Lake Lemon Aquatic Vegetation Management Plan 2007 Update

Monroe & Brown County, Indiana

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Executive Summary

Aquatic Control was contracted by the Lake Lemon Conservancy District to complete aquatic vegetation sampling in order to update their lakewide, long-term integrated aquatic vegetation management plan which was originally completed in 2004. Funding for the update of this plan was obtained from the Lake Lemon Conservancy District (LLCD) and the Indiana Department of Natural Resources (IDNR)-Division of Fish and Wildlife as part of the Lake and River Enhancement program (LARE). The update will serve 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. Items covered include the 2007 sampling results, a review of the 2007 vegetation controls, and updates to the budget and action plans.

Lake lemon is the 11th largest lake in Indiana covering 1,512 acres with an average depth of 9.5 feet. Eurasian watermilfoil is the primary nuisance exotic species in Lake Lemon. Milfoil beds have traditionally covered 100-400 acres of the Lake Lemon littoral zone. The original plan and updates called for the use of systemic herbicides for control of Eurasian watermilfoil throughout the lake. Prior to LARE funding, treatments primarily focused on control of milfoil in high-use areas with systemic herbicides and control of mixed species with contact herbicides. In 2005, LARE funded treatment of 111 acres of milfoil, primarily in the upper shallow end of the lake. The following spring milfoil was present at lower levels. LARE funding was significantly reduced in 2006 and LARE treatments just focused on high use areas with systemic herbicides. This allowed milfoil to spread outside of the high use areas. In addition, the high use areas often times became infested with nuisance levels of native vegetation following the selective milfoil treatments creating the need for a second application.

With the knowledge that future LARE funds would likely not be sufficient to treat all milfoil areas, the 2006 Plan Update called for the use of LARE funds to treat off-shore milfoil areas with systemic herbicides, while the LLCD would maintain high-use areas with contact herbicides in order to alleviate the need for two treatments. In addition, the plan called for pre-treatment Invasive Species Mapping Surveys followed by summer Tier II surveys.

In 2007, LLCD received a $20,000 grant from LARE for treatment of milfoil with Renovate herbicide. In addition, LARE also awarded a $4,680 grant for plant sampling and plan updates. The funding was primarily applied to the May 23, 2007 treatment of a 42.8 acre bed of milfoil in the upper end of the lake. On the same day, a contact herbicide treatment, funded by LLCD, was completed on 61.3 acres of nuisance vegetation along the shoreline and in high-use areas. Several other small treatments were completed throughout the year. These treatments provided relief from nuisance levels of vegetation throughout the busy summer season. However, by late summer and early fall there was re-growth along the shoreline areas where contact herbicides were applied.

With the current lack of funding and extent of coverage, Eurasian watermilfoil will likely never be eliminated from Lake Lemon. The main focus of vegetation management on

Lake Lemon must be the reduction of nuisance conditions created by aquatic vegetation with Eurasian watermilfoil being the primary target. With this in mind, it is recommended that available LARE funds be used to treat areas of milfoil that do not get treated with the traditional contact herbicide treatments. This strategy will not eliminate milfoil from the lake, but may lessen the problem of the untreated areas being allowed to flourish and spread to new areas. Contact herbicide treatments should continue to be used in areas of mixed vegetation in order to reduce nuisance conditions. The contact treatments should only focus on areas where lake access and boating lanes are impaired by plant growth. If control is needed before the Memorial Day Holiday, LLCD should expect re-growth by late summer. The estimated costs for 2008 actions include $30,000 for milfoil treatments with Renovate herbicide, $30,000 for native vegetation control, and $5,200 for plant sampling and plan updates. Plant sampling should consist of a spring Invasive Species Mapping Survey and a summer Tier II survey.

Acknowledgements

Funding for the vegetation sampling, treatment, and the plan update was provided by the Indiana Department of Natural Resources (IDNR) Division of Fish and Wildlife and the Lake Lemon Conservancy District. Aquatic Control Inc. completed the field work, data processing, and map generation. Special thanks are given to Dave Kittaka, Angela Sturdevant, and Debbie King with the Indiana Department of Natural Resources for their assistance and review of this plan. Special thanks are also given to Bob Madden and Scott McWhorters of the Lake Lemon Conservancy District for their assistance with this plan. Author of this report is Joey Leach of Aquatic Control. The author would like to acknowledge the valuable input from Brian Isaacs, Nathan Long, Brendan Hastie, and Barbie Huber of Aquatic Control for their field assistance, map generation, review, and editing of this report.

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1.0 INTRODUCTION

This report was created in order to update the Lake Lemon Aquatic Vegetation Management Plan. The update will serve 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. Items covered include the 2007 sampling results, a review of the 2007 vegetation controls, and updates to the budget and action plans. The plan update was funded by the Indiana Department of Natural Resources Lake and River Enhancement Program (LARE) and the Lake Lemon Conservancy District.

2.0 2007 PLANT SAMPLING RESULTS

Two surveys were completed in 2007 in order to document changes in the plant community, to map treatment areas, and to assess the effects of control techniques. An Invasive Mapping Survey was completed in the spring in order to map treatment areas and document invasive species abundance. A Tier II survey was completed in late summer in order to assess changes in the plant community.

2.1 Spring Survey (Invasive Mapping Survey)

Aquatic Control completed an Invasive Mapping Survey on May 14, 2007. This survey was designed to locate and document areas of invasive aquatic plants prior to herbicide application. The survey was completed using an 18 foot fiberglass boat equipped with built in GPS and depth finders. Areas of the lake containing invasive species were recorded on the GPS device and also drawn on waterproof lake maps along with abundance ratings. This information was taken back to the office where data was downloaded into a GIS mapping program that enabled calculation of the size of impacted areas along with creation of accurate invasive species maps.

The survey revealed that 144.8 acres of Eurasian watermilfoil (Figure 1) and 23.6 acres of curlyleaf pondweed (Figure 2) existed within the littoral zone. The majority of the Eurasian watermilfoil was found in the upper end of Lake Lemon. Of the 144.8 acres of Eurasian watermilfoil, 96.4 acres is considered to be dense (>50% abundance). Curlyleaf pondweed was considered to be spotty (<50% abundance) at all mapped locations. Invasive species were growing to a maximum depth of approximately 8.0 feet.

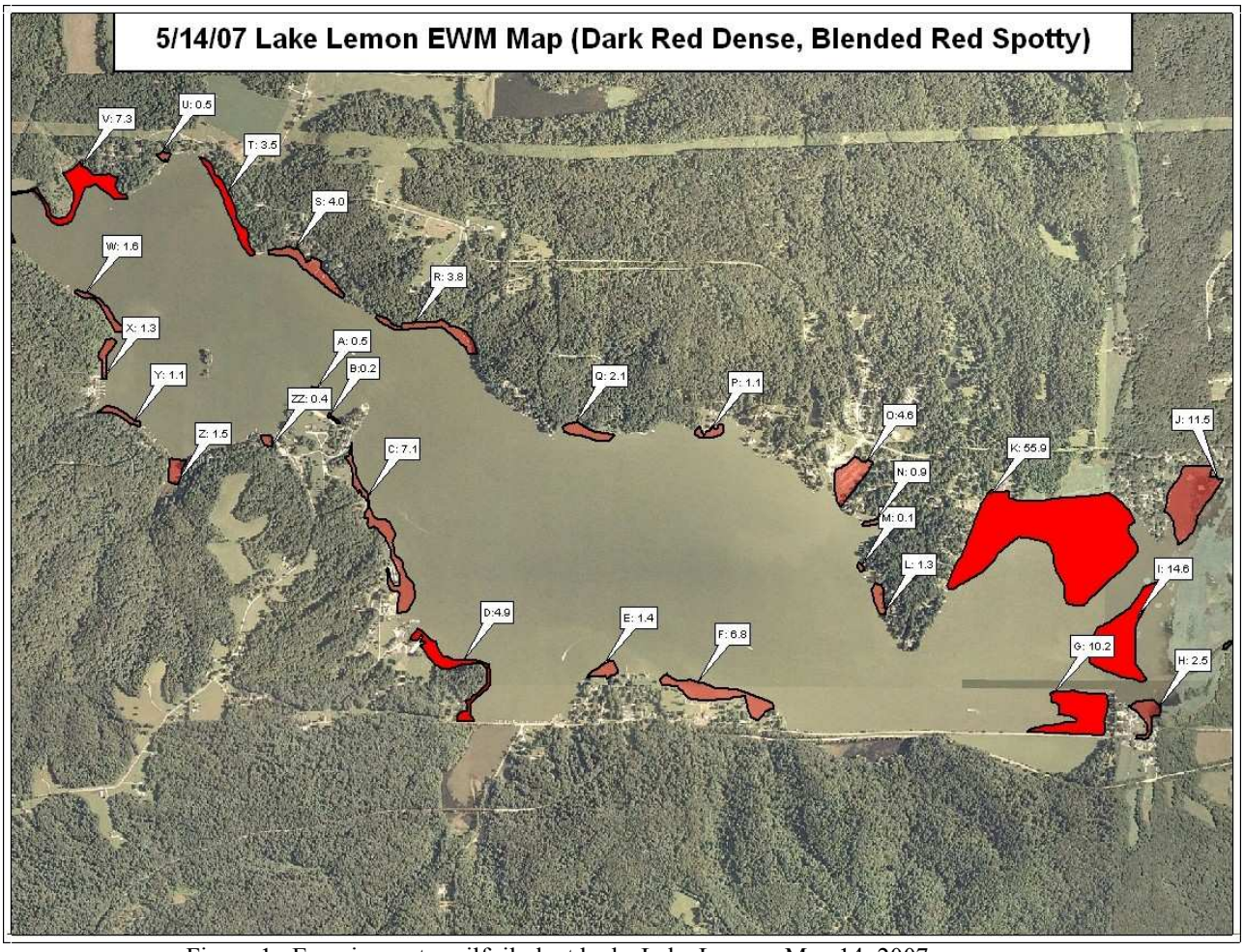

Figure 1. Eurasian watermilfoil plant beds, Lake Lemon, May 14, 2007.

