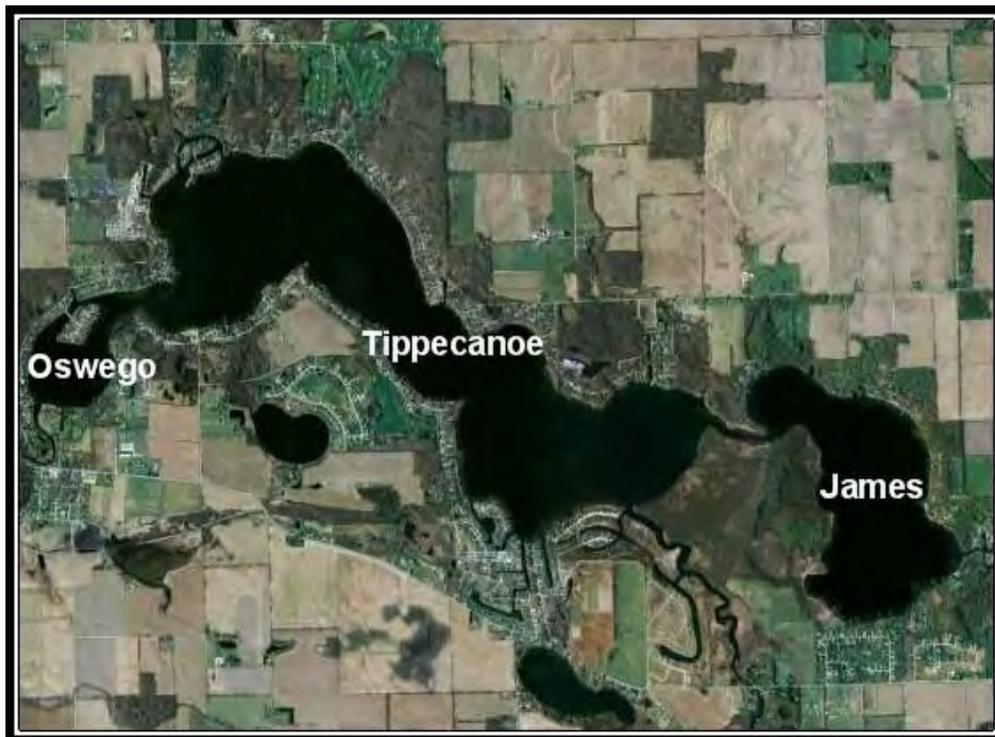


*Lake Tippecanoe
Aquatic Vegetation Management Plan
2013 Update
Kosciusko County, Indiana*

January 23, 2014



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Executive Summary

Lake Tippecanoe, including James and Oswego lakes, is a 1,110 acre chain of natural lakes located 2 miles west of North Webster, Indiana in Kosciusko county (individually Oswego covers 75 acres, Tippecanoe 763 acres, and James 272 acres). The primary invasive species within the chain are Eurasian watermilfoil (*Myriophyllum spicatum*) and curlyleaf pondweed (*Potamogeton crispus*). Eel grass (*Vallisneria americana*) and filamentous bluegreen algae are also abundant in Lake Tippecanoe and can reach nuisance levels. Lake Tippecanoe Property Owners Association (LTPOA) has actively managed Eurasian watermilfoil and curlyleaf pondweed for many years. LTPOA funded invasive treatments were initiated in 2003 and continued through present day.

In 2013, LTPOA was awarded a Lake and River Enhancement (LARE) grant of \$39,800 for creation of a plan update and early season spot treatment of curlyleaf pondweed and Eurasian watermilfoil. An invasive species survey completed on May 7th found 97.9 acres of Eurasian watermilfoil and 105.1 acres of curlyleaf pondweed. Treatment of these areas was completed on May 15th with a combination of 2,4-D and endothal based herbicides (brand names: DMA 4 and Aquathol K). In late July a map was presented to LTPOA and Indiana Department of Natural Resources (IDNR) biologists requesting treatment of 28.9 acres of eel grass. IDNR approved treatment of 11 acres of eel grass. This area was treated on August 8th with a copper based herbicide (Nautique) and an endothal based herbicide (Hydrothol 191). A Tier II survey of all three lakes was completed on August 28th. The survey found invasive curlyleaf pondweed and Eurasian watermilfoil to be well below the 10% frequency of occurrence objective in all lakes. The number of sites with plants decreased from previous surveys as well as the maximum plant depth. This could be due to the early spring flooding and cooler conditions. On September 5th starry stonewort (*Nitellopsis obtusa*), a new invasive species to the Tippecanoe chain of lakes, was discovered by Aquatic Weed Control in a channel along the southwestern shore of Tippecanoe Lake. Aquatic Weed Control applied Cutrine Ultra and Hydrothol 191 liquid to a 4.65 acre area on September 10th to control the starry stonewort. The treatment was funded through the Great Lakes Restoration Initiative (GLRI).

It is important to continue with the current strategy of maintaining invasive species at low levels with early season selective herbicide treatments. Areas of known starry stonewort infestation should continue to be monitored and treated to lessen the chance of its further spread. In addition, summer Tier II surveys should be continued in order to document changes in the plant community. Control of eel grass and filamentous algae appears to now be one of the primary concerns of residents and LTPOA members. Eel grass is considered a beneficial species for fish and wildlife, so control will be closely monitored. It is advised that eel grass control should be a three pronged approach that involves herbicide treatment in approved areas, physical removal of washed up plant material, and education and/or restrictions on near shore boating which is likely creating the floating mats. In addition, the ecozone should continue to be monitored. The original plan for the ecozone was to conduct a survey every three years. The next scheduled ecozone survey should take place in 2015.

Acknowledgements

Funding for the vegetation sampling and preparation of an aquatic vegetation management plan was provided by the LTPOA and the Indiana Department of Natural Resources Lake and River Enhancement Program. Aquatic Control, Inc. completed the fieldwork, data processing, and map generation. Special thanks are due to Holly LaSalle and Jeff Thornburgh with the LTPOA for their help in initiating and completing this project. Special thanks are given to Indiana Department of Natural Resources-Division of Fish and Wildlife staff, for assistance and review of this plan. Author of this report is Nathan Long of Aquatic Control. The author would like to acknowledge the valuable input from Patrick Whitson, Brendan Hastie, and Barbie Huber of Aquatic Control for their field assistance, map generation, review, and editing of this report.

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1.0 Problem Statement and Management History

1.1 Problem Statement

The primary invasive species within the Tippecanoe chain are Eurasian watermilfoil and curlyleaf pondweed (Figure 1). Starry stonewort is a newly discovered invasive species observed growing in Lake Tippecanoe in 2013 (Figure. 2). These invasive species can create dense surface mats that impact navigation, swimming, fishing, native vegetation, and property values. Eel grass and filamentous bluegreen algae are also abundant in Lake Tippecanoe and can reach nuisance levels.



Figure 1. Illustrations of Eurasian watermilfoil (left) and curlyleaf pondweed (right) (Illustrations provided by Applied Biochemist).



Figure 2. Starry stonewort discovered in Lake Tippecanoe on September 5, 2013 (picture supplied by Aquatic Weed Control).

1.2 Goals and Objectives

An effective aquatic vegetation management plan must include well-defined goals and objectives. Listed below are three goals formulated by LARE program staff and Division of Fish and Wildlife Biologists:

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

The objectives of the initial plan were:

- Maintain Eurasian watermilfoil and curlyleaf pondweed below 10% frequency of occurrence in all three lakes.
- Maintain at least 11, 10, and 12 native plants collected each year in the summer tier II survey at James, Oswego, and Tippecanoe Lakes, respectively.
- Maintain a native species diversity of 0.77, 0.81, and 0.79 each year in the summer tier II survey at James, Oswego, and Tippecanoe Lakes, respectively.
- Maintain native coverage of 80%, 70%, and 80% each year in the summer tier II survey at James, Oswego, and Tippecanoe Lakes, respectively.

The discovery of starry stonewort On September 5, 2013 prompts an additional objective of:

- Detecting and controlling starry stonewort wherever it is found to keep it from spreading throughout the chain of lakes

1.3 Plant Management History

LTPOA has been funding invasive treatments on the Tippecanoe chain since 2003. Up until 2012 these treatments have focused on main lake areas of the chain. These treatments are summarized in Table 1. In addition, LTPOA has funded treatment of eel grass. These treatments have been limited to areas approved by IDNR. These treatments are outlined in Table 2. LTPOA is not the only party funding vegetation management on these lakes. Individual lot owners and channel associations have historically funded treatment of a wide variety of vegetation. It is somewhat difficult to summarize these small scale treatments, but Table 3 is that attempt. The information in Table 3 was obtained from IDNR permit reports.

Table 1. LTPOA funded invasive plant controls since 2003.

Year	Species Targeted	Lakes Treated	Acres Treated	Chemical	Conc. (ppm)
2003 ¹	Milfoil & Curlyleaf	Tippe & Oswego	35.0	Renovate & Aquathol	1.5 & 0.5
2004 ¹	Milfoil & Curlyleaf	Tippe & Oswego	32.0	Renovate & Aquathol	1.5 & 0.5
2005 ¹	Milfoil & Curlyleaf	Tippe, James, & Oswego	21.5	Renovate & Aquathol	1.5 & 0.5
2006*	Milfoil	Tippe, James, & Oswego	37.0	Renovate	1.5
2007* ²	Milfoil & Curlyleaf	Tippe, James, & Oswego	CLP-104 & EWM-34.0	Renovate & Aquathol	1.5 & 1.0
2008* ²	Milfoil & Curlyleaf	Tippe, James, & Oswego	CLP-104 & EWM-32.5	Renovate & Aquathol	1.5 & 1.0
2009* ²	Milfoil & Curlyleaf	Tippe, James, & Oswego	CLP-104 & EWM-51.8	Renovate & Aquathol	1.5 & 1.0
2010	Milfoil	Tippe, James, & Oswego	EWM-34.8	Renovate	1.5
2011	Milfoil & Curlyleaf	Tippe, James, & Oswego	EWM-16.5 & CLP-46	2,4-D & Aquathol	1.0-2.0 & 1.0
2012* ³	Milfoil & Curlyleaf	Tippe, James, & Oswego	EWM-101.1 & CLP-98.6	2,4-D & Aquathol	1.0-2.0 & 1.0
2013* ^{3,4}	Milfoil, Curlyleaf, & Starry stonewort	Tippe, James, & Oswego	EWM-77.7, CLP-84.9, & SSW-4.65	2,4-D, Aquathol, Cutrine Ultra, & Hydrothol	1.0-2.0, 1.0, 0.8, & 1 quart per acre

*LARE funds used to cover portion of treatment

¹ Only areas of milfoil treated, added 0.5 ppm Aquathol to knock down curlyleaf which was also present in those areas

² All main lake areas of curlyleaf pondweed were treated in early season in an attempt to reduce turion bank

³ Included all areas of milfoil and curlyleaf pondweed

⁴ Starry stonewort treatments funded by Great Lakes Restoration Initiative (GLRI)

Table 2. LTPOA funded eel grass treatments.

Year	Species Targeted	Lakes Treated	Acres	Herbicide	Herbicide Concentration (ppm)
2004	Eel grass	Tippe, James, Oswego	8	Nautique	1
2005	Eel grass	Tippe & James	4	Nautique	1
2006	Eel grass	Tippe	7.5	Nautique	1
2011	Eel grass	Tippe	11.1	Nautique	1
2012	Eel grass	Tippe	9.5	Nautique	1
2013	Eel grass	Tippe	11	Nautique and Hydrothol	1 and 0.2

Table 3. Summary of lot and channel treatments not funded by LTPOA, according to IDNR permit reports.

Oswego Lake

Year	Species Listed on Permit Report	Acres
2009	Coontail & algae	4.91
2010	Milfoil, curlyleaf pondweed, sago pondweed	0.68
2011	Milfoil, curlyleaf pondweed, algae, chara	8.80
2012	Coontail, algae, milfoil, curlyleaf pondweed, eel grass, naiad	9.61
2013	Eurasian watermilfoil, curlyleaf pondweed, algae, naiad, and eel grass,	12.44

Lake Tippecanoe

Year	Species Listed on Permit Report	Acres
2009	Eurasian milfoil, eel grass, northern milfoil, naiad, curlyleaf, sago pondweed, and coontail	19.03
2010	Eel grass, coontail, northern milfoil, curlyleaf, Eurasian milfoil, algae	11.25
2011	Eurasian milfoil, curlyleaf pondweed, algae coontail	48.35
2012	Coontail, algae, milfoil, curlyleaf pondweed, sago pondweed, naiad	15.77
2013	Eurasian watermilfoil, curlyleaf pondweed, naiad, sago pondweed, eel grass, algae, and coontail	24.16

James Lake

Year	Species Listed on Permit Report	Acres
2009	Coontail and algae	4.91
2010	Milfoil, curlyleaf pondweed, & algae	0.68
2011	Milfoil, curlyleaf, algae, eel grass, & naiad	8.80
2012	Curlyleaf, milfoil, coontail, algae, sago, naiad, elodea	8.54
2013	Eurasian watermilfoil, curlyleaf pondweed, coontail, algae, and sago pondweed	1.61

The invasive species survey had to be postponed several times due to high water, below normal spring temperatures, and flooding. The survey was finally completed on May 7th and found 97.9 acres of Eurasian watermilfoil and 105.1 acres of curlyleaf pondweed. Only 52.8 acres of Eurasian watermilfoil was mapped and treated within the main lake areas. A total of 57.2 acres of curlyleaf pondweed was identified within the main lake areas. With a few exceptions, these species were typically growing together in the same areas. Comparable amounts of Eurasian watermilfoil and curlyleaf pondweed were found in 2013 as to the previous year's survey. An initial treatment was completed on May 15th with a combination of 1.0 ppm liquid 2,4-D and Aquathol in channel areas that contained both species, 1.0 ppm of Aquathol in areas containing only curlyleaf pondweed, and 2.0 ppm of liquid 2,4-D in areas that contained only Eurasian watermilfoil or main lake areas of Eurasian watermilfoil. Aquatic Control (AC) completed treatment on the main lake areas and Aquatic Weed Control (AWC) completed treatments in the channels. This treatment is summarized in Table 4 and illustrated in Figure 3.

Table 4. Oswego, Tippecanoe, & James Lakes May 15, 2013 Invasive Species Treatment.

