Webster Lake
Aquatic Vegetation Management Plan
2008 Update-Draft
Kosciusko County, Indiana

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Executive Summary

Aquatic Control was contracted by the Webster Lake Conservation Association to complete aquatic vegetation sampling in order to update their aquatic vegetation management plan. Funding for development of this plan update was obtained from the Webster Lake Conservation Association and the Indiana Department of Natural Resources-Division of Fish and Wildlife as part of the Lake and River Enhancement fund (LARE). The update serves as a tool to track changes in the vegetation community, to adjust the action plan as needed, and to maintain eligibility for additional LARE funds. Major items included in this update are the 2008 sampling results, a review of the 2008 vegetation controls, and updates to the budget and action plans. This plan update covers both Webster (653 acres) and Backwater (203 acres) Lakes.

Aquatic vegetation is an important component of lakes in Indiana; however, as a result of many factors this vegetation can develop to a nuisance level. Nuisance aquatic vegetation, as used in this update, describes plant growth that negatively impacts the present uses of the lake including fishing, boating, swimming, aesthetic, and lakefront property values. The primary nuisance species within Webster and Backwater Lakes are the invasive plants Eurasian watermilfoil (*Myriophyllum spicatum)* and curlyleaf pondweed (*Potamogetan crispus)*. Other aquatic vegetation, which has reached nuisance levels in Webster Lake, includes the native species common coontail (*Ceratophyllum demersum)* and duckweed (*Lemna spp*.). Due to the morphology of the lakes and extensive shallow areas, a large percentage of the lakes can become infested with heavy growths of these nuisance species.

Due to recent successful control of curlyleaf pondweed and Eurasian watermilfoil in both Webster and Backwater Lakes, the 2007 update recommended a similar control strategy for the 2008 season. This strategy involved early season treatment of curlyleaf pondweed in both lakes. In addition, Eurasian watermilfoil would be spot treated in late spring in Webster Lake while milfoil would be treated at the same time as curlyleaf pondweed in Backwater Lake. Renovate (active ingredient: triclopyr) would be used for control of the milfoil while Aquthol K (active ingredient: endothal) would be used for control of curlyleaf pondweed. Along with the treatments, the update also recommended three Tier II surveys along with an invasive mapping survey. In 2008, WLCA was awarded a grant from LARE of $20,000 for treatment of milfoil and $6,000 for the plan update and plant sampling.

On April 23, 2008, Tier II surveys were completed on both lakes. These surveys indicated that there was a reduction in milfoil and curlyleaf abundance in both Webster and Backwater Lakes when compared to the 2007 early spring sampling. The first treatments were completed on April 29. A total of 104 acres of curlyleaf pondweed was treated on Webster Lake with Aquathol K herbicide at a rate of 1.0 ppm. This was the third season for this treatment. On the same day, 75 acres of Backwater Lake was treated with a mixture of Aquathol K and Renovate. This was the second season of treating with Aquathol K on Backwater, but the first year that Renovate was used in combination for milfoil control (2,4-D was used in 2007). Both of these treatments were funded by

WLCA. Invasive mapping and Tier II surveys were completed on both lakes on May 27. Surveys indicated that there was a reduction in curlyleaf in both lakes. When compared to the April survey, Milfoil was significantly reduced on Backwater lake (only detected at a single sample site), but as expected, increased in Webster Lake where no treatment had occurred. On June 3, 2008, 46.8 acres of milfoil was treated on Webster Lake with Renovate herbicide. This treatment was funded by LARE and the WLCA. Contact herbicide treatments were completed on near shore areas of both lakes on June 17th (38.25 acres in Webster & 4.5 acres on Backwater). This treatment primarily focused on control of coontail. On August 27, 2008, Tier II surveys were completed on both lakes. Invasive species had significantly declined on both lakes when compared to the May survey results. Native vegetation remained abundant throughout both lakes. A public meeting was held on October 28, 2008 in order to inform lake users of the treatment and sampling completed during 2008 and to gain lake user input. Those in attendance appeared to be pleased with the results of the treatments, and wished to continue with the LARE funded controls.

Due to the success of vegetation controls over the last several years, it is recommended that WLCA continue with a similar plan of action with a goal of maintaining the submersed plant community in both lakes at a similar level as seen in 2007 and 2008. Maintaining the current levels of aquatic macrophytes will require additional funds to control remaining areas of Eurasian watermilfoil and curlyleaf pondweed. It is recommended that WLCA requests LARE for $22,500 for a combination treatment of up to 75 acres curlyleaf pondweed and Eurasian watermilfoil in Backwater Lake, $3,000 for treatment of remaining curlyleaf pondweed in Webster Lake, $25,000 for treatment of up to 50 acres of milfoil in Webster Lake, and $6,000 for plant sampling and plan updates on both lakes. In addition, WLCA should continue to fund shoreline treatments for control of nuisance vegetation.

Acknowledgements

Funding for the vegetation sampling and preparation of an aquatic vegetation management plan update was provided by the Indiana Department of Natural Resources – Division of Fish & Wildlife and the Webster Lake Conservation Association. Aquatic Control Inc completed the fieldwork, data processing, and map generation. Special thanks are given to Mr. Tom Plew and Kevin Smith of the Webster Lake Conservation Association for their assistance in this project. Special thanks are also given to Jed Pearson and Angela Sturdevant from the Indiana Department of Natural Resources for their review of this report. Author of this report is Nathan Long of Aquatic Control. The author would like to acknowledge the valuable input from Brendan Hastie, Patrick Whitson, and Barbie Huber of Aquatic Control for their field assistance, map generation, review, and editing of this report.

Table of Contents

Executive Summary i
Acknowledgements iii
Table of Contents iv
List of Figures v
List of Tables vii
1.0 Introduction 1
2.0 2008 Sampling 2
2.1 Webster Lake Sampling Results 2
2.1.1 April Survey 2
2.1.2 May Survey 5
2.1.3 August Survey 11
2.2 Backwater Lake Sampling Results 14
2.2.1 April Survey 14
2.2.2 May Survey 17
2.2.3 August Survey 21
2.3 Plant Sampling Discussion 23
2.3.1 Webster Lake Sampling Discussion 23
2.3.2 Backwater Lake Sampling Discussion 27
3.0 2008 Vegetation Control 30
3.1 Webster Lake Vegetation Control 30
3.2 Backwater Lake Vegetation Control 33
4.0 Action Plan and Budget Update 35
5.0 Public Involvement 37
6.0 References Cited 39
7.0 Appendix Update 40
7.1 Plant Sampling Data 40
7.2 Permit Application 43

List of Figures

Figure 1. Webster Lake, common coontail distribution and abundance, April 23, 2008 4
Figure 2. Webster Lake, curlyleaf pondweed distribution and abundance April 23, 2008 4
Figure 3. Webster Lake, Eurasian watermilfoil distribution and abundance, April 23, 2008 5
Figure 4. Webster Lake, Eurasian watermilfoil location, May 27, 2008 6
Figure 5. Webster Lake, common coontail distribution and abundance, May 27, 2008....9
Figure 6. Webster Lake, Eurasian watermilfoil distribution and abundance, May 27, 2008 10
Figure 7. Webster Lake, curlyleaf pondweed distribution and abundance, May 27, 2008 10
Figure 8. Webster Lake, coontail distribution and abundance, August 27, 2008..13
Figure 9. Webster Lake, Eurasian watermilfoil distribution and abundance, August 27, 2008 14
Figure 10. Backwater Lake, coontail distribution and abundance, April 23, 2008....16
Figure 11. Backwater Lake, Eurasian watermilfoil distribution and abundance April 23, 2008 16
Figure 12. Backwater Lake, curlyleaf pondweed distribution and abundance, April 23, 2008 17
Figure 13. Backwater Lake, Eurasian watermilfoil map, May 27, 2008 18
Figure 14. Backwater Lake, curlyleaf pondweed map, May 27, 2008 18
Figure 15. Backwater Lake, common coontail distribution and abundance May 27, 2008 20
Figure 16. Backwater Lake, Eurasian watermilfoil distribution and abundance, May 27, 2008 20
Figure 17. Backwater Lake, common coontail distribution and abundance August 27, 2008 22
Figure 18. Backwater Lake, sago pondweed distribution and abundance, August 27, 2008 22
Figure 19. Webster Lake, Eurasian watermilfoil and curlyleaf pondweed percent occurrence in the last four April and May surveys and the last seven summer surveys....24
Figure 20. Comparison of % of sites with vegetation, native diversity index, native species collected/site, number of native species collected, and Secchi depth in the last five surveys of Webster Lake 26
Figure 21. Backwater Lake, Eurasian watermilfoil and curlyleaf pondweed Percent occurrence since 2005....28
Figure 22. Comparison of % of sites with vegetation, native diversity index, native species collected/site, and number of native species collected in the last five surveys of Backwater Lake 29

Figure 23. Backwater Lake, white water lily and spatterdock beds, August 27, 2008.....30
Figure 24. Webster Lake, curlyleaf pondweed treatment areas April 29, 2008 31
Figure 25. Webster Lake, Eurasian watermilfoil treatment areas June 3, 2008 32
Figure 26. Webster Lake, shoreline treatment areas, June 17, 2008 33
Figure 27. Backwater Lake, curlyleaf pondweed and Eurasian watermilfoil treatment areas, April 29, 2008.....34
Figure 28. Backwater Lake, shoreline treatment areas, June 17, 2008.....35
Figure 29. Notice which appeared in "The Paper" "Mail Journal" newspapers...38

List of Tables

Table 1. Occurrence and abundance of submersed aquatic plants in Webster Lake, April 23, 2008 3
Table 2. Occurrence and abundance of submersed aquatic plants in Webster Lake, May 27, 2008 8
Table 3. Occurrence and abundance of submersed aquatic plants in Webster Lake, August 27, 2008 12
Table 4. Occurrence and abundance of submersed aquatic plants in Backwater Lake, April 23, 2008 15
Table 5. Occurrence and abundance of submersed aquatic plants in Backwater Lake, May 27, 2008 19
Table 6. Occurrence and abundance of submersed aquatic plants in Backwater Lake, August 27, 2008 21
Table 7. Eurasian watermilfoil and curlyleaf pondweed percent occurrence in the last four April and May surveys and the last seven summer surveys of Webster Lake 23
Table 8. Webster Lake species percent occurrence since 2001 25
Table 9. Comparison of number of sample sites, % of sites with vegetation, number of natives collected, native diversity index, and Secchi depth in the last five summer surveys of Webster Lake 26
Table 10. Backwater Lake, Eurasian watermilfoil and curlyleaf pondweed percent occurrence since 2005 27
Table 11. Backwater Lake species percent occurrence since 2005 28
Table 12. Comparison of number of sample sites, % of sites with vegetation, number of natives collected, and native diversity index in the last five summer surveys of Backwater Lake 29
Table 13. Webster Lake Conservation Association budget estimate for the next four seasons 37
Table 14. Webster lake public meeting survey results, October 28, 2008 38

1.0 INTRODUCTION

This report was created in order to update the Webster Lake Aquatic Vegetation Management Plan which covers the years 2005-2010. This plan update includes both Webster and Backwater Lakes. Webster Lake is the largest of the lakes surveyed. It measures 653.18 acres and has a mean depth of 11.97 feet. Backwater Lake feeds into Webster Lake in the southeast corner. It is a very shallow lake, which measures 203.26 acres and has a mean depth of 2.89 feet (Aquatic Control 2005).

The plan update was funded by the Indiana Department of Natural Resources Lake and River Enhancement Program (LARE) and the Webster Lake Conservation Association. The update serves as a tool to track changes in the vegetation community, to adjust the action plan as needed, and to maintain eligibility for additional LARE funds. The primary items covered include the 2008 sampling results, a review of the 2008 vegetation controls, and updates to the budget and action plans. Once reviewed and approved, the update should be included in the original vegetation management plan, following the 2006 update and prior to the original Appendix.

Non-native Eurasian watermilfoil and curlyleaf pondweed are the primary species of concern in both Webster and Backwater Lakes. These invasive species have historically reached levels that have severely impacted lake use. Lake-wide milfoil controls were initiated in 2001 and have continued through present day. These controls have significantly reduced milfoil abundance, but it has not been eliminated from the lakes. Lake-wide controls of curlyleaf pondweed began in 2006 in Webster Lake and 2007 in Backwater Lake. Controls have also been effective at significantly reducing curlyleaf abundance. Native vegetation is a very important component to these lakes. Native vegetation provides habitat for fish and invertebrates, helps prevent erosion, and can improve water quality. However, due to the shallow nature of Webster and Backwater Lakes, native vegetation can reach nuisance levels impairing lake use. Controls have been, and should continue to be limited to high-use areas of the lakes.

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

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

Below is a list of more specific objectives created to help achieve the original goals of the plan:

- Maintain the current abundance of beneficial native vegetation while increasing diversity through watershed improvements, selective invasive species controls, and best management practices outlined in previous studies.

- Keep Eurasian watermilfoil below 5% occurrence in summer Tier II surveys
- Keep curlyleaf pondweed below 10% occurrence in May Tier II surveys
- Control nuisance vegetation around docks and the boat ramp in order to allow for boat access

2.0 2008 PLANT SAMPLING

Three sampling events took place in 2008 on Webster and Backwater Lakes. This is more sampling than required by LARE, but due to the aggressive vegetation control program it was believed that additional surveys would be beneficial in documenting potential changes in the plant community. Sampling consisted of three Tier II surveys and one invasive plant survey on both lakes. Surveys were completed according to IDNR protocol (IDNR 2007).

2.1 Webster Lake Sampling Results

2.1.1 April survey, Webster Lake

On April 23, 2008 a Tier II survey was completed on Webster Lake. A Secchi disk reading was taken prior to sampling and was found to be 4.5 feet. Plants were present to a maximum depth of 15 feet. The same 90 points that were sampled in 2007 were used in this survey. Native plants were present at 64 of the sites. A total of eight species were collected of which six were natives. The maximum number of species collected at a single site was three. The mean number of species collected per site was 0.96 and the mean number of native species collected per site was 0.89 (Table 1).

Table 1. Occurrence and abundance of submersed aquatic plants in Webster Lake April 23, 2008.

Occurrence and abundance of submersed aquatic plants in Webster Lake						
County:	Kos	Sites with plants:	65	Mean species/site:	0.96	
Date:	4/23/2008	Sites with native plants:	61	Standard error (ms/s):	0.08	
Secchi (ft):	4.5	Number of species:	8	Mean native species/site:	0.80	
Maximum plant depth (ft):	15	Number of native species:	6	Standard error (mns/s):	0.07	
Trophic status	Mesotrophic	Maximum species/site:	3	Species diversity:	0.57	
Total sites:	90			Native species diversity:	0.40	

Depths 0 to 20 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	61.1	38.9	30.0	18.9	12.2	29.6
curlyleaf pondweed	8.9	91.1	6.7	2.2	0.0	2.7
slender naiad	8.9	91.1	7.8	1.1	0.0	2.2
Eurasian watermilfoil	6.7	93.3	6.7	0.0	0.0	1.3
Chara	4.4	95.6	1.1	2.2	1.1	2.7
sago pondweed	2.2	97.8	2.2	0.0	0.0	0.4
flatstemmed pondweed	2.2	97.8	2.2	0.0	0.0	0.4
nitella	1.1	98.9	1.1	0.0	0.0	0.2

Depths 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	45.2	54.8	35.5	3.2	6.5	15.5
Chara	12.9	87.1	3.2	6.5	3.2	7.7
slender naiad	12.9	87.1	9.7	3.2	0.0	3.9
curlyleaf pondweed	9.7	90.3	9.7	0.0	0.0	1.9
sago pondweed	6.5	93.5	6.5	0.0	0.0	1.3
Eurasian watermilfoil	3.2	96.8	3.2	0.0	0.0	0.6
nitella	3.2	96.8	3.2	0.0	0.0	0.6

Depths 5 to 10 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	79.5	20.5	27.3	31.8	20.5	45.0
Eurasian watermilfoil	11.4	88.6	11.4	0.0	0.0	2.3
curlyleaf pondweed	11.4	88.6	6.8	4.5	0.0	4.1
slender naiad	9.1	90.9	9.1	0.0	0.0	1.8
flatstemmed pondweed	4.5	95.5	4.5	0.0	0.0	0.9

Depths 10 to 15 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	55.6	44.4	33.3	22.2	0.0	20.0

Depths 15 to 20 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	20.0	80.0	20.0	0.0	0.0	4.0

Species Observed: pickeral weed, spatterdock, watermeal

Common coontail occurred at the highest percentage of sample sites (61.1%) and had the highest dominance rating (29.6). Location and density of coontail is illustrated in Figure 1. Curlyleaf pondweed (Figure 2) and slender naiad tied for second in percent occurrence (8.9%), followed by Eurasian watermilfoil which was found at 6.7% of sites (Figure 3). Chara, sago pondweed, flatstem pondweed, and nitella were all present at less than 5% of the sample sites.

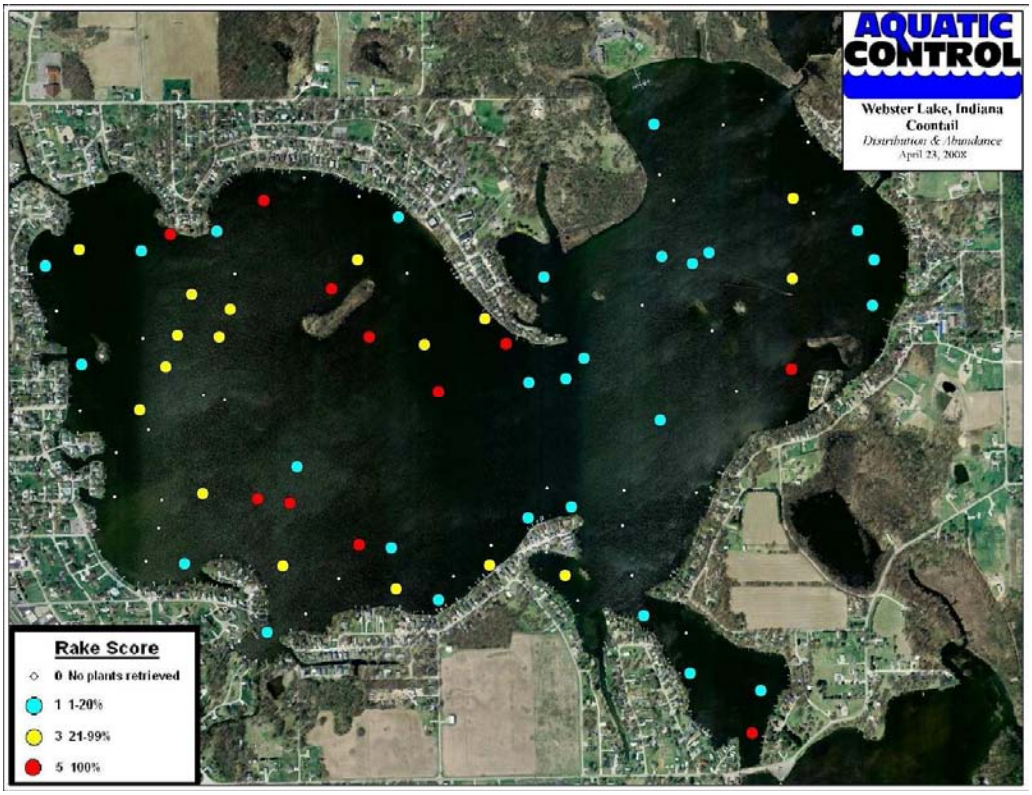


Figure 1. Webster Lake, coontail distribution and abundance, April 23, 2008.

