2010 LEGEND LAKE

Aquatic Invasive Species Adaptive Management Program
Progress Report and Management Plan Update

The Legend Lake Protection and Rehabilitation District

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Professional Resources for Management of Lakes, Ponds, Rivers and Wetlands

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Introduction

Legend Lake is located on the Menominee Indian Reservation in Menominee County, Wisconsin. Legend Lake is a chain of interconnected water bodies named Wahtohsah, Skice, Main Channel, Spring, Peshtigo, Little Blacksmith, Big Blacksmith, Sapokesick and Pywaosit Lakes. The lakes comprising the Legend Lake system have historically been important natural resources to the Menominee Indian Tribe – having been used for fishing, hunting, and wild rice harvest. The value of these lake resources were major reasons why this location was chosen for the Menominee Reservation. In the 1960's these nine natural lake basins were dredged and dammed to create a six mile long waterway that encompasses a total of 1230 acres, and has roughly 47 ½ miles of shoreline. With a total of approximately 2500 properties located on or around the system today, Legend Lake is a popular recreational destination. Along with fishing, the lake experiences heavy boat traffic from waterskiing, inner-tubing and jet-skiing. Much of the habitat is dominated by aquatic vegetation. There are deep areas in many of the original lake basins, with the maximum depth being 74 feet found in Big Blacksmith Lake. The man-made channels throughout the lake system range from 6 to 10 feet in depth, and many contain heavy aquatic vegetation.

Over the past decade, Legend Lake has been managing Eurasian watermilfoil (*Myriophyllum spicatum*), an invasive exotic plant. To address the problems created by Eurasian watermilfoil, the Legend Lake Protection and Rehabilitation District (LLPRD) developed an aquatic plant management plan entitled *Legend Lake Aquatic Plant Management Plan 2006-2008*. The LLPRD and its consultants developed this management plant in cooperation with the Menominee Indian Tribe of Wisconsin (MITW) and the Wisconsin Department of Natural Resources (WDNR). This document serves as an update to this management plan, and summarizes recent studies and management activities that have been done on Legend Lake.

Management History

In 2001, Eurasian watermilfoil was first identified in Legend Lake. By 2003, its distribution was estimated at 50 acres. It expanded rapidly to 150 acres in 2004, and between 250 - 400 acres by the spring of 2005. The following is a summary of important events throughout the management history of Eurasian watermilfoil and other exotic invasive species on Legend Lake.

2005

The first formal Eurasian watermilfoil mapping survey takes place in the fall of 2005, and identifies the plant growing in 538 acres throughout Legend Lake.

LLPRD and its consultants begin meetings with MITW and WDNR to discuss milfoil management.

2006

In February, the LLPRD adopts an aquatic plant management plan.

In March, the WDNR and MITW approve a chemical application permit to treat 218 of the 538 acres of Eurasian watermilfoil. A multi-year lake monitoring effort that includes analysis of water chemistry, dissolved oxygen, aquatic plants and pesticide concentration is implemented.

In May, 218 acres of Eurasian watermilfoil are treated with the herbicide Navigate® (2,4-D) at a rate of 100 lbs/acre.

In October, a mapping survey finds a 59% reduction of Eurasian watermilfoil in treated areas, but an expansion in untreated areas. Total Eurasian watermilfoil distribution is found to be 660 acres.

A review of year-long lake monitoring data finds few negative impacts to water quality, dissolved oxygen or native aquatic plants.

2007

In March, the WDNR and MITW approve a chemical application permit to treat 246.2 of the 660 acres of Eurasian watermilfoil in Legend Lake.

In May, 246.2 acres of milfoil are treated using the herbicide Navigate® at the rate of 150 lbs/acre, as recommended by the Army Corps of Engineers.

In September, an aquatic invasive species (AIS) grant from the WDNR is awarded for the control of Eurasian watermilfoil on Legend Lake.

An October survey finds a 74% reduction of Eurasian watermilfoil in treated areas, but expansion in untreated areas. Total Eurasian watermilfoil distribution is found to be 498 acres.

Again, a review of year-long lake monitoring data finds few negative impacts to water quality, dissolved oxygen or native aquatic plants. LLPRD and consultants emphasize the need for treating all Eurasian watermilfoil acreage to gain long-term control.

2008

Additional grants are awarded including a grant for the Clean Boats – Clean Waters program, an Education and Prevention grant, and a grant for Chemical Control.

In March, WDNR and MITW approve treatment of all 498 acres of Eurasian watermilfoil.

Treatments are conducted in May using Navigate® at rates of 100 – 150 lbs/acre. During this time, beds of curly-leaf pondweed, another invasive exotic plant, are discovered.

Weed harvesting operations are suspended to prevent spread of Eurasian watermilfoil via plant fragmentation.

n July, a follow-up treatment of 36.1 acres of Eurasian watermilfoil using Navigate® at a rate of 150 lbs/acre occurs.

An October survey finds a total of 156.4 acres of Eurasian watermilfoil present in Legend Lake. Monitoring data continues to show minimal negative impacts to water quality, dissolved oxygen or native aquatic plants.

2009

In May, 5 acres of curly-leaf pondweed are treated with the herbicide Aquathol Super K® (granular endothall) at an average rate of 40 lbs/acre. 156.4 acres of Eurasian watermilfoil are treated with Navigate® at rates of 150 lbs/acre.

12 acres of Eurasian watermilfoil were treated in July during a follow-up survey, with Navigate® at a rate of 150 lbs/acre.

In October, a mapping survey finds a total of 129.1 acres of Eurasian watermilfoil remaining in the Legend Lake system. Again, monitoring data continues to show minimal negative impacts to water quality, dissolved oxygen or native plants.

LLPRD adopts an updated APM plan in December.

2010

In early May, 128.1 acres (one acre of milfoil was not found) of Eurasian watermilfoil are located and treated using Navigate® at a rate of 150 lbs/acre. Also in May, a curly-leaf pondweed survey took place, identifying a total of 19.64 acres. Due to the growth stage of the plant, budget and permitting constraints, only 7 acres of the total curly-leaf pondweed are treated in mid-May, using Aquathol Super K® at an average rate of 40 lbs/acre. A substantial effort was made to hand-pull the remaining curly-leaf pondweed plants later in the season.

In May the LLPRD is awarded a $20,000 grant from the WDNR for management and control of curly-leaf pondweed.

In July, a follow-up treatment locates and targets 5.16 acres of Eurasian watermilfoil, using Navigate® at a rate of 150 lbs/acre.

An October Eurasian watermilfoil mapping survey finds a total of 119.4 acres of milfoil remaining in the Legend Lake system.

Legend Lake Monitoring Program and Methods

In 2006 there was a concern of how Legend Lake would respond to the large-scale treatments that would occur. With any large-scale treatment, there is the potential to cause a decline in water quality and the quality of native plant communities. Because of that, a multi-year lake monitoring effort that included analysis of water chemistry, dissolved oxygen, aquatic plants, and pesticide concentrations was implemented. Changes in these parameters can help indicate positive or negative impacts that large-scale treatments may be having on the system. Because few impacts were noted in previous years, less sample dates occurred in 2010 than in previous years.

Dissolved Oxygen

In 2010, Dissolved oxygen and temperature profiles were taken at 14 locations throughout the Legend Lake system (**Figure 1**). Dissolved oxygen (mg/l) was recorded at each location in two foot intervals, from the surface to the bottom (maximum depth of 50 feet). System-wide dissolved oxygen data was collected once in each month of April, July, August, and September. Dissolved oxygen data was also collected on Sapokesick (site #11) once a week for five weeks following the Eurasian watermilfoil treatment.

Water Quality

Data was collected in each of the nine lake basins. Sampling occurred once per month in April, July, August, and September. Water quality parameters included: total phosphorus concentration, chlorophyll *a* concentration, and Secchi disc depth. Chlorophyll *a* and total phosphorus samples were sent to Northern Lake Service, Inc, a State certified laboratory, for analysis.

2,4-D Assays

To gain a better understanding of post-treatment herbicide movement, immunoassays of 2,4-D concentration were collected at five locations within Sapokesick (**Figure 2**). Samples were collected prior to treatment, as well as 8, 15, 22, and 28 days after treatment. All samples were sent to Davy Labs, a State certified laboratory, for analysis.

Aquatic Plant Communities

The Wisconsin Department of Natural Resources conducted a point-intercept survey for Spring and Sapokesick Lakes in August. Methods used for the 2006-2009 aquatic plant surveys were duplicated during this survey.

Milfoil Mapping

Since Eurasian watermilfoil often grows and spreads during cooler fall water temperatures, a survey was done in October to map Eurasian watermilfoil beds throughout Legend Lake. Unlike past years, where point-intercept data from August was used to locate milfoil beds, a full focused point-intercept survey was used. This method used the same map (with a 60 meter grid of GPS coordinates) as the point-intercept survey in August. The locations and spatial orientation of the beds were plotted with GPS, and the areas of the beds were determined using the modified acreage grid method. This focused point-intercept method is thought to be better at locating smaller beds that may have been overlooked with previous survey methods, and should provide better results.