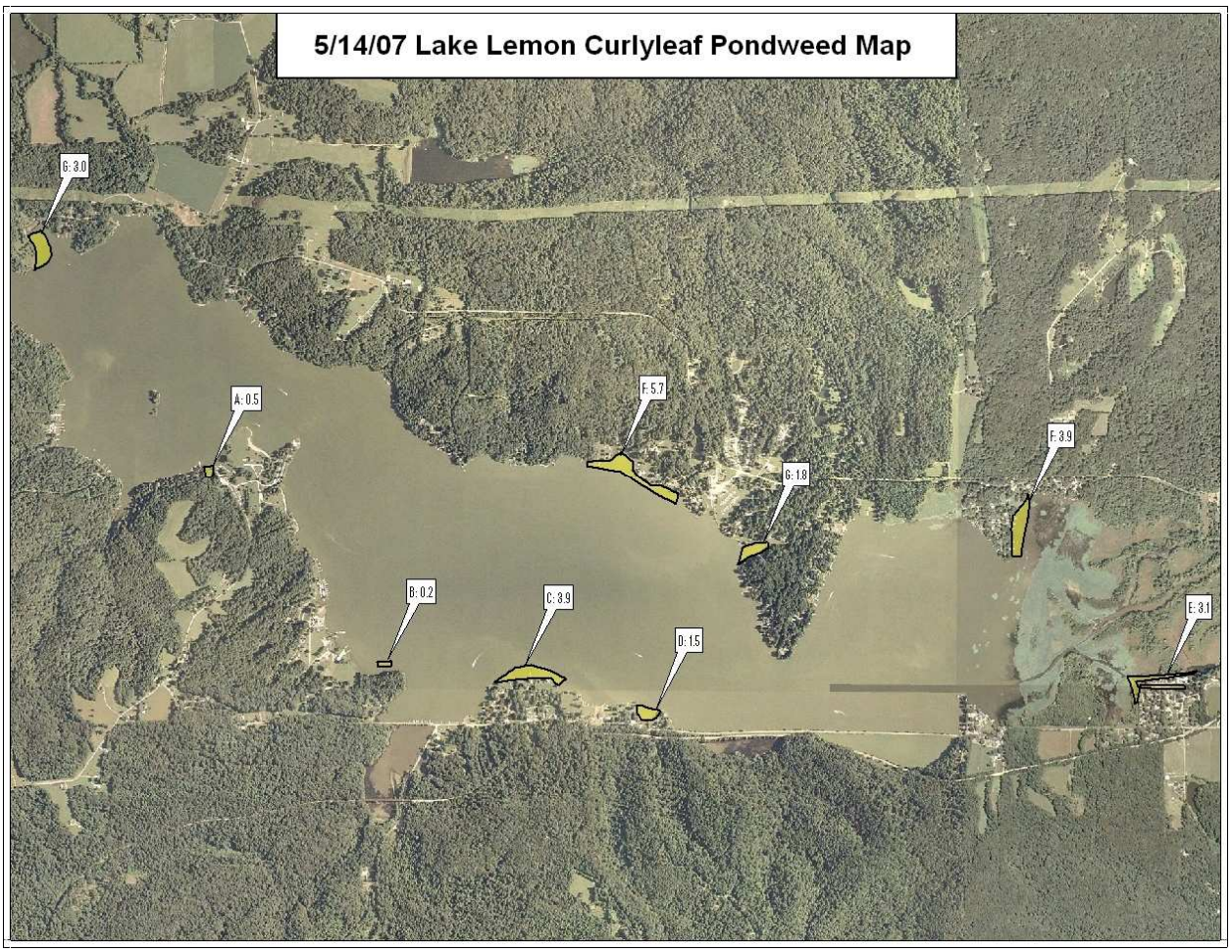

Figure 2. Curlyleaf pondweed beds, Lake Lemon, May 14, 2007

2.2 Summer Survey

A Tier II survey was completed August 2, 2007 in order to document changes in the overall plant community and individual species abundance. IDNR Tier II survey protocol was used in the summer sampling event (IDNR 2007). The same 100 sites sampled in 2006 were sampled again in 2007. A Secchi reading was taken prior to the survey and found to be 3.5 feet. Plants were found to a maximum depth of 8 feet. Plants were present at 85 of the 100 sample sites and native plants were present at 50 of the sites (Table 1). A total of 5 species were collected of which 3 of these species were native. The mean number of species collected per site was 1.13 and the mean number of native species collected was 0.59. The species diversity index was 0.63 and the native species diversity index was 0.47.

Table 1. Lake Lemon Tier II survey results, August 2, 2007.

Occurrence and abundance of submersed aquatic plants in Lake Lemon						
County:	Bro/Mon	Sites with plants: 85			Mean species/site: 1.13	
Date:	8/2/2007	Sites with native plants: 50			Standard error (ms/s): 0.06912878	
Secchi (ft):	3.5	Number of species: 5			Mean native species/site: 0.59	
Maximum plant depth (ft):	8	Number of native species: 3			Standard error (mns/s): 0.06528106	
Trophic status	Mesotrophic	Maximum species/site: 3			Species diversity: 0.63	
Total sites:	100				Native species diversity: 0.47	
Depths (0 to 10 ft)	**Frequency of Occurrence**	**Rake score frequency per species**				**Plant Dominance**
Species		**0**	**1**	**3**	**5**	
Eurasian watermilfoil	54.0	46.0	24.0	13.0	17.0	26.0
common coontail	37.0	63.0	14.0	10.0	13.0	15.8
Brittle naiad	20.0	80.0	2.0	10.0	8.0	12.4
curlyleaf pondweed	1.0	99.0	0.0	0.0	1.0	0.2
small pondweed	1.0	99.0	0.0	0.0	1.0	1.0
Depths (0 to 5 ft)	**Frequency of Occurrence**	**Rake score frequency per species**				**Plant Dominance**
Species		**0**	**1**	**3**	**5**	
Eurasian watermilfoil	58.6	41.4	25.3	13.8	19.5	28.7
common coontail	41.4	58.6	14.9	11.5	14.9	17.9
Brittle naiad	23.0	77.0	2.3	11.5	9.2	14.3
curlyleaf pondweed	1.1	98.9	0.0	0.0	1.1	0.2
small pondweed	1.1	98.9	0.0	0.0	1.1	1.1
Depths (5 to 10 ft)	**Frequency of Occurrence**	**Rake score frequency per species**				**Plant Dominance**
Species		**0**	**1**	**3**	**5**	
Eurasian watermilfoil	23.1	76.9	15.4	7.7	0.0	7.7
common coontail	7.7	92.3	7.7	0.0	0.0	1.5
Species Observed: American water willow, bulrush, common cattail, Hibiscus, spatterdock, arrowhead, American pondweed, American lotus, creeping water primrose, yellowflag iris No plants were found below 8ft						

Eurasian watermilfoil was the most frequently occurring species (54.0%) and also had the highest dominance rating (26.0). Location and density of milfoil is illustrated in Figure 3. Milfoil was almost entirely located in the western two thirds of the lake. Coontail was the second most frequently occurring species (37.0%) and was found mainly in the eastern one third of the lake (Figure 4). Brittle naiad ranked third in frequency followed by curlyleaf pondweed and small pondweed which were only found at a single location.

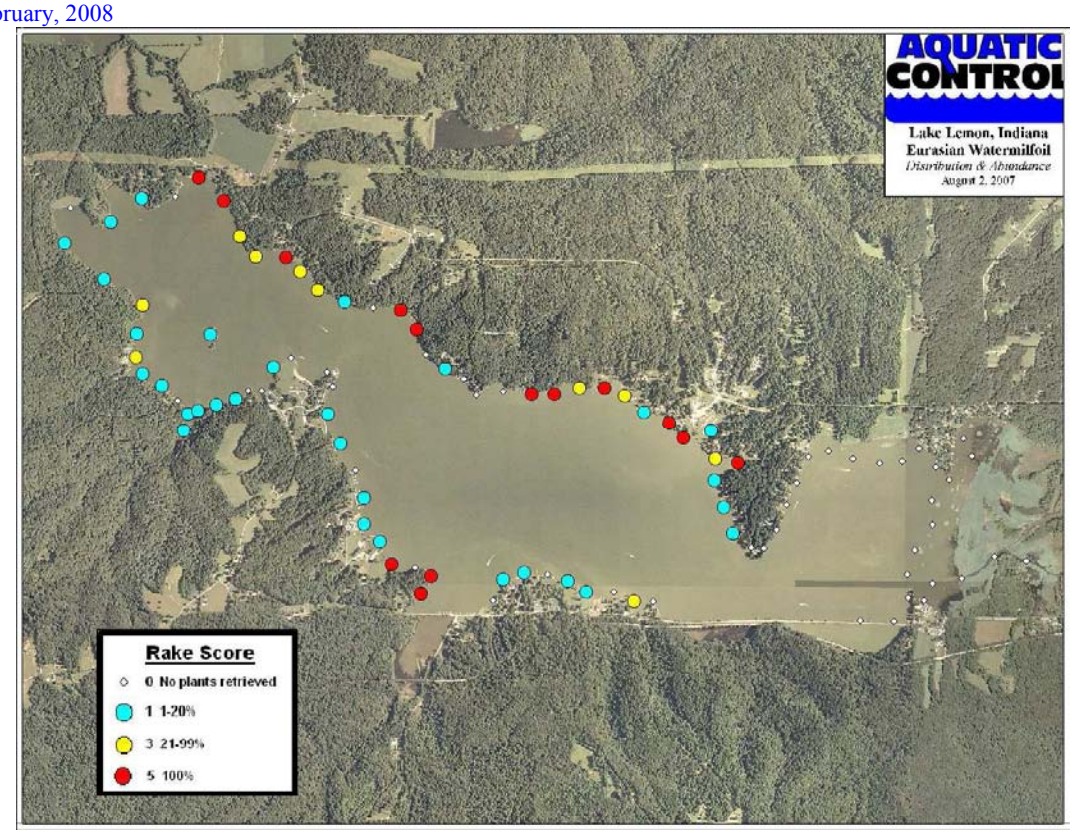

Figure 3. Lake Lemon, Eurasian watermilfoil distribution and abundance, August 2, 2007.