Area	Species	Acres	Avg Depth (ft)	Acre Ft	Product	Concentration (ppm)	Channel/ Main Lake
AC1	CLP	2.75	4	11	Aquathol	1	Lake
AC2	EWM & CLP	1.9	4	7.6	Aquathol & DMA	1.0 & 2.0	Lake
AC3	EWM & CLP	2	3	6	Aquathol & DMA	1.0 & 2.0	Lake
AC4	EWM & CLP	24.5	5	122.5	Aquathol & DMA	1.0 & 2.0	Lake
AC5	EWM & CLP	9.5	4	38	Aquathol & DMA	1.0 & 2.0	Lake
AC6	EWM & CLP	4.5	5	22.5	Aquathol & DMA	1.0 & 2.0	Lake
AC7	EWM & CLP	10.4	5	52	Aquathol & DMA	1.0 & 2.0	Lake
AC8	EWM & CLP	2	3	6	Aquathol & DMA	1.0 & 1.0	Channel
AC9	CLP	1.1	3	3.3	Aquathol	1	Channel
AC10	CLP	1.6	5	8	Aquathol	1	Lake
AWC1	CLP	1.75	4	7	Aquathol	1	Channel
AWC2	EWM & CLP	1.4	4	5.6	Aquathol & DMA	1.0 & 1.0	Channel
AWC3	EWM & CLP	3.5	4	14	Aquathol & DMA	1.0 & 1.0	Channel
AWC4	EWM & CLP	2.6	3	7.8	Aquathol & DMA	1.0 & 1.0	Channel
AWC5	EWM & CLP	1.6	4	6.4	Aquathol & DMA	1.0 & 1.0	Channel
AWC6	EWM & CLP	5.75	3	17.3	Aquathol & DMA	1.0 & 1.0	Channel
AWC7	EWM & CLP	1.5	4	6	Aquathol & DMA	1.0 & 1.0	Channel
AWC8	EWM & CLP	3.2	3	9.6	Aquathol & DMA	1.0 & 1.0	Channel
AWC9	EWM & CLP	3.4	3	10.2	Aquathol & DMA	1.0 & 1.0	Channel

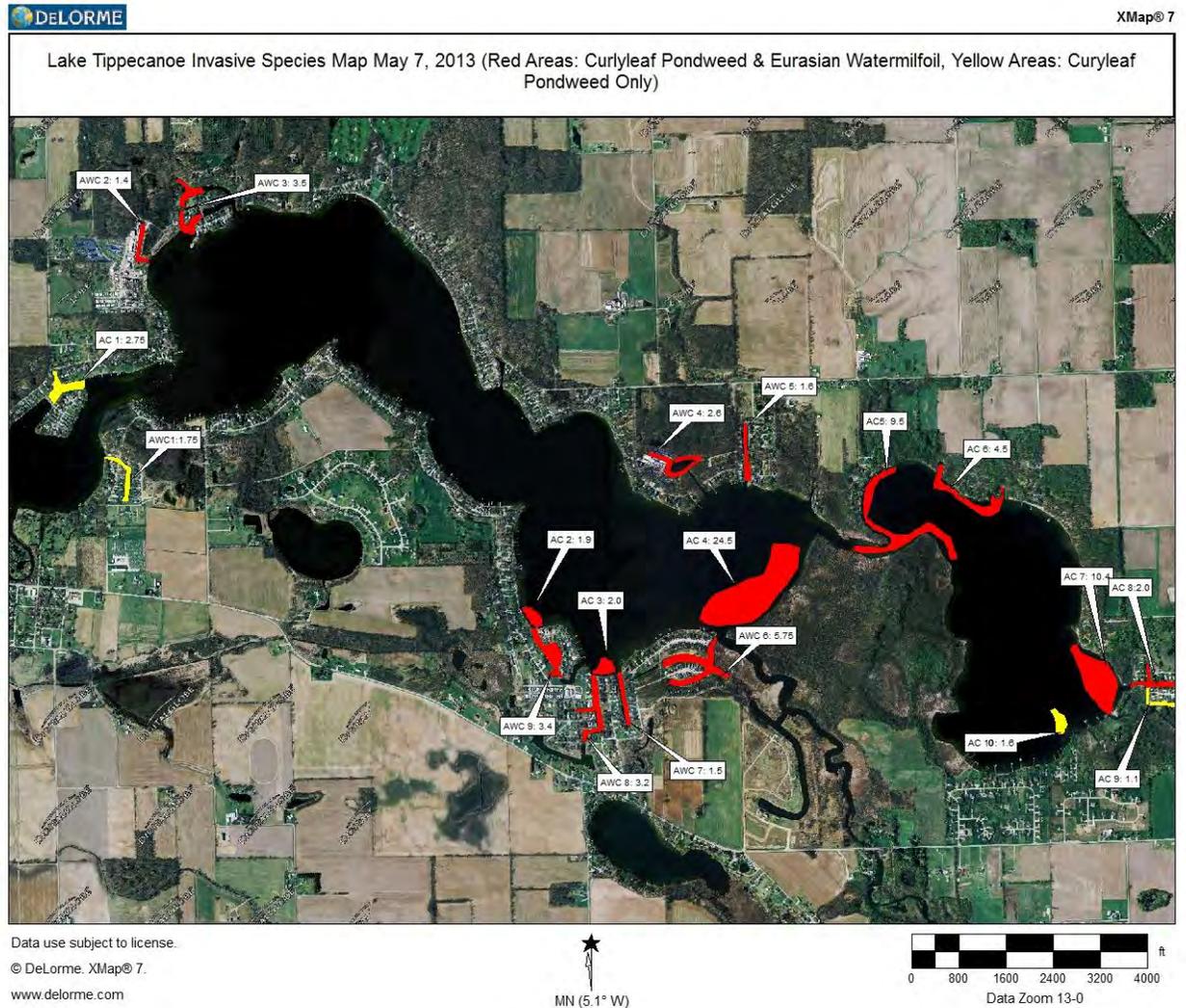


Figure 3. Lake Tippecanoe Eurasian watermilfoil and curlyleaf pondweed treatment areas, May 15, 2013 (Red=CLP & EWM, Yellow=CLP only).

In addition to the invasive treatments, LTPOA also funded treatment of eel grass. In mid-July, areas deemed to have potentially nuisance levels of eel grass were mapped out by Aquatic Control. This map was sent to IDNR and LTPOA for approval following inspection. IDNR approved treatment of 11 acres. These areas were treated with 1.0 ppm Nautique and 0.2 ppm hydrothol herbicide on August 8th (Figure 4).

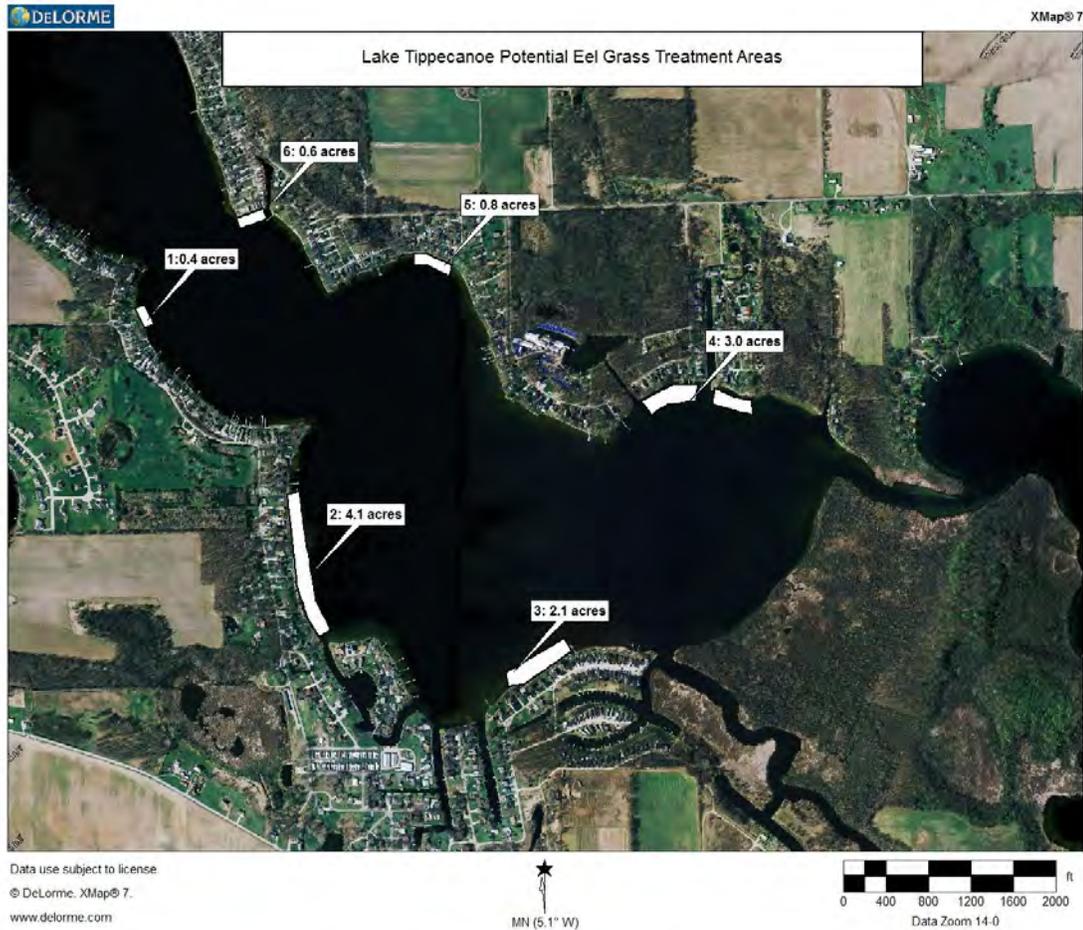


Figure 4. Lake Tippecanoe eel grass treatment areas, August 8, 2013.

Starry stonewort was first observed growing in Lake Tippecanoe by Aquatic Weed Control on September 5, 2013. It was found growing in a 4.65 acre channel along the southwestern shore. The finding was reported to IDNR and Aquatic Weed Control completed a treatment to the area on September 10, 2013. Cutrine Ultra was applied at a rate of 2.3 gallons per acre-foot along with Hydrothol 191 at 1 quart per acre. This treatment was funded by GLRI. The starry stonewort area is shown in Figure 5.



Figure 5. Starry stonewort treatment area (red), September 10, 2013 (map provided by IDNR).

2.0 AQUATIC PLANT COMMUNITY CHARACTERIZATION

Aquatic vegetation sampling must be completed in order to create an effective aquatic vegetation management plan. Sampling provides valuable data that allows managers to accomplish several tasks: locate areas of nuisance and beneficial vegetation; monitor changes in abundance of native and exotic species; monitor and react to changes in the overall plant community; monitor the effectiveness of management techniques; and compare the plant communities to other populations. In 2013, LARE and the LTPOA funded an invasive species mapping survey and a Tier II survey. The invasive mapping survey was covered in Section 1.3.

2.1 Tier II Sampling Results

2.1.1 Methods

The tier II survey helps meet the following objectives:

1. to document the distribution and abundance of submersed and floating-leaved aquatic vegetation
2. to compare present distribution and abundance with past distribution and abundance within select areas

The same sites used in past tier II surveys were used again in the 2013 survey (Figure 6). Once a site was reached the boat was slowed to a stop and the coordinates were recorded on a hand-held GPS unit and later downloaded into a mapping program. A depth measurement was taken by dropping a two-headed standard sampling rake that was attached to a rope marked off in 1-foot increments. An additional ten feet of rope was released and the boat was reversed at minimum operating speed for a distance of ten feet. Once the rake is retrieved individual species abundance on the rake is scored with either a 0 (no plants retrieved), 1 (1-20% of rake teeth filled), 3 (21-99% of rake teeth filled), or 5 (100% of rake teeth filled) (IDNR 2010).

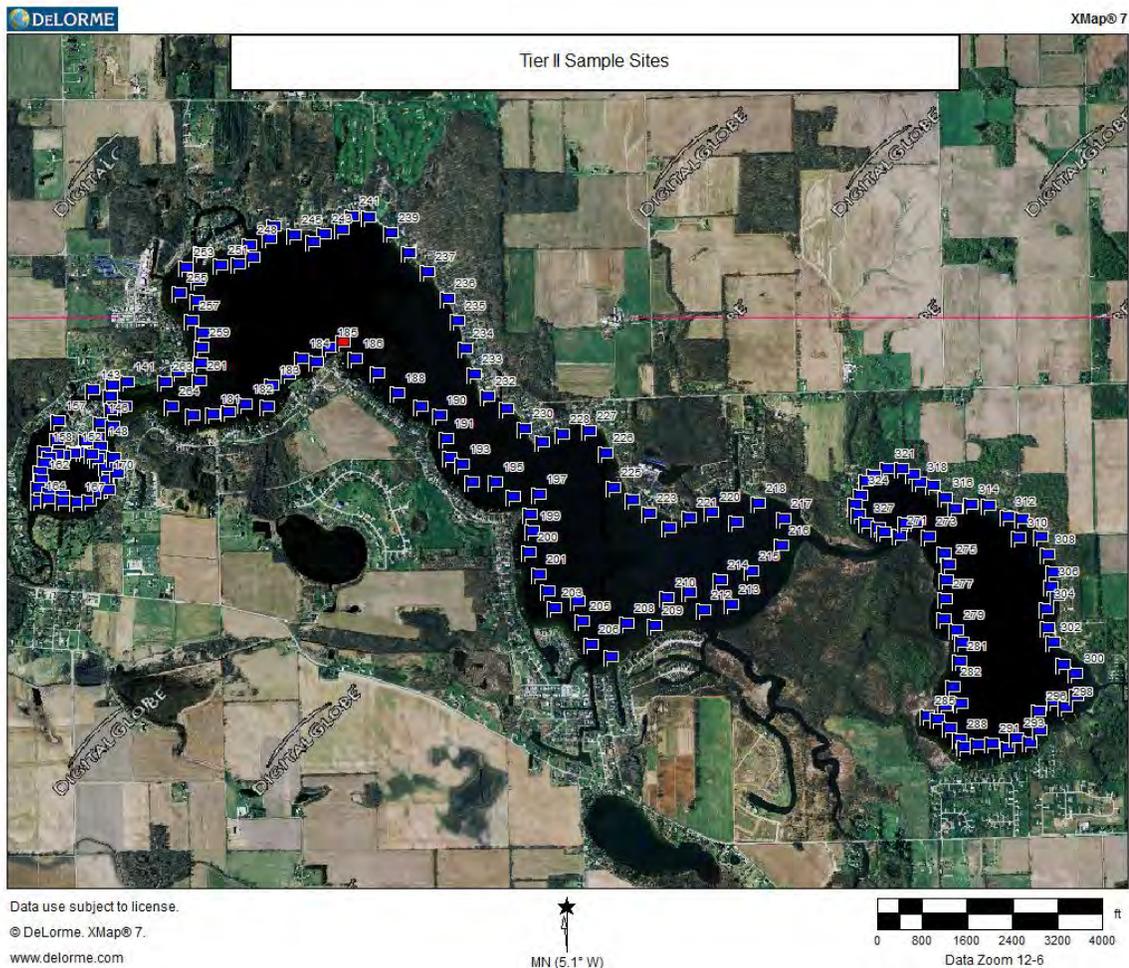


Figure 6. Tier II Sample Sites.

2.1.2 Oswego Lake

On August 28, 2013, forty sites were sampled on Oswego Lake. Twelve species were collected and plants were present at 17 sites. Eel grass was the most frequently occurring species (40%). Eurasian watermilfoil was the only invasive species collected. (Figure 7). No plants were collected in the 15-20ft contour. Results of the survey are summarized in Table 5.