Curly-Leaf Pondweed Mapping

Since curly-leaf pondweed was first identified in 2008, there has been a concern of it becoming a nuisance in Legend Lake. Because of this, a survey was done in the spring of 2010, to identify the distribution and abundance of the plant. This survey was done using surface observations and rake tows. Locations were recorded on a map using shoreline features, and acreage grid method was used to estimate the area of each location.

Figure 1. System-wide 2010 Water Quality and Dissolved Oxygen Monitoring Sites.

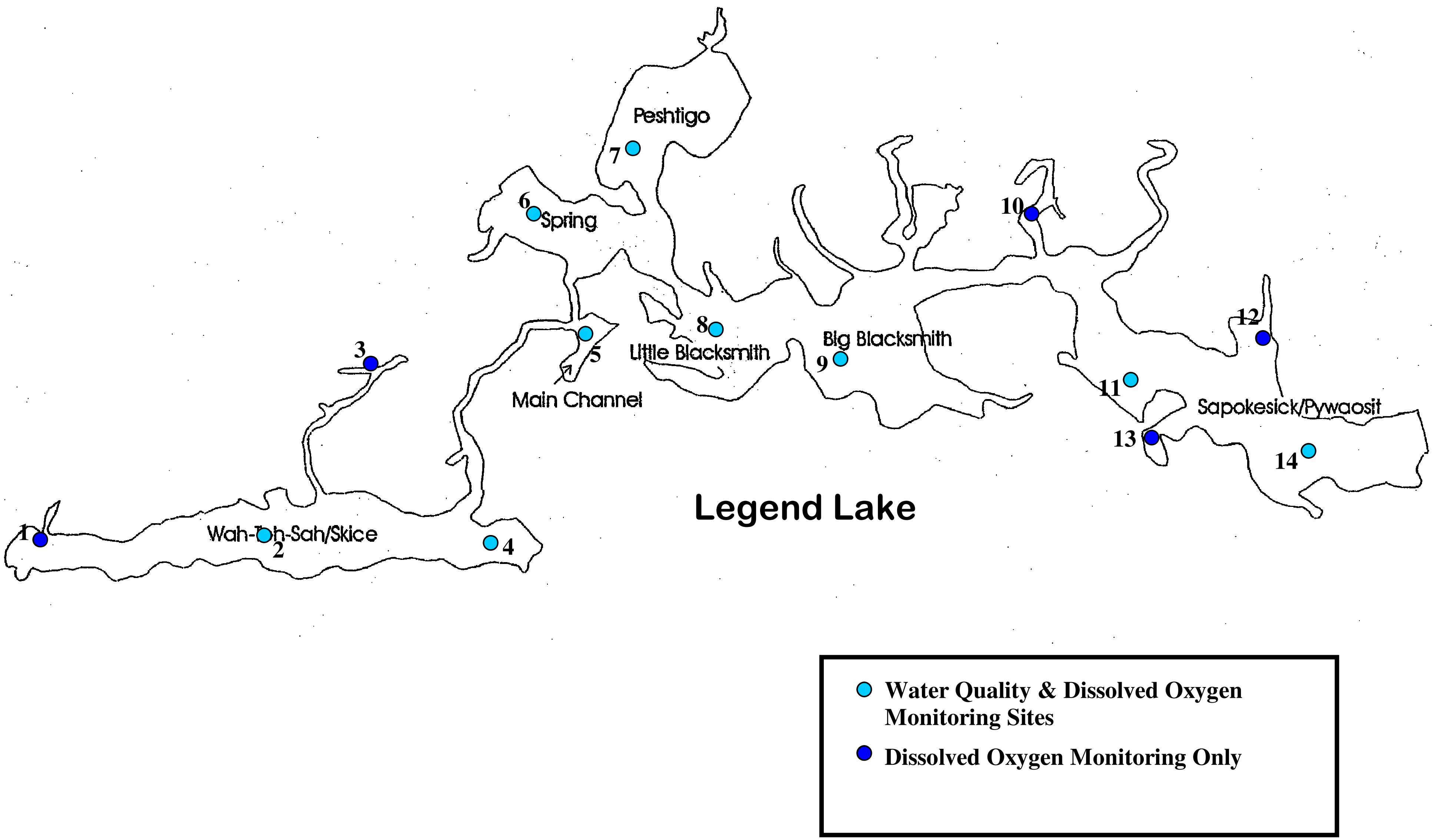
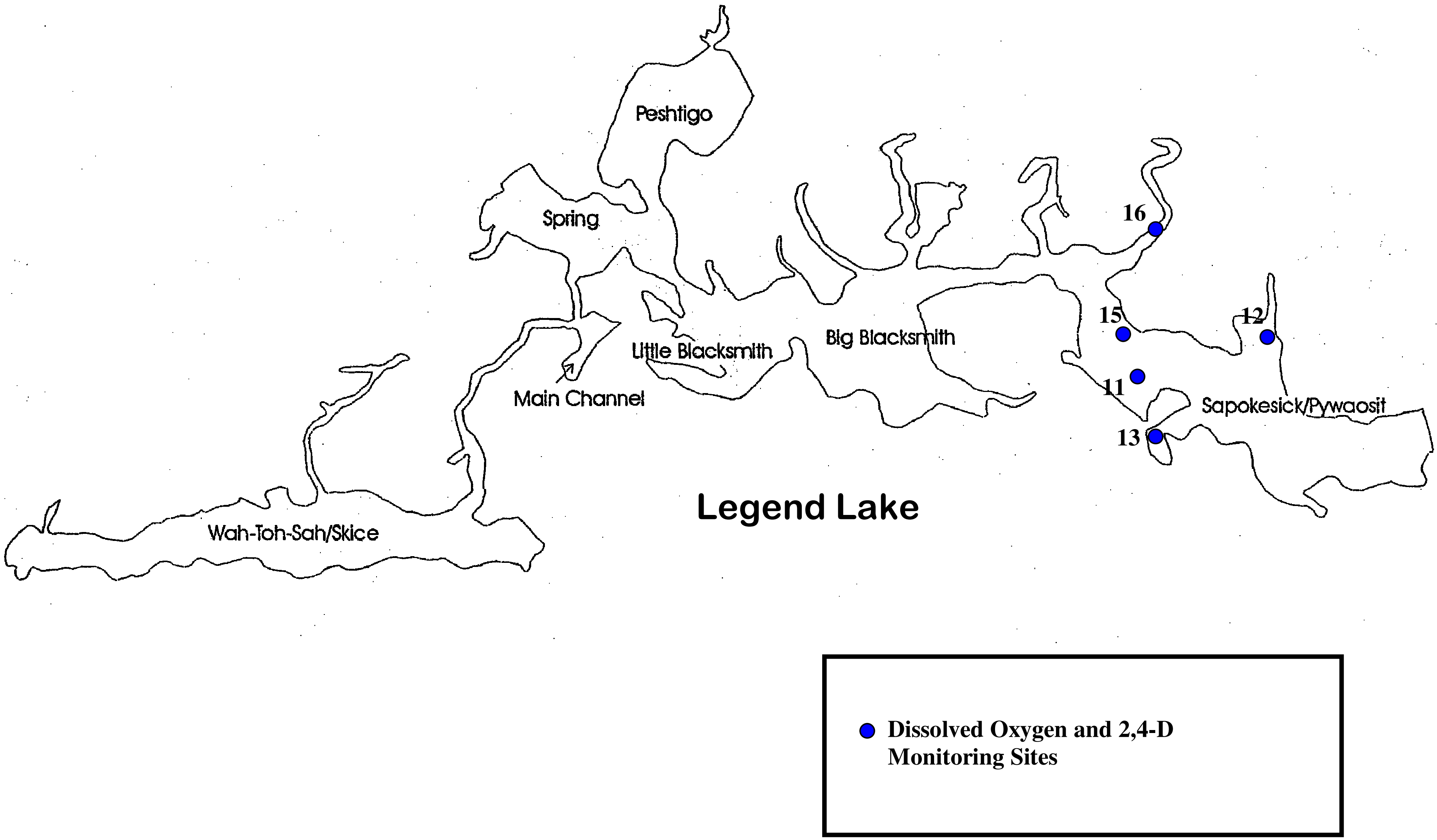


Figure 2. 2010 Intensive Dissolved Oxygen and 2,4-D Monitoring Sites.



