City of LaPorte Lakes
Aquatic Vegetation Management Plan
2008 Update
LaPorte County, Indiana

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Executive Summary

Aquatic Control was contracted by LaPorte City Parks and Recreation to complete aquatic vegetation sampling in order to update the City of LaPorte Lakes Aquatic Vegetation Management Plan 2007-2011 (Aquatic Control 2008). The original 2008 plan included sampling results and recommendations for Clear, Pine, Stone, and Lily Lakes. In 2008, the City only received funding for updating the Clear Lake portion of the plan. Pine and Stone Lake will be briefly addressed in this plan, but since no funding was available for sampling or invasive species control on these lakes, there will be little additional information to add.

Aquatic vegetation is an important component of Indiana Lakes. Aquatic vegetation provides fish habitat, food for wildlife, prevents erosion, and can improve overall water quality. However, as a result of many factors, this vegetation can develop to a nuisance level. Nuisance aquatic vegetation, as used in this paper, describes plant growth that negatively impacts the present uses of the lake including fishing, boating, swimming, aesthetic, and lakefront property values. Clear Lake (97 acres) is a shallow lake (avg. depth: 7.8 ft) that receives the majority of its runoff from urban areas. This fact makes it highly susceptible to invasive species problems. The primary nuisance species within Clear Lake is the invasive species Eurasian watermilfoil (*Myriophyllum spicatum*). Vegetation sampling in 2007 revealed that Eurasian watermilfoil was present at nuisance levels throughout Clear Lake making general recreation almost impossible. In addition, these dense milfoil beds likely had negative impacts on the fish and native plant populations.

The primary plant control recommendation from the original plan was to initiate a whole lake fluridone treatment on Clear Lake in the spring of 2008. The fluridone treatment was designed to maintain greater than 2.0 ppb of fluridone within Clear Lake for 90-120 days. Sonar AS (active ingredient: fluridone) was used in the treatment. An initial 6.0 ppb dose was applied on April 30th and "bumped" on June 11. Fluridone residue monitoring was completed throughout the spring and summer. Testing indicated that greater than 2.0 ppb of fluridone was maintained through at least August 29th. A Tier II survey was completed on August 28th and only a single decaying fragment of milfoil was collected, indicating that milfoil had been successfully controlled. The survey also indicated that the treatment had only minor impacts on the native plant community.

A public meeting was held on September 17, 2008 in order to inform lake users of the plant management activities and gain their input on the direction of the plan. Attendees at the meeting expressed their satisfaction with the treatment results. Another meeting was conducted with the LARE biologist, District Fisheries Biologist and representatives from LaPorte Parks on November 6. Sampling and treatment data along with a potential budget and action plan was presented and discussed at this meeting. Pine and Stone Lakes were discussed at this meeting and it was agreed that the Parks Department would pursue funding for vegetation sampling and treatment of milfoil on these lakes.

Information has been gathered over the past several years of vegetation surveys and management on Clear Lake. That information is used to create the following list of recommendations:

- Closely monitor Clear Lake for potential Eurasian watermilfoil regrowth. An invasive species survey should be completed in May of 2009. A summer Tier II survey should also be completed in order to document changes in the native population. Any areas of milfoil discovered during the summer Tier II survey should also be accurately mapped for potential treatment.
- Treat any areas of returning milfoil on Clear Lake with Renovate herbicide (active ingredient: triclopyr). Treatment should be completed as quickly as possible following any potential detection.
- Complete an invasive mapping survey on Pine and Stone Lakes in the spring of 2009. Areas of Eurasian watermilfoil should be treated with Renovate herbicide following the survey. Follow-up summer Tier II surveys should also be completed on these lakes in order to assess any changes in the native plant population. These two lakes should be included in the 2009 update.
- Work to improve the water quality of Clear Lake. This may include cleaning out the catch basin, properly maintaining the alum dosing station, and establishing native prairie vegetation along the shoreline as opposed to turf grass.
- Due to the potential expansion of native vegetation, small shoreline spot treatments may be required in order to provide shoreline fishing access.
- IDNR should consider conducting a fish survey on Clear Lake in order to assess changes in the fish population following the removal of Eurasian watermilfoil.

Acknowledgements

Funding for the vegetation sampling and preparation of an aquatic vegetation management plan was provided by the City of LaPorte Parks Department and the Indiana Department of Natural Resources Lake and River Enhancement Program. Aquatic Control, Inc. completed the fieldwork, data processing, and map generation. Special thanks are due to Dean Heise and the City of LaPorte Parks Department for their help in initiating and completing this project. Special thanks are given to Bob Robertson and Chip Long, Fisheries Biologists for the Indiana Department of Natural Resources-Division of Fish And Wildlife, for their assistance and review of this plan. Special thanks are also given to Gwen White and Angela Sturdevant, Aquatic Biologist from the Lake and River Enhancement Program (LARE) for their review and assistance on this plan. 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.

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1.0 INTRODUCTION

In 2004, the LaPorte Area Lake Association received LARE funding for creation of a Pine Lake Aquatic Vegetation Management Plan (Aquatic Control 2005). This plan was updated in 2005 and 2006 (Aquatic Control 2006 & 2007). In 2006, the City of LaPorte Parks Department requested a grant for development of a vegetation management plan for Stone, Lily, Harris, Pine and Lily Lakes (Figure 1). LARE made the decision to take funds intended for the Pine Lake update and vegetation control and apply them towards all five lakes. The City of LaPorte was selected to administer the grant. Grant funds were used to complete selective Eurasian watermilfoil treatments on Pine, Stone, and Lily Lakes. In addition, vegetation sampling was completed on Pine, Stone, Lily, and Clear Lakes (Harris Lake was not navigable). Treatment and sampling data, along with management recommendations, was compiled in the City of LaPorte Lakes Aquatic Vegetation Management Plan 2007-2011 (Aquatic Control 2008).

Figure 1. City of LaPorte Lakes location map.

