



*Aquatic Enhancement
& Survey, Inc.*

**Wall Lake Aquatic Vegetation Management Plan
Update, LaGrange County, Indiana
2006**



Prepared for:

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Executive Summary

Wall Lake is a 141 acre oligotrophic glacial lake in LaGrange County Indiana. It has a relatively small watershed of 753 acres comprised largely of wooded, developed and agricultural lands. Wall Lake has a relatively diverse aquatic flora with at least 20 species of submersed aquatic plants being identified in various surveys. (See table 1 below) This includes 18 native species, and one endangered species (see Wall Lake plant list below). Fifteen years ago Wall Lake's flora was largely native, relatively stable, and user friendly. Only the lake's three excavated channels had aquatic plants in enough quantity to provide a major hindrance to recreational activities such as boating and fishing. The aquatic plant understory was dominated by Chara while native pondweeds grew in tall stands in many deeper areas. In the mid 1990's Eurasian watermilfoil, an exotic invasive species began to become more prominent in Wall Lake. From 1998 to 2003 the amount of Eurasian watermilfoil and the density of its growth increased despite effective lakewide treatment with both contact and systemic herbicides. In 2005 LARE cost share funding was utilized by the Wall Lake Fisherman's Association to develop an aquatic plant management plan for the lake. Under the plan another cost-share grant was obtained to perform a six part-per-billion fluridone treatment on Eurasian milfoil. The treatment was performed in May of 2005 and control of Wall Lake's Eurasian watermilfoil problem was complete by the end of that season. In 2006 five acres of returning Eurasian watermilfoil was treated to prevent a quick return to problem growth levels. Wall Lake's plant community appears to have responded well to treatment but is undergoing a slow and low-grade regression back toward milfoil colonization. The amount of milfoil that will be present in 2007 is difficult to determine, but a doubling of the 2006 season's five acre treatment is probably a realistic estimate. It is recommended that the Wall Lake residents plan to treat ten acres of Eurasian watermilfoil with granular 2,4-D aquatic herbicide in the 2007 season. An increase in the growth of Curlyleaf pondweed, an early-season growing exotic invasive has occurred and it is recommended that these plants also be chemically treated in 2007. This should be done with an ultra-early contact herbicide application (Aquathol K liquid) to prevent reproduction of these plants via early season turion formation. If the Curlyleaf pondweed is allowed to grow unchecked the development of a significant secondary problem may occur. The expected cost the treatment of 10 acres of Eurasian watermilfoil is 4306.00. The expected cost of the ultra-early Curlyleaf pondweed treatment is 2680.00. The estimated cost of planning and plant surveys is 3200.00. Whereas purple loosestrife has begun to colonize Wall Lake's shoreline, a program of treatment for this plant should be implemented to protect area wetlands. The cost of this treatment is estimated to be 700.00. Prospects appear to be excellent for continued management of Wall Lake's plant community to provide for good wildlife habitat, good plant species diversity, recreational use, and the maintenance of habitat for a new Walleye stocking program at the lake. Following up on the recommendations from Wall Lake's recent Lake Diagnostic Study will also be important in protecting the lake's water quality and aquatic plant community.

Table 1 Submersed Aquatic Plant Species Identified in Various Wall Lake Surveys

Common Name(s)	Scientific Name	Species Code	Nativity Native/Introduced	Indiana Status (Rare/Threatened/Endangered)
Variable pondweed	<i>Potamogeton gramineus</i>	POGR	N	
Chara, Muskgrass, Stonewort	<i>Chara sp.</i>	CH?AR	N	
Nitella (2003 IDNR survey)	<i>Nitella sp.</i>	NI?TE	N	
Flatstem pondweed	<i>Potamogeton zosteriformis</i>	POZO	N	
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	*MYSP2	I	
Northern watermilfoil, Shortspike watermilfoil, Common watermilfoil (2003 IDNR Survey)	<i>Myriophyllum sibiricum</i>	MYSI	N	
Illinois pondweed	<i>Potamogeton illinoensis</i>	POIL	N	
Curlyleaf pondweed	<i>Potamogeton crispus</i>	POCR3	I	
Sago pondweed	<i>Potamogeton pectinatus</i>	POPE6	N	
Elodea, Common waterweed	<i>Elodea canadensis</i>	ELCA	N	
Heartleaf pondweed	<i>Potamogeton pulcher</i>		N	E
Largeleaf pondweed	<i>Potamogeton amplifolius</i>	POAM	N	
Vallisneria, Tapegrass, Eelgrass, Wild celery	<i>Vallisneria americana</i>	VAAM	N	
Small pondweed	<i>Potamogeton pusillus</i>	POPU	N	
Coontail	<i>Ceratophyllum demersum</i>	CEDE	N	
Great bladderwort, Common bladderwort	<i>Utricularia vulgaris</i>	UTMA	N	
Creeping Bladderwort	<i>Utricularia gibba L.</i>	UTGI	N	
Water stargrass	<i>Zosterella dubia,</i> <i>Heteranthera dubia</i>	ZODU/HE DU	N	
Filamentous algae	Any species	ALGA	N	
Common naiad, Slender naiad	<i>Najas flexilis</i>	NAFL	N	
Spiny naiad	<i>Najas marina</i>	NAMA	N	

1.0 Introduction

In the 1996 season Aquatic Enhancement & Survey, Inc. began seasonal mapping of Wall Lake’s plantbeds through a combination of visual inspection and rake tosses in preparation for a possible plant control program. By 1998 residents on the lake’s three channels had contracted for control of aquatic vegetation in the channels via aquatic pesticide application. Residents had also begun to note an increasing interference in fishing and boating from dense milfoil growth in the open lake and the Wall Lake Fisherman's Association hired Aquatic Enhancement & Survey, Inc. to treat approximately 14 acres of Eurasian watermilfoil in the lake's two basins. Subsequently seasonal treatments for Eurasian watermilfoil took place nearly every year. Despite this the plants continued to spread, eventually dominating approximately 25 acres of Wall Lake, densely colonizing most of the littoral zone between the six and 12 foot depth contours. The lake’s basic treatment history is summarized in the table below.(see table 2) After receiving IDNR Lake and River Enhancement (LARE) cost-share funding to develop an aquatic vegetation management plan beginning in 2004 the Wall Lake

Fisherman’s Association hired Aquatic Enhancement & Survey, Inc. to develop the plan. The plan was completed in 2005. The purpose of the plan is to provide guidance to the Lake Association and the Indiana Department of Natural Resources for managing the lake’s plant community to protect the ecological integrity and recreational and aesthetic value of the lake. The plan contains the following primary goals:

Goal 1. • 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.

Goal 2. • Direct efforts to preventing and/or controlling the negative impacts of aquatic invasive species.

Goal 3. • Provide reasonable public recreational access while minimizing the negative impacts on plant, fish, and wildlife resources.

This update document summarizes plant management activities, the lakes current plant community, and lake-user responses to management activities that took place in 2006. It also provides a proposed course for future plant management that is consistent with the original plan goals. Tier I Aquatic Plant Data was collected on Wall Lake on May 20 and 24, 2006 and again on August 8, 2006 (post-treatment). Sixteen species of rooted submersed aquatic plant were collected or observed in the surveys, showing good diversity. One state endangered species of pondweed, Heartleaf pondweed *Potamogeton pulcher* was identified. A voucher specimen of this plant should be obtained for preservation and positive identification in 2007. Based on the May Tier I survey results the granular systemic aquatic herbicide (2,4-D) was applied to the five acres of Wall Lake deemed to have the most Eurasian watermilfoil growth. The product was applied at the rate of 100 pounds per surface acre. The treatment was performed on June 2nd. Post treatment Tier I and Tier II Plant Surveys were performed on August 8th. Eurasian watermilfoil control appeared to be very good in the treated areas, but a low grade re-infestation appears to be progressing in Wall Lake with stunted and scattered milfoil plants occurring roughly over the entire area of previous dense colonization. The amount of milfoil in Wall Lake is expected to again increase slightly in the 2007 season with some areas possibly supporting dense stands of the plant. The Wall Lake Fisherman’s Association is advised to plan on treating approximately ten acres of Wall Lake for returning Eurasian watermilfoil plants using granular 2,4-D aquatic herbicide. Curlyleaf pondweed, another invasive non-native plant has become much more prominent since the implementation of whole-lake control of Eurasian watermilfoil. An ultra-early treatment of the Curlyleaf is advised in 2007 to help provide control of this potential problem.

Table 2 Basic Plant Management History for Wall Lake

Year	Approximate Acres	Management
------	-------------------	------------

	of Milfoil	
1996	7	Basic Plant Mapping performed
1997	10	Basic Plant Mapping repeated
1998	14	Channel treatments for native and exotic plant control 14 acres of open-lake milfoil treatment (2,4-D)
1999	20	Channel treatments for native and exotic plant control
2000	22	Channel treatments for native and exotic plant control App. 22 acres of open-lake milfoil treatment (2,4-D)
2001	22	Channel treatments for native and exotic plant control App. 22 acres of open-lake milfoil treatment (Reward)
2002	22	Mechanical Harvesting
2003	25	Channel treatments for native and exotic plant control Approx. 25 acres of open-lake milfoil treatment (Reward) INDR random sampling begins Association applies for LARE funding
2004	25	Channel treatments for native and exotic plant control Approx. 25 acres of open-lake milfoil treatment (Reward) Wall Lake APMP developed
2005	0 (end of season)	Channel treatments for native and exotic plant control LARE cost-share funded 6 bump 6 fluridone treatment and plant plan updated
2006	5	5 acres of returning milfoil treated (2,4-D) (LARE cost-share) Wall Lake Diagnostic Study Completed.
2007	?	Proposed 10 acre treatment of returning milfoil (2,4-D)

2.0 Watershed and Lake Characteristics

While no major changes have taken place in the Wall Lake watershed some current issues could have implications for the health of Wall Lake and its plant community in the near future. Purple Loosestrife *Lythrum salicaria*, an invasive non-native wetland plant appears to have been relatively recently introduced to Wall Lake. Wetlands that drain to Wall Lake don't appear to have been colonized yet but the lakeshore has. Loosestrife plants appearing on the Wall Lake shoreline will undoubtedly spread to these wetland areas if steps are not taken to implement control. Purple loosestrife has the potential to affect wetland plant communities by displacing native plants, diminishing diversity, and degrading the filter function that these wetlands provide for lake-bound watershed runoff. Informing lake residents of the proper way to remove plants from their property can help, but supplementing this with a lakewide treatment program could prove very cost effective if implemented soon. A large confined feeding livestock facility may also be established to the southeast of Wall Lake. While this facility will be located outside the Wall Lake watershed, land applications of waste products could take place on agricultural lands that drain to Wall Lake. Residents should maintain a pro-active stance with regard to working with area farmers, IDEM, and USDA officials to see that best management practices are used in the watershed. Wall Lake residents are currently working toward the placement of the lake's homes on a centralized wastewater collection system. This could be a positive step toward maintaining the lakes water quality and plant community over the long-term. With a diagnostic study in place (Aquatic Enhancement, 2006) the Wall Lake Fisherman's Association should follow up on study recommendations to help protect the lake's water quality which is closely linked to the health of the aquatic plant community.

3.0 Lake Uses

There have been no significant changes in the current year.

See: *Aquatic Plant Management Plan, Wall Lake, Lagrange County, Indiana* (Aquatic Enhancement & Survey, Inc. 2005)

4.0 Fisheries

The Wall Lake residents have recently initiated a Walleye stocking program. Maintaining a healthy and diverse aquatic plant community could help in maximizing the success of this program. The Wall Lake Fisherman's Association should stay aware, however, that the new fishery could attract additional fisherman to the lake, increasing the odds of exotic plant species introductions to the lake via boat-trailers. This is important now that the establishment of Hydrilla, yet another invasive plant, has been confirmed in Indiana. Water from fish stocking trucks should also be screened carefully for plant fragments, especially if the fish are transported from the Southern United States.

5.0 Problem Statement

There have been no significant changes in the current year.

See: *Aquatic Plant Management Plan, Wall Lake, Lagrange County, Indiana* (Aquatic Enhancement & Survey, Inc. 2005)

6.0 Vegetation Management Goals and Objectives

There have been no significant changes in the current year.

See: *Aquatic Plant Management Plan, Wall Lake, Lagrange County, Indiana* (Aquatic Enhancement & Survey, Inc. 2005)

7.0 Plant Management History, 2006 Season Management Actions

With Wall Lake's milfoil population struggling to recover from a whole-lake treatment in 2005, the 2006 season control was a matter of prioritizing the areas where the milfoil is doing best as targets for treatment. Scattered stunted plants were present over many acres but the plants just to the west of the lake's large peninsula seemed to be doing well so they were targeted for treatment. (See figure 1) An approximately one acre area near the south shore of the lake has always been a hotspot for milfoil growth and contained healthy plants so it was also targeted and treated. The areas near the launch and in the lake's southeast channel system were treated because healthy milfoil plants were noted to be present there at the end of the 2005 season (after the whole lake treatment).

5/20,24/06 Wall Lake
 Eurasian milfoil Treatment
 Map, 5 acres total

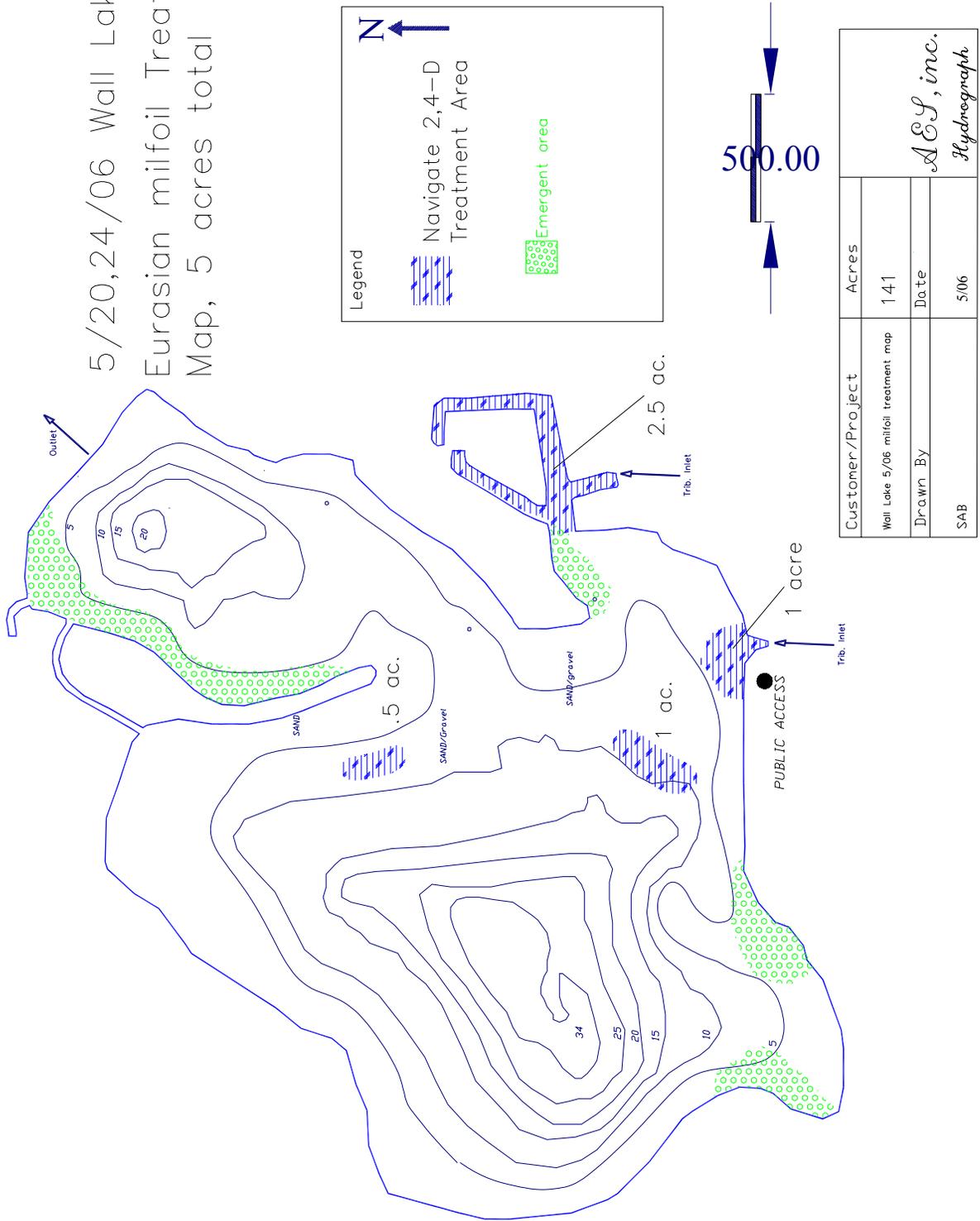


Figure 1 2006 2, 4-D granular treatment map

Customer/Project	Acres
Wall Lake 5/06 milfoil treatment map	141
Drawn By	Date
SAB	5/06
<i>AEI, inc.</i> <i>Hydrographer</i>	

8.0 Aquatic Plant Community Characterization

8.1 Methods

Plant sampling in 2006 included Tier I surveys on 5/20, 24/06 and 8/8/06 utilizing the same sampling protocol as in the original Plant Management Plan. For details see: *Aquatic Plant Management Plan, Wall Lake, Lagrange County, Indiana* (Aquatic Enhancement & Survey, Inc. 2005) A single Tier II survey was performed on 8/8/06. The tier II protocol was modified over the original protocol used in the Plant Management Plan by redesignating rake-toss sampling effort according to lake trophic status (oligotrophic for Wall Lake) combined with lake size (141 acres) rather than lake size alone. In addition, sampling was performed in a depth-stratified manner with a specified number of samples collected in depth contour categories according to the table below. This method over-estimated the depth of 2006 season plant growth slightly. Plants were found growing to a depth of 18.5 feet in 2006.

Lake Acres	Total # of Sites	Hypereutrophic		Eutrophic			Mesotrophic				Oligotrophic				
		0-5 foot contour	5-10 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	15-20 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	15-20 foot contour	20-25 foot contour
<10	20	10	10	10	7	3	10	5	3	2	10	4	3	2	1
10-49	30	20	10	10	10	10	10	10	7	3	10	10	5	3	2
50-99	40	30	10	17	13	10	10	10	10	10	10	10	10	7	3
100-199	50	40	10	23	17	10	14	14	12	10	10	10	10	10	10
200-299	60	50	10	30	20	10	18	16	16	10	14	12	12	12	10
300-399	70	60	10	37	23	10	22	20	18	10	17	15	14	14	10
400-499	80	70	10	43	27	10	25	23	22	10	19	18	17	16	10
500-799	90	80	10	50	30	10	29	27	24	10	22	21	19	18	10
>=800	100	90	10	57	33	10	33	31	26	10	25	23	22	20	10

Table 3 Tier II Sample size requirements as determined by lake size, trophic state, and apportioned by depth class (source IDNR)

8.2 Results

8.2.1 Tier I

During the May 20 Tier I survey various areas of Wall Lake's littoral zone were designated as 21 separate plantbeds (See figure 2) based on their relative homogeneity of biological and physical characteristics. These same plantbed boundaries were also utilized in a second Tier I survey in August. Substrate, size, and abundance data for the two surveys is located in tables four and five below. A short description of each plantbed follows.

Plantbed 1- Plantbed one is 25.53 acres in size with a silt-with-sand bottom. Eight plant species were noted in this plantbed during the August survey.

Plantbed 2- Plantbed two is 4.68 acres in size with a sandy substrate. Seven submersed species were noted in this plantbed during the August Tier I survey.