2010 Results

Dissolved Oxygen

Lakes naturally experience oxygen depletions throughout the year. As plants die, decomposition uses the oxygen that is available. Also, temperature is inversely related to dissolved oxygen concentration. The warmer the water, the less dissolved oxygen it can hold. Because of this, oxygen depletions are commonly observed during the warmest months of the year. Oxygen depletions are typically found in the deepest basins of the lake, because of the lack of mixing with surface water. The only time these deep areas receive oxygenated water is during fall turnover, and during spring turnover, before the lake stratifies.

There is a concern that large treatments of Eurasian watermilfoil will add too much dead plant biomass, and lead to oxygen depletions. Because of this, an early season treatment strategy is applied. Since the plants are small and still growing, they add minimal biomass for decomposition. Also, the water is cold during this time of year and has a high capacity for dissolved oxygen. Because of these factors, the chance for oxygen depletions and/or anoxia (defined as less than 1 mg/l oxygen concentration) can be decreased.

Data collected between 2006 and 2009 showed occasional declines in dissolved oxygen. However, even in shallow locations, these declines were not significant enough to have a negative impact to aquatic life. Most of the declines seem to be related to seasonal trends. Although containing less sampling dates than in the past, the 2010 data is similar to prior years (**Appendix**). In all cases anoxia was either not found or confined to the very deepest areas. These results are typical of mesotrophic seepage lakes. **Table 1** shows the depth at which anoxia was recorded at the main basin of each lake.

Table 1. Legend Lake System 2010 dissolved oxygen monitoring results: depth (ft) at which anoxia (less than 1.0 mg/l oxygen concentration) occurred.

	Sample Date/Depth (ft)								
Lake	**4/14**	**5/13**	**5/19**	**5/27**	**6/2**	**6/10**	**7/7**	**8/4**	**9/1**
Wahtohsah	30	--	--	--	--	--	26	24	22
Sapokesick*	28	28	30	30	28	30	26	24	26
Skice	NF	--	--	--	--	--	24	22	22
Pywaosit	NF	--	--	--	--	--	36	36	30
Main Channel	NF	--	--	--	--	--	NF	NF	NF
Spring	20	--	--	--	--	--	24	20	20
Peshtigo	22	--	--	--	--	--	18	18	20
Little Blacksmith	NF	--	--	--	--	--	16	14	16
Big Blacksmith	NF	--	--	--	--	--	28	30	28

NF = Not Found: no anoxia was recorded at any depth.
*Intensive monitoring site in 2010

Water Quality

From 2006 to 2009, small declines in water quality could be observed shortly after a large-scale treatment. These conditions were short lived, as water quality remained in good condition throughout the year. 2010 showed similar trends, and overall showed good water quality for a mesotrophic lake. To date, the data that has been collected on Legend Lake suggests that little, if any, negative effects on water quality have taken place because of the chemical treatments. The data and results of the 2010 water quality monitoring efforts are presented in **Table 2**.

Trophic State Index (TSI) is a measure of a lake's productivity. It takes into consideration the water quality parameters that were measured, such as total phosphorus, chlorophyll, and water clarity. A high TSI value means a highly productive lake and poor water quality, whereas a low TSI value is characteristic of a lake with low productivity and good water quality. A desired TSI value for good water quality in lakes is below 50. Legend Lake consistently had TSI values below 50 throughout the season (**Table 2**). As seen in **Figure 3**, the water quality measurements taken throughout the season, place Legend Lake well within the boundaries of a mesotrophic lake. **Figure 4** compares the average TSI values throughout the years of collecting data.

Table 2. 2010 Legend Lake Water Quality Analysis Data and Results.

Location	Sample Date	Phosphorus (µg/l)	Phosphorus TSI	Chlorophyll a (ug/l)	Chlorophyll a TSI	Secchi (m)	Secchi TSI	Average TSI
Wahtosah	14-Apr	16	44.13	1.10	31.53	4.2	39.19	38.29
	7-Jul	14	42.21	2.90	41.04	3.4	42.57	41.94
	4-Aug	14	42.21	2.50	39.59	2.7	45.95	42.58
	1-Sep	16	44.13	3.30	42.31	2.7	45.62	44.02
Skice	14-Apr	11	38.73	1.10	31.53	4.1	39.83	36.70
	7-Jul	11	38.73	0.90	29.57	3.2	43.24	37.18
	4-Aug	15	43.20	2.90	41.04	--	--	42.12
	1-Sep	11	38.73	2.80	40.70	2.6	46.28	41.90
Main Channel	14-Apr	14	42.21	2.70	40.34	>2.5	--	41.27
	7-Jul	11	38.73	1.90	36.90	>2.3	--	37.81
	4-Aug	10	37.35	2.90	41.04	>2.2	--	39.20
	1-Sep	13	41.14	2.90	41.04	>2.3	--	41.09
Spring	14-Apr	18	45.83	1.90	36.90	3.5	41.80	41.51
	7-Jul	11	38.73	2.60	39.97	2.9	44.68	41.13
	4-Aug	13	41.14	2.80	40.70	2.7	45.95	42.59
	1-Sep	13	41.14	2.30	38.77	3.7	40.96	40.29
Peshtigo	14-Apr	15	43.20	1.20	32.39	3.7	41.07	38.89
	7-Jul	11	38.73	3.40	42.61	2.6	46.28	42.54
	4-Aug	11	38.73	2.20	38.33	2.9	44.68	40.58
	1-Sep	11	38.73	2.30	38.77	3.4	42.18	39.89
Little Blacksmith	14-Apr	16	44.13	2.50	39.59	3.5	41.80	41.84
	7-Jul	10	37.35	2.30	38.77	2.9	44.83	40.32
	4-Aug	13	41.14	2.50	39.59	--	--	40.36
	1-Sep	14	42.21	2.70	40.34	3.2	43.38	41.97

Location	Sample Date	Phosphorus (µg/l)	Phosphorus TSI	Chlorophyll a (ug/l)	Chlorophyll a TSI	Secchi (m)	Secchi TSI	Average TSI
Big Blacksmith	14-Apr	17	45.00	2.20	38.33	3.5	41.80	41.71
	7-Jul	9	35.83	2.00	37.40	3.4	42.18	38.47
	4-Aug	9	35.83	1.90	36.90	3.1	43.51	38.75
	1-Sep	8.5	35.01	1.60	35.21	3.7	41.07	37.10
Pywaosit	14-Apr	13	41.14	1.30	33.17	5.3	35.96	36.76
	7-Jul	10	37.35	1.10	31.53	3.7	41.07	36.65
	4-Aug	14	42.21	3.30	42.31	4.3	39.09	41.20
	1-Sep	9.5	36.61	0.75	27.78	5.6	35.08	33.16
Sapokesik	14-Apr	15	43.20	1.20	32.39	4.9	36.99	37.53
	7-Jul	9	35.83	1.30	33.17	3.8	40.61	36.54
	4-Aug	14	42.21	1.70	35.81	4.1	39.72	39.24
	1-Sep	7.2	32.62	0.91	29.67	5.7	34.92	32.40

Figure 3. Trophic State Indices derived from 2010 Legend Lake Water Quality Analysis Results.