In 2008, the City only received funding for updating the Clear Lake portion of the plan. Pine and Stone Lake will be briefly addressed in this plan, but since no funding was available for sampling or invasive controls on these lakes, there will be little additional information to add. It was determined that Lily and Harris Lakes offer very little recreational opportunity, so they did not fall under the LARE guidelines for funding.

For review, the vegetation management goals of the 2007 plan are as follows:

- Develop and/or 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/or 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.

2.0 PROBLEM STATEMENT

Aquatic vegetation is an important component of Indiana Lakes. Aquatic vegetation provides fish habitat, food for wildlife, prevents erosion, and can improve overall water quality. However, as a result of many factors, this vegetation can develop to a nuisance level. Nuisance aquatic vegetation, as used in this paper, describes plant growth that negatively impacts the present uses of the lake including fishing, boating, swimming, aesthetic, and lakefront property values. Clear Lake (97 acres) is a shallow lake (avg. depth: 7.8 ft) that receives the majority of its runoff from urban areas. This fact makes it highly susceptible to invasive species problems. The primary nuisance species within Clear Lake is the invasive species Eurasian watermilfoil (*Myriophyllum spicatum*). Vegetation sampling in 2007 revealed that Eurasian watermilfoil was present at nuisance levels throughout Clear Lake making general recreation almost impossible. In addition, these dense beds likely had negative impacts on the fish and native plant populations.

3.0 2008 PLANT SAMPLING RESULTS

Two surveys were completed in 2008 in order to document changes in the Clear Lake plant community, to map invasive species locations, and to determine success or failure of control techniques. A spring invasive species mapping survey was completed in April of 2008. This survey was designed to document areas of invasive species with a focus on curlyleaf pondweed (*Potamogeton crispus*). Curlyleaf pondweed typically reaches its maximum density in late spring and dies back in early summer. Previous sampling on this lake was completed in late summer, so very little data was available on the abundance of this species. A Tier II survey was completed in August. This survey was designed to monitor the effectiveness of the whole lake treatment, changes in the plant community, and to help plan for future plant management. In addition to the plant surveys, Eurasian watermilfoil root crown samples were collected from three locations throughout the season. This collection was part of a cooperative project with Mississippi State University and SePRO Corporation to document the effects of a whole lake fluridone treatment on milfoil carbohydrate reserves. Data from this sampling is currently not available.

3.1 Spring Survey (Invasive Plant Mapping)

Clear Lake Invasive Species Mapping was completed on April 24, 2008. A Secchi disk measurement of 7.0 feet was recorded. It was apparent that the water level of Clear Lake was 1-2 feet higher than in 2007. The survey revealed that Eurasian watermilfoil was still present throughout the entire lake with the exception of areas that were out of the water in 2007 (it appeared that milfoil had yet to move into the recently flooded areas).

Eurasian watermilfoil was approximately 2-3 feet under the surface of the water and appeared to be actively growing. Curlyleaf pondweed was rather sparse in Clear Lake. Six small patches were mapped which only totaled 0.71 acres (Figure 2).

Figure 2. Pretreatment curlyleaf pondweed beds, Clear Lake, April 24, 2008.

3.2 Summer Survey (Tier II Survey)

Tier II sampling took place on August 28, 2008. A Secchi disk reading was taken prior to sampling and was found to be 2.5 feet. Dissolved oxygen and temperature readings were also recorded prior to sampling. There appeared to be relatively high levels of dissolved oxygen throughout the water column at the time of the survey (Table 1).

Table 1. Dissolved oxygen and temperature profile, August 28, 2008

Depth	Dissolved Oxygen (mg/l)	Temperature (F)
Surface	9.0	79.3
3	8.7	78.6
6	8.7	78.2
8 (bottom)	8.2	77.5

Plants were present to a maximum of 8.0 feet. The same 50 sites that were sampled in the summer of 2007 were sampled again in this survey. A total of 7 species were collected of which 6 of the species were native. Sixty percent of sites contained vegetation. The maximum number of species collected at a site was 2. The average number of native species per site was 0.72. Table 2 outlines the results from the Tier II survey.

Table 2. Occurrence and abundance of submersed aquatic plants in Clear Lake August 28, 2008.

Occurrence and abundance of submersed aquatic plants in Clear Lake

County:	LaPorte	Sites with plants:	30	Mean species/site:	0.74
Date:	8/28/2008	Sites with native plants:	30	Standard error (ms/s):	0.0981877
Secchi (ft):	2.5	Number of species:	7	Mean native species/site:	0.72
Maximum plant depth (ft):	8	Number of native species:	6	Standard error (mns/s):	0.0949328
Trophic status	Mesotrophic	Maximum species/site:	2	Species diversity:	0.58
Total sites:	50			Native species diversity:	0.56

Depths 0 to 8 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	44.0	56.0	44.0	0.0	0.0	8.8
Illinois pondweed	18.0	82.0	12.0	0.0	6.0	8.4
flatstem pondweed	4.0	96.0	4.0	0.0	0.0	0.8
Eurasian watermilfoil	2.0	98.0	2.0	0.0	0.0	0.4
Chara	2.0	98.0	2.0	0.0	0.0	0.4
eel grass	2.0	98.0	2.0	0.0	0.0	0.4
variable 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	50.0	50.0	50.0	0.0	0.0	10.0
Chara	4.2	95.8	4.2	0.0	0.0	0.8
eel grass	4.2	95.8	4.2	0.0	0.0	0.8
flatstem pondweed	4.2	95.8	4.2	0.0	0.0	0.8
variable pondweed	4.2	95.8	4.2	0.0	0.0	0.8

Depths 5 to 8 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
common coontail	38.5	61.5	38.5	0.0	0.0	7.7
Illinois pondweed	26.9	73.1	19.2	0.0	7.7	11.5
Eurasian watermilfoil	3.8	96.2	3.8	0.0	0.0	0.8
flatstem pondweed	3.8	96.2	3.8	0.0	0.0	0.8

species observed: bulrush, pickerel weed, smartweed, American lotus, cattail, phragmites, sago pondweed. white water lily, spatterdock

Coontail was found at the highest percentage of sample sites (44.0%) and had the highest dominance rating (Figure 3). It also had the highest frequency of occurrence and dominance ratings for each depth range.