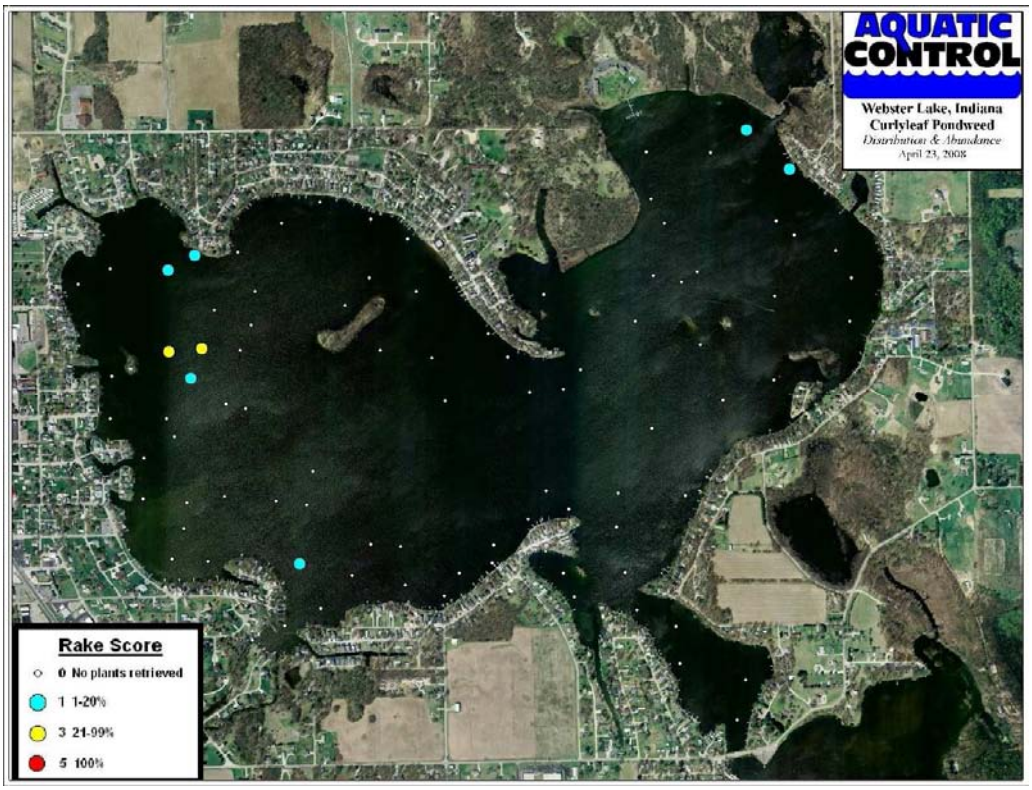


Figure 2. Webster Lake, curlyleaf pondweed distribution and abundance, April 23, 2008.

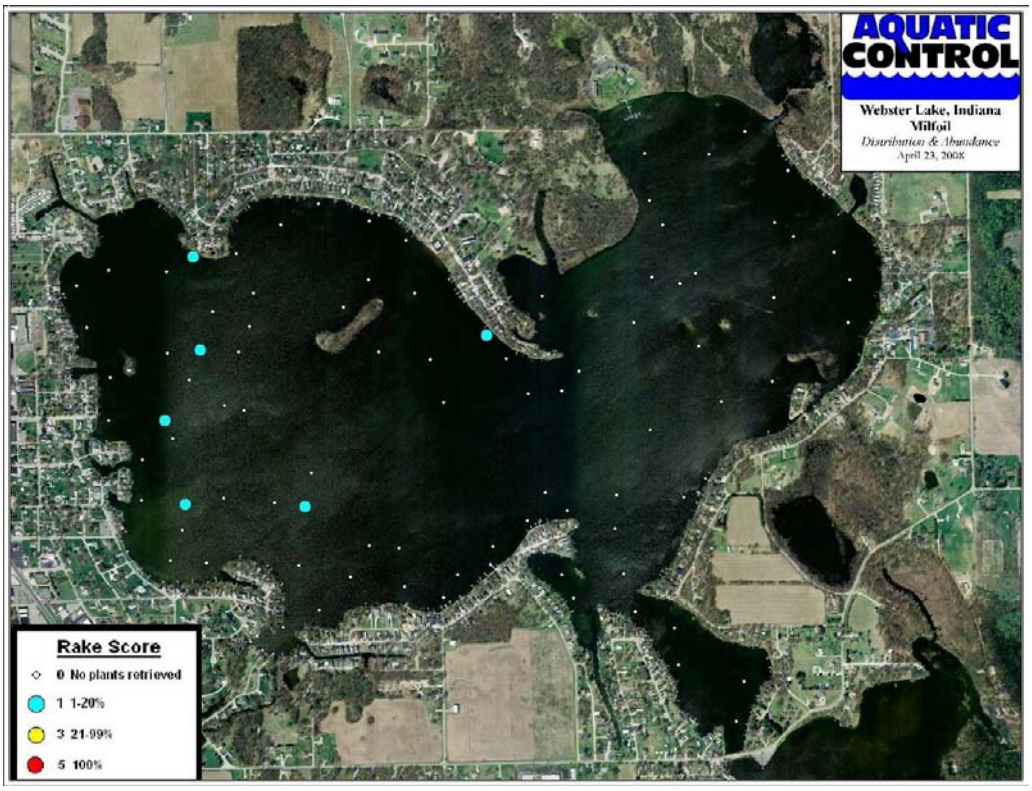


Figure 3. Webster Lake, Eurasian watermilfoil distribution and abundance, April 23, 2008.

2.1.2 May survey, Webster Lake

On May 27, 2008 a second round of sampling was completed on Webster Lake. This sampling included invasive species mapping along with another Tier II survey. A Secchi disk reading was taken prior to sampling and was found to be 7.0 feet. Plants were present to a maximum of 17 feet. A total of 46.8 acres of Eurasian watermilfoil was detected. The majority of the milfoil was located in the western half of the lake (Figure 4). No curlyleaf pondweed was detected during the invasive species mapping.

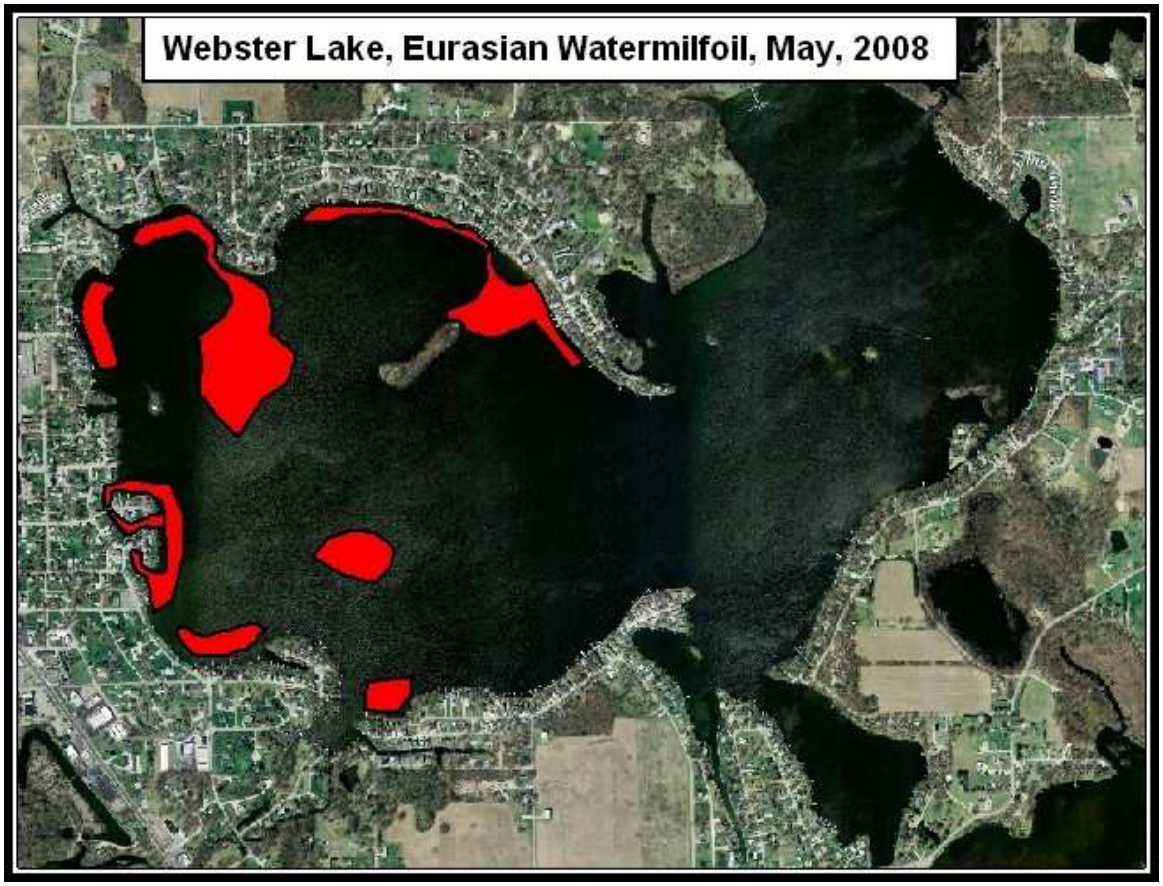


Figure 4. Webster Lake Eurasian watermilfoil location, May 27, 2008

A Tier II survey was also completed on May 27 (Table 2). The same 90 points were sampled. Plants were present at 75 of the 90 sites. A total of 8 species were collected of which 6 of the species were native. The maximum number of species per site was 4 and the mean number of species collected per site was 1.21. The mean number of native species collected per site was 1.07.

Table 2. Occurrence and abundance of submersed aquatic plants in Webster Lake, May 27, 2008.

Occurrence and abundance of submersed aquatic plants in Webster Lake

County:	Kos	Sites with plants:	75	Mean species/site:	1.21
Date:	5/27/2008	Sites with native plants:	75	Standard error (ms/s):	0.10
Secchi (ft):	7	Number of species:	8	Mean native species/site:	1.07
Maximum plant depth (ft):	17	Number of native species:	6	Standard error (mns/s):	0.08
Trophic status	Mesotrophic	Maximum species/site:	4	Species diversity:	0.62
Total sites:	90			Native species diversity:	0.50

Depths 0 to 20 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	71.1	28.9	26.7	15.6	28.9	40.0
Eurasian watermilfoil	14.4	85.6	0.0	6.7	7.8	4.2
Chara	13.3	86.7	5.6	3.3	4.4	5.8
slender naiad	6.7	93.3	2.2	2.2	1.1	1.8
sago pondweed	5.6	94.4	1.1	0.0	4.4	1.6
curlyleaf pondweed	3.3	96.7	2.2	0.0	1.1	0.7
American elodea	3.3	96.7	0.0	1.1	2.2	0.7
horned pondweed	3.3	96.7	0.0	2.2	1.1	1.1

Depths 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	64.7	35.3	35.3	5.9	23.5	34.1
Chara	29.4	70.6	11.8	5.9	11.8	12.9
Eurasian watermilfoil	5.9	94.1	0.0	0.0	5.9	1.2
curlyleaf pondweed	5.9	94.1	5.9	0.0	0.0	1.2
slender naiad	5.9	94.1	5.9	0.0	0.0	1.2
sago pondweed	5.9	94.1	0.0	0.0	5.9	1.2

Depths 5 to 10 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	74.1	25.9	24.1	20.7	29.3	41.0
Eurasian watermilfoil	20.7	79.3	0.0	10.3	10.3	6.2
Chara	12.1	87.9	5.2	3.4	3.4	5.2
sago pondweed	6.9	93.1	1.7	0.0	5.2	2.1
slender naiad	5.2	94.8	0.0	3.4	1.7	1.7
American elodea	5.2	94.8	0.0	1.7	3.4	1.0
horned pondweed	5.2	94.8	0.0	3.4	1.7	1.7
curlyleaf pondweed	3.4	96.6	0.0	0.0	1.7	0.7

Depths 10 to 15 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	80.0	20.0	30.0	0.0	50.0	56.0
slender naiad	10.0	90.0	0.0	0.0	0.0	2.0

Depths 15 to 20 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	40.0	60.0	20.0	20.0	0.0	16.0
slender naiad	20.0	80.0	20.0	0.0	0.0	4.0

Species Observed: white water lily, common cattail, duckweed, watermeal

Once again, common coontail was collected at the highest percentage of sample sites (71.1%) and had the highest dominance index (40.0). Location and density of this species is illustrated in Figure 5. Eurasian watermilfoil ranked second in frequency of occurrence (14.4%) and location and density is illustrated in Figure 6. Chara was the only other species present at more than 10% of sites. Curlyleaf pondweed was the only other invasive species collected. Curlyleaf was present at three sites and received a rake score of 1 at all three locations (Figure 7). Slender naiad, sago pondweed, American elodea, and horned pondweed, were all present at less than 7% of the sample sites.

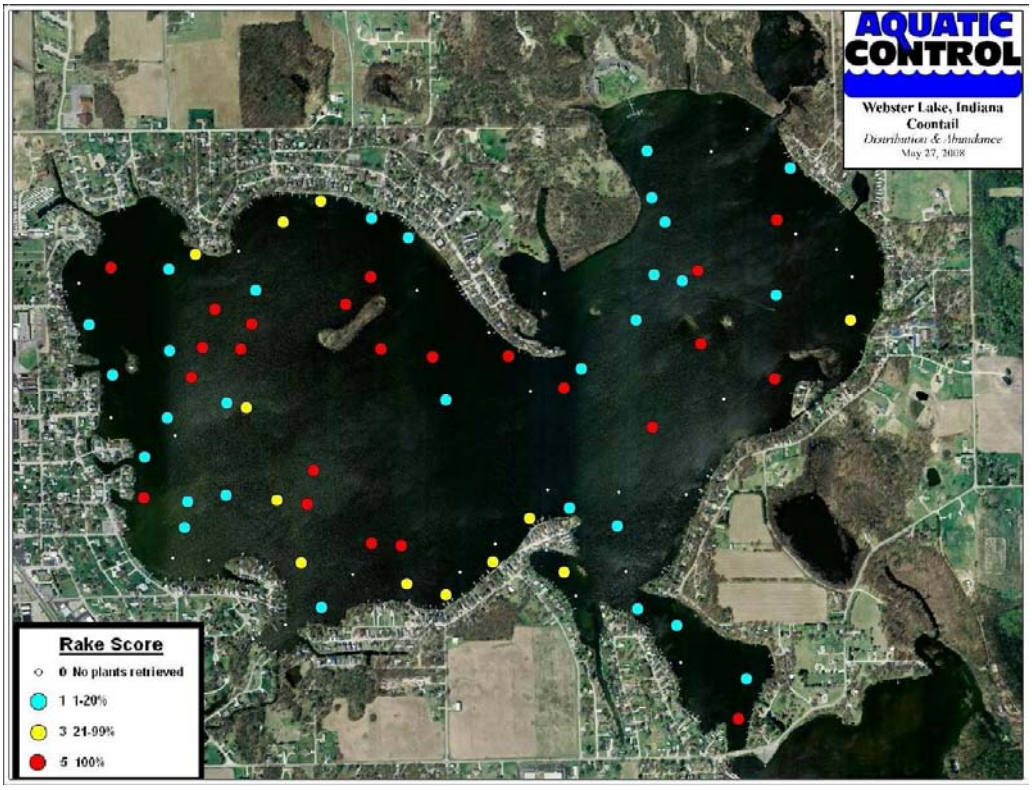


Figure 5. Webster Lake, common coontail distribution and abundance, May 27, 2008.

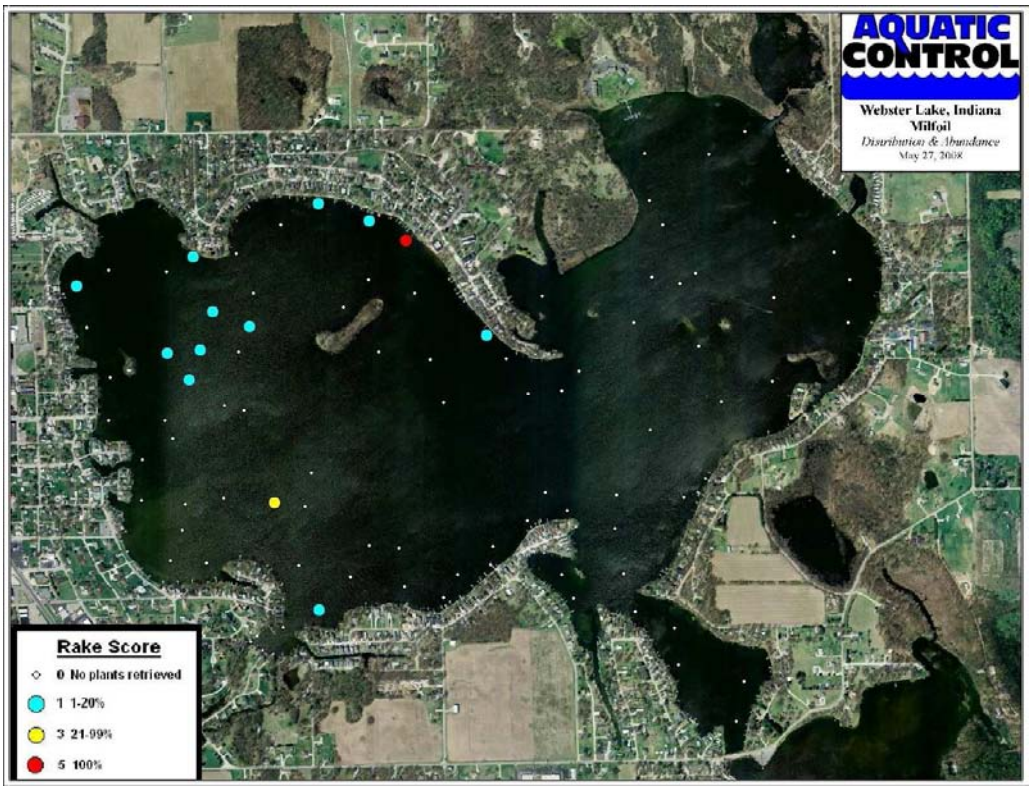


Figure 6. Webster Lake, Eurasian watermilfoil distribution and abundance, May 27, 2008.

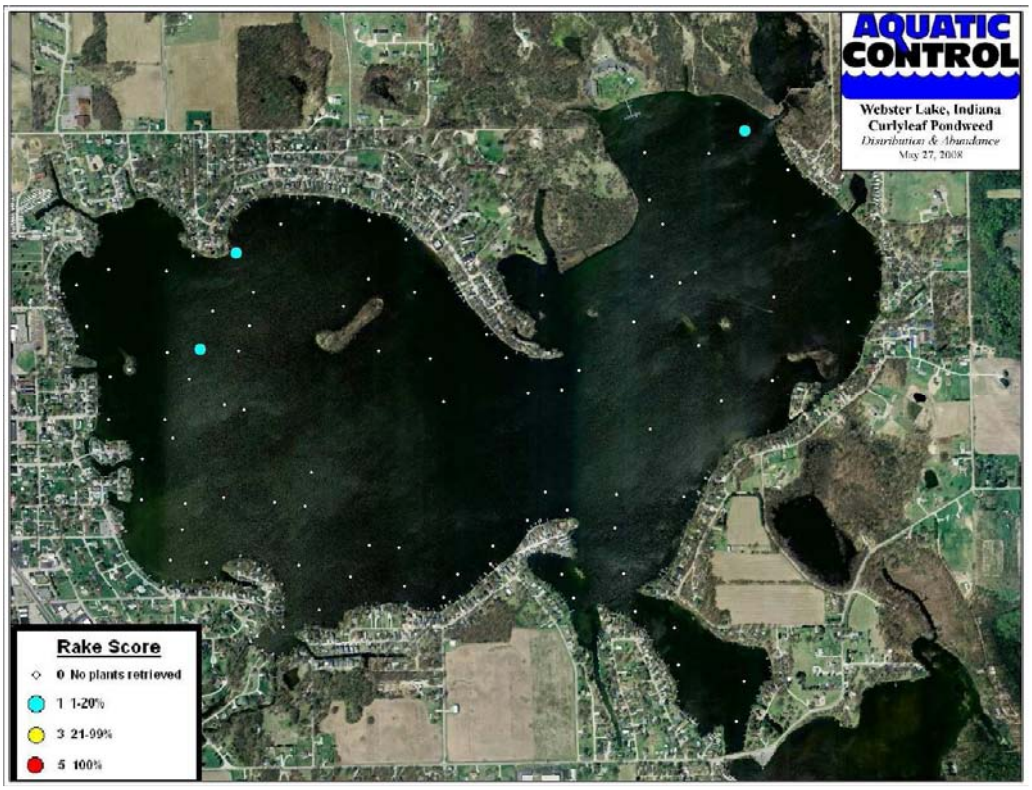


Figure 7. Webster Lake, curlyleaf pondweed distribution and abundance, May 27, 2008.

2.1.3 August survey, Webster Lake

A third and final Tier II survey of Webster Lake was completed on August 27, 2008 (Table 3). The same 90 sites were sampled. A Secchi disk reading was taken prior to sampling and was found to be 9.0 feet. Submersed vegetation was present at 78 of the 90 sites. A total of 7 species were collected of which 6 of the species were native. The maximum number of species per site was 4 and the mean species collected per site was 1.28.

Table 3. Occurrence and abundance of submersed aquatic plants in Webster Lake, August 27, 2008.

