER QUALITY MONITORING

The District should conduct ongoing, detailed water quality monitoring on Big Cedar Lake. Monitoring should include nutrients as well as clarity.

HAND CONTROLS

Riparians should be encouraged to use the least intensive method to remove nuisance vegetation. This could include minimal raking and pulling. NR109 allows landowners to remove plants from an area up to 30 feet wide without a permit. The 30-foot area includes the swimming and pier areas. Landowners may manually remove Eurasian watermilfoil and curly-leaf pondweed from the remainder of their shorelines without a permit, without the use of auxiliary power. Removal of native plants beyond that allowed in the 30-foot area, will require a WDNR permit. If screens are considered by individuals, a WDNR permit will be required. Property owners in Sensitive Areas should consult DNR to determine if a permit is needed for any potential activities on their shorelines.

Riparians should be encouraged to allow native plants to remain. This will help prevent infestation of the areas by Eurasian watermilfoil or curly-leaf pondweed. The native plants will also help stabilize the sediments.

The District should inform landowners about the importance of keeping their shorelines free of floating plant debris. Wave action can carry plant fragments into new areas, possibly aggravating nuisance conditions. Plant debris can be used in mulch piles or gardens.

Handpulling is recommended to control small new infestations of curly-leaf pondweed and Eurasian watermilfoil.

There is no cost associated with this component unless the District wants to hire students to assist landowners with this option.

EDUCATION AND INFORMATION

The District should take steps to educate property owners regarding their activities and how they may affect the plant community in Big Cedar Lake. Informational material should be distributed regularly to residents, landowners, and lake users and local government officials. A newsletter to landowners and residents should be part of the annual plant management budget. Topics should include information relating to lake use impacts, importance and value of aquatic plants, land use impacts, etc. Information on shoreline restoration and plantings can be provided. Publications are available that list sources of plants and methods of creating buffers. Other issues that should be addressed may include landscape practices, fertilizer use, and erosion control. Existing materials are available through the WDNR and the UWEX. Other materials should be developed as needed. The Town provides an informational materials rack in the Town Hall and should continue to stock various lake handouts.

The District should consider participating in the Clean Boats Clean Waters program. Information on this is available on the WDNR website at <http://dnr.wi.gov/lakes/>.

The District should also enlist the participation of the local schools. The schools could use Big Cedar Lake as the base for their environmental education programs. Some schools have a mandatory community service requirement that may be tapped to assist with lake management activities. Regular communication with residents will improve their understanding of the lake ecosystem and should lead to long term protection.

The District should inform residents about the lake management activities that are undertaken and the reasons behind the activities.

These activities and their associated costs are highly variable. Boat launch inspection programs should cover at least 200 hours per season. Grants are available to offset some of the costs. Other activities' costs will depend upon the frequency of the mailings and the availability of existing materials.

WATERSHED CONTROLS

The District should continue aggressive improvement of water runoff into Big Cedar Lake. All areas of the watershed should be toured regularly for identification of new problems.

The District should work with the Town officials to encourage rigid enforcement of erosion control in the watershed and consideration of lake-friendly methods of development and road construction. The District should also work with the County Conservation Department and the Natural Resource Conservation Department to improve participation in programs such as the Conservation Rehabilitation and Enhancement Program (CREP) that will protect Big Cedar Lake.

LAND USE PLANNING

The District should take an active role in land use planning decisions in the local municipalities. Development proposals should be analyzed with the lake in mind and revised if necessary to protect the lake from damaging runoff. Long range planning should ensure that future development includes lake protection.

STORM WATER PLANNING

The District should review any new development proposals in the watershed to ensure that the lake will not be damaged by changes in flows or quality of stormwater. The District may consider applying for grants to assist with land use and storm water planning. The District may work with the Town and County to develop, refine, and implement storm water ordinances. The District should work with the Town to educate residents on the importance of the use of phosphorus-free fertilizer and the local ordinance that requires its use.

CHEMICAL TREATMENT

- The scope of any District-sponsored treatment should be small at first because chemical treatment has not been used in recent years. This should be done with the consent of a majority of District residents in the proposed treatment areas. Residents may "opt out" of the chemical treatment. In other words, their shorelines would not be treated. Residents may also conduct individual chemical treatments, however, WDNR permits must be obtained prior to any treatments.
- The District may decide to use chemicals to control nuisance plants in the shoreline areas. Treatments should minimize the effects on non-target plants. Care should be taken to avoid treating too much plant material at a time. Earlier, rather than later season treatments will accomplish this. Waiting until there are high densities to treat could place undue stress on the fish community by reducing oxygen concentrations post treatment. WDNR will allow treatment of native plants only if severe navigational impediments are present.
- In the most diverse areas of the lake, treatment should focus only on Eurasian watermilfoil.
- The swimming beaches may be treated with non-selective, contact herbicides to provide safe swimming conditions.
- Depending upon conditions, targets species for chemical treatment include: Eurasian watermilfoil and curly-leaf pondweed. Curly-leaf pondweed treatments should be conducted very early in the season, but only in areas where native pondweeds are not present to be impacted by the treatment.
- Areas which are chemically treated should not be harvested.

Appendix A, cont'd.

- The District should work with DNR on a rapid response chemical treatment if new exotic species are found in the lake.

WDNR Administrative Rule NR 107 should be consulted for the specific requirements for conducting a treatment. The following are some of the steps that should be followed by the District when preparing to conduct chemical treatments.

- Complete and submit the WDNR permit application forms. Include treatment map, area sizes and name and addresses of all affected riparian landowners.
- Contact licensed firm to coordinate proposed treatment.
- When treatment areas will be greater than 10 acres, a public notice should be placed in the local paper informing the public about the proposed treatment. This will also inform those who may be using the public beaches.
- Provide a copy of the WDNR application to any riparian landowner who is adjacent to the proposed treatment areas. This may be done by newsletter, or box drops.
- At the time of treatment, WDNR approved yellow posting signs must be posted in and adjacent to treatment areas, at least every 300 feet. The signs must indicate what chemical has been used, and any use restrictions and must remain posted for at least the time of any restrictions.
- Current administrative codes should be reviewed annually to ensure compliance..