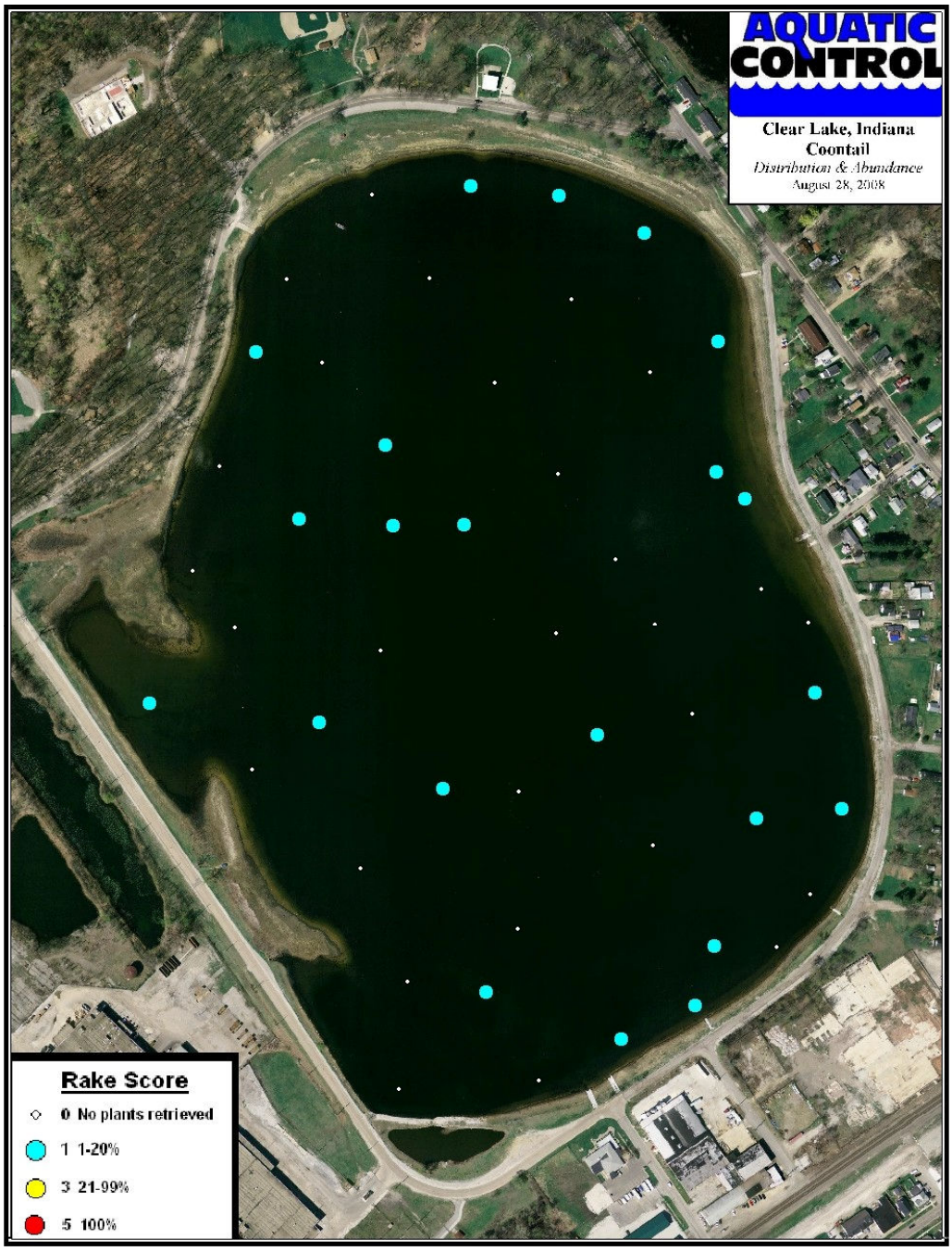

Figure 3. Clear Lake, coontail distribution and abundance, August 28, 2008.

Illinois pondweed (*Potamogeton illinoensis*), was present at 18.0% of the sample sites in the 2008 Tier II survey (Figure 4). Illinois pondweed was growing in several dense beds along the south side of Clear Lake. Despite having a much lower frequency of occurrence than coontail, Illinois pondweed had nearly the same dominance rating thanks to higher rake scores in the southern section of the lake.