Occurrence and abundance of submersed aquatic plants in Webster Lake						
County:	Kos	Sites with plants:	78	Mean species/site:	1.28	
Date:	8/27/2008	Sites with native plants:	78	Standard error (ms/s):	0.09	
Secchi (ft):	9	Number of species:	7	Mean native species/site:	1.27	
Maximum plant depth (ft):	20	Number of native species:	6	Standard error (mns/s):	0.08	
Trophic status	Mesotrophic	Maximum species/site:	4	Species diversity:	0.60	
Total sites:	90			Native species diversity:	0.59	

Depths 0 to 20 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	74.4	25.6	31.1	7.8	35.6	46.4
slender naiad	30.0	70.0	23.3	4.4	2.2	9.6
Chara	10.0	90.0	7.8	1.1	1.1	3.3
sago pondweed	5.6	94.4	3.3	2.2	0.0	2.0
leafy pondweed	4.4	95.6	4.4	0.0	0.0	0.9
water stargrass	2.2	97.8	1.1	0.0	1.1	1.3
Eurasian watermilfoil	1.1	98.9	1.1	0.0	0.0	0.2

Depths 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	69.4	30.6	38.9	8.3	22.2	35.0
slender naiad	41.7	58.3	33.3	8.3	0.0	11.7
Chara	22.2	77.8	16.7	2.8	2.8	7.8
sago pondweed	5.6	94.4	5.6	0.0	0.0	1.1

Depths 5 to 10 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	84.2	15.8	34.2	5.3	44.7	54.7
slender naiad	28.9	71.1	21.1	2.6	5.3	11.1
leafy pondweed	7.9	92.1	7.9	0.0	0.0	1.6
sago pondweed	5.3	94.7	0.0	5.3	0.0	3.2
water stargrass	5.3	94.7	2.6	0.0	2.6	3.2
Eurasian watermilfoil	2.6	97.4	2.6	0.0	0.0	0.5
Chara	2.6	97.4	2.6	0.0	0.0	0.5

Depths 10 to 15 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	75.0	25.0	0.0	16.7	58.3	68.3
slender naiad	8.3	91.7	8.3	0.0	0.0	1.7
leafy pondweed	8.3	91.7	8.3	0.0	0.0	1.7

Depths 15 to 20 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	25.0	75.0	25.0	0.0	0.0	5.0
sago pondweed	25.0	75.0	25.0	0.0	0.0	5.0

Species Observed: white water lily, spatterdock, cattail, duckweed, giant duckweed, star duckweed

By far the most abundant species was coontail, which was present at 74.4% of sites (Figure 8). Slender naiad now the second most abundant species, and occurred at 30% of

sites. Leafy pondweed, sago pondweed, water stargrass and chara were all collected at less than 8% of sites. Eurasian watermilfoil was only collected at a single site (Figure 9).

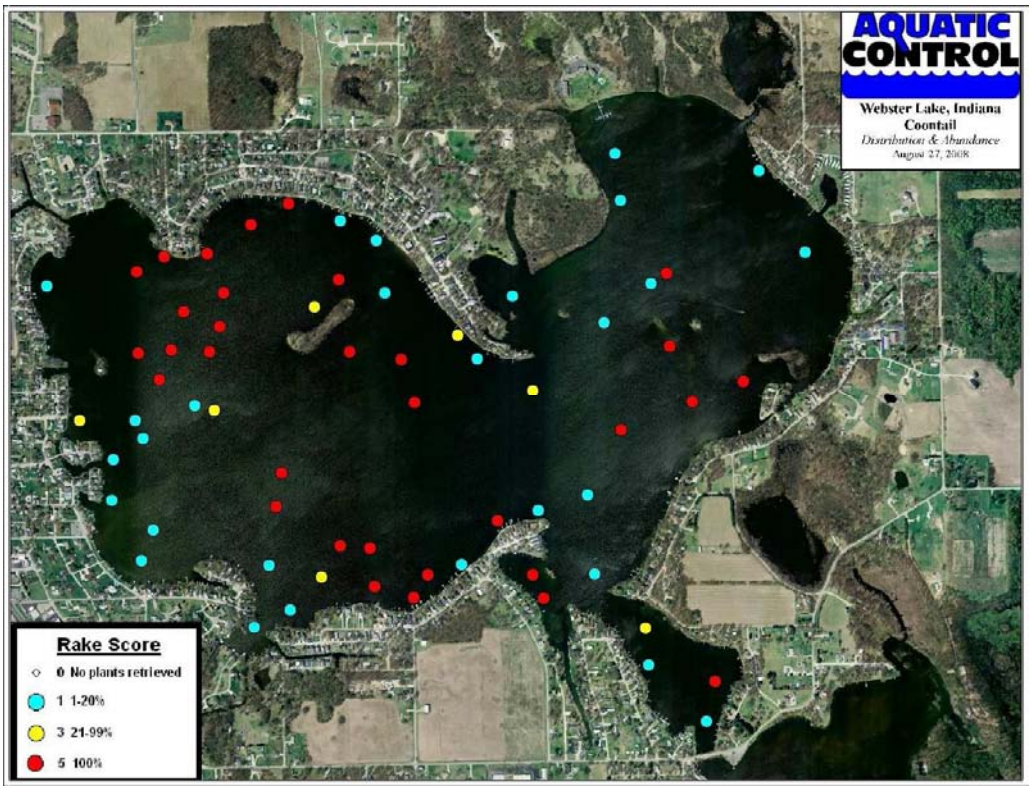


Figure 8. Webster Lake, coontail distribution and abundance, August 27, 2008

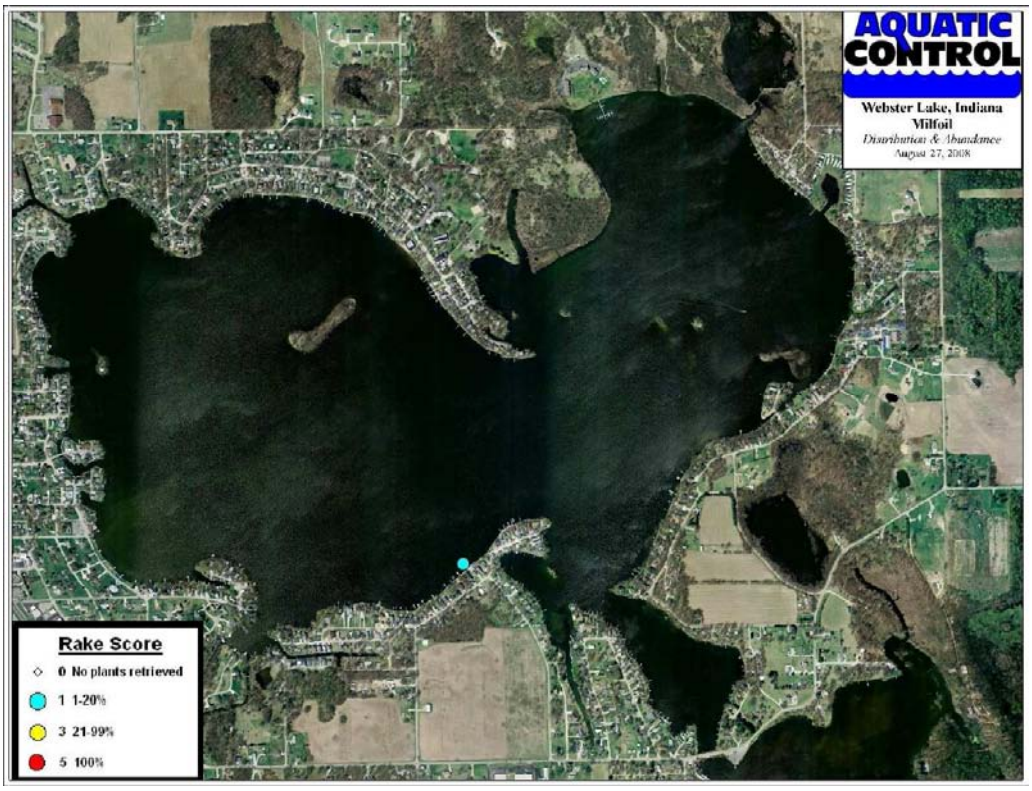


Figure 9. Webster Lake, Eurasian watermilfoil distribution and abundance, August 27, 2008

2.2 Backwater Lake Sampling Results

Backwater Lake was also surveyed on three different occasions in 2008. Tier II surveys were completed on April 23, May 27, and August 27. An Invasive Species Mapping Survey was completed on May 27.

2.2.1 April survey, Backwater Lake

On April 23, 2008 the first Tier II survey was completed on Backwater Lake (Table 4). IDNR protocol requires that Mesotrophic Lakes like Backwater to be sampled to a depth of 20 feet; however, this is not possible on Backwater Lake since there are no areas deeper than 8 feet. A Secchi disk reading was taken prior to sampling and was found to be 3.0 feet. Plants were present to a maximum depth of 6 feet. The same 50 sites that were sampled in 2007 were sampled again during the April survey. All 50 sample sites contained aquatic vegetation. A total of seven species were collected of which five of the species were native. The maximum number of species collected at a site was 3 and the mean number of species per site was 1.46. Mean number of native species per site was 1.26.

Table 4. Occurrence and abundance of submersed aquatic plants in Backwater Lake, April 23, 2008.

Occurrence and abundance of submersed aquatic plants in Backwater Lake						
County:	Kos	Sites with plants:	50	Mean species/site:	1.46	
Date:	4/23/2008	Sites with native plants:	50	Standard error (ms/s):	0.09	
Secchi (ft):	3	Number of species:	7	Mean native species/site:	1.12	
Maximum plant depth (ft):	6	Number of native species:	5	Standard error (mns/s):	0.05	
Trophic status	Mesotrophic	Maximum species/site:	3	Species diversity:	0.50	
Total sites:	50			Native species diversity:	0.20	

Depths 0 to 6 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	100.0	0.0	18.0	44.0	38.0	68.0
Eurasian watermilfoil	20.0	80.0	20.0	0.0	0.0	4.0
curlyleaf pondweed	14.0	86.0	14.0	0.0	0.0	2.8
American elodea	6.0	94.0	6.0	0.0	0.0	1.2
common bladderwort	2.0	98.0	2.0	0.0	0.0	0.4
nitella	2.0	98.0	2.0	0.0	0.0	0.4
Illinois pondweed	2.0	98.0	2.0	0.0	0.0	0.4

Depths 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	100.0	0.0	18.4	42.9	38.8	68.2
Eurasian watermilfoil	18.4	81.6	18.4	0.0	0.0	3.7
curlyleaf pondweed	14.3	85.7	14.3	0.0	0.0	2.9
American elodea	6.1	93.9	6.1	0.0	0.0	1.2
common bladderwort	2.0	98.0	2.0	0.0	0.0	0.4
nitella	2.0	98.0	2.0	0.0	0.0	0.4
Illinois pondweed	2.0	98.0	2.0	0.0	0.0	0.4

Depths 5 to 6 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
Eurasian watermilfoil	100.0	0.0	100.0	0.0	0.0	20.0
common coontail	100.0	0.0	0.0	100.0	0.0	60.0

Species Observed: duckweed, watermeal, spatterdock

The most frequently occurring species was coontail, which was present at all sample sites. Location and density of this species is illustrated in Figure 10. Eurasian watermilfoil ranked second in frequency of occurrence (20.0%) followed by curlyleaf pondweed (14.3%). Location and density of these two species is illustrated in Figures 11 and 12 respectively. American elodea, common bladderwort, nitella, and Illinois pondweed were also collected.

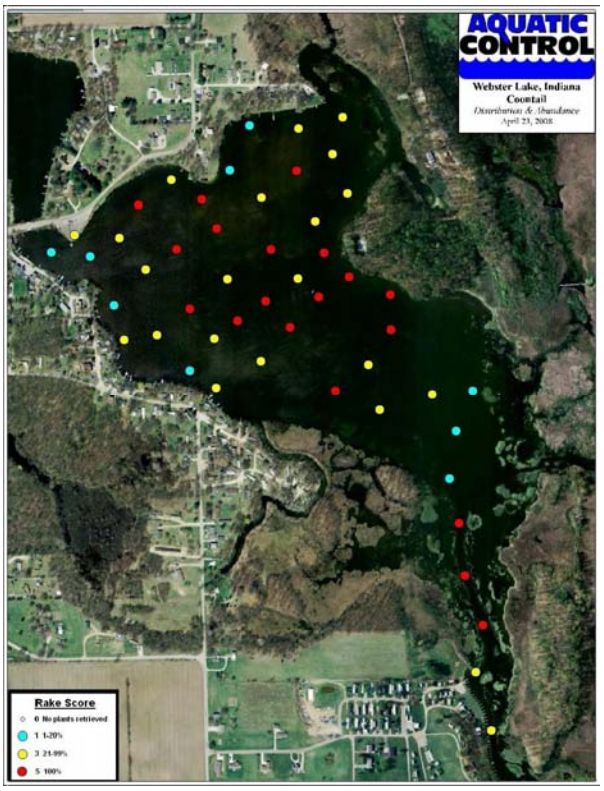


Figure 10. Backwater Lake, coontail distribution and abundance, April 23, 2008

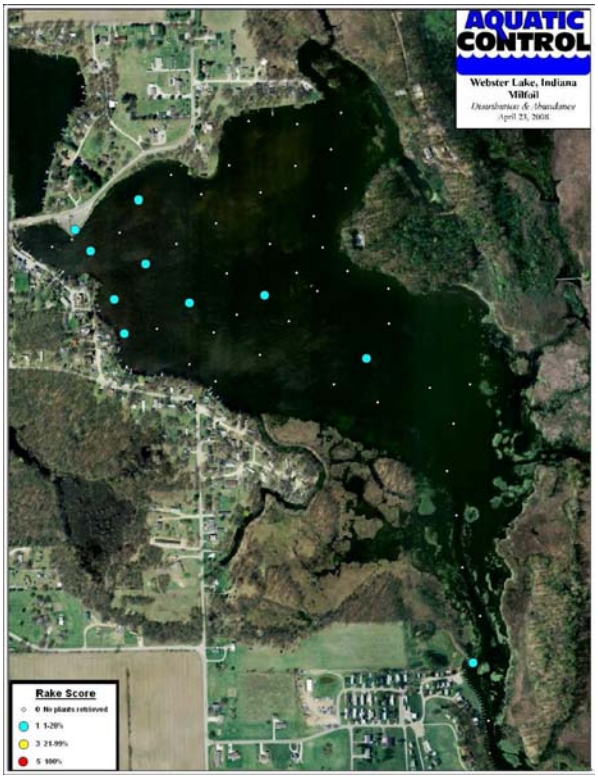


Figure 11. Backwater Lake, Eurasian watermilfoil distribution and abundance, April 23, 2008.

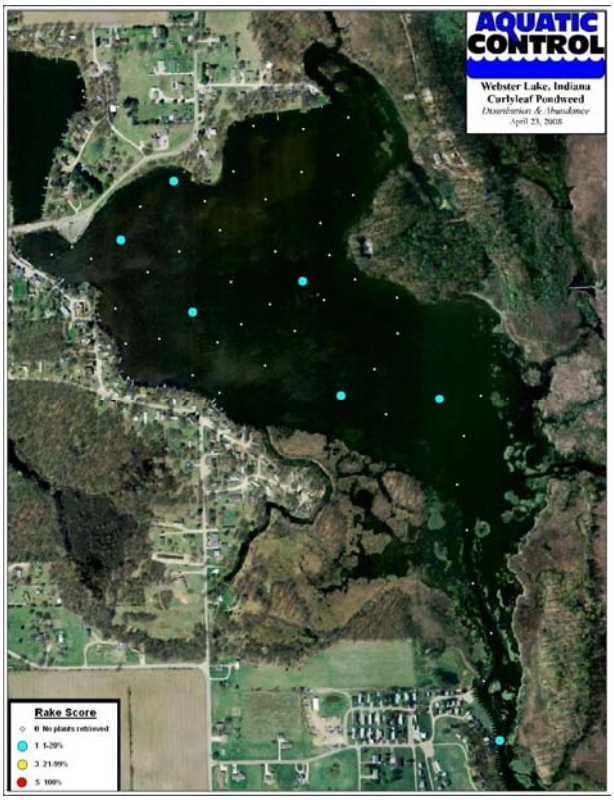


Figure 12. Backwater Lake, curlyleaf pondweed distribution and abundance, April 23, 2008

2.2.2 May Survey, Backwater Lake

On May 27, 2008 an invasive species mapping survey was completed on Backwater Lake. A Secchi disk reading was taken prior to sampling and was found to be 4.0 feet. A total of 1.6 acres of milfoil was mapped in the southeast corner of the lake (Figure 13). Curlyleaf pondweed was only found in one location totaling 1.4 acres. This area was located within the channel in the south central part of the lake (Figure 14). Both of these location were south of the April treatment area.

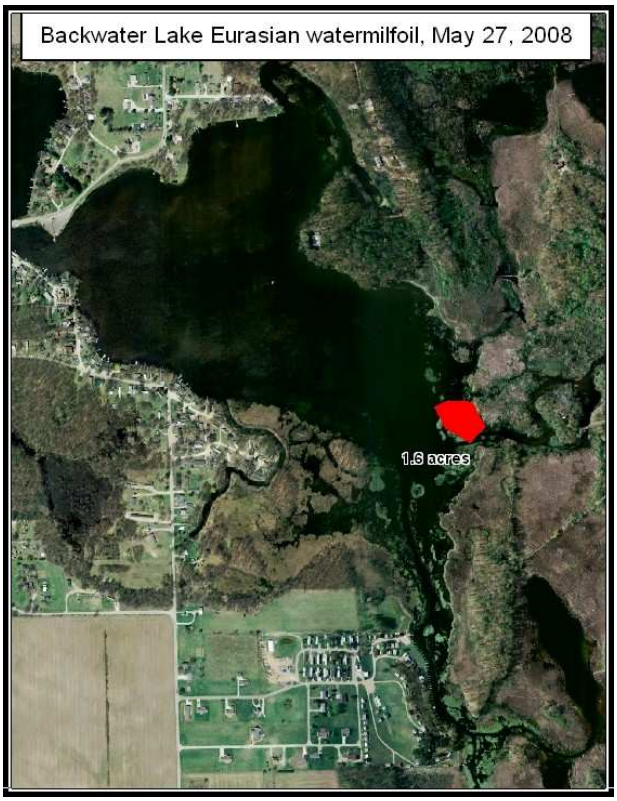


Figure 13. Backwater Lake, Eurasian watermilfoil map, May 27, 2008.

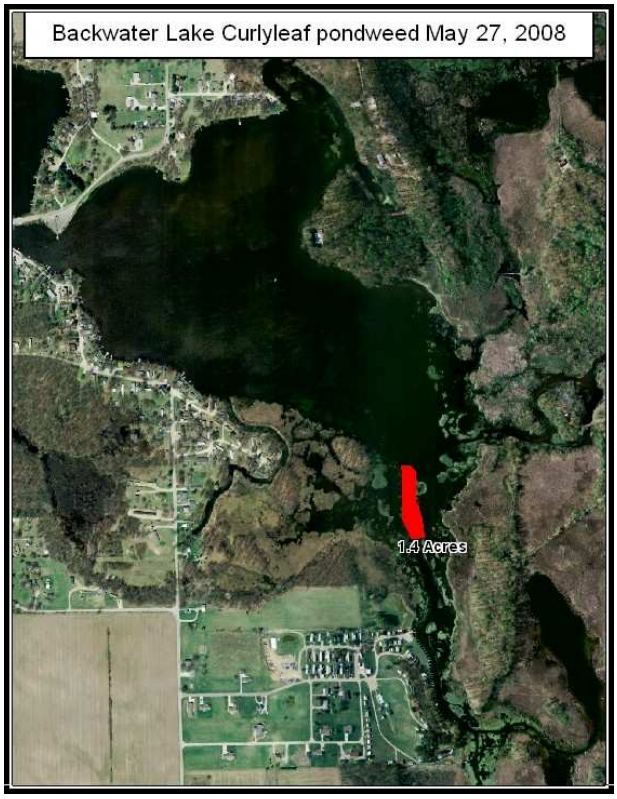


Figure 14. Backwater Lake, curlyleaf pondweed map, May 27, 2008.

A Tier II survey was completed immediately following the invasive mapping survey (Table 5). Plants were present to a maximum depth of 7 feet. The same 50 sites that were sampled in this survey as were sampled in the spring survey. Aquatic vegetation was present at 92% of sample sites. Six species were collected of which five of the species were native. The maximum number of species collected at a site was 4 and the mean number of species per site was 1.08. Mean number of native species per site was 1.06.