HARVESTING

- The District may use harvesting and skimming to provide relief from nuisance conditions.
- Harvesting should not be done in areas that are treated with herbicides.
- Any harvesting done should be carefully planned to avoid native plants as much as possible.
- Harvesting may be used to create channels to provide navigational access.
- No harvesting should be done in shallow waters less than three feet deep except where providing navigational access to open water areas.
- Predominantly Eurasian watermilfoil areas should be "topped". In shallower areas that would mean that the top 2 to 3 feet of plant material should be harvested. In deep areas, the top 4 or 5 feet of plant material should be harvested, cutting above any native plants. This will allow light to reach the natives and will encourage their growth.
- Native plants may be harvested if necessary to open access lanes and minimize disruption and cutting by boaters.
- Educational efforts should be developed to inform the public about the benefits of a comprehensive plant management program, that gives equal consideration to fish and wildlife, while reducing recreational nuisances and unsafe situations.

WDNR Administrative Rule NR 109 should be consulted for the specific requirements for conducting harvesting. The following are some of the steps that should be followed by the District when preparing to harvest.

- Complete WDNR permit application forms. Include map, area sizes and name and addresses of all affected riparian landowners.
- Current administrative codes should be reviewed annually to ensure compliance.

- Records should be kept documenting loads and other pertinent information. The District should stress to the operators the importance of keeping accurate records.
- The District should provide operators with a copy of the harvesting permit and be sure it is read and understood, to ensure compliance with its provisions.
- The District should concentrate harvesting efforts on Eurasian Water Milfoil. Efforts should be made to eliminate "shading" of lower growing native plants and to reduce floaters.
- Daily records should be kept documenting loads, maintenance, downtime, and other pertinent information. The District should stress to the operators the importance of keeping accurate records.
- Harvesting operators should be trained to identify target plant species. This would allow the operators to avoid areas with high numbers of pondweeds that should not be cut.
- Operators should not cut plants in less than three feet of water unless providing access to open water areas.
- The District may continue its current harvesting schedule.
- Any turtles or game fish that may be harvested with the plants should be returned to the lake.
- Avoid harvesting in areas with spawning fish.
- Disposal of cut plants may continue to be disposed of locally.
- The District should continue its practice of attempting to hire experienced operators as well as conducting comprehensive training in equipment operation and maintenance.
- The District is required to summarize its harvesting records into an annual report to provide to WDNR.
- The District should review the plant management plan and operations every three to five years.
- The District should distribute informational materials to its members that include such topics as proper lawn and garden practices, land use impacts and the importance and value of aquatic plants.

General Harvesting Recommendations

Emphasis of harvesting program should be placed on removal of plants necessary to facilitate recreational use, rather than simply 100% removal. The emphasis should be on providing access rather than clear cutting.

Staff needs to make sure that cutter bars are kept out of the sediments or to cut one foot above the plant beds, especially within areas where muskgrass dominates the plant community. Harvesting in shallow water depths should be restricted to Eurasian watermilfoil infested areas thereby further protecting the muskgrass beds and the pondweeds dispersed among the muskgrass.

Staff should concentrate harvesting efforts on the Eurasian watermilfoil areas (especially to help reduce the amount of floaters). Eurasian watermilfoil should be harvested before a canopy, and flowers, begin to form. Attempts should be made to avoid cutting areas that have desirable native plant species especially when native pondweeds are in seed. Where Eurasian watermilfoil is present along with native plants, cutting above the native plants will open up more sunlight to the natives, will encourage native plant growth, and will remove any flowering portions of Eurasian watermilfoil.

Staff should maintain an aggressive program to reduce the amount of "floaters" and to remove them as soon as they occur. Equipment should be operated so that cut plant material does not fall off the harvester. Deep water areas that need to be harvested for access purposes should be cut to depths between five and six feet to prevent boating activity from cutting plants.

Off-load sites must be cleaned of plant debris following each off-load. This will help to prevent Eurasian watermilfoil infestations along the neighboring shoreline.

Comprehensive and detailed records should continue to be kept documenting:

- Date
- Hours worked - including harvest and down time
- Loads harvested - including plant types and densities
- Areas harvested - located on a map
- Weather conditions
- Other pertinent information, including an estimation of numbers, species, and area of incidental turtle and fish captures.

Site Specific Recommendations

Some areas of Big Cedar Lake should continue to be given special consideration. Each of the following recommendations expand upon the previous recommendations.

Northern Bay, Developed Shorelines: As designated by the WDNR, harvesting should be restricted to providing riparian access only. A single, 50-foot wide navigational channel should be placed along the ends of the piers, and to the inlet to Gilbert Lake . Sediment disruption should be minimized as much as possible. There should be an emphasis on removing floating plant debris.

Island Areas: Harvesting of plant nuisances may be performed in those areas deep enough so as not to disturb the bottom sediments and the Chara.

Gilbert Lake: The harvesting recommendations referenced in the Gilbert Lake Plan should continue to be followed: Harvesting should be done only once per year, beginning July 15 and ending before the third week in August. Harvesting should be restricted to providing a navigational channel only, no wider than 6 feet, or the width of the harvester. Cutting should be restricted to 3 feet deep and should not cut into the bottom sediments at any time.

Sensitive Area 2: No harvesting may be done in this area.

Schedule For Harvesting

The District should establish a schedule based on the nuisance conditions. A review of past harvesting records in conjunction with a pre-harvest survey should be conducted each spring to determine which areas need attention and which areas are undergoing a change from the previous year. If plants become a nuisance in mid-May, begin harvesting but note previous recommendations, especially with regard to fish spawning areas.

Harvested Fish & Wildlife

Care should be given to returning any captured game fish and turtles to the lake. If game fish are caught in quantities of more than a few per area, the harvesting crew should take the following actions:

- Reduce the operating speed of the harvester to give fish a chance to flee.
- If that does not help, then reduce cutting depth and see if problem is resolved.
- If fish are still being harvested, refrain from cutting area and consult with WDNR or private consultant for further recommendations.