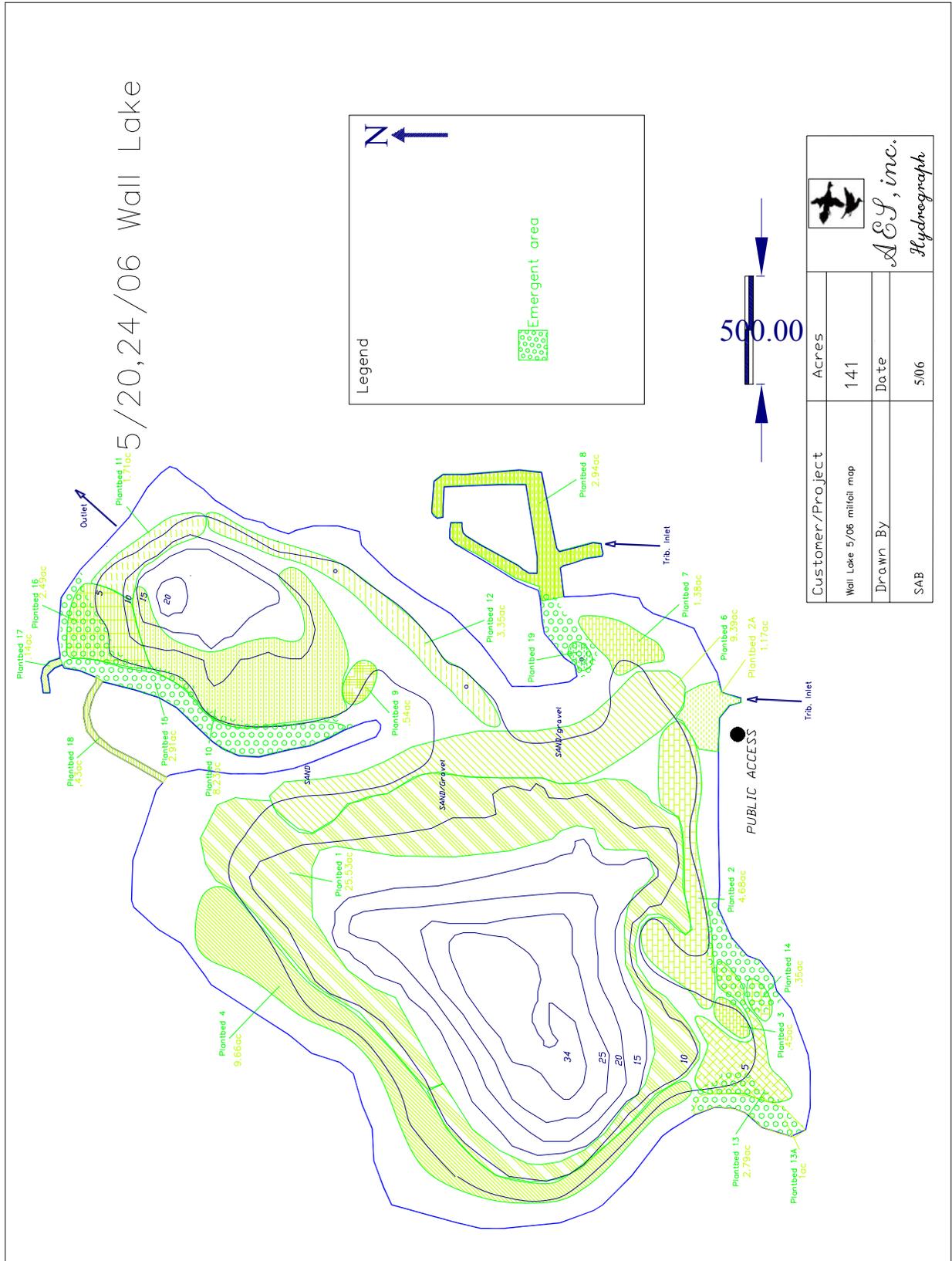


Figure 2 2006 Tier I Plantbeds for Wall Lake

Scores are assigned according to the following table:

Species Abundance or Canopy

1=< 2%

2= 2-20%

3= 21-60%

4=> 60%

Wall 5/20,24/06 Tier I sampling results: (submersed plants)

Abundances

Plantbed	CODE	1	1 A	2	2 A	3	4	6	7	8	9	1 0	1 1	1 2	1 3	1 3 A	1 4	1 5	1 6	1 7	1 8	1 9	
Size (Acres)																							
Substrate		2	2	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Marl Present?						1	1										1						
High Organic in Sediments?										1					1	1						1	
S Canopy																							
N Canopy																							
F Canopy																							
E Canopy					1	1				2					1	3		2	2	2	3	3	
Plant Species																							
Illinois pondweed <i>Potamogeton illinoensis</i>	POIL	2		2			2	2	2		2	2	2	2	2	1	2	2	2				
• Curly-leaf pondweed <i>Potamogeton crispus</i>	POCR	3		2					3	2		3	2	2	2			2	1	3	3	2	
Sago pondweed <i>Stuckenia pectinata</i>	POPE	2		1	2		2		2	1		2	2		2					2	2		
Flatstem pondweed <i>Potamogeton zosteriformus</i>	POZO	2		2			2		2	2	2				2		1		2	2	2	2	
Coontail <i>Ceratophyllum echinatum</i>	CEDE																						
Variable pondweed <i>Potamogeton gramineus</i>	POGR			2		2	2	2	2				2	2		2			2				
Chara <i>Chara sp.</i>	CH	2	2	3	3	4	3	3	3	3	2	2		3	2		4	2	3		2	2	
Large-leaved pondweed <i>Potamogeton amplifolius</i>	POAM	2					2	2	2	2	2	2	2	2	2			3	2	2			2
Eelgrass/Tapegrass <i>Vallisneria americana</i>	VAAM	1																					
Great bladderwort <i>Utricularia vulgaris</i>	UTMA																						
Slender naiad <i>Najas flexilis</i>	NAFL																						
• Eurasian watermilfoil <i>Myriophyllum spicatum</i>	MYSP	2		1	3					2		2									1		
Algae	ALG	1			2					3											2	2	2
Elodea <i>Elodea canadensis</i>	ELCA				2					2													
Small pondweed <i>Potamogeton pusillus</i>	POPU																				1	1	
Spiny naiad <i>Najas marina</i>	NAMA																						

Table 4 May Tier I data for Wall Lake

- Non-native

Scores are assigned according to the following table:

Species Abundance or Canopy

1=< 2%

2= 2-20%

3= 21-60%

4=> 60%

Tier I sampling results: (submersed plants)

Abundances

Plantbed	CODE	1	2	2 A	3	4	6	7	8	9	1 0	1 1	1 2	1 3	13 A	1 4	1 5	1 6	1 7	1 8	1 9
Size (Acres)																					
Substrate		2	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Marl Present?					1	1										1		1			1
High Organic in Sediments?									1					1	1		1	1	1	1	1
S Canopy					1		1		1				1	1			1	1	1		
N Canopy									1												
F Canopy																					
E Canopy			1	1	1	3			3		1		1	4		4	3	3	4	4	
Plant Species																					
Chara <i>Chara sp.</i>	CH	3	3	2	4	4	4	4	3	4	1	4	3	3	1	4	2	3		3	2
Illinois pondweed <i>Potamogeton illinoensis</i>	POIL	3	3	3		2	3		2		3	3	3	2	1		1	3	3	2	
• Curly-leaf pondweed <i>Potamogeton crispus</i>	POCR			1																1	
• Eurasian watermilfoil <i>Myriophyllum spicatum</i>	MYSP	1		1					1		2		1	1					3	1	
Variable pondweed <i>Potamogeton gramineus</i>	POGR	3	3	2	3	3	3	3	2	3	1	3	3	3	1	3	3				
Great bladderwort <i>Utricularia vulgaris</i>	UTMA								1												1
Slender naiad <i>Najas flexilis</i>	NAFL								1				1	1	2		2	2	2	1	2
Sago pondweed <i>Stuckenia pectinata</i>	POPE	3	2		1	1	3	2	2	3	2		2		1			2	2	2	
Flatstem pondweed <i>Potamogeton zosteriformus</i>	POZO	2						3	2		3	2	1	1	2						2
Coontail <i>Ceratophyllum echinatum</i>	CEDE			1					1												
Large-leaved pondweed <i>Potamogeton amplifolius</i>	POAM	2	2	2			2	3	2	2	2	1	1	2			1	3	2	1	2
Eelgrass/Tapegrass <i>Vallisneria americana</i>	VAAM	3	2		1	2	3			1	3	3	2	2	2			3			
Water stargrass <i>Heteranthera dubia</i>	HEDU											1						1	3	3	1
Algae	ALG							1	3											1	2
Elodea <i>Elodea canadensis</i>	ELCA			1					1												3
Small pondweed <i>Potamogeton pusillus</i>	POPU								2					1						1	
Spiny naiad <i>Najas marina</i>	NAMA																				
*Heartleaf pondweed <i>Potamogeton pulcher</i> Tuckerm.								1													2
Creeping Bladderwort <i>Utricularia gibba</i> L.	UTGI								3												

Table 5 August 2006 Tier I Data for Wall Lake

- Non-native *State Endangered

Plantbed 2A- Plantbed 2A is 1.17 acres in size with a silt-with-sand bottom. Nine plant species were present in this area during the August survey. This plantbed was included in the treatment in 2006.

Plantbed 3- Plantbed three is .45 acres in size with a silt-with-sand substrate. Organic sediment is present. Four submersed plant species were present in this plantbed during the August survey. Chara dominates the flora.

Plantbed 4- Plantbed four is 9.66 acres in size. The substrate is silt-with-sand. Five submersed species were noted in plantbed four in the August Tier I survey. Chara dominates the flora.

Plantbed 6- Plantbed six is 9.39 acres in size with a sandy substrate. Six species of submersed plant were noted in this plantbed during the August Tier I survey. Chara is dominant.

Plantbed 7- Plantbed seven is 1.38 acres in size with a silt-with-sand substrate. An endangered plant (Heartleaf pondweed) was found here in 2006. A voucher of this plant should be collected in 2007 to confirm identity. Five plant species were present during the August Tier I survey. Chara was dominant.

Plantbed 8- Plantbed eight is a 2.94 acre excavated channel system in the lake's southeast corner. The substrate is silt-with-sand with a high amount of organic material present. Thirteen submersed plant species and algae were present during the August Tier I survey. This entire plantbed was treated for milfoil in 2006.

Plantbed 9- Plantbed nine is .54 acres in size with a silt-with-sand substrate. Five submersed plant species were noted in this plantbed during the August Tier I survey. Chara was dominant.

Plantbed 10- Plantbed 10 is 8.23 acres in size with a silt-with-sand substrate. Eight submersed plant species were present in plantbed 10 during the August Tier I survey.

Plantbed 11- Plantbed 11 is 1.71 acres in size with a silt-with-sand bottom. Seven species of submersed plant were present in Plantbed 11 during the August Tier I survey. Chara is dominant.

Plantbed 12- Plantbed 12 is 3.35 acres in size with a silt-with-sand substrate. Nine species of submersed aquatic plant were present in this plantbed during the August Tier I survey.

Plantbed 13- Plantbed 13 is 2.79 acres in size with a silt-with-sand substrate. A high amount of organic sediment is present. Nine species of submersed aquatic plant were present in this plantbed during the August Tier I survey.

Plantbed 13A- Plantbed 13A is a one acre emergent plantbed with a silt-with-sand bottom. A high amount of organic sediment is present. Seven species of submersed aquatic plant were present in bed 13 A during the August Tier I survey.

Plantbed 14- Plantbed 14 is .35 acres in size with a silt-with-sand substrate. Marl is also present in this area. Two species of submersed aquatic plant were noted in this area during the August Tier I survey. Chara was dominant.

Plantbed 15- Plantbed 15 is a 2.91 acre emergent plantbed with a silt-with-sand bottom. Five species of submersed plant were noted in this plantbed during the August Tier I survey.

Plantbed 16- Plantbed 16 is 2.49 acres in size with a silt-with-sand bottom. Both marl and organic sediments are present. Seven species of submersed aquatic plant were noted in this plantbed in the August Tier I survey.

Plantbed 17- Plantbed 17 is a short excavated channel. It is .14 acres in size. Eight species of submersed aquatic plant were present in plantbed 17 during the August Tier I survey.

Plantbed 18- Plantbed 18 is a long narrow excavated channel. It is .43 acres in size. Ten species of submersed aquatic plant were present in this plantbed during the August Tier I survey.

Plantbed 19- Plantbed 19 is a .24 acres in size with a silt-with-sand bottom. Marl and organic matter are present. Six species of submersed aquatic plant were present in this plantbed during the August Tier I survey including Heartleaf pondweed.

Descriptor	Post-Treatment (Reward) 8/30/04	Pre-treatment 5/23/05	Post-Treatment (Sonar) 8/29/05	Post-Treatment (5 acres 2,4-D) *New Protocol 8/29/06	range for 21 other Indiana lakes	mean for 21 other Indiana lakes
# Sampling sites	60	64	61	50		
Total number of species	14	11	10	10	1 to 17	8
Total number of native species	11	10	9	8	1 to 16	7
Mean number of species per site	2.82	1.64	2.11	1.42	.38 to 2.66	1.61
Species diversity index (SDI), 0-1 scale,	.86	0.79	0.80	.82	0.0 to .91	0.66
Aquatic Vegetation % Frequency of Occurrence	100	100	100	68		
Mean rake density	4.1	3.125	3.44	n/d	1.8 to 4.7	3.3

Table 6 Tier II Plant Community Data for Wall Lake

8.2.2 Tier II

Tier II plant sampling was performed on August 8th, 2006. Rake tosses were performed at 50 random stratified sampling sites per INDR Tier II Protocol. (IDNR 2006) Sampling site coordinates were recorded on a WAAS enabled hand-held GPS unit, converted to Autocad® coordinates, and mapped on a contour map of Wall Lake. (Figure 3) Statistical plant community descriptors for four Tier II surveys performed on Wall Lake in 2004, 2005 and 2006 are listed in the table above. (Table 6) These descriptors were based on the descriptor set from (Pearson 2004). For comparison, the range and mean of descriptors from a set of 21 other Indiana lakes (Pearson 2004) are listed in the table. Maps showing rake scores and collection locations for the three most abundant species; Chara, Flatstem pondweed, and Sago pondweed are provided (figures 3, 4, and 5, respectively). A Eurasian watermilfoil map is also provided. (Figure 7)