Table 5. Occurrence and abundance of submersed aquatic plants in Backwater Lake, May 27, 2008.

Occurrence and abundance of submersed aquatic plants in Backwater Lake						
County:	Kos	Sites with plants:	46	Mean species/site:	1.08	
Date:	5/27/2008	Sites with native plants:	46	Standard error (ms/s):	0.08	
Secchi (ft):	4	Number of species:	6	Mean native species/site:	1.06	
Maximum plant depth (ft):	7	Number of native species:	5	Standard error (mns/s):	0.07	
Trophic status	Mesotrophic	Maximum species/site:	4	Species diversity:	0.27	
Total sites:	50			Native species diversity:	0.24	

Depths 0 to 7 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	92.0	8.0	26.0	24.0	42.0	61.6
American elodea	8.0	92.0	8.0	0.0	0.0	1.6
Eurasian watermilfoil	2.0	98.0	2.0	0.0	0.0	0.4
sago pondweed	2.0	98.0	2.0	0.0	0.0	0.4
flatstemmed pondweed	2.0	98.0	2.0	0.0	0.0	0.4
nitella	2.0	98.0	2.0	0.0	0.0	0.4

Depths 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	91.5	8.5	25.5	21.3	44.7	62.6
American elodea	8.5	91.5	8.5	0.0	0.0	1.7
Eurasian watermilfoil	2.1	97.9	2.1	0.0	0.0	0.4
sago pondweed	2.1	97.9	2.1	0.0	0.0	0.4
flatstemmed pondweed	2.1	97.9	2.1	0.0	0.0	0.4
nitella	2.1	97.9	2.1	0.0	0.0	0.4

Depths 5 to 7 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	100.0	0.0	33.3	66.7	0.0	46.7

Once again coontail was the most abundant species and was present at 92% of sample sites. Location and density of coontail is illustrated in Figure 15. American elodea ranked second in occurrence (8.0%). Sago pondweed flatstem pondweed and nitella were all present at single sites. Eurasian watermilfoil was the only invasive species collected at it was also present at a single location (Figure 16).

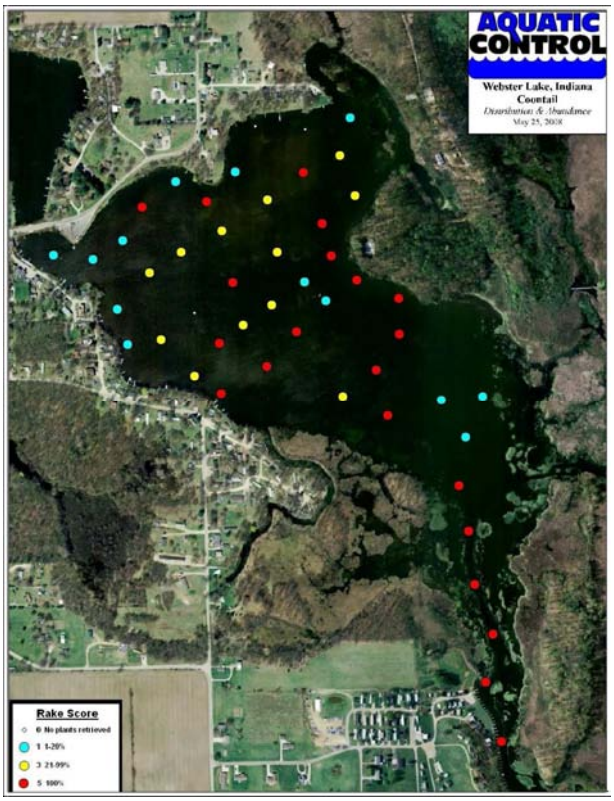


Figure 15. Backwater Lake, common coontail distribution and abundance, May 27, 2008.

Figure 16. Backwater Lake, Eurasian watermilfoil distribution and abundance, May 27, 2008.

2.2.3 August Survey, Backwater Lake

The final 2008 Tier II survey was completed on August 27. The same 50 sites were sampled. Vegetation was collected at all but two sites. A total of 5 species were collected of which all were native. The maximum number of species per site was 2 and the mean number of species per site was 1.22. Invasive species were observed, but for the first time since Tier II surveying began on Backwater Lake, none were collected. Results of the sampling are summarized in Table 6.

Table 6. Occurrence and abundance of submersed aquatic plants in Backwater Lake, August 27, 2008.

Occurrence and abundance of submersed aquatic plants in Backwater Lake

County:	Kos	Sites with plants:	48	Mean species/site:	1.22
Date:	8/27/2008	Sites with native plants:	48	Standard error (ms/s):	0.07
Secchi (ft):	2	Number of species:	5	Mean native species/site:	1.22
Maximum plant depth (ft):	6	Number of native species:	5	Standard error (mns/s):	0.07
Trophic status	Mesotrophic	Maximum species/site:	2	Species diversity:	0.43
Total sites:	50			Native species diversity:	0.43

Depths 0 to 6 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	90.0	10.0	28.0	20.0	42.0	59.6
sago pondweed	14.0	86.0	10.0	4.0	0.0	4.4
nitella	12.0	88.0	10.0	2.0	0.0	3.2
Chara	4.0	96.0	4.0	0.0	0.0	0.8
slender naiad	2.0	98.0	2.0	0.0	0.0	0.4

Depths 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	91.5	8.5	27.7	21.3	42.6	60.9
sago pondweed	12.8	87.2	8.5	4.3	0.0	4.3
nitella	12.8	87.2	10.6	2.1	0.0	3.4
Chara	4.3	95.7	4.3	0.0	0.0	0.9
slender naiad	2.1	97.9	2.1	0.0	0.0	0.4

Depths 5 to 6 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	66.7	33.3	33.3	0.0	33.3	40.0
sago pondweed	33.3	66.7	33.3	0.0	0.0	6.7

As expected, common coontail was the most frequently occurring species (90.0%). Distribution and abundance of common coontail is illustrated in Figure 17. Sago pondweed ranked second in percent occurrence and was present at 14.0% of sample sites (Figure 18). Nitella, chara, and slender naiad made up the remainder of the sample. Curlyleaf pondweed and Eurasian watermilfoil were not collected with rake sampling, but were observed in the southern end of the lake.

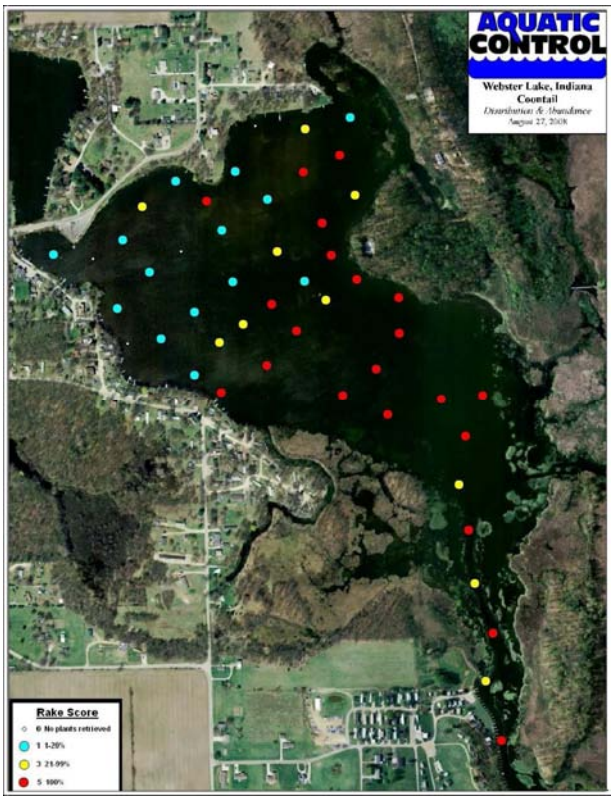


Figure 17. Backwater Lake, coontail distribution and abundance, August 27, 2008

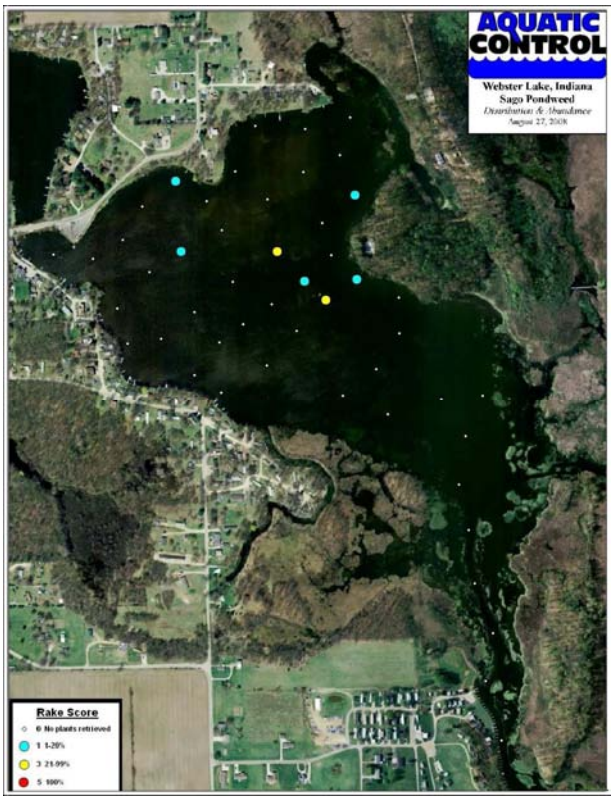


Figure 18. Backwater Lake, sago pondweed distribution and abundance, August 27, 2008

2.3 Plant Sampling Discussion

Backwater Lake was sampled along with Webster Lake due to the fact the water flows through Backwater before it reaches Webster. This leads to the potential for the spread of invasive species from Backwater into Webster making monitoring and management of Backwater Lake a high priority for the WLCA. Despite the connection, these two lakes have unique ecosystems thus plant sampling data and sampling discussion are kept separate.

2.3.1 Webster Lake Sampling Discussion

Webster Lake has a history of nuisance conditions created by Eurasian watermilfoil and curlyleaf pondweed. This fact is likely due to the large areas of nutrient rich shallow water that are perfect locations for invasive species colonization. A great deal of capital has been invested in an effort to keep these species under control and control of these species is one of the primary goals of the vegetation management plan. Table 7 and Figure 19 summarize the data collected over the last several years. It appears that controls are effectively reducing the abundance of these species. This is especially evident when comparing the April data. This data was collected prior to initiation of any vegetation controls during that season. The May data was collected following curlyleaf treatments in 2006-2008 and the August data reflects the results of the Renovate treatments which were completed in 2005-2008.

Table 7. Eurasian watermilfoil and curlyleaf pondweed percent occurrence in the last four April and May surveys and the last seven summer surveys of Webster Lake. (Whole lake fluridone treatment completed in 2002, Renovate spot treatments completed for milfoil control in June of 2005-2008 and early season curlyleaf treatments completed in April of 2006-2008.)

APRIL SURVEYS (2005-2008)

Invasive Species	(4/05)	(4/06)	(4/07)	(4/08)
Eurasian watermilfoil	40.6%	29.4%	8.9%	6.7%
Curlyleaf pondweed	47.5%	45.6%	12.2%	8.9%

MAY SURVEYS (2005-2008)

Invasive Species	(5/05)	(5/06)	(5/07)	(5/08)
Eurasian watermilfoil	36.9%	40.9%	14.6%	14.4%
Curlyleaf pondweed	65.6%	5.7%	0.0%	3.3%

SUMMER SURVEYS (2001-2008) (Fluridone Treatment 2002)

Invasive Species	(8/01)	(9/03)	(8/04)	(8/05)	(8/06)	(8/07)	(8/08)
Eurasian watermilfoil	47.0%	1.0%	12.5%	6.3%	1.1%	2.2%	1.1%
Curlyleaf pondweed	17.0%	5.0%	21.3%	20.0%	0.0%	0.0%	0.0%

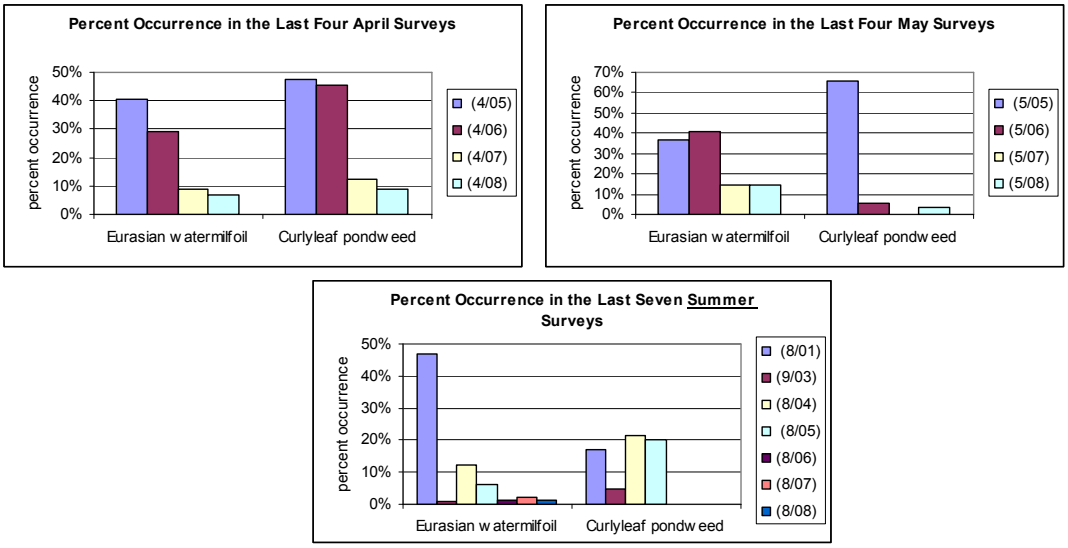


Figure 19. Webster Lake, Eurasian watermilfoil and curlyleaf pondweed percent occurrence in the last four April and May surveys and the last seven summer surveys. (Data are from Table 6.)

There is a great deal of historical data on individual species percent occurrence in Webster Lake (Table 8). We have focused on the decreases in curlyleaf pondweed and Eurasian watermilfoil, but it is also valuable to look at individual native species. The best time to sample for the majority of native species is in late summer. There were not any major changes in the individual native species percent occurrence when compared to 2007, with the exception of slender naiad, which increased from 6.7% to 30%. Common coontail, Chara, water stargrass, and sago pondweed all exhibited minor increases. Leafy pondweed was collected in 2008, but not in 2007. Flatstem pondweed and bladderwort were collected in 2007 but not in 2008. All of these species, with the exception of slender naiad, occur at relatively low levels, so their changes may be a result of the small sample size.

Table 8. Webster Lake species percent occurrence since 2001 (yellow=summer survey, gray=April survey, and white=May survey) (Data collected by Aquatic Control Inc.).

Species	% of Survey Sites (8/01)*	% of Survey Sites (9/03)	% of Survey Sites (8/04)	% of Survey Sites (4/05)	% of Survey Sites (5/05)	% of Survey Sites (8/05)	% of Survey Sites (4/06)	% of Survey Sites (5/06)	% of Survey Sites (8/06)	% of Survey Sites (4/07)	% of Survey Sites (5/07)	% of Survey Sites (8/07)	% of Survey Sites (4/08)	% of Survey Sites (5/08)	% of Survey Sites (8/08)
Eurasian watermilfoil (*Myriophyllum spicatum*)	47.0%	1.0%	12.5%	40.6%	36.9%	6.3%	29.4%	40.9%	1.1%	8.9%	14.6%	2.2%	6.7%	14.4%	1.1%
Curlyleaf pondweed (*Potamogeton crispus*)	17.0%	5.0%	21.3%	47.5%	65.6%	20.0%	45.6%	5.7%	0.0%	12.2%	0.0%	0.0%	8.9%	3.3%	0.0%
Common Coontail (*Ceratophylum demersum*)		45.0%	36.9%	20.6%	41.9%	66.3%	38.1%	65.9%	71.1%	58.9%	76.4%	72.2%	61.1%	71.1%	74.4%
Chara (*Chara spp.*)		1.0%	11.3%	10.6%	10.6%	13.8%	7.5%	6.8%	10.0%	6.7%	11.2%	7.8%	4.4%	13.3%	0.0%
Elodea (*Elodea canidensis*)		0.0%	0.5%	0.6%	4.4%	0.6%	1.9%	6.8%	0.0%	0.0%	7.9%	0.0%	0.0%	3.3%	0.0%
Northern watermilfoil (*Myriophylum sibiricum*)		1.0%	0.0%	0.0%	4.4%	5.0%	1.3%	1.1%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%
Variable watermilfoil (*Myriophylum heterophyllum*)		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Slender naiad (*Najas flexilis*)		0.0%	22.5%	7.5%	8.8%	28.8%	28.1%	20.5%	23.3%	0.0%	7.9%	6.7%	8.9%	6.7%	30.0%
Spiny naiad (*Najas marina*)		1.0%	1.9%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nitella (*Nitella spp.*)		0.0%	1.3%	0.0%	0.0%	0.6%	0.0%	1.1%	1.1%	0.0%	0.0%	0.0%	1.1%	0.0%	10.0%
Largeleaf pondweed (*Potamogeton amplifolius*)	5.5%	0.0%	0.0%	0.0%	2.5%	3.1%	0.6%	0.0%	1.1%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%
Illinois pondweed (*Potamogeton illinoensis*)		0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Small pondweed (*Potamogeton pusillus*)		0.0%	7.5%	0.0%	0.0%	3.1%	0.6%	1.1%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Leafy pondweed (*Potamogeton foliosus*)		1.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	4.4%
Flatstem pondweed (*Potamogeton zosteriformis*)		5.0%	29.4%	0.6%	10.0%	9.4%	0.0%	0.0%	0.0%	1.1%	0.0%	1.1%	2.2%	0.0%	0.0%
Sago pondweed (*Stuckenia pectinata*)		46.0%	3.8%	0.0%	1.9%	7.5%	0.0%	0.0%	2.2%	3.3%	9.0%	2.2%	2.2%	5.6%	5.6%
Bladderwort (*Utricularia spp.*)		0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%
Eel grass (*Vallisnaria americana*)		0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Horned pondweed (*Zannichellia palustris*)		0.0%	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	3.3%	0.0%
Water stargrass (*Zosterella dubia*)		7.0%	5.6%	0.0%	0.6%	8.8%	0.0%	0.0%	1.1%	1.1%	0.0%	1.1%	0.0%	0.0%	2.2%

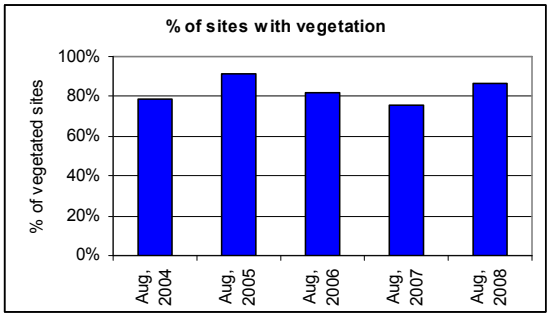
*other species collected, but no individual frequency recorded:

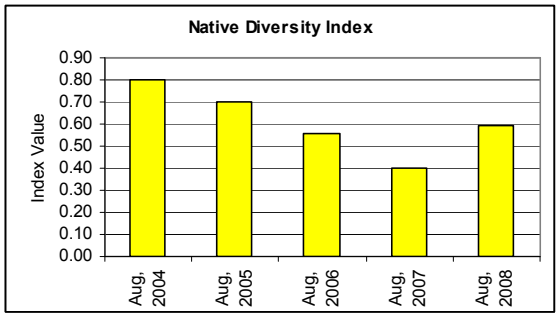
The goal of the 2008 management actions was to decrease the abundance and density of nuisance exotic vegetation and maintain the abundance and density of native vegetation. Preserving the native vegetation is especially important in Webster Lake since it is one of the premier lakes for muskellunge fishing in the state of Indiana and the Midwest. There is a great deal of spring sampling data on Webster Lake, but these surveys are primarily completed to track changes in Eurasian watermilfoil and curlyleaf pondweed. In order to get a good understanding of the changes in the overall plant community it is best to compare summer data. Table 9 and Figure 20 compare data collected since 2004. This season there was an 11.2% increase in the percentage of sample sites containing vegetation. Increases were also seen in the number of native species collected per site

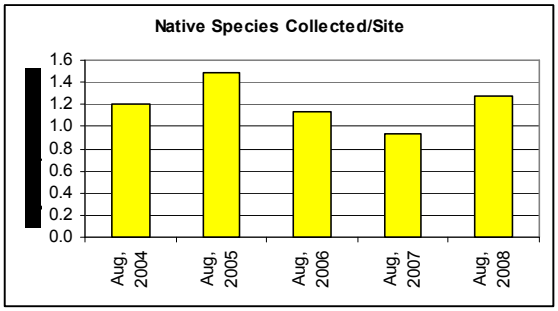
and the native diversity index. However, it may appear that there is a decrease in metrics when compared to 2004 and 2005 data. This may be due to a change in the IDNR sampling protocol that decreased the number of sampling points and changed the depth of sample sites. For example, in 2004 and 2005 sample sites were primarily located in shallow water leading to a more diverse sample. The change in the protocol required that sample points be spaced out more evenly over different depth ranges. Most of the deeper water sites in Webster Lake are dominated by coontail. This has likely led to a perceived decrease in species diversity when compared to 2004 and 2005. However, the overall diversity of submersed native vegetation in Webster Lake still remains relatively low.