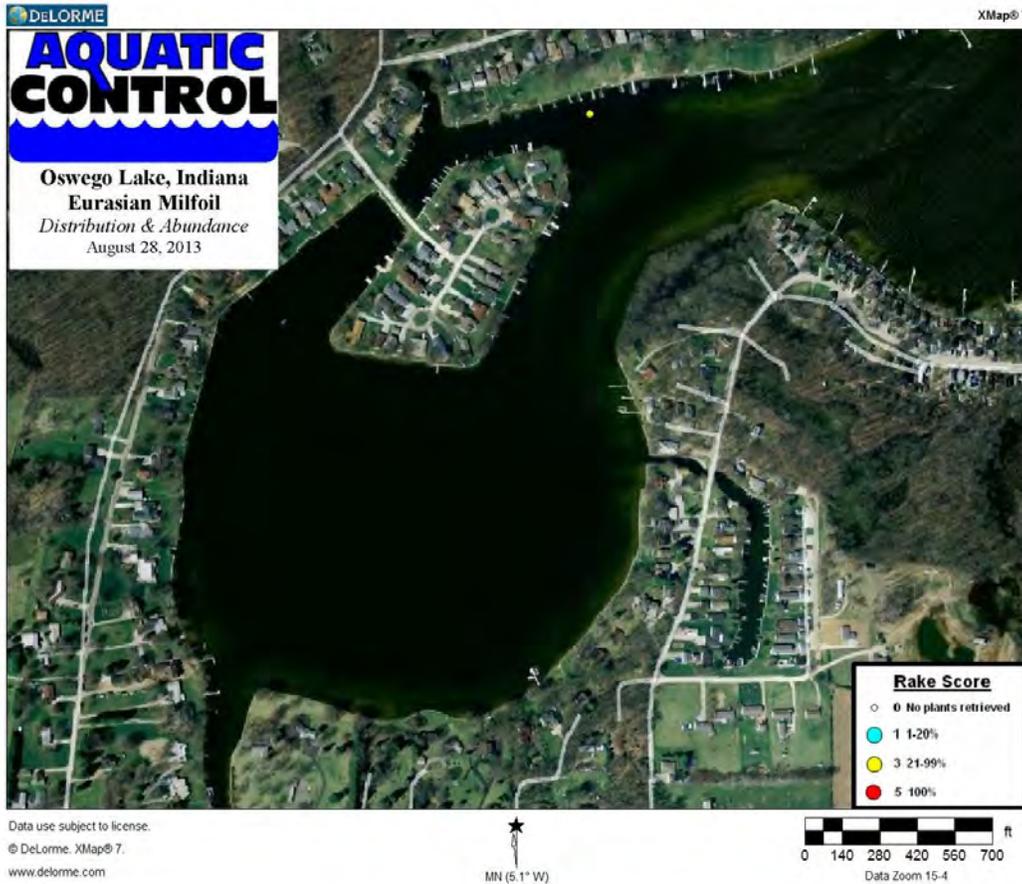


Figure 7. Eurasian watermilfoil location on Oswego Lake, August 28, 2013.

Table 5. Occurrence and abundance of submersed aquatic plants in Oswego Lake, August 28, 2013.

Occurrence and Abundance of Submersed Aquatic Plants in Oswego Lake (all depths).							
County:	Kos	Total Sites:	40	Mean species/site:	1.30		
Date:	8.28.13	Sites with plants:	17	SE Mean species/site:	0.29		
Secchi (ft):	7.0	Sites with native plants:	17	Mean native species/site:	1.28		
Max Plant Depth (ft):	10.0	Number of species:	12	SE Mean natives/site:	0.28		
Trophic Status:	Meso	# of native species:	11	Species diversity:	0.84		
		Maximum species/site:	6	Native species diversity:	0.83		
All Depths (0 to 20 ft)	Frequency of Occurrence	Rake score freq per sp.				Plant Dominance	
Species		0	1	3	5		
Eel grass	40.0	60.0	10.0	5.0	25.0	30.0	
Southern naiad	22.5	77.5	5.0	10.0	7.5	14.5	
Chara	17.5	82.5	7.5	2.5	7.5	10.5	
Illinois pondweed	10.0	90.0	7.5	2.5	0.0	3.0	
Nitella	10.0	90.0	10.0	0.0	0.0	2.0	
coontail	7.5	92.5	5.0	0.0	2.5	3.5	
Leafy pondweed	5.0	95.0	2.5	2.5	0.0	2.0	
Sago pondweed	5.0	95.0	0.0	2.5	2.5	4.0	
Slender naiad	5.0	95.0	2.5	0.0	2.5	3.0	
Eurasian watermilfoil	2.5	97.5	0.0	2.5	0.0	1.5	
Flat-stemmed pondweed	2.5	97.5	0.0	0.0	2.5	2.5	
Spiny naiad	2.5	97.5	2.5	0.0	0.0	0.5	
Filamentous Algae	25.0						
Other species observed: White water lily, watermeal, spatterdock, sacred lotus, duckweed							

Table 5 continued

Occurrence and Abundance of Submersed Aquatic Plants in Oswego Lake (0-5 ft).								
County:	Kos	Total Sites:	18	Mean species/site:	2.06			
Date:	8.28.13	Sites with plants:	13	SE Mean species/site:	0.40			
Secchi (ft):	7	Sites with native plants:	13	Mean native species/site:	2.00			
Max Plant Depth (ft):	10	Number of species:	11	SE Mean natives/site:	0.38			
Trophic Status:	Meso	# of native species:	10	Species diversity:	0.81			
		Maximum species/site:	5	Native diversity:	0.80			
Depth: 0 to 5 ft		Frequency of Occurrence		Rake score frequency per				Plant Dominance
Species			0	1	3	5		
Eel grass		72.2	27.8	16.7	5.6	50.0	56.7	
Southern naiad		38.9	61.1	11.1	22.2	5.6	21.1	
Chara		27.8	72.2	11.1	0.0	16.7	18.9	
Illinois pondweed		16.7	83.3	11.1	5.6	0.0	5.6	
Leafy pondweed		11.1	88.9	5.6	5.6	0.0	4.4	
Nitella		11.1	88.9	11.1	0.0	0.0	2.2	
coontail		5.6	94.4	0.0	0.0	5.6	5.6	
Eurasian watermilfoil		5.6	94.4	0.0	5.6	0.0	3.3	
Sago pondweed		5.6	94.4	0.0	0.0	5.6	5.6	
Slender naiad		5.6	94.4	0.0	0.0	5.6	5.6	
Spiny naiad		5.6	94.4	5.6	0.0	0.0	1.1	
Filamentous Algae		44.4						
Occurrence and Abundance of Submersed Aquatic Plants in Oswego Lake (5-10 ft).								
County:	Kos	Total Sites:	8	Mean species/site:	1.88			
Date:	8.28.13	Sites with plants:	4	SE Mean species/site:	0.88			
Secchi (ft):	7	Sites with native plants:	4	Mean native species/site:	1.88			
Max Plant Depth (ft):	10	Number of species:	9	SE Mean natives/site:	0.88			
Trophic Status:	Meso	# of native species:	9	Species diversity:	0.87			
		Maximum species/site:	6	Native diversity:	0.87			
Depth: 5 to 10 ft		Frequency of Occurrence		Rake score frequency per				Plant Dominance
Species			0	1	3	5		
Eel grass		37.5	62.5	12.5	12.5	12.5	22.5	
Chara		25.0	75.0	12.5	12.5	0.0	10.0	
coontail		25.0	75.0	25.0	0.0	0.0	5.0	
Nitella		25.0	75.0	25.0	0.0	0.0	5.0	
Southern naiad		25.0	75.0	0.0	0.0	25.0	25.0	
Flat-stemmed pondweed		12.5	87.5	0.0	0.0	12.5	12.5	
Illinois pondweed		12.5	87.5	12.5	0.0	0.0	2.5	
Sago pondweed		12.5	87.5	0.0	12.5	0.0	7.5	
Slender naiad		12.5	87.5	12.5	0.0	0.0	2.5	
Filamentous Algae		25						

2.1.3 Tippecanoe Lake

Ninety sites were sampled on Tippecanoe Lake in 2013. Twelve species were collected and plants were present at 50 sites. Eel grass was the most frequently occurring species and was found at 41.1% of the sites. Eurasian watermilfoil was the only invasive species collected (Figure 8) and was only found in a single location. The results of the survey are located in Table 6.

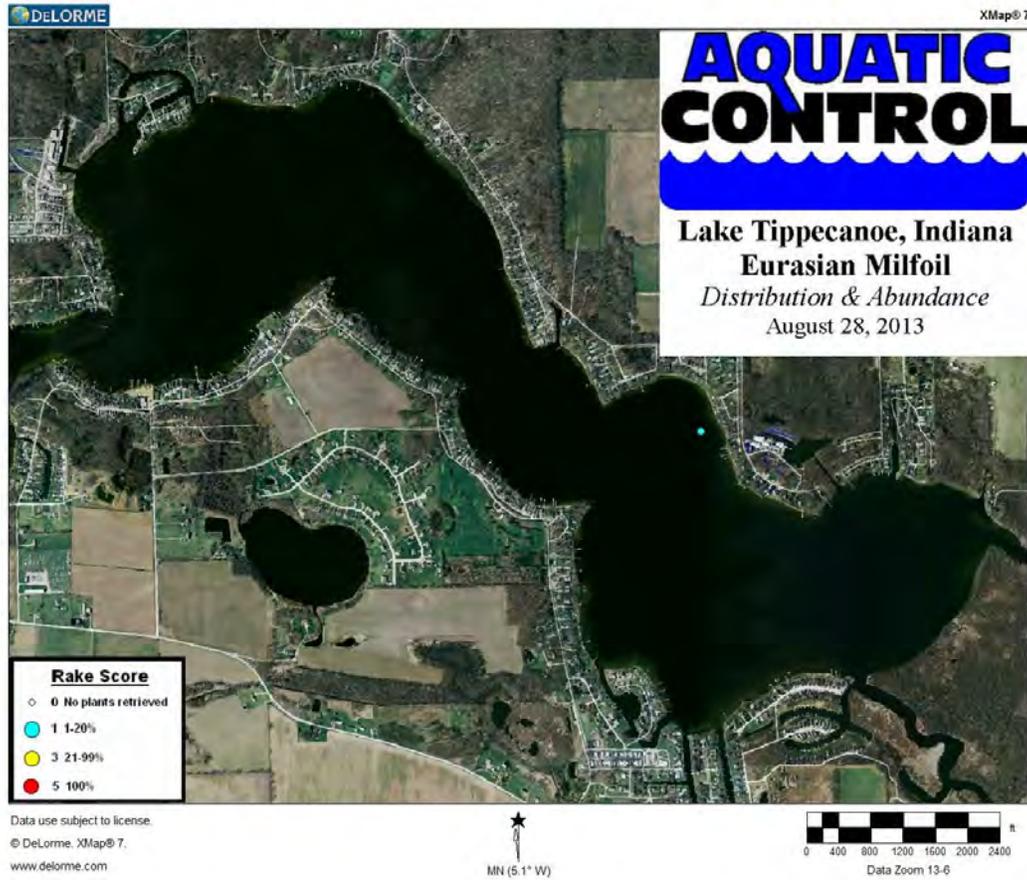


Figure 8. Eurasian watermilfoil locations on Tippecanoe Lake, August 28, 2013.

Table 6. Occurrence and abundance of submersed aquatic plants in Lake Tippecanoe, August 28, 2013.

Occurrence and Abundance of Submersed Aquatic Plants in Lake Tippecanoe (all depths).						
County: Kos	Total Sites:	90	Mean species/site:	1.18		
Date: 8.28.13	Sites with plants:	50	SE Mean species/site:	0.14		
Secchi (ft): 6.0	Sites with native plants:	50	Mean native species/site:	1.17		
Max Plant Depth (ft): 16.0	Number of species:	12	SE Mean natives/site:	0.14		
Trophic Status: Meso	# of native species:	11	Species diversity:	0.81		
	Maximum species/site:	5	Native species diversity:	0.80		
All Depths	Frequency of Occurrence	Rake score freq per sp.				Plant Dominance
Species		0	1	3	5	
Eel grass	41.1	58.9	14.4	10.0	16.7	25.6
Sago pondweed	21.1	78.9	8.9	5.6	6.7	11.8
Chara	14.4	85.6	5.6	4.4	4.4	8.2
Southern naiad	13.3	86.7	10.0	1.1	2.2	4.9
Coontail	11.1	88.9	5.6	0.0	5.6	6.7
Slender naiad	4.4	95.6	3.3	1.1	0.0	1.3
Illinois pondweed	3.3	96.7	3.3	0.0	0.0	0.7
Variablele pondweed	3.3	96.7	1.1	2.2	0.0	1.6
Common bladderwort	2.2	97.8	2.2	0.0	0.0	0.4
Eurasian watermilfoil	1.1	98.9	1.1	0.0	0.0	0.2
Flat-stemmed pondweed	1.1	98.9	0.0	1.1	0.0	0.7
Horned pondweed	1.1	98.9	1.1	0.0	0.0	0.2
Filamentous Algae	17.8					
Species Observed: Common cattail, spatterdock, bulrush, hibiscus, and white water lily.						

Table 6 Continued.

Occurrence and Abundance of Submersed Aquatic Plants in Lake Tippecanoe (0-5 ft).							
County: Kos		Total Sites: 45	Mean species/site: 1.73				
Date: 8.28.13		Sites with plants: 35	SE Mean species/site: 0.20				
Secchi (ft): 6	Sites with native plants: 35	Mean native species/site: 1.71					
Max Plant Depth (ft): 16	Number of species: 11	SE Mean natives/site: 0.20					
Trophic Status: Meso	# of native species: 10	Species diversity: 0.81					
	Maximum species/site: 5	Native diversity: 0.81					
Depth: 0 to 5 ft	Frequency of Occurrence	Rake score frequency per s				Plant Dominance	
Species		0	1	3	5		
Eel grass	55.6	44.4	17.8	13.3	24.4	36.0	
Sago pondweed	33.3	66.7	13.3	8.9	11.1	19.1	
Chara	28.9	71.1	11.1	8.9	8.9	16.4	
Southern naiad	20.0	80.0	13.3	2.2	4.4	8.4	
Coontail	8.9	91.1	4.4	0.0	4.4	5.3	
Illinois pondweed	6.7	93.3	6.7	0.0	0.0	1.3	
Slender naiad	6.7	93.3	4.4	2.2	0.0	2.2	
Common bladderwort	4.4	95.6	4.4	0.0	0.0	0.9	
Variablele pondweed	4.4	95.6	2.2	2.2	0.0	1.8	
Eurasian watermilfoil	2.2	97.8	2.2	0.0	0.0	0.4	
Flat-stemmed pondweed	2.2	97.8	0.0	2.2	0.0	1.3	
Filamentous Algae	28.9						
Occurrence and Abundance of Submersed Aquatic Plants in Lake Tippecanoe (5-10 ft).							
County: Kos		Total Sites: 22	Mean species/site: 0.95				
Date: 8.28.13		Sites with plants: 11	SE Mean species/site: 0.25				
Secchi (ft): 6	Sites with native plants: 11	Mean native species/site: 0.95					
Max Plant Depth (ft): 16	Number of species: 6	SE Mean natives/site: 0.25					
Trophic Status: Meso	# of native species: 6	Species diversity: 0.71					
	Maximum species/site: 4	Native diversity: 0.71					
Depth: 5 to 10 ft	Frequency of Occurrence	Rake score frequency per s				Plant Dominance	
Species		0	1	3	5		
Eel grass	45.5	54.5	18.2	13.6	13.6	25.5	
Coontail	13.6	86.4	9.1	0.0	4.5	6.4	
Sago pondweed	13.6	86.4	4.5	4.5	4.5	8.2	
Southern naiad	13.6	86.4	13.6	0.0	0.0	2.7	
Horned pondweed	4.5	95.5	4.5	0.0	0.0	0.9	
Variablele pondweed	4.5	95.5	0.0	4.5	0.0	2.7	
Filamentous Algae	13.6						
Occurrence and Abundance of Submersed Aquatic Plants in Lake Tippecanoe (10-15 ft).							
County: Kos		Total Sites: 13	Mean species/site: 0.31				
Date: 8.28.13		Sites with plants: 2	SE Mean species/site: 0.24				
Secchi (ft): 6	Sites with native plants: 2	Mean native species/site: 0.31					
Max Plant Depth (ft): 16	Number of species: 3	SE Mean natives/site: 0.24					
Trophic Status: Meso	# of native species: 3	Species diversity: 0.63					
	Maximum species/site: 3	Native diversity: 0.63					
Depth: 10 to 15 ft	Frequency of Occurrence	Rake score frequency per s				Plant Dominance	
Species		0	1	3	5		
Coontail	15.4	84.6	0.0	0.0	15.4	15.4	
Eel grass	7.7	92.3	0.0	0.0	7.7	7.7	
Slender naiad	7.7	92.3	7.7	0.0	0.0	1.5	
Occurrence and Abundance of Submersed Aquatic Plants in Lake Tippecanoe (15-20 ft).							
County: Kos		Total Sites: 8	Mean species/site: 0.13				
Date: 8.28.13		Sites with plants: 1	SE Mean species/site: 0.13				
Secchi (ft): 6	Sites with native plants: 1	Mean native species/site: 0.13					
Max Plant Depth (ft): 16	Number of species: 1	SE Mean natives/site: 0.13					
Trophic Status: Meso	# of native species: 1	Species diversity: 0.00					
	Maximum species/site: 1	Native diversity: 0.00					
Depth: 15 to 20 ft	Frequency of Occurrence	Rake score frequency per s				Plant Dominance	
Species		0	1	3	5		
Sago pondweed	12.5	87.5	12.5	0.0	0.0	2.5	

2.1.4 James Lake

Sixty sites were sampled on James Lake in 2013. Seven species were collected and plants were present at 32 sites. Coontail (*Ceratophyllum demersum*) was the most frequently occurring species and had an abundance of 35.0%. No submersed invasive species were collected or observed during the Tier II survey, and no plants were collected in the 15 to 20ft contour. The results of the survey are located in Table 7.