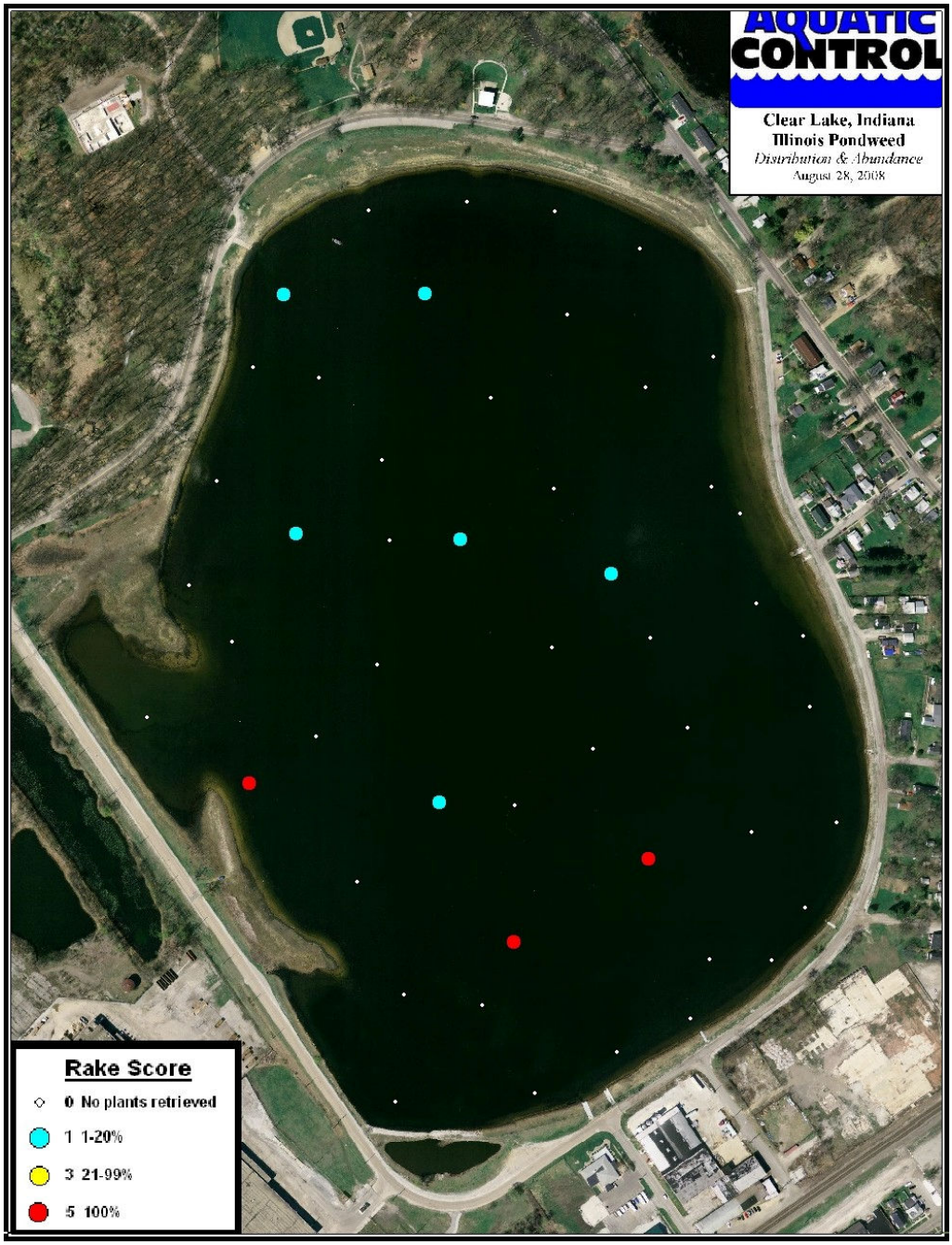

Figure 4. Clear Lake, Illinois pondweed distribution and abundance, August 28, 2008.

Flatstem pondweed (*Potamogeton zosteriformis*) was found at two sites within Clear Lake. Chara (*Chara spp.)*, eel grass (*Valisneria americana*), and variable pondweed (*Potamogeton gramineus*) were only found at single locations. The same was true for Eurasian watermilfoil which was found at a single site near the middle of the lake (Figure 5). The milfoil specimen was brown and decayed yet was positively identified as Eurasian watermilfoil.

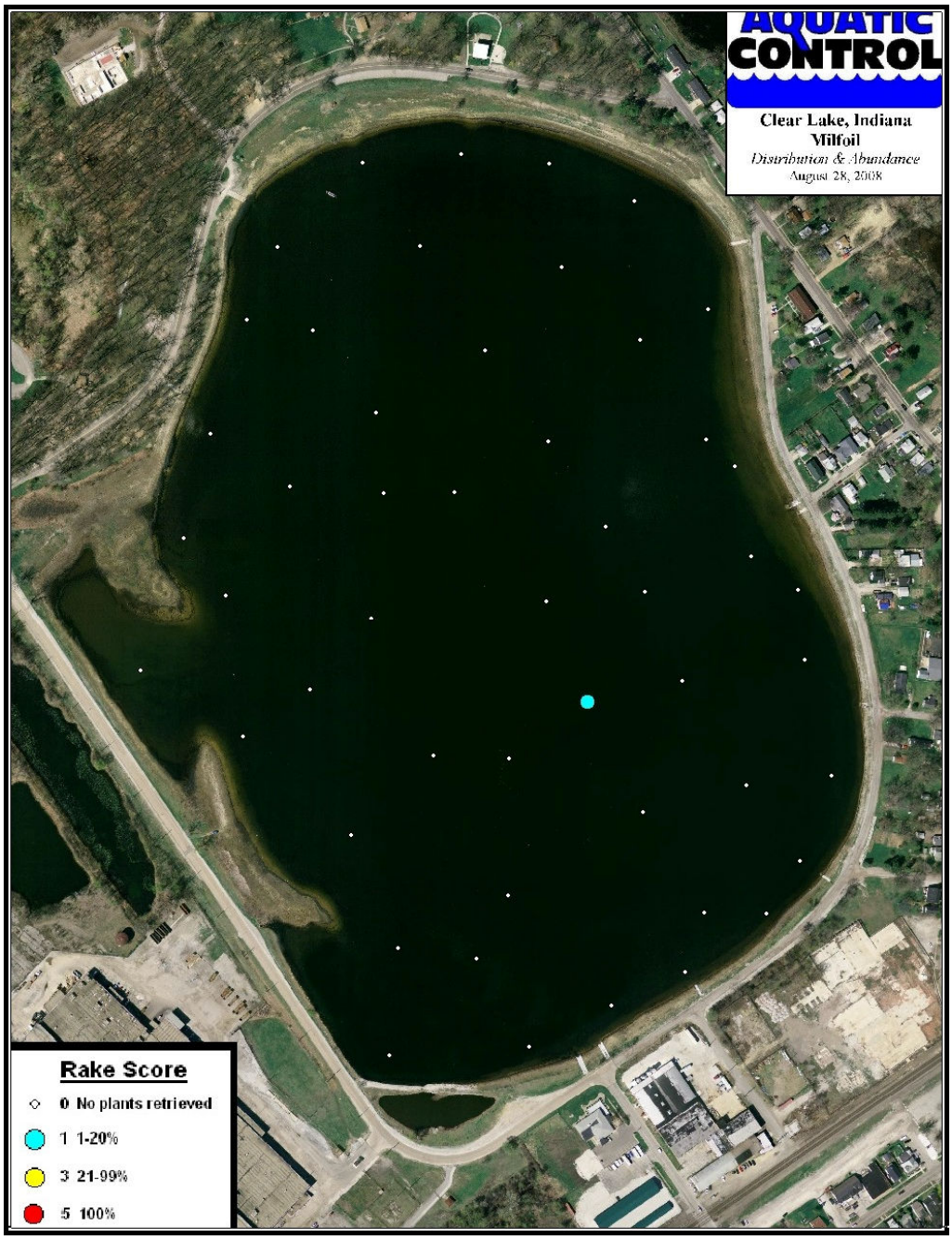

Figure 5. Clear Lake, Eurasian watermilfoil distribution and abundance, August 28, 2008.