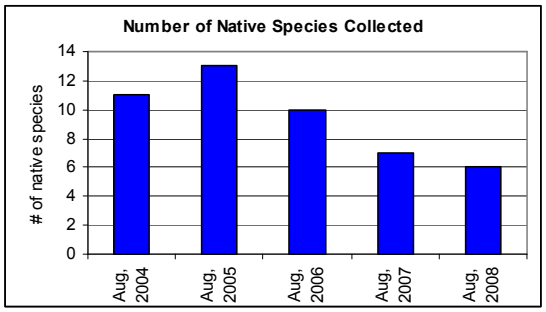
Table 9. Comparison of number of sample sites, % of sites with vegetation, number of natives collected, native diversity index, and Secchi depth in the last five summer surveys of Webster Lake.

Survey Date	Number of Sample Sites	% of sites with vegetation	Native Species/Site	Number of Natives Collected	Native Diversity Index	Secchi Depth
Aug, 2004	160	79.0%	1.20	11	0.80	5.0
Aug, 2005	160	91.2%	1.48	13	0.70	8.0
Aug, 2006	90	82.2%	1.13	10	0.56	7.0
Aug, 2007	90	75.5%	0.94	7	0.40	7.0
Aug, 2008	90	86.7%	1.27	6	0.59	9.0









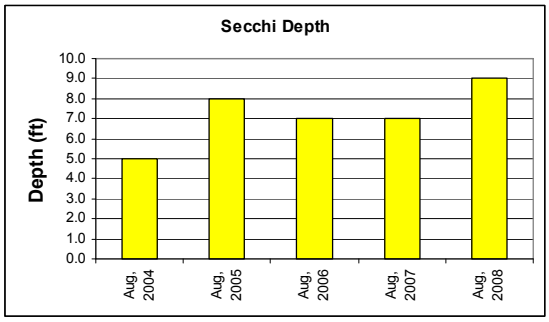


Figure 20. Comparison of % of sites with vegetation, native diversity index, native species collected/site, number of native species collected, and Secchi depth in the last five summer surveys of Webster Lake. (Data are from Table 8.)

2.3.2 Backwater Lake Sampling Discussion

Discussion of Backwater Lake is included in this update due to the potential of invasive species entering Webster Lake via Backwater Lake. In 2006, Eurasian watermilfoil was not treated in Backwater Lake due to the lack of funds and abundance of milfoil in Webster Lake. In 2007, an early season treatment using a combination Aquathol K and 2,4-D was completed on the lower 2/3 of Backwater Lake. This treatment targeted both curlyleaf pondweed and Eurasian watermilfoil. The treatment effectively controlled curlyleaf pondweed and reduced Eurasian watermilfoil. A similar treatment was completed in 2008, but Renovate herbicide was used in place of 2,4-D. Data indicates that this treatment was more effective at reducing Eurasian watermilfoil abundance (reduction from 32% of sites in August 2007 to 0% of sites in August 2008). Curlyleaf pondweed also appears to be on the decline in Backwater Lake (Table 10 and Figure 21).

Table 10. Backwater Lake, Eurasian watermilfoil and curlyleaf pondweed percent occurrence in the since 2005. (Early season curlyleaf/Eurasian watermilfoil treatments initiated in April 2007.)

APRIL SURVEYS (2005-2008)

Invasive Species	(4/05)	(4/06)	(4/07)	(4/08)
Eurasian watermilfoil	28.6%	33.3%	48.0%	20.0%
Curlyleaf pondweed	26.2%	42.9%	32.0%	14.0%

MAY SURVEYS (2005, 2007 & 2008)

Invasive Species	(5/05)	(5/07)	(5/08)
Eurasian watermilfoil	31.0%	14.0%	2.0%
Curlyleaf pondweed	40.5%	10.0%	0.0%

AUGUST SURVEYS (2005-2008)

Invasive Species	(8/05)	(8/06)	(8/07)	(8/08)
Eurasian watermilfoil	33.3%	64.0%	32.0%	0.0%
Curlyleaf pondweed	9.5%	4.0%	0.0%	0.0%

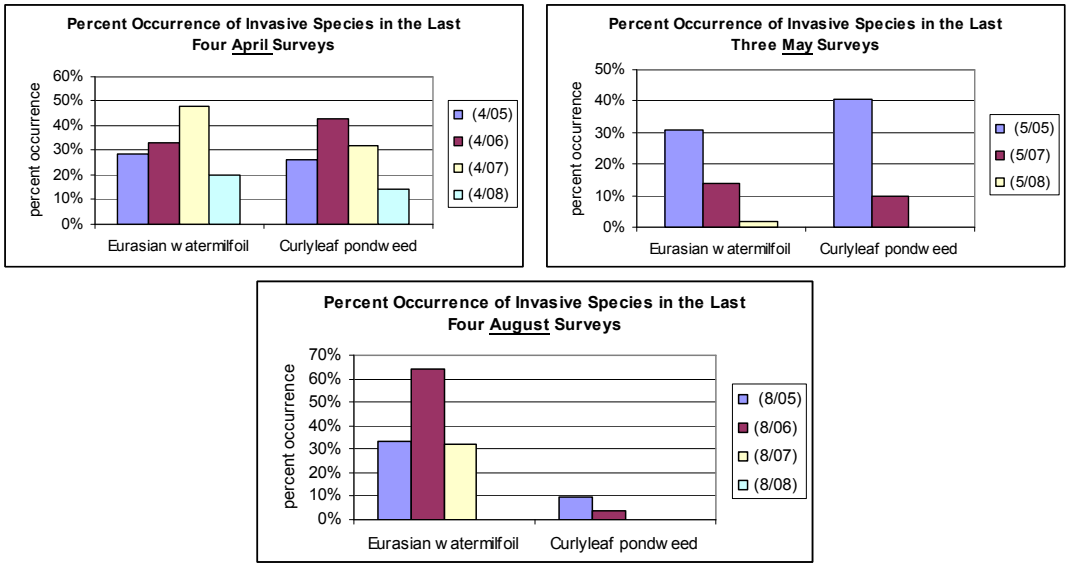


Figure 21. Backwater Lake, Eurasian watermilfoil and curlyleaf pondweed percent occurrence since 2005. (Data are from Table 9.)

There appears to be only minor changes in the submersed native species of Backwater Lake since 2005 (Table 11). Common coontail is by far the most abundant submersed species in the lake, typically occurring at more than 90% of sample sites in recent surveys. Illinois pondweed was collected for the first time in Backwater Lake this season and it also appears that nitella has increased in abundance. American elodea was found at 2-20% of sites from April of 2006 through May of 2008, but was not collected in this August survey.

Table 11. Backwater Lake species percent occurrence since 2005 (data collected by Aquatic Control Inc.).

Species	(8/01)*	(9/03)	(8/04)	(4/05)	(5/05)	(8/05)	(4/06)	(5/06)	(8/06)	(4/07)	(5/07)	(8/07)	(4/08)	(5/08)	(8/08)
Eurasian watermilfoil (*Myriophyllum spicatum*)	47%*	1.0%	12.5%	40.6%	36.9%	6.3%	29.4%	40.9%	1.1%	8.9%	14.6%	2.2%	6.7%	14.4%	1.1%
Curlyleaf pondweed (*Potamogeton crispus*)	17%*	5.0%	21.3%	47.5%	65.6%	20.0%	45.6%	5.7%	0.0%	12.2%	0.0%	0.0%	8.9%	3.3%	0.0%
Common Coontail (*Ceratophylum demersum*)		45.0%	36.9%	20.6%	41.9%	66.3%	38.1%	65.9%	71.1%	58.9%	76.4%	72.2%	61.1%	71.1%	74.4%
Chara (*Chara spp.*)		1.0%	11.3%	10.6%	10.6%	13.8%	7.5%	6.8%	10.0%	6.7%	11.2%	7.8%	4.4%	13.3%	10.0%
Elodea (*Elodea canidensis*)		0.0%	0.5%	0.6%	4.4%	0.6%	1.9%	6.8%	0.0%	0.0%	7.9%	0.0%	0.0%	3.3%	0.0%
Northern watermilfoil (*Myriophylum sibiricum*)		1.0%	0.0%	0.0%	4.4%	5.0%	1.3%	1.1%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%
Variable watermilfoil (*Myriophylum heterophyllum*)		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Slender naiad (*Najas flexilis*)		0.0%	22.5%	7.5%	8.8%	28.8%	28.1%	20.5%	23.3%	0.0%	7.9%	6.7%	8.9%	6.7%	30.0%
Spiny naiad (*Najas marina*)		1.0%	1.9%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nitella (*Nitella spp.*)		0.0%	1.3%	0.0%	0.0%	0.6%	0.0%	1.1%	1.1%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%
Largeleaf pondweed (*Potamogeton amplifolius*)	5.5%*	0.0%	0.0%	0.0%	2.5%	3.1%	0.6%	0.0%	1.1%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%
Illinois pondweed (*Potamogeton illinoensis*)		0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Small pondweed (*Potamogeton pusillus*)		0.0%	7.5%	0.0%	0.0%	3.1%	0.6%	1.1%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Leafy pondweed (*Potamogeton foliosus*)		1.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	4.4%
Flatstem pondweed (*Potamogeton zosteriformis*)		5.0%	29.4%	0.6%	10.0%	9.4%	0.0%	0.0%	0.0%	1.1%	0.0%	1.1%	2.2%	0.0%	0.0%
Sago pondweed (*Stuckenia pectinata*)		46.0%	3.8%	0.0%	1.9%	7.5%	0.0%	0.0%	2.2%	3.3%	9.0%	2.2%	2.2%	5.6%	5.6%
Bladderwort (*Utricularia spp.*)		0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%
Eel grass (*Vallisnaria americana*)		0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Horned pondweed (*Zannichellia palustris*)		0.0%	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	3.3%	0.0%
Water stargrass (*Zosterella dubia*)		7.0%	5.6%	0.0%	0.6%	8.8%	0.0%	0.0%	1.1%	1.1%	0.0%	1.1%	0.0%	0.0%	2.2%

*other species collected, but no individual frequency recorded

Reductions have occurred in invasive species abundance and one would like to believe that this would lead to an increase in native diversity within the lake. In order to get a good understanding of the changes in the overall plant community it is best to compare summer data. Table 12 and Figure 22 compare data collected since 2004. There appears to be slight increases in overall submersed vegetation diversity in Backwater Lake.

Table 12. Comparison of number of sample sites, % of sites with vegetation, number of natives collected, and native diversity index in the last five summer surveys on Backwater Lake. (Early season treatments initiated in April 2007.)

Survey Date	Number of Sample Sites	% of sites with vegetation	Native Species/Site	Number of Natives Collected	Native Diversity Index
August, 2004	40	86.0%	0.76	2	0.29
August, 2005	40	100.0%	1.12	6	0.38
August, 2006	50	100.0%	1.14	5	0.49
August, 2007	50	98.0%	1.28	5	0.42
August, 2008	50	96.0%	1.22	5	0.59

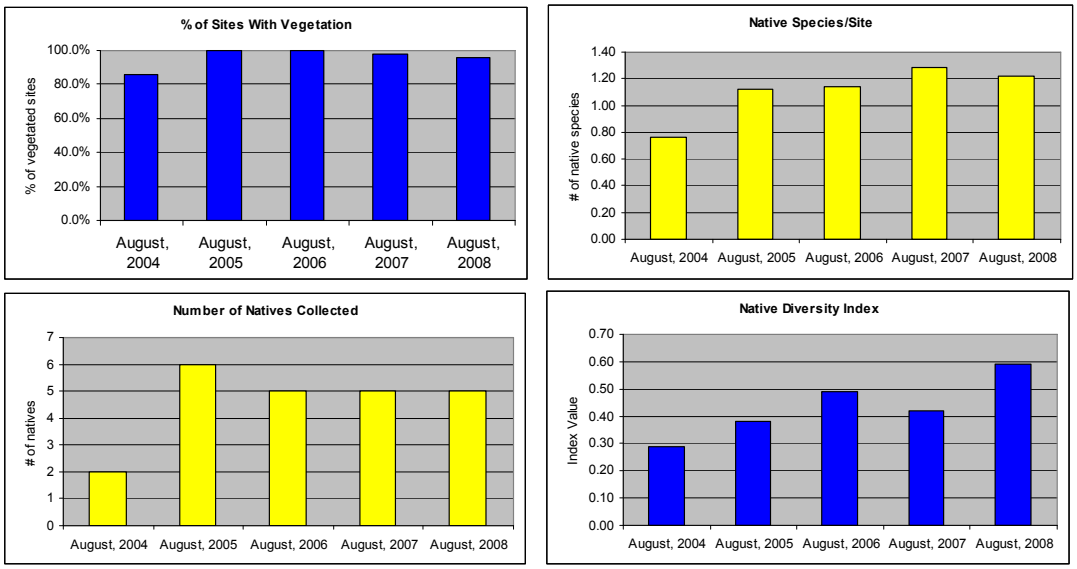


Figure 22. Comparison of % of sites with vegetation, native diversity index, native species collected/site, and number of native species collected in the last five surveys of Backwater Lake. (Data are from Table 10.)

There were no official surveys of emergent or rooted floating vegetation completed on Backwater Lake, however, some visual observations were made and pictures were taken of these plant beds. In 2004 and 2005 there appeared to be a reduction in the abundance of spatterdock and white water lily. The reason for the reduction was not clear. It appeared that there was an increase in the abundance of these species in Backwater Lake in 2008. There is no data to back this claim, but it may be beneficial to at least keep picture records or possibly complete a more detailed rooted floating vegetation survey of Backwater Lake in order to support perceived increase. Figure 23 contains pictures of spatterdock and white water lily beds that appear to have expanded in Backwater Lake.

Figure 23. Backwater Lake, white water lily and spatterdock beds, August 27, 2008

3.0 2008 VEGETATION CONTROL

In general, the goals of the vegetation management plan are to control nuisance aquatic species, with a focus on exotic nuisance plants, while preserving and enhancing native vegetation. On Webster Lake an early season curlyleaf treatment was completed on April 29, a selective milfoil treatment was completed on June 3, and a shoreline treatment for the control of nuisance native vegetation was completed on June 17. Backwater Lake received a treatment on April 29 for control of curlyleaf pondweed and Eurasian watermilfoil and a shoreline treatment on June 17 primarily for control of coontail.

3.1 Webster Lake Vegetation Control

On April 29, 2008, WLCA funded treatment of 125 acres of curlyleaf pondweed on Webster Lake (Figure 24). This treatment was completed using Aquathol K (active ingredient endothal) at a rate of 1.0 ppm. Aquatic application boats fitted with dropper hoses were used to apply the product. Areas designated for treatment were downloaded onto GPS devices in order to insure accurate application. The treatment was very successful at reducing the abundance of curlyleaf pondweed in 2008.

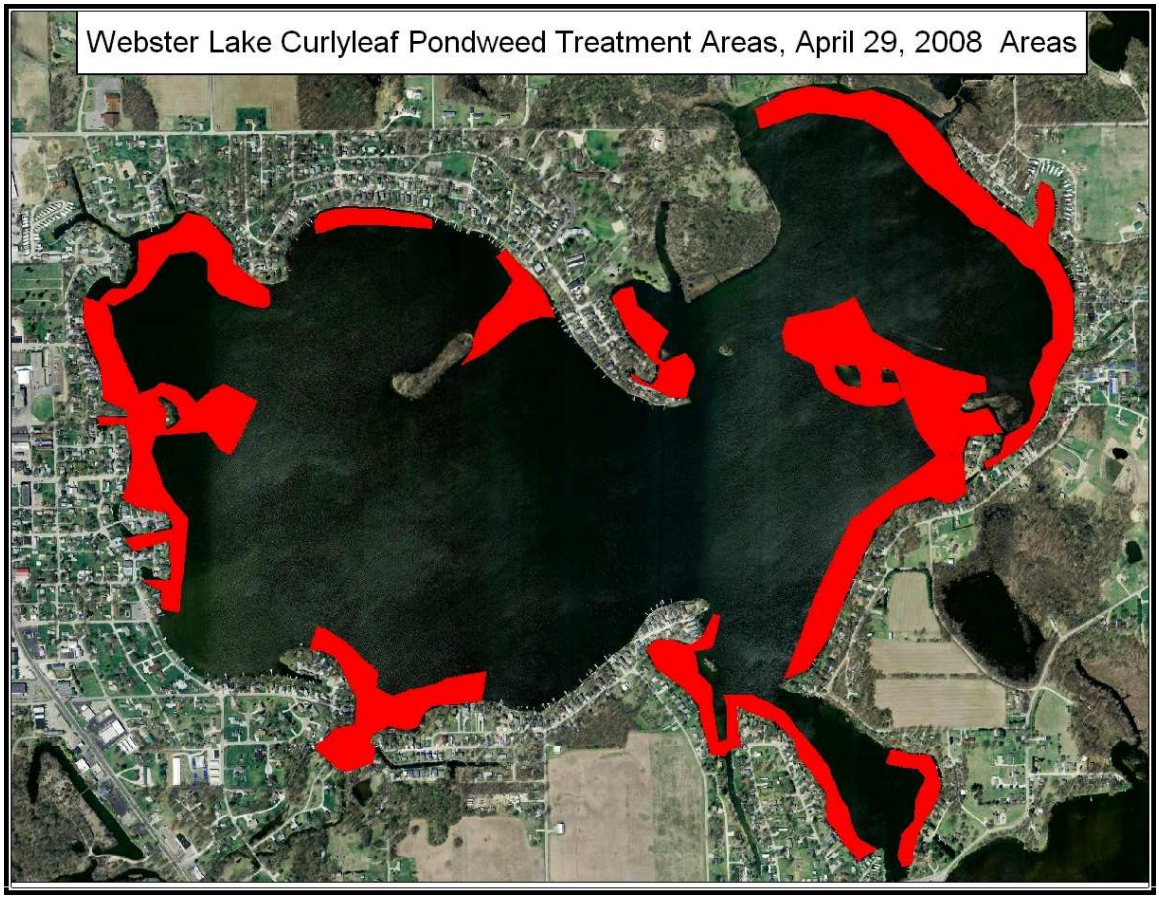


Figure 24. Webster Lake curlyleaf pondweed treatment areas, April 29, 2008.

The curlyleaf pondweed treatment was completed early in the season primarily for three reasons:

1. to control curlyleaf pondweed before it produced reproductive structures
2. to minimize native damage
3. to reduce the amount of nutrients released from dying plants since the plants have a relatively small biomass in early spring

On June 3, 2008, 46.8 acres of Eurasian watermilfoil was treated on Webster Lake (Figure 25). This treatment was funded by LARE and WLCA. Renovate was used in the application at a rate of 1.0-1.5 ppm. These areas were mapped during the Invasive Species Mapping Survey and downloaded onto GPS units that were used during the application to insure proper product placement. Sampling data indicate that the treatment effectively controlled Eurasian watermilfoil in Webster Lake.