Table 7. Occurrence and abundance of submersed aquatic plants in James Lake, August 28, 2013.

Occurrence and Abundance of Submersed Aquatic Plants in Lake James (all depths).							
County:	Kos	Total Sites:	60	Mean species/site:	1.02		
Date:	8.28.13	Sites with plants:	32	SE Mean species/site:	0.14		
Secchi (ft):	4.0	Sites with native plants:	32	Mean native species/site:	1.02		
Max Plant Depth (ft):	15.0	Number of species:	7	SE Mean natives/site:	0.14		
Trophic Status:	Meso	# of native species:	7	Species diversity:	0.77		
		Maximum species/site:	3	Native species diversity:	0.77		
All Depths (0 to 20 ft)		Frequency of Occurrence		Rake score frequency per			Plant Dominance
Species			0	1	3	5	
Coontail		35.0	65.0	3.3	8.3	23.3	29.0
Eel Grass		21.7	78.3	11.7	8.3	1.7	9.0
Chara		18.3	81.7	5.0	5.0	8.3	12.3
Sago pondweed		18.3	81.7	15.0	0.0	3.3	6.3
Slender naiad		3.3	96.7	3.3	0.0	0.0	0.7
Variable pondweed		3.3	96.7	3.3	0.0	0.0	0.7
Flat-stemmed pondweed		1.7	98.3	1.7	0.0	0.0	0.3
Filamentous Algae		13.3					
Other species observed: Spatterdock, cattail, hibiscus, whitw water lily, purple loosestrife.							
Occurrence and Abundance of Submersed Aquatic Plants in Lake James (0-5 ft).							
County:	Kos	Total Sites:	31	Mean species/site:	1.52		
Date:	8.28.13	Sites with plants:	23	SE Mean species/site:	0.20		
Secchi (ft):	4.0	Sites with native plants:	23	Mean native species/site:	1.52		
Max Plant Depth (ft):	15	Number of species:	7	SE Mean natives/site:	0.20		
Trophic Status:	Meso	# of native species:	7	Species diversity:	0.79		
		Maximum species/site:	3	Native diversity:	0.79		
Depth: 0 to 5 ft		Frequency of Occurrence		Rake score freq per sp.			Plant Dominance
Species			0	1	3	5	
Coontail		38.7	61.3	3.2	12.9	22.6	31.0
Chara		35.5	64.5	9.7	9.7	16.1	23.9
Eel Grass		32.3	67.7	12.9	16.1	3.2	15.5
Sago pondweed		32.3	67.7	25.8	0.0	6.5	11.6
Slender naiad		6.5	93.5	6.5	0.0	0.0	1.3
Flat-stemmed pondweed		3.2	96.8	3.2	0.0	0.0	0.6
Variable pondweed		3.2	96.8	3.2	0.0	0.0	0.6
Filamentous Algae		22.6					

Table 7 Continued.

Occurrence and Abundance of Submersed Aquatic Plants in Lake James (5-10 ft).								
County:	Kos	Total Sites:	8	Mean species/site:	0.88			
Date:	8.28.13	Sites with plants:	5	SE Mean species/site:	0.30			
Secchi (ft):	4.0	Sites with native plants:	5	Mean native species/site:	0.88			
Max Plant Depth (ft):	15	Number of species:	3	SE Mean natives/site:	0.30			
Trophic Status:	Meso	# of native species:	3	Species diversity:	0.45			
		Maximum species/site:	2	Native diversity:	0.45			
Depth: 5 to 10 ft		Frequency of Occurrence	Rake score freq per sp.				Plant Dominance	
Species			0	1	3	5		
Coontail		62.5	37.5	12.5	0.0	50.0	52.5	
Eel Grass		12.5	87.5	12.5	0.0	0.0	2.5	
Sago pondweed		12.5	87.5	12.5	0.0	0.0	2.5	
Filamentous Algae		12.5						
Occurrence and Abundance of Submersed Aquatic Plants in Lake James (10-15 ft).								
County:	Kos	Total Sites:	11	Mean species/site:	0.64			
Date:	8.28.13	Sites with plants:	4	SE Mean species/site:	0.31			
Secchi (ft):	4.0	Sites with native plants:	4	Mean native species/site:	0.64			
Max Plant Depth (ft):	15	Number of species:	3	SE Mean natives/site:	0.31			
Trophic Status:	Meso	# of native species:	3	Species diversity:	0.57			
		Maximum species/site:	3	Native diversity:	0.57			
Depth: 10 to 15 ft		Frequency of Occurrence	Rake score freq per specie				Plant Dominance	
Species			0	1	3	5		
Coontail		36.4	63.6	0.0	9.1	27.3	32.7	
Eel Grass		18.2	81.8	18.2	0.0	0.0	3.6	
Variable pondweed		9.1	90.9	9.1	0.0	0.0	1.8	

2.2 Plant Sampling Discussion

The objective of maintaining Eurasian watermilfoil percent occurrence below 10% was met on all three lakes. Eurasian watermilfoil was only found at a single site on both Lake Tippecanoe and Oswego. Eurasian watermilfoil was not detected in Lake James during the Tier II survey.

Eel grass is considered to be an ecologically beneficial native species, but has created some problems for residents and boaters on Lake Tippecanoe. Small areas of near shore eel grass were treated in early summer. Eel grass frequency showed a slight decline in Lake Tippecanoe this season and thus there was also a decline in complaints from residents. This plant should continue to be monitored and managed on a limited basis. If this plant continues to decline IDNR may limit treatments, however, if this plant rebounds to nuisance levels treatment acreage may need to be adjusted upwards.

Overall, there continues to be a relatively abundant and diverse native plant population in all three lakes. All three lakes met or exceeded the native species diversity objective, but Tippecanoe and James fell beneath the number of native species target. Additionally, all three lakes fell beneath the objective for native plant coverage. Many Indiana lakes showed decreased abundance and diversity this season. It is not clear why this happened, but could be due, in part, to the early flooding and abnormally cool spring and summer we experienced in 2013. It is important to continue monitoring native vegetation on these lakes in order to deduce whether this is just sampling variability or an actual

decline. Tables 8-10, on the following pages, compare Tier II surveys completed from 2004 through 2013.

Table 8. Occurrence and abundance of submersed aquatic plants in Oswego Lake, 2004-2013.

Oswego Lake									
Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC
Date	5/24/04	8/25/04	5/17/05	8/8/05	8/2/06	7/23/07	8/20/09	8/29/12	8/28/13
Total Sites	33	40	40	40	40	40	40	40	40
Sites with Plants	31	38	30	36	34	29	25	26	17
Sites with Native Plants	29	38	28	36	34	29	25	26	17
Secchi (ft)		6	12	5.5	7.5	6	7	9	7
Number of Species	8	12	7	16	14	9	10	10	12
Number of Native Species	6	10	5	14	12	9	8	8	11
Species Diversity	0.79	0.84	0.83	0.85	0.82	0.80	0.86	0.81	0.84
Native Species Diversity	0.66	0.81	0.76	0.84	0.80	0.80	0.83	0.79	0.83
Mean Native Species/Site	1.09	1.70	0.93	2.08	1.78	1.40	1.38	1.33	1.28
Species Frequency of Occurrence - Depth: 0 to 20 ft									
Eurasian Watermilfoil	51.5	10.0	10.0	5.0	7.5	0.0	5.0	0.0	2.5
Curlyleaf pondweed	27.3	7.5	22.5	2.5	5.0	0.0	0.0	2.5	0.0
Brittle water nymph	0.0	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0
Coontail	57.6	50.0	25.0	35.0	45.0	40.0	25.0	30.0	7.5
Sago pondweed	0.0	17.5	0.0	12.5	5.0	20.0	12.5	7.5	5.0
Chara sp.	21.2	35.0	27.5	47.5	30.0	15.0	15.0	25.0	17.5
Nitella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Eel grass	12.1	37.5	0.0	55.0	55.0	37.5	40.0	40.0	40.0
Richardson's pondweed	0.0	5.0	5.0	7.5	7.5	7.5	12.5	2.5	0.0
Illinois pondweed	0.0	5.0	0.0	0.0	2.5	10.0	0.0	2.5	10.0
Leafy pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Small pondweed	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0
Slender naiad	0.0	7.5	0.0	5.0	12.5	0.0	15.0	2.5	5.0
Spiny naiad	0.0	5.0	0.0	12.5	2.5	2.5	0.0	7.5	2.5
Canada waterweed	0.7	2.5	0.0	0.0	5.0	0.0	2.5	0.0	0.0
Southern naiad	0.0	0.0	0.0	2.5	0.0	0.0	0.0	22.5	22.5
Largeleaf pondweed	0.0	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0
Northern watermilfoil	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0
Variable pondweed	16.4	0.0	0.0	0.0	7.5	2.5	12.5	0.0	0.0
Flat-stemmed pondweed	19.3	5.0	22.5	7.5	2.5	5.0	0.0	0.0	2.5
Horned pondweed	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Common bladderwort	0.7	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0
Variable watermilfoil	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Water stargrass	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whorled watermilfoil	0.7	0.0	12.5	5.0	0.0	0.0	0.0	0.0	0.0
Filamentous algae	33.3	12.5	0.0	0.0	0.0	0.0	20.0	40.0	25.0

Table 8 Continued.

Species Frequency of Occurrence - Depth: 0 to 5 ft									
Eurasian Watermilfoil	52.4	5.3	0.0	9.5	0.0	0.0	0.0	0.0	5.6
Curly leaf pondweed	23.8	0.0	21.7	4.8	10.0	0.0	0.0	5.3	0.0
Coontail	42.9	21.1	21.7	14.3	20.0	26.7	14.3	21.1	5.6
Sago pondweed	0.0	26.3	0.0	23.8	10.0	46.7	42.9	15.8	5.6
Chara sp.	28.6	63.2	43.5	76.2	60.0	33.3	57.1	47.4	27.8
Nitella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Eel grass	19.0	57.9	0.0	61.9	80.0	53.3	100.0	57.9	72.2
Richardson's pondweed	0.0	5.3	4.3	4.8	10.0	13.3	28.6	5.3	0.0
Illinois pondweed	0.0	10.5	0.0	0.0	0.0	20.0	0.0	5.3	16.7
Small pondweed	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0
Leafy pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Slender naiad	0.0	5.3	0.0	4.8	10.0	0.0	14.3	5.3	5.6
Spiny naiad	0.0	5.3	0.0	14.3	10.0	6.7	0.0	15.8	5.6
Southern naiad	0.0	0.0	0.0	4.8	0.0	0.0	0.0	36.8	38.9
Largeleaf pondweed	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0
Northern watermilfoil	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0
Variable pondweed	14.3	0.0	0.0	0.0	10.0	6.4	28.6	0.0	0.0
Flat-stemmed pondweed	4.8	10.5	30.4	4.8	10.0	6.7	0.0	0.0	0.0
Horned pondweed	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whorled watermilfoil	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0
Filamentous algae	47.6	15.8	0.0	0.0	0.0	0.0	0.0	52.6	44.4
Species Frequency of Occurrence - Depth: 5 to 10 ft									
Eurasian Watermilfoil	71.4	25.0	40.0	0.0	20.0	0.0	0.0	0.0	0.0
Curly leaf pondweed	57.1	25.0	40.0	7.1	0.0	0.0	0.0	0.0	0.0
Coontail	85.7	66.7	40.0	64.3	50.0	55.6	60.0	25.0	25.0
Sago pondweed	0.0	16.7	0.0	0.0	10.0	11.1	0.0	0.0	12.5
Chara sp.	14.3	16.7	10.0	21.4	50.0	11.1	0.0	25.0	25.0
Nitella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0
Eel grass	0.0	33.3	0.0	64.3	80.0	66.7	0.0	50.0	37.5
Richardson's pondweed	0.0	8.3	10.0	14.3	10.0	11.1	0.0	0.0	0.0
Illinois pondweed	0.0	0.0	0.0	0.0	10.0	11.1	0.0	0.0	12.5
Slender naiad	0.0	16.7	0.0	7.1	20.0	0.0	0.0	0.0	12.5
Spiny naiad	0.0	8.3	0.0	14.3	0.0	0.0	0.0	0.0	0.0
Canada waterweed	0.0	8.3	0.0	7.1	10.0	0.0	0.0	0.0	0.0
Southern naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0
Largeleaf pondweed	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Northern watermilfoil	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0
Variable pondweed	14.3	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Flat-stemmed pondweed	0.0	0.0	20.0	14.3	0.0	11.1	0.0	0.0	12.5
Whorled watermilfoil	0.0	0.0	10.0	14.3	0.0	0.0	0.0	0.0	0.0
Filamentous algae	0.0	8.3	0.0	0.0	0.0	0.0	0.0	75.0	25.0

Table 8 Continued

Species Frequency of Occurrence - Depth: 10 to 15 ft									
Eurasian Watermilfoil	25.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Curly leaf pondweed	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Coontail	75.0	100.0	0.0	100.0	50.0	50.0	18.2	77.8	0.0
Chara sp.	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Eel grass	0.0	0.0	0.0	0.0	60.0	0.0	0.0	33.3	0.0
Slender naiad	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
Canada waterweed	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Southern naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0
Variable pondweed	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Variable watermilfoil	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Filamentous algae	25.0	20.0	0.0	0.0	0.0	0.0	0.0	44.0	0.0
Species Frequency of Occurrence - Depth: 15 to 20 ft									
Coontail	0.0	75.0	NA	100.0	60.0	50.0	0.0	0.0	0.0
Eel grass	0.0	0.0	NA	0.0	0.0	12.5	0.0	0.0	0.0
Richardson's pondweed	0.0	0.0	NA	0.0	10.0	0.0	0.0	0.0	0.0

Table 9. Occurrence and abundance of submersed aquatic plants in Tippecanoe Lake, 2004-2013.