Wall Lake Tier II Plant
Survey Sampling points
8/06

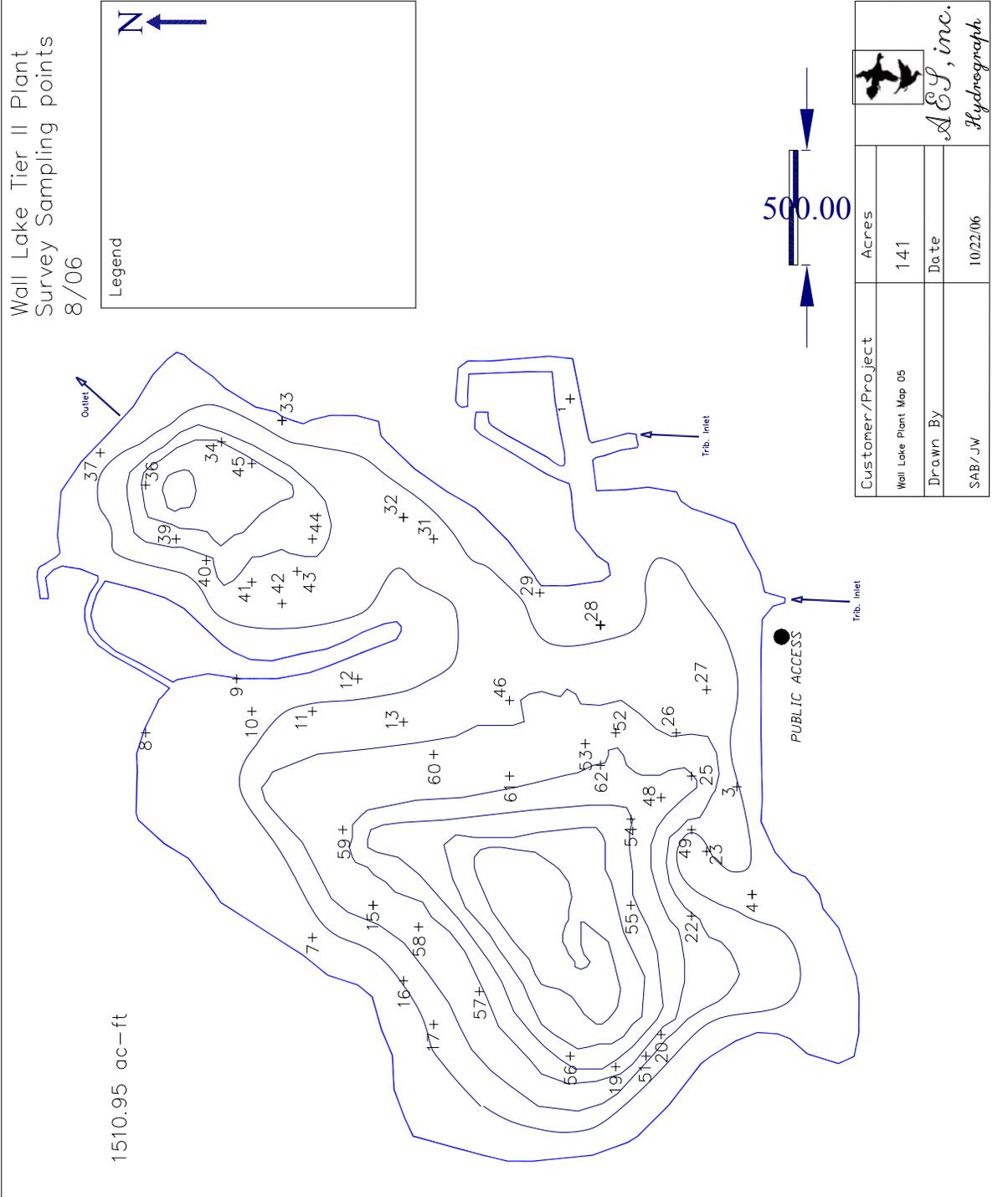


Figure 3 Tier II Sampling Points 2006

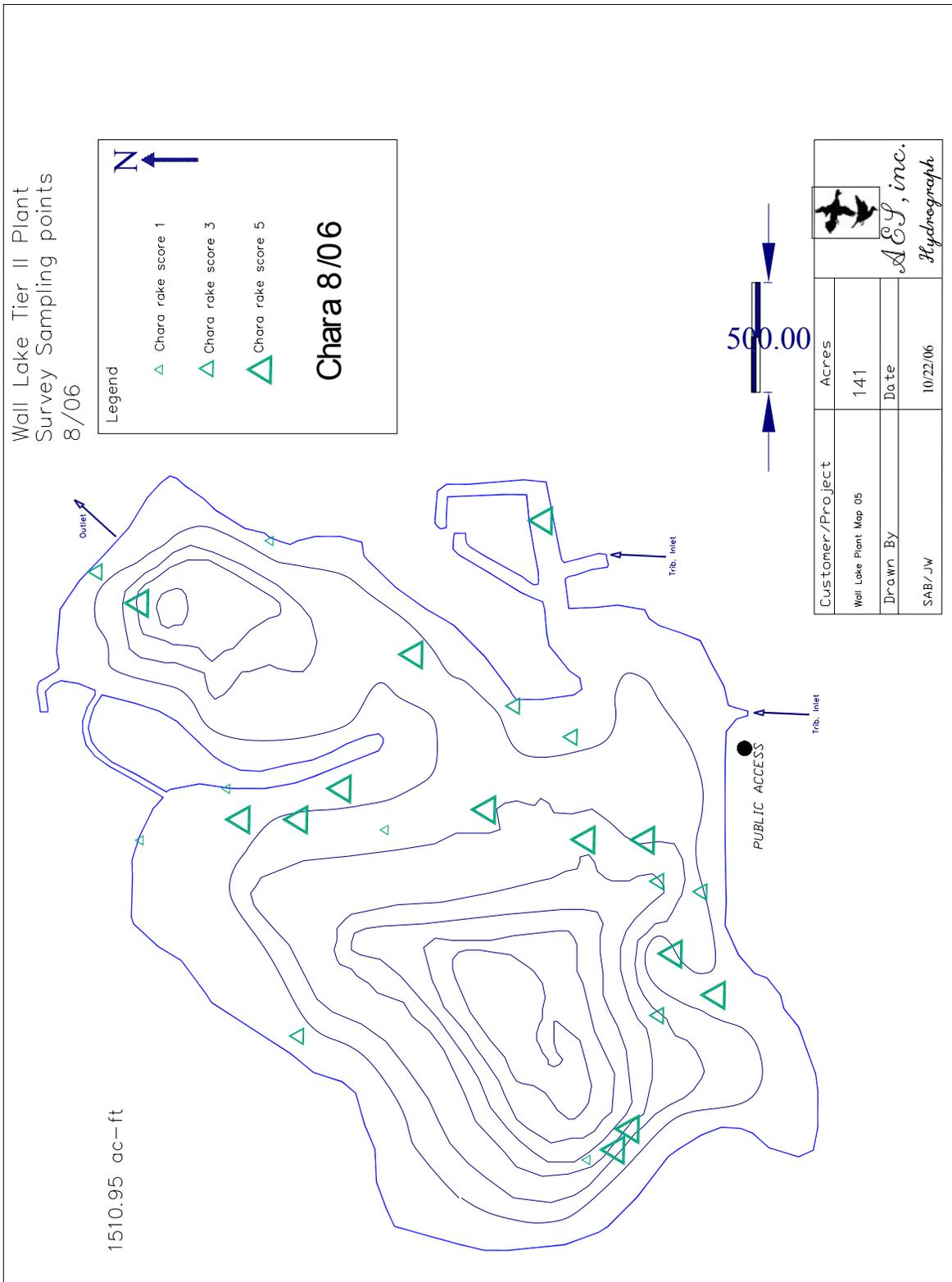


Figure 4 Tier II Chara map for Wall Lake 8/06

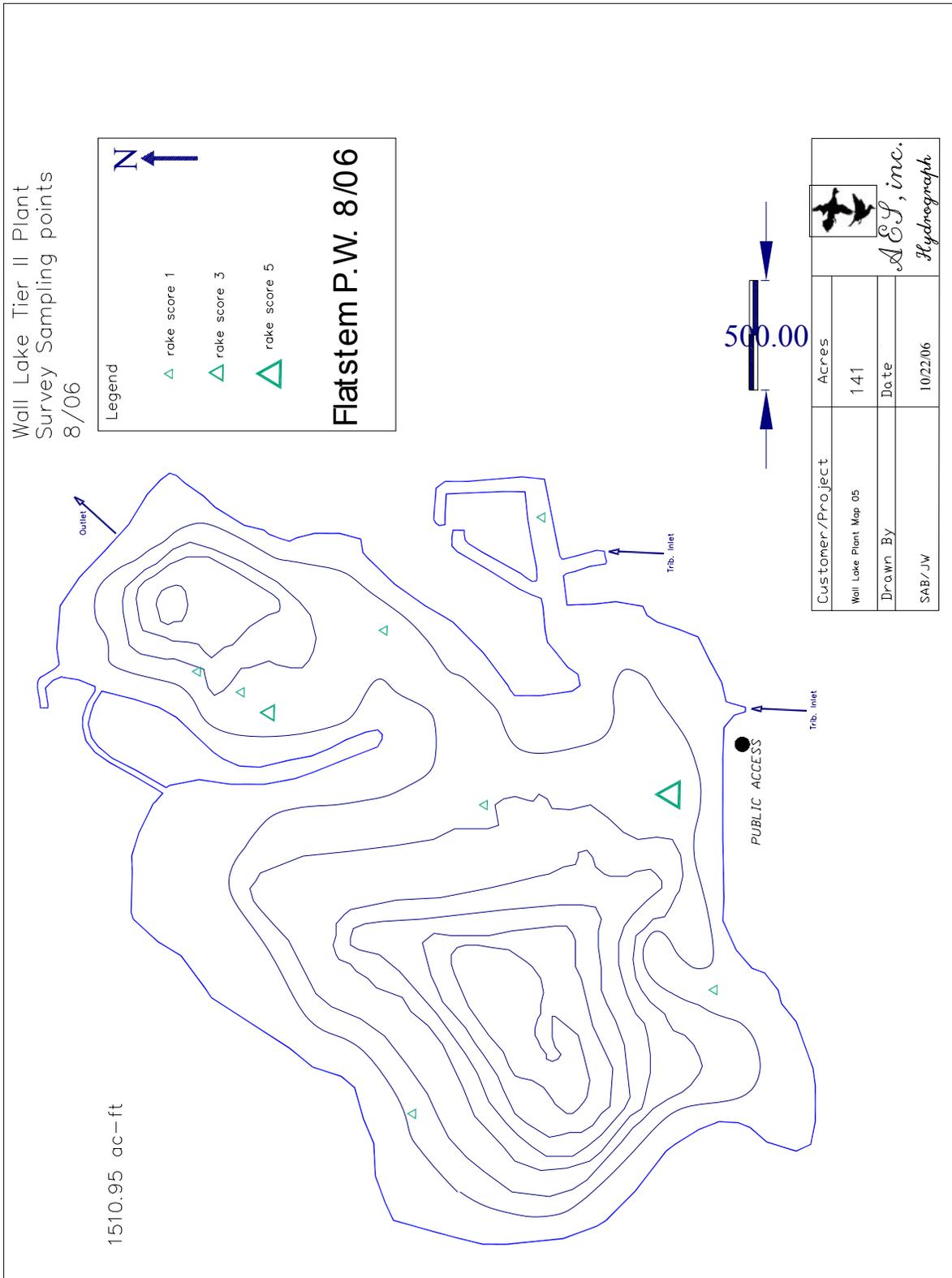


Figure 5 Tier II Flatstem P.W. Map for Wall Lake 8/06

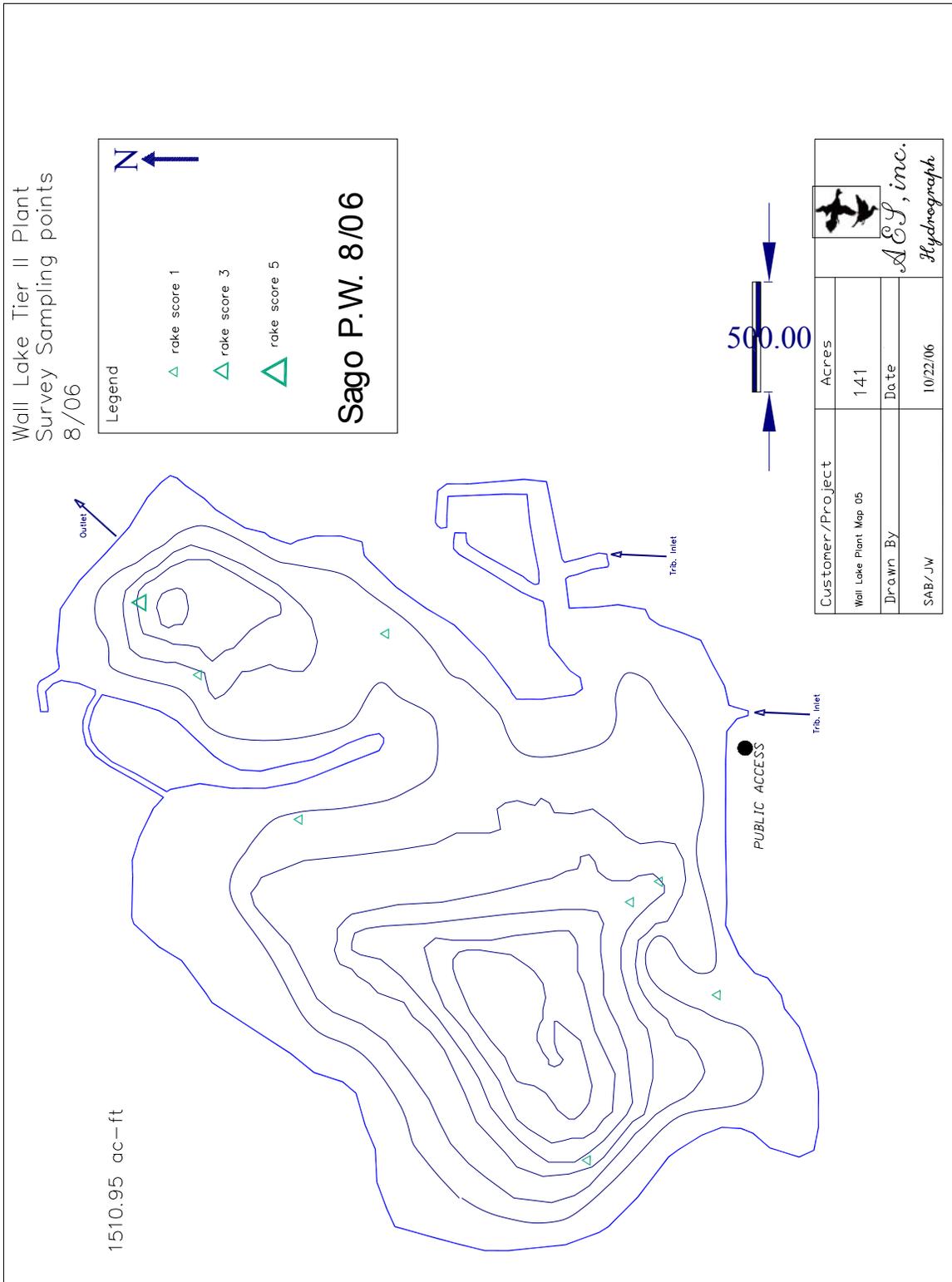


Figure 6 Tier II Sago P.W. map for Wall Lake 8/06

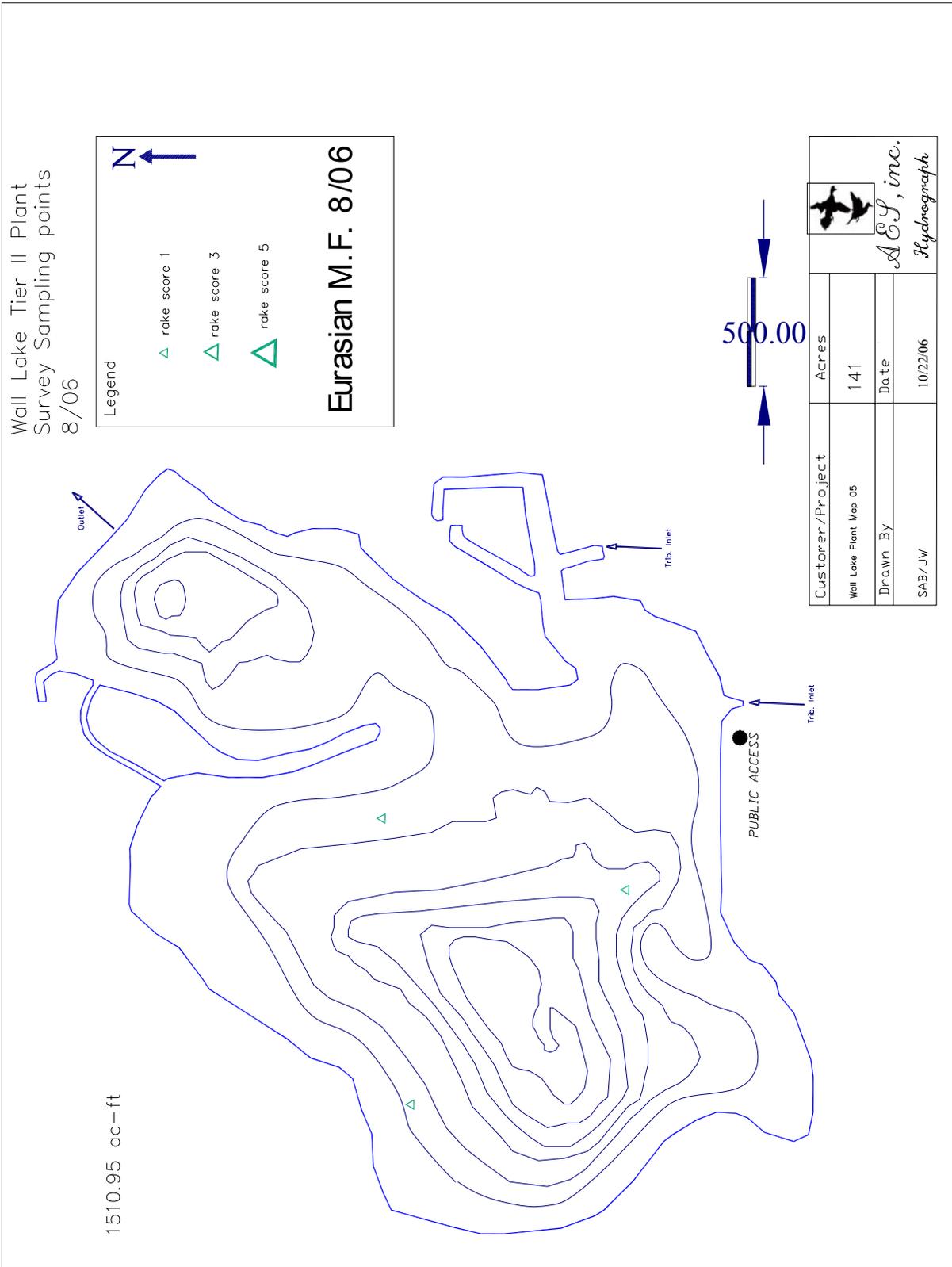


Figure 7 Tier II Eurasian watermilfoil map for Wall Lake 8/06

8.3 Macrophyte Inventory Discussion

Wall Lake displayed above average diversity compared to the set of 21 Indiana Lakes. Ten species were collected compared to an average of 8 for 21 Indiana Lakes. The mean number of species per site however was below average. Wall Lake appears to have declined slightly in diversity since 2004 but comparison of the most recent data is complicated slightly by the new sampling protocol implemented in 2006. A higher number of rake tosses in deep water where few or no plants are present was required which probably deflated some of the descriptors. Overall the plant community appears to be healthy and display good diversity. Chara was the most abundant plant being recovered at 50 percent of sampling sites. (Table 7) Native pondweed species ranked number two, three, and four and also tied for 5th place with Vallisneria showing solid dominance by beneficial species. No voucher specimens were collected in the 2006 season. Heartleaf pondweed *Potamogeton pulcher* was added to the Wall Lake species list. Since this plant has a “state endangered” status, collection, positive identification and preservation of a specimen should be completed as a part of the 2007 season management activities. Eurasian watermilfoil occurred at only six percent of sites, but was recovered at a relatively low mean density (1). It is likely that the occurrence of Eurasian milfoil will exceed 10 percent of sampling sites in 2007 as colonization returns. A realistic goal in the post treatment period for the occurrence of would be to use treatment to limit the occurrence to 15 percent of sampling sites or less. The set of tables and charts below displays plant community data since 2004 to demonstrate changes over time. Tables and charts are also presented to show the composition of the lake’s plant community at various depth contours.

Species Codes		occurrence (# of sites)	% of sites	mean density	relative density
CH,	Chara	25	50.00%	3.6	1.82
MYSP	Eurasian watermilfoil	3	6.00%	1	0.06
CLPW	Curlyleaf pondweed	2	4.00%	0.1	0.04
POIL	Illinois pondweed	7	14.00%	2.1	0.3
VAAM	Vallisneria	4	8.00%	1	0.08
NAFL	Slender naiad (common naiad)	3	6.00%	1	0.06
POZO	Flatstem pondweed	9	18.00%	1.7	0.3
POPE	Sago pondweed	8	16.00%	1.3	0.2
POGR	Variable pondweed	6	12.00%	1.3	0.16
POAM	Largeleaf pondweed	4	8.00%	2.5	0.2

Table 7 Species specific Tier II Data for Wall Lake 8/06

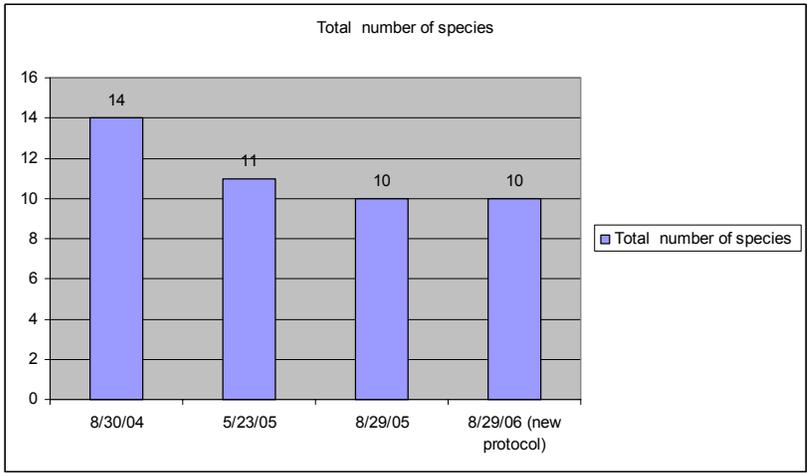


Figure 8 Total number of plant species 2004-2006

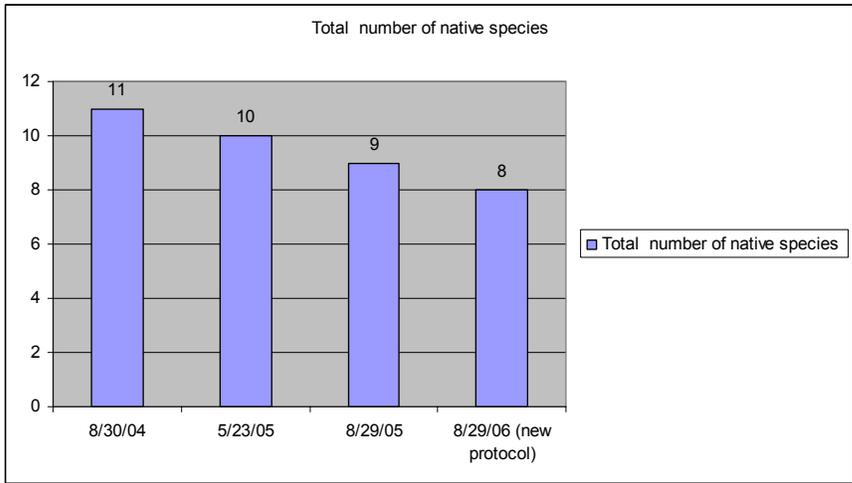


Figure 9 Total number of native species 2004-2006

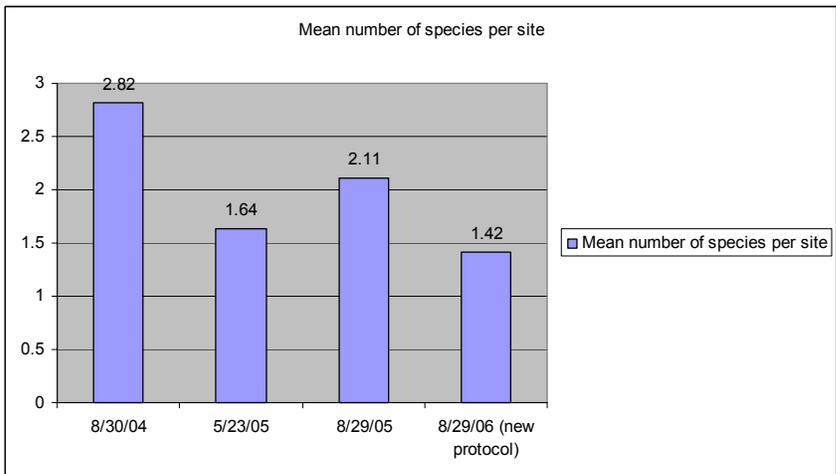


Figure 10 Mean number of species per site 2004-2006

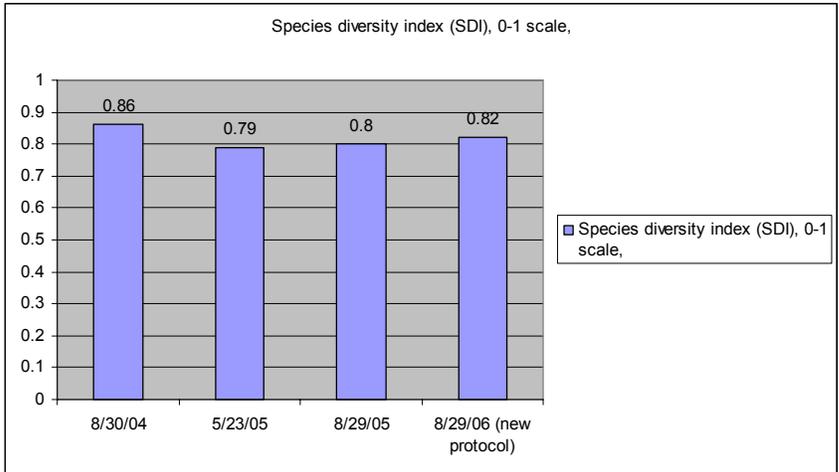


Figure 11 Species diversity index 2004-2006

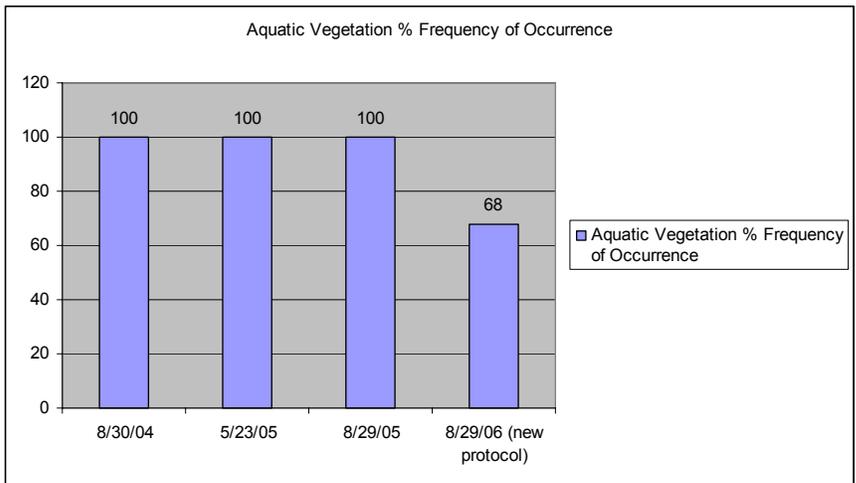


Figure 12 Aquatic vegetation % frequency of occurrence 2004-2006

Wall Lake 8/8,15/06

Depth Contour
All

for comparison with 21 other
Northern Indiana Lakes (Pearson 04)
(submersed species only, fil. algae excluded)