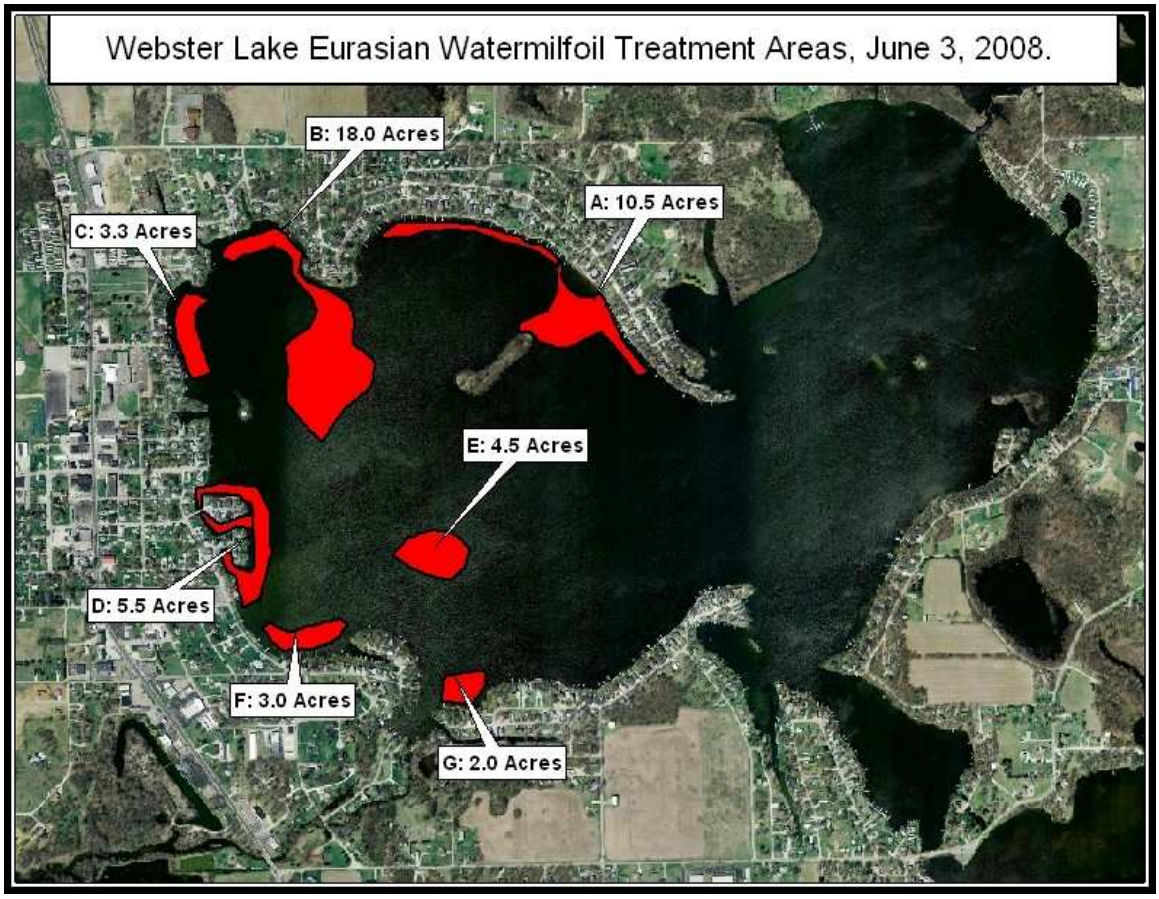


Figure 25. Webster Lake, Eurasian watermilfoil treatment areas, June 3, 2008.

A shoreline treatment was completed to Webster Lake on June 17, 2008. This treatment was designed to reduce nuisance conditions in high-use areas. The primary species targeted with this treatment was common coontail. A combination of Reward (active ingredient: diquat) and Komeen (active ingredient: copper) was used in the treatment. A total of 38.25 acres was treated in Webster Lake (Figure 26). The treatment was funded by WLCA. The shoreline treatments were very effective at reducing nuisance conditions in the lake.

Figure 26. Webster Lake shoreline treatment areas, June 17, 2008.

3.2 Backwater Lake Vegetation Control

On April 29, 2008, 75 acres of curlyleaf pondweed and Eurasian watermilfoil were treated on Backwater Lake. Treatment was completed in the lower 2/3 of the lake where these species were most abundant, close to Webster Lake, and interfering with lake use (Figure 27). The treatment was funded by WLCA. Aquathol K at a rate of 1.0 ppm was used in combination with 0.5 ppm of Renovate OTF (granular formulation). A GPS device was used in order to achieve accuracy in herbicide concentrations. The treatment significantly reduced the abundance of both species to the point that neither species was collected during the summer Tier II survey.

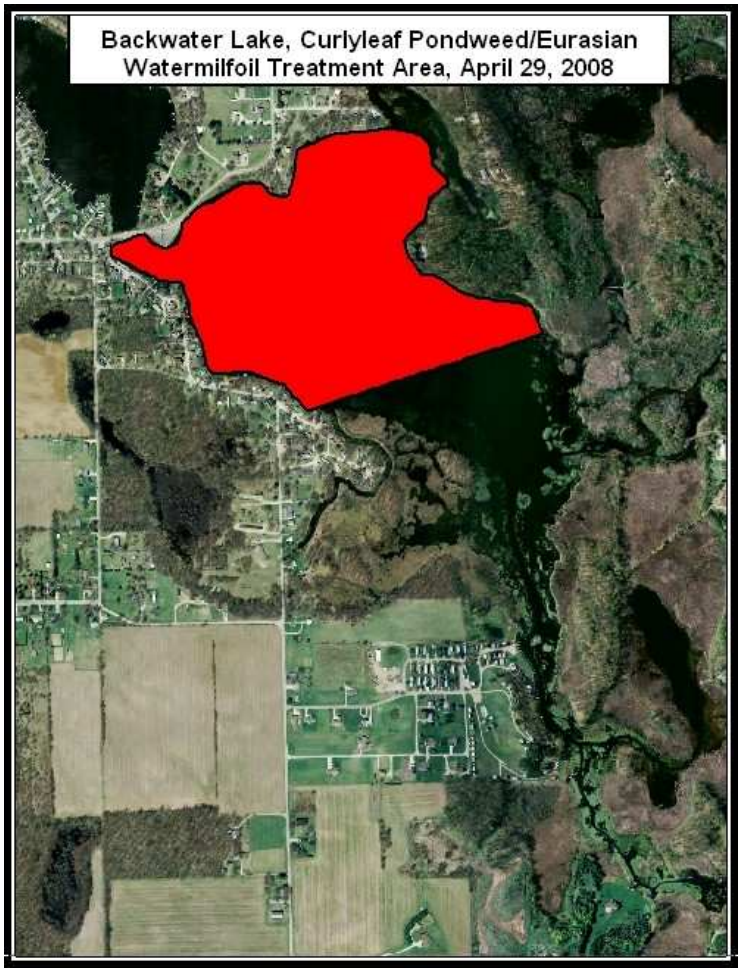


Figure 27. Backwater Lake, curlyleaf pondweed and Eurasian watermilfoil treatment areas, April 29, 2008

Backwater Lake also received shoreline treatment for control of nuisance vegetation and algae. A total of 4.5 acres was treated on June 17, 2008 (Figure 28). Reward, Komeen, copper sulfate, and Aquathol were used in the application. Coontail and filamentous algae were the primary targets of the treatment. The treatment was funded by individual groups of lot owners that live on Backwater Lake.

Figure 28. Backwater Lake shoreline treatment areas, June 17, 2008.

4.0 ACTION PLAN AND BUDGET UPDATE

Eurasian watermilfoil has historically been the primary nuisance exotic species in Webster Lake. Selective treatments with Renovate herbicide have resulted in excellent control of milfoil and have met the objective of keeping milfoil at below 5% occurrence in summer surveys (1.1% in 2006, 2.2% in 2007 and 1.1% in 2008). However, it appears that we may be entering a maintenance phase since 40-50 acres has required treatment the past three seasons. It is important to remain vigilant and continue treating any remaining milfoil beds. If no management activities were completed in 2009, it is likely that invasive species could return to pre-treatment levels within 1-2 years. It is difficult to predict the number of acres that will require treatment next season, but controls will likely be needed in the eastern basin of Webster Lake (appear to be obtaining two years control following application and the eastern basin was last treated in 2007). Since 40-50 acres has required treatment the past three seasons it is recommended to request $25,000 from LARE for control of Eurasian watermilfoil. That amount would treat approximately 50 acres of milfoil.

Since the last whole lake fluridone treatment, curlyleaf pondweed has become more of a nuisance in the spring and early summer than Eurasian watermilfoil. Three consecutive seasons of curlyleaf pondweed treatments on Webster Lake have been very effective at reducing nuisance conditions caused by this plan. In addition, there has been a significant reduction in curlyleaf abundance prior to application, which leads one to believe that there has been a reduction in curlyleaf turions (reproductive structures). In 2009, an invasive species survey should be completed in April in order to document any remaining beds. These beds should be treated with 1.0 ppm of Aquathol K herbicide once surface temperatures reach a consistent 50 degrees F. It is estimated that less than 10 acres will require treatment in 2009. The cost of that treatment would be approximately $3,000.

It will also be necessary to complete shoreline contact herbicide treatments in order to relieve residents of nuisance conditions caused by native vegetation, primarily coontail. These treatments should not extend beyond 100 feet from the shoreline and should include only the areas treated this past season. Treatments should be completed in mid to late June much like they were in 2008. These treatments will need to be funded by WLCA.

This was the second season that Backwater Lake was treated for early season control of curlyleaf pondweed. The 2007 treatment included 2,4-D at a rate of 0.5 ppm for milfoil control. Renovate was used in place of 2,4-D in 2008 and was more effective (no Eurasian watermilfoil collected during summer 2008 survey while milfoil was present at 32% of sites summer 2007). Backwater Lake should be assessed prior to treatment. It is anticipated that very little milfoil will be present, but it is recommended that the same area be treated for one more season for control of curlyleaf pondweed due to the ability of curlyleaf turions to remain viable for several years. The cost of this treatment would be no more than $22,500 for treatment of 75 acres of curlyleaf pondweed.

Along with herbicide applications, it will be important to continue monitoring the vegetation in a similar fashion. Three Tier II surveys should be sufficient to keep track of any major changes in the plant population and make appropriate management decisions. These surveys should be completed near the same time as they were in 2008. Invasive mapping surveys should also be completed prior to the milfoil and curlyleaf treatments.

A budget for the proposed applications and sampling is provided in Table 13. The budget includes the estimated cost of treatments that should be eligible for funding by LARE and cost for treatments funded solely by the WLCA. The budget extends for the next four seasons. It is recommended that WLCA requests $22,500 for treatment of up to 75 acres curlyleaf pondweed and Eurasian watermilfoil in Backwater Lake, $3,000 for treatment of up to 10 acres of curlyleaf pondweed in Webster Lake, $25,000 for treatment of up to 50 acres of milfoil in Webster Lake, and $6,000 for plant sampling and plan updates on both lakes.

Table 13. Webster Lake Conservation Association budget estimate for the next four seasons.

	2009	2010	2011	2012
Early season curlyleaf pondweed treatment (20 acres)	$3,000	$3,000	$3,000	$3,000
Renovate treatment for selective milfoil control (50 acres)	$25,000	$20,000	$20,000	$15,000
Developed shoreline treatment (including algae not to exceed 80 acres, not eligible for LARE funding)	$15,000	$15,500	$16,000	16,500
Curlyleaf treatment on Backwater Lake (75 acres)	$22,500	$2,000	$2,000	$2,000
Plant Sampling and plan update	$6,000	$6,000	$6,000	$6,000
Total LARE Funding Request:	**$56,500**	**$31,000**	**$31,000**	**$26,000**
Total Funded Strictly by Association if LARE funds milfoil and curlyleaf treatments (does not include 10% match):	$15,000	$15,500	$16,000	$16,500

5.0 PUBLIC INVOLVEMENT

A public meeting was held at the Webster Lake Community Center on October 28, 2008. The meeting was designed to educate lake users on the benefits of aquatic vegetation, review the 2008 vegetation controls, and discuss the future of aquatic plant management on Webster Lake. The meeting was advertised in two local newspapers (Figure 29). The meeting was also used to gain input from lake users concerning their perceptions of aquatic vegetation and satisfaction or dissatisfaction concerning vegetation control techniques. Six individuals were in attendance and filled out a lake use survey. The results of the survey are listed in Table 14. As Table 14 indicates, 83% of those present were property owners and members of the lake association. Swimming and boating continue to be the most popular activities on the lake. All of the respondents were pleased with the LARE funded treatments and wished to continue with vegetation control efforts on the lake.

Figure 29. Notice which appeared in "The Paper" and "Mail Journal Newspapers.

Table 14. Webster Lake public meeting survey results, October 28, 2008.

Webster Lake User Survey 10/28/08		
Are you a lake property owner?	Yes: 83%	No: 17%
Are you currently a member of your lake association?	Yes:83%	No: 17%
How many years have you been at the lake?	2 or Less: 0%	5 to 10: 0%
	2 to 5: 0%	Over 10: 100%
How do you use the lake (mark all that apply)	100% Swimming	17% Irrigation
	100% Boating	0% Drinking water
	83% Fishing	
Do you have aquatic plants at your shoreline in nuisance quantities?	Yes: 50% No: 50%	
Does aquatic vegetation interfere with your use or enjoyment of the lake?	Yes: 50% No: 50%	
Does the level of vegetation in the lake affect your property values?	Yes: 67% No: 17% No Response: 17%	
Are you in favor of continuing efforts to control vegetation on the lake?	Yes: 100% No: 0%	
Are you aware that the LARE funds will only apply to work controlling invasive exotic species, and more work may need to be privately funded?	Yes: 83% No: 17%	
Were you satisfied with the results of the LARE funded invasive treatments this season?	Yes: 100%	
Mark any of these you think are problems on your lake:		
0% Too many boats access the lake		
17% Use of jet skis on the lake		
33% Too much fishing		
17% Fish population problem		
17% Dredging needed		
17% Overuse by nonresidents		
50% Too many aquatic plants		
0% Not enough aquatic plants		
0% Poor water quality		
17% Pier/funneling problem		

It will be important for the Association to continue to inform users of proper land management practices that have minimal negative impacts on the lakes water quality. This may include discouraging fertilizer use, not disposing of yard waste in or near the lake, and allowing natural vegetation to grow along the shoreline as opposed to concrete seawalls. Residents should also continue to be informed of the benefits of native vegetation on fish populations and water quality. These items can be reinforced in Association newsletters, websites, and at Association meetings.

6.0 REFERENCES CITED

Aquatic Control Inc. 2005. Webster Lake Aquatic Vegetation Management Plan. Prepared for the Webster Lake Conservation Association. North Webster, IN.

IDNR. 2007. Procedure Manual for Surveying Aquatic Vegetation: Tier II Reconnaissance Surveys. IN Department of Natural Resources, Division of Fish and Wildlife.

7.0 APPENDIX UPDATE

7.1 2008 Plant Sampling Data

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	POCR3	CEDE4	CH?AR	NAFL	POPE6	POZO	NI?TE
Webster	4/23/08	41.317359	-85.670945	1	3.0	5			5					
Webster	4/23/08	41.318455	-85.670643	2	4.0	1			1					
Webster	4/23/08	41.31992	-85.673179	3	4.0	0								
Webster	4/23/08	41.321401	-85.675048	4	5.0	0								
Webster	4/23/08	41.325357	-85.674072	5	8.0	1			1					
Webster	4/23/08	41.323508	-85.67285	6	5.0	0								
Webster	4/23/08	41.326136	-85.671464	7	5.0	0								
Webster	4/23/08	41.326704	-85.669602	8	6.0	5			5					
Webster	4/23/08	41.327683	-85.672293	9	2.0	1				1				
Webster	4/23/08	41.3294	-85.672979	10	7.0	1			1					
Webster	4/23/08	41.329683	-85.672418	11	11.0	1			1					
Webster	4/23/08	41.329013	-85.669569	12	6.0	3			3				1	
Webster	4/23/08	41.328321	-85.666835	13	5.0	1			1					
Webster	4/23/08	41.3295	-85.666786	14	15.0	1			1					
Webster	4/23/08	41.330249	-85.667351	15	7.0	1			1					
Webster	4/23/08	41.330688	-85.668854	16	15.0	0								
Webster	4/23/08	41.331069	-85.669532	17	12.0	3			3					
Webster	4/23/08	41.332496	-85.66903	18	5.0	1		1						
Webster	4/23/08	41.333577	-85.670624	19	3.0	1		1						
Webster	4/23/08	41.33295	-85.671927	20	11.0	0								
Webster	4/23/08	41.332968	-85.674282	21	18.0	1			1					
Webster	4/23/08	41.331669	-85.674096	22	4.0	3				3		1		
Webster	4/23/08	41.331006	-85.673613	23	10.0	0								
Webster	4/23/08	41.329568	-85.674031	24	6.0	1			1					
Webster	4/23/08	41.328322	-85.674686	25	8.0	0								
Webster	4/23/08	41.329059	-85.678036	26	3.0	1			1					
Webster	4/23/08	41.326983	-85.676679	27	7.0	1			1					
Webster	4/23/08	41.326454	-85.677307	28	10.0	1			1				1	
Webster	4/23/08	41.326361	-85.678555	29	14.0	1			1					
Webster	4/23/08	41.32734	-85.679333	30	8.0	5			5					
Webster	4/23/08	41.327977	-85.680055	31	7.0	3	1		3		1			
Webster	4/23/08	41.327309	-85.682116	32	8.0	3			3					
Webster	4/23/08	41.326113	-85.681631	33	9.0	5			5					
Webster	4/23/08	41.327525	-85.68401	34	6.0	5			5					
Webster	4/23/08	41.329149	-85.682703	35	6.0	0								
Webster	4/23/08	41.330574	-85.683019	36	6.0	1			1					
Webster	4/23/08	41.329494	-85.684398	37	10.0	3			3					
Webster	4/23/08	41.328747	-85.685292	38	9.0	5			5					
Webster	4/23/08	41.331117	-85.684349	39	8.0	1					1			
Webster	4/23/08	41.331593	-85.686224	40	8.0	0								
Webster	4/23/08	41.331005	-85.687603	41	10.0	5			5					
Webster	4/23/08	41.330219	-85.689217	42	5.0	1			1		1			
Webster	4/23/08	41.329141	-85.688596	43	15.0	0								
Webster	4/23/08	41.328216	-85.688743	44	8.0	3			3					
Webster	4/23/08	41.327519	-85.689126	45	8.0	3			3					
Webster	4/23/08	41.328614	-85.690066	46	8.0	3			3					
Webster	4/23/08	41.330131	-85.690784	47	5.0	5	1	1	5					
Webster	4/23/08	41.329719	-85.691777	48	6.0	1		1	1					
Webster	4/23/08	41.32749	-85.69173	49	6.0	3		3						
Webster	4/23/08	41.326757	-85.690941	50	6.0	3		1	3					
Webster	4/23/08	41.32603	-85.689658	51	15.0	0								
Webster	4/23/08	41.325896	-85.688936	52	22.0	0								
Webster	4/23/08	41.327568	-85.690536	53	7.0	5	1	3	3					
Webster	4/23/08	41.329756	-85.693893	54	6.0	3			3					
Webster	4/23/08	41.329332	-85.695066	55	4.0	5			1	5				
Webster	4/23/08	41.328191	-85.694686	56	4.0	0								
Webster	4/23/08	41.326816	-85.693824	57	5.0	3			1	3	1			
Webster	4/23/08	41.325605	-85.693876	58	4.0	3					3			
Webster	4/23/08	41.325617	-85.691829	59	7.0	3	1		3					
Webster	4/23/08	41.325126	-85.691549	60	20.0	0								
Webster	4/23/08	41.324534	-85.692644	61	4.0	0								
Webster	4/23/08	41.323414	-85.692692	62	4.0	1						1		
Webster	4/23/08	41.32332	-85.691083	63	7.0	1	1							
Webster	4/23/08	41.323485	-85.689692	64	15.0	3			3					
Webster	4/23/08	41.322601	-85.691185	65	5.0	0								
Webster	4/23/08	41.321767	-85.691626	66	3.0	0								
Webster	4/23/08	41.321697	-85.690295	67	4.0	1			1					
Webster	4/23/08	41.323347	-85.687809	68	7.0	5			5					
Webster	4/23/08	41.32417	-85.686481	69	9.0	1			1					
Webster	4/23/08	41.323253	-85.686702	70	7.0	5	1		5					
Webster	4/23/08	41.321644	-85.686944	71	7.0	3		1	3		1			
Webster	4/23/08	41.319934	-85.687498	72	5.0	1			1		1			
Webster	4/23/08	41.320415	-85.686183	73	5.0	0								
Webster	4/23/08	41.321318	-85.685042	74	10.0	0								
Webster	4/23/08	41.322171	-85.684356	75	7.0	5			5					
Webster	4/23/08	41.322105	-85.683258	76	7.0	1			1					
Webster	4/23/08	41.32106	-85.683081	77	8.0	3			3					
Webster	4/23/08	41.320762	-85.68165	78	6.0	1			1		1			
Webster	4/23/08	41.321372	-85.681125	79	20.0	0								
Webster	4/23/08	41.321666	-85.679908	80	7.0	3			3					
Webster	4/23/08	41.322163	-85.679844	81	20.0	0								
Webster	4/23/08	41.322867	-85.678588	82	7.0	1			1					
Webster	4/23/08	41.323632	-85.677928	83	19.0	0								
Webster	4/23/08	41.323143	-85.677106	84	5.0	1			1					
Webster	4/23/08	41.323565	-85.675299	85	6.0	0								
Webster	4/23/08	41.322657	-85.675355	86	5.0	0								
Webster	4/23/08	41.32139	-85.677314	87	3.0	3			3					
Webster	4/23/08	41.320744	-85.676896	88	2.0	1								1
Webster	4/23/08	41.320372	-85.674631	89	4.0	1			1					
Webster	4/23/08	41.318903	-85.673059	90	4.0	1			1					