Off-Loading and Disposal Sites

Current disposal practices should continue. The District has a disposal site for use when chemical treatments are not conducted. There are no wetlands or floodplains on or near the site. Care should be taken to keep lake areas adjacent to off-load sites clean of cut vegetation. Staff should be instructed to remove any vegetation debris immediately upon off-loading the harvester.

The haul route is Gonring Dr West to Hwy 144, north to the disposal site.



Figure 4 Disposal Site, Big Cedar Lake Harvesting

The District should continue efforts to locate one or two more off-load sites. This would reduce the amount of time spent in transport, and would increase the efficiency of the program. That in turn would allow for lower staff hours, or more time spent on other activities to benefit Big Cedar.

The District may purchase a transport barge for improve the efficiency of the harvesting program.

The District should continue its practice of attempting to hire experienced operators, as well as conducting comprehensive training in equipment operation, maintenance and safety. All employees should be trained in the identification of the plants in Big Cedar Lake. This will help protect beneficial plant beds and will ensure accurate documentation of changes that may occur in the aquatic plant community as part of their daily program.

The district should develop a plan to train new employees so they can understand the Districts' approach to harvesting and get experience while under the direction of the long-term employees.

Maintenance Program & Downtime

Maintenance should continue as is currently done. The focus should continue to be on preventive methods, rather than reactive. The use of synthetic, biodegradable hydraulic fluids in the harvester will reduce the adverse impacts to the lake from spills. A small spill kit should be acquired to immediately and efficiently deal with any spills that may occur.

Storage

All equipment used by the District to harvest aquatic plants is stored in the District's building.

Insurance

Insurance coverage should remain the same unless conditions should prompt a review.

Recommended Record Keeping

Staff should continue to fill out the daily operation log detailing harvesting hours. The information should be entered into a database to provide ready access and evaluation.

Staff should make sure that information recorded is complete, including hours worked in each area, equipment used, numbers of harvester loads removed, and hours spent on maintenance and repair. Any obvious changes seen during the course of the summer should be noted, including regrowth patterns and densities.

Operator Summary

Harvester operators should be provided with the Daily Log Sheet as well as a summary of the areas to be treated and methods to be followed.

Other Activities

Other administrative records should be maintained.

- The District should ensure that the harvesters are complying with the WDNR permits, and all laws associated with exotic species control.
- The District should file its annual report with WDNR in compliance with permit requirements.

BOAT LAUNCH ACTIVITIES

The District should enlist property owners, volunteers, students or hired help to remove debris regularly in the near-shore and shoreline areas, especially at the boat launch. This will minimize the amount of plant fragments that are moved by boats and trailers and will increase the chances of noticing new invasions of exotic species.

The District should continue to pursue efforts to minimize/prevent introductions of exotic species. This can include signage at the boat launch. This might include developing volunteer or staffing for launch sites to educate boaters using the sites.

NEW INFESTATIONS OF EXOTIC SPECIES

New infestations should be aggressively managed to eradicate the species from the system. Depending on the species, different levels of response may be needed. A reaction to a Hydrilla invasion, should warrant a “top level” response of closing access sites, treating the invasion and surrounding areas, and surveying the lake.

Steps should be taken to work with the Town, WDNR and Legislators to facilitate rapid response:

- The Legislature should be approached to develop state laws to allow local rapid response to take place.
- The WDNR should be approached to develop an emergency access plan should an infestation be found.
- Materials should be developed and produced to use in the event of an invasion. These would include press releases, public informational materials about the cause and effect of the invasion, and access site notices.

If a new exotic species is found, the following steps should be taken immediately:

- WDNR should be notified of the invasion.
- If a new exotic species is found, the following steps should be taken immediately:
 - Take a digital photo of the plant in the setting where it was found and mark with a GPS. Then collect 5 – 10 intact specimens. Try to get the root system, all leaves as well as seed heads and flowers where present. Place in a Ziploc bag with no water. Place on ice.
 - Fill out form <http://dnr.wi.gov/lakes/forms/3200-125-plantincident.pdf>
 - Contact the DNR Aquatic Invasive Species Contact (currently Heidi Bunk, WDNR Lakes Biologist) and deliver the specimens, report, digital photo, and coordinates. Do this as soon as possible, but no later than four days after the plant is discovered. A board member and lake consultant should also be notified.
 - Upon determination of species, a coordinated response plan should be developed in consultation with the DNR, the County, and lake consultants as needed.
 - The District should contact a chemical treatment applicator to schedule an immediate treatment of the area where the exotic was found. States with experience in reacting to new invasions recommend treating a five acre area surrounding the site.
 - A full, point-intercept survey of the lake should be conducted to determine the extent of the invasion.
 - The site should be inspected throughout the season to ensure efficacy of the treatment.
 - The survey and treatments should continue for at least three consecutive seasons to ensure eradication.
 - Surrounding lakes should be notified of the infestation and advised to begin surveying.

CONTINGENCY PLANS

The District should be prepared for changing aquatic plant conditions that may fall outside the specific recommendations in this Plant Management Plan. While the final determination will be permitted by WDNR, developing local consensus on possible solutions is often needed. In evaluating whether to treat or harvest a "new" nuisance condition, the following should be considered:

- ***Are the plants native or exotic species?***

If unsure, consult WDNR or an aquatic plant specialist to determine the species.

- ***Is the area in shallow or deep water?***

This quickly limits some of the options. Harvesting, for instance, cannot be used in water less than 3 feet deep. Different chemicals may be needed for deep water treatments.

- ***Is the condition impeding or preventing recreational use, or is something else a factor?***

Access channels may be created either by harvesting or chemical treatment. However, if water depth prevents access during a drought, chemical treatment will not open up boating access. However, chemical treatment may eliminate a filamentous algae that is causing odor problems.

- ***Is the situation creating unsafe conditions?***

Dense, stringy weeds in a beach area, for instance, could create dangerous conditions for young swimmers.