Tippecanoe Lake									
Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC
Date	5/24/04	8/25/04	5/17/05	8/8/05	8/2/06	7/23/07	8/20/09	8/29/12	8/28/13
Total Sites	140	119	119	119	90	89	89	90	90
Sites with Plants	119	106	81	95	78	81	67	69	50
Sites with Native Plants	99	103	68	95	76	81	67	68	50
Secchi (ft)	-	6	13	6	7	6	7	8	6
Number of Species	12	12	10	15	16	13	11	14	12
Number of Native Species	10	10	8	13	14	12	10	12	11
Species Diversity	0.83	0.82	0.83	0.83	0.84	0.81	0.75	0.84	0.81
Native Species Diversity	0.79	0.78	0.79	0.82	0.80	0.80	0.73	0.82	0.80
Mean Native Species/Site	0.97	1.54	0.77	1.70	1.72	1.79	1.31	1.79	1.17
Species Frequency of Occurrence - Depth: 0 to 25 ft									
Eurasian Watermilfoil	22.9	19.3	5.0	3.4	10.0	9.0	4.5	12.2	1.1
Curly leaf pondweed	45.7	3.4	30.3	0.8	4.4	0.0	0.0	0.0	0.0
Coontail	13.6	26.1	16.8	26.9	35.6	36.0	23.6	22.2	11.1
Sago pondweed	0.0	10.9	0.0	10.1	5.6	13.5	6.7	28.9	21.1
Chara sp.	30.7	23.5	19.3	18.5	25.6	37.1	11.2	26.7	14.4
Eel grass	12.9	61.3	3.4	58.0	55.6	58.4	60.7	53.3	41.1
Slender naiad	0.0	5.9	0.0	1.7	4.4	1.1	4.5	3.3	4.4
Richardson's pondweed	0.0	9.2	4.2	7.6	10.0	4.5	14.6	5.6	0.0
Canada waterweed	0.7	0.0	0.8	0.8	3.3	2.2		2.2	0.0
Variable pondweed	16.4	3.4	0.0	0.0	2.2	4.5	6.7	3.3	3.3
Flat-stemmed pondweed	19.3	6.7	21.8	11.8	0.0	12.4	1.1	1.1	1.1
Horned pondweed	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Common Bladderwort	0.7	0.0	0.0	16.0	0.0	0.0	1.1	0.0	2.2
Water stargrass	0.7	5.0	2.5	11.8	11.1	6.7	0.0	2.2	0.0
Southern naiad	0.0	0.0	0.0	3.4	0.0	1.1	0.0	26.7	13.3
Small pondweed	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Northern watermilfoil	0.0	0.0	0.0	11.8	4.4	0.0	0.0	0.0	0.0
Illinois pondweed	0.0	1.7	0.0	2.5	0.0	1.1	1.1	3.3	3.3
Leafy pondweed	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0
Variable watermilfoil	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
Spiny naiad	0.0	0.0	0.0	0.0	6.7	0.0	0.0	1.1	0.0
Whorled watermilfoil	0.7	0.0	8.4	0.0	1.1	0.0	0.0	0.0	0.0
Filamentous algae	48.6	13.4	0.0	0.0	0.0	0.0	0.0	12.2	17.8

Table 9 Continued.

Species Frequency of Occurrence - Depth: 0 to 5 ft									
Eurasian Watermilfoil	29.5	13.2	6.3	0.0	3.1	4.5	8.0	11.6	2.2
Curly leaf pondweed	42.3	3.8	39.7	0.0	9.4	0.0	0.0	0.0	0.0
Coontail	9.0	13.2	4.8	7.9	3.1	2.3	12.0	9.3	8.9
Sago pondweed	0.0	11.3	0.0	6.3	6.3	22.7	4.0	39.5	33.3
Chara sp.	38.5	34.0	22.2	17.5	65.6	68.2	32.0	41.9	28.9
Eel grass	12.8	67.9	3.2	65.1	59.4	72.7	60.0	67.4	55.6
Slender naiad	0.0	11.3	0.0	3.2	9.4	2.3	4.0	0.0	6.7
Richardson's pondweed	0.0	17.0	3.2	9.5	6.3	9.1	16.0	7.0	0.0
Canada waterweed	0.0	0.0	0.0	0.0	6.3	0.0	0.0	2.3	0.0
Variable pondweed	19.2	5.7	0.0	0.0	6.3	9.1	0.0	7.0	4.4
Flat-stemmed pondweed	25.6	9.4	31.7	11.1	0.0	18.2	4.0	0.0	2.2
Horned pondweed	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Common Bladderwort	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4
Water stargrass	1.3	5.7	1.6	27.0	6.3	4.5	0.0	4.7	0.0
Southern naiad	0.0	0.0	0.0	3.2	0.0	2.3	0.0	34.9	20.0
Small pondweed	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Northern watermilfoil	0.0	0.0	0.0	11.1	3.1	0.0	0.0	0.0	0.0
Illinois pondweed	0.0	1.9	0.0	4.8	0.0	0.0	4.0	4.7	6.7
Leafy pondweed	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0
Variable watermilfoil	0.0	0.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0
Spiny naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0
Whorled watermilfoil	1.3	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0
Filamentous algae	55.1	18.9	0.0	0.0	0.0	0.0	0.0	20.9	28.9
Species Frequency of Occurrence - Depth: 5 to 10 ft									
Eurasian Watermilfoil	15.4	41.9	9.1	13.6	8.3	21.1	2.7	13.6	0.0
Curly leaf pondweed	61.5	6.5	31.8	0.0	0.0	0.0	0.0	0.0	0.0
Coontail	23.1	22.6	40.9	63.6	37.5	57.9	16.2	40.9	13.6
Sago pondweed	0.0	22.6	0.0	18.2	4.2	5.3	13.5	31.8	13.6
Chara sp.	15.4	6.5	4.5	4.5	8.3	15.8	5.4	22.7	0.0
Eel grass	15.4	71.0	4.5	72.7	83.3	84.2	83.8	59.1	45.5
Slender naiad	0.0	0.0	0.0	0.0	4.2	0.0	3.0	4.5	0.0
Richardson's pondweed	0.0	6.5	9.1	9.1	12.5	0.0	21.6	4.5	0.0
Canada waterweed	0.0	0.0	0.0	4.5	4.2	10.5	0.0	4.5	0.0
Variable pondweed	15.4	15.4	15.4	0.0	0.0	0.0	8.1	0.0	4.5
Flat-stemmed pondweed	23.1	6.5	22.7	22.7	0.0	15.8	0.0	4.5	0.0
Horned pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5
Common Bladderwort	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Water stargrass	0.0	6.5	9.1	4.5	25.0	10.5	0.0	0.0	0.0
Southern naiad	0.0	0.0	0.0	9.1	0.0	0.0	0.0	31.8	13.6
Northern watermilfoil	0.0	0.0	0.0	13.6	4.2	0.0	0.0	0.0	0.0
Illinois pondweed	0.0	3.2	0.0	0.0	0.0	5.3	0.0	4.5	0.0
Leafy pondweed	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Variable watermilfoil	0.0	0.0	0.0	15.4	4.2	0.0	0.0	0.0	0.0
Whorled watermilfoil	0.0	0.0	22.7	0.0	4.2	0.0	0.0	0.0	0.0
Filamentous algae	61.5	16.1	0.0	0.0	0.0	0.0	0.0	9.1	13.6

Table 9 Continued.

Species Frequency of Occurrence - Depth: 10 to 15 ft									
Eurasian Watermilfoil	0.0	0.0	0.0	14.3	20.8	16.7	6.7	15.4	0.0
Curly leaf pondweed	66.7	0.0	28.6	0.0	4.2	0.0	0.0	0.0	0.0
Coontail	66.7	70.0	57.1	57.1	58.3	66.7	73.3	30.8	15.4
Sago pondweed	0.0	0.0	0.0	14.3	8.3	8.3	0.0	7.7	0.0
Chara sp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0
Eel grass	33.3	40.0	0.0	42.9	45.8	25.0	53.3	30.8	7.4
Slender naiad	0.0	0.0	0.0	0.0	0.0	0.0	13.3	7.7	7.7
Richardson's pondweed	0.0	0.0	0.0	0.0	16.7	0.0	6.7	7.7	0.0
Flat-stemmed pondweed	16.7	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0
Water stargrass	0.0	10.0	0.0	14.3	8.3	16.7	0.0	0.0	0.0
Southern naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0
Northern watermilfoil	0.0	0.0	0.0	14.3	8.3	0.0	0.0	0.0	0.0
Leafy pondweed	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0
Spiny naiad	0.0	0.0	0.0	0.0	20.8	0.0	0.0	0.0	0.0
Species Frequency of Occurrence - Depth: 15 to 20 ft									
Eurasian Watermilfoil	0.0	0.0	0.0	0.0	10.0	0.0	0.0	10.0	0.0
Curly leaf pondweed	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0
Coontail	33.3	50.0	0.0	50.0	80.0	90.9	8.3	30.0	0.0
Sago pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	12.5
Eel grass	0.0	16.7	0.0	0.0	0.0	9.1	0.0	10.0	0.0
Slender naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0
Southern naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0
Spiny naiad	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Species Frequency of Occurrence - Depth: 20 to 25 ft									
Coontail	0.0	NA	0.0	0.0	0.0	66.7	0.0	50.0	0.0
Sago pondweed	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spiny naiad	0.0	NA	0.0	0.0	10.0	0.0	0.0	0.0	0.0

Table 10. Occurrence and abundance of submersed aquatic plants in James Lake, 2004-2013.

Lake James									
Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC
Date	5/24/04	8/26/04	5/17/05	8/8/05	8/2/06	7/23/07	8/20/09	8/29/12	8/28/13
Total Sites	74	64	64	64	60	60	60	60	60
Sites with Plants	62	61	54	56	50	47	52	47	32
Sites with Native Plants	56	61	53	56	50	47	52	47	32
Secchi (ft)	-	6	16	9	4.5	7	5.5	5.5	4
Number of Species	11	14	9	13	14	10	12	12	7
Number of Native Species	9	12	7	12	13	8	10	10	7
Species Diversity	0.80	0.85	0.83	0.79	0.78	0.76	0.80	0.76	0.77
Native Species Diversity	0.71	0.81	0.74	0.78	0.77	0.74	0.79	0.72	0.77
Mean Native Species/Site	1.11	1.91	1.19	1.58	1.43	1.35	1.53	1.23	1.02

Table 10 Continued.

Species Frequency of Occurrence - Depth: 0 to 25 ft									
Eurasian Watermilfoil	12.2	23.4	32.8	1.6	1.7	6.7	0.0	10.0	0.0
Curly leaf pondweed	43.2	9.4	43.8	0.0	0.0	1.7	1.7	0.0	0.0
Brittle waternymph	0.0	0.0	32.8	0.0	10.0	0.0	1.7	0.0	0.0
Coontail	43.2	57.8	43.8	54.7	61.7	56.7	51.7	58.3	35.0
Sago pondweed	0.0	6.3	0.0	0.0	6.7	3.3	13.3	11.7	18.3
Chara sp.	36.5	35.9	0.0	28.1	15.0	26.7	26.7	21.7	18.3
Eel grass	1.4	42.2	1.6	37.5	18.3	26.7	31.7	13.3	21.7
Slender naiad	0.0	15.6	0.0	12.5	8.3	10.0	16.7	1.7	3.3
Canada waterweed	0.7	4.7	15.6	6.3	6.7	5.0	3.3	1.7	0.0
Leafy pondweed	0.0	3.1	0.0	0.0	1.7	0.0	0.0	0.0	0.0
Richardson's pondweed	0.0	0.0	0.0	1.6	1.7	0.0	1.7	1.7	0.0
Largeleaf pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variable pondweed	16.4	6.3	0.0	0.0	0.0	0.0	3.3	0.0	3.3
Flat-stemmed pondweed	19.3	9.4	18.8	4.7	6.7	5.0	0.0	1.7	1.7
Horned pondweed	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Common bladderwort	0.7	1.6	0.0	0.0	0.0	0.0	1.7	0.0	0.0
Water stargrass	0.7	6.3	1.6	3.1	3.3	0.0	3.3	5.0	0.0
Small pondweed	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Southern naiad	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.3	0.0
Northern watermilfoil	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Prickly coontail	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0
Water crowfoot	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0
Spiny naiad	0.0	1.6	0.0	0.0	0.0	1.7	0.0	3.3	0.0
Whorled watermilfoil	0.7	0.0	4.7	1.6	0.0	0.0	0.0	0.0	0.0
Filamentous algae	47.3	4.7	0.0	0.0	0.0	0.0	6.7	11.7	13.3
Species Frequency of Occurrence - Depth: 0 to 5 ft									
Eurasian Watermilfoil	17.3	31.6	42.5	2.3	5.3	18.2	0.0	13.3	0.0
Curly leaf pondweed	46.2	7.9	52.5	0.0	0.0	4.5	0.0	0.0	0.0
Brittle waternymph	0.0	0.0	0.0	0.0	31.6	0.0	5.6	0.0	0.0
Coontail	40.4	42.1	37.5	45.5	26.3	31.8	16.7	53.3	38.7
Sago pondweed	0.0	0.0	0.0	0.0	21.1	4.5	38.9	16.7	32.3
Chara sp.	51.9	57.9	52.5	40.9	47.4	63.6	72.2	40.0	35.5
Eel grass	1.9	57.9	2.5	50.0	47.4	50.0	50.0	23.3	32.3
Slender naiad	0.0	0.0	0.0	18.2	26.3	27.3	33.3	3.3	6.5
Canada waterweed	1.9	7.9	22.5	9.1	10.5	9.1	11.1	3.3	0.0
Leafy pondweed	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Richardson's pondweed	0.0	0.0	0.0	2.3	5.3	0.0	0.0	0.0	0.0
Largeleaf pondweed	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variable pondweed	3.8	0.0	0.0	0.0	0.0	0.0	11.1	0.0	3.2
Flat-stemmed pondweed	23.1	7.9	22.5	4.5	21.1	13.6	0.0	3.3	3.2
Horned pondweed	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water stargrass	0.0	5.3	2.5	4.5	5.3	0.0	0.0	10.0	0.0
Small pondweed	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0
Southern naiad	0.0	0.0	0.0	4.5	0.0	0.0	0.0	6.7	0.0
Northern watermilfoil	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0
Water crowfoot	1.9	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0
Spiny naiad	0.0	2.6	0.0	0.0	0.0	4.5	0.0	3.3	0.0
Whorled watermilfoil	0.0	0.0	5.0	2.3	0.0	0.0	0.0	0.0	0.0
Filamentous algae	65.4	7.9	0.0	0.0	0.0	0.0	0.0	23.3	22.6

Table 10 Continued.