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of Occurrence

50
10
8
1.42
0.82
68.00

Table 8 Wall Lake plant descriptors for all depths, 2006

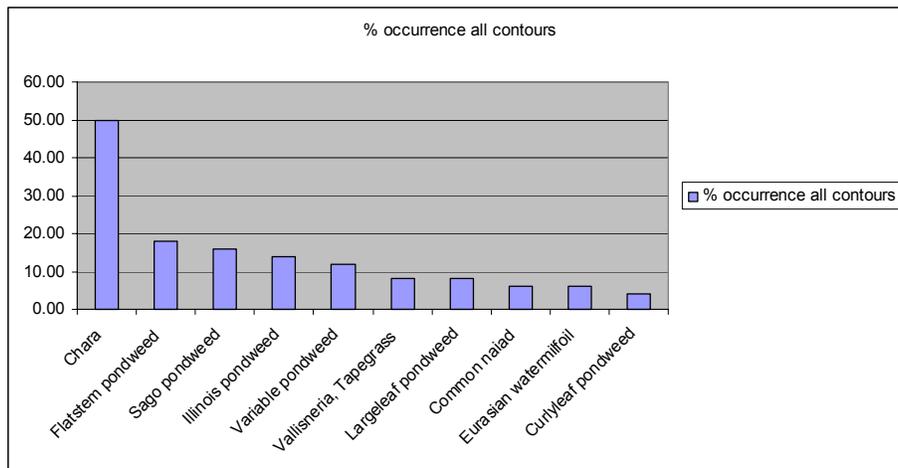


Figure 13 Wall Lake species occurrence at all depths, 2006

Depth Contour (ft)

All

Common Name(s)	# sites	% occurrence all contours	mean density	relative density
Chara	25	50.00	3.64	1.82
Flatstem pondweed	9	18.00	1.67	0.30
Sago pondweed	8	16.00	1.25	0.20
Illinois pondweed	7	14.00	2.14	0.30
Variable pondweed	6	12.00	1.33	0.16
Vallisneria, Tapegrass	4	8.00	1.00	0.08
Largeleaf pondweed	4	8.00	2.50	0.20
Common naiad	3	6.00	1.00	0.06
Eurasian watermilfoil	3	6.00	1.00	0.06
Curlyleaf pondweed	2	4.00	1.00	0.04

Table 9 Wall Lake species descriptors for all depths, 2006

Wall Lake 8/8,15/06

Depth Contour

for comparison with 21 other
Northern Indiana Lakes (Pearson 04)
(submersed species only, fil. algae excluded)

0-5.9

Descriptor

Sampling sites

10

Total number of species

8

Total number of native species

8

Mean number of species per site

2.50

Species diversity index (SDI), 0-1 scale,

0.78

Aquatic Vegetation % Frequency of
Occurrence

100.00

Table 10 Wall Lake descriptors for 0-5.9 feet, 2006

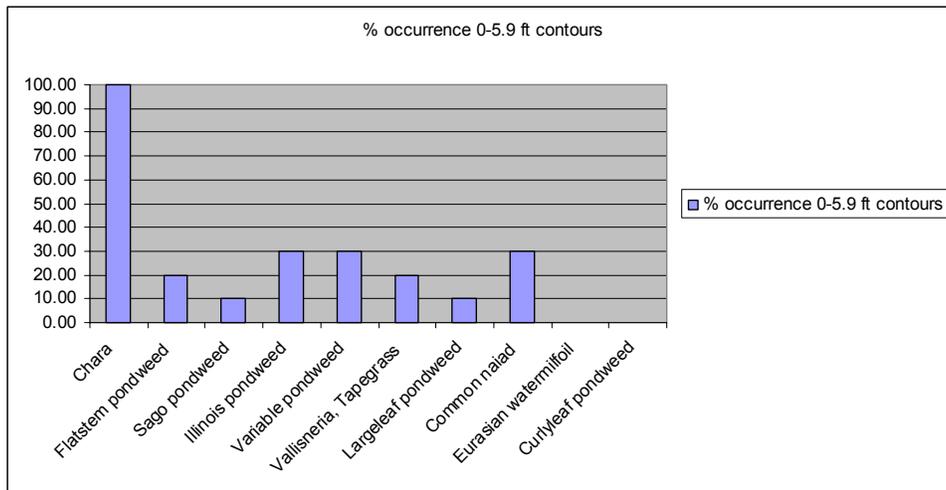


Figure 14 Wall Lake species occurrence for 0-5.9 feet, 2006

Depth Contour (ft) 0-5.9

Common Name(s)	# sites	% occurrence 0-5.9 ft contours	mean density	relative density
Chara	10	100.00	2.80	2.80
Flatstem pondweed	2	20.00	1.00	0.20
Sago pondweed	1	10.00	1.00	0.10
Illinois pondweed	3	30.00	1.00	0.30
Variable pondweed	3	30.00	1.00	0.30
Vallisneria, Tapegrass	2	20.00	1.00	0.20
Largeleaf pondweed	1	10.00	3.00	0.30
Common naiad	3	30.00	1.00	0.30
Eurasian watermilfoil	0	0.00	#DIV/0!	0.00
Curlyleaf pondweed	0	0.00	#DIV/0!	0.00

Figure 15 Wall Lake species descriptors for 0-5.9 feet, 2006

Wall Lake 8/8,15/06

Depth Contour

for comparison with 21 other
Northern Indiana Lakes (Pearson 04)
(submersed species only, fil. algae excluded)

6-10.9

Descriptor

Sampling sites

10

Total number of species

8

Total number of native species

7

Mean number of species per site

2.10

Species diversity index (SDI), 0-1 scale,

0.82

Aquatic Vegetation % Frequency of Occurrence

100.00

Table 11 Wall Lake descriptors for 6-10.9 feet, 2006

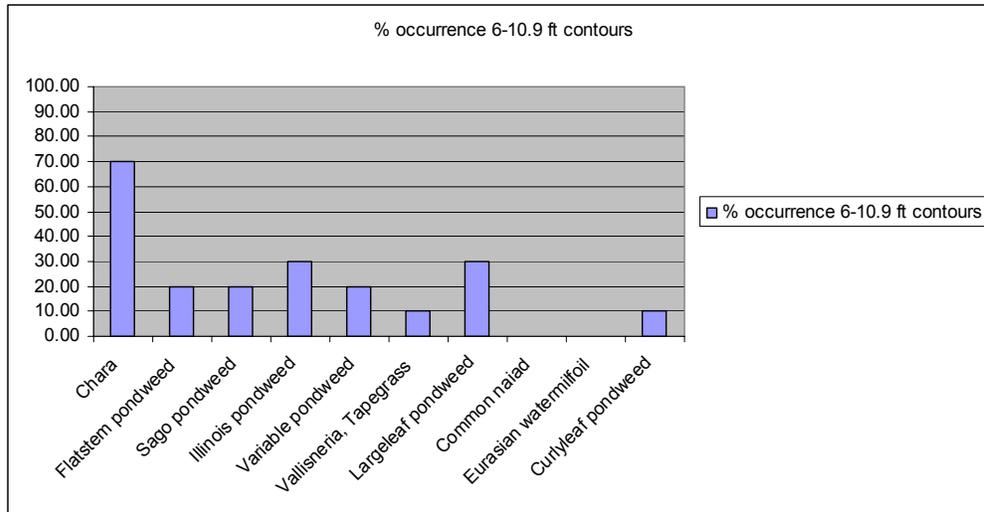


Figure 16 Wall Lake species occurrence for 6-10.9 feet, 2006

Depth Contour (ft) 6-10.9

Common Name(s)	# sites	% occurrence	mean density	relative density
Chara	7	70.00	5.00	3.50
Flatstem pondweed	2	20.00	4.00	0.80
Sago pondweed	2	20.00	2.00	0.40
Illinois pondweed	3	30.00	3.67	1.10
Variable pondweed	2	20.00	1.00	0.20
Vallisneria, Tapegrass	1	10.00	1.00	0.10
Largeleaf pondweed	3	30.00	2.33	0.70
Common naiad	0	0.00	#DIV/0!	0.00
Eurasian watermilfoil	0	0.00	#DIV/0!	0.00
Curlyleaf pondweed	1	10.00	1.00	0.10

Table 12 Wall Lake species descriptors for 6-10.9 feet, 2006

Wall Lake 8/8,15/06

Depth Contour

for comparison with 21 other
Northern Indiana Lakes (Pearson 04)
(submersed species only, fil. algae excluded)

11-15.9

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of Occurrence

10
8
6
1.70
0.82
90.00

Table 13 Wall Lake descriptors for 11-15.9 feet, 2006

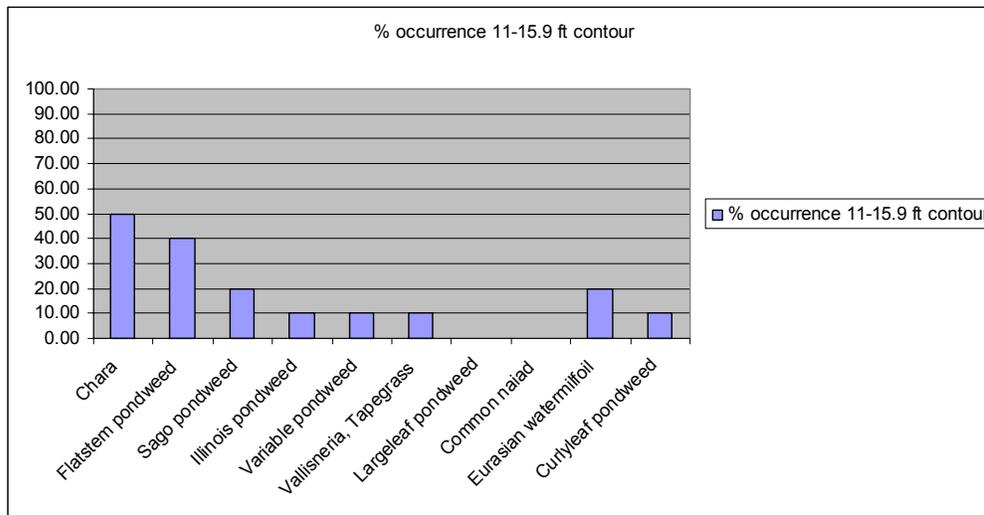


Figure 17 Wall Lake species occurrence for 11-15.9 feet, 2006

Depth Contour (ft) 11-15.9

Common Name(s)	# sites	% occurrence	mean density	relative density
Chara	5	50.00	3.80	1.90
Flatstem pondweed	4	40.00	1.00	0.40
Sago pondweed	2	20.00	1.00	0.20
Illinois pondweed	1	10.00	1.00	0.10
Variable pondweed	1	10.00	3.00	0.30
Vallisneria, Tapegrass	1	10.00	1.00	0.10
Largeleaf pondweed	0	0.00	#DIV/0!	0.00
Common naiad	0	0.00	#DIV/0!	0.00
Eurasian watermilfoil	2	20.00	1.00	0.20
Curlyleaf pondweed	1	10.00	1.00	0.10

Table 14 Wall Lake species descriptors for 11-15.9 feet, 2006

Wall Lake 8/8,15/06

Depth Contour
16-20.9

for comparison with 21 other
Northern Indiana Lakes (Pearson 04)
(submersed species only, fil. algae excluded)

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of Occurrence

10
4
3
0.80
0.69
50.00

Table 15 Wall Lake descriptors for 16-20.9 feet, 2006

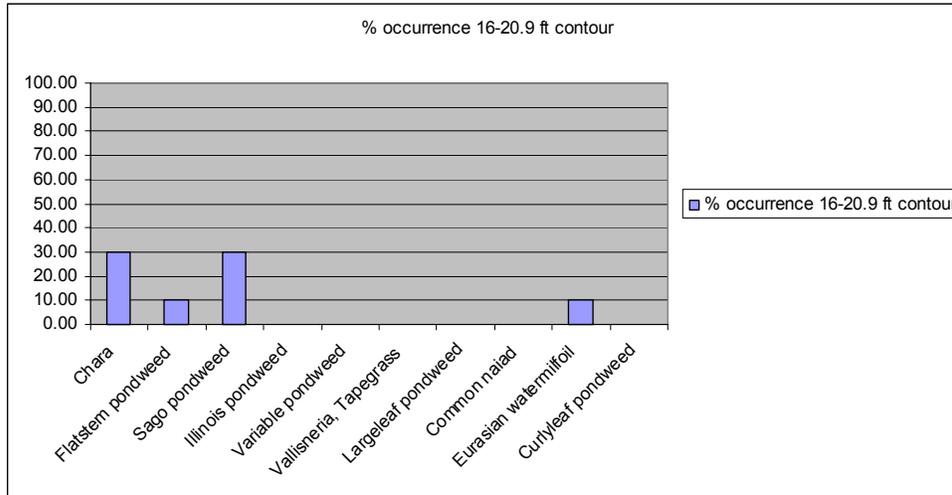


Figure 18 Wall Lake species occurrence for 16-20.9 feet, 2006

Depth Contour (ft) 16-20.9

Common Name(s)	# sites	% occurrence	mean density	relative density
Chara	3	30.00	3.00	0.90
Flatstem pondweed	1	10.00	1.00	0.10
Sago pondweed	3	30.00	1.00	0.30
Illinois pondweed	0	0.00	#DIV/0!	0.00
Variable pondweed	0	0.00	#DIV/0!	0.00
Vallisneria, Tapegrass	0	0.00	#DIV/0!	0.00
Largeleaf pondweed	0	0.00	#DIV/0!	0.00
Common naiad	0	0.00	#DIV/0!	0.00
Eurasian watermilfoil	1	10.00	1.00	0.10
Curlyleaf pondweed	0	0.00	#DIV/0!	0.00

Table 16 Wall Lake species descriptors for 16-20.9 feet, 2006

9.0 Aquatic Vegetation Management Alternatives

Continued treatment of returning Eurasian watermilfoil is recommended to spare the Wall Lake Plant community from the inevitable return of Eurasian watermilfoil dominance. New alternative selective herbicides may be released to the market in the near future and prove useful/efficacious in allowing a change in tactics in future seasons. Eventually another whole-lake type treatment may be a good option for Wall Lake. It is estimated that treatment of ten acres for Eurasian watermilfoil will be warranted in 2007. A program of ultra early (pre-turion) control for Curlyleaf pondweed is also advisable and will be a recommendation of this update.

10.0 Public Involvement

A public meeting for Wall Lake's plant management was incorporated into a regular association meeting during the summer of 2006. Approximately 40 people were in attendance. Information was presented by Aquatic Enhancement & Survey, Inc. A discussion was held about the status and goals of the Wall Lake Plant Management Plan and opportunity was provided for lake residents to ask questions and provide input regarding the plant management and water-use restrictions involved. The Lake Use Survey below (fig. 19) was distributed to those present, filled out, and collected. Thirty-three surveys were returned. Results are tabulated in table 17 below. Thirty respondents indicated that they were lake property owners, two indicated they were not. Thirty one respondents were association members, one indicated they were not. When asked how long they had been at the lake most respondents indicated they were long-time lake residents. Two respondents indicated two years or less, three indicated two to five years, six had been at the lake five to ten years, and eighteen had been at the lake over ten years. When asked to mark ways in which they use the lake 29 respondents marked swimming, 29 marked boating, 28 fishing, and 28 chose viewing wildlife. When asked to write in other lake activities one respondent indicated exercise as an activity. When asked whether Wall Lake contained aquatic plants in nuisance quantities in 2006, 22 respondents indicated it did while eight indicated it did not. Twenty eight respondents indicated that they own or occupy lakeshore property while four indicated they have channel property, and three said they have neither. When asked whether they felt that the level of aquatic vegetation at the lake affects their property value 25 indicated it did, while only three said it did not. Thirty one respondents said they were in favor of continued vegetation control while only one was not. When asked whether they were aware that LARE funds only apply toward the management of exotic plants 26 indicated they were, while seven indicated they were not. Respondents were presented a list of seven common lake problems and asked to mark which apply to Wall Lake. Canada geese were the lead problem as indicated by 24 respondents. Aquatic plants were close behind being marked by 21 of the respondents. Eight indicated that more speed enforcement was needed, four indicated dredging was needed, two marked poor water quality as a concern, and one marked "too much fishing". No respondents indicated that a lack of aquatic plants was a problem. One resident commented that sewers were needed around the lake and another thought that more plants along the lakeshore might be helpful. When asked if they had caught any of the walleye stocked by the association

in Wall Lake in 2005 eight indicated that they had while 25 said they had not. Overall the meeting attendants were very interested in continuing efforts to manage exotic plants at the lake and were pleased with plant management results thus far.

Lake User Survey Wall Lake

1. Are you a lake property owner? Yes No
 2. Are you currently a member of your lake association? Yes No
 3. How many years have you been at the lake? (circle one) 2 or less, 2-5 years, 5-10 years, Over 10 years
 4. How do you use the lake (mark all that apply)
 - Swimming
 - Boating
 - Fishing
 - View Wildlife
 - Irrigation (including lawn)
 - Enjoy View and Atmosphere
 Other _____
 5. Do you feel that Wall Lake had Aquatic plants in nuisance quantities in the 2006 season? Yes No
 6. Do you own or occupy property on a _____ channel Lakeshore _____ Neither
 7. Do you feel the level of vegetation in the lake affects your property values? Yes No
 8. Are you in favor of continuing efforts to control vegetation on the lake? Yes No
 9. 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 No
 10. Mark any of these you think are problems on your lake:
 - Too much fishing
 - Canada Geese
 - Dredging needed
 - Too many aquatic plants
 - Not enough aquatic plants
 - Poor water quality
 - Additional Speed enforcement needed
 Other _____
 11. Have you caught any of the Walleye Stocked in Wall Lake? Yes No
- Please add any additional comments on the back:**
- Check here if commenting on the back

Figure 19 2006 Wall Lake User Survey

Lake Property Owner?	Yes	No				
	30	2				
Are you an association member?	Yes	No				
	31	1				
Years at the lake?	2 or less	two to five	five to ten	Over 10		
	2	3	6	18		
How do you use the lake?	Swim	Irrigation	Boating	Fishing	View wildlife	Other
	29	0	29	28	28	Exercise
Dis Wall have nusiance plants in 2006?	Yes	No				
	22	8				
Do you own property on	Channel	Lakeshore	Neither			
	4	28	3			
Does the lake vegetation affect your property value?	Yes	No				
	25	3				
Are you in favor of continued vegetation control?	Yes	No				
	31	1				
Are you aware that LARE funds will only apply to exotics?	Yes	No				
	24	7				
Mark other lake problems			Too much fishing	Canada Geese	Dredging needed	
			1	24	4	
	Too many plants		Not enough plants		Poor water quality	
	21		0		2	
	Need more speed enforcement		Other			
	8		Need sewers			
			More lakeshore plants might be helpful			
Have you caught any of the stocked Walleye?	Yes	No				
	8	25				

Table 17 Wall Lake 2006 Lake user survey results

11.0 Public Education

Residents and users who have attended the Wall Lake Fisherman's Association meetings seem to understand well the potential for recreational and ecological impairment at Wall Lake if Eurasian watermilfoil is allowed to return to its former level of colonization. The outboard choking masses of aquatic plants are still fresh in the minds of Wall Lake residents. The issue of controlling Purple loosestrife and other invasive wetland plants has also been addressed at the meetings and these efforts should continue in 2007. It may be wise to stress the possibility of watercraft introducing new invasive plants to the lake. This will be especially important now that Hydrilla has been found in Indiana. The clear posting of invasive species information at the private access or a basic screening process for launching watercraft may be steps to consider to help protect the lakes healthy diverse plant community.