- ***Will the considered option improve the situation long term, short term, or both?***

The short term solution may eliminate the problem this summer, but make it worse in future years, while the long term solution may be the best over the long haul.

- ***Is the considered option detrimental to fish, wildlife, or humans?***

If it is, maybe there are other options to solve the problem that would be safer.

- ***Will the considered option increase invasion by other nuisance species?***

Consider whether the option will create "bare" lakebed that will quickly be invaded by weedy species, or whether the option will protect desirable vegetation while removing the nuisance.

Appendix B

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



August 19th, 2015

Daniel W. Carroll
Operations Manager/Chief of Water Safety Patrol
Big Cedar Lake P.R.D.
4480 Gonring Dr
West Bend, WI 53095

Subject: 2014 – 2018 Mechanical Harvesting Permit; SE-2014-67-11M
Revised Permit Conditions

Dear Mr. Carroll:

The Department of Natural Resources (Department) has received your request for an amendment to your existing harvesting permit. The (electronic) request, dated July 28th, 2015, is for an additional 1.73 acres of harvesting in Sensitive Area #1. Your original permit application was for harvesting aquatic plants by mechanical means in up to 19.71 acres on Big Cedar and Gilbert's Lake in the Townships of Polk and West Bend, Washington County. The combined acreage is now 21.44 acres. Please read your revised permit carefully and contact us if you have questions.

The revised permit is being issued in accordance with the 2014 Big Cedar Lake Aquatic Plant Management Plan and your request to amend, dated July 28th, 2015. The inset figure on Figure 11 of your Aquatic Plant Management Plan is replaced by the new Figure 19. Figure 19 describes the new harvesting patterns permitted in Sensitive Area #1. The Department has added Figure 19 as an appendix to your approved Aquatic Plant Management Plan.

Your original permit condition #10 has been significantly revised. Condition #14 is new.

It is recommended that a new aquatic plant survey (point intercept) be completed during the summer of 2018. This survey will prepare you to update your aquatic plant management plan and will allow you to apply for another multiple year permit in 2019.

Attached is a copy of your permit with the conditions that must be followed. In addition, I have included a copy of our findings of fact, conclusions of law, and your right to appeal our action. 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 of you.

If you have any questions, please contact me at 262.574.2130 or heidi.bunk@wi.gov.

Sincerely,

Heidi Bunk
Lakes Biologist

Cc: Travis Motl, Fisheries Biologist
Roger Walsh, BCLPRD
Kathy Aron, Aron and Associates

Rob McLennan, DNR Water Quality Supervisor
Samm Posnanski, Water Resources Specialist

Appendix B, cont'd

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Permit for Mechanical Harvesting of Aquatic Plants

Big 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 21.44 acres of Big Cedar Lake, Washington County, Township 11 North, Range 19 East, Sections 17, 20, 29, 30, 31, 32, and Township 10 North Range 19 East Sections 4 and 5, subject to the following conditions. **This permit is issued for a 5-year term and will expire on December 31, 2018.**

PERMIT CONDITIONS

1. Big Cedar Lake Protection and Rehabilitation District representatives or harvester operators must notify Lakes Biologist Heidi Bunk (262-574-2130), four (4) working days prior to anticipated start of the harvesting operation. A schedule of harvesting operations should be submitted upon request. Department staff may schedule and conduct an onsite supervision of harvesting activities.
2. Mechanical harvesting will only be allowed in the areas specified in the 2014 Big Cedar Lake Aquatic Plant Management Plan submitted to the Department, the revision as described on Figure 19 and as further defined by the conditions below. A copy of the permit and maps shall be maintained onboard the harvester(s) at all times harvesting operations are conducted.
3. All aquatic plants cut must be removed immediately from the water. Disposal of the harvested aquatic plants must be located in the areas specified in the Big Cedar Lake 2014 harvesting application and must be in accordance with any applicable county and local regulations. **Disposal shall not occur in a wetland, below the ordinary high water mark of any waterway, or in a floodplain or floodway.**
4. The quantity and species of plants to be mechanically harvested must be in accordance with the Big Cedar Lake 2014 Aquatic Plant Management Plan, Figure 19 and as described in the permit application.
5. All mechanical harvesting records must be maintained and made available to the Department upon request. Annual reports summarizing harvesting activities shall be given to the Department by **November 1st each year**. The annual report shall include a map showing the areas harvested, the total acres harvested, and the total amount of plant material removed from the body of water.
6. Basic aquatic plant identification skills shall be a part of the harvesting employee's training. At a minimum, the employees shall be able to differentiate between invasive and native plant stands and how to recognize Eurasian watermilfoil from native milfoils and curly-leaf pondweed from native pondweeds.
7. The cutting bar on the harvester shall not be set to hit or upset the bottom sediment in the lake. Harvesting personnel shall take the precaution to avoid harvesting in shallow areas where no Eurasian watermilfoil is present. The upset of the sediments can increase the potential for Eurasian watermilfoil colonization and also damages the aquatic community.
8. As much as possible, game fish and turtles harvested with the plants shall be returned to the lake.
9. Off-loading sites must be cleaned of plant debris following each off-load to assist in the prevention of Eurasian watermilfoil colonization along the neighboring shoreline.

Appendix B, cont'd

10. Harvesting in Sensitive Area #1 in the Northern Bay shall conform to the mapped instructions on Figure 19. A single, 70-foot wide navigational channel shall be cut parallel to the pier line. A single, 50-foot wide navigational channel shall be cut to the Gilbert Lake inlet. These areas shall be cut no deeper than three feet.
11. The Gilbert's Lake area may only be harvested once per year, beginning July 15th and ending the third week of August, to protect the sensitive nature of this area and fish spawning. The navigational channel shall be maintained no wider than six (6) feet or the width of the harvester. The cutting bar shall be set to harvest no deeper than three (3) feet. At no time should the harvesting machinery directly touch the bottom sediment.
12. No cutting shall occur in Sensitive Area #2. The harvester may skim within Sensitive Area #2 to remove floating mats of vegetation.
13. Harvesting in the "Moderate Harvest Area" and "Frequent Harvest Area" should conform to the legend notes as described in the Big Cedar Lake Aquatic Plant Management Plan (Figures 11 and 12, pages 48 and 49). Harvesting may not be conducted in such a manner that a "clear cut" of the native aquatic vegetation results. Harvesting through dense stands of native plants is limited to a 20 foot wide navigational access.
14. Harvesting in Sensitive Area #1 in the Northern Bay may also include a "Skim Zone" as needed to remove floating vegetation. The "Skim Zone" shall conform to the map instructions on Figure 19. The "Skim Zone" varies in width between 40 feet and 110 feet. This area shall be cut no deeper than one foot.