No surveys designed to document changes in rooted floating or emergent vegetation were completed on Clear Lake. However, it appeared that American lotus (*Nelumbo lutea*), white water lily (*Nymphaea odorata*), and pickerel weed *(Pontederia cordata)* expanded this season (Figure 6). This was evident during the Tier II survey when one of the sample points which was originally placed at the edge of the lotus bed in 2007, was now well within the lotus bed.

Figure 6. Clear Lake, American lotus bed (left) and water lily, pickerelweed, and bulrush beds (right), August 7, 2008.

3.3 Aquatic Vegetation Sampling Discussion

Clear Lake was dominated by Eurasian watermilfoil prior to the 2008 treatment. Control of milfoil was the primary recommended action in last year's plan. The treatment effectively controlled Eurasian watermilfoil as exhibited by the summer Tier II data and in Figure 7.

Clear Lake August 2007 **Clear Lake August 2008**

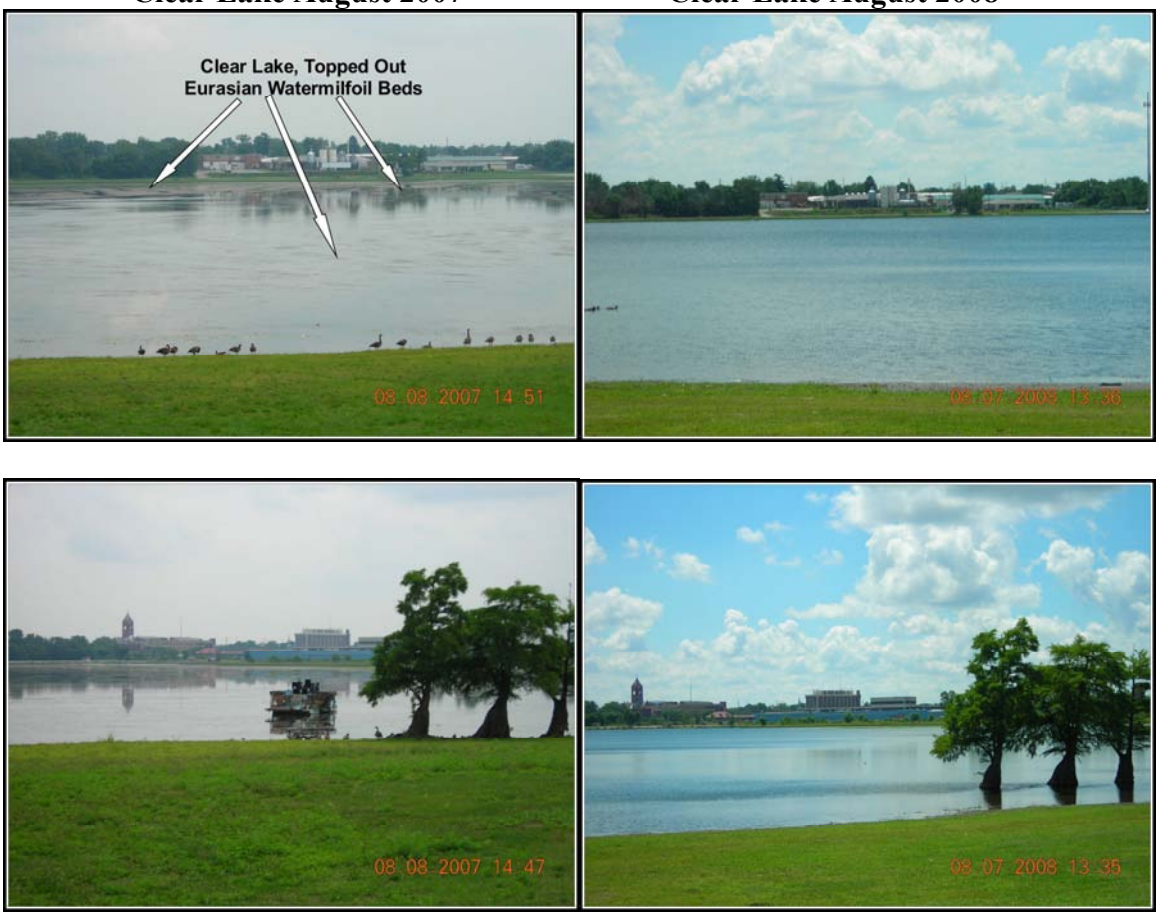

Figure 7. Clear Lake, August 2007 pictures on left and August 2008 on right.

Low rates of fluridone were applied in an effort control milfoil while minimizing damage on native species. As previously discussed, it appears that there was little to no damage on the emergent/rooted floating plant community. This is typically the case with low rate whole lake fluridone treatments. However there were some changes within the submersed vegetation community. Table 3 outlines changes in percent occurrence as documented in the last two summer Tier II surveys. It appears that there was little variation in percent occurrence of common coontail and Illinois pondweed. However, brittle naiad (an invasive species), slender naiad, sago pondweed, small pondweed, and water stargrass were not collected in 2008, but were present in 2007. The lack of water stargrass and small pondweed was somewhat surprising since these species are usually tolerant to low rates of fluridone. Chara, eel grass, flatstem pondweed, and variable pondweed were all collected in 2008, but were not found in the previous year's survey. These species are all fairly tolerant to low rates of fluridone, so their presence was not unexpected. It will be very interesting to observe how these species react to the loss of Eurasian watermilfoil in 2009. Theoretically, they should spread and move into areas once occupied by dense milfoil beds.