Species Frequency of Occurrence - Depth: 5 to 10 ft									
Eurasian Watermilfoil	0.0	23.1	30.8	0.0	0.0	0.0	0.0	16.7	0.0
Curlyleaf pondweed	66.7	23.1	53.8	0.0	0.0	0.0	5.6	0.0	0.0
Coontail	75.0	76.9	92.3	100.0	93.3	93.8	55.6	75.0	62.5
Sago pondweed	0.0	0.0	0.0	0.0	0.0	6.3	5.6	8.3	12.5
Chara sp.	0.0	7.7	0.0	0.0	0.0	12.5	16.7	8.3	0.0
Eel grass	0.0	38.5	0.0	25.0	6.7	18.8	50.0	8.3	12.5
Slender naiad	0.0	0.0	0.0	0.0	0.0	0.0	22.2	0.0	0.0
Canada waterweed	0.0	0.0	7.7	0.0	0.0	6.3	0.0	0.0	0.0
Leafy pondweed	0.0	7.7	0.0	0.0	6.7	0.0	0.0	0.0	0.0
Richardson's pondweed	0.0	0.0	0.0	0.0	0.0	0.0	5.6	8.3	0.0
Flat-stemmed pondweed	16.7	23.1	15.4	0.0	0.0	0.0	0.0	0.0	0.0
Common bladderwort	0.0	7.7	0.0	0.0	0.0	0.0	5.6	0.0	0.0
Water stargrass	0.0	15.4	0.0	0.0	0.0	0.0	5.6	0.0	0.0
Spiny naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0
Whorled watermilfoil	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0
Filamentous algae	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5
Species Frequency of Occurrence - Depth: 10 to 15 ft									
Coontail	66.7	83.3	14.3	100.0	93.8	100.0	90.9	71.4	36.4
Sago pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0
Eel grass	0.0	0.0	0.0	16.7	6.3	14.3	0.0	0.0	18.2
Canada waterweed	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0
Variable pondweed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Flat-stemmed pondweed	0.0	0.0	14.3	16.7	0.0	0.0	0.0	0.0	0.0
Water stargrass	0.0	0.0	0.0	0.0	6.3	0.0	9.1	0.0	0.0
Prickly coontail	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0
Species Frequency of Occurrence - Depth: 15 to 20 ft									
Coontail	0.0	0.0	0.0	80.0	30.0	45.5	61.5	45.5	0.0
Eel grass	0.0	0.0	0.0	0.0	0.0	9.1	7.7	0.0	0.0
Species Frequency of Occurrence - Depth: 20 to 25 ft									
Coontail	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0

3.0 PLANT MANAGEMENT DISCUSSION & ACTION PLAN

If left unmanaged, Eurasian watermilfoil, curlyleaf pondweed, and starry stonewort could potentially become severe problems on the Tippecanoe Chain of Lakes by impeding boating, fishing, swimming, and property values. In addition, these species may also have negative impacts on the native submersed plant community and overall ecology of the lake. Controls have successfully limited the abundance of invasive species. It is recommended that selective herbicide treatments be continued next season, and, if funds permit, these treatments should again include channel areas. Treatments for curlyleaf pondweed and Eurasian watermilfoil in channels and other isolated areas should be completed with 1.0 ppm 2,4-D and 1.0 ppm Aquathol K. Main lake treatments should be completed with 2.0 ppm 2,4-D and 1.0 ppm of Aquathol. It is estimated that up to 70 acres of each species may need treatment next season in main lake areas and 30 acres in channels. Treatment for starry stonewort should be completed with 0.8 ppm Cutrine Ultra and 1 quart Hydrothol per acre. These treatments should be completed in late April or early May when water temperatures approach 50° F (warming trend) and are not

higher than 60° F. The cost of this treatment of curlyleaf pondweed and Eurasian watermilfoil would be approximately \$54,000.00. The cost of treating starry stonewort twice this year would be approximately \$4,200.00. Vegetation sampling should consist of an invasive species mapping survey in mid April and a Tier II survey in late summer. The cost of the plant survey along with the plan update would be approximately \$6,000.00.

One of the primary concerns of lake users is the abundance of eel grass in the lake. Eel grass is considered a beneficial species for fish and wildlife, so control will be closely monitored by IDNR. Additionally, due to the decline in native diversity and coverage observed in 2013 native control in general will be a concern for IDNR in 2014. It is advised that eel grass control should be a three pronged approach that involves herbicide treatment in approved areas, physical removal of washed up plant material, and education and/or restrictions on near shore boating which is likely helping to create the floating mats. It is also advised that the LTPOA limit treatment of natives including eel grass in areas that overlap with Eurasian watermilfoil treatment areas when possible. Reducing impacts to native species may help reduce the abundance of invasive species by allowing the natives to compete and become established following selective herbicide treatments designed to control invasive species. IDNR approved 11 acres for treatment in 2013. The cost this treatment in 2014 would be approximately \$5,000.00. There are new herbicides being developed for better control of eel grass. These herbicides may work better, but they will also likely cost more on a per acre basis. LTPOA contracted with local businesses to remove washed up plant material in 2013. It is recommended that they plan on that budgetary expense in 2014 as treatments will not be enough to keep this plant in check.

In addition, the ecozone should continue to be monitored. The ecozone may need intervention to establish vegetation in several areas although water lilies were noted growing in some new areas of the Ecozone in 2013. Tier II and emergent vegetation surveys should be completed every two to three years in order to monitor changes in the plant community. The next scheduled ecozone surveys should occur in 2015.

Listed below are recommendations for meeting the goals of the vegetation management plan:

1. Complete Invasive Species Sampling in the spring of 2014 in order to map out invasive species treatment areas. This survey should be completed around mid-April depending on water temperature.
2. Complete treatment of invasive milfoil and curlyleaf pondweed with 2,4-D liquid and Aquathol K. Treatment should be completed in late April or early May of 2014 when water temperatures approach 50° F (warming trend) and are not higher than 60° F. . Estimate that there may be 100 acres of milfoil and curlyleaf pondweed.
3. Continue to monitor and treat starry stonewort with Cutrine Ultra and Hydrothol wherever it is found to limit its further spread into new areas.

4. Continue summer Tier II surveys on all lakes, in order to monitor the changes in the native plant population and assess the effectiveness of vegetation controls.
5. Work at limiting the impact of eel grass through herbicide treatments, manual removal of washed up fragments, and education of boaters on the impact of near shore boating.
6. Continue to monitor the ecozone area with Tier II and emergent vegetation surveys and work with revegetation specialist on the feasibility of establishing native rooted floating plant beds in this area.

<u>2014 Budget</u>	<u>Cost Estimate</u>
Pretreatment visual survey, Tier II Survey, and AVMP Update	\$6,000.00
Treatment of 70 acres of Eurasian watermilfoil on the main lake	\$21,000.00
Treatment of 70 acres of curlyleaf pondweed on the main lake	\$21,000.00
Treatment of 30 acres of channels for control of both Eurasian watermilfoil and curlyleaf pondweed with a combination of 1.0 ppm Aquathol K and 1.0 ppm 2,4-D	\$12,000.00
Control of 10 acres of eel grass with EPA approved herbicides	\$5,000.00
Total Cost Estimate:	\$65,000.00
LARE Grant Request (excludes eel grass):	\$60,000.00
LARE Share (\$35,000 cap on treatment)	\$48,000.00
Association Cost Share if Grant Awarded (includes eel grass):	\$17,000.00

It should also be noted that if funding cost-share is not available from the LTPOA to treat all of the Eurasian watermilfoil and curlyleaf pondweed present in 2014, it is also possible to receive “maintenance” funding up to \$5,000 with a required 50% cost-share through LARE. No plan update is required if “maintenance” funding is awarded and channel treatments are not eligible.

4.0 PUBLIC INVOLVEMENT

Aquatic Control attended a meeting of the LTPOA on October 21, 2013 to present the results of the herbicide treatment and to discuss the 2014 strategy. Eight individuals attended the meeting and all of attendees completed the Lake Use Survey (Table 11). Many in attendance expressed frustration over the amount of eel grass present along their shoreline due to high speed boating uprooting the vegetation. They also mentioned that physically removing the eel grass is very expensive. Future dredging plans were also discussed.

Table 11. Lake User Survey, October 21, 2013.

Tippecanoe Chain of Lakes 10/21/13		
Are you a lake property owner?	Yes: 100%	No: 0%
Are you currently a member of your lake association?	Yes: 87.5%	No: 12.5%
How many years have you been at the lake?	2 or Less: 0%	5 to 10: 0%
	2 to 5: 0%	Over 10: 100%
How do you use the lake (mark all that apply)	Swimming 62.5%	Irrigation 12.5%
	Boating 100%	Drinking water 0%
	Fishing 75%	Other? 0%
Do you have aquatic plants at your shoreline in nuisance quantities?	Yes: 25% No: 75%	
Does aquatic vegetation interfere with your use or enjoyment of the lake?	Yes: 37.5% No: 62.5%	
Does the level of vegetation in the lake affect your property values?	Yes: 37.5% No: 62.5%	
Are you in favor of continuing efforts to control vegetation on the lake?	Yes: 87.5% No: 12.5%	
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: 75% No: 25%	
Were you satisfied with the results of the LARE funded invasive treatments this season?	Yes: 87.5% No: 0%	
Mark any of these you think are problems on your lake:		
25% Too many boats access the lake		
25% Use of jet skis on the lake		
0% Too much fishing		
0% Fish population problem		
50% Dredging needed		
12.5% Overuse by nonresidents		
37.5% Too many aquatic plants		
0% Not enough aquatic plants		
12.5% Poor water quality		
25% Pier/funneling problem		
Comments:		
Bow fishing at night with bright lights		

5.0 REFERENCES CITED

- Applied Biochemists. 1998. Water weeds and algae, 5th edition. Applied Biochemists, J. C. Schmidt and J. R. Kannenberg, editors. Milwaukee, Wisconsin.
- Aquatic Control Inc. 2008. Lake Tippecanoe Aquatic Vegetation Management Plan 2007 Update. Report to Lake Tippecanoe Property Owners Association. Syracuse, Indiana.
- Aquatic Control Inc. 2009. Lake Tippecanoe Chain 2008 Ecozone Survey Report. Report to Lake Tippecanoe Property Owners Association. Syracuse, Indiana.
- Aquatic Control Inc. 2010. Lake Tippecanoe Aquatic Vegetation Management Plan 2009 Update Report to Lake Tippecanoe Property Owners Association. Syracuse, Indiana.
- Aquatic Control Inc. 2013. Lake Tippecanoe Aquatic Vegetation Management Plan 2012 Update Report to Lake Tippecanoe Property Owners Association. Syracuse, Indiana.
- IDNR 2010. A Sampling Method to Assess Occurrence, Abundance and Distribution of Submersed Aquatic Plants in Indiana Lakes. IN Department of Natural Resources. Division of Fish & Wildlife, Indianapolis, Indiana.

6.0 APPENDICIES
6.1 Data Sheets
6.1.1 Oswego Lake

WPT Lat	Long	Depth	Rake score	Eurasian watermilfoil	Fil. Algae	Chara	Eel grass	Slender naiad	coontail	Sago pondweed	Southern naiad	Spiny naiad	Illinois pondweed	Leafy pondweed	Nitella	Flat-stemmed pondweed
141	41.329775	-85.782915	3	5		5	5				3		1		1	
142	41.329647	-85.783899	4	5	3		5				3			1		
143	41.329411	-85.785196	4	5			5					1				
144	41.329092	-85.78401	5	5			5							3	1	
145	41.328427	-85.783947	4	1		P	1									
146	41.327774	-85.784631	6	3			3	1	1							
147	41.327084	-85.784789	4	0		P										
148	41.326647	-85.784664	4	1		P	1									
149	41.326238	-85.784699	8	0												
150	41.326913	-85.785582	5	0		P										
151	41.326409	-85.785756	10	0												
152	41.326373	-85.786368	6	0		P										
153	41.326313	-85.786356	13	0												
154	41.326235	-85.787014	9	0												
155	41.32627	-85.787475	18	0												
156	41.32699	-85.787461	4	0		P										
157	41.327913	-85.787409	5	5			5	5	5							
158	41.326397	-85.788236	6	1		P	1					1				
159	41.326128	-85.787942	18	0												
160	41.32584	-85.788232	15	0												
161	41.325445	-85.788554	16	0												
162	41.325056	-85.788471	19	0								1				
163	41.324637	-85.788667	15	0												
164	41.324006	-85.788714	4	5		1	5					5	3			
165	41.324372	-85.787952	17	0												
166	41.324301	-85.78712	19	0												
167	41.323945	-85.786198	16	0												
168	41.324006	-85.785377	10	5		1	5		1						1	
169	41.324373	-85.784686	3	5		5	5				1					
170	41.325016	-85.784228	14	0												
171	41.325385	-85.783582	5	5		1	5				3					
172	41.325709	-85.784274	18	0												
173	41.326049	-85.784891	18	0												
174	41.326254	-85.785211	20	0												
175	41.326123	-85.78382	5	0		P										
176	41.324531	-85.784173	3	5		5	1				5					
177	41.323996	-85.787066	9	5		3					3	5	1		1	5
178	41.324112	-85.788063	3	3		P	3					3	1			
179	41.327624	-85.783909	4	5		P										
180	41.328574	-85.783051	2	5			5									



6.1.2 Tippecanoe Lake

WPT	Lat	Long	Depth	Rake score	Eurasian watermilfoil	Fil. Algae	Coontail	Eel grass	Chara	Variable pondweed	Slender naiad	Sago pondweed	Canada waterweed	Illinois pondweed	Flat-stemmed pondweed	Southern naiad	Horned pondweed
181	41.328204	-85.777431	21	1			1	1									
182	41.328712	-85.775322	7	0													
183	41.329643	-85.773605	4	0													
184	41.330895	-85.771664	12	0													
185	41.33147	-85.769914	3	1												1	
186	41.330896	-85.768256	11	5			5	5			1						
187	41.330218	-85.766825	9	0													
188	41.329269	-85.765498	7	3			1	3				3					
189	41.328611	-85.764031	9	0													
190	41.328144	-85.762773	3	0													
191	41.327052	-85.762321	14	0													
192	41.326123	-85.76214	4	3				3	3								
193	41.325777	-85.761345	9	0													
194	41.324935	-85.760697	3	5				5	5	3							
195	41.324916	-85.759228	6	1		P		1									
196	41.324233	-85.758057	3	5				1	1			5					
197	41.324364	-85.756407	5	0													
198	41.323357	-85.756982	7	5				5		3		5					1
199	41.322541	-85.756801	18	0													
200	41.321564	-85.757022	4	5				5				3				1	
201	41.320453	-85.756391	5	5			5	1									
202	41.319665	-85.755803	15	0													
203	41.318829	-85.755404	4	3		P			3		1	1					
204	41.319147	-85.753859	5	5				3				5					
205	41.318192	-85.753599	4	3				3				1					
206	41.317091	-85.753037	4	3		P		3									
207	41.316462	-85.751712	3	3				1	3							1	
208	41.318097	-85.750765	13	0													
209	41.317995	-85.748948	3	5				5				5				5	
210	41.319323	-85.748181	4	0		P											
211	41.319605	-85.746716	5	0		P											
212	41.31874	-85.745822	3	0		P											
213	41.319017	-85.743988	2	0		P											
214	41.320199	-85.744685	14	0													
215	41.320647	-85.742727	5	0		P											
216	41.321847	-85.740786	3	5		P	1	1				3			3	5	
217	41.323165	-85.74061	4	0		P											
218	41.323922	-85.742285	3	1		P		1									
219	41.32299	-85.743691	11	0													
220	41.323501	-85.745302	9	5			5										
221	41.323234	-85.746704	4	5				5						1		3	
222	41.322735	-85.747984	5	1			1										
223	41.323402	-85.74928	16	0													
224	41.324056	-85.750354	3	3				1				3				1	
225	41.324681	-85.751587	4	5		P		5		1		1					
226	41.326352	-85.752094	5	5	1		5	5									
227	41.327405	-85.753172	13	5			5										
228	41.327247	-85.754867	19	0													
229	41.326891	-85.756155	9	0													
230	41.327524	-85.757309	3	5				3				3					
231	41.328492	-85.75848	8	1		P		1								1	
232	41.329071	-85.759699	19	0													
233	41.330139	-85.760535	4	5				5									
234	41.331405	-85.761159	10	0													
235	41.332729	-85.761634	20	0													
236	41.333843	-85.762297	21	0													
237	41.335093	-85.76355	6	3				3								1	
238	41.336051	-85.764806	9	0													
239	41.336982	-85.765942	15	0													
240	41.337768	-85.767387	9	1			1	1				1					
241	41.337833	-85.768485	4	1				1									
242	41.337164	-85.76911	9	0													
243	41.336971	-85.770222	10	5		P		5									
244	41.336582	-85.770951	4	0													
245	41.336912	-85.77221	7	3				3									
246	41.337313	-85.773449	4	5		P		5	1								
247	41.336731	-85.773796	12	0													
248	41.336419	-85.775075	3	1					1								
249	41.33581	-85.774817	20	0													
250	41.335506	-85.775789	20	0													
251	41.335448	-85.776939	4	5					5								
252	41.33601	-85.778217	2	5				5	5								
253	41.335332	-85.779154	4	1		P			1			1					
254	41.334693	-85.77832	16	1								1					
255	41.334122	-85.779603	9	5				5				1					
256	41.333718	-85.778437	9	0													
257	41.332739	-85.778804	5	5								5					
258	41.332138	-85.778065	12	0													
259	41.33144	-85.77817	3	1										1			
260	41.330687	-85.77821	8	1				1								1	
261	41.329843	-85.77831	6	0													
262	41.330266	-85.779611	4	5				5		3							
263	41.329785	-85.780509	13	0													
264	41.328625	-85.780055	4	5				3				5					
265	41.328168	-85.77868	11	0													
266	41.328303	-85.776432	4	5				5	1		1	1				1	
267	41.328593	-85.773884	3	5					5					1			
268	41.330159	-85.772536	3	1								1					
269	41.330761	-85.770773	3	5				1	3				1			1	
270	41.33171	-85.76904	8	0													