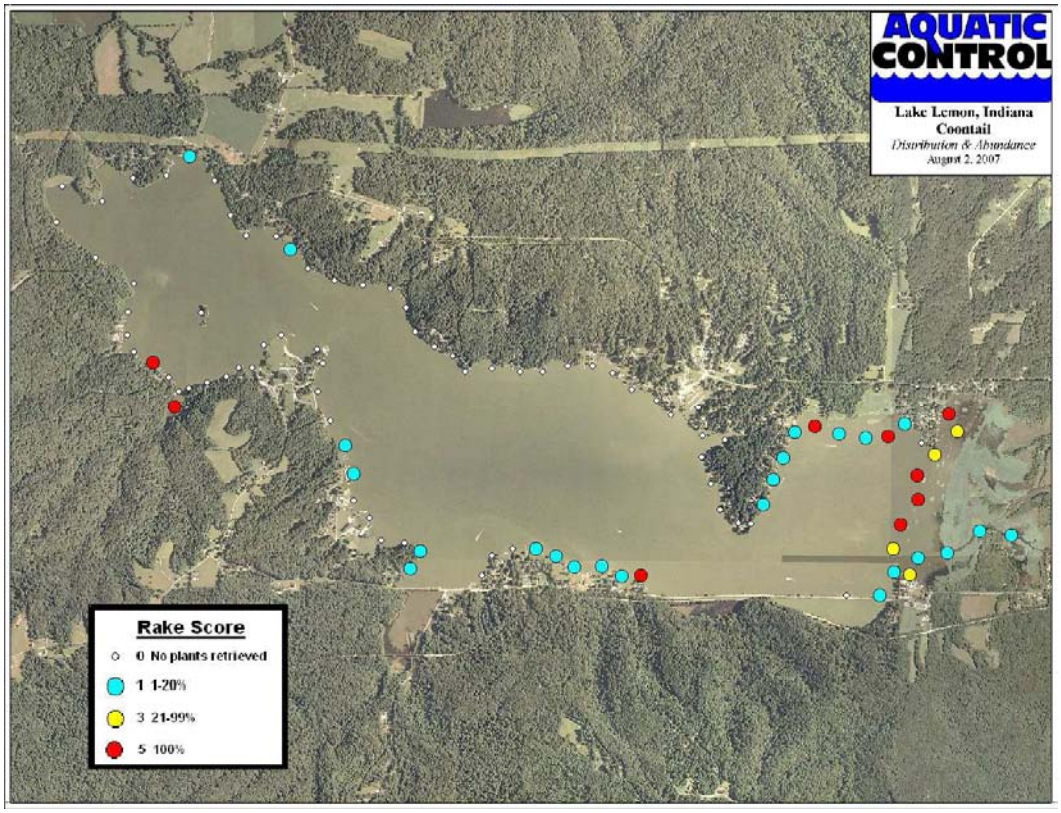

Figure 4. Lake Lemon, coontail distribution and abundance, August 2, 2007.

2.3 Aquatic Vegetation Sampling Discussion

One of the primary goals of the vegetation management plan is to reduce the negative impacts caused by Eurasian watermilfoil. Due to a reduction in funding and a lack of LLCD funds in 2007, it was decided that dense, inshore beds of mixed vegetation would be treated with contact herbicides. These treatments would be funded by LLCD. Beds of Eurasian watermilfoil that were allowed to spread outside high use areas in 2006 would be targeted with systemic herbicides funded by LARE. The results indicate that milfoil frequency of occurrence remained about the same as the 2006 August sampling with no significant increase in milfoil abundance (Figure 5). In section 2.2, Figure 3 illustrates the location of milfoil in the summer survey. Areas that contained milfoil in August were areas that were primarily treated with contact herbicides in the spring and milfoil had returned by fall. Areas where milfoil was treated with systemic herbicides were still relatively free of milfoil. The upper end of the lake contained no milfoil. This was likely due to the large systemic treatment that was completed on that area in the spring of 2007 (treatments will be discussed in more detail in section 3.0).

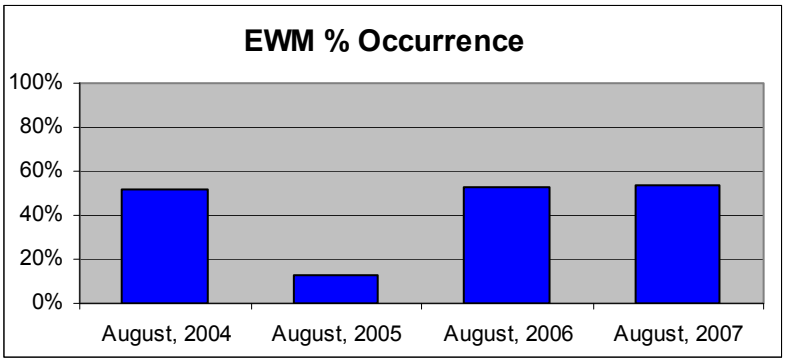

Figure 5. Lake Lemon, comparison of Eurasian watermilfoil percent occurrence in the last four surveys.

Curlyleaf pondweed did not reach nuisance levels in the spring of 2007. This species has historically not been a problem in Lake Lemon, but did become a nuisance in the spring of 2006. The invasive species mapping survey completed in May 2007 found curlyleaf pondweed to be rather sparse throughout the lake. A strange phenomenon occurred in 2006 when curlyleaf pondweed did not senesce like it typically does in the summer. This plant was present at 10% of the summer sample sites in the 2006 survey compared to no sites in 2005 (Figure 6). The August 2007 Tier II found that curlyleaf had decreased from 10.0% to 1.0%.

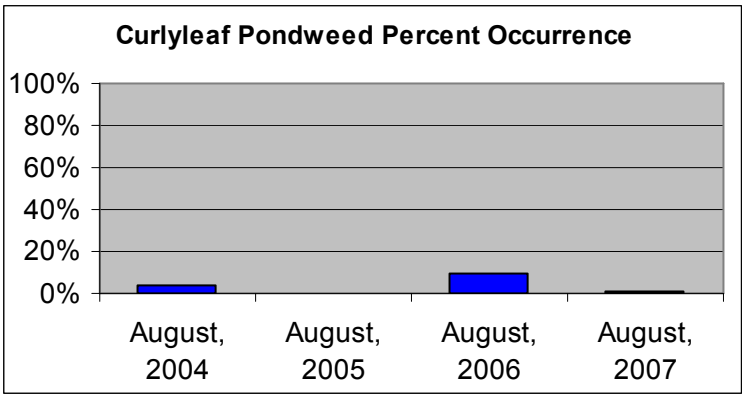

Figure 6. Lake Lemon, comparison of curlyleaf pondweed percent occurrence in the last four surveys.

Another goal of the vegetation management plan is to preserve and enhance the native plant community. The main limitation to native plant growth in Lake Lemon is the lack of light penetration caused by dense algae blooms. These blooms typically occur in late July or August. There appears to be a marked improvement in the water clarity. Secchi readings for August 2007 were the highest recorded since Tier II sampling began (Figure 7). A microscopic bloom did eventually occur, however it was short lived. The reason for the increase in water clarity is unclear. We may speculate that lower than average rainfall in 2007 limited the sediment input into the lake. Lowered sediment input may decrease nutrient loading thus limiting phytoplankton growth. If the clarity of the lake continues to improve, the abundance of vegetation may increase as well.

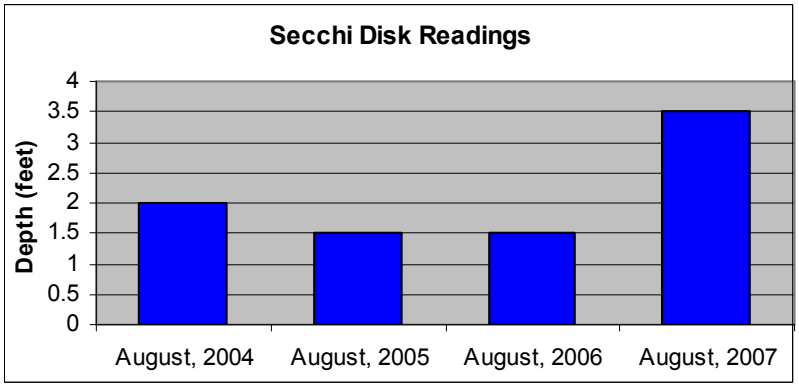

Figure 7. Lake Lemon, comparison of Secchi Disk readings in the last four surveys.

There was an increase in the use of contact herbicides this season in order to avoid the need to complete multiple treatments to the same areas. This may be the cause of a decrease in the native diversity and a slight decrease in native abundance (Figures 8 & 9). Despite the slight reduction in species diversity and native abundance there was an increase in the number of sites with plants (Figure 10). It is very possible that the increase in water clarity this season is responsible for the increase in plant density.

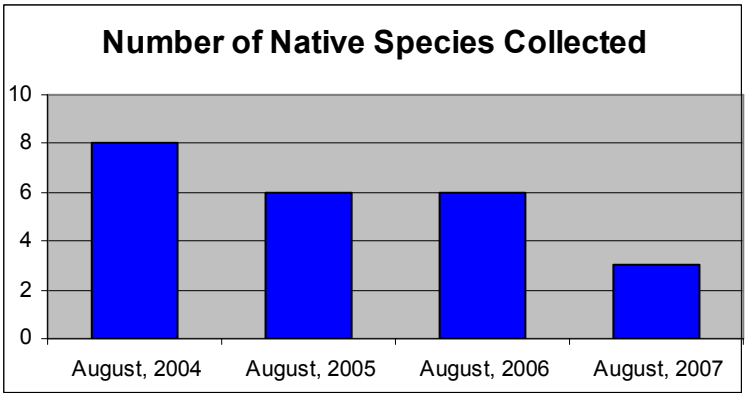

Figure 8. Lake Lemon, comparison of the number of native species collected in the last four surveys.

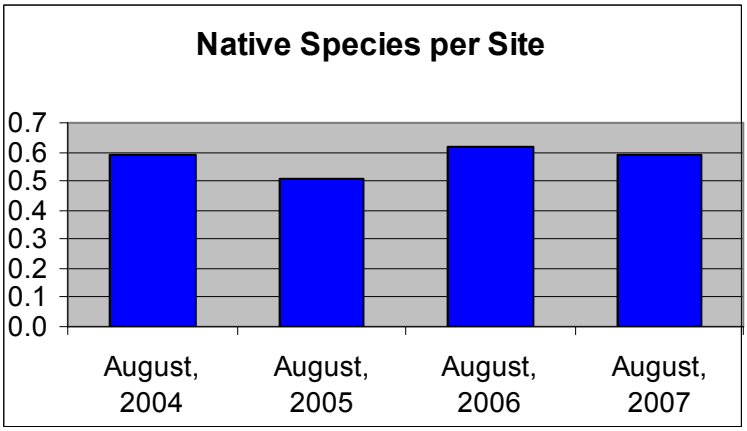

Figure 9. Lake Lemon, comparison of the average number of native species per sample site in the last four surveys.