FINDING OF FACTS

1. Big Cedar Lake Protection and Rehabilitation District has filed an application for a permit to conduct a mechanical harvesting operation in the Townships of Polk and West Bend, Washington County. The specific area to be harvested is in accordance with the 2014 Big Cedar lake Aquatic Plant Management Plan and Figure 19, submitted July 28th, 2015.
2. The department has determined the proposed mechanical harvesting will provide nuisance aquatic plant relief in the designated areas. The mechanical harvesting will allow for increased navigation and recreational opportunities.
3. The department has determined that there will be no significant adverse impacts resulting from the mechanical harvesting of Big Cedar Lake and Gilbert's Lake.
4. The total harvesting area is 21.44 acres shown on the maps submitted with the application, Figure 19 submitted on July 28th, 2015 and as approved in the conditions above.

Appendix B, cont'd

CONCLUSIONS OF LAW

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 the 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 Sections 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, 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 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, August 19th, 2015

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By Heidi Bunk

Heidi Bunk
Lakes Biologist

Appendix B, cont'd

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 DNR USE ONLY	
Date Received <u>4/1/2014</u>	ID Number <u>SE-2014-07-11M</u>
Fee Received <u>9360.00</u>	County Code <u>67</u>
Exp. Date <u>12/31/2018</u>	WBIC <u>25300 + 25000</u>

Section I: Applicant Data

Permit Applicant Name <u>Big Cedar Lake PRD</u>			Applicant is <input type="checkbox"/> Private Individual <input type="checkbox"/> Contractor <input checked="" type="checkbox"/> Lake Organization (Specify) <u>BCLPRD</u>		
Applicant Mailing Address <u>4480 Gearing Dr</u>			Lake Property Address, City, State, ZIP (if different) <u>Same</u>		
City <u>West Bend</u>	State <u>WI</u>	ZIP Code <u>53095</u>			
Telephone Number <u>262-629-9322</u>	E-Mail Address <u>bigcedarlakepr.com@net</u>	Telephone Number	E-Mail Address		

Individuals and organizations (e.g., Lake District, Lake Association, Property Owners Association, County Department of Recreation), sponsoring removal. Attach additional sheets if necessary.

Name	Address	Phone	E-mail Address
A.			
B.			
C.			
D.			

Has a Lake Management plan been provided to the DNR? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, date approved of most current copy <u>2014 PMP</u>	Location of Applicant file copy <u>District office</u>
Does the proposed plant removal agree with the approved plan? If NO, explain. Attach additional sheets if necessary.		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Is this area within or adjacent to a Sensitive Area designated by the Wisconsin Department of Natural Resources? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	If yes, list sites <u>See Plant Management Plan</u>
---	--

Section II: Location of Aquatic Plant Removal and Disposal

Waterbody of proposed plant removal <u>Cedar and Gilbert lake</u>	Lake Surface Area (acres) <u>932</u>	County <u>Washington</u>	Town <u>11</u>	Range <u>19 E</u>	Section <u>20</u>
Name of Firm (if sub-contracted)		Telephone Number			
Street Address		City, State and ZIP			
Name of 1st Plant Disposal Site (if applicable) <u>Fritsche Property 144 E Hwy 33</u>	1/4 / 1/4	1/4	Section	Township	Range E / W County
				N	
Name of 2nd Plant Disposal Site (if applicable) <u>See Attached Sheet</u>	1/4 / 1/4	1/4	Section	Township	Range E / W County
				N	

Area(s) Proposed for Plant Removal (Note details in permit cover letter for final permitted sizes). Please see attached sample drawing for guidance

- Length from shore _____ ft. x Shoreline or area width _____ ft. / 43,560 ft. = _____ Estimated Acreage Avg. Depth _____ ft.
- Length from shore _____ ft. x Shoreline or area width _____ ft. / 43,560 ft. = _____ Estimated Acreage Avg. Depth _____ ft.
- Length from shore _____ ft. x Shoreline or area width _____ ft. / 43,560 ft. = _____ Estimated Acreage Avg. Depth _____ ft.
- Offshore Control Site Length _____ ft. x Shoreline or area width _____ ft. / 43,560 ft. = _____ Estimated Acreage Avg. Depth _____ ft.
- Offshore Control Site Length _____ ft. x Shoreline or area width _____ ft. / 43,560 ft. = _____ Estimated Acreage Avg. Depth _____ ft.

TOTAL ESTIMATED ACREAGE _____ (See Plant Management Plan)

Appendix B, cont'd

Mechanical / Manual Aquatic Plant Control Application

Form 3200-113 (R 3/04)

Page 2 of 4

Section II: Location of Aquatic Plant Removal (cont.)

What type of aquatic plants below the Ordinary High Water Mark are proposed to be removed? (check all that apply)

- ☐ Emergent
(above water level)
 ☒ Submergent
(below water level)
 ☐ Floating Leaf
(at the surface i.e. lily pads)

Section III: Map & Property Ownership

Attach a copy of a lake map that includes the property(s) to be harvested. If no printed map is available, provide a sketch of the site at the bottom of this page. On the map, identify the following required information.