6.1.3 James Lake

WPT	Lat	Long	Depth	Rake score	Fil. Algae	Eel Grass	Sago pondweed	Chara	Coontail	Slender naiad	Variable pondweed	Flat-stemmed pondweed
271	41.322327	-85.733135	4	0	P							
272	41.322978	-85.732155	10	0								
273	41.322295	-85.731323	3	1			1	1				
274	41.321508	-85.730298	15	0								
275	41.320924	-85.730016	14	0								
276	41.320177	-85.730186	3	3				3				
277	41.3193	-85.730257	21	0								
278	41.3183	-85.730305	15	5					5			
279	41.317778	-85.729503	2	1				1				
280	41.317156	-85.729125	3	0								
281	41.316232	-85.72927	5	3	P	1	1					
282	41.315013	-85.729715	10	5			1		5			
283	41.314229	-85.729243	5	3					3			
284	41.31412	-85.73025	8	5					5			
285	41.313629	-85.731376	3	5			1	5	3			
286	41.313478	-85.730753	16	0								
287	41.313006	-85.729947	3	5					5			
288	41.312493	-85.729281	15	0								
289	41.312106	-85.729032	2	5		1			5			1
290	41.31222	-85.728127	14	5					5			
291	41.312248	-85.727204	5	0								
292	41.312069	-85.726177	3	5		1		5				
293	41.312546	-85.725604	17	0								
294	41.31233	-85.724789	3	3		3		3				
295	41.312905	-85.724127	2	5		3	5		5			
296	41.313828	-85.724225	4	0	P							
297	41.31433	-85.723216	16	0								
298	41.314029	-85.722491	2	5			1	5				
299	41.314578	-85.721796	2	5				5	5			
300	41.315673	-85.721836	4	1	P				1	1		
301	41.316092	-85.722587	13	0								
302	41.317151	-85.723301	20	0								
303	41.317857	-85.723613	3	3		3			3	1		
304	41.318806	-85.72372	18	0								
305	41.31942	-85.722986	3	3		1		3				
306	41.319849	-85.723424	20	0								
307	41.320541	-85.723288	15	0								
308	41.321441	-85.723627	16	0								
309	41.322284	-85.724072	4	0	P							
310	41.322216	-85.725501	5	0								
311	41.323166	-85.725248	4	5		5	1					
312	41.323242	-85.726217	7	1					1			
313	41.323803	-85.727433	3	0	P							
314	41.323858	-85.728576	3	5		3	1	5				
315	41.323629	-85.729573	10	0								
316	41.3242	-85.730225	15	0								
317	41.324785	-85.731044	3	1			1	1				
318	41.324941	-85.731848	4	0								
319	41.325306	-85.732276	14	0								
320	41.325573	-85.733056	17	0								
321	41.32557	-85.733927	3	5	P		5		5		1	
322	41.325263	-85.734786	13	5		1			5			
323	41.325006	-85.735329	7	5		1			5			
324	41.324288	-85.735676	16	0								
325	41.32384	-85.736047	7	5					5			
326	41.32337	-85.735817	4	5					5			
327	41.322955	-85.73535	5	5		3			5			
328	41.322734	-85.734554	3	3			1		3			
329	41.322519	-85.73417	6	0	P							
330	41.322913	-85.732784	12	3		1			3		1	

6.2 IDNR VEGETATION PERMIT APPLICATIONS

6.2.1 2014 Oswego Lake Permit



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT
State Form 26727 (R5 / 9-13)
Approved by State Board of Accounts, 2013

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
ATTN: COMMERCIAL LICENSE CLERK
402 W. Washington Street, Rm W273
Indianapolis, IN 46204
Telephone Number: (317) 232-4102
Fax Number: (317) 232-8150

Check type of permit:

FEE \$5.00

Whole Lake Multiple Treatment Areas

INSTRUCTIONS: 1. Please print or type information.
2. Applicant must sign the application and is the only signature required. If applicant is also the certified chemical applicator that will be performing the treatment(s), he/she will also sign as the Certified Applicator.

Applicant Name Holly LaSalle		Lake Association Name Lake Tippecanoe Property Owners Association	
Street or Rural Route 67 ENS T49 A		Telephone Number 574-834-2185	
City and State Syracuse, IN		ZIP Code 46567	
Certified Applicator Name	Company or Corporation Name	Certification Number	
Street or Rural Route		Telephone Number	
City and State		ZIP Code	
Water Body Name (One application per water body) Oswego		Nearest Town North Webster	County Kosciusko
Is the body of water a water supply or does it 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 number: 1	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32975W85.78219 to N41.32950W85.78219	Total acres to be controlled: 1.9	Proposed shoreline treatment length (ft): 720	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 4	Expected date(s) of treatment(s): Late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify)					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50		<input type="checkbox"/>	
Southern naiad	<input type="checkbox"/>	20		<input type="checkbox"/>	
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Illinois pondweed	<input type="checkbox"/>	10		<input type="checkbox"/>	
Nitella	<input type="checkbox"/>	5		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	5		<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	

Treatment area number: 2	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32871W85.78376 to N41.32698W85.78736	Total acres to be controlled: 3	Proposed shoreline treatment length (ft): 1420	Perpendicular distance from shoreline (ft): 100
Maximum depth of treatment (ft): 5	Expected date(s) of treatment(s): late June/early July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen crystal</u>				
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____				
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species
Eel grass	<input checked="" type="checkbox"/>	50		<input type="checkbox"/>
Southern naiad	<input type="checkbox"/>	10		<input type="checkbox"/>
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>
Illinois pondweed	<input type="checkbox"/>	10		<input type="checkbox"/>
Coontail	<input type="checkbox"/>	10		<input type="checkbox"/>
Treatment area number: 3	Latitude / Longitude or Universal Transverse Mercator (UTM): Treatment of EWM and Curlyleaf following mapping	Total acres to be controlled: <20	Proposed shoreline treatment length (ft): na	Perpendicular distance from shoreline (ft): na
Maximum depth of treatment (ft): na	Expected date(s) of treatment(s): April/early May	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>2,4-D 1-2 ppm and Aquathol K 1 ppm</u>				
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____				
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species
Eel grass	<input type="checkbox"/>		coontail	<input type="checkbox"/>
Southern naiad	<input type="checkbox"/>		leafy pondweed	<input type="checkbox"/>
Chara	<input type="checkbox"/>		sago pondweed	<input type="checkbox"/>
Illinois pondweed	<input type="checkbox"/>		curlyleaf pondweed	<input checked="" type="checkbox"/>
Nitella	<input type="checkbox"/>		Eurasian watermilfoil	<input checked="" type="checkbox"/>
AGREEMENT				
I have read and understand the Indiana Aquatic Vegetation Control Permit Laws and agree to abide by them. Under the penalties of perjury (IC 35-44-2-1), I affirm the information supplied by me is true and correct to the best of my knowledge.				
Signature of Applicant _____			Date (month, day, year) _____	
Signature of Certified Applicator _____			Date (month, day, year) _____	
<u>Make check or money order payable to DNR - Division of Fish and Wildlife in the amount of \$5.00</u> <u>Return completed application with the \$5.00 permit fee to the address shown on page 1.</u>				
OFFICE USE ONLY				
Permit Number	Check Number	Other		
<input type="checkbox"/> Denied <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions		Fisheries Section Approval		



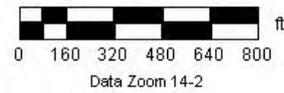
Page 3 of 3 Oswego Lake Permit Map



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6.2.2 2014 Tippecanoe Lake Permit



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 28727 (R5 / 9-13)
Approved by State Board of Accounts, 2013

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
ATTN: COMMERCIAL LICENSE CLERK
402 W. Washington Street, Rm W273
Indianapolis, IN 46204
Telephone Number: (317) 232-4102
Fax Number: (317) 232-8150

Check type of permit:

FEE \$5.00

Whole Lake Multiple Treatment Areas

INSTRUCTIONS: 1. Please print or type information.
2. Applicant must sign the application and is the only signature required. If applicant is also the certified chemical applicator that will be performing the treatment(s), he/she will also sign as the Certified Applicator.

Applicant Name Holly LaSalle		Lake Association Name Lake Tippecanoe POA	
Street or Rural Route 67 EMS T49A		Telephone Number 574-834-2185	
City and State Syracuse, IN		ZIP Code 46567	
Certified Applicator Name	Company or Corporation Name	Certification Number	
Street or Rural Route		Telephone Number	
City and State		ZIP Code	
Water Body Name (One application per water body) Lake Tippecanoe		Nearest Town North Webster	County Kosciusko
Is the body of water a water supply or does it 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 number: 1	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32692W85.76237 to N41.32640W85.76247	Total acres to be controlled: 0.5	Proposed shoreline treatment length (ft): 440	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): Late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50		<input type="checkbox"/>	
Sago pondweed	<input type="checkbox"/>	20		<input type="checkbox"/>	
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Southern naiad	<input type="checkbox"/>	5		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	5		<input type="checkbox"/>	
Illinois pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
Variable pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	

Treatment area number: 2	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32207W85.75742 to N41.31859W85.75639	Total acres to be controlled: 3.6	Proposed shoreline treatment length (ft): 1880	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50	Illinois pondweed	<input type="checkbox"/>	5
sago pondweed	<input type="checkbox"/>	10	Variable pondweed	<input type="checkbox"/>	5
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
naiad	<input type="checkbox"/>	10		<input type="checkbox"/>	
coontail	<input type="checkbox"/>	10		<input type="checkbox"/>	
Treatment area number: 3	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.31739W85.75036 to N41.31831W85.74830	Total acres to be controlled: 2.3	Proposed shoreline treatment length (ft): 650	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50	Illinois pondweed	<input type="checkbox"/>	5
Sago pondweed	<input type="checkbox"/>	20	Variable pondweed	<input type="checkbox"/>	5
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Naiad	<input type="checkbox"/>	5		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	5		<input type="checkbox"/>	
AGREEMENT					
I have read and understand the Indiana Aquatic Vegetation Control Permit Laws and agree to abide by them. Under the penalties of perjury (IC 35-44-2-1), I affirm the information supplied by me is true and correct to the best of my knowledge.					
Signature of Applicant _____			Date (month, day, year) _____		
Signature of Certified Applicator _____			Date (month, day, year) _____		
Make check or money order payable to DNR - Division of Fish and Wildlife in the amount of \$5.00 Return completed application with the \$5.00 permit fee to the address shown on page 1.					
OFFICE USE ONLY					
Permit Number _____		Check Number _____		Other _____	
<input type="checkbox"/> Denied		<input type="checkbox"/> Approved		<input type="checkbox"/> Approved w/Conditions	
				Fisheries Section Approval _____	



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (RS / 9-13)
Approved by State Board of Accounts, 2013

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
ATTN: COMMERCIAL LICENSE CLERK
402 W. Washington Street, Rm W273
Indianapolis, IN 46204
Telephone Number: (317) 232-4102
Fax Number: (317) 232-8150

Check type of permit:

Whole Lake Multiple Treatment Areas

FEE \$5.00

INSTRUCTIONS: 1. Please print or type information.
2. Applicant must sign the application and is the only signature required. If applicant is also the certified chemical applicator that will be performing the treatment(s), he/she will also sign as the Certified Applicator.

Applicant Name Holly LaSalle		Lake Association Name Lake Tippecanoe POA	
Street or Rural Route 67 EMS T49A		Telephone Number 574-834-2185	
City and State Syracuse, IN		ZIP Code 46567	
Certified Applicator Name	Company or Corporation Name	Certification Number	
Street or Rural Route		Telephone Number	
City and State		ZIP Code	
Water Body Name (One application per water body)	Nearest Town	County	
Is the body of water a water supply or does it 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 number: 4	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32417W85.74185 to N41.32417W85.74536	Total acres to be controlled: 2.75	Proposed shoreline treatment length (ft): 1080	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): Late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50		<input type="checkbox"/>	
Sago pondweed	<input type="checkbox"/>	20		<input type="checkbox"/>	
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Southern naiad	<input type="checkbox"/>	5		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	5		<input type="checkbox"/>	
Illinois pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
Variable pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	



Treatment area number: 5	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32773W85.75230 to N41.32795W85.75353	Total acres to be controlled: 1.6	Proposed shoreline treatment length (ft): 500	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50	Illinois pondweed	<input type="checkbox"/>	5
sago pondweed	<input type="checkbox"/>	10	Variable pondweed	<input type="checkbox"/>	5
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
naiad	<input type="checkbox"/>	10		<input type="checkbox"/>	
coontail	<input type="checkbox"/>	10		<input type="checkbox"/>	
Treatment area number: 6	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32919W85.75867 to N41.32898W85.75947	Total acres to be controlled: 0.25	Proposed shoreline treatment length (ft): 280	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	50	Illinois pondweed	<input type="checkbox"/>	5
Sago pondweed	<input type="checkbox"/>	20	Variable pondweed	<input type="checkbox"/>	5
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Naiad	<input type="checkbox"/>	5		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	5		<input type="checkbox"/>	
AGREEMENT					
I have read and understand the Indiana Aquatic Vegetation Control Permit Laws and agree to abide by them. Under the penalties of perjury (IC 35-44-2-1), I affirm the information supplied by me is true and correct to the best of my knowledge.					
Signature of Applicant _____			Date (month, day, year) _____		
Signature of Certified Applicator _____			Date (month, day, year) _____		
Make check or money order payable to DNR - Division of Fish and Wildlife in the amount of \$5.00 Return completed application with the \$5.00 permit fee to the address shown on page 1.					
OFFICE USE ONLY					
Permit Number	Check Number	Other			
<input type="checkbox"/> Denied	<input type="checkbox"/> Approved	<input type="checkbox"/> Approved w/Conditions	Fisheries Section Approval		



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R5 / 9-13)
Approved by State Board of Accounts, 2013

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
ATTN: COMMERCIAL LICENSE CLERK
402 W. Washington Street, Rm W273
Indianapolis, IN 46204
Telephone Number: (317) 232-4102
Fax Number: (317) 232-8150

Check type of permit:

Whole Lake Multiple Treatment Areas

FEE \$5.00

INSTRUCTIONS: 1. Please print or type information.
2. Applicant must sign the application and is the only signature required. If applicant is also the certified chemical applicator that will be performing the treatment(s), he/she will also sign as the Certified Applicator.