11.1 Hydrilla and its implications for Wall Lake

Keeping lake residents and users aware of the possibility of bringing new invasive species into Wall Lake on watercraft trailers will be especially important now that Hydrilla has been found in Indiana. Hydrilla *Hydrilla verticillata* is an invasive submersed aquatic plant thought to be native to Africa, Australia, and parts of Asia. As a hearty growing plant Hydrilla was used in aquariums and this led to its introduction into Florida waters in 1960. Since then Hydrilla has spread to become the single most problematic plant in the United States. (See USGS map below) In Florida alone millions are spent in controlling the growth of Hydrilla each year. The potential exists for the same type of damage on

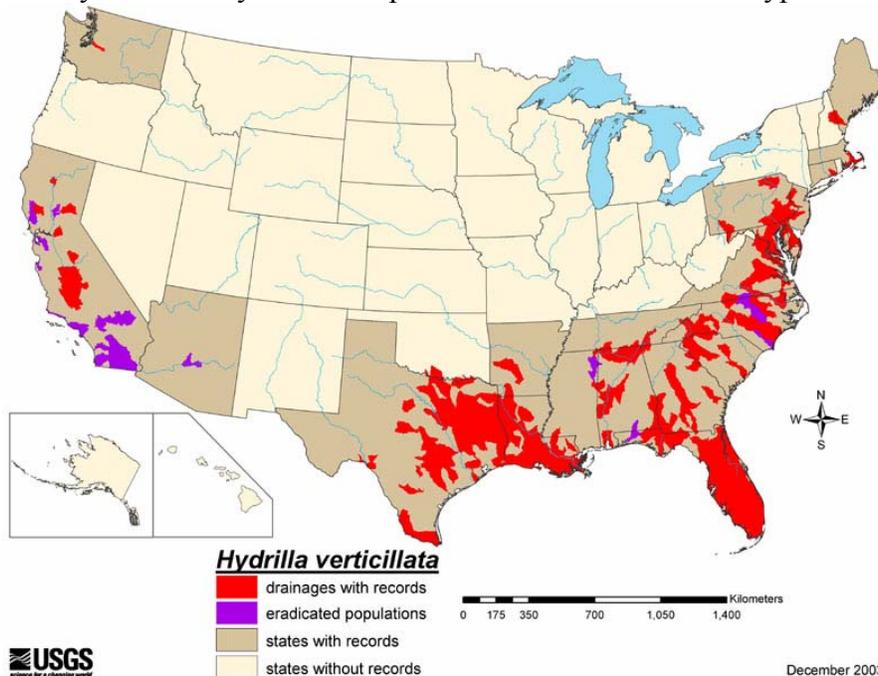


Figure 20 Known occurrences of Hydrilla in the U.S. in 2003. From the USGS website, http://nas.er.usgs.gov/taxgroup/plants/docs/hy_verti.html

Indiana waterways if Hydrilla is allowed to spread. Like many invasive aquatic plants Hydrilla can form dense surface mats depriving native plant communities of light, decreasing plant community diversity and causing serious impairment of recreational activities including fishing, swimming, and boating.



Figure 21 Hydrilla mats clog the surface of Lake Conroe Texas. Photo courtesy of Earl Chilton, Texas Parks and Wildlife Department

Hydrilla can spread by fragmentation, or the production of seeds, tubers (root structures), or turions (seed-like plant buds). Because of the potential for spread through fragmentation, plant material hitching a ride on watercraft trailers is probably a major mechanism of introduction. Tubers and turions can be very hearty, surviving dry periods or herbicide treatments, remaining hidden in the lake bottom for extended periods of time. Because of these characteristics great ecological damage and recreational impairment can occur in watersheds colonized by Hydrilla. In 2006 Hydrilla was discovered in Lake Manitou in Rochester Indiana (Fulton County). This is the first known occurrence of this plant in the Midwest. The Indiana Department of Natural Resources has devised a plan for eradicating and controlling the Hydrilla to prevent spread to other water bodies. Checks of other lakes in close proximity to Lake Manitou have not located any other Hydrilla, so it is possible that the plant is only in Lake Manitou at this time. However, it's also possible that other lakes contain young Hydrilla infestations that have yet to be recognized so it's important that associations and lake residents learn to identify this plant. Acting early in spotting Hydrilla can help prevent spread and ultimately save a huge cost to the ecology and recreational value of Indiana lakes. Other infestations can also undoubtedly occur in the future as a result of plants being transported to Indiana from out-of-state. Whereas many Lagrange County lakes are popular boating and sportfishing destinations there is a definite possibility that this plant could appear in Wall Lake in the future adding to the current invasive plant problems. Information on Hydrilla identification should be presented to the Wall Lake users at meetings as a regular part of the lake resident educational program.



Figure 22 Hydrilla is similar in appearance to the native plant *Elodea canadensis* and also Brazilian elodea, an exotic also recently found in Indiana. It forms long stems containing many whorls of short leaves. Photo Courtesy of Dr. John H. Rodgers, Jr.

11.1.1 Hydrilla Identification

Hydrilla strongly resembles the native aquatic plant *Elodea*, *Elodea canadensis* and the introduced species Brazilian elodea *Egeria densa*. Both these species can be found in Indiana although the occurrence of Brazilian elodea has been very limited thus far. Native *Elodea* is a part of the Wall Lake plant community. Hydrilla is a long slender plant that sometimes branches and has short leaves arranged around the stem in a star-like (whorled) pattern. Characteristics which differentiate Hydrilla from *Elodea* and Brazilian *Elodea* include a typical leaf count of five in the whorl. Brazilian elodea typically has four to six leaves but never three, and native *Elodea* usually has three. (fig 39) Small teeth are also present on the midrib of Hydrilla leaves and may give the plant a “rough” feel.

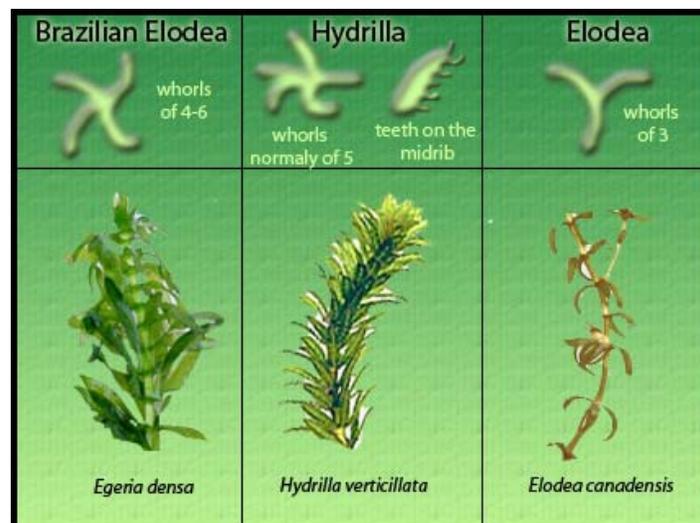


Figure 23 Brazilian elodea has a typical leaf count of 4-6, while Hydrilla's is usually 5, and *Elodea*'s 3. Photo courtesy of Rob Nelson at ExploreBiodiversity.com

Hydrilla also has small serrations along the leaf edges (fig 24). Another distinguishing characteristic of Hydrilla is the presence of tubers (.2 to .4 inch long off-white structures attached to the root) (fig 25).



Figure 24 Edges of Hydrilla leaves have fine serrations visible upon close examination
Photo Courtesy of Dr. John H. Rodgers, Jr.



Figure 25 Hydrilla plants with tubers attached. Photo courtesy of King County Natural Resources and Parks, Water and Land Resources Division

Anyone noting the presence of Hydrilla or Brazilian elodea is asked to immediately contact Doug Keller, Invasive species coordinator for the Indiana Department of Natural Resources at 317-234-3883, email: dkeller@dnr.in.gov. If you have questions about the identity of aquatic plants found, photos of the plants can be e-mailed to Doug for basic identification to determine if further action is required. More information on stopping the spread of invasive aquatic species is available online at <http://www.protectyourwaters.net/>

12.0 Integrated Management Action Strategy

Based on the value of Wall Lake as a unique public resource with a possible state listed endangered species present in its plant community, and the overwhelming desire by its users to continue to control the lake's Eurasian milfoil problem, it's recommended that the 2006 season's management regime be repeated in 2007. The acreage treated with 2,4-D granular will likely need to increase in 2007 so a treatment of approximately ten acres should be planned. In addition an ultra-early treatment utilizing Aquathol K liquid aquatic herbicide for Curlyleaf pondweed should be initiated to prevent this invasive plant from replacing milfoil as a nuisance and impairment to the lake. An aggressive program of treatment for Purple loosestrife should also be initiated now while it can be a cost-effective endeavor and possibly prevent spread to the watersheds upstream wetlands. This coupled with a regular program of resident education may be able to keep this emerging problem from becoming worse. Residents should also be informed as to the likely course of plant management as increased treatment becomes necessary to deal with recolonizing Eurasian watermilfoil. Monitoring and aquatic plant surveys per the 2007 IDNR protocol should be used to evaluate changes in the lake's plant community and treatment effectiveness. At least one public meeting should be dedicated each season to help educate the lake residents about proper practices in managing their own lakeside properties and allow for the collection of ideas and opinions from lake users and the general public.

13.0 Estimated Project Budget and Timeline

2007

-April 2007 Treat Approx. 10 acres of Curlyleaf pondweed with Aquathol K liquid herbicide to prevent reproduction

\$2680.00

-June 2007 hold public meeting to discuss plan with community and lake users

\$200.00

- May 2007 Map Exotic Plants and Designate Treatment areas

\$900.00

-Mid to late May 2007 2-4-D Eurasian watermilfoil treatment to designated areas maximum 10 acres

\$4360.00

-July or August 2007 Tier II Plant Survey, Designate any retreatment areas

\$1200.00

-July 2007 shoreline spot treatment of Purple loosestrife

\$700.00

-November 2007 AVMP document preparation

\$900.00

2007 Total \$10,940.00

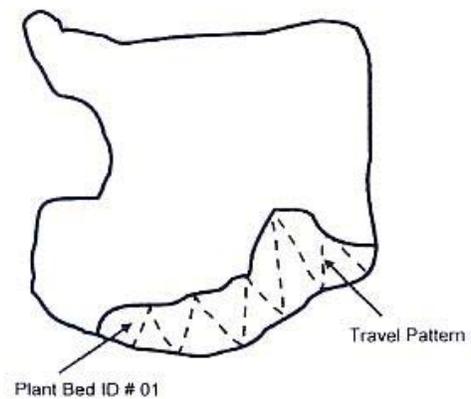
14.0 References Cited

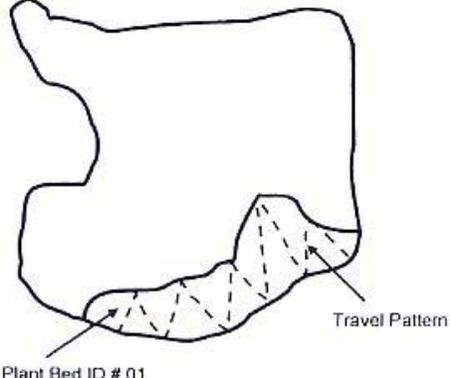
Pearson, J. 2004, A sampling method to assess occurrence, abundance and distribution of submersed aquatic plants in Indiana lakes, Indiana Department of Natural Resources, Division of Fish and Wildlife, Tri-Lakes Fisheries Station, 5570 North Hatchery Road Columbia City, Indiana 46725

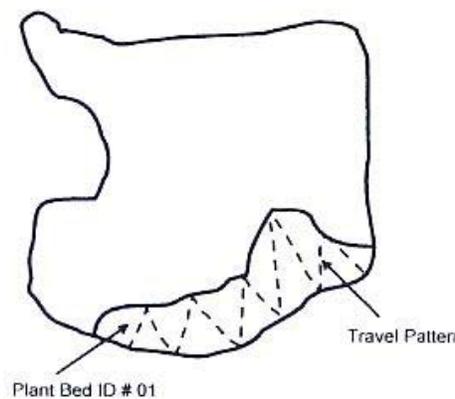
IDNR 2004. Procedure manual for surveying aquatic Vegetation: Tier I and Tier II, Indiana Department of Natural Resources, Indianapolis, Indiana.

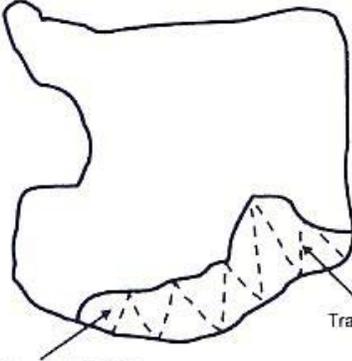
15.0 Appendices

Appendix A Tier I Data Sheets 5/06

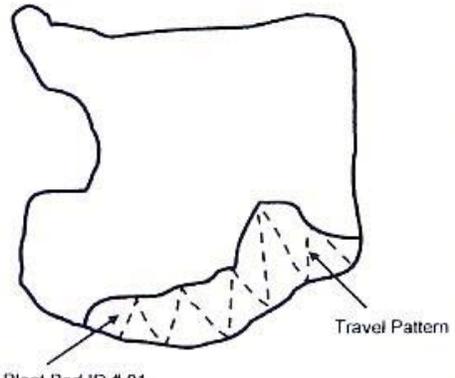
Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___
State of Indiana Department of Natural Resources						
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE: 5/24/06		
SITE INFORMATION				SITE COORDINATES		
Plant Bed ID: 1	Waterbody Name: WAW UK			Center of the Bed		
Bed Size: 2				Latitude:		
Substrate: 2	Waterbody ID:			Longitude:		
Marl? 0	Total # of Species			Max. Lakeward Extent of Bed		
High Organic? 0	Canopy Abundance at Site			Latitude:		
			S:	N:	F:	E:
			Longitude:			
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey 	
POIL ✓	2					
POCR3 ✓	3					
POPE ✓	2					
POZO ✓	2					
CEDE						
POBR						
CA?AR	2					
PDAM ✓	2					
VAAM ✓	1					
VTMA						
NAFL						
MYSF ✓	2					
AGA ✓	1					
SCSP.						
POCH						
NYTV						
LYSA						
TYLA						
NULV						
TYAN						
REMINDER INFORMATION						
Substrate:		Marl		Canopy:		QE Code:
1 = Silt/Clay	1 = Present	1 = < 2%	0 = as defined	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map		
2 = Silt w/Sand	0 = absent	2 = 2-20%	1 = Species susp			
3 = Sand w/Silt		3 = 21-60%	2 = Genus suspected			
4 = Hard Clay		4 = > 60%	3 = Unknown			
High Organic		Abundance:		Voucher:		
5 = Gravel/Rock	1 = Present	1 = < 2%	0 = Not Taken			
6 = Sand	0 = absent	2 = 2-20%	1 = Taken, not verified			
Overall Surface Cover		3 = 21-60%	2 = Taken, verified			
N = Nonrooted floating		4 = > 60%				
F = Floating, rooted						
E = Emergent						
S = Submersed						

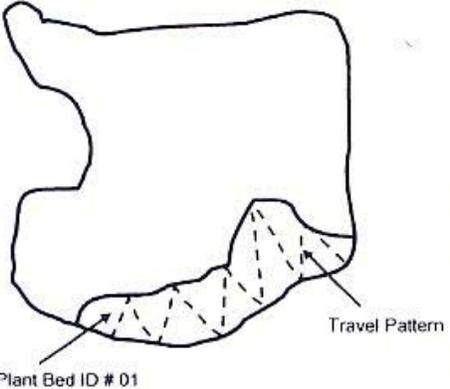
Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___
State of Indiana Department of Natural Resources						
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE: 5/24/06		
SITE INFORMATION				SITE COORDINATES		
Plant Bed ID: 2	Waterbody Name: WAU LK			Center of the Bed		
Bed Size:				Latitude:		
Substrate: 3	Waterbody ID:			Longitude:		
Marl? 0	Total # of Species			Max. Lakeward Extent of Bed		
High Organic? 0	Canopy Abundance at Site				Latitude:	
	S:	N:	F:	E:	Longitude:	
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey 	
POIL ✓	2					
POCR3 ✓	2					
POPE ✓	1					
POZO ✓	2					
CEDE						
POGR ✓	2					
PDAM ✓	3					
CH & AR ✓	3					
VTMA						
NAFL						
MYSP ✓	1					
Comments:						
SC5P.						
POCH						
NYTV						
LYSA						
TYLA						
NULV						
TYAN						
REMINDER INFORMATION						
Substrate:		Marl:		Canopy:		QE Code:
1 = Silt/Clay		1 = Present		1 = < 2%		0 = as defined
2 = Silt w/Sand		0 = absent		2 = 2-20%		1 = Species suspr
3 = Sand w/Silt				3 = 21-60%		2 = Genus suspected
4 = Hard Clay		High Organic		4 = > 60%		3 = Unknown
5 = Gravel/Rock		1 = Present				
6 = Sand		0 = absent				
Overall Surface Cover		Abundance:		Voucher:		Reference ID:
N = Nonrooted floating		1 = < 2%		0 = Not Taken		Unique number or
F = Floating, rooted		2 = 2-20%		1 = Taken, not varified		letter to denote specific
E = Emergent		3 = 21-60%		2 = Taken, varifer		location of a species;
S = Submersed		4 = > 60%				referenced on attached map

Aquatic Vegetation Plant Bed Data Sheet						Page <u>2</u> of <u> </u>
State of Indiana Department of Natural Resources						
ORGANIZATION: <u>AQUATIC ENHANCEMENT & SURVEY, INC.</u>				DATE: <u>5/20/06</u>		
SITE INFORMATION				SITE COORDINATES		
Plant Bed ID: <u>2A</u>	Waterbody Name: <u>WAW LK</u>			Center of the Bed		
Bed Size: <u>3</u>				Latitude:		
Substrate: <u>3</u>	Waterbody ID:			Longitude:		
Marl? <u>0</u>	Total # of Species			Max. Lakeward Extent of Bed		
High Organic? <u>0</u>	Canopy Abundance at Site			Latitude:		
				Longitude:		
				S: N: F: E: <u>1</u>		
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey 	
POIL						
POCR3						
POPE ✓	2					
POZO						
CEDE						
POBR						
ALGA ✓	2					
ELCA ✓	2					
CHA sp ✓	3					
VTMA						
NAFL						
MYSF ✓	3					
NITULA ✓	2					
SCSP.						
POCH ✓	2					
NYTV ✓	2					
LYSA						
TYLA						
NULV						
TYAN						
REMINDER INFORMATION						
Substrate:		Marl		Canopy:		QE Code:
1 = Silt/Clay		1 = Present		1 = < 2%		0 = as defined
2 = Silt w/Sand		0 = absent		2 = 2-20%		1 = Species suspe
3 = Sand w/Silt				3 = 21-60%		2 = Genus suspected
4 = Hard Clay		High Organic		4 = > 60%		3 = Unknown
5 = Gravel/Rock		1 = Present				
6 = Sand		0 = absent				
Overall Surface Cover			Abundance:		Voucher:	
N = Nonrooted floating			1 = < 2%		0 = Not Taken	
F = Floating, rooted			2 = 2-20%		1 = Taken, not varified	
E = Emergent			3 = 21-60%		2 = Taken, varified	
S = Submersed			4 = > 60%			

Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___	
State of Indiana Department of Natural Resources						
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE: 5/24/06		
SITE INFORMATION				SITE COORDINATES		
Plant Bed ID: 7	Waterbody Name: WAW LK			Center of the Bed		
Bed Size:				Latitude:		
Substrate: 2	Waterbody ID:			Longitude:		
Marl? 0	Total # of Species			Max. Lakeward Extent of Bed		
High Organic? 0	Canopy Abundance at Site			Latitude:		
S:			N:			E: 0
Longitude:						
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey 	
POIL ✓	2					
POCR3 ✓	3					
POPE ✓	2					
POED ✓	2					
CEDE						
POGR ✓	2					
PDAM ✓	2					
CA?AR ✓	3					
UTMA						
NAFL						
MYSP						
SCSP.						
POCH						
NYTV						
LYSA						
TYLA						
NULV						
TYAN						
REMINDER INFORMATION						
Substrate:		Marl		Canopy:		QE Code:
1 = Silt/Clay		1 = Present		1 = < 2%		0 = as defined
2 = Silt w/Sand		0 = absent		2 = 2-20%		1 = Species suspt
3 = Sand w/Silt				3 = 21-60%		2 = Genus suspected
4 = Hard Clay		High Organic:		4 = > 60%		3 = Unknown
5 = Gravel/Rock		1 = Present				
6 = Sand		0 = absent				
Overall Surface Cover		Abundance:		Voucher:		Reference ID:
N = Nonrooted floating		1 = < 2%		0 = Not Taken		Unique number or
F = Floating, rooted		2 = 2-20%		1 = Taken, not varified		letter to denote specific
E = Emergent		3 = 21-60%		2 = Taken, varifier		location of a species;
S = Submersed		4 = > 60%				referenced on attached map.
Comments: SOME POCR @ SURFACE						