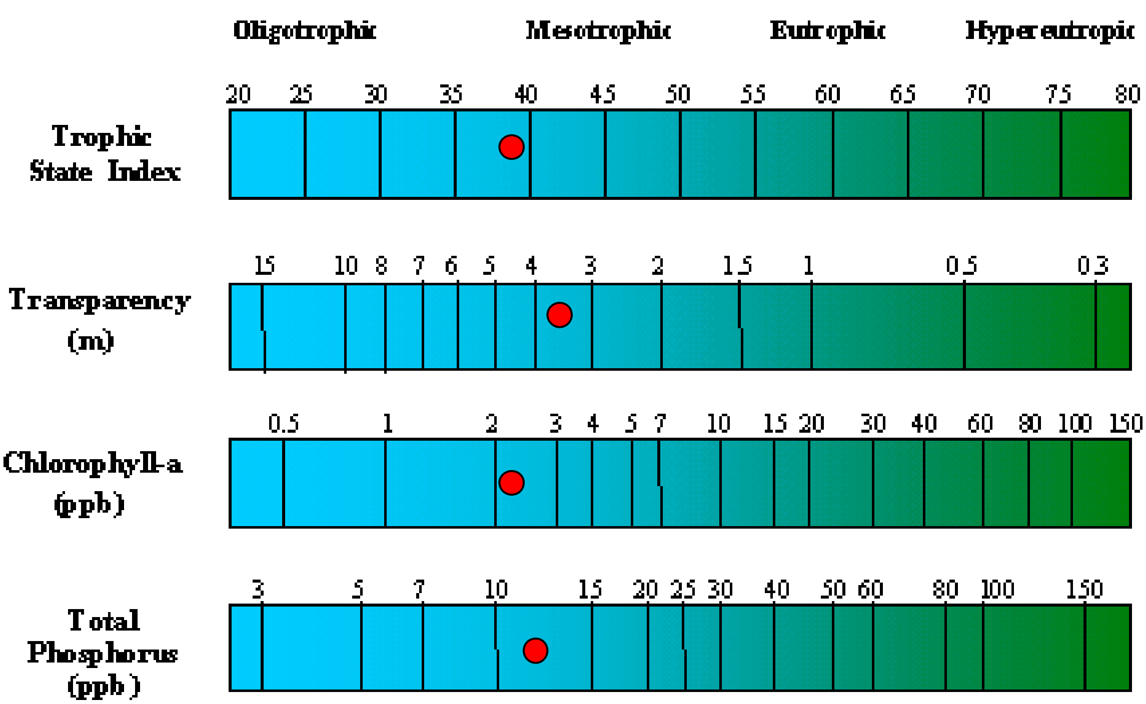
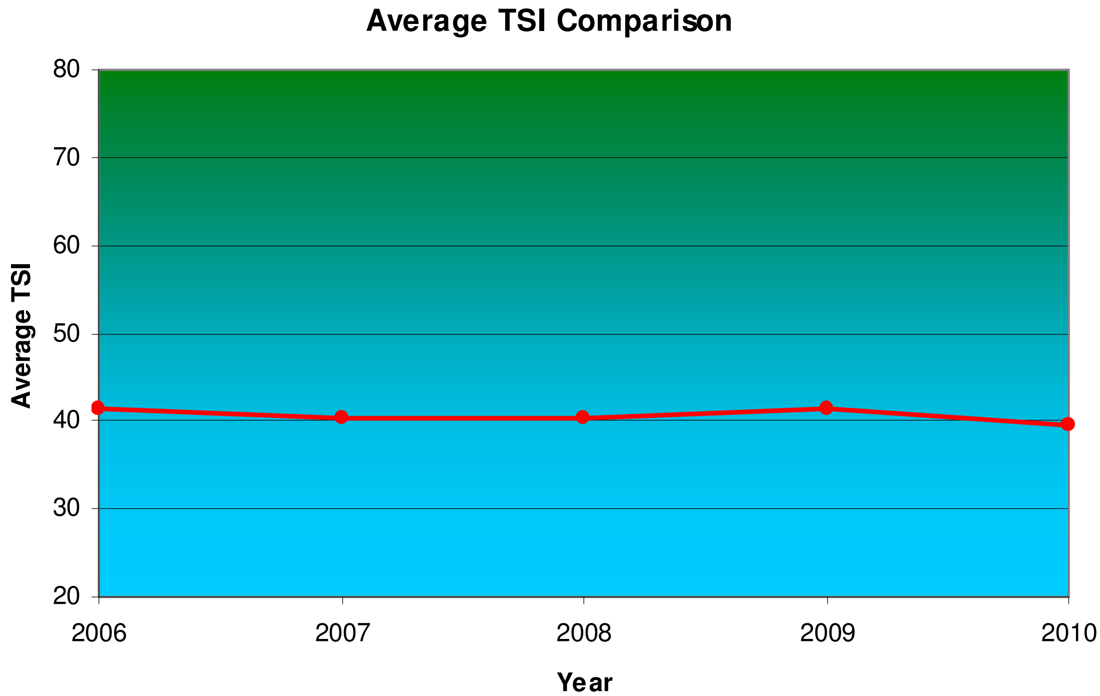


Figure 4. Average TSI value comparisons for Legend Lake from 2006-2010.



2,4-D Assays

Analysis of 2,4-D concentrations was done on samples from five points on Sapokesick Lake (**Table 3**). All results were very low, considering the recommended target concentration is 2 – 4 ppm (2000 – 4000 ppb). According to previous data, this occurs because 2,4-D dissipates from treatment sites and spreads throughout the lake. By 28 days after treatment (DAT) all the locations were below 70 ppb, the EPA's drinking water standard for 2,4-D. Unlike 2009 when 2,4-D concentrations were nearly undetectable by 29 DAT, a low concentration still remained in 2010. This is more similar to data prior to 2009, and may be due to differences in water temperatures and the resultant biological activity.

Table 3. Results of 2,4-D immunoassays conducted on samples collected from Sapokesick Lake in 2010

	2,4-D concentration (ppb)			
Site (Sapokesick)	**8 DAT**	**15 DAT**	**22 DAT**	**28 DAT**
11	99.6	111.0	117.0	43.8
12	125.0	81.2	47.2	30.3
13	196.0	98.2	131.0	35.5
15	151.0	101.0	54.1	41.0
16	150.0	91.6	48.6	21.2

DAT=Days After Treatment

Aquatic Plant Community

Since aquatic plant surveys began monitoring native plant communities on the Legend Lake System, many plant species inconsistently vary in abundance from year to year. It has been difficult to attribute changes in native (non-target) plant frequency to the treatments. For the most part, native plants appear to be minimally affected by the herbicide treatments. The one exception had been the decline in northern watermilfoil on some lakes from 2006 to 2007 and from 2007 to 2008 following large-scale treatments. The 2010 northern watermilfoil frequency on Sapokesick Lake, following a large-scale treatment, was not significantly different from 2009 frequency.

Sapokesick and Spring Lake were the only lakes surveyed in the 2010 season. **Table 4** and **5** present the data from the recent surveys, compared with data from 2006-2009. Plant species that are considered potentially susceptible to 2,4-D herbicides are in bold. Values that reflect statistically significant changes from the previous year are in italics.

Overall, the Legend Lake system continues to have a healthy and diverse native plant community.

Table 4. Sapokesick Lake

Species common name	Scientific name	August, 2006 Percent Frequency	August, 2007 Percent Frequency	August, 2008 Percent Frequency	August, 2009 Percent Frequency	August, 2010 Percent Frequency
Eurasian watermilfoil	***Myriophyllum spicatum***	58.00	33.33	16.39	13.90	4.82
Watershield	***Brasenia schreberi***	4.70	3.21	1.64	2.70	2.41
Coontail	***Ceratophyllum demersum***	33.30	44.98	29.51	13.90	18.88
Muskgrasses	*Chara*	3.90	16.06	33.2	36.29	45.78
Needle spikerush	*Eleocharis acicularis*	--	0.80	--	--	0.80
Common waterweed	*Elodea canadensis*	29.40	52.21	50.82	25.10	54.22
Water star-grass	*Heteranthera dubia*	1.60	--	1.23	0.39	1.20
Brown-fruited rush	*Juncus peleocarpus f. submersus*	--	--	--	0.39	0.40
Forked duckweed	*Lemna trisulca*	--	--	0.41	--	--
Water marigold	*Megalodonta beckii*	--	--	--	1.16	1.20
Northern water milfoil	***Myriophyllum sibiricum***	10.60	6.83	2.46	1.93	2.01
Najas sp.	*Najas sp.*	41.20	53.01	59.02	39.38	59.44
Nitella	*Nitella* sp.	2.40	6.02	3.69	3.86	10.84
Spatterdock	***Nuphar variegata***	0.80	0.4	1.64	1.54	0.80
White water lily	***Nymphaea odorata***	5.10	3.61	1.23	4.25	2.01
Water smartweed	*Polygonum amphibium*	--	0.40	--	visual	visual
Pickerelweed	*Pontederia cordata*	--	0.40	--	visual	--
Large-leaf pondweed	*Potamogeton amplifolius*	1.60	2.81	3.28	0.39	3.61
leafy pondweed	*Potamogeton foliosus*	--	1.20	--	--	0.40
Fries pondweed	*Potamogeton friesii*	--	0.4	0.41	1.93	1.20
Variable pondweed	*Potamogeton gramineus*	0.80	1.61	0.82	5.79	8.43
Illinois pondweed	*Potamogeton illinoensis*	27.10	27.71	24.18	5.41	2.41
Floating-leaf pondweed	*Potamogeton natans*	0.40	1.61	1.23	0.77	visual
White-stem pondweed	*Potamogeton praelongis*	27.80	2.41	4.1	5.79	6.02
Small pondweed	*Potamogeton pusillus*	9.40	13.25	33.61	23.55	24.10