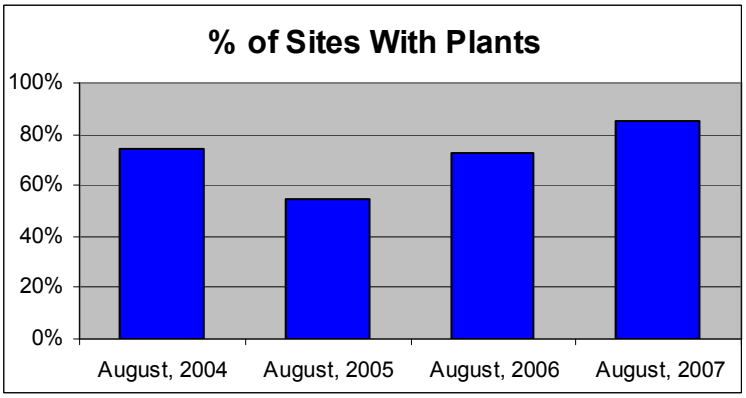

Figure 10. Lake Lemon, comparison of the percentage of sites with plants in the last four surveys.

Table 2 summarizes the data from the past four surveys as it relates to percent occurrence of individual species. Historically, Eurasian watermilfoil has been the most abundant species found in Lake Lemon. In 2005 milfoil had been reduced from 51.5% in 2004 to only 14.4 % in 2005. This was likely due to the use of systemic herbicides on over 100

acres of milfoil. Due to lack of funding in 2006 and 2007 milfoil abundance increased to 53% and 54% respectively. While coontail can be a beneficial native plant, it has become a nuisance to recreation in high use areas. Coontail occurrence increased from 27% in 2006 to 37% in 2007. Chara, Slender naiad, and sago pondweed were collected in 2006 at one location but were not sampled in 2007. It is unlikely that contact treatments are responsible for the absence of these plants in the 2007 survey. It is more likely that they were not sampled simply because these species are not abundant in the lake due to poor water clarity and the sampling method used is not ideal for sampling plants growing at a low frequency of occurrence. Small pondweed decreased from 10% frequency in 2006 to 1% in 2007. This may be due to contact herbicide treatments. The 2008 survey may provide more information as to whether this species is declining or if the low frequency of occurrence was just for the 2007 season.

Table 2. Percent occurrence of species collected in the last four Tier II surveys on Lake Lemon.

Species	% of survey sites (8/04)	% of survey sites (8/05)	% of survey sites (8/06)	% of survey sites (8/07)
Eurasian watermilfoil *(Myriophyllum spicatum)*	51.5%	14.4%	53.0%	54.0%
curlyleaf pondweed *(Potamogeton crispus)*	3.5%		10.0%	1.0%
common coontail *(Ceratophyllum demersum)*	26.0%	13.2%	23.0%	37.0%
Chara (*Chara spp*.)	5.0%		1.0%	
Slender naiad *(Najas flexillis)*			1.0%	
sago pondweed *(Potamogeton pectinatus)*		1.7%	1.0%	
small pondweed *(Potamogeton pusillus)*	6.5%	7.5%	10.0%	1.0%
American elodea *(Elodea canadensis)*	3.5%	2.3%		
American pondweed *(Potamogeton nodosus)*	1.5%			
flatstemmed pondweed *(Potamogeton zosteriformis)*		1.1%		
horned pondweed *(Zannachellia palustris)*	50.0%			
brittle naiad *(Najas minor)*	15.0%		26.0%	20.0%

3.0 2007 VEGETATION CONTROLS

With the knowledge that future LARE funds would likely not be sufficient to treat all milfoil areas, the 2006 Plan Update called for the use of LARE funds to treat off-shore milfoil areas with systemic herbicides, while the LLCD would maintain high-use areas with contact herbicides in order to alleviate the need for two treatments.

In 2007, LLCD received a $20,000 grant from LARE for treatment of milfoil with Renovate herbicide. In addition, LARE also awarded a $4,680 grant for plant sampling and plan updates. The first treatment was completed May 23 to 42.8 acres of Eurasian watermilfoil located in the upper end of Lake Lemon. Renovate 3 (active ingredient: triclopyr) was used in this application at a rate of 1.25 ppm. Product was applied with a 16-ft airboat equipped with a pumping system. Herbicide was delivered through a pair of 3-foot dropper hoses. LARE funds were used for this treatment. On the same day 61.3 acres of mixed vegetation (milfoil/coontail) was also treated with contact herbicides. A

combination of Aquathol K (active ingredient: endothal) and Komeen (active ingredient: copper) were used in the application. The contact herbicide treatment focused on control of vegetation in near-shore high-use areas. GPS devices were used in both applications in order to allow for precision delivery of accurate rates of product to the proper areas (Figure 11).

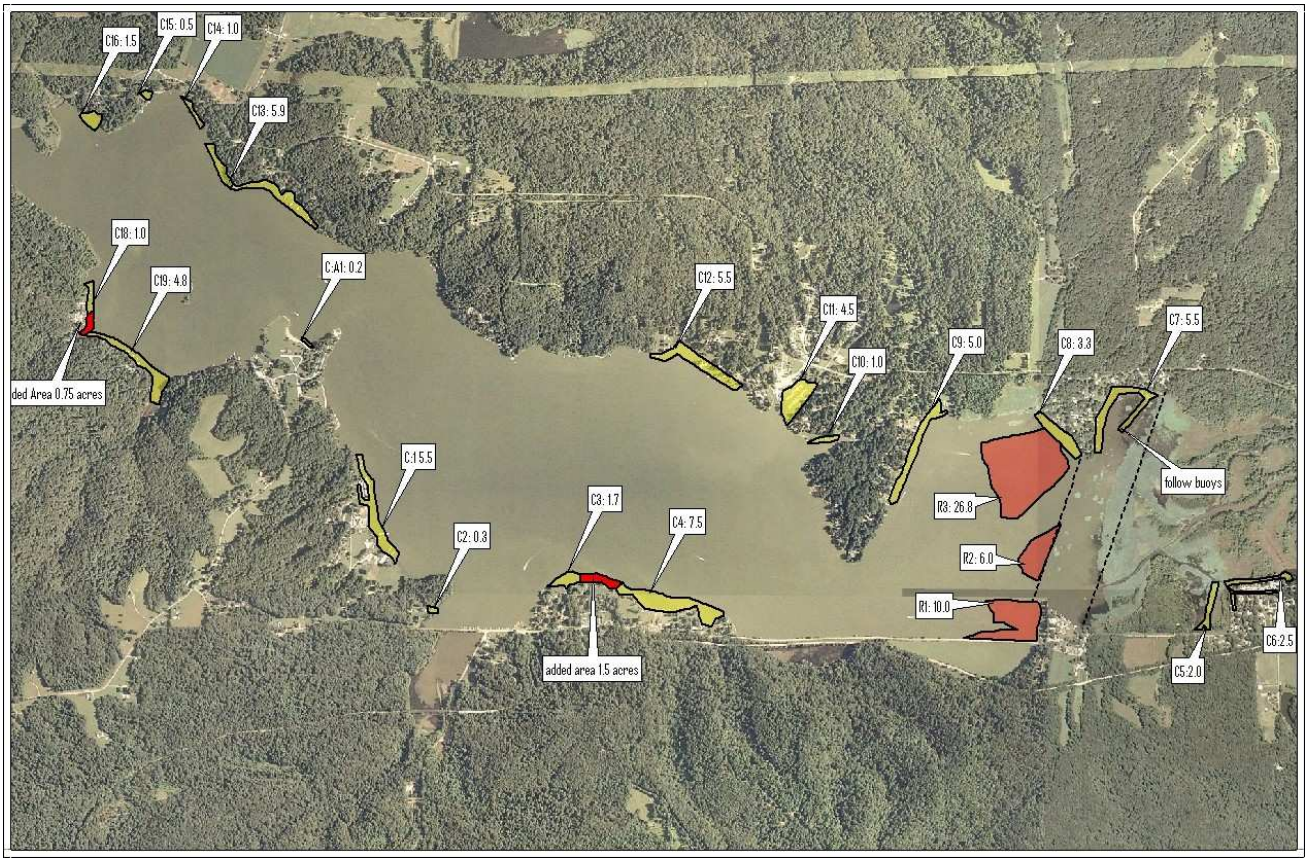

Figure 11. Lake Lemon. Eurasian watermilfoil (red areas in upper end treated with Renovate) and coontail/milfoil (yellow areas treated with Aquathol/Komeen) treatment, May 23, 2007.

The second treatment of the season was completed on June 8. Approximately 4.9 acres of Eurasian watermilfoil was treated with Renovate herbicide at a rate of 1.5 ppm (Figure 12). In addition, 15.3 acres of shoreline received treatment with an Aquathol/Komeen combination (Figure 13). Several small shoreline areas that were treated in May were touched up due to an unacceptable level of control (areas highlighted in black on Figure 13).

Figure 12. Lake Lemon Eurasian watermilfoil Renovate treatment, June 8, 2007.

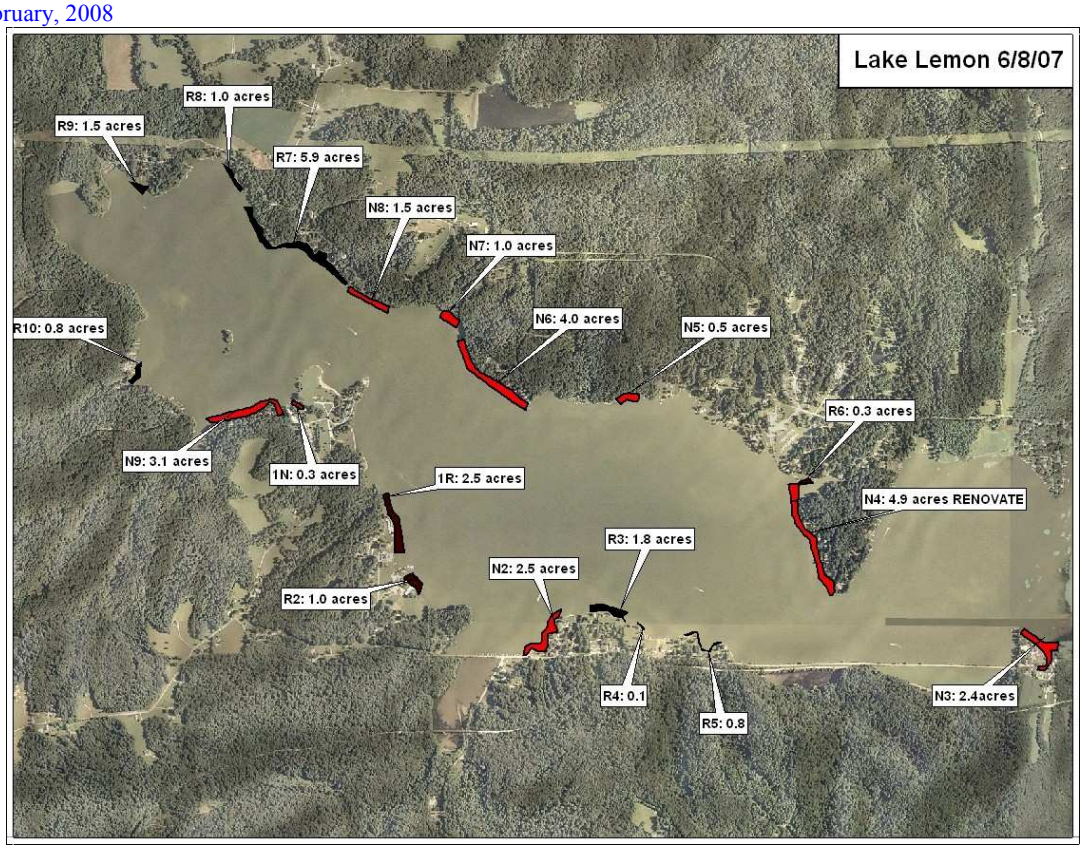

Figure 13. Lake Lemon, Aquathol/Komeen treatment areas (N4 treated with Renovate), June 8, 2007.