Aquatic Vegetation Plant Bed Data Sheet				Page ___ of ___	
State of Indiana Department of Natural Resources					
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.			DATE: 5/24/06		
SITE INFORMATION			SITE COORDINATES		
Plant Bed ID: 8	Waterbody Name: WAU LK		Center of the Bed		
Bed Size:			Latitude:		
Substrate: 2	Waterbody ID:		Longitude:		
Marl? 0	Total # of Species		Max. Lakeward Extent of Bed		
High Organic? 1	Canopy Abundance at Site			Latitude:	
	S:	N:	F:	E: 2	Longitude:
SPECIES INFORMATION					
Species Code	Abundance	QE	Vchr.	Ref. ID	
POIL					
POCR3 ✓	2				
POPE ✓	1				
POZO ✓	2				
CEDE					
POBR					
CH?AR ✓	3				
ALGAE ✓	3				
ELCA ✓	2				
VTMA					
NAFL					
MYSP ✓	2				
POAM ✓	2				
CAREX SP. ✓	1				
SCSP.					
POCH ✓	2				
NYTV ✓	2				
LYSA					
TYLA ✓	1				
NULV					
TYAN					
REMINDER INFORMATION					
Substrate:		Marl		Canopy:	
1 = Silt/Clay		1 = Present		1 = < 2%	
2 = Silt w/Sand		0 = absent		2 = 2-20%	
3 = Sand w/Silt				3 = 21-60%	
4 = Hard Clay				4 = > 60%	
5 = Gravel/Rock		High Organic			
6 = Sand		1 = Present			
		0 = absent			
		Overall Surface Cover		Abundance:	
		N = Nonrooted floating		1 = < 2%	
		F = Floating, rooted		2 = 2-20%	
		E = Emergent		3 = 21-60%	
		S = Submersed		4 = > 60%	
				QE Code:	
				0 = as defined	
				1 = Species suspr	
				2 = Genus suspected	
				3 = Unknown	
				Reference ID:	
				Unique number or	
				letter to denote specific	
				location of a species,	
				referenced on attached map	
				Voucher:	
				0 = Not Taken	
				1 = Taken, not varified	
				2 = Taken, varified.	
			Individual Plant Bed Survey		
			Comments:		
			SE CHANNELS		

Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___	
State of Indiana Department of Natural Resources						
ORGANIZATION: <u>AQUATIC ENHANCEMENT & SURVEY, INC.</u>			DATE:			
SITE INFORMATION			SITE COORDINATES			
Plant Bed ID: 2 <u>9</u>	Waterbody Name: <u>Wau LK</u>		Center of the Bed			
Bed Size: <u>2</u>	Waterbody ID:		Latitude:			
Substrate: <u>2</u>	Total # of Species:		Longitude:			
Marl? <u>0</u>	Canopy Abundance at Site		Max. Lakeward Extent of Bed			
High Organic? <u>0</u>	S:	N:	F:	E: <u>0</u>		
			Latitude:			
			Longitude:			
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	<div style="text-align: center;">Individual Plant Bed Survey</div> 	
<u>POIL L</u>	<u>2</u>					
POCR3						
<u>POPE</u>						
<u>POZO L</u>	<u>2</u>					
<u>CEDE</u>						
<u>POBR</u>						
<u>CH2AR L</u>	<u>2</u>					
<u>POAM L</u>	<u>2</u>					
<u>VTMA</u>						
<u>NAFL</u>						
<u>MYSP</u>						
<u>SCSP</u>						
<u>POCH</u>						
<u>NYTV</u>						
<u>LYSA</u>						
<u>TYLA</u>						
<u>NULV</u>						
<u>TYAN</u>						
REMINDER INFORMATION						
Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand		Marl: 1 = Present 0 = absent High Organic: 1 = Present 0 = absent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		
Overall Surface Cover: N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		QE Code: 0 = as defined 1 = Species suspr 2 = Genus suspected 3 = Unknown		
				Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map		
				Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifex		
Comments:						

Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___		
State of Indiana Department of Natural Resources							
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE:			
SITE INFORMATION				SITE COORDINATES			
Plant Bed ID: 15	Waterbody Name: WAU LK			Center of the Bed			
Bed Size: 2	Waterbody ID:			Latitude:			
Substrate: 2	Total # of Species			Longitude:			
Marl? 0	Canopy Abundance at Site			Max. Lakeward Extent of Bed			
High Organic? 0	S: N: F: E: 2			Latitude:			
				Longitude:			
SPECIES INFORMATION							
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey 		
POIL ✓	2						
POCR3 ✓	2						
POPE							
POZD							
CEDE							
POBR							
CH? AR ✓	3						
POAM ✓	3						
VTMA							
NAFL							
MYSF							
WATERSHIELD ✓	2						
SCSP ✓	2						
POCH ✓	2						
NYTV ✓	3						
LYSA							
TYLA ✓	2						
NULV							
TYAN							
REMINDER INFORMATION							
Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand		Marl 1 = Present 0 = absent High Organic 1 = Present 0 = absent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown	
Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map			
				Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, variflex			
				Comments: EMERGENT BED			

Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___	
State of Indiana Department of Natural Resources						
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.			DATE: 5/24/06			
SITE INFORMATION				SITE COORDINATES		
Plant Bed ID: 16	Waterbody Name: WAU LK			Center of the Bed		
Bed Size: 2	Waterbody ID:			Latitude:		
Substrate: 2	Total # of Species			Longitude:		
Marl? 0	Canopy Abundance at Site			Max. Lakeward Extent of Bed		
High Organic? 0	S:	N:	F:	E: 2	Latitude:	
				Longitude:		
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey	
POIL ✓	2					
POCR3 ✓	1					
POPE						
POZD ✓	2					
CEDE						
POBR ✓	2					
PDAM ✓	2					
CH?AR ✓	3					
UTMA						
NAFL						
MYSP						
Comments:						
SCSP.						
POCH ✓	2					
NYTV ✓	2					
LYSA						
TYLA						
NULV						
TYAN						
REMINDER INFORMATION						
Substrate:		Marl		Canopy:		QE Code:
1 = Silt/Clay		1 = Present		1 = < 2%		0 = as defined
2 = Silt w/Sand		0 = absent		2 = 2-20%		1 = Species susp
3 = Sand w/Silt				3 = 21-60%		2 = Genus suspected
4 = Hard Clay		High Organic		4 = > 60%		3 = Unknown
5 = Gravel/Rock		1 = Present				
6 = Sand		0 = absent				
		Overall Surface Cover		Abundance:		Voucher:
		N = Nonrooted floating		1 = < 2%		0 = Not Taken
		F = Floating, rooted		2 = 2-20%		1 = Taken, not varified
		E = Emergent		3 = 21-60%		2 = Taken, varified
		S = Submersed		4 = > 60%		

Appendix B Tier I Data Sheets 8/06

Aquatic Vegetation Plant Bed Data Sheet Page ___ of ___

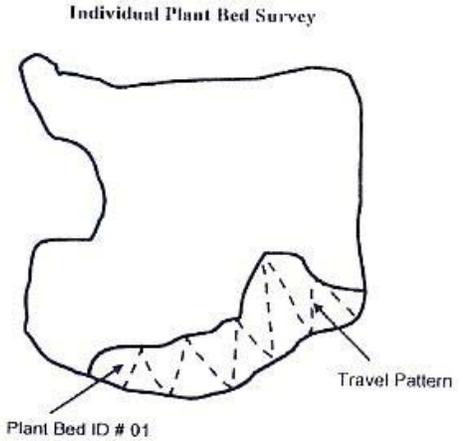
State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/8/06

SITE INFORMATION		SITE COORDINATES	
Plant Bed ID: <u>1</u>	Waterbody Name: <u>WALL LAKE</u>	Center of the Bed	
Bed Size:	Waterbody ID:	Latitude:	Longitude:
Substrate: <u>3</u>	Total # of Species: <u>SB EO</u>	Max. Lakeward Extent of Bed	
Marl? <u>0</u>	High Organic? <u>0</u>	Latitude:	Longitude:
Canopy Abundance at Site			
S:	N:	F:	E:

SPECIES INFORMATION				
Species Code	Abundance	QE	Vchr.	Ref. ID
CH?AR ✓	3			
POIL ✓	3			
POCR3				
MYSP2 ✓	1			
POGR ✓	3			
PORI				
UTMA				
NAFL				
POFR5				
MYVE				
POPE6 ✓	3			
POZO ✓	2			
CEDE				
POAM ✓	2			
SCSP.				
LYSA				
NYTV				
SA SP.				
ARVM				
NULU				
TYLA				
CASP.				

VAAM ✓
FOAM ✓



Comments: Plants to 14 ft. depth.

REMINDER INFORMATION			
Substrate:	Marl	Canopy:	QE Code:
1 = Silt/Clay	1 = Present	1 = < 2%	0 = as defined
2 = Silt w/Sand	0 = absent	2 = 2-20%	1 = Species suspx
3 = Sand w/Silt		3 = 21-60%	2 = Genus suspected
4 = Hard Clay	High Organic:	4 = > 60%	3 = Unknown
5 = Gravel/Rock	1 = Present		
6 = Sand	0 = absent		
	Overall Surface Cover	Abundance:	Voucher:
	0 = Nonrooted floating	1 = < 2%	0 = Not Taken
	1 = Floating, rooted	2 = 2-20%	1 = Taken, not varified
	2 = Emergent	3 = 21-60%	2 = Taken, varified
	3 = Submersed	4 = > 60%	
			Reference ID:
			Unique number or letter to denote specific location of a species, referenced on attached map

Page ___ of ___

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/8/06

SITE INFORMATION

Plant Bed ID: 2A Waterbody Name: WALL LAKE

Bed Size: Substrate: 3 Waterbody ID: Latitude: Longitude:

Marl? 0 Total # of Species 58 EG Max. Lakeward Extent of Bed

High Organic? 0 Canopy Abundance at Site Latitude: Longitude:

S: N: F: E: 1

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH?AR	✓ 2			
POIL	✓ 3			
POCR3	✓ 1			
MYSP 2	✓ 1			
POGR	✓ 2			
PORI				
UTMA				
NAPL				
POAR 5				
MYVE				
POPE 6				
POZO				
CEDE	✓ 1			
POAM	✓ 2			
SCSP.	✓ 1			
LVSA				
NYTV	✓ 2			
SA SP.				
ARVM				
NULU				
TYLA				
CASP	✓ 1			

Individual Plant Bed Survey

Comments:

SECA#1 -

18ft.

NO LOOSE STRIP

very little mysp at ramp only

REMINDER INFORMATION

<p>Substrate:</p> <p>1 = Silt/Clay</p> <p>2 = Silt w/Sand</p> <p>3 = Sand w/Silt</p> <p>4 = Hard Clay</p> <p>5 = Gravel/Rock</p> <p>6 = Sand</p>	<p>Marl</p> <p>1 = Present</p> <p>0 = absent</p>	<p>Canopy:</p> <p>1 = < 2%</p> <p>2 = 2-20%</p> <p>3 = 21-60%</p> <p>4 = > 60%</p>	<p>QE Code:</p> <p>0 = as defined</p> <p>1 = Species suspt</p> <p>2 = Genus suspected</p> <p>3 = Unknown</p>	<p>Reference ID:</p> <p>Unique number or letter to denote specific location of a species, referenced on attached map</p>
<p>Overall Surface Cover</p> <p>N = Nonrooted floating</p> <p>F = Floating, rooted</p> <p>E = Emergent</p> <p>S = Submersed</p>	<p>Abundance:</p> <p>1 = < 2%</p> <p>2 = 2-20%</p> <p>3 = 21-60%</p> <p>4 = > 60%</p>	<p>Voucher:</p> <p>0 = Not Taken</p> <p>1 = Taken, not varified</p> <p>2 = Taken, varified</p>		

Species
detrit
atunchamp
44°43.54
55°12.62

EXCA
LCAD1

SCSP 2
RVIV 1
AAM 3

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.		DATE: 8/8/06	
SITE INFORMATION		SITE COORDINATES	
Plant Bed ID: 3	Waterbody Name: WALL LAKE	Center of the Bed	
Bed Size: 2	Waterbody ID: 1	Latitude:	Longitude:
Substrate: 2	Total # of Species: 54 E 1	Max. Lakeward Extent of Bed	
Marl? 0	Canopy Abundance at Site	Latitude:	Longitude:
High Organic? 0		S: 1 N: 1 F: 1 E: 1	

SPECIES INFORMATION					Individual Plant Bed Survey
Species Code	Abundance	QE	Vchr.	Ref. ID	
CH?AR ✓	4				<p style="text-align: center;">Plant Bed ID # 01</p> <p style="text-align: right;">Travel Pattern</p>
POIL					
POCR3					
MYSP2					
POGR ✓	3				
POR1					
UTMA					
NAFL					
POPR5					
MYVE					
POPE6 ✓	1				
POZO					
CEDE					
POAM					
SCSP.					
LVSA					
NYTV ✓	1				
SA SP.					
ARVM					
NULU					
TYLA					
CASP.					

REMINDER INFORMATION				
Substrate:	Marl	Canopy:	QE Code:	Reference ID:
1 = Silt/Clay	1 = Present	1 = < 2%	0 = as defined	Unique number or letter to denote specific location of a species; referenced on attached map
2 = Silt w/Sand	0 = absent	2 = 2-20%	1 = Species suspi	
3 = Sand w/Silt		3 = 21-80%	2 = Genus suspected	
4 = Hard Clay	High Organic:	4 = > 80%	3 = Unknown	
5 = Gravel/Rock	1 = Present			
6 = Sand	0 = absent			
	Overall Surface Cover	Abundance:	Voucher:	
	N = Nonrooted floating	1 = < 2%	0 = Not Taken	
	F = Floating, rooted	2 = 2-20%	1 = Taken, not verified	
	E = Emergent	3 = 21-80%	2 = Taken, verified	
	S = Submersed	4 = > 80%		

VAMW2

Page ___ of ___

Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/8/06

SITE INFORMATION				SITE COORDINATES	
Plant Bed ID: <u>4</u>	Waterbody Name: <u>WALL LAKE</u>			Center of the Bed	
Bed Size				Latitude:	
Substrate: <u>2</u>	Waterbody ID:			Longitude:	
Marl? <u>0</u>	Total # of Species <u>55</u> <u>E1</u>			Max. Lakeward Extent of Bed	
High Organic? <u>0</u>	Canopy Abundance at Site			Latitude:	
	S:	N:	F:	E: <u>3</u>	Longitude:

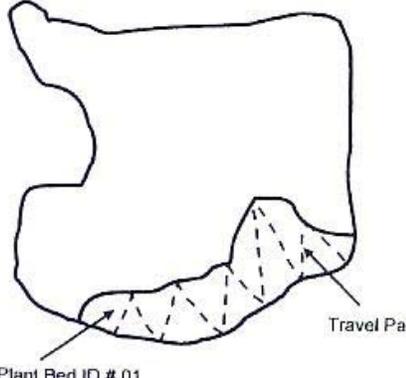
SPECIES INFORMATION				
Species Code	Abundance	QE	Vchr.	Ref. ID
CH?AR ✓	4			
POIL ✓	2			
POCR3				
MYSP2				
POGR ✓	3			
PORI				
UTMA				
NAFL				
POAR5				
MYVE				
POPE6 ✓	1			
POZO				
CEOE				
POAM				
SCSP.				
LYSA				
NYTV ✓	3			
SA SP.				
ARVM				
NULU				
TYLA				
CASP.				

VAAMV2

Individual Plant Bed Survey

Comments:

REMINDER INFORMATION				
Substrate:	Marl	Canopy:	QE Code:	Reference ID:
1 = Silt/Clay	1 = Present	1 = < 2%	0 = as defined	Unique number or
2 = Silt w/Sand	0 = absent	2 = 2-20%	1 = Species suspr	letter to denote specific
3 = Sand w/Silt		3 = 21-60%	2 = Genus suspected	location of a species,
4 = Hard Clay	High Organic:	4 = > 60%	3 = Unknown	referenced on attached map
5 = Gravel/Rock	1 = Present			
6 = Sand	0 = absent			
	Overall Surface Cover	Abundance:	Voucher:	
	N = Nonrooted floating	1 = < 2%	0 = Not Taken	
	F = Floating, rooted	2 = 2-20%	1 = Taken, not varified	
	E = Emergent	3 = 21-60%	2 = Taken, varified	
	S = Submersed	4 = > 60%		

Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___	
State of Indiana Department of Natural Resources							
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE: 8/8/06			
SITE INFORMATION				SITE COORDINATES			
Plant Bed ID: 6	Waterbody Name: WALL LAKE			Center of the Bed			
Bed Size:				Latitude:			
Substrate: 2	Waterbody ID:			Longitude:			
Merl? 0	Total # of Species 56 EO			Max. Lakeward Extent of Bed			
High Organic? 0	Canopy Abundance at Site			Latitude:			
	S: 1	N:	F:	E:	Longitude:		
SPECIES INFORMATION							
Species Code	Abundance	QE	Vchr.	Ref. ID	Individual Plant Bed Survey 		
CH?AR ✓	4						
POIL ✓	3						
POCR3							
MYSP2							
POGR ✓	3						
PORI							
UTMA							
NAFL							
POAR5							
MYVE							
POPE6 ✓	3						
POZO							
CEDE							
POAM ✓	2						
SCSP.							
LYSA							
NYTV							
SA SP.							
ARVM							
NULU							
TYLA							
CASP							
REMINDER INFORMATION					Comments:		
Substrate:	Merl:	Canopy:		QE Code:			Reference ID:
1 = Silt/Clay	1 = Present	1 = < 2%		0 = as defined			Unique number or letter to denote specific location of a species; referenced on attached map
2 = Silt w/Sand	0 = absent	2 = 2-20%		1 = Species suspt			
3 = Sand w/Silt		3 = 21-60%		2 = Genus suspected			
4 = Hard Clay	High Organic:	4 = > 60%		3 = Unknown			
5 = Gravel/Rock	1 = Present						
6 = Sand	0 = absent						
	Overall Surface Cover	Abundance:		Voucher:			
	N = Nonrooted floating	1 = < 2%		0 = Not Taken			
	F = Floating, rooted	2 = 2-20%		1 = Taken, not verified			
	E = Emergent	3 = 21-60%		2 = Taken, variflor			
	S = Submersed	4 = > 60%					

VAMV3

Aquatic Vegetation Plant Bed Data Sheet

Page ___ of ___

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.		DATE: 8/8/06	
SITE INFORMATION		SITE COORDINATES	
Plant Bed ID: 7	Waterbody Name: WALL LAKE	Center of the Bed	
Bed Size:	Waterbody ID:	Latitude:	Longitude:
Substrate: 2	Total # of Species: 57 40	Max. Lakeward Extent of Bed	
Marl? 0	Canopy Abundance at Site		Latitude:
High Organic? 0	S:	N:	F:
			E:
SPECIES INFORMATION		Individual Plant Bed Survey	

Species Code	Abundance	QE	Veltr.	Ref. ID
CH?AR ✓	4			
POIL				
POCR3				
MYSP2				
POGR ✓	3			
PORI				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6 ✓	3			
POZO ✓	3			
CEDE				
POAM ✓	3			
SCSP.				
LVSA				
NYTV				
SA SP.				
ARVM				
NULU				
TYLA				
CASP				

Plant Bed ID # 01

Travel Pattern

Comments:

REMINDER INFORMATION

Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand	Marl: 1 = Present 0 = absent High Organic: 1 = Present 0 = absent	Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	QE Code: 0 = as defined 1 = Species suspr 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed	Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	Voucher: 0 = Not Taken 1 = Taken, not verified 2 = Taken, verified		