- Area and dimensions of each proposed plant removal area.
- Location of all riparian neighbors (property owners riparian to and adjacent to the proposed removal area) including project participants and non-participants. Consecutively number each riparian neighbor (both project participants and non-participants). In the space below:
- Name all riparian owners, including project participants & non-participants. The number should correspond with the numbered properties on the map. Attach additional sheets if necessary.
- Check Yes box to indicate project participants and No box for non-participants.

No.	Name of Riparian Neighbor	Project Participant	Control dimensions (calculated acreage)
1.		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2.		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3.		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4.		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5.		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6.		<input type="checkbox"/> Yes <input type="checkbox"/> No	

- ☐ Check here if separate sheets are attached identifying additional neighbor riparian owners. Indicate project participants and/or non-participants.
 ☒ Check here if printed map attached. If no printed map, use this space to sketch the site and provide required information.

Map

Appendix B, cont'd

Mechanical / Manual Aquatic Plant Control Application

Form 3200-113 (R 3/04)

Page 3 of 4

Section IV: Methods

What mechanical or manual methods to remove plants are proposed? (check all that apply)

- ☒ Mechanical harvesting ☐ Raking ☐ Other _____
☐ Hand Pulling ☐ Cutting _____

Please explain why you selected the proposed method(s).

This method has worked good for us in the past.

Note: Other control methods (i.e. bottom barriers, weed rollers, herbicides) also need DNR permits. Contact this office for more details.

Section V: Fees

Fees are not refundable and are calculated as follows:

Check box for type of project:

1. ☐ single riparian area, one property owner, less than one acre \$30.00
2. ☒ multiple riparian areas, offshore control areas, multiple riparian properties, one acre or greater \$30.00/acre (round up to the nearest whole acre)
If proposed removal is greater than 10 acres fee caps at \$300.00

19.71 acres x \$30.00 per acre = \$ *300.00*

Total non-refundable fee enclosed (max \$300.00) \$ *300.00*

Section VI: Reasons for Aquatic Plant Removal

Purpose of Aquatic Plant Removal

- ☒ Maintain navigational channel for common use
☐ Maintain private access for boating
☐ Maintain private access for fishing
☐ Improve swimming
☐ Other _____

Nuisance Caused By

- ☐ Emergent water plants
☒ Submergent water plants
☐ Floating water plants
☐ Other _____

Name of plants, if known

See Plant Management Plan

Section VII: Alternatives Considered

A. Previously Done?

- | | | |
|-----------------------------------|---|--|
| 1. Chemical | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. Sediment screens | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 3. Dredging | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Drawdown | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 5. Nutrient controls in watershed | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 6. Nutrient controls on property | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 7. Other | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

B. Presently Proposed?

- | | |
|---|--|
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |

NOTE: Consider feasibility of alternatives for each control site. This information not only helps the department make a decision on this application but also helps you evaluate your investment in aquatic plant management.

Describe the level of success for alternative methods previously used:

- | | |
|-----------------------------------|------------------|
| 1. Chemical | <i>Poor</i> |
| 2. Sediment screens | <i>NA</i> |
| 3. Dredging | <i>Average</i> |
| 4. Drawdown | <i>NA</i> |
| 5. Nutrient controls in watershed | <i>Excellent</i> |
| 6. Nutrient controls on property | <i>NA</i> |
| 7. Other | |

Appendix B, cont'd

Mechanical / Manual Aquatic Plant Control Application

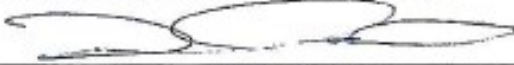
Form 3200-113 (R 3/04)

Page 4 of 4

Section VIII: Applicants Responsibilities

1. The applicant has prepared a detailed map, which shows the length, width and average depth of each area proposed for the control of rooted vegetation.
2. The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management 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.
3. The applicant agrees to inform all operators of harvesting equipment of the conditions and terms of this permit and to insure that all operators understand and abide by those terms and conditions.
4. The applicant agrees to comply with all terms and conditions of this permit, if used, as well as applicable Wisconsin Administrative 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.


Applicant's Signature

03-19-14

Date Signed

DNR Use Only

Review Notes:

☐ Natural Heritage Inventory Review

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

The foregoing application is approved. Permission is hereby granted to the applicant to mechanically or manually remove aquatic plants described in the application during the season. The approval of an aquatic plant management permit may not represent an endorsement of the permitted activity, but represents that the applicant has complied with Wisconsin Administrative Rules.


Season Year

2014-18

Application fee if received?

☒ Yes ☐ No

State of Wisconsin
Department of Natural Resources For the Secretary

By 
Regional Director or Designee

5-13-14

Date Signed

5-13-14 (email)

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 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 s. 227.48(2), Wis. Stats.