On July 13, 3.4 acres of spatterdock, which was interfering with boating lanes, was treated with Aqua-pro herbicide (active ingredient: glyphosate). These areas were located on the east end of Lake Lemon in an area known as Chitwood (Figure 14). In addition, 0.8 acres of mixed vegetation was treated with Aquathol/Kommen herbicide combination and 0.9 acres of milfoil was treated with Renovate.

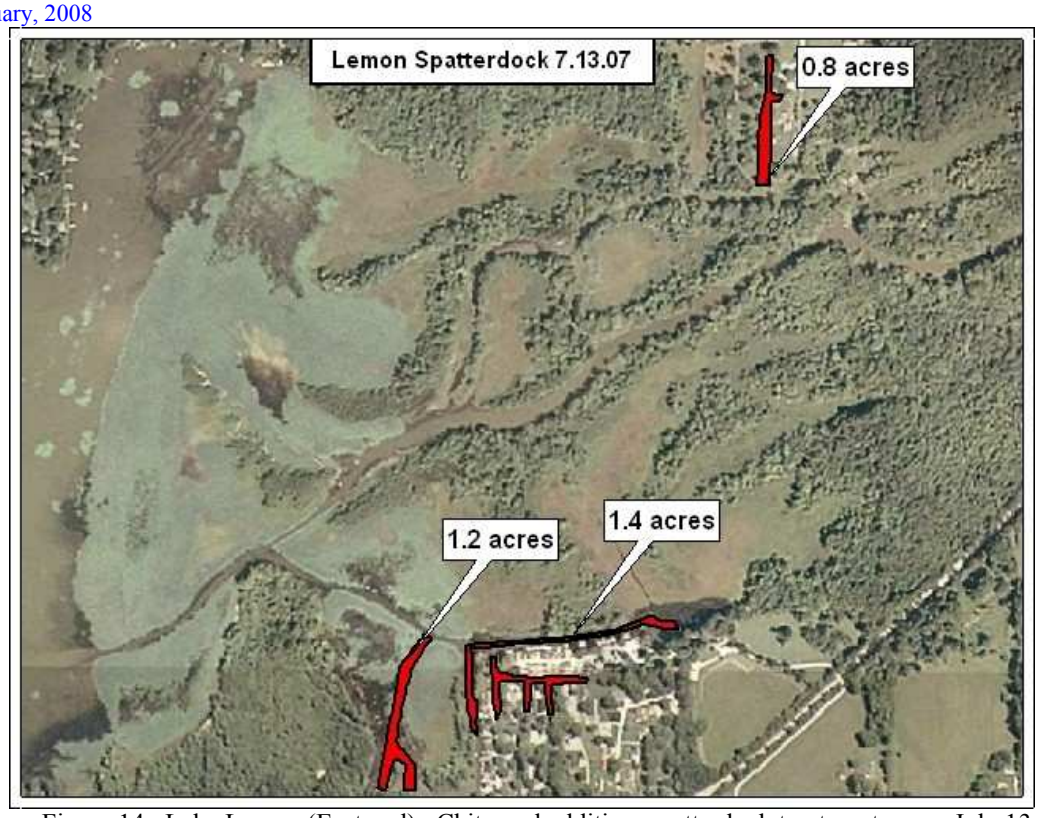

Figure 14. Lake Lemon (East end), Chitwood addition, spatterdock treatment areas, July 13, 2007.

There was very little nuisance vegetation present throughout late June and July. On August 2 a treatment to 4.0 acres of milfoil was completed with Renovate herbicide. On August 2, 17.9 acres of American lotus was treated with AquaPro herbicide. The treatment areas consisted of locations where lotus had expanded beyond established maintenance lines. In addition to the lotus, several small areas of milfoil totaling 4.0 acres were treated with Renovate herbicide (Figure 15).

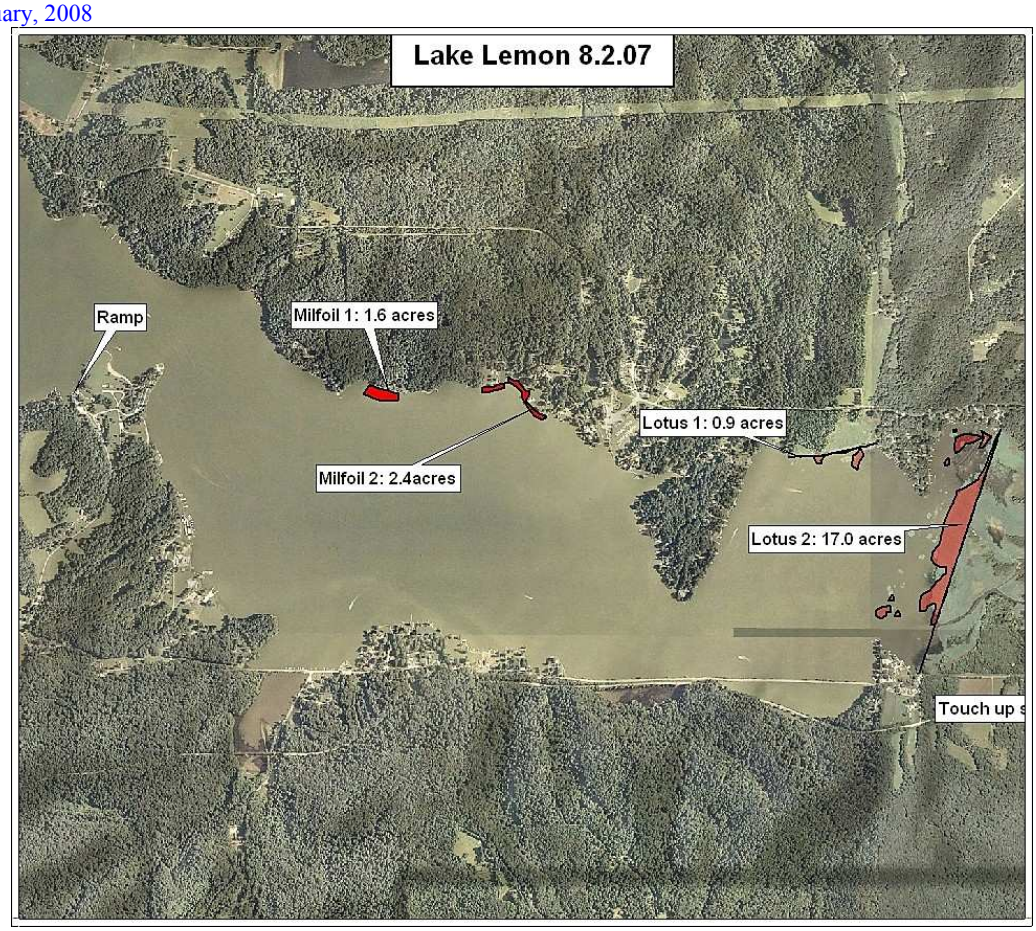

Figure 15. Lake Lemon Lotus and Eurasian watermilfoil treatment areas, August 2, 2007.

The last treatment was a lotus touch up treatment completed August 17. Table 3 summarized all of the treatments completed on Lake Lemon during the 2007 season.

Table 3. Summary of the 2007 Aquatic Vegetation Treatments on Lake Lemon.

Treatment Date	Herbicide Used	Species Targeted	Funding Source	Acres
5/23/07	Renovate	Milfoil	LARE	42.8
5/23/07	Aquathol/Kommen	Milfoil, Coontail, & Curlyleaf	LLCD	61.3
6/8/07	Renovate	Milfoil	LARE	4.9
6/8/07	Aquathol/Komeen	Milfoil, Coontail & Curlyleaf	LLCD	15.3
6/11/07	Aquathol/Komeen	Milfoil & Coontail	LLCD	14.0
7/13/07	Aqua-Pro	Spatterdock	LLCD	3.4
7/13/07	Aquathol/Komeen	Milfoil & Coontail	LLCD	0.8
7/13/07	Renovate	Milfoil	LARE	0.9
8/2/07	Renovate	Milfoil	LARE	4.0
8/2/07	Aqua-Pro	Lotus	LLCD	17.9
8/17/07	Aqua-Pro	Lotus (touch-up of 8/2 treatment)	LLCD	17.9

In addition to the herbicide applications, LLCD personnel continued to dig up any purple loosestrife that was discovered. This has been a very effective means of preventing the spread of this plant and is especially important on Lake Lemon which contains large wetland areas that may be susceptible to invasion.

LLCD also received LARE funding for sediment removal. Sediment removal began in 2006 and continued through 2007. This should help reduce the demand for vegetation controls by increasing depths thus reducing the amount of vegetation that reaches the surface and interferes with lake use. A map detailing the dredging areas can be obtained from the LLCD website or http://msdadmin.scican.net/lakelemon1/srp.htm.

4.0 PUBLIC INVOLVEMENT

A public meeting was held on October 17, 2007 at the Unionville Retirement Center in order to update lake users on the vegetation management controls completed in 2007 and gain input for the 2008 season. One means of gaining input is through a Lake User Survey. These surveys were distributed prior to the meeting and collected at the end of the presentation. Nine of the thirteen lake users in attendance completed the survey. All of those surveyed lived on Lake Lemon and the majority had lived on the lake for more than 5 years. Swimming and boating were the most popular activities on the lake. Seventy-eight percent indicated that they have nuisance plants along their shoreline and 67% believe that these plants affect their property value. All of those surveyed indicated that they wished to continue with vegetation controls. The most common problem checked was the need for dredging. Results of the survey are outlined in Table 4.