ET, PUCHBU
 CHED
 YC IHERM
 'Hear + leaf
 Pondweed)
 2
 SA-1

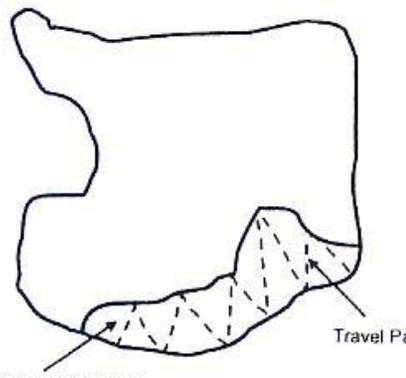
Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___																																																																																																																		
State of Indiana Department of Natural Resources																																																																																																																							
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SITE INFORMATION			SITE COORDINATES																																																																																																																				
Plant Bed ID: 8	Waterbody Name: WALL LAKE		Center of the Bed																																																																																																																				
Bed Size:			Latitude:																																																																																																																				
Substrate: 2	Waterbody ID:		Longitude:																																																																																																																				
Marl? 0	Total # of Species 516 59		Max. Lakeward Extent of Bed																																																																																																																				
High Organic? 1	Canopy Abundance at Site			Latitude:																																																																																																																			
	S: 1	N: 1	F: X	E: 3																																																																																																																			
SPECIES INFORMATION																																																																																																																							
<table border="1" style="width: 50%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Species Code</th> <th style="width: 10%;">Abundance</th> <th style="width: 5%;">QE</th> <th style="width: 10%;">Vchr.</th> <th style="width: 15%;">Ref. ID</th> </tr> </thead> <tbody> <tr><td>CH?AR</td><td>3</td><td></td><td></td><td></td></tr> <tr><td>POIL</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>POCR3</td><td></td><td></td><td></td><td></td></tr> <tr><td>MYSP2</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>POGR</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>POR1</td><td></td><td></td><td></td><td></td></tr> <tr><td>UTMA</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>NAFL</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>POPR5</td><td></td><td></td><td></td><td></td></tr> <tr><td>MYVE</td><td></td><td></td><td></td><td></td></tr> <tr><td>POPE6</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>POZO</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>CEDE</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>POAM</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>SCSP.</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>LYSA</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>NYTV</td><td>3</td><td></td><td></td><td></td></tr> <tr><td>SA SP.</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>ARVM</td><td></td><td></td><td></td><td></td></tr> <tr><td>NULU</td><td></td><td></td><td></td><td></td></tr> <tr><td>TYLA</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>CASP.</td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <div style="width: 45%; text-align: center;"> <p>Individual Plant Bed Survey</p> </div>					Species Code	Abundance	QE	Vchr.	Ref. ID	CH?AR	3				POIL	2				POCR3					MYSP2	1				POGR	2				POR1					UTMA	1				NAFL	1				POPR5					MYVE					POPE6	2				POZO	2				CEDE	1				POAM	2				SCSP.	1				LYSA	1				NYTV	3				SA SP.	2				ARVM					NULU					TYLA	1				CASP.				
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TYLA	1																																																																																																																						
CASP.																																																																																																																							
<p>Comments: MYSP, 1 plant found 79.5° Water temp.</p>																																																																																																																							
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Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 8 = Sand		Marl: 1 = Present 0 = absent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%																																																																																																																			
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ALGA 3
 IRVI 1
 LEMNA 1
 ELCA 1
 POPU 2
 ITGI 3

Spike
 Rush 1
 bco 1
 Zettor
 Bush 1
 PHAR 1

Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___	
State of Indiana Department of Natural Resources							
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE: 8/8/06			
SITE INFORMATION				SITE COORDINATES			
Plant Bed ID: 9	Waterbody Name: WALL LAKE			Center of the Bed			
Bed Size:							
Substrate: 3	Waterbody ID:			Latitude:			
Marl? 0	Total # of Species 55 EO			Longitude:			
High Organic? 0	Canopy Abundance at Site			Max. Lakeward Extent of Bed			
S: _____ N: _____ F: _____ E: _____				Latitude:			
				Longitude:			
SPECIES INFORMATION							
	Species Code	Abundance	QE	Vchr.	Ref. ID	<div style="text-align: center;"> <p>Individual Plant Bed Survey</p> </div>	
<i>POAM VAAM ✓</i>	CH?AR ✓	4					
	POIL						
	POCR3						
	MYSP 2						
	POGR ✓	3					
	PORI						
	UTMA						
	NAFL						
	POPR 5						
	MYVE						
	POPE 6 ✓	3					
	POZO						
	CEDE						
	POAM ✓	2					
	SCSP.						
	LVSA						
	NYTV						
	SA SP.						
	ARVM						
	NULU						
	TYLA						
	CASP						
REMINDER INFORMATION							
Substrate:		Marl		Canopy:			QE Code:
1 = Silt/Clay		1 = Present		1 = < 2%		0 = as defined	
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4 = Hard Clay				4 = > 60%		3 = Unknown	
5 = Gravel/Rock		High Organic:				Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map	
6 = Sand		1 = Present					
		0 = absent				Voucher: 0 = Not Taken 1 = Taken, not verified 2 = Taken, varifier	
		Overall Surface Cover		Abundance:			
		N = Nonrooted floating		1 = < 2%			
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Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___																																																																																																																		
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Plant Bed ID: 10	Waterbody Name: WALL LAKE		Center of the Bed																																																																																																																				
Bed Size:			Latitude:																																																																																																																				
Substrate: 2	Waterbody ID:		Longitude:																																																																																																																				
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MYVE																																																																																																																							
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Comments:																																																																																																																							
REMINDER INFORMATION																																																																																																																							
<p>Substrate:</p> <p>1 = Silt/Clay</p> <p>2 = Silt w/Sand</p> <p>3 = Sand w/Silt</p> <p>4 = Hard Clay</p> <p>5 = Gravel/Rock</p> <p>6 = Sand</p>	<p>Marl:</p> <p>1 = Present</p> <p>0 = absent</p> <p>High Organic:</p> <p>1 = Present</p> <p>0 = absent</p> <p>Overall Surface Cover</p> <p>N = Nonrooted floating</p> <p>F = Floating, rooted</p> <p>E = Emergent</p> <p>S = Submersed</p>	<p>Canopy:</p> <p>1 = < 2%</p> <p>2 = 2-20%</p> <p>3 = 21-60%</p> <p>4 = > 60%</p> <p>Abundance:</p> <p>1 = < 2%</p> <p>2 = 2-20%</p> <p>3 = 21-60%</p> <p>4 = > 60%</p>	<p>QE Code:</p> <p>0 = as defined</p> <p>1 = Species suspt</p> <p>2 = Genus suspected</p> <p>3 = Unknown</p> <p>Voucher:</p> <p>0 = Not Taken</p> <p>1 = Taken, not verified</p> <p>2 = Taken, verified</p>	<p>Reference ID:</p> <p>Unique number or letter to denote specific location of a species; referenced on attached map</p>																																																																																																																			

Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___
State of Indiana Department of Natural Resources						
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.				DATE: 8/8/06		
SITE INFORMATION				SITE COORDINATES		
Plant Bed ID: 11	Waterbody Name: WALL LAKE			Center of the Bed		
Bed Size: 2	Waterbody ID:			Latitude:		
Substrate: 2	Total # of Species: 57 E1			Longitude:		
Marl? 0	Canopy Abundance at Site			Max. Lakeward Extent of Bed		
High Organic? 1	S: 1 N: F: E: 1			Latitude:		
				Longitude:		
SPECIES INFORMATION						<div style="text-align: center;">Individual Plant Bed Survey</div> 
Species Code	Abundance	QE	Vchr.	Ref. ID		
CH?AR ✓	4					
POIL ✓	3					
POCR3						
MYSP2						
POGR ✓	3					
PORI						
UTMA						
NAFL						
POPR5						
MYVE						
POPE6						
POZO ✓	2					
CEDE						
POAM ✓	1					
SCSP.						
LVSA						
NYTV ✓	2					
SA SP.						
ARVM						
NULU						
TYLA						
CASP.						
REMINDER INFORMATION						
Substrate:	Marl:	Canopy:		QE Code:	Reference ID:	
1 = Silt/Clay	1 = Present	1 = < 2%		0 = as defined	Unique number or	
2 = Silt w/Sand	0 = absent	2 = 2-20%		1 = Species susp	letter to denote specific	
3 = Sand w/Silt		3 = 21-60%		2 = Genus suspected	location of a species;	
4 = Hard Clay	High Organic:	4 = > 60%		3 = Unknown	referenced on attached map	
5 = Gravel/Rock	1 = Present					
6 = Sand	0 = absent					
	Overall Surface Cover	Abundance:		Voucher:		
	N = Nonrooted floating	1 = < 2%		0 = Not Taken		
	F = Floating, rooted	2 = 2-20%		1 = Taken, not verified		
	E = Emergent	3 = 21-60%		2 = Taken, varifier		
	S = Submersed	4 = > 60%				

VAAM ✓
water stars
grass ✓

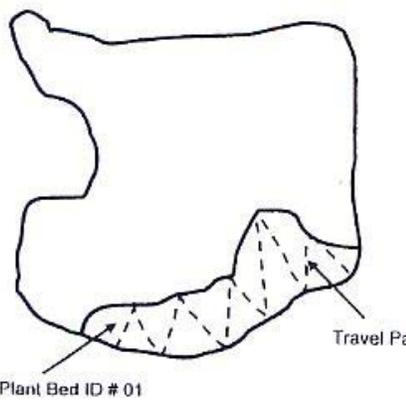
Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___																																																																																																																		
State of Indiana Department of Natural Resources																																																																																																																							
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SITE INFORMATION			SITE COORDINATES																																																																																																																				
Plant Bed ID: 12	Waterbody Name: WALL LAKE		Center of the Bed																																																																																																																				
Bed Size:			Latitude:																																																																																																																				
Substrate: 3	Waterbody ID:		Longitude:																																																																																																																				
Marl? 0	Total # of Species 59 EO		Max. Lakeward Extent of Bed																																																																																																																				
High Organic? 0	Canopy Abundance at Site			Latitude:																																																																																																																			
	S: 1	N:	F:	E:																																																																																																																			
SPECIES INFORMATION																																																																																																																							
<p style="margin-left: 20px;">JAAMWZ</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Species Code</th> <th style="width: 10%;">Abundance</th> <th style="width: 5%;">QE</th> <th style="width: 5%;">Vchr.</th> <th style="width: 10%;">Ref. ID</th> </tr> </thead> <tbody> <tr><td>CH?AR ✓</td><td>3</td><td></td><td></td><td></td></tr> <tr><td>POIL ✓</td><td>3</td><td></td><td></td><td></td></tr> <tr><td>POCR3</td><td></td><td></td><td></td><td></td></tr> <tr><td>MYSP2 ✓</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>POGR ✓</td><td>3</td><td></td><td></td><td></td></tr> <tr><td>PORI</td><td></td><td></td><td></td><td></td></tr> <tr><td>UTMA</td><td></td><td></td><td></td><td></td></tr> <tr><td>NAFL ✓</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>POAR5</td><td></td><td></td><td></td><td></td></tr> <tr><td>MYVE</td><td></td><td></td><td></td><td></td></tr> <tr><td>POPE6 ✓</td><td>2</td><td></td><td></td><td></td></tr> <tr><td>POZO ✓</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>CEDE</td><td></td><td></td><td></td><td></td></tr> <tr><td>POAM ✓</td><td>1</td><td></td><td></td><td></td></tr> <tr><td>SCSP.</td><td></td><td></td><td></td><td></td></tr> <tr><td>LYSA</td><td></td><td></td><td></td><td></td></tr> <tr><td>NYTV</td><td></td><td></td><td></td><td></td></tr> <tr><td>SA SP.</td><td></td><td></td><td></td><td></td></tr> <tr><td>ARVM</td><td></td><td></td><td></td><td></td></tr> <tr><td>NULU</td><td></td><td></td><td></td><td></td></tr> <tr><td>TYLA</td><td></td><td></td><td></td><td></td></tr> <tr><td>CASP</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Species Code	Abundance	QE	Vchr.	Ref. ID	CH?AR ✓	3				POIL ✓	3				POCR3					MYSP2 ✓	1				POGR ✓	3				PORI					UTMA					NAFL ✓	1				POAR5					MYVE					POPE6 ✓	2				POZO ✓	1				CEDE					POAM ✓	1				SCSP.					LYSA					NYTV					SA SP.					ARVM					NULU					TYLA					CASP					<div style="text-align: center;"> <p>Individual Plant Bed Survey</p> </div>			
Species Code	Abundance	QE	Vchr.	Ref. ID																																																																																																																			
CH?AR ✓	3																																																																																																																						
POIL ✓	3																																																																																																																						
POCR3																																																																																																																							
MYSP2 ✓	1																																																																																																																						
POGR ✓	3																																																																																																																						
PORI																																																																																																																							
UTMA																																																																																																																							
NAFL ✓	1																																																																																																																						
POAR5																																																																																																																							
MYVE																																																																																																																							
POPE6 ✓	2																																																																																																																						
POZO ✓	1																																																																																																																						
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Aquatic Vegetation Plant Bed Data Sheet

State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.		DATE: 8/8/06	
SITE INFORMATION		SITE COORDINATES	
Plant Bed ID: BA	Waterbody Name: WALL LAKE	Center of the Bed	
Bed Size:	Waterbody ID:	Latitude:	Longitude:
Substrate: 2	Total # of Species: 59 E1	Max. Lakeward Extent of Bed	
Marl? 0	High Organic? 1	Latitude:	Longitude:
Canopy Abundance at Site			
S: 1	N: 1	F: 1	E: 1

SPECIES INFORMATION					Individual Plant Bed Survey
Species Code	Abundance	QE	Vchr.	Ref. ID	
CH?AR ✓B	3				
POIL ✓B	2				
POCR3					
MYSP2 ✓X	1				
POGR ✓B	3				
PORI					
UTMA					
NAPL ✓X	1				
POPR5					
MYVE					
POPE6					
POZO ✓X	1				
CEDE					
POAM ✓B	2				
SCSP.					
LYSA					
NYTV ✓X	1				
SA SP.					
ARVM					
NULU					
TYLA					
CASP.					

POPUS 1
/AAMV 2

Comments:

REMINDER INFORMATION				
Substrate:	Marl	Canopy:	QE Code:	Reference ID:
1 = Silt/Clay	1 = Present	1 = < 2%	0 = as defined	Unique number or letter to denote specific location of a species; referenced on attached map
2 = Silt w/Sand	0 = absent	2 = 2-20%	1 = Species suspr	
3 = Sand w/Silt		3 = 21-80%	2 = Genus suspected	
4 = Hard Clay	High Organic	4 = > 60%	3 = Unknown	
5 = Gravel/Rock	1 = Present			
6 = Sand	0 = absent			
	Overall Surface Cover	Abundance:	Voucher:	
	N = Nonrooted floating	1 = < 2%	0 = Not Taken	
	F = Floating, rooted	2 = 2-20%	1 = Taken, not verified	
	E = Emergent	3 = 21-80%	2 = Taken, varifier	
	S = Submersed	4 = > 60%		

Aquatic Vegetation Plant Bed Data Sheet

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State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.		DATE: 8/8/06
SITE INFORMATION		
Plant Bed ID: 14	Waterbody Name: WALL LAKE	
Bed Size:	Latitude:	
Substrate: 3	Waterbody ID:	Longitude:
Marl? 0	Total # of Species 32 ES	Max. Lakeward Extent of Bed
High Organic? 0	Canopy Abundance at Site	
	S:	N: F: E: 4
		Latitude:
		Longitude:

SPECIES INFORMATION				
Species Code	Abundance	QE	Vchr.	Ref. ID
CH?AR ✓	4			
POIL				
POCR3				
MYSP2				
POGR ✓	3			
POR1				
UTMA				
NAFL				
POPR5				
MYVE				
POPE6				
POZO				
CEDE				
POAM				
SCSP ✓	1			
LYSA				
NYTV ✓	4			
SA SP.				
ARVM				
NULU ✓	2			
TYLA				
CASP				

Individual Plant Bed Survey

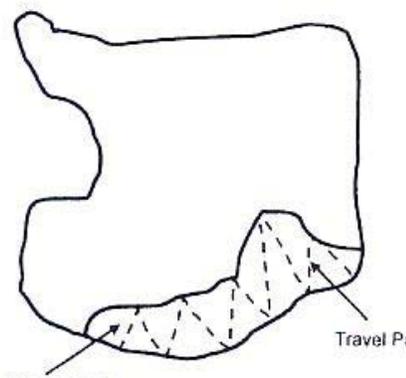
Comments: **Emergent Bed**

REMINDER INFORMATION			
Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand	Marl: 1 = Present 0 = absent High Organic: 1 = Present 0 = absent	Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown
Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier
Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map			

under sheet 14 ✓
POCO ✓ 2

Aquatic Vegetation Plant Bed Data Sheet					Page ___ of ___	
State of Indiana Department of Natural Resources						
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.			DATE: 8/8/06			
SITE INFORMATION			SITE COORDINATES			
Plant Bed ID: 15	Waterbody Name: WALL LAKE		Center of the Bed			
Bed Size:			Latitude:			
Substrate: 2	Waterbody ID:		Longitude:			
Marl? 0	Total # of Species 55 EG		Max. Lakeward Extent of Bed			
High Organic? 1	Canopy Abundance at Site			Latitude:		
	S: 1	N:	F:	E: 4		
				Longitude:		
SPECIES INFORMATION						
Species Code	Abundance	QE	Vchr.	Ref. ID	<div style="text-align: center;">Individual Plant Bed Survey</div>	
CH?AR ✓	2					
POIL ✓	1					
POCR3						
MYSP2						
POGR ✓	3					
POR1						
UTMA						
NAFL ✓	2					
POPR5						
MYVE						
POPE6						
POZO						
CEDE						
POAM ✓	1					
SCSP. ✓	2					
LYSA						
NYTV ✓	4					
SA SP.						
ARVM						
NULU						
TYLA ✓	2					
CASP						
REMINDER INFORMATION						
Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand		Marl: 1 = Present 0 = absent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	QE Code: 0 = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		Voucher: 0 = Not Taken 1 = Taken, not verified 2 = Taken, verifier		
Comments: Emergent Bed						

POCR 2
later
sheild 3
button
insh 1

Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___	
State of Indiana Department of Natural Resources							
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.			DATE: 8/8/06				
SITE INFORMATION				SITE COORDINATES			
Plant Bed ID: 16	Waterbody Name: WALL LAKE			Center of the Bed			
Bed Size:				Latitude:			
Substrate: 2	Waterbody ID:			Longitude:			
Marl? 1	Total # of Species 57 22			Max. Lakeward Extent of Bed			
High Organic? 1	Canopy Abundance at Site				Latitude:		
	S: 1	N: 1	F: 1	E: 3	Longitude:		
SPECIES INFORMATION							
	Species Code	Abundance	QE	Vctr.	Ref. ID	<div style="text-align: center;">  <p>Individual Plant Bed Survey</p> <p>Plant Bed ID # 01</p> <p>Travel Pattern</p> </div>	
	CH?AR ✓	3					
	POIL ✓	3					
	POCR3						
	MYSP2						
	POGR						
	PORI						
	UTMA						
	NAFL ✓	2					
	POPR5						
	MYVE						
	POPE6 ✓	2					
	POZO ✓	2					
	CEDE						
	POAM ✓	2					
	SCSP.						
	LYSA						
	NYTU ✓	3					
	SA SP.						
	ARVM						
	NULU						
	TYLA						
	CASP.						
REMINDER INFORMATION							Comments: Emergent bed
Substrate:		Marl		Canopy:			
1 = Silt/Clay		1 = Present		1 = < 2%			
2 = Silt w/Sand		0 = absent		2 = 2-20%			
3 = Sand w/Silt				3 = 21-80%			
4 = Hard Clay				4 = > 80%			
5 = Gravel/Rock		High Organic					
6 = Sand		1 = Present					
		0 = absent					
		Overall Surface Cover		Abundance:			
		N = Nonrooted floating		1 = < 2%			
		F = Floating, rooted		2 = 2-20%			
		E = Emergent		3 = 21-80%			
		S = Submersed		4 = > 80%			
				Voucher:			
				0 = Not Taken			
				1 = Taken, not verified			
				2 = Taken, verified			

1AAMJ 3
Water
star
grass ✓ 1
~~POAM~~

POCOV 2

Aquatic Vegetation Plant Bed Data Sheet

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State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/8/06

SITE INFORMATION				SITE COORDINATES	
Plant Bed ID: <u>17</u>	Waterbody Name: <u>WALL LAKE</u>			Center of the Bed	
Bed Size:				Latitude:	
Substrate: <u>2</u>	Waterbody ID:			Longitude:	
Marl? <u>0</u>	Total # of Species <u>58</u> <u>27</u>			Max. Lakeward Extent of Bed	
High Organic? <u>1</u>	Canopy Abundance at Site			Latitude:	
	S: <u>1</u>	N:	F:	E: <u>3</u>	Longitude:

SPECIES INFORMATION					
Species Code	Abundance	QE	Vchr.	Ref. ID	
CH?AR					
POIL ✓	<u>3</u>				
POCR3					
MYSP2 ✓	<u>3</u>				
POGR					
PORI					
UTMA					
NAFL ✓	<u>2</u>				
POFR5					
MYVE					
POPE6 ✓	<u>2</u>				
POZO					
CEDE					
POAM ✓	<u>2</u>				
SCSP ✓	<u>1</u>				
LYSA ✓	<u>1</u>				
NYTV ✓	<u>3</u>				
SA SP ✓	<u>1</u>				
ARVM					
NULU					
TYLA ✓	<u>2</u>				
CASP					