Table 3. Clear Lake, species percent occurrence comparison by year.

Species	Aug-07	Aug-08
Eurasian watermilfoil *(Myriophyllum spicatum)*	100.0%	2.0%
common coontail *(Ceratophyllum demersum)*	48.0%	44.0%
Chara (Chara spp.)	-	2.0%
Slender naiad *(Najas flexillis)*	12.0%	-
sago pondweed *(Potamogeton pectinatus)*	2.0%	-
small pondweed *(Potamogeton pusillus)*	20.0%	-
eel grass *(Vallisneria americana)*	-	2.0%
American elodea *(Elodea canadensis)*	6.0%	-
flatstemmed pondweed *(Potamogeton zosteriformis)*	-	4.0%
variable pondweed *(Potamogeton gramineus)*	-	2.0%
water stargrass *(Zosterella dubia)*	10.0%	-
brittle naiad *(Najas minor)*	24.0%	-
Illinois pondweed *(Potamogeton illinoensis*	16.0%	18.0%

A better understanding of changes in the overall plant community can be achieved by comparing overall plant abundance and diversity metrics over the last two surveys (Table 4). There was a decrease in water clarity this season. This was likely due to a large biomass of Eurasian watermilfoil that had decomposed during the season. It is expected the clarity will improve as native vegetation becomes more established. The comparison also indicates that there were slight decreases in the abundance and diversity of native submersed species in 2008. This is expected to rebound as native species colonize areas once occupied by Eurasian watermilfoil.

Table 4. Clear Lake, Tier II survey results comparison.

Tier II Metric	Aug-07	Aug-08
Secchi	7	2.5
Max Plant Depth	8	8
Total Sites	50	50
Sites with Plants	50	30
Sites with Native Plants	37	30
Number of Species	9	7
Number of Native Species	7	6
Maximum Species/Site	4	2
Mean Species/Site	2.38	0.74
Mean Native Species/Site	1.14	0.72
Species Diversity Index	0.71	0.58
Native Species Diversity Index	0.75	0.56

4.0 2008 VEGETATION CONTROL

A whole lake fluridone treatment was completed on Clear Lake in 2008. The goal of the treatment was to eradicate all Eurasian watermilfoil in the lake while having minimal impacts on native vegetation. In order to achieve this goal the prescription called for maintenance of a rather low fluridone concentration (2 ppb) over an extended period of time (90-120 days). The treatment was to begin with a 6 ppb dose and then be bumped back to 6 ppb after 14-21 days. An initial 6 ppb dose of Sonar AS was applied on April 30. Product was applied evenly over the surface of the lake. Regular testing of fluridone levels (FasTEST) was completed at 7, 13, 28, 42, 58, 98, and 120 days after treatment. Samples were collected from two locations within the lake and analyzed at SePRO's North Carolina lab (Figure 8). Fluridone levels were bumped back to 6.0 ppb on June 11 and remained above 2.0 ppb for over 120 days (Figure 9).

Figure 8. Clear Lake, FasTEST collection sites

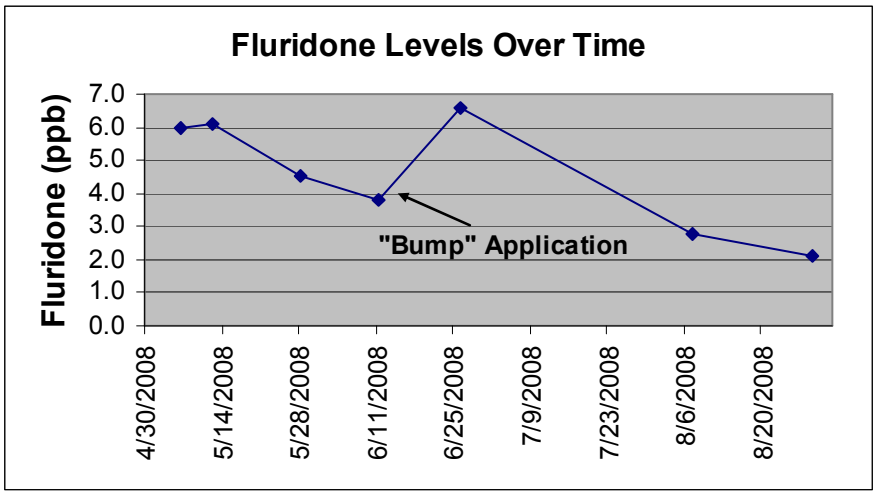

Figure 9. Clear Lake, average fluridone levels and over time.

5.0 ACTION PLAN AND BUDGET UPDATE

The 2008 whole lake treatment of Clear Lake helped the Parks Department move towards the goal of reducing the negative impacts of aquatic invasive species, specifically, Eurasian watermilfoil. Native vegetation was slightly impacted by this treatment, but is expected to recover and expand beyond pre-treatment levels in upcoming years.

Treatment also allowed for easier navigation and general use of Clear Lake. It will be important to closely monitor vegetation in Clear Lake in the upcoming years in order locate any returning milfoil and to document native vegetation recovery. An invasive mapping survey should be completed in the spring of 2009 in order to locate any areas of Eurasian watermilfoil. This survey should be conducted by crossing the lake in 50-100 foot transects and visually observing vegetation or tossing rakes if visibility is limited. Any areas of Eurasian watermilfoil should be recorded on a GPS device and downloaded into a GIS program. If milfoil is discovered, these areas should be treated as soon as possible with Renovate herbicide. A Tier II survey should also be completed on Clear Lake in order to document changes in the native plant community. This survey should be completed in mid to late summer. Any areas of Eurasian watermilfoil should be recorded during this survey so that they can be treated.

There is the possibility that native vegetation, specifically coontail, could reach nuisance levels thus resticting navigation, shoreline fishing, and general lake recreation. Treatment of native vegetation in selected areas may be required in order to relieve these potential nuisance conditions. Treatments can be completed using contact herbicides for approximately $300-$500/acre. A permit would be required if more than 625 square feet is treated.