Table 4. Lake Lemon Lake User Survey, October 17, 2007.

Lemon Lake User Survey 10/17/07		
Are you a lake property owner?	Yes 100%	No 0%
How many years have you been at the lake?	2 or Less: 0%	5 to 10: 33%
	2 to 5: 22%	Over 10: 44%
How do you use the lake (mark all that apply)	100% Swimming	0% Irrigation
	100% Boating	0% Drinking water
	56% Fishing	11% Other, duck hunting
Do you have aquatic plants at your shoreline in nuisance quantities?	Yes: 78% No: 22%	
Does aquatic vegetation interfere with your use or enjoyment of the lake?	Yes: 78% No: 22%	
Does the level of vegetation in the lake affect your property values?	Yes: 67% No: 22% (11% no response)	
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: 89% No: 11%	
Were you satisfied with the results of the LARE funded invasive treatments this season?	Yes: 78% No: 0% (22% no response)	
Mark any of these you think are problems on your lake:		
0% Too many boats access the lake		
11% Use of jet skis on the lake		
0% Too much fishing		
22% Fish population problem		
78% Dredging needed		
0% Overuse by nonresidents		
78% Too many aquatic plants		
0% Not enough aquatic plants		
33% Poor water quality		
0% Pier/funneling problem		

In the author's opinion, one of the biggest problems concerning Lake Lemon is the poor water quality. However, only 33% of those surveyed felt like water quality was an important issue concerning Lake Lemon. It will be important to educate the lake users on the importance of improving the lake's water quality. Best Management Practices were discussed in previous studies and reiterated at the public meeting. Regular newsletters, along with the Conservancy website, could be used to remind residents of their potential impact on Lake Lemon's water quality as well as the importance of attending the public meetings. Those in attendance were also encouraged to attend the 2008 ILMS conference to be held in Warsaw, Indiana. Despite the poor attendance, those that were present at the meeting appeared to be knowledgeable on most aspects of aquatic plant management.

Another topic discussed at the public meeting was the discovery of hydrilla (*Hydrilla verticillata*) in Lake Manitou. Hydrilla is an invasive aquatic species that was originally discovered in Florida in the 1960's. There are many characteristics of hydrilla that make it a threat to Indiana waterways. This species can grow in lower light conditions than most native species, grows faster than most native species, and can shade out other species by forming a surface canopy. Hydrilla can be easily confused with native elodea. The best way to distinguish hydrilla is that it typically has five leaves along each whorl along with visible serrated edges along the leaf margin (Figure 16). What makes controlling the spread of hydrilla difficult is the fact that it can be spread by fragments. **That is why it is vitally important that lake users remove all plants and sediment from their boats when entering and leaving Lake Lemon.** More information about controlling the spread of hydrilla can be found at www.protectyourwaters.net.

Figure 16. Illustration of hydrilla on the left compared to native elodea on the right. Hydrilla typically contains five toothed leaves per whorl while native elodea typically has three leaves per whorl and the teeth are not visible on the leaves (Illustrations provided by Applied Biochemist).

5.0 ACTION PLAN AND BUDGET UPDATE

Eurasian watermilfoil is the primary nuisance exotic species in Lake Lemon. Milfoil beds have traditionally covered 100-400 acres of the Lake Lemon littoral zone. The original plan and updates called for the use of systemic herbicides for control of Eurasian watermilfoil throughout the lake. Prior to LARE funding, treatments primarily focused on control of milfoil in high-use areas with systemic herbicides and use of contact herbicides for control of mixed species beds. In 2005, LARE funded treatment of 111 acres of milfoil, primarily in the upper shallow end of the lake. The following spring milfoil was present at lower levels. LARE funding was significantly reduced in 2006 and treatments went back to the strategy of focusing on high use areas with systemic herbicides. This allowed milfoil to spread outside of the high use areas. In addition, the high use areas often times became infested with nuisance levels of native vegetation following the selective milfoil treatments creating the need for a second application.

With the knowledge that future LARE funds would likely not be sufficient to treat all milfoil areas, the 2006 Plan Update called for the use of LARE funds to treat off-shore milfoil areas with systemic herbicides, while the LLCD would maintain high-use areas with contact herbicides in order to alleviate the need for two treatments. In addition, the plan called for pre-treatment Invasive Species Mapping Surveys followed by summer Tier II surveys.

In 2007, LLCD received a $20,000 grant from LARE for treatment of milfoil with Renovate herbicide. In addition, LARE also awarded a $4,680 grant for plant sampling and plan updates. The majority of the grant was applied to a treatment completed on May 23, 2007 for the treatment of a 42.8 acre bed of milfoil in the upper end of the lake. On the same day, a contact herbicide treatment was completed on 61.3 acres of nuisance vegetation along the shoreline and in high-use areas. Several other small treatments were completed throughout the year. These treatments provided relief from nuisance levels of vegetation throughout the busy summer season. However, by late summer and early fall there was re-growth along the shoreline areas that were not treated with Renovate but with contact herbicides. This was clearly illustrated in the Tier II survey which found milfoil only in the lower 2/3 of the lake that was not treated with Renovate but with Aquathol/Komeen.

With the current lack of funding and extent of coverage, Eurasian watermilfoil will likely never be eliminated from Lake Lemon. The main focus of vegetation management on Lake Lemon must be the reduction of nuisance conditions created by aquatic vegetation with Eurasian watermilfoil being the primary target. With this in mind it is recommended that available LARE funds be used to treat areas of milfoil that do not get treated with the traditional contact herbicide treatments. This strategy will not eliminate milfoil from the lake, but may lessen the problem of the untreated areas being allowed to flourish and spread to new areas. Contact herbicide treatments should continue to be used in areas of mixed vegetation. The contact treatments should only focus on areas where lake access and boating lanes are impaired by plant growth. If control is needed before the Memorial Day Holiday, LLCD should expect re-growth by late summer. The estimated costs for 2008 actions include $30,000 for milfoil treatments with Renovate herbicide, $30,000 for native vegetation control, and $5,200 for plant sampling and plan

updates. Plant sampling should consist of a spring Invasive Species Mapping Survey and a summer Tier II survey. A proposed maintenance budget is illustrated below in Table 5.

Table 5. Updated Budget Estimate.

	2008	2009	2010	2011	2012
Triclopyr Application Cost (Eurasian watermilfoil only)	$30,000	$31,000	$32,000	$33,000	$34,000
Herbicide & Application Cost (spatterdock, lotus, and pondweeds)	$30,000	$31,000	$32,000	$33,000	$34,000
Vegetation Sampling & Plan Update	$5,200	$5,300	$5,400	$5,500	$5,600
Total:	**$65,200**	**$67,300**	**$69,400**	**$71,500**	**$73,600**

Lake Lemon's water level was drawn down 4-5 feet during the late fall and winter of 2007-2008. In the past, it has been difficult to maintain the low levels needed to impact nuisance vegetation, due to the large Lake Lemon watershed. However, thanks to an extremely dry 2007 season, the lake had been well below normal pool for most of the fall and into early January, 2008. Unfortunately, very few hard freezes have occurred during the lake draw-down period. Heavy January rains have actually raised the level of Lake Lemon well above summer pool. The 2008 surveys should provide insight as to the effects of the drawdown.

Aquatic vegetation management should be continued on Lake Lemon. While no treatmemt is an option, this option would likely allow Eurasian watermilfoil to spread even more. Continued spread of milfoil would likely cause a sharp decrease in native abundance along with an increase in nuisance levels of vegetation. No treatment would also likely allow dense beds of coontail to impede recreation in high use areas of the lake.

6.0 REFERENCES CITED

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 2007 Sampling Data-Tier II Survey