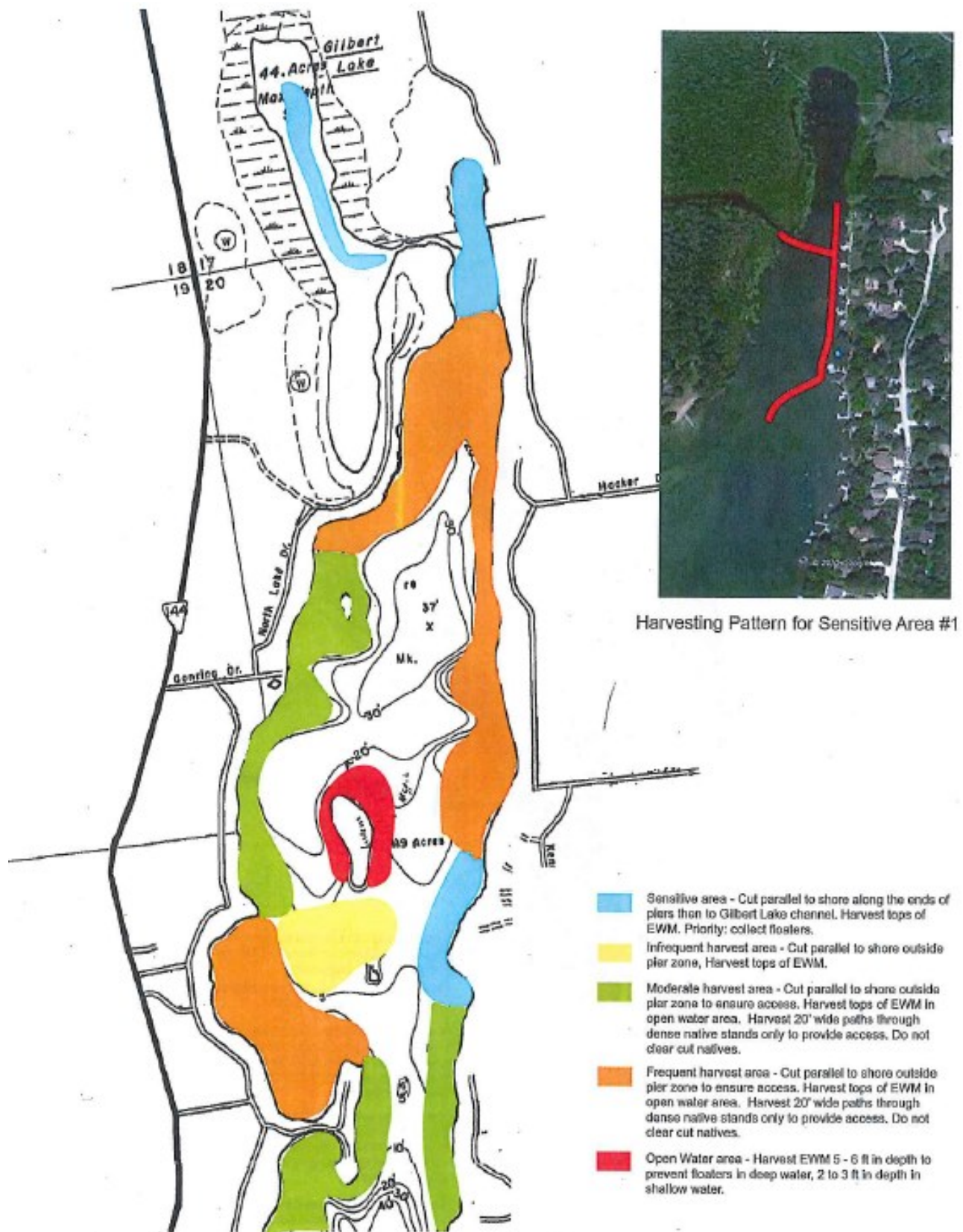
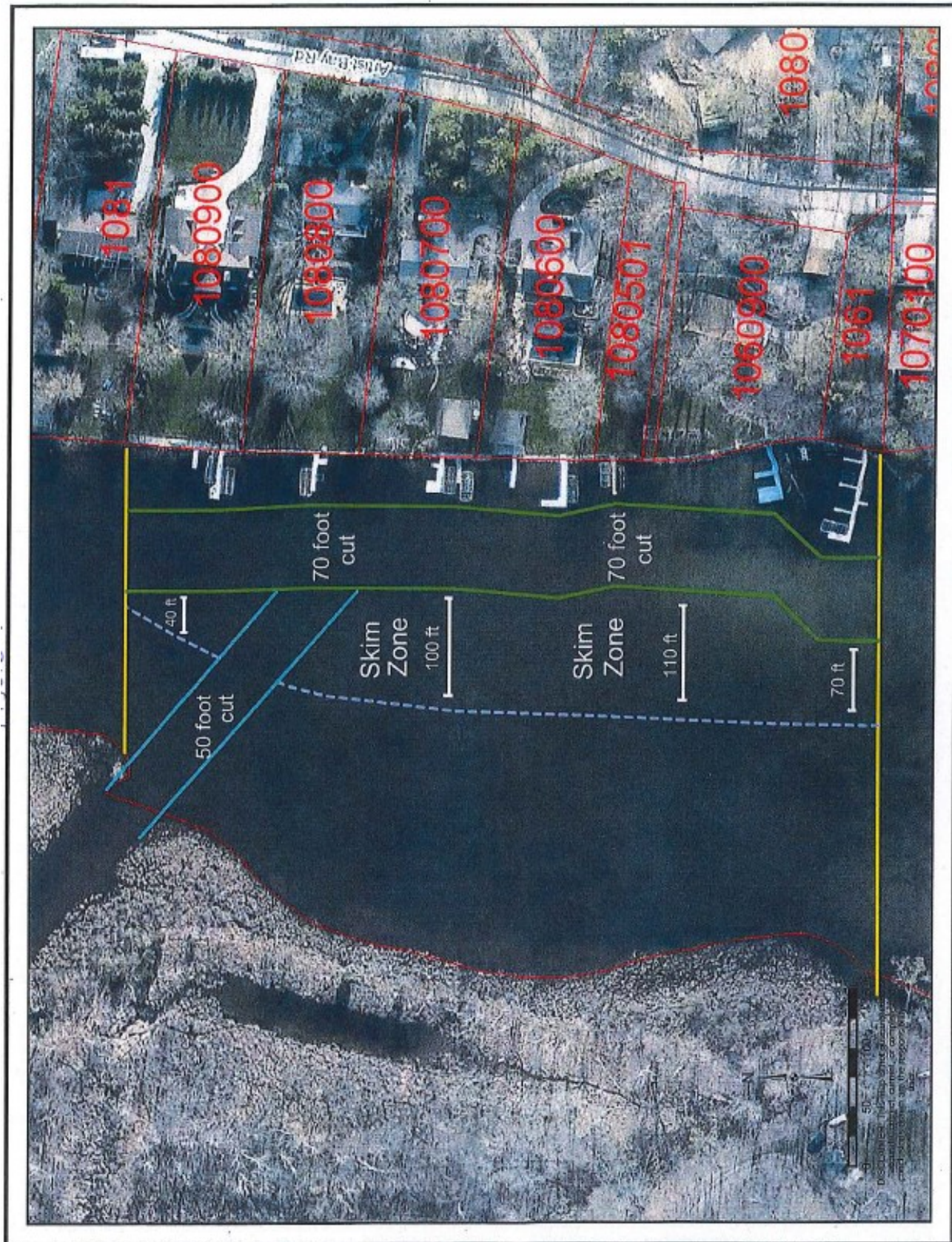


Figure 11 Big Cedar Lake Plant Management Plan, 2014



Figure 12 Big Cedar Lake Plant Management Plan, 2014

Appendix B, cont'd



Harvested Fish & Wildlife

Big Cedar Harvesting Disposal Site

Care should be given to returning any captured game fish and turtles to the lake. If game fish are caught in quantities of more than a few per area, the harvesting crew should take the following actions:

- Reduce the operating speed of the harvester to give fish a chance to flee.
- If that does not help, then reduce cutting depth and see if problem is resolved.
- If fish are still being harvested, refrain from cutting area and consult with WDNR or private consultant for further recommendations.