Table 4. Sapokesick Lake cont.						
Species common name	**Scientific name**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**
Clasping-leaf pondweed	*Potamogeton richardsonii*	3.50	24.1	32.79	32.82	21.29
Fern Pondweed	*Potamogeton robbinsii*	13.30	28.11	29.51	28.19	35.34
Stiff pondweed	*Potamogeton strictifolius*	--	1.2	--	5.41	--
Vasey's pondweed	*Potamogeton vaseyi*	--	--	--	0.39	--
Flat-stem pondweed	*Potamogeton zosteriformis*	20.40	24.1	31.97	28.96	24.10
Stiff water crowfoot	*Ranunculus aquatilis*	0.40	0.80	--	--	--
sagittaria sp.	*sagittaria sp.*	--	visual	--	--	0.40
Water bulrush	*Schoenoplectus subterminalis*	--	0.80	--	--	--
Softstem bulrush	*Schoenoplectus tabernaemontani*	--	--	--	visual	--
Narrow-leaf burreed	*Sparganium angustifolium*	--	0.40	--	--	--
Sago pondweed	*Stuckenia pectinata*	3.50	8.84	4.92	6.95	8.03
Creeping bladderwort	***Utricularia gibba***	3.50	23.29	36.89	23.94	20.88
Twin-stem bladderwort	***Utricularia giminiscapa***	--	--	--	--	1.20
Flat-leaf bladderwort	***Utricularia intermedia***	--	--	--	0.39	--
Small bladderwort	***Utricularia minor***	--	--	0.41	0.77	0.80
Large purple bladderwort	***Utricularia purpurea***	--	--	--	--	0.40
Common bladderwort	***Utricularia vulgaris***	1.60	1.61	5.33	5.41	12.05
Wild celery	*Vallisneria americana*	22.00	32.53	34.02	28.57	36.55
Curly-leaf pondweed	***Potamogeton crispus***	0.4	--	--	--	--
Filamentous algae	--	--	0.80	5.74	4.63	11.24
Moss	--	--	--	--	--	4.42
Freshwater sponge	--	--	--	--	--	0.40

Table 5. Spring Lake
and northern Main Channel

		August, 2006	**August, 2007**	**August, 2008**	**August, 2009**	**August, 2010**
Species common name	**scientific name**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**
Eurasian watermilfoil	***Myriophyllum spicatum***	59.6	6.36	9.01	8.11	6.48
Watershield	***Brasenia schreberi***	3	0.91	--	visual	visual
Coontail	***Ceratophyllum demersum***	21.2	11.82	7.21	4.50	8.33
Northern watermilfoil	***Myriophyllum sibiricum***	18.2	--	--	--	--
Spiny hornwort	*Ceratophyllum echinatum*	--	--	--	--	0.93
Muskgrasses	*Chara*	32.3	46.36	61.26	58.56	66.67
Needle spikerush	*Eleocharis acicularis*	--	0.91	--	--	0.93
Common waterweed	*Elodea canadensis*	37.4	49.09	49.55	32.43	49.07
Water stargrass	*Heteranthera dubia*	1	--	--	--	0.93
Water marigold	*Megalodonta beckii*	3	0.91	0.9	--	--
Najas sp.	*Najas sp.*	44.4	32.73	48.65	36.94	49.07
Nitella	*Nitella* sp.	1	14.55	0.9	--	8.33
Spatterdock	***Nuphar variegata***	8.1	1.82	--	2.70	3.70
White water lily	***Nymphaea odorata***	5.1	1.82	--	1.80	0.93
Pickerelweed	*Pontederia cordata*	3	1.82	--	0.90	0.93

Table 5. Spring Lake cont.						
Species common name	**Scientific name**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**	**Percent Frequency**
Large-leaf pondweed	*Potamogeton amplifolius*	--	1.82	2.7	4.50	4.63
Leafy pondweed	*Potamogeton foliosus*	--	0.78	--	--	--
Frie's pondweed	*Potamogeton friesii*	--	--	--	--	3.70
Variable pondweed	*Potamogeton gramineus*	11.1	--	--	10.81	11.11
Illinois pondweed	*Potamogeton illinoensis*	18.2	34.55	27.93	12.61	19.44
White-stem pondweed	*Potamogeton praelongis*	38.4	5.45	7.21	7.21	10.19
Small pondweed	*Potamogeton pusillus*	4	0.91	9.91	10.81	10.19
Clasping-leaf pondweed	*Potamogeton richardsonii*	--	10.91	29.73	18.92	18.52
Fern Pondweed	*Potamogeton robbinsii*	16.2	36.36	32.43	27.93	38.89
Stiff pondweed	*Potamogeton strictifolius*	--	0.91	--	0.90	0.93
Flat-stem pondweed	*Potamogeton zosteriformis*	21.2	11.82	27.93	26.13	27.78
Stiff water crowfoot	*Ranunculus aquatilis*	--	0.91	--	--	--
sagittaria sp	*sagittaria sp.*	--	--	--	--	1.85
Sago pondweed	*Stuckenia pectinata*	8.1	4.55	25.23	16.22	13.89
Twin-stem bladderwort	***Utricularia geminiscapa***	--	--	--	--	1.85
Creeping bladderwort	***Utricularia gibba***	--	40.91	17.12	22.52	24.07
Flat-stem bladderwort	***Utricularia intermedia***	--	--	--	--	0.93
Small bladderwort	***Utricularia minor***	--	--	--	3.60	7.41
Common bladderwort	***Utricularia vulgaris***	23.2	40.91	28.83	30.63	44.44
Wild celery	*Vallisneria americana*	21.2	36.36	27.03	27.03	41.67
Broad-leaved cattail	*Typha latifolia*	1	--	--	--	--
Northern wild rice	*Zizania palustris*	1	--	--	--	--
Filamentous algae	--	--	8.18	5.41	6.31	26.85
Moss	--	--	--	--	--	3.70
Freshwater sponge	--	--	--	--	--	0.93

Milfoil Mapping

The May 2010 treatments appeared to be successful at reducing Eurasian watermilfoil abundance. As a result, the follow-up treatment in July could only find 5.16 acres of milfoil. These areas were treated the same day using Navigate® at a rate of 150 lbs/acre. Re-growth of milfoil was noticed during the late summer to early fall months. The full focused point-intercept survey conducted in October found a total of 119.4 acres of milfoil (**Figures 5-13; Tables 6-8**). Besides Sapokesick and Peshtigo lakes, most of the lakes showed an increase in abundance or very slight change from 2009 to 2010 (**Table 7**). Sapokesick Lake showed a drastic decrease in abundance of 147.6%, and Peshtigo showed a decrease of 29.5%. Overall, a system-wide decrease in abundance of 8.1% was observed (**Table 7**).

Table 6. Legend Lake Eurasian watermilfoil acreage from 2005–2010 – derived from October mapping surveys

	Year / Eurasian watermilfoil acreage					
Location (total area)	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Wahtosah/Skice (284 ac)	114.2	180.3	249.7	32.2	19.5	30.7
Main Channel (18 ac)	10.5	6.9	0.7	3.4	1.1	3.8
Spring (114 ac)	38	87.8	6.8	14.6	10.6	12.9
Peshtigo (94 ac)	32.1	21	16.1	9.6	14.5	11.2
Little Blacksmith (84 ac)	60.4	34.1	6.1	9.9	5	16.1
Big Blacksmith (233 ac)	88.2	43.6	16	13.4	10.7	14.2
Sapokesik/Pywaosit (458 ac)	194.6	286.5	202.3	73.3	67.9	30.5
Totals (1285 ac)	**538**	**660.2**	**497.7**	**156.4**	**129.3**	**119.4**

Table 7. Percent Change in Eurasian watermilfoil acreage from 2009–2010 – derived from October mapping surveys

	Year/Eurasian watermilfoil acreage		
Location	**2009**	**2010**	**% change**
Wahtosah / Skice	19.5	30.7	36.5
Main Channel	1.1	3.8	71.1
Spring	10.6	12.9	17.8
Peshtigo	14.5	11.2	-29.5
Little Blacksmith	5.0	16.1	68.9
Big Blacksmith	10.7	14.2	24.6
Sapokesick	61.9	25	-147.6
Pywaosit	5.8	5.5	-5.5
Totals	**129.1**	**119.4**	**-8.1**

Figure 5. October 2010 distribution of Eurasian watermilfoil (*Myriophyllum spicatum*) in the Legend Lake system, Menominee County, Wisconsin (119.4 acres total).