*Water stars grass ✓ 3
POPU ✓ 1
ALG ✓ 1
POCOVI
Bottom
Bush ✓ 2*

Individual Plant Bed Survey

Comments: Gean's Channel
Significant Mysp

REMINDER INFORMATION			
Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand	Marl 1 = Present 0 = absent High Organic 1 = Present 0 = absent	Canopy: 1 = < 2% 2 = 2-20% 3 = 21-80% 4 = > 80%	QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown
		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-80% 4 = > 80%	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
		Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed	Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier

Aquatic Vegetation Plant Bed Data Sheet

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State of Indiana Department of Natural Resources

ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC. DATE: 8/8/06

SITE INFORMATION

Plant Bed ID: 18 Waterbody Name: WALL LAKE

Bed Size: _____

Substrate: 2 Waterbody ID: _____

Marl? 0 Total # of Species 510 EG

High Organic? 1 Canopy Abundance at Site

S: _____ N: _____ F: _____ E: 4

SITE COORDINATES

Center of the Bed

Latitude: _____

Longitude: _____

Max. Lakeward Extent of Bed

Latitude: _____

Longitude: _____

SPECIES INFORMATION

Species Code	Abundance	QE	Vchr.	Ref. ID
CH?AR	✓ 3			
POIL	✓ 2			
POCR3	✓ 1			
MYSP2	✓ 1			
POGR				
PORI				
UTMA				
NAPL	✓ 1			
POPR5				
MYVE				
POPE6	✓ 2			
POZO				
CEDE				
POAM	✓ 1			
SCSP	✓ 1			
LVSA				
NYTV	✓ 4			
SA SP	✓ 1			
ARVM				
NULU				
TYLA				
CASP				

Individual Plant Bed Survey

Plant Bed ID # 01

Travel Pattern

Water star grass ✓ 3
ELCA ✓ 3
ALGA 2

POCOV ✓
False loosestrife
Spike rush ✓ 1

Comments: Ralph's Channel

REMINDER INFORMATION

Substrate:
1 = Silt/Clay
2 = Silt w/Sand
3 = Sand w/Silt
4 = Hard Clay
5 = Gravel/Rock
6 = Sand

Marl:
1 = Present
0 = absent

High Organic:
1 = Present
0 = absent

Overall Surface Cover:
N = Nonrooted floating
F = Floating, rooted
E = Emergent
S = Submerged

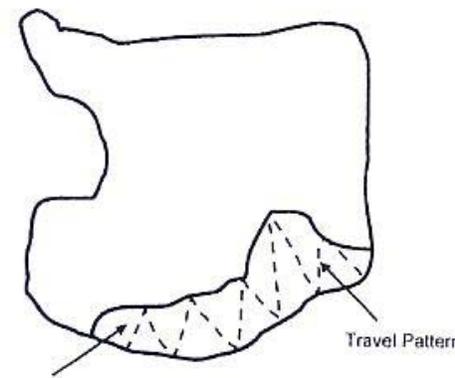
Canopy:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

Abundance:
1 = < 2%
2 = 2-20%
3 = 21-60%
4 = > 60%

QE Code:
0 = as defined
1 = Species suspx
2 = Genus suspected
3 = Unknown

Reference ID:
Unique number or letter to denote specific location of a species; referenced on attached map

Voucher:
0 = Not Taken
1 = Taken, not verified
2 = Taken, verified

Aquatic Vegetation Plant Bed Data Sheet						Page ___ of ___			
State of Indiana Department of Natural Resources									
ORGANIZATION: AQUATIC ENHANCEMENT & SURVEY, INC.			DATE: 8/8/06						
SITE INFORMATION			SITE COORDINATES						
Plant Bed ID: 19	Waterbody Name: WALL LAKE		Center of the Bed						
Bed Size:			Latitude:						
Substrate: 2	Waterbody ID:		Longitude:						
Marl? 1	Total # of Species 57 E 4		Max. Lakeward Extent of Bed						
High Organic? 1	Canopy Abundance at Site			Latitude:					
	S:	N:	F:	E: 4	Longitude:				
SPECIES INFORMATION									
Species Code	Abundance	QE	Vchr.	Ref. ID	<div style="text-align: right;">Individual Plant Bed Survey</div> 				
CH?AR	2								
POIL									
POCR3									
MYSP2									
POGR									
PORI									
UTMA	1								
NAFL	2								
POAR5									
MYVE									
POPE6									
POZO	2								
CEDE									
POAM	2								
SCSP.	1								
LVSA									
NYTV	4								
SA SP.									
AKVM									
NULU	3								
TYLA	2								
CASP									
REMINDER INFORMATION									
Substrate: 1 = Silt/Clay 2 = Silt w/Sand 3 = Sand w/Silt 4 = Hard Clay 5 = Gravel/Rock 6 = Sand		Marl: 1 = Present 0 = absent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		QE Code: 0 = as defined 1 = Species suspi 2 = Genus suspected 3 = Unknown		Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map	
Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent S = Submersed		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifex					
<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>heart leaf bnd weed 2</p> <p>Water Star Grass 1</p> <p>Pocota</p> </div> <div style="width: 30%; border: 1px solid black; padding: 5px;"> Comments: Emergent Bed </div> </div>									

Appendix C Tier II Data Sheets 8/06

APPENDIX A

- 0-5 10+
 - 6-10.9 10+
 - 11-15.9 10+
 - 16-20.9 9 10
 - 21-25 10

Submersed Aquatic Plant Survey Form

Page ___ of ___

WATER BODY NAME		WAL		SECCHI															
COUNTY		STEVENS		MAX PLANT DEPTH															
DATE		8/8/06		WEATHER															
CREW LEADER		SB		COMMENTS															
RECORDER		DJG																	
Rake score (1-5), observed only (9), algae present (p) Use acronyms for species, V1, V2...for voucher codes																		Note	
																		Species Code	
Site	WPT	Nothing	Easting	Depth	-ft	CHAR	Pool	Point	MSP2	ROG3	RM1	UTM	NAFL	SPINY	POPE	Other CEDE			
1	73		0-5	3ft	0-5	5											1		
2	74		0-5	5ft	0-5	5	3												
3	75		0-5	3ft	0-5	3		1		X			1						
4	76		0-5	5ft	0-5	5									1		1		
5	77		0-5	2ft	0-5	5	1												
6	78		0-5	3ft	0-5	5		5											
7	79		0-5	2ft	0-5	3		1											
8	80		0-5	2ft	0-5	1	1	1					1						
9	81		0-5	2ft	0-5	1													
10	82		5-10	6ft	6-10	5		1											
11	83		5-10	7ft	6-10	5	5	1											
12	84		5-10	6ft	6-10	5	3	1											
13	85		10-15	12.5ft	11-15	1			1										
14	86		5-10	8ft	6-10	5													
15	87		15-20	17ft	16-20														
16	88		10-15	11ft	6-10														
17	89		10-15	11ft	11-15				1										
18	90		10-15	11ft	6-10														
19	91		15-20	16ft	16-20	1													
20	114		5-10	5ft	6-10	5													
21	115		5-10	7ft	6-10	3													
22	116		15-20	18ft	16-20	3													
23	117		5-10	7ft	6-10	5													
24	118		5-10	7ft	6-10	5	1												
25	119		10-15	11ft	11-15	3				1									
26	299		15-20	15ft	11-15	5													
27	300		5-10	7ft	6-10														
28	301		0-5	4ft	0-5	3													
29	302		0-5	3ft	0-5	3							1						
30	303		5-10	7ft	6-10	5	5												
31	314		5-10	8ft	6-10	5	3												
32	315		10-15	12ft	11-15			3											
Other plant species observed at lake																			
33	316		0-5	2.5ft	0-5	1	1												

APPENDIX A

Submersed Aquatic Plant Survey Form

Page ____ of ____

WATER BODY NAME		WALL		SECCHI	
COUNTY		STEVENS		MAX PLANT DEPTH	
DATE		8/8/06		WEATHER	
CREW LEADER		SB		COMMENTS	
RECORDER		DJG			

Rake score (1-5), observed only (9), algae present (p)
Use acronyms for species, V1, V2...for voucher codes

Note

Site	Species Code														Voucher Code		
	UPT	Nothing	Eastings	Depth	ALL	CHAR	POIL	POG1	MSP2	POA3	PO1	VMA	NAFL	SPINY		POPE	
34	318		15-20	8ft	15-20												
35	366		5-10	8ft	6-10	5											5
36	367		5-10	9ft	6-10	5											5
37	368		0-5	2ft	0-5	3											
38	369		0-5	2ft	0-5												
39	370		15-20	16ft	15-20												
40	371		15-20	17ft	15-20												
	372		15-20	15ft	11-15												
42	373		5-10	8ft	6-10												
	374		10-15	8ft	11-15												
44	375		15-20	17ft	16-20												
45	376		15-20	17ft	16-20												
	377		10-15	14ft	11-15	5											
47	378		10-15	15ft	11-15												
48	379		15-20	17ft	16-20												
	380		10-15	14ft	11-15												
49	381		10-15	13ft	11-15	1											
	382		10-15	14ft	11-15	5											
52	41° 48' 63"	85°	12.11	18	16-20	5											
53	.65		.12	21	21-25												
54	.62		.19	23	21-25												
55	.62		.27	24	21-25												
56	.66		.41	24	21-25												
57	.72		.35	24	21-25												
58	.76		.29	23	21-25												
59	.81		.20	24	21-25												
60	.75		.13	22	21-25												
61	.70		.15	24	21-25												
62	.64		.14	24	21-25												

Other plant species observed at lake

Appendix D 2007 Season IDNR Vegetation Permit Application



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)
 Approved State Board of Accounts 1987
 Whole Lake Multiple Treatment Areas
 Check type of permit

FOR OFFICE USE ONLY	
License No.	
Date Issued	
Lake County	

Return to: Page 1 of 34
 DEPARTMENT OF NATURAL RESOURCES
 Division of Fish and Wildlife
 Commercial License Clerk
 402 West Washington Street, Room W273
 Indianapolis, IN 46204

FEE: \$5.00

INSTRUCTIONS: Please print or type information

Applicant's Name Tom Johnson		Lake Assoc. Name Wall Lake Fisherman's Association	
Rural Route or Street 5945 N. 1185 E.		Phone Number	
City and State Orland, IN 46776		ZIP Code	
Certified Applicator (if applicable)		Company or Inc. Name	
Rural Route or Street		Certification Number	
City and State		ZIP Code	

Lake (One application per lake) Wall Lake	Nearest Town Orland	County LaGrange
Does water flow into a water supply		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 N41 43.603 W85 12.079		
Total acres to be treated 10	Proposed shoreline treatment length (ft) open lake	Perpendicular distance from shoreline (ft) varies	
Maximum Depth of Treatment (ft) 15	Expected date(s) of treatment(s) 5/15/2007		
Treatment method: <input checked="" type="checkbox"/> Chemical <input type="checkbox"/> Physical <input type="checkbox"/> Biological Control <input type="checkbox"/> 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. Littoral Seek and Destroy on up to 5 acres of Eurasian watermilfoil, 2-4-D granular			
Plant survey method: <input checked="" type="checkbox"/> Rake <input checked="" type="checkbox"/> Visual <input checked="" type="checkbox"/> Other (specify) Tier I and Tier II surveys, see Wall LARE Plant Plan			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Eurasian watermilfoil	X	38%
Illinois pondweed		9%
Slender naiad		13%
Chara		18%
Great Bladderwort		1%
Vallisneria		8%
Curly-leaf pondweed		5%
Coontail		2%
Flatstem pondweed		2%
Largeleaf pondweed		1%
Sago pondweed		1%
Variable pondweed/Spiny naiad		1%
Small pondweed		1%



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)
 Approved State Board of Accounts 1987
 Whole Lake 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 2 of 34
 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 Tom Johnson		Lake Assoc. Name Wall Lake Fisherman's Association	
Rural Route or Street 5945 N. 1185 E.		Phone Number	
City and State Orland, IN 46776		ZIP Code	
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number	
Rural Route or Street			
City and State		ZIP Code	
Lake (One application per lake) Wall Lake		Nearest Town Orland	County LaGrange
Does water flow into a water supply		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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 #	2	LAT/LONG or UTM's		N41.72896 W85.20168	
Total acres to be rolled	3	Proposed shoreline treatment length (ft)	open lake	Perpendicular distance from shoreline (ft)	varies
Maximum Depth of Treatment (ft)	15	Expected date(s) of treatment(s)			4/10/2007
Treatment method:	<input checked="" type="checkbox"/> Chemical	<input type="checkbox"/> Physical	<input type="checkbox"/> Biological Control	<input type="checkbox"/> 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.					
Aquathol K liquid					
Plant survey method:	<input checked="" type="checkbox"/> Rake	<input checked="" type="checkbox"/> Visual	<input checked="" type="checkbox"/> Other (specify) Tier I and Tier II surveys, see Wall LARE Plant Plan		
Aquatic Plant Name	Check if Target Species		Relative Abundance % of Community		
Eurasian watermilfoil			38%		
Illinois pondweed			9%		
Slender naiad			13%		
Chara			18%		
Great Bladderwort			1%		
Vallisneria			8%		
Curly-leaf pondweed	X		5%		
Coontail			2%		
Flatstem pondweed			2%		
Largeleaf pondweed			1%		
Sago pondweed			1%		
Variable pondweed/Spiny naiad			1%		
Small pondweed			1%		



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)
 Approved State Board of Accounts 1987
 Whole Lake Multiple Treatment Areas
 Check type of permit

FOR OFFICE USE ONLY	
License No.	
Date Issued	
Lake County	

Return to: Page 3 of 4
 DEPARTMENT OF NATURAL RESOURCES
 Division of Fish and Wildlife
 Commercial License Clerk
 402 West Washington Street, Room W273
 Indianapolis, IN 46204

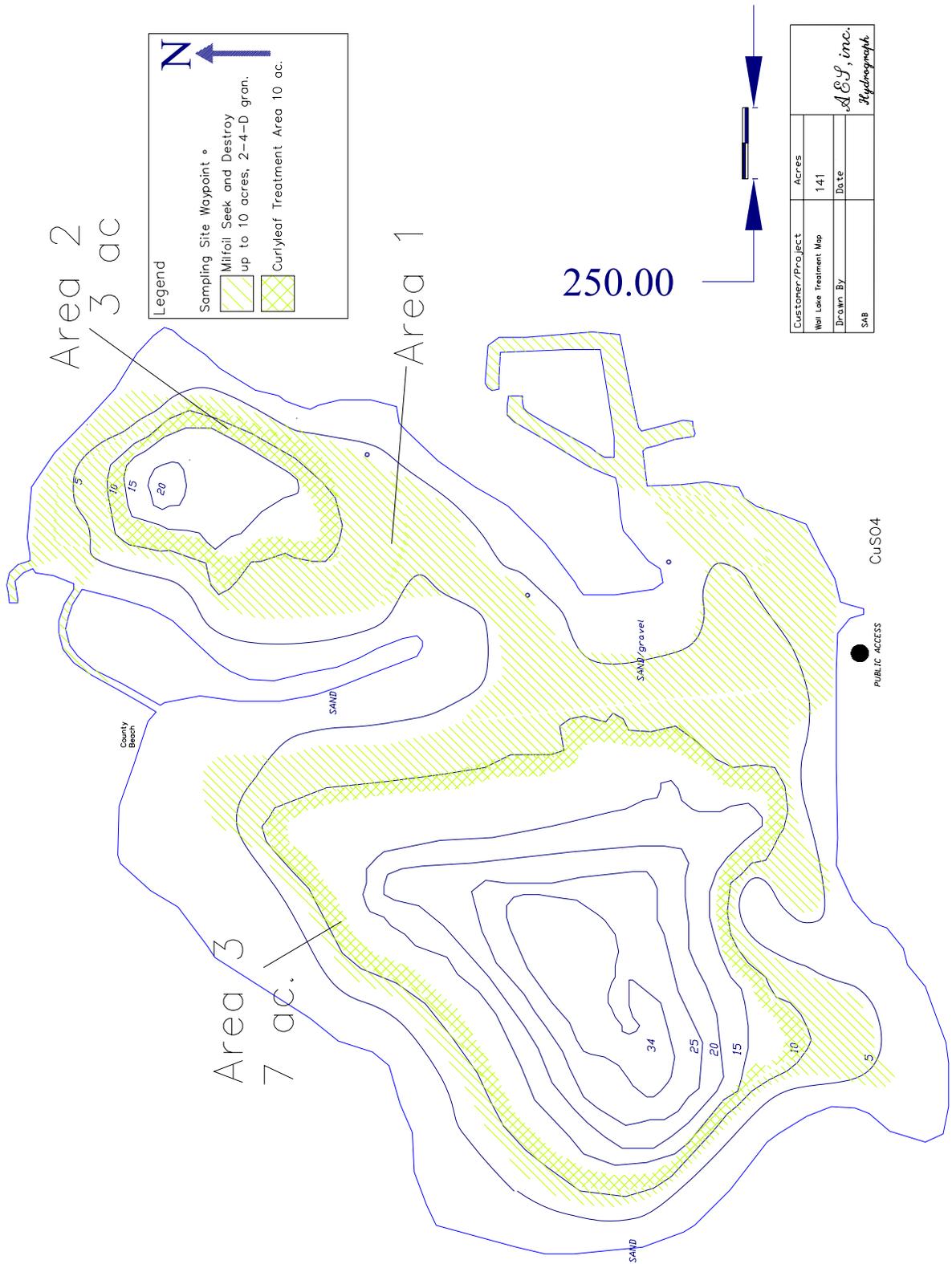
INSTRUCTIONS: Please print or type information

FEE: \$5.00

Applicant's Name Tom Johnson		Lake Assoc. Name Wall Lake Fisherman's Association	
Rural Route or Street 5945 N. 1185 E.		Phone Number	
City and State Orland, IN 46703		ZIP Code	
Certified Applicator (if applicable)		Company or Inc. Name	
Rural Route or Street		Certification Number	
City and State		ZIP Code	
Lake (One application per lake) Wall Lake		Nearest Town Orland	
		County LaGrange	
Does water flow into a water supply		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 #	2	LAT/LONG or UTM's		N41.72977 W85.20309
Total acres to be treated	7	Proposed shoreline treatment length (ft)	open lake	Perpendicular distance from shoreline (ft)
Maximum Depth of Treatment (ft)	15	Expected date(s) of treatment(s)	4/10/2007	
Treatment method:	<input checked="" type="checkbox"/> Chemical	<input type="checkbox"/> Physical	<input type="checkbox"/> Biological Control	<input type="checkbox"/> 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				
Aquathol K liquid				
Plant survey method	<input checked="" type="checkbox"/> Rake	<input checked="" type="checkbox"/> Visual	<input checked="" type="checkbox"/> Other (specify) Tier I and Tier II surveys, see Wall LARE Plant Plan	
Aquatic Plant Name	Check if Target Species		Relative Abundance % of Community	
Eurasian watermilfoil			38%	
Illinois pondweed			9%	
Slender naiad			13%	
Chara			18%	
Great Bladderwort			1%	
Vallisneria			8%	
Curly-leaf pondweed	X		5%	
Coontail			2%	
Flatstem pondweed			2%	
Largeleaf pondweed			1%	
Sago pondweed			1%	
Variable pondweed/Spiny naiad			1%	
Small pondweed			1%	



Appendix E Additional Resources

Calendar of lake management, conferences, classes, and workshops

Lake Pleasant residents can attend the following events to learn more about lake management and converse with other lake associations and lake management professionals regarding treatment programs

2007

March 30th and 31st, Indiana Lakes Management Society conference. Lake Monroe, Bloomington Indiana. More information is available at www.indianalakes.org or by calling 260-665-8226

October, Several local workshops offered by the Indiana Lakes Management Society, dates to be announced. More information is available at www.indianalakes.org or by calling 260-665-8226

Sources of local, state, and federal funding and information

Funding assistance for watershed wetland and grassland restoration is available from:

Ducks Unlimited
Great Lakes/Atlantic Regional Office
331 Metty Drive, Suite #4
Ann Arbor, MI 48103
734-623-2000

Pheasants Forever, Northeast Indiana Chapter
Habitat Officer, Dave Hurley
1003 County Road 8
Corunna, IN 46730

Other help for watershed improvements can be obtained from:

Indiana Department of Natural Resources
Division of Fish and Wildlife Room W265
402 W. Washington Street
Indianapolis, IN 46204-2739
317-233-5468

USDA Natural Resources Conservation Service
1220 N 200W
Angola, IN 46703

Wood-Land-Lakes RC&D

Peachtree Plaza 200
1220 N 200 W -Ste J
Angola, IN 46703
260-665-3211, Ext. 5