Off-Loading and Disposal Sites

Current disposal practices should continue. The District has a disposal site for use when chemical treatments are not conducted. There are no wetlands or floodplains on or near the site. Care should be taken to keep lake areas adjacent to off-load sites clean of cut vegetation. Staff should be instructed to remove any vegetation debris immediately upon off-loading the harvester.

The haul route is Goring Dr West to Hwy 144, north to the disposal site.



Not in Wetland
or Floodplain
SAP 4/9/2014

feet 1000
meters 500

Figure 4 Disposal Site, Big Cedar Lake Harvesting

The District should continue efforts to locate one or two more off-load sites. This would reduce the amount of time spent in transport, and would increase the efficiency of the program. That in turn would allow for lower staff hours, or more time spent on other activities to benefit Big Cedar.

The District may purchase a transport barge for improve the efficiency of the harvesting program.

Appendix B, cont'd

The most significant changes have occurred in the Big Cedar Lake Sensitive Area #2. The original report listed white waterlilies, sago pondweed, large leaf pondweed, Richardson's pondweed, and Chara as present. Eurasian watermilfoil (*Myriophyllum spicatum*) is now also present in Area #2, but the very important stand of bulrushes is no longer present. Current species in this area included naiads, Chara, Flat-stem pondweed, sago pondweed, waterlilies and Eurasian watermilfoil.

Because of the significant decline in the plant species diversity, Sensitive Area #2 was re-evaluated by WNDR but they determined the area still warranted regulation under the NR 107 criteria.

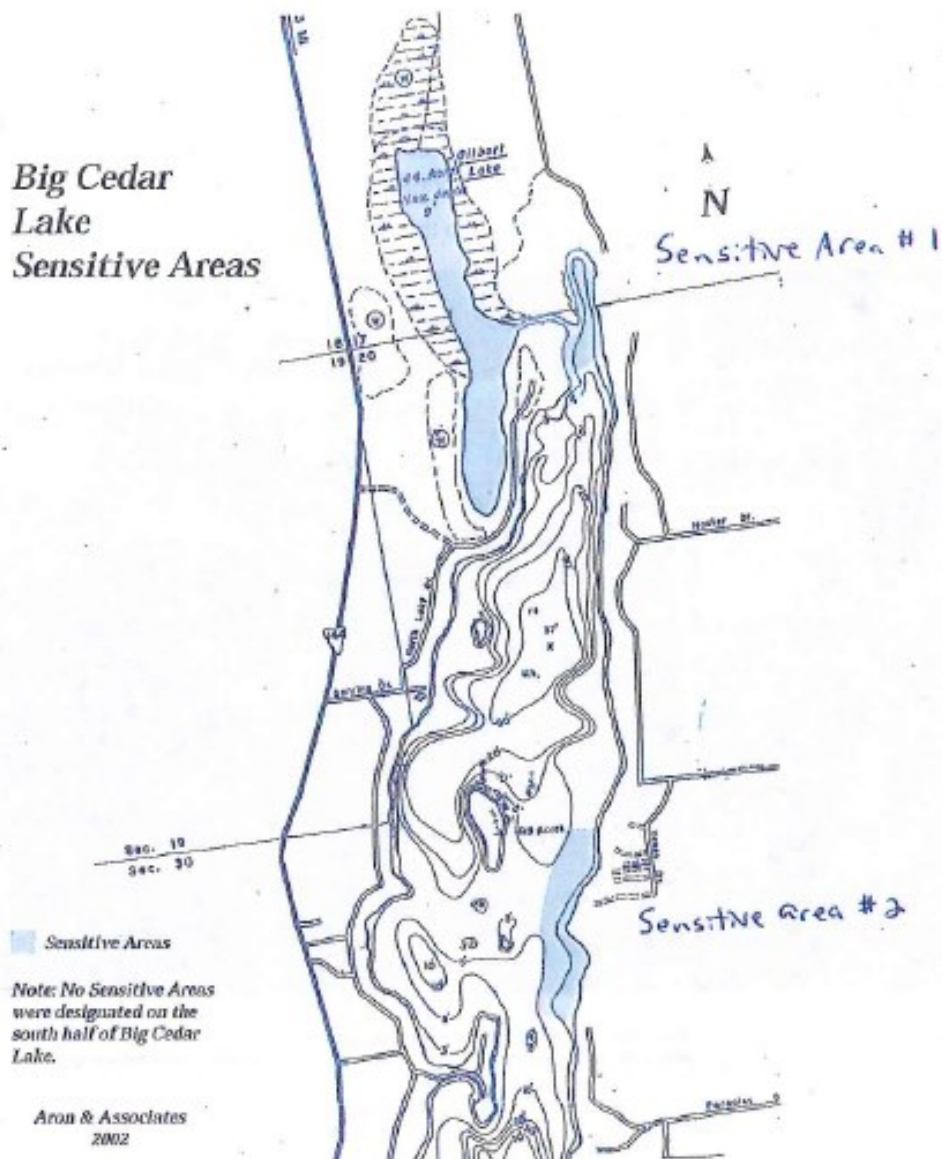


Figure 2 NR 107 Sensitive Areas, Big Cedar Lake