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	Eurasian watermilfoil (*Myriophyllum spicatum*) MYSP2	curlyleaf pondweed (*Potamogeton crispus*) POCR3	common coontail (*Ceratophyllum demersum*) CEDE4	small pondweed (*Potamogeton pusillus*) POPU7	brittle naiad (*Najas minor*) NAMI
Lemon	8/2/07	39.264088	-86.413047	1	3.0	3	1				3
Lemon	8/2/07	39.264603	-86.411847	2	3.0	1					1
Lemon	8/2/07	39.263863	-86.409482	3	8.0						
Lemon	8/2/07	39.263131	-86.409109	4	9.0						
Lemon	8/2/07	39.261694	-86.40943	5	8.0	1	1				
Lemon	8/2/07	39.260115	-86.40859	6	5.0	1	1				
Lemon	8/2/07	39.258818	-86.407596	7	5.0	1			1		
Lemon	8/2/07	39.25734	-86.407045	8	4.0	1	1		1		
Lemon	8/2/07	39.25603	-86.407028	9	5.0	1	1				
Lemon	8/2/07	39.25512	-86.405967	10	3.0	1	1				
Lemon	8/2/07	39.253963	-86.405197	11	3.0	5	5				
Lemon	8/2/07	39.253821	-86.403642	12	7.0						
Lemon	8/2/07	39.253364	-86.402633	13	4.0	5	5		1		
Lemon	8/2/07	39.252458	-86.403297	14	4.0	5	5		1		
Lemon	8/2/07	39.25217	-86.398492	15	8.0						
Lemon	8/2/07	39.253168	-86.397858	16	4.0	1	1				
Lemon	8/2/07	39.253529	-86.396462	17	3.0	1	1				
Lemon	8/2/07	39.25349	-86.394895	18	4.0	1			1		
Lemon	8/2/07	39.253073	-86.393602	19	3.0	1	1		1		1
Lemon	8/2/07	39.252527	-86.392338	20	3.0	3	1		1		3
Lemon	8/2/07	39.25259	-86.390514	21	4.0	1			1		
Lemon	8/2/07	39.252049	-86.389195	22	4.0	3	3		1		
Lemon	8/2/07	39.252095	-86.387923	23	5.0	5			5		
Lemon	8/2/07	39.251134	-86.374246	24	7.0						
Lemon	8/2/07	39.251073	-86.372013	25	5.0	1			1		
Lemon	8/2/07	39.252279	-86.371105	26	5.0	1			1		
Lemon	8/2/07	39.253494	-86.371127	27	4.0	3			3		
Lemon	8/2/07	39.252134	-86.370017	28	4.0	3			3		1
Lemon	8/2/07	39.253016	-86.369446	29	4.0	3			1		3
Lemon	8/2/07	39.253267	-86.367548	30	4.0	5			1		5
Lemon	8/2/07	39.25438	-86.365387	31	3.0	5			1		5
Lemon	8/2/07	39.254163	-86.36329	32	3.0	3			1		3
Lemon	8/2/07	39.254708	-86.370661	33	4.0	5			5		
Lemon	8/2/07	39.256027	-86.369491	34	4.0	5			5		
Lemon	8/2/07	39.257272	-86.36951	35	3.0	5			5		
Lemon	8/2/07	39.258341	-86.368345	36	3.0	3			3		
Lemon	8/2/07	39.259547	-86.366853	37	2.0	3			3		
Lemon	8/2/07	39.260437	-86.367436	38	2.0	5			5		
Lemon	8/2/07	39.258996	-86.369231	39	5.0						
Lemon	8/2/07	39.259931	-86.37036	40	3.0	1			1		
Lemon	8/2/07	39.259266	-86.371482	41	3.0	5			5		
Lemon	8/2/07	39.259188	-86.372945	42	4.0	1			1		
Lemon	8/2/07	39.259408	-86.374712	43	4.0	1			1		
Lemon	8/2/07	39.259777	-86.376341	44	4.0	5			5		
Lemon	8/2/07	39.259473	-86.377685	45	5.0	1			1		
Lemon	8/2/07	39.25815	-86.378474	46	5.0	1			1		
Lemon	8/2/07	39.257051	-86.37914	47	4.0	1			1		
Lemon	8/2/07	39.255755	-86.379795	48	8.0	1			1		
Lemon	8/2/07	39.254808	-86.380623	49	9.0						
Lemon	8/2/07	39.254864	-86.381468	50	4.0						
Lemon	8/2/07	39.255534	-86.382653	51	5.0	1	1				
Lemon	8/2/07	39.256866	-86.383297	52	3.0	1	1				
Lemon	8/2/07	39.258229	-86.38388	53	3.0	1	1				
Lemon	8/2/07	39.259128	-86.382351	54	3.0	5	5				
Lemon	8/2/07	39.259354	-86.383842	55	4.0	3	3				
Lemon	8/2/07	39.260832	-86.384125	56	3.0	1	1				
Lemon	8/2/07	39.260434	-86.385932	57	4.0	5	5				
Lemon	8/2/07	39.261208	-86.386878	58	3.0	5	5	1			
Lemon	8/2/07	39.261749	-86.388534	59	2.0	5	1				5
Lemon	8/2/07	39.262605	-86.389794	60	3.0	3	3				1
Lemon	8/2/07	39.263002	-86.391154	61	3.0	5	5				5
Lemon	8/2/07	39.263006	-86.392778	62	3.0	5	3				5
Lemon	8/2/07	39.262697	-86.394447	63	2.0	5	5				5

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	Eurasian watermilfoil (*Myriophyllum spicatum*) MYSP2	curlyleaf pondweed (*Potamogeton crispus*) POCR3	common coontail (*Ceratophyllum demersum*) CEDE4	small pondweed (*Potamogeton pusillus*) POPU7	brittle naiad (*Najas minor*) NAMI	
Lemon	8/2/07	39.262709	-86.395968	64	3.0	5	5				5	2
Lemon	8/2/07	39.262896	-86.39783	65	2.0	5				5	1	2
Lemon	8/2/07	39.262697	-86.399616	66	3.0							0
Lemon	8/2/07	39.263514	-86.400449	67	6.0							0
Lemon	8/2/07	39.263979	-86.401677	68	5.0	1	1					1
Lemon	8/2/07	39.264778	-86.40293	69	7.0							0
Lemon	8/2/07	39.266015	-86.403531	70	4.0	5	5					1
Lemon	8/2/07	39.266994	-86.404623	71	3.0	5	5					1
Lemon	8/2/07	39.267171	-86.406414	72	3.0							0
Lemon	8/2/07	39.26744	-86.4083	73	4.0	1	1					1
Lemon	8/2/07	39.268049	-86.410071	74	4.0	3	3					1
Lemon	8/2/07	39.268997	-86.411274	75	4.0	3	3		1			2
Lemon	8/2/07	39.269698	-86.41218	76	2.0	5	5					1
Lemon	8/2/07	39.269755	-86.414169	77	6.0	3	3					1
Lemon	8/2/07	39.270775	-86.415273	78	3.0	3	3					1
Lemon	8/2/07	39.272575	-86.416293	79	3.0	5	5					1
Lemon	8/2/07	39.273778	-86.417982	80	4.0	5	5		1			2
Lemon	8/2/07	39.272853	-86.419541	81	4.0							0
Lemon	8/2/07	39.272726	-86.421733	82	3.0	1	1					1
Lemon	8/2/07	39.271515	-86.423768	83	5.0	1	1					1
Lemon	8/2/07	39.272281	-86.42647	84	3.0							0
Lemon	8/2/07	39.270441	-86.426829	85	6.0	1	1					1
Lemon	8/2/07	39.2686	-86.424226	86	5.0	1	1					1
Lemon	8/2/07	39.267275	-86.42168	87	4.0	3	3					1
Lemon	8/2/07	39.265745	-86.417178	88	4.0	3	1				3	2
Lemon	8/2/07	39.265784	-86.422065	89	5.0	1	1					1
Lemon	8/2/07	39.264616	-86.422109	90	3.0	3	3					1
Lemon	8/2/07	39.263731	-86.421672	91	4.0	1	1					1
Lemon	8/2/07	39.26315	-86.420414	92	3.0	5	1		5			2
Lemon	8/2/07	39.262392	-86.419371	93	8.0							0
Lemon	8/2/07	39.261697	-86.418688	94	5.0	1	1					1
Lemon	8/2/07	39.260818	-86.418962	95	2.0	3	1		3		1	3
Lemon	8/2/07	39.261841	-86.418005	96	4.0	1	1					1
Lemon	8/2/07	39.262158	-86.416785	97	3.0	1	1					1
Lemon	8/2/07	39.262469	-86.415546	98	3.0	1	1					1
Lemon	8/2/07	39.262916	-86.414677	99	3.0	3					3	1
Lemon	8/2/07	39.262933	-86.413811	100	3.0	3					3	1

7.2 2008 Vegetation Control Permit Application

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 10
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: Lake Lemon Conservancy District	Lake Assoc. Name: Lake Lemon Conservancy District	
Rural Route or Street: 7599 N. Tunnel Road		Phone Number: 812-334-0233
City and State: Unionville, IN		ZIP Code: 47468
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): Lake Lemon	Nearest Town: Unionville	County: Monroe-Brown
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 Maint. Line N39° 15.687' W86° 21.850' to N39°15.097' W86° 22.083'		
Total acres to be controlled 25	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)	
Maximum Depth of Treatment (ft) 4	Expected date(s) of treatment(s) Mid August with follow-up in early September		

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. Glyphosate for control of Lotus which expands beyond maintenance line and to open boat channels, spatterdock will be treated in boat channels only.

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
American Lotus	X	70
Eurasian watermilfoil		3
Coontail		20
Spatterdock	X	5
Chara		1
Elodea		1

Treatment Area #	2	LAT/LONG or UTM's Maint. Line N39° 15.664' W86° 22.386' to N39° 15.689' W86° 22.246'	
Total acres to be controlled	5	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)
Maximum Depth of Treatment (ft)	6	Expected date(s) of treatment(s) Mid August with touch-up treatment in early to mid September	

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. Glyphosate will be used for control of Lotus which expands beyond maintenance line

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
American Lotus	X	85
Eurasian watermilfoil		5
Coontail		10

Treatment Area #	3	LAT/LONG or UTM's N39.26324 W86.41325 to N39.26719 W86.42228	
Total acres to be controlled	13	Proposed shoreline treatment length (ft) 11500	Perpendicular distance from shoreline (ft) 50
Maximum Depth of Treatment (ft)	8	Expected date(s) of treatment(s) Late May initial treatment with follow-up in July	

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. Renovate for selective control of Eurasian watermilfoil, natives will only be treated to keep boat lanes open

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	50
Coontail	x	20
Chara		10
Curlyleaf pondweed	x	20

AQUATIC CONTROL

Treatment Area #	4	LAT/LONG or UTM's	N39.27277 W86.42229 to N39.22777 W86.41664		
Total acres to be controlled	4.04	Proposed shoreline treatment length (ft)	2500	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	6	Expected date(s) of treatment(s)	Late may initial treatment with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/komeen for small pondweed if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	30
Curlyleaf pondweed	x	30
American Pondweed		5
Small Pondweed	X	15
Coontail	x	10
Chara		10

Treatment Area #	5	LAT/LONG or UTM's	N39.27007 W86.41325 to N39.26719 W86.42228		
Total acres to be controlled	2.82	Proposed shoreline treatment length (ft)	2000	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	6	Expected date(s) of treatment(s)	Initial treatment in late May with follow-up in July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/komeen for small pondweed if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	50
Curlyleaf pondweed	X	30
Small Pondweed	X	20

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Treatment Area # 6	LAT/LONG or UTM's N39.26440 W86.40284 to N39.26307 W86.39884		
Total acres to be controlled 2.71	Proposed shoreline treatment length (ft) 1750	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) Initial treatment in late May with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/komeen for small pondweed if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	50
Curlyleaf pondweed	X	30
American pondweed		5
Small pondweed	X	15

Treatment Area # 7	LAT/LONG or UTM's N39.26282 W86.39708 to N39.26046 W86.37590		
Total acres to be controlled 24.96	Proposed shoreline treatment length (ft) 13780	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) Initial treatment in late May with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	50
Curlyleaf pondweed	X	30
American Pondweed		2
Chara	X	3
Coontail	X	10
Small Pondweed	X	5

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Treatment Area # 8	LAT/LONG or UTM's N39.26148 W86.37091 to N39.26110 W86.36442		
Total acres to be controlled 10.39	Proposed shoreline treatment length (ft) 3500	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 4	Expected date(s) of treatment(s) Initial treatment in late May with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/Komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	40
Coontail	X	40
American Lotus		5
Chara		5
American Pondweed		5
Elodea	X	5

Treatment Area # 9	LAT/LONG or UTM's Boat lanes (see map)		
Total acres to be controlled 7.5	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)	
Maximum Depth of Treatment (ft) 4	Expected date(s) of treatment(s) Initial treatment in late May with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/Komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	5
Coontail	X	50
American Lotus		15
Chara		5
Brittle naiad		5
Spatterdock		5
Elodea	X	15