In addition to vegetation controls, efforts to improve the water quality of Clear Lake should be stepped up. This may include cleaning out the catch basin in the southern end of the lake, maintaining the alum dosing station, and converting shoreline turf grass areas to native prairie or wildflower stands.

The reduction in Eurasian watermilfoil may have a positive impact on the Clear Lake fishery by allowing predator species easier access to prey species. This should increase growth rates of predator species and also may have positive impacts on prey species by thinning out their number thus allowing for better growth. It may be beneficial for IDNR to conduct a fish survey on Clear Lake in order to assess any changes in the fish community.

Pine Lake and Stone Lake have historically had problems with invasive species, specifically, Eurasian watermilfoil. It is recommended that an invasive mapping survey is completed on Pine and Stone Lakes in the spring of 2009. Areas of Eurasian watermilfoil should be treated with Renovate herbicide following the survey. Follow-up summer Tier II surveys should also be completed on these lakes in order to assess any changes in the native plant population. These two lakes should be included in the 2009 update.

It is recommended that the Association request $4,000 for treating up to 10 acres of Eurasian watermilfoil and $4,000 for plant sampling and updating the 2009 Clear Lake Plan (Table 5). In addition, it is recommended that the Association request $15,000 for treatment of up to 30 acres of Eurasian watermilfoil on Pine and Stone Lakes. If these lakes are added to the plan and sampling the cost for this service will increase to approximately $8,000 for all three lakes (Table 6).

Table 5. Budget estimates for management options on Clear Lake.

	2009	2010	2011	2012
Selective treatment of Eurasian watermilfoil with Renovate herbicide	$4,000	$4,000	$4,000	$4,000
AVMP update and plant sampling	$4,000	$4,000	$4,000	$4,000
Total:	**$8,000**	**$8,000**	**$8,000**	**$8,000**

Table 6. Budget estimates for Pine, Stone, and Clear Lakes.

	2009	2010	2011	2012
Selective treatment of Eurasian watermilfoil with Renovate herbicide	$19,000	$19,000	$19,000	$19,000
AVMP update and plant sampling, includes Clear Lake	$8,000	$8,000	$8,000	$8,000
Total:	**$27,000**	**$27,000**	**$27,000**	**$27,000**

6.0 PUBLIC PARTICIPATION

An effective aquatic vegetation management plan must include input from lake users. A public meeting was held on September 17 at the LaPorte City Parks Office. The public meeting was held in order to gain input concerning the plan from lake users, educate lake users on the benefits of native vegetation, inform lake users about the 2008 vegetation controls, and to update lake users on 2009 plans. Twelve people were present for the meeting. Eight of those in attendance took the time to fill out a survey form. Table 7 shows the results from the survey. It appears that those in attendance were pleased with the results of this year's LARE sponsored work and wished to continue with vegetation management activities.

Table 7. Public meeting survey results, September 17, 2008.

Clear Lake 9/17/08		
Are you a lake property owner?	Yes 0%	No 100%
Are you currently a member of your lake association?	Yes 0%	No 100%
How many years have you been at the lake?	2 or Less: 13%	5 to 10: 0%
	2 to 5: 0%	Over 10: 25%
How do you use the lake (mark all that apply)	Swimming 38%	Irrigation 0%
	Boating 25%	Drinking water 0%
	Fishing 50%	Other? _25%___
Do you have aquatic plants at your shoreline in nuisance quantities?	Yes: 25% No: 25%	
Does aquatic vegetation interfere with your use or enjoyment of the lake?	Yes: 25% No: 25%	
Does the level of vegetation in the lake affect your property values?	Yes: 25% No: 12%	
Are you in favor of continuing efforts to control vegetation on the lake?	Yes: 88% 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: 88% No: 12%	
Were you satisfied with the results of the LARE funded invasive treatments this season?	Yes: 88% No: 0%	
Mark any of these you think are problems on your lake:		
0% Too many boats access the lake		
12% Use of jet skis on the lake		
0% Too much fishing		
0% Fish population problem		
38% Dredging needed		
12 % Overuse by nonresidents		
38% Too many aquatic plants		
0% Not enough aquatic plants		
12% Poor water quality		
0% Pier/funneling problem		

7.0 REFERENCES CITED

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8.0 APPENDIX UPDATE-2008 SAMPLING DATA