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	POCR3	CEDE4	CH?AR	NAFL	POPE6	ELCA7	ZAPA
Webster	5/27/08	41.317359	-85.670945	1	5.0	5			5					
Webster	5/27/08	41.318455	-85.670643	2	4.0	1			1					
Webster	5/27/08	41.31992	-85.673179	3	5.0	1			1					
Webster	5/27/08	41.321401	-85.675048	4	7.0	0								
Webster	5/27/08	41.325357	-85.674072	5	5.0	5			5					
Webster	5/27/08	41.323508	-85.67285	6	6.0	0								
Webster	5/27/08	41.326136	-85.671464	7	7.0	5				5				
Webster	5/27/08	41.326704	-85.669602	8	7.0	5			5					
Webster	5/27/08	41.327683	-85.672293	9	5.0	5			5	1		1		
Webster	5/27/08	41.3294	-85.672979	10	9.0	1			1					
Webster	5/27/08	41.329683	-85.672418	11	7.0	5			5					
Webster	5/27/08	41.329013	-85.669569	12	7.0	1			1					
Webster	5/27/08	41.328321	-85.666835	13	7.0	3			3					
Webster	5/27/08	41.3295	-85.666786	14	18.0	0								
Webster	5/27/08	41.330249	-85.667351	15	9.0	0								
Webster	5/27/08	41.330688	-85.668854	16	15.0	0								
Webster	5/27/08	41.331069	-85.669532	17	13.0	5			5					
Webster	5/27/08	41.332496	-85.66903	18	6.0	1			1					
Webster	5/27/08	41.333577	-85.670624	19	5.0	1		1						
Webster	5/27/08	41.33295	-85.671927	20	20.0	0								
Webster	5/27/08	41.332968	-85.674282	21	16.0	1			1		1			
Webster	5/27/08	41.331669	-85.674096	22	6.0	3			1					3
Webster	5/27/08	41.331006	-85.673613	23	8.0	1			1					
Webster	5/27/08	41.329568	-85.674031	24	9.0	1			1					
Webster	5/27/08	41.328322	-85.674686	25	7.0	1			1					
Webster	5/27/08	41.329059	-85.678036	26	5.0	1				1				
Webster	5/27/08	41.326983	-85.676679	27	8.0	1			1					
Webster	5/27/08	41.326454	-85.677307	28	11.0	5			5					
Webster	5/27/08	41.326361	-85.678555	29	16.0	0								
Webster	5/27/08	41.32734	-85.679333	30	8.0	5			5		3			
Webster	5/27/08	41.327977	-85.680055	31	7.0	3	1			1	1		1	
Webster	5/27/08	41.327309	-85.682116	32	12.0	5			5					
Webster	5/27/08	41.326113	-85.681631	33	14.0	1			1					
Webster	5/27/08	41.327525	-85.68401	34	10.0	5			5					
Webster	5/27/08	41.329149	-85.682703	35	7.0	0								
Webster	5/27/08	41.330574	-85.683019	36	7.0	5	5		1					
Webster	5/27/08	41.329494	-85.684398	37	13.0	5			5					
Webster	5/27/08	41.328747	-85.685292	38	11.0	5			5					
Webster	5/27/08	41.331117	-85.684349	39	9.0	3	1		1					
Webster	5/27/08	41.331593	-85.686224	40	8.0	3	1		3					
Webster	5/27/08	41.331005	-85.687603	41	10.0	3			3					
Webster	5/27/08	41.330219	-85.689217	42	6.0	1		1		1				
Webster	5/27/08	41.329141	-85.688596	43	13.0	1			1					
Webster	5/27/08	41.328216	-85.688743	44	10.0	5	1		5					
Webster	5/27/08	41.327519	-85.689126	45	10.0	5			5					
Webster	5/27/08	41.328614	-85.690066	46	8.0	5	1		5					
Webster	5/27/08	41.330131	-85.690784	47	6.0	3	1		3		1			
Webster	5/27/08	41.329719	-85.691777	48	6.0	1			1					
Webster	5/27/08	41.32749	-85.69173	49	7.0	3	1		1	1				1
Webster	5/27/08	41.326757	-85.690941	50	7.0	5	1		5				1	
Webster	5/27/08	41.32603	-85.689658	51	15.0	1			1					
Webster	5/27/08	41.325896	-85.688936	52	17.0	3			3					
Webster	5/27/08	41.327568	-85.690536	53	7.0	5	1	1	5			1		
Webster	5/27/08	41.329756	-85.693893	54	7.0	5			5					
Webster	5/27/08	41.329332	-85.695066	55	5.0	5	1			5				
Webster	5/27/08	41.328191	-85.694686	56	5.0	1			1					
Webster	5/27/08	41.326816	-85.693824	57	6.0	1			1	1				
Webster	5/27/08	41.325605	-85.693876	58	5.0	3				3				
Webster	5/27/08	41.325617	-85.691829	59	8.0	1			1			1		
Webster	5/27/08	41.325126	-85.691549	60	8.0	0								
Webster	5/27/08	41.324534	-85.692644	61	5.0	1			1					
Webster	5/27/08	41.323414	-85.692692	62	4.0	5			5					
Webster	5/27/08	41.32332	-85.691083	63	7.0	1			1					
Webster	5/27/08	41.323485	-85.689692	64	10.0	1			1					
Webster	5/27/08	41.322601	-85.691185	65	6.0	1			1					
Webster	5/27/08	41.321767	-85.691626	66	5.0	1				1				
Webster	5/27/08	41.321697	-85.690295	67	6.0	1				1				
Webster	5/27/08	41.323347	-85.687809	68	10.0	5	3		3					
Webster	5/27/08	41.32417	-85.686481	69	9.0	5			5					
Webster	5/27/08	41.323253	-85.686702	70	8.0	5			5					
Webster	5/27/08	41.321644	-85.686944	71	6.0	5			3			3		
Webster	5/27/08	41.319934	-85.687498	72	6.0	5				5		1	1	1
Webster	5/27/08	41.320415	-85.686183	73	7.0	3	1		1					
Webster	5/27/08	41.321318	-85.685042	74	8.0	0								
Webster	5/27/08	41.322171	-85.684356	75	7.0	5			5					
Webster	5/27/08	41.322105	-85.683258	76	8.0	5			5					
Webster	5/27/08	41.32106	-85.683081	77	7.0	3			3					
Webster	5/27/08	41.320762	-85.68165	78	8.0	3			3					
Webster	5/27/08	41.321372	-85.681125	79	11.0	0					1			
Webster	5/27/08	41.321666	-85.679908	80	7.0	3			3					
Webster	5/27/08	41.322163	-85.679844	81	10.0	0								
Webster	5/27/08	41.322867	-85.678588	82	8.0	3			3					
Webster	5/27/08	41.323632	-85.677928	83	10.0	0								
Webster	5/27/08	41.323143	-85.677106	84	5.0	1			1					
Webster	5/27/08	41.323565	-85.675299	85	7.0	0								
Webster	5/27/08	41.322657	-85.675355	86	7.0	1			1					
Webster	5/27/08	41.32139	-85.677314	87	4.0	3			3					
Webster	5/27/08	41.320744	-85.676896	88	4.0	0								
Webster	5/27/08	41.320372	-85.674631	89	5.0	1			1		1			
Webster	5/27/08	41.318903	-85.673059	90	6.0	0								

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	CEDE4	CH?AR	NAFL	POPE6	POFO3	POZO	ZODU	ZAPA
Webster	8/27/08	41.317359	-85.670945	1	4.0	1		1							
Webster	8/27/08	41.318455	-85.670643	2	4.0	5		5							
Webster	8/27/08	41.31992	-85.673179	3	4.0	3		3							
Webster	8/27/08	41.321401	-85.675048	4	5.0	1		1							
Webster	8/27/08	41.325357	-85.674072	5	7.0	5		5			3				
Webster	8/27/08	41.323508	-85.67285	6	4.0	0									
Webster	8/27/08	41.326136	-85.671464	7	6.0	5		5							
Webster	8/27/08	41.326704	-85.669602	8	5.0	5		5		1					
Webster	8/27/08	41.327683	-85.672293	9	4.0	5		5			1				
Webster	8/27/08	41.3294	-85.672979	10	6.0	1		1							
Webster	8/27/08	41.329683	-85.672418	11	13.0	5		5							
Webster	8/27/08	41.329013	-85.669569	12	7.0	0									
Webster	8/27/08	41.328321	-85.666835	13	4.0	1				1					
Webster	8/27/08	41.3295	-85.666786	14	6.0	1								1	
Webster	8/27/08	41.330249	-85.667351	15	7.0	1		1		1					
Webster	8/27/08	41.330688	-85.668854	16	17.0	0									
Webster	8/27/08	41.331069	-85.669532	17	15.0	0									
Webster	8/27/08	41.332496	-85.66903	18	5.0	1		1							
Webster	8/27/08	41.333577	-85.670624	19	5.0	1			1						
Webster	8/27/08	41.33295	-85.671927	20	19.0	0									
Webster	8/27/08	41.332968	-85.674282	21	6.0	1		1							
Webster	8/27/08	41.331669	-85.674096	22	20.0	1		1			1				
Webster	8/27/08	41.331006	-85.673613	23	6.0	1			1	1					
Webster	8/27/08	41.329568	-85.674031	24	4.0	1				1					
Webster	8/27/08	41.328322	-85.674686	25	7.0	1		1							
Webster	8/27/08	41.329059	-85.678036	26	4.0	1		1							
Webster	8/27/08	41.326983	-85.676679	27	7.0	1				1					
Webster	8/27/08	41.326454	-85.677307	28	14.0	3		3							
Webster	8/27/08	41.326361	-85.678555	29	13.0	0									
Webster	8/27/08	41.32734	-85.679333	30	5.0	1		1	1	1					
Webster	8/27/08	41.327977	-85.680055	31	5.0	3		3		1					
Webster	8/27/08	41.327309	-85.682116	32	11.0	5		5		1					
Webster	8/27/08	41.326113	-85.681631	33	12.0	5		5							
Webster	8/27/08	41.327525	-85.68401	34	11.0	5		5							
Webster	8/27/08	41.329149	-85.682703	35	6.0	1		1							
Webster	8/27/08	41.330574	-85.683019	36	5.0	1		1	1						
Webster	8/27/08	41.329494	-85.684398	37	10.0	5		5							
Webster	8/27/08	41.328747	-85.685292	38	11.0	3		3				1			
Webster	8/27/08	41.331117	-85.684349	39	6.0	1		1		1					
Webster	8/27/08	41.331593	-85.686224	40	6.0	5		5							
Webster	8/27/08	41.331005	-85.687603	41	11.0	5		5							
Webster	8/27/08	41.330219	-85.689217	42	11.0	5		5							
Webster	8/27/08	41.329141	-85.688596	43	10.0	5		5							
Webster	8/27/08	41.328216	-85.688743	44	10.0	5		5				1			
Webster	8/27/08	41.327519	-85.689126	45	9.0	5		5				1			
Webster	8/27/08	41.328614	-85.690066	46	9.0	5		5							
Webster	8/27/08	41.330131	-85.690784	47	4.0	5		5	1	1					
Webster	8/27/08	41.329719	-85.691777	48	6.0	5		5							
Webster	8/27/08	41.32749	-85.69173	49	8.0	5		5							
Webster	8/27/08	41.326757	-85.690941	50	7.0	5		5							
Webster	8/27/08	41.32603	-85.689658	51	6.0	1		1		1					
Webster	8/27/08	41.325896	-85.688936	52	6.0	5		3		5					
Webster	8/27/08	41.327568	-85.690536	53	10.0	5		5							
Webster	8/27/08	41.329756	-85.693893	54	5.0	0									
Webster	8/27/08	41.329332	-85.695066	55	4.0	1		1							
Webster	8/27/08	41.328191	-85.694686	56	5.0	3			3	1					
Webster	8/27/08	41.326816	-85.693824	57	4.0	0									
Webster	8/27/08	41.325605	-85.693876	58	4.0	5		3	5						
Webster	8/27/08	41.325617	-85.691829	59	5.0	1		1							
Webster	8/27/08	41.325126	-85.691549	60	6.0	1		1							
Webster	8/27/08	41.324534	-85.692644	61	4.0	1		1	1						
Webster	8/27/08	41.323414	-85.692692	62	4.0	1		1		1					
Webster	8/27/08	41.32332	-85.691083	63	5.0	1				1					
Webster	8/27/08	41.323485	-85.689692	64	6.0	0									
Webster	8/27/08	41.322601	-85.691185	65	5.0	1		1							
Webster	8/27/08	41.321767	-85.691626	66	4.0	1		1							
Webster	8/27/08	41.321697	-85.690295	67	4.0	1				1					
Webster	8/27/08	41.323347	-85.687809	68	5.0	1				1					
Webster	8/27/08	41.32417	-85.686481	69	9.0	5		5							
Webster	8/27/08	41.323253	-85.686702	70	9.0	5		5		1					
Webster	8/27/08	41.321644	-85.686944	71	6.0	1		1							
Webster	8/27/08	41.319934	-85.687498	72	6.0	5		1		5					
Webster	8/27/08	41.320415	-85.686183	73	5.0	3		1		1	1				
Webster	8/27/08	41.321318	-85.685042	74	7.0	3		3				1			
Webster	8/27/08	41.322171	-85.684356	75	12.0	5		5							
Webster	8/27/08	41.322105	-85.683258	76	6.0	5		5		1	3				
Webster	8/27/08	41.32106	-85.683081	77	6.0	5		5							
Webster	8/27/08	41.320762	-85.68165	78	5.0	5		5		3					
Webster	8/27/08	41.321372	-85.681125	79	5.0	5		5	1	3					
Webster	8/27/08	41.321666	-85.679908	80	6.0	5	1	1		3				5	
Webster	8/27/08	41.322163	-85.679844	81	18.0	0									
Webster	8/27/08	41.322867	-85.678588	82	7.0	5		5		1					
Webster	8/27/08	41.323632	-85.677928	83	13.0	0									
Webster	8/27/08	41.323143	-85.677106	84	6.0	1		1							
Webster	8/27/08	41.323565	-85.675299	85	6.0	1		1							
Webster	8/27/08	41.322657	-85.675355	86	6.0	0									
Webster	8/27/08	41.32139	-85.677314	87	4.0	5		5							
Webster	8/27/08	41.320744	-85.676896	88	3.0	5		5							
Webster	8/27/08	41.320372	-85.674631	89	4.0	3				3					
Webster	8/27/08	41.318903	-85.673059	90	5.0	1		1							

Backwater Lake

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	POCR3	CEDE4	ELCA7	UTMA	NI?TE	POIL
Backwater	4/23/08	41.316254	-85.669875	91	3.0	3	1		3				
Backwater	4/23/08	41.315939	-85.670434	92	4.0	1			1				
Backwater	4/23/08	41.315862	-85.669501	93	4.0	1	1		1				
Backwater	4/23/08	41.316198	-85.668809	94	4.0	3		1	3				
Backwater	4/23/08	41.316788	-85.668349	95	3.0	5	1		5		1		
Backwater	4/23/08	41.317241	-85.667566	96	3.0	3		1	3				
Backwater	4/23/08	41.316892	-85.666831	97	3.0	5			5				
Backwater	4/23/08	41.317415	-85.666162	98	3.0	1			1				
Backwater	4/23/08	41.318221	-85.665680	99	2.0	1			1				
Backwater	4/23/08	41.318167	-85.664508	100	2.0	3			3				
Backwater	4/23/08	41.318374	-85.663447	101	2.0	3			3				
Backwater	4/23/08	41.317699	-85.663698	102	3.0	3			3				
Backwater	4/23/08	41.317406	-85.664560	103	3.0	5			5				
Backwater	4/23/08	41.316923	-85.665397	104	4.0	3			3				
Backwater	4/23/08	41.316376	-85.666478	105	4.0	5			5				
Backwater	4/23/08	41.315993	-85.667427	106	5.0	5			5				
Backwater	4/23/08	41.315629	-85.668169	107	6.0	3	1		3				
Backwater	4/23/08	41.314988	-85.668931	108	3.0	1	1		1				
Backwater	4/23/08	41.314365	-85.668688	109	3.0	1	1		3				
Backwater	4/23/08	41.314447	-85.667905	110	5.0	3			3			1	
Backwater	4/23/08	41.314922	-85.667116	111	5.0	5	1	1	5				
Backwater	4/23/08	41.315458	-85.666214	112	5.0	3			3				
Backwater	4/23/08	41.315991	-85.665165	113	4.0	5			5				
Backwater	4/23/08	41.316500	-85.664112	114	4.0	3			3				
Backwater	4/23/08	41.316994	-85.663343	115	2.0	3			3				
Backwater	4/23/08	41.315931	-85.663902	116	4.0	5			5				
Backwater	4/23/08	41.315474	-85.664531	117	4.0	3		1	3				
Backwater	4/23/08	41.315064	-85.665298	118	4.0	5	1		5				
Backwater	4/23/08	41.314703	-85.665978	119	5.0	5			5				
Backwater	4/23/08	41.314382	-85.666535	120	5.0	3			3				
Backwater	4/23/08	41.313807	-85.667116	121	4.0	1			1				
Backwater	4/23/08	41.313494	-85.666492	122	4.0	3			3				
Backwater	4/23/08	41.313974	-85.665416	123	4.0	3			3				
Backwater	4/23/08	41.314584	-85.664716	124	3.0	5			5				
Backwater	4/23/08	41.315132	-85.664031	125	4.0	5			5				
Backwater	4/23/08	41.315500	-85.663293	126	3.0	5			5				
Backwater	4/23/08	41.315180	-85.662309	127	3.0	5			5				
Backwater	4/23/08	41.314543	-85.662288	128	2.0	5			5				
Backwater	4/23/08	41.313907	-85.662839	129	3.0	3	1		3				
Backwater	4/23/08	41.313435	-85.663621	130	4.0	5		1	5				
Backwater	4/23/08	41.31309	-85.66257	131	4.0	3			3				
Backwater	4/23/08	41.31337	-85.66130	132	3.0	3		1	3				
Backwater	4/23/08	41.31344	-85.66033	133	2.0	1			1				
Backwater	4/23/08	41.31271	-85.66073	134	2.0	1			1				
Backwater	4/23/08	41.31185	-85.66089	135	3.0	3			1	1			1
Backwater	4/23/08	41.31104	-85.66067	136	4.0	5			5	1			
Backwater	4/23/08	41.31009	-85.66052	137	4.0	5			5	1			
Backwater	4/23/08	41.30922	-85.66009	138	4.0	5			5				
Backwater	4/23/08	41.30836	-85.66026	139	3.0	3	1		3				
Backwater	4/23/08	41.30732	-85.65989	140	4.0	3		1	3				