Treatment Area #	10	LAT/LONG or UTM's	N39.25131 W86.36853 to N39.25097 W86.37124		
Total acres to be controlled	3.55	Proposed shoreline treatment length (ft)	1800	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	4	Expected date(s) of treatment(s)	Initial treatment in late May with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/Komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	40
Coontail	X	40
Small pondweed	X	10
Chara		2
American Pondweed		3
Elodea	X	5

Treatment Area #	11	LAT/LONG or UTM's	N39.25161 W86.38692 to N39.25166 W86.39856		
Total acres to be controlled	10.34	Proposed shoreline treatment length (ft)	6200	Perpendicular distance from shoreline (ft)	50
Maximum Depth of Treatment (ft)	4	Expected date(s) of treatment(s)	Initial treatment in late May with follow-up in early July		
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. Renovate for selective control of Eurasian watermilfoil, Aquathol/komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	50
American water willow		10
Coontail	X	20
Curlyleaf pondweed	X	20

Treatment Area #	12	LAT/LONG or UTM's	N39.25217 W86.40355 (center of bed)
Total acres to be controlled	0.5	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)
Maximum Depth of Treatment (ft)	4	Expected date(s) of treatment(s)	Initial treatment in late May with follow-up in early July

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. Renovate for selective control of Eurasian watermilfoil, Aquathol/Komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	40
Coontail	X	50
Water willow		10

Treatment Area #	13	LAT/LONG or UTM's	N39.25466 W86.40621 to N39.25874 W86.40776
Total acres to be controlled	3.56	Proposed shoreline treatment length (ft) 2125	Perpendicular distance from shoreline (ft) 50
Maximum Depth of Treatment (ft)	4	Expected date(s) of treatment(s)	Initial treatment in late May with follow-up in early July

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. Renovate for selective control of Eurasian watermilfoil, Aquathol/Komeen for small pondweed & coontail if they reach nuisance levels

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	55
Curlyleaf pondweed	X	20
Small pondweed	X	5
Coontail	X	20

Treatment Area # 14		LAT/LONG or UTM's Throughout Lake	
Total acres to be controlled	Proposed shoreline treatment length (ft)		Perpendicular distance from shoreline (ft)
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s)	Initial treatment in late May with follow-up in early July	
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. Renovate for selective control of Eurasian watermilfoil throughout entire lake (see 2004 avmp and 2007 update)

Plant survey method: ☒ Rake ☐ Visual ☐ Other (specify) Data from August 2007 Tier II plant sampling

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	45
Coontail		30
Brittle naiad		20
Small pondweed		3
Curlyleaf pondweed		2

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

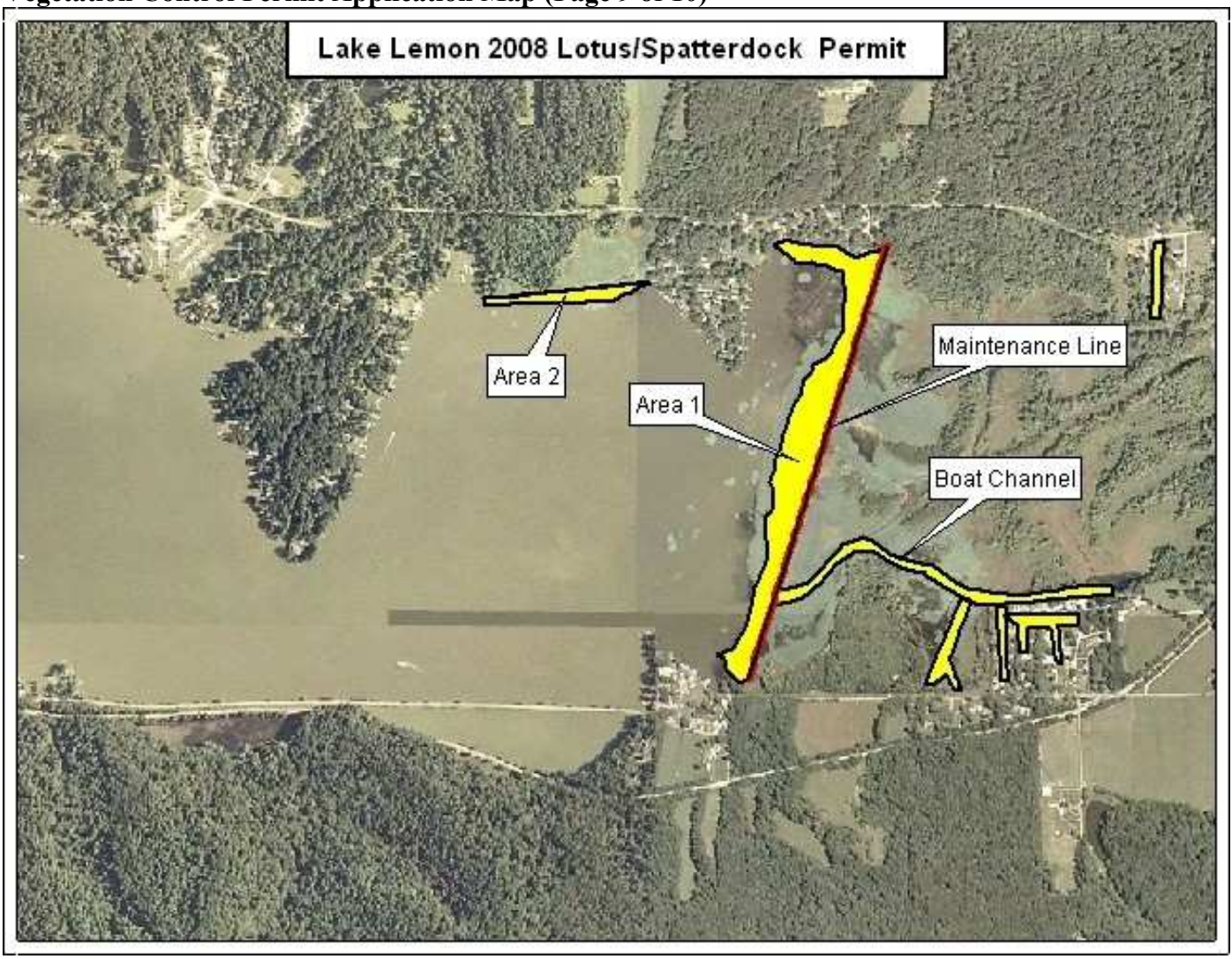
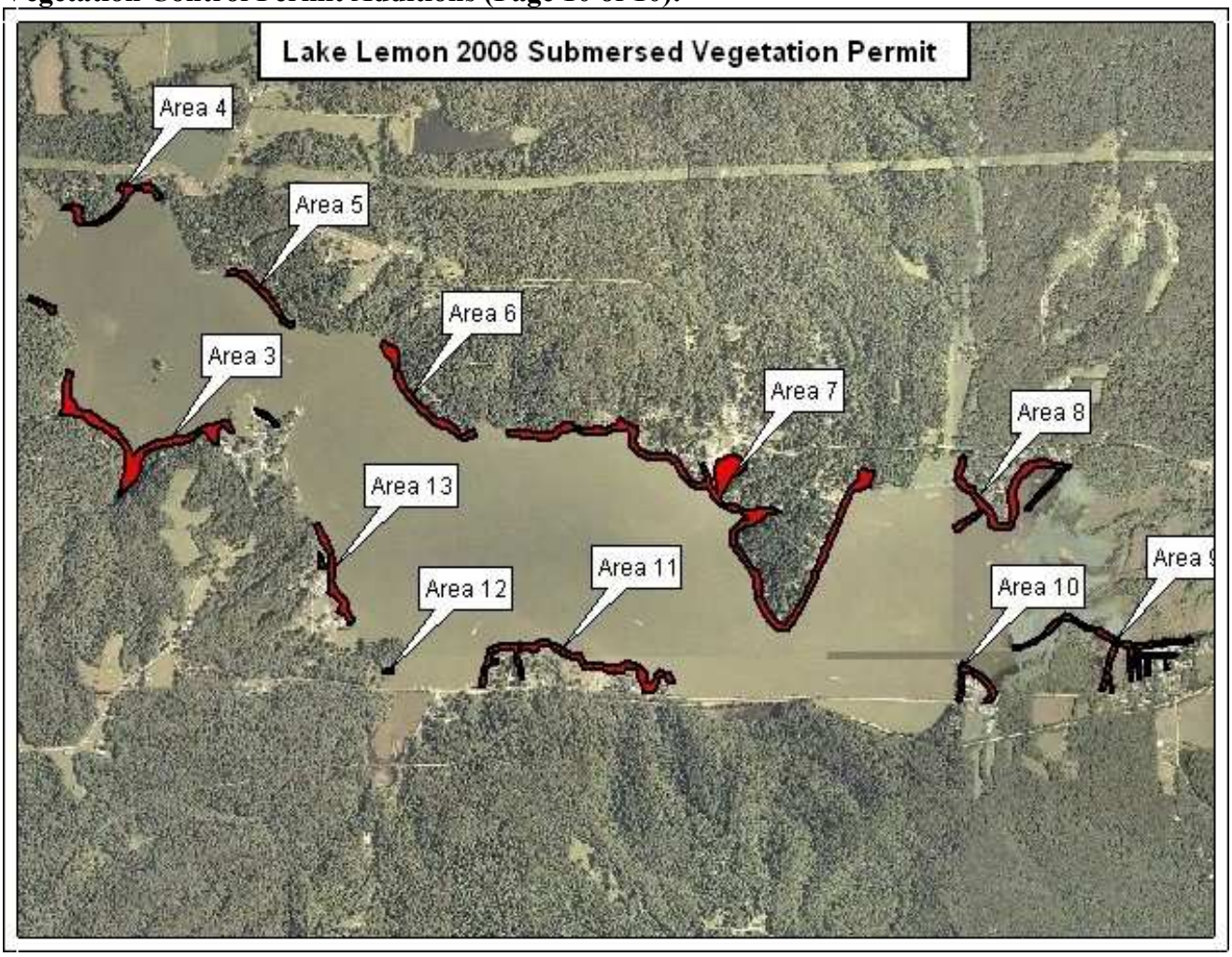
☐ Approved ☐ Disapproved	Fisheries Staff Specialist
☐ Approved ☐ Disapproved	Environmental Staff Specialist

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

Vegetation Control Permit Application Map (Page 9 of 10)



Vegetation Control Permit Additions (Page 10 of 10):