Applicant Name Holly LaSalle		Lake Association Name Lake Tippecanoe POA	
Street or Rural Route 67 EMS T49A		Telephone Number 574-834-2185	
City and State Syracuse, IN		ZIP Code 46567	
Certified Applicator Name	Company or Corporation Name	Certification Number	
Street or Rural Route		Telephone Number	
City and State		ZIP Code	
Water Body Name (One application per water body)		Nearest Town	County
Is the body of water a water supply or does it flow into a water supply?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

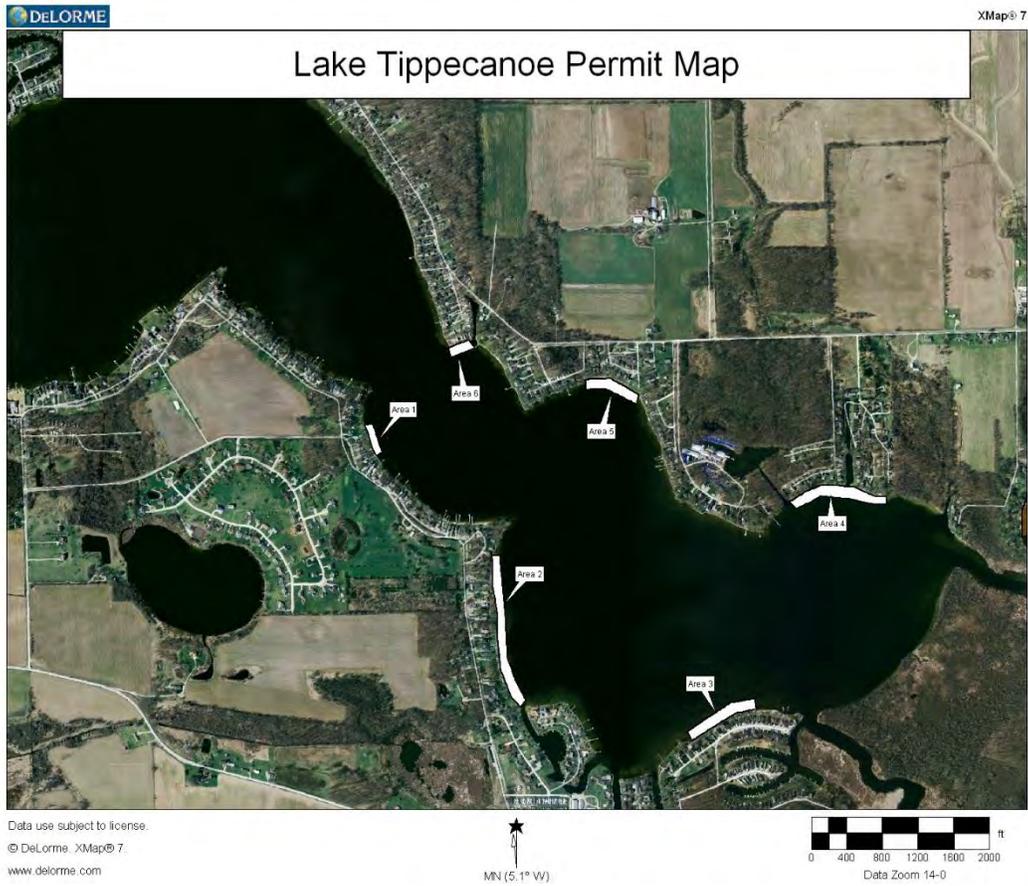
Please complete one section for EACH treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

Treatment area number: 7	Latitude / Longitude or Universal Transverse Mercator (UTM): Treatment of EWM and CLP following invasive mapping	Total acres to be controlled: <70	Proposed shoreline treatment length (ft): na	Perpendicular distance from shoreline (ft): na	
Maximum depth of treatment (ft): na	Expected date(s) of treatment(s): April/early May	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. 2,4-D 1-2ppm Aquathol 1 ppm					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) Summer Tier 2					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input type="checkbox"/>	40	horned pondweed	<input type="checkbox"/>	5
Sago pondweed	<input type="checkbox"/>	10	Curlyleaf pondweed	<input checked="" type="checkbox"/>	0
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Southern naiad	<input type="checkbox"/>	5		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	5		<input type="checkbox"/>	
Illinois pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
Variable pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
Common bladderwort	<input type="checkbox"/>	5		<input type="checkbox"/>	
Eurasian watermilfoil	<input checked="" type="checkbox"/>	5		<input type="checkbox"/>	
Flatstem pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	

Treatment area number:	Latitude / Longitude or Universal Transverse Mercator (UTM):	Total acres to be controlled:	Proposed shoreline treatment length (ft):	Perpendicular distance from shoreline (ft):	
Maximum depth of treatment (ft):	Expected date(s) of treatment(s):	Treatment method: <input type="checkbox"/> Chemical <input type="checkbox"/> Physical <input type="checkbox"/> Biological Control <input type="checkbox"/> Mechanical			
Based on treatment method, describe chemical to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control.					
Plant survey method: <input type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
Treatment area number:	Latitude / Longitude or Universal Transverse Mercator (UTM):	Total acres to be controlled:	Proposed shoreline treatment length (ft):	Perpendicular distance from shoreline (ft):	
0					
Maximum depth of treatment (ft):	Expected date(s) of treatment(s):	Treatment method: <input type="checkbox"/> Chemical <input type="checkbox"/> Physical <input type="checkbox"/> Biological Control <input type="checkbox"/> Mechanical			
Based on treatment method, describe chemical to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control.					
Plant survey method: <input type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
AGREEMENT					
I have read and understand the Indiana Aquatic Vegetation Control Permit Laws and agree to abide by them. Under the penalties of perjury (IC 35-44-2-1), I affirm the information supplied by me is true and correct to the best of my knowledge.					
Signature of Applicant _____			Date (month, day, year) _____		
Signature of Certified Applicator _____			Date (month, day, year) _____		
<u>Make check or money order payable to DNR - Division of Fish and Wildlife in the amount of \$5.00</u> <u>Return completed application with the \$5.00 permit fee to the address shown on page 1.</u>					
OFFICE USE ONLY					
Permit Number		Check Number		Other	
<input type="checkbox"/> Denied		<input type="checkbox"/> Approved		<input type="checkbox"/> Approved w/Conditions	
				Fisheries Section Approval	



Page 7 of 7 Tippecanoe Lake Permit Map



6.2.3 James Lake Permit



APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R5 / 9-13)
Approved by State Board of Accounts, 2013

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
ATTN: COMMERCIAL LICENSE CLERK
402 W. Washington Street, Rm W273
Indianapolis, IN 46204
Telephone Number: (317) 232-4102
Fax Number: (317) 232-8150

Check type of permit:

Whole Lake Multiple Treatment Areas

FEE \$5.00

- INSTRUCTIONS: 1. Please print or type information.
2. Applicant must sign the application and is the only signature required. If applicant is also the certified chemical applicator that will be performing the treatment(s), he/she will also sign as the Certified Applicator.

Applicant Name Holly LaSalle		Lake Association Name Lake Tippecanoe POA	
Street or Rural Route 67 EMS T49A		Telephone Number 574-834-2185	
City and State Syracuse, IN		ZIP Code 46567	
Certified Applicator Name	Company or Corporation Name	Certification Number	
Street or Rural Route		Telephone Number	
City and State		ZIP Code	
Water Body Name (One application per water body) James	Nearest Town North Webster	County Kosciusko	
Is the body of water a water supply or does it 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 number: 1	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32335W85.73590o N41.32547W85.763437	Total acres to be controlled: 1.75	Proposed shoreline treatment length (ft): 1000	Perpendicular distance from shoreline (ft): 100	
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): Late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komcen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	30		<input type="checkbox"/>	
Sago pondweed	<input type="checkbox"/>	10		<input type="checkbox"/>	
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Southern naiad	<input type="checkbox"/>	10		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	30		<input type="checkbox"/>	
Flatstem	<input type="checkbox"/>	5		<input type="checkbox"/>	
Variable pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	

Treatment area number: 2	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32384W85.72754 to N41.32255W85.72401	Total acres to be controlled: 1.9	Proposed shoreline treatment length (ft): 1140	Perpendicular distance from shoreline (ft): 100
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>				
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____				
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species
Eel grass	<input checked="" type="checkbox"/>	30	Flatstem pondweed	<input type="checkbox"/>
sago pondweed	<input type="checkbox"/>	10	Variable pondweed	<input type="checkbox"/>
Chara	<input type="checkbox"/>	10		
naiad	<input type="checkbox"/>	10		
coontail	<input type="checkbox"/>	30		
Treatment area number: 3	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.32109W85.72300 to N41.31874W85.72300	Total acres to be controlled: 2.25	Proposed shoreline treatment length (ft): 850	Perpendicular distance from shoreline (ft): 100
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>				
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____				
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species
Eel grass	<input checked="" type="checkbox"/>	30	flatstem pondweed	<input type="checkbox"/>
Sago pondweed	<input type="checkbox"/>	15	Variable pondweed	<input type="checkbox"/>
Chara	<input type="checkbox"/>	10		
Naiad	<input type="checkbox"/>	5		
Coontail	<input type="checkbox"/>	30		
AGREEMENT				
I have read and understand the Indiana Aquatic Vegetation Control Permit Laws and agree to abide by them. Under the penalties of perjury (IC 35-44-2-1), I affirm the information supplied by me is true and correct to the best of my knowledge.				
Signature of Applicant _____			Date (month, day, year) _____	
Signature of Certified Applicator _____			Date (month, day, year) _____	
Make check or money order payable to DNR - Division of Fish and Wildlife in the amount of \$5.00 Return completed application with the \$5.00 permit fee to the address shown on page 1.				
OFFICE USE ONLY				
Permit Number	Check Number		Other	
<input type="checkbox"/> Denied <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions			Fisheries Section Approval	





APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R5 / 9-13)
Approved by State Board of Accounts, 2013

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
ATTN: COMMERCIAL LICENSE CLERK
402 W. Washington Street, Rm W273
Indianapolis, IN 46204
Telephone Number: (317) 232-4102
Fax Number: (317) 232-8150

Check type of permit:

FEE \$5.00

Whole Lake Multiple Treatment Areas

- INSTRUCTIONS:** 1. Please print or type information.
2. Applicant must sign the application and is the only signature required. If applicant is also the certified chemical applicator that will be performing the treatment(s), he/she will also sign as the Certified Applicator.

Applicant Name Holly LaSalle		Lake Association Name Lake Tippecanoe POA	
Street or Rural Route 67 EMS T49A		Telephone Number 574-834-2185	
City and State Syracuse, IN		ZIP Code 46567	
Certified Applicator Name	Company or Corporation Name	Certification Number	
Street or Rural Route		Telephone Number	
City and State		ZIP Code	
Water Body Name (One application per water body)	Nearest Town	County	
Is the body of water a water supply or does it 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 number: 4	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.31786W85.72328 to N41.31644W85.72100	Total acres to be controlled: 2	Proposed shoreline treatment length (ft): 700	Perpendicular distance from shoreline (ft): 100
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): Late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Nautique, Hydrothol, Komeen Crystal

Plant survey method: Rake Visual Other (specify) _____

Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	30		<input type="checkbox"/>	
Sago pondweed	<input type="checkbox"/>	10		<input type="checkbox"/>	
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
Southern naiad	<input type="checkbox"/>	10		<input type="checkbox"/>	
Coontail	<input type="checkbox"/>	30		<input type="checkbox"/>	
Flatstem	<input type="checkbox"/>	5		<input type="checkbox"/>	
Variable pondweed	<input type="checkbox"/>	5		<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	
	<input type="checkbox"/>			<input type="checkbox"/>	

Treatment area number: 5	Latitude / Longitude or Universal Transverse Mercator (UTM): N41.31333W85.72321to N41.31204W85.72130		Total acres to be controlled: 5.1	Proposed shoreline treatment length (ft): 2000	Perpendicular distance from shoreline (ft): 100
Maximum depth of treatment (ft): 6	Expected date(s) of treatment(s): late June/July	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>Nautique, Hydrothol, Komeen Crystal</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) _____					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input checked="" type="checkbox"/>	30	Flatstem pondweed	<input type="checkbox"/>	5
sago pondweed	<input type="checkbox"/>	10	Variable pondweed	<input type="checkbox"/>	5
Chara	<input type="checkbox"/>	10		<input type="checkbox"/>	
naiad	<input type="checkbox"/>	10		<input type="checkbox"/>	
coontail	<input type="checkbox"/>	30		<input type="checkbox"/>	
Treatment area number: 6	Latitude / Longitude or Universal Transverse Mercator (UTM): area to be determined following spring invasive survey		Total acres to be controlled: <30	Proposed shoreline treatment length (ft): na	Perpendicular distance from shoreline (ft): na
Maximum depth of treatment (ft): na	Expected date(s) of treatment(s): April/early May	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 to be used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. <u>2,4-D 1-2 ppm Aquathol K 1 ppm</u>					
Plant survey method: <input checked="" type="checkbox"/> Rake <input type="checkbox"/> Visual <input type="checkbox"/> Other (specify) <u>Summer Tier 2 survey results</u>					
Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community	Aquatic Plant Name	Check if Target Species	% Relative Abundance of Community
Eel grass	<input type="checkbox"/>	30	flatstem pondweed	<input type="checkbox"/>	5
Sago pondweed	<input type="checkbox"/>	15	Variable pondweed	<input type="checkbox"/>	5
Chara	<input type="checkbox"/>	10	Eurasian watermilfoil	<input checked="" type="checkbox"/>	0
Naiad	<input type="checkbox"/>	5	Curlyleaf pondweed	<input checked="" type="checkbox"/>	0
Coontail	<input type="checkbox"/>	30		<input type="checkbox"/>	
AGREEMENT					
I have read and understand the Indiana Aquatic Vegetation Control Permit Laws and agree to abide by them. Under the penalties of perjury (IC 35-44-2-1), I affirm the information supplied by me is true and correct to the best of my knowledge.					
Signature of Applicant _____			Date (month, day, year) _____		
Signature of Certified Applicator _____			Date (month, day, year) _____		
Make check or money order payable to DNR - Division of Fish and Wildlife in the amount of \$5.00 Return completed application with the \$5.00 permit fee to the address shown on page 1.					
OFFICE USE ONLY					
Permit Number _____		Check Number _____		Other _____	
<input type="checkbox"/> Denied <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions			Fisheries Section Approval _____		

Page 5 of 5 James Lake Permit Map



6.3 Species List

<i>Scientific Name</i>	<i>Common name</i>
<i>Any algae</i>	Algae
<i>Ceratophyllum demersum</i>	coontail
<i>Ceratophyllum echinatum</i>	prickly coontail
<i>Chara sp.</i>	Chara
<i>Elodea canadensis</i>	Canada waterweed
<i>Myriophyllum heterophyllum</i>	variable watermilfoil
<i>Myriophyllum sibiricum</i>	northern watermilfoil
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil
<i>Myriophyllum verticillatum</i>	whorled watermilfoil
<i>Najas flexilis</i>	slender naiad
<i>Najas guadalupensis</i>	southern naiad
<i>Najas marina</i>	spiny naiad
<i>Najas minor</i>	brittle waternymph
<i>Nitella obtusa</i>	starry stonewort
<i>Nitella sp.</i>	Nitella
<i>Potamogeton amplifolius</i>	largeleaf pondweed
<i>Potamogeton crispus</i>	curlyleaf pondweed
<i>Potamogeton foliosus</i>	leafy pondweed
<i>Potamogeton gramineus</i>	variable pondweed
<i>Potamogeton illinoensis</i>	Illinois pondweed
<i>Potamogeton pectinatus</i>	sago pondweed
<i>Potamogeton richardsonii</i>	Richardson's pondweed
<i>Potamogeton zosteriformis</i>	flat-stemmed pondweed
<i>Ranunculus longirostris</i>	white water crowfoot
<i>Utricularia vulgaris</i>	common bladderwort
<i>Vallisneria americana</i>	eel grass
<i>Zannichellia palustris</i>	horned pondweed
<i>Zostrella dubia</i>	water stargrass