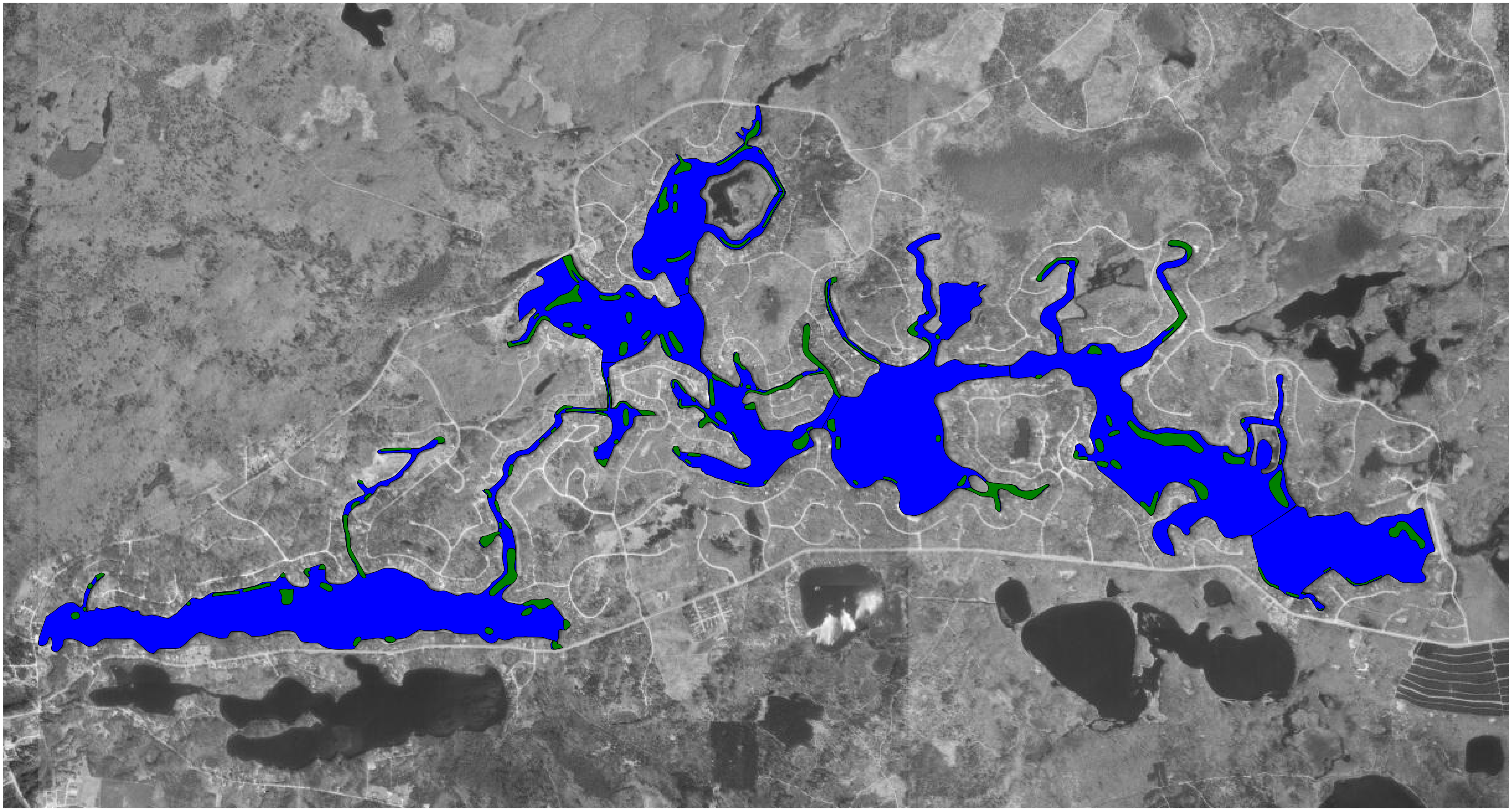


Figure 6. October 2010 distribution of Eurasian watermilfoil in Wahtohsah and Skice Lakes.

Figure 7. October 2010 distribution of Eurasian watermilfoil in Main Channel.

Figure 8. October 2010 distribution of Eurasian watermilfoil in Spring Lake.

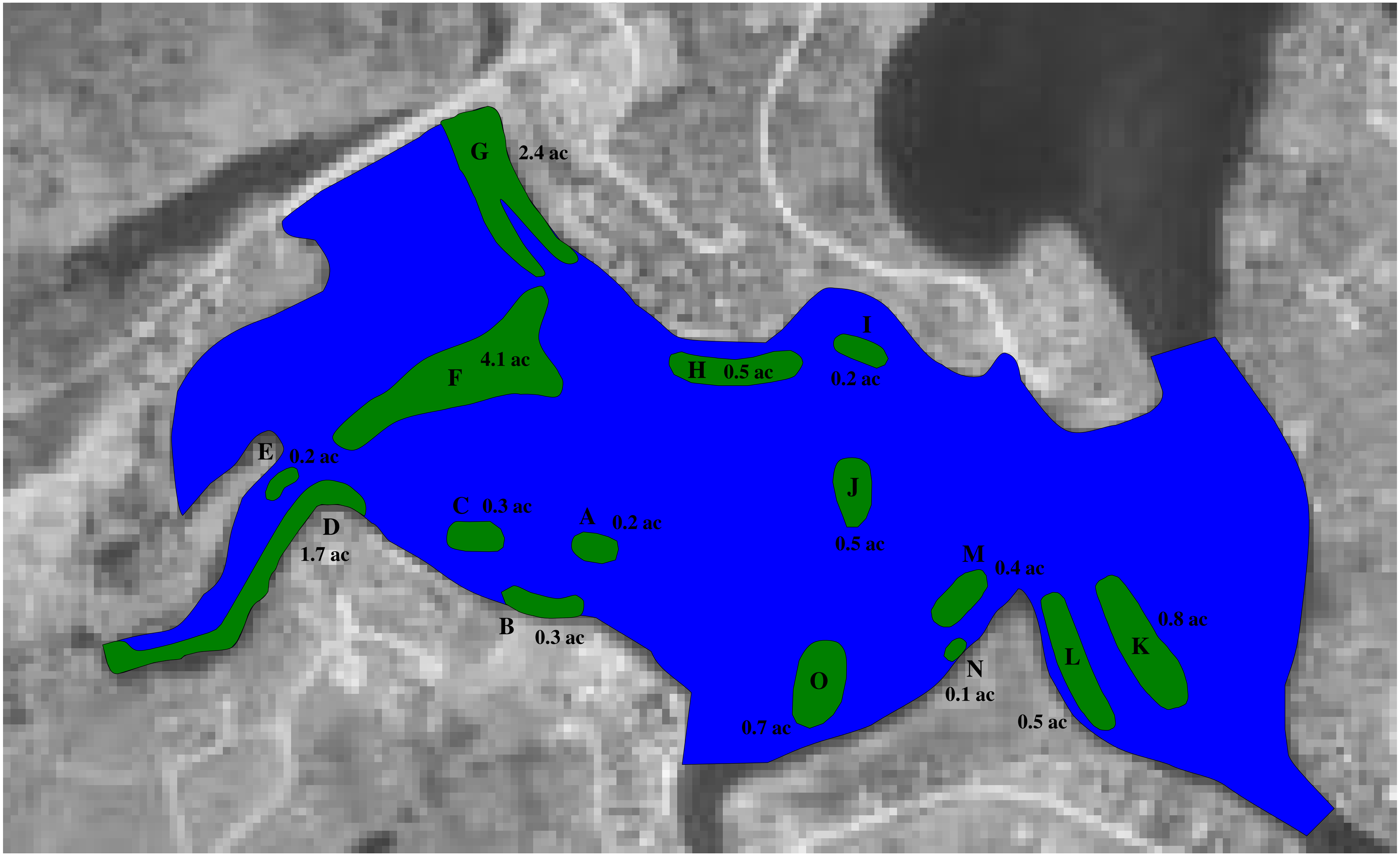


Figure 9. October 2010 distribution of Eurasian watermilfoil in Peshtigo Lake.

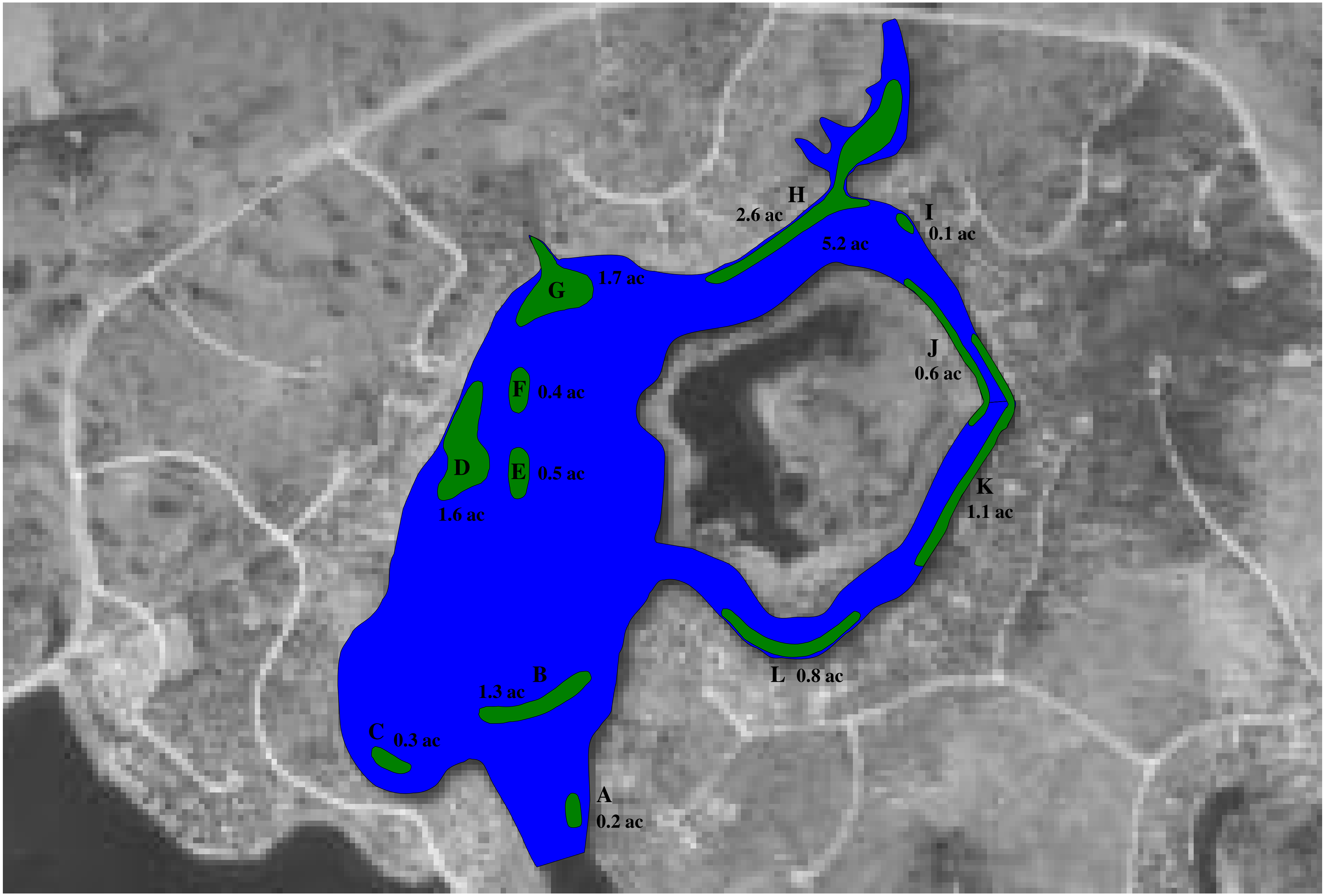


Figure 10. October 2010 distribution of Eurasian watermilfoil in Little Blacksmith Lake.

Figure 11. October 2010 distribution of Eurasian watermilfoil in Big Blacksmith Lake.

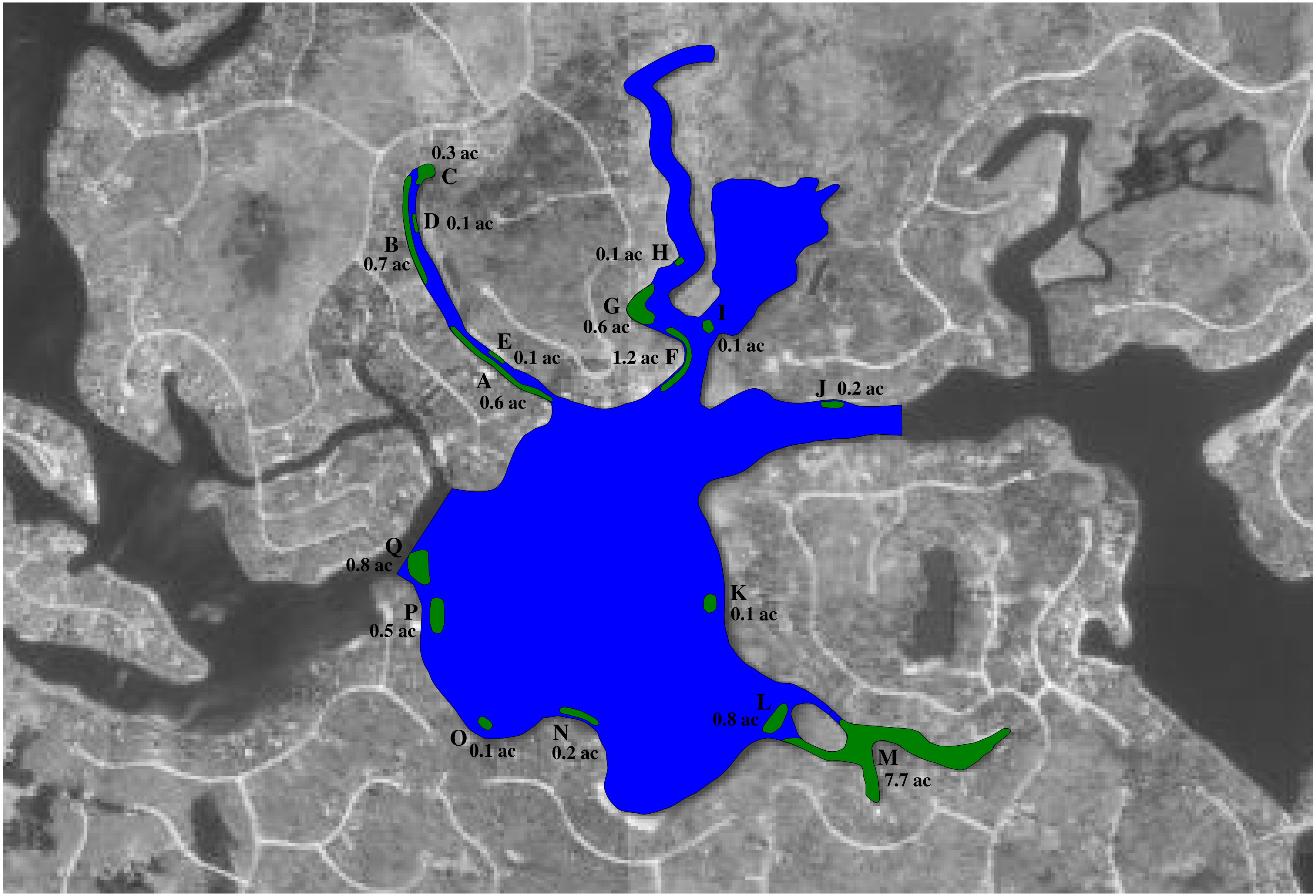


Figure 12. October 2010 distribution of Eurasian watermilfoil in Sapokesick Lake.

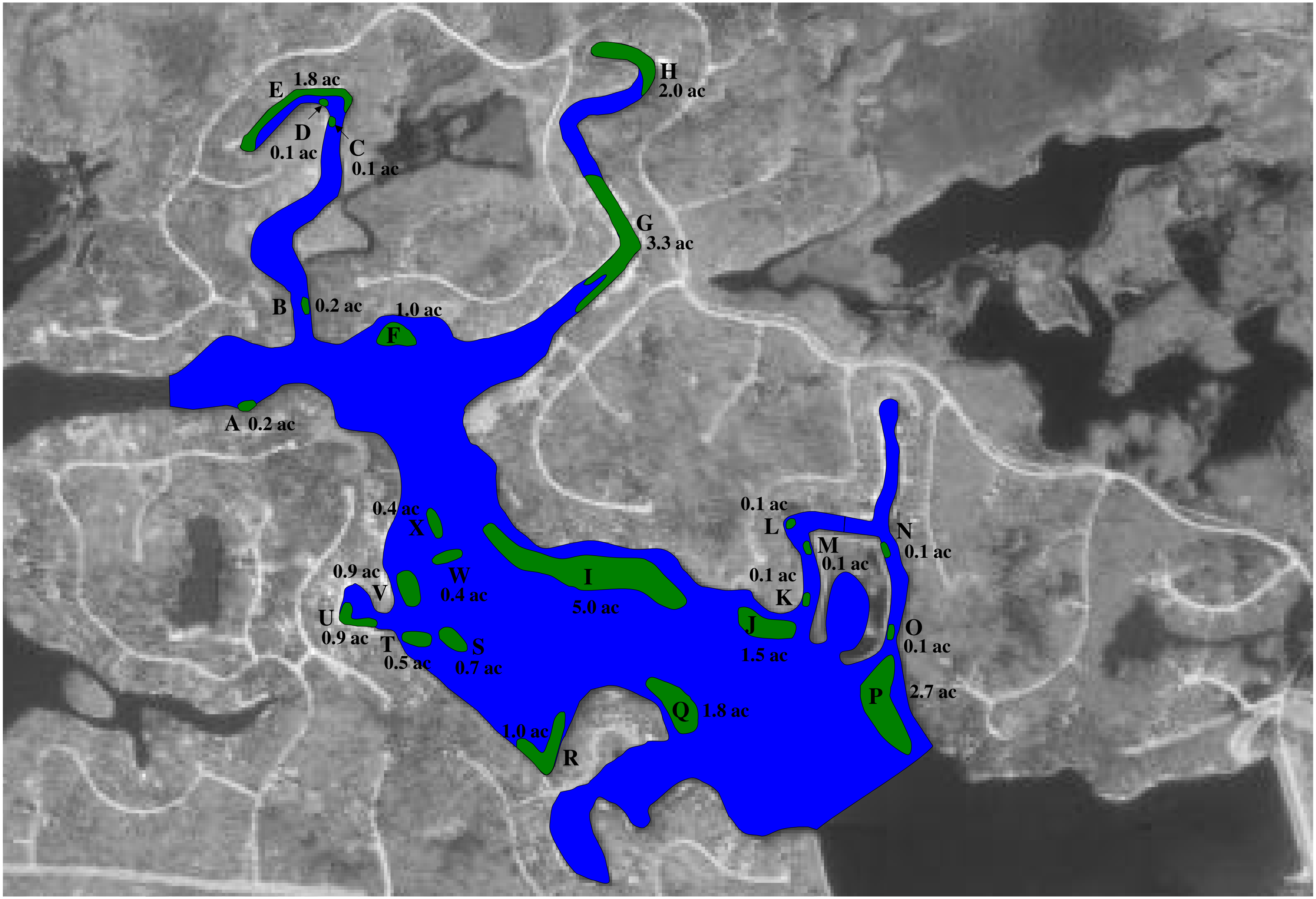


Figure 13. October 2010 distribution of Eurasian watermilfoil in Pywaosit Lake.

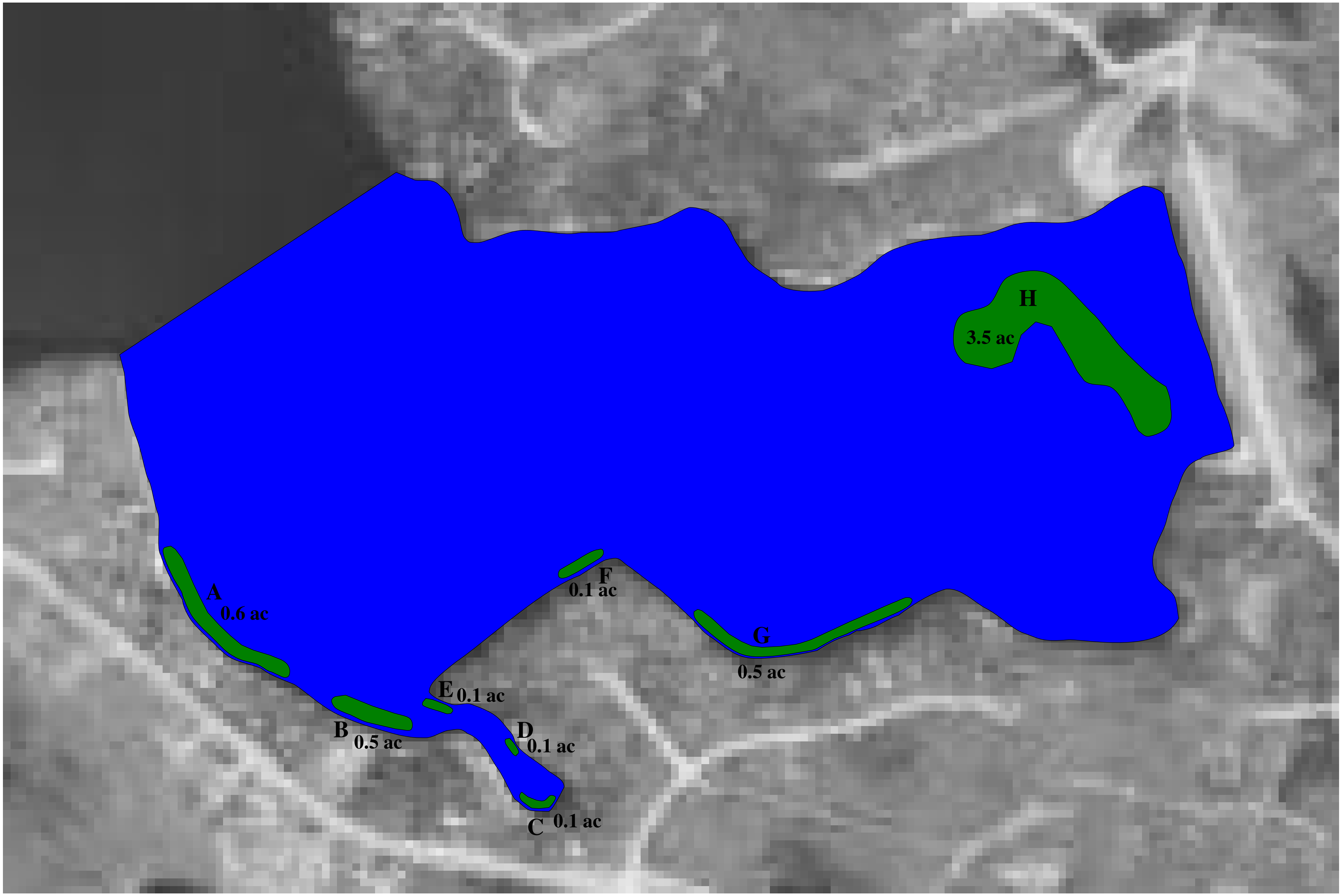


Table 8. Eurasian watermilfoil acreage (119.4 acres total) by bed from October 2010 survey.

Wahtosah/Skice 294 acres	
Bed	EWM acreage
A	0.4
B	0.2
C	0.4
D	0.4
E	0.2
F	1.1
G	1.5
H	0.4
I	1.5
J	0.4
K	0.4
L	1.1
M	2.7
N	0.4
O	0.4
P	0.2
Q	1.9
R	0.8
S	0.4
T	0.4
U	0.4
V	0.4
W	0.8
X	1.9
Y	1.1
Z	4.2
AA	1.5
AB	0.2
AC	0.4
AD	0.4
AE	0.4
AF	0.4
AG	0.2
AH	0.2
AI	1.1
AJ	1.9
Total:	**30.7**

Main Channel 18 acres	
Bed	EWM acreage
A	0.2
B	0.1
C	0.4
D	0.1
E	0.9
F	0.5
G	0.4
H	0.4
I	0.6
J	0.2
Total:	**3.8**

Spring 114 acres	
Bed	EWM acreage
A	0.2
B	0.3
C	0.3
D	1.7
E	0.2
F	4.1
G	2.4
H	0.5
I	0.2
J	0.5
K	0.8
L	0.5
M	0.4
N	0.1
O	0.7
Total:	**12.9**

Little Blacksmith 91 acres	
Bed	EWM acreage
A	0.9
B	0.1
C	0.8
D	0.2
E	0.1
F	2.6
G	3.2
H	0.1
I	1.7
J	0.1
K	0.7
L	0.1
M	0.2
N	0.1
O	0.4
P	0.3
Q	0.1
R	0.8
S	1.7
T	0.5
U	0.1
V	1.3
Total:	**16.1**

Pywaosit 122 acres	
Bed	EWM acreage
A	0.6
B	0.5
C	0.1
D	0.1
E	0.1
F	0.1
G	0.5
H	3.5
Total:	**5.5**

Sapokesick 252 acres	
Bed	EWM acreage
A	0.2
B	0.2
C	0.1
D	0.1
E	1.8
F	1.0
G	3.3
H	2.0
I	5.0
J	1.5
K	0.1
L	0.1
M	0.1
N	0.1
O	0.1
P	2.7
Q	1.8
R	1.0
S	0.7
T	0.5
U	0.9
V	0.9
W	0.4
X	0.4
Total:	**25.0**

Table 6. Continued

Peshtigo 93 acres	
Bed	EWM acreage
A	0.2
B	1.3
C	0.3
D	1.6
E	0.5
F	0.4
G	1.7
H	2.6
I	0.1
J	0.6
K	1.1
L	0.8
Total:	**11.2**

Big Blacksmith 233 acres	
Bed	EWM acreage
A	0.6
B	0.7
C	0.3
D	0.1
E	0.1
F	1.2
G	0.6
H	0.1
I	0.1
J	0.2
K	0.1
L	0.8
M	7.7
N	0.2
O	0.1
P	0.5
Q	0.8
Total:	**14.2**

Curly-leaf pondweed

Curly-leaf pondweed, another invasive exotic plant, has been observed in the Legend Lake System for several years. After some small scale treatments, it was suggested that a dedicated mapping effort be done to gain a better picture of the distribution of the plant in Legend Lake. Since the plant is a cold-water species and dies back during the summer months, a spring survey was conducted in 2010, locating 19.64 acres of curly-leaf pondweed (**Table 9**). All of the areas where curly-leaf pondweed was located can be found in **figures 14-21**.

Table 9. Curly-leaf Pondweed acreage by lake (from May 2010 survey)

Location	**CLPW Acreage**
Wahtohsah	7.75
Skice	not found
Main Channel	0.88
Spring	0.63
Peshtigo	4.50
Little Blacksmith	0.88
Big Blacksmith	not found
Sapokesick	5.00
Pywaosit	not found
Total	**19.64 acres**

Figure 14. May 2010 distribution of curly-leaf pondweed in Wahtohsah and Skice Lakes.

Figure 15. May 2010 distribution of curly-leaf pondweed in Main Channel.