8.1 August Tier II Survey

Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	CEDE4	CH?AR	VAAM3	POZO	POGR8	POIL
Clear	8/28/08	41.622761	-86.723957	1	5.0	1							1
Clear	8/28/08	41.622121	-86.72359	2	6.0	0							
Clear	8/28/08	41.621485	-86.722938	3	8.0	1		1					
Clear	8/28/08	41.620868	-86.722123	4	8.0	1		1					1
Clear	8/28/08	41.620028	-86.721181	5	7.0	0							
Clear	8/28/08	41.619247	-86.720752	6	6.0	1	1	1					
Clear	8/28/08	41.618398	-86.720179	7	7.0	5							5
Clear	8/28/08	41.617618	-86.719543	8	6.0	1		1					
Clear	8/28/08	41.616904	-86.720509	9	5.0	1		1					
Clear	8/28/08	41.617756	-86.721576	10	6.0	5							5
Clear	8/28/08	41.618832	-86.722345	11	6.0	1		1					1
Clear	8/28/08	41.619899	-86.722985	12	6.0	0							
Clear	8/28/08	41.620912	-86.723822	13	7.0	1		1					1
Clear	8/28/08	41.621319	-86.724649	14	5.0	0							
Clear	8/28/08	41.620076	-86.724492	15	5.0	1					1		
Clear	8/28/08	41.619338	-86.723616	16	6.0	1		1					
Clear	8/28/08	41.618221	-86.723189	17	5.0	0							
Clear	8/28/08	41.617348	-86.722707	18	6.0	0							
Clear	8/28/08	41.616517	-86.722794	19	10.0	0							
Clear	8/28/08	41.618978	-86.724311	20	5.0	5							5
Clear	8/28/08	41.619493	-86.725371	21	5.0	1		1					
Clear	8/28/08	41.620516	-86.724928	22	5.0	0							
Clear	8/28/08	41.622198	-86.724272	23	5.0	1		1					
Clear	8/28/08	41.623412	-86.723079	24	5.0	0							
Clear	8/28/08	41.622773	-86.722487	25	6.0	1							1
Clear	8/28/08	41.621961	-86.72181	26	8.0	0							
Clear	8/28/08	41.621264	-86.721153	27	8.0	0							
Clear	8/28/08	41.620606	-86.720566	28	8.0	1							1
Clear	8/28/08	41.6201	-86.720155	29	8.0	0							
Clear	8/28/08	41.619407	-86.719777	30	8.0	1					1		
Clear	8/28/08	41.618603	-86.719116	31	8.0	1		1					
Clear	8/28/08	41.61802	-86.718562	32	5.0	0							
Clear	8/28/08	41.618679	-86.718234	33	5.0	1		1					
Clear	8/28/08	41.619568	-86.718508	34	5.0	1		1				1	
Clear	8/28/08	41.620376	-86.71906	35	5.0	0							
Clear	8/28/08	41.621276	-86.719527	36	5.0	1		1					
Clear	8/28/08	41.622046	-86.720207	37	7.0	0							
Clear	8/28/08	41.622608	-86.721022	38	8.0	0							
Clear	8/28/08	41.623479	-86.722059	39	5.0	1		1		1			
Clear	8/28/08	41.623402	-86.721151	40	5.0	1		1					
Clear	8/28/08	41.623118	-86.720268	41	5.0	1		1					
Clear	8/28/08	41.622281	-86.719505	42	5.0	1		1					
Clear	8/28/08	41.62107	-86.71923	43	4.0	1		1	1				
Clear	8/28/08	41.620114	-86.718578	44	5.0	0							
Clear	8/28/08	41.617616	-86.718901	45	5.0	0							
Clear	8/28/08	41.617159	-86.719745	46	5.0	1		1					
Clear	8/28/08	41.616584	-86.721357	47	5.0	0							
Clear	8/28/08	41.617263	-86.721901	48	8.0	1		1					
Clear	8/28/08	41.618808	-86.721564	49	8.0	0							
Clear	8/28/08	41.620862	-86.722858	50	8.0	1		1					

8.2 2008 Vegetation Control Permit Application

Clear Lake

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 2
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: Dean Heise	Lake Assoc. Name: City of Laporte	
Rural Route or Street: 250 Pine Lake Avenue		Phone Number: 219-326-9600
City and State: LaPorte, IN		ZIP Code: 46350
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): Clear Lake	Nearest Town: LaPorte	County: LaPorte
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: Areas to be determined following spring survey	
Total acres to be controlled: n.a.	Proposed shoreline treatment length (ft): n.a.	Perpendicular distance from shoreline (ft): n.a.
Maximum Depth of Treatment (ft): 8	Expected date(s) of treatment(s): Late May through late 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. Renovate used to spot treat milfoil if it returns

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermiloil	x	5
Common coontail		40
Illinois pondweed		30
Flatstem pondweed		10
Chara		5
Eel grass		5
Variable pondweed		5

Page 2 of 2

Treatment Area #	LAT/LONG or UTM's	
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)	

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. _____

Plant survey method: ☐ Rake ☐ Visual ☐ Other (specify) _____

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community

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

Pine Lake

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
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Date Issued
Lake County

Return to: Page 1 of 2
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: Dean Heise	Lake Assoc. Name: City of Laporte	
Rural Route or Street: 250 Pine Lake Avenue		Phone Number: 219-326-9600
City and State: LaPorte, IN		ZIP Code: 46350
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): Pine Lake	Nearest Town: LaPorte	County: LaPorte
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 Milfoil where it occurs (Areas determined after LARE survey)	
Total acres to be controlled n.a.	Proposed shoreline treatment length (ft) n.a.	Perpendicular distance from shoreline (ft) n.a.
Maximum Depth of Treatment (ft) n.a.	Expected date(s) of treatment(s) mid to late may	

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 and/or 2,4-D for selective control of Eurasian watermilfoil

Plant survey method: [x] Rake [x] Visual [ ] Other (specify) 2007 summer t2 survey

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eel grass		15
coontail		10
Eurasian watermilfoil	x	10
Richardson's pondweed		1
Variable pondweed		10
Bur-marigold		2
northern watermilfoil		10
Chara spp.		1
elodea		10
slender naiad		10
Whitestem pondweed		10
largeleaf pondweed		1
Whitestem pondweed		5
Water stargrass		4
Robbin's pondweed		5

Treatment Area #	LAT/LONG or UTM's	
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)	

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. _____

Plant survey method: ☐ Rake ☐ Visual ☐ Other (specify) _____

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community

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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

Stone Lake

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 2
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: Dean Heise	Lake Assoc. Name: City of Laporte	
Rural Route or Street: 250 Pine Lake Avenue		Phone Number: 219-326-9600
City and State: LaPorte, IN		ZIP Code: 46350
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): Stone Lake	Nearest Town: LaPorte	County: LaPorte
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 Milfoil where it occurs (Areas determined after LARE 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) mid to late May	

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 and/or 2,4-D for selective control of Eurasian watermilfoil

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

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermiloil	x	1
Water Stargrass		1
Common coontail		13
Common naiad		5
Water marigold		5
Chara		1
Elodea		5
Northern milfoil		1
Nitella		1
Largeleaf pondweed		10
Curlyleaf pondweed		1
Fries pondweed		2 (continued on next page)

Page 2 of 2

Treatment Area # 1 continued	LAT/LONG or UTM's	
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)	

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.

Plant survey method: ☐ Rake ☐ Visual ☐ Other (specify) AREA 1 CONTINUED

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Variable pondweed		5
Whitestem pondweed		5
Robbins pondweed		10
Stiff pondweed		1
Flatstem pondweed		15
Water Crowfoot		1
Horned pondweed		1
Eel grass		15
Arrowhead		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

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☐ Approved ☐ Disapproved	Environmental Staff Specialist

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INDIANAPOLIS, IN 46204