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	CEDE4	POPE6	ELCA7	POZO	NI?TE
Backwater	5/27/08	41.316254	-85.669875	91	4.0	0						
Backwater	5/27/08	41.315939	-85.670434	92	6.0	1		1				
Backwater	5/27/08	41.315862	-85.669501	93	5.0	1		1				
Backwater	5/27/08	41.316198	-85.668809	94	5.0	1		1				
Backwater	5/27/08	41.316788	-85.668349	95	4.0	5		5				
Backwater	5/27/08	41.317241	-85.667566	96	3.0	1		1				
Backwater	5/27/08	41.316892	-85.666831	97	4.0	5		5				
Backwater	5/27/08	41.317415	-85.666162	98	4.0	1		1				
Backwater	5/27/08	41.318221	-85.665680	99	2.0	0						
Backwater	5/27/08	41.318167	-85.664508	100	3.0	0						
Backwater	5/27/08	41.318374	-85.663447	101	3.0	1		1				
Backwater	5/27/08	41.317699	-85.663698	102	4.0	3		3				
Backwater	5/27/08	41.317406	-85.664560	103	4.0	5		5				
Backwater	5/27/08	41.316923	-85.665397	104	4.0	5		3		1		
Backwater	5/27/08	41.316376	-85.666478	105	4.0	3		3				
Backwater	5/27/08	41.315993	-85.667427	106	6.0	3		3				
Backwater	5/27/08	41.315629	-85.668169	107	7.0	3		3				
Backwater	5/27/08	41.314988	-85.668931	108	4.0	1		1				
Backwater	5/27/08	41.314365	-85.668688	109	5.0	1		1				
Backwater	5/27/08	41.314447	-85.667905	110	5.0	3		3				
Backwater	5/27/08	41.314922	-85.667116	111	5.0	0						
Backwater	5/27/08	41.315458	-85.666214	112	5.0	5		5				
Backwater	5/27/08	41.315991	-85.665165	113	5.0	3		3				
Backwater	5/27/08	41.316500	-85.664112	114	1.0	5		5				
Backwater	5/27/08	41.316994	-85.663343	115	3.0	3		3				
Backwater	5/27/08	41.315931	-85.663902	116	4.0	5		5				
Backwater	5/27/08	41.315474	-85.664531	117	4.0	1		1				
Backwater	5/27/08	41.315064	-85.665298	118	4.0	3		3				
Backwater	5/27/08	41.314703	-85.665978	119	5.0	3		3				
Backwater	5/27/08	41.314382	-85.666535	120	5.0	5		5				
Backwater	5/27/08	41.313807	-85.667116	121	5.0	3		3				
Backwater	5/27/08	41.313494	-85.666492	122	5.0	5		5				
Backwater	5/27/08	41.313974	-85.665416	123	5.0	5		5				
Backwater	5/27/08	41.314584	-85.664716	124	3.0	5		5				
Backwater	5/27/08	41.315132	-85.664031	125	4.0	1		1				
Backwater	5/27/08	41.315500	-85.663293	126	4.0	5		5				
Backwater	5/27/08	41.315180	-85.662309	127	2.0	5		5				
Backwater	5/27/08	41.314543	-85.662288	128	3.0	5		5				
Backwater	5/27/08	41.313907	-85.662839	129	4.0	5		5		1		
Backwater	5/27/08	41.313435	-85.663621	130	5.0	3		3				
Backwater	5/27/08	41.31309	-85.66257	131	4.0	5		5				1
Backwater	5/27/08	41.31337	-85.66130	132	3.0	3		1		1		
Backwater	5/27/08	41.31344	-85.66033	133	3.0	3	1	1	1		1	
Backwater	5/27/08	41.31271	-85.66073	134	2.0	1		1				
Backwater	5/27/08	41.31185	-85.66089	135	1.0	5		5				
Backwater	5/27/08	41.31104	-85.66067	136	5.0	5		5				
Backwater	5/27/08	41.31009	-85.66052	137	5.0	5		5				
Backwater	5/27/08	41.30922	-85.66009	138	4.0	5		5				
Backwater	5/27/08	41.30836	-85.66026	139	4.0	5		5				
Backwater	5/27/08	41.30732	-85.65989	140	4.0	5		5		1		

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	CEDE4	CH?AR	NAFL	POPE6	NI?TE
Backwater	8/27/08	41.316254	-85.669875	91	1.0	1			1		
Backwater	8/27/08	41.315939	-85.670434	92	4.0	1	1				
Backwater	8/27/08	41.315862	-85.669501	93	5.0	0					
Backwater	8/27/08	41.316198	-85.668809	94	5.0	1	1				
Backwater	8/27/08	41.316788	-85.668349	95	4.0	3	3	1			
Backwater	8/27/08	41.317241	-85.667566	96	3.0	1	1			1	
Backwater	8/27/08	41.316892	-85.666831	97	2.0	5	5				
Backwater	8/27/08	41.317415	-85.666162	98	3.0	1	1				
Backwater	8/27/08	41.318221	-85.665680	99	2.0	1		1			
Backwater	8/27/08	41.318167	-85.664508	100	2.0	3	3				
Backwater	8/27/08	41.318374	-85.663447	101	1.0	1	1				
Backwater	8/27/08	41.317699	-85.663698	102	3.0	5	5				
Backwater	8/27/08	41.317406	-85.664560	103	3.0	5	5				
Backwater	8/27/08	41.316923	-85.665397	104	3.0	1	1				
Backwater	8/27/08	41.316376	-85.666478	105	4.0	1	1				
Backwater	8/27/08	41.315993	-85.667427	106	6.0	1				1	
Backwater	8/27/08	41.315629	-85.668169	107	6.0	1	1				
Backwater	8/27/08	41.314988	-85.668931	108	3.0	1	1				
Backwater	8/27/08	41.314365	-85.668688	109	4.0	0					
Backwater	8/27/08	41.314447	-85.667905	110	4.0	1	1				
Backwater	8/27/08	41.314922	-85.667116	111	5.0	1	1				1
Backwater	8/27/08	41.315458	-85.666214	112	5.0	1	1				
Backwater	8/27/08	41.315991	-85.665165	113	4.0	5	3			3	
Backwater	8/27/08	41.316500	-85.664112	114	3.0	5	5				
Backwater	8/27/08	41.316994	-85.663343	115	3.0	3	3			1	
Backwater	8/27/08	41.315931	-85.663902	116	3.0	5	5				
Backwater	8/27/08	41.315474	-85.664531	117	3.0	1	1			1	
Backwater	8/27/08	41.315064	-85.665298	118	3.0	5	5				
Backwater	8/27/08	41.314703	-85.665978	119	3.0	3	3				
Backwater	8/27/08	41.314382	-85.666535	120	4.0	3	3				1
Backwater	8/27/08	41.313807	-85.667116	121	4.0	1	1				
Backwater	8/27/08	41.313494	-85.666492	122	3.0	5	5				
Backwater	8/27/08	41.313974	-85.665416	123	4.0	5	5				
Backwater	8/27/08	41.314584	-85.664716	124	6.0	5	5				
Backwater	8/27/08	41.315132	-85.664031	125	4.0	5	3			3	
Backwater	8/27/08	41.315500	-85.663293	126	3.0	5	5			1	
Backwater	8/27/08	41.315180	-85.662309	127	3.0	5	5				
Backwater	8/27/08	41.314543	-85.662288	128	3.0	5	5				
Backwater	8/27/08	41.313907	-85.662839	129	3.0	5	5				
Backwater	8/27/08	41.313435	-85.663621	130	4.0	5	5				
Backwater	8/27/08	41.31309	-85.66257	131	3.0	5	5				
Backwater	8/27/08	41.31337	-85.66130	132	3.0	5	5				
Backwater	8/27/08	41.31344	-85.66033	133	3.0	5	5				
Backwater	8/27/08	41.31271	-85.66073	134	1.0	5	5				
Backwater	8/27/08	41.31185	-85.66089	135	3.0	3	3				1
Backwater	8/27/08	41.31104	-85.66067	136	4.0	5	5				1
Backwater	8/27/08	41.31009	-85.66052	137	4.0	3	3				
Backwater	8/27/08	41.30922	-85.66009	138	4.0	5	5				1
Backwater	8/27/08	41.30836	-85.66026	139	3.0	3	3				
Backwater	8/27/08	41.30732	-85.65989	140	3.0	5	5				3

7.2 2009 Vegetation Control Permits

2009 Webster Lake Permit

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT
State Form 26727 (R / 11-03)
Approved State Board of Accounts 1987
[ ] Whole Lake [X] Multiple Treatment Areas
Check type of permit

INSTRUCTIONS: Please print or type information

FOR OFFICE USE ONLY
License No.
Date Issued
Lake County

Return to: Page 1 of 6
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Commercial License Clerk
402 West Washington Street, Room W273
Indianapolis, IN 46204

FEE: $5.00

Applicant's Name: Webster Lake Conservation Association	Lake Assoc. Name: Webster Lake Conservation Association	
Rural Route or Street: 85 EMS W19		Phone Number: 574-372-7291
City and State: North Webster, IN		ZIP Code: 46555
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code

Lake (One application per lake): Webster Lake	Nearest Town: North Webster	County: Kosciusko
Does water flow into a water supply		[ ] Yes [X] No

Please complete one section for *EACH* treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

Treatment Area #	1	LAT/LONG or UTM's	Center of bed @ N41.32367 W85.67219		
Total acres to be controlled	2.5	Proposed shoreline treatment length (ft)	2300	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	8	Expected date(s) of treatment(s)	mid June		

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward and Nautique or Komeen

Plant survey method: [X] Rake [ ] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	X	75
Chara	x	5
Eurasian watermilfoil	x	10
Slender naiad	x	10

Page 2 of 6

Treatment Area # 2	LAT/LONG or UTM's Center of Bed at N41.32786 W85.67519		
Total acres to be controlled 4.6	Proposed shoreline treatment length (ft) 4000	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 8	Expected date(s) of treatment(s) mid June		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward and Nautique or Komeen			
Plant survey method: [X] Rake [x] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	55
Slender naiad	x	10
Eurasian watermilfoil	x	5
Largeleaf pondweed		5
Chara	x	5
Sago pondweed	x	5
spatterdock		5
Duckweed		5
Curyleaf pondweed	x	5

Treatment Area # 3	LAT/LONG or UTM's Center of Bed @ N41.32842 W85.68379		
Total acres to be controlled 1.4	Proposed shoreline treatment length (ft) 1204	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 8	Expected date(s) of treatment(s) mid June		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique or Komeen			
Plant survey method: [X] Rake [x] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	65
Sago pondweed	x	5
Duckweed		5
Watermeal		5
Slender naiad	x	5
Eurasian watermilfoil	x	5
Spatterdock		5
Variable watermilfoil	x	5

Page 3 of 6

Treatment Area #	4	LAT/LONG or UTM's	Center of Bed at N41.33127 W85.68379		
Total acres to be controlled	3.25	Proposed shoreline treatment length (ft)	2854	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	8	Expected date(s) of treatment(s)	mid June		

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward and Nautique or Komeen

Plant survey method: [X] Rake [x] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	60
Slender naiad	x	15
Sago pondweed	x	5
American elodea	x	5
Duckweed		5
watermeal		5
Eurasian watermilfoil	x	5

Treatment Area #	5	LAT/LONG or UTM's	Center of Bed @ N41.32565 W85.69400		
Total acres to be controlled	12.15	Proposed shoreline treatment length (ft)	10600	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	8	Expected date(s) of treatment(s)	mid June		

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique or Komeen

Plant survey method: [X] Rake [x] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	50
Slender naiad	x	20
Chara	x	20
Sago pondweed	x	5
Eurasian watermilfoil	x	5
Duckweed		5

Page 4 of 6

Treatment Area # 6	LAT/LONG or UTM's Center of Bed at N41.32041 W85.68114		
Total acres to be controlled 3.07	Proposed shoreline treatment length (ft) 2679	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 8	Expected date(s) of treatment(s) mid June		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward and Nautique or Komeen			
Plant survey method: [X] Rake [x] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	70
Sago pondweed	x	5
Eurasian watermilfoil	x	5
Slender naiad	x	10
Largeleaf pondweed		5
Illinois pondweed		5

Treatment Area # 7	LAT/LONG or UTM's Center of Bed @ N41.31094 W85.67394		
Total acres to be controlled 11.25	Proposed shoreline treatment length (ft) 9802	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 8	Expected date(s) of treatment(s) mid June		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward and Nautique or Komeen			
Plant survey method: [X] Rake [x] Visual [ ] Other (specify) Data taken from 5.08 T2 Survey & Species Observed			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	60
Eurasian watermilfoil	x	5
Spatterdock		5
Slender naiad	x	5
Duckweed		5
Watermeal		5
Flatstem pondweed	x	5
Sago pondweed	x	1
American elodea	x	2
White water lily		2

Page 5 of 6

Treatment Area # 8	LAT/LONG or UTM's Treat EWM and CLP wher it occurs (determine following survey)	
Total acres to be controlled	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)
Maximum Depth of Treatment (ft)	Expected date(s) of treatment(s) Curlyleaf April and Milfoil late May early June	

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. April aquathol K for CLP (<20 acres) and May or June Renovate for EWM (<60 acres)

Plant survey method: [X] Rake [X] Visual [ ] Other (specify) Data collected during Spring T2 and visual survey

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail		50
Slender naiad		10
Curlyleaf pondweed	x	10
Eurasian watermilfiol	x	10
Chara		5
Sago pondweed		5
Flatstem Pondweed		5
Nitella		1
Duckweed		3
watermeal		1

INSTRUCTIONS: Whoever treats the lake fills in "Applicant's Signature" unless they are a professional. If they are a professional company who specializes in lake treatment, they should sign on the "Certified Applicant" line.

Applicant Signature	Date
Certified Applicant's Signature	Date

FOR OFFICE ONLY

[ ] Approved [ ] Disapproved	Fisheries Staff Specialist
[ ] Approved [ ] Disapproved	Environmental Staff Specialist

Mail check or money order in the amount of $5.00 to:

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
COMMERCIAL LICENSE CLERK
402 WEST WASHINGTON STREET ROOM W273
INDIANAPOLIS, IN 46204

AQUATIC CONTROL

Webster Lake Vegetation Control Permit Map (Page 6 of Permit)

2009 Backwater Lake Permit

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT
State Form 26727 (R / 11-03)
Approved State Board of Accounts 1987
[ ] Whole Lake [x] Multiple Treatment Areas
Check type of permit

INSTRUCTIONS: Please print or type information

FOR OFFICE USE ONLY
License No.
Date Issued
Lake County

Return to: Page 1 of 4
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Commercial License Clerk
402 West Washington Street, Room W273
Indianapolis, IN 46204

FEE: $5.00

Applicant's Name: Webster Lake Conservation Association	Lake Assoc. Name: Webster Lake Conservation Association	
Rural Route or Street: 85 EMS W19		Phone Number: 574-372-7291
City and State: North Webster, IN		ZIP Code: 46555
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code

Lake (One application per lake): Backwater Lake	Nearest Town: North Webster	County: Kosciusko
Does water flow into a water supply		[ ] Yes [x] No

Please complete one section for *EACH* treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

Treatment Area # 1	LAT/LONG or UTM's: Lower 2/3 of lake early season treatment same as 2006 & 2007		
Total acres to be controlled 75	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) mid April		

Treatment method: [ ] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Treat Eurasian watermilfoil and CLP with Renovate and Aquathol

Plant survey method: [X] Rake [X] Visual [ ] Other (specify) Data from spring t2

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail		45
Curlyleaf Pondweed	x	15
Eurasian watermilfoil	X	20
elodea		5
Spatterdock		8
Water lily		1
Nitella		2
Illinois pondweed		2
Bladderwort		2

Page 2 of 4

Treatment Area # 2	LAT/LONG or UTM's Center of bed at N41.31430 W85.66890		
Total acres to be controlled 4	Proposed shoreline treatment length (ft) 2050	Perpendicular distance from shoreline (ft) 75	
Maximum Depth of Treatment (ft) 5	Expected date(s) of treatment(s) mid June		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward, copper, komeen and aquathol will be used to control vegetation near docks and boat lanes

Plant survey method: [X] Rake [X] Visual [ ] Other (specify) data from May t2

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	70
Sago pondweed	x	5
Flatstem pondweed	x	5
Duckweed		5
Watermeal		5
Spatterdock		5
White water lily		5

Treatment Area # 3	LAT/LONG or UTM's Center of bed at N41.3186 W85.66890		
Total acres to be controlled 2	Proposed shoreline treatment length (ft) 1068	Perpendicular distance from shoreline (ft) 75	
Maximum Depth of Treatment (ft) 5	Expected date(s) of treatment(s) mid June		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward, Komeen, and Aquathol will be used to control vegetation in boating lane and around docks

Plant survey method: [X] Rake [X] Visual [ ] Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	60
Sago pondweed	x	5
Flatstem pondweed	x	5
Duckweed		5
Watermeal		5
Spatterdock		10
white water lily		10

Page 3 of 4

Treatment Area # 4	LAT/LONG or UTM's Center of bed at N41.31757 W85.66218		
Total acres to be controlled 1	Proposed shoreline treatment length (ft) 570	Perpendicular distance from shoreline (ft) 50-75	
Maximum Depth of Treatment (ft) 4	Expected date(s) of treatment(s) 1-Jun		

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward, Komeen, copper, and Aquathol

Plant survey method: [X] Rake [X] Visual [ ] Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	55
Sago pondweed	x	5
Flatstem pondweed	x	5
Duckweed		5
Watermeal		5
Spatterdock		10
Sago pondweed	x	5
white water lily		10

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Applicant Signature	Date
Certified Applicant's Signature	Date

FOR OFFICE ONLY

[ ] Approved [ ] Disapproved	Fisheries Staff Specialist
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Mail check or money order in the amount of $5.00 to:

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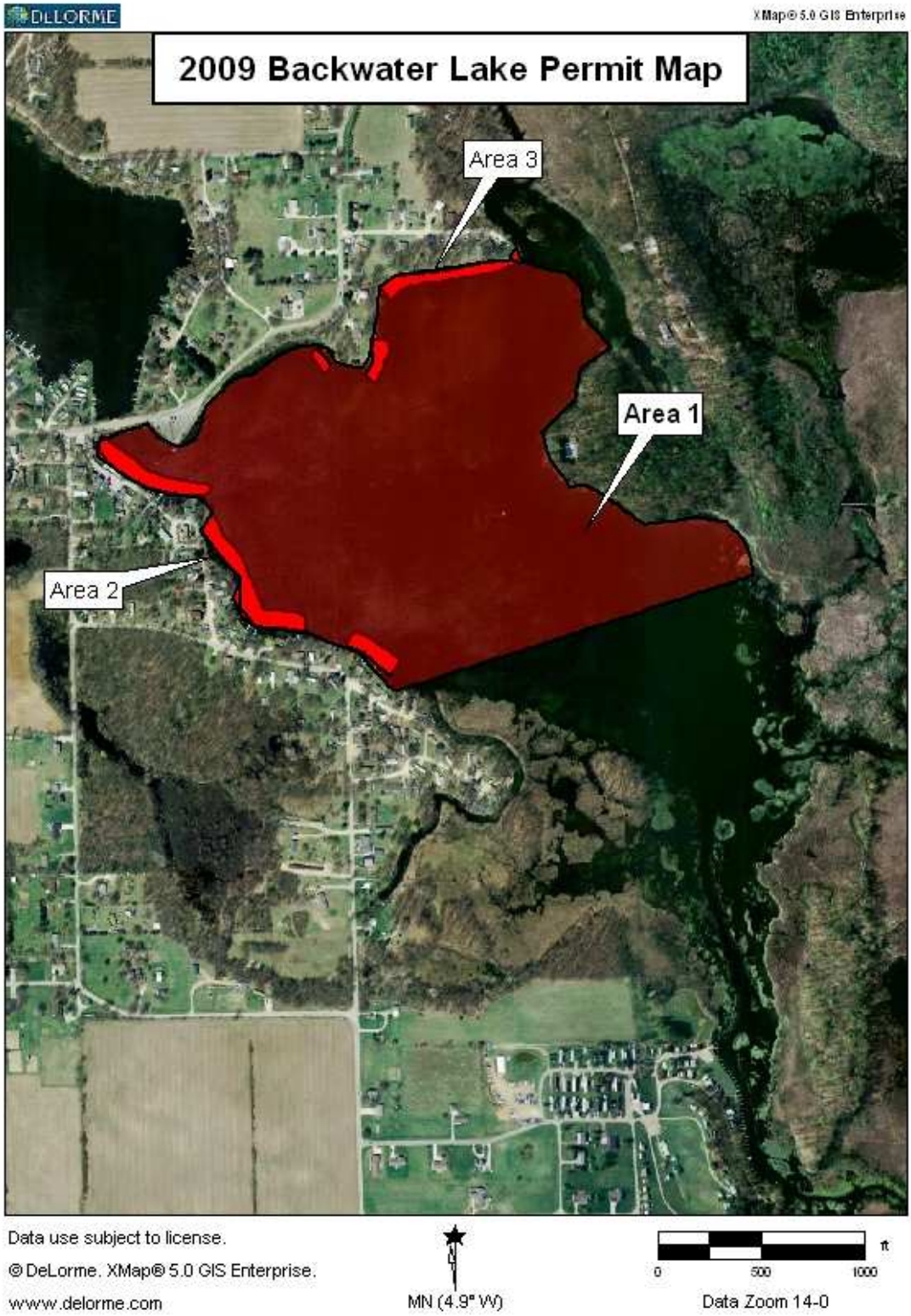
402 WEST WASHINGTON STREET ROOM W273
INDIANAPOLIS, IN 46204

AQUATIC CONTROL

Backwater Lake Vegetation Control Permit Map (Page 4 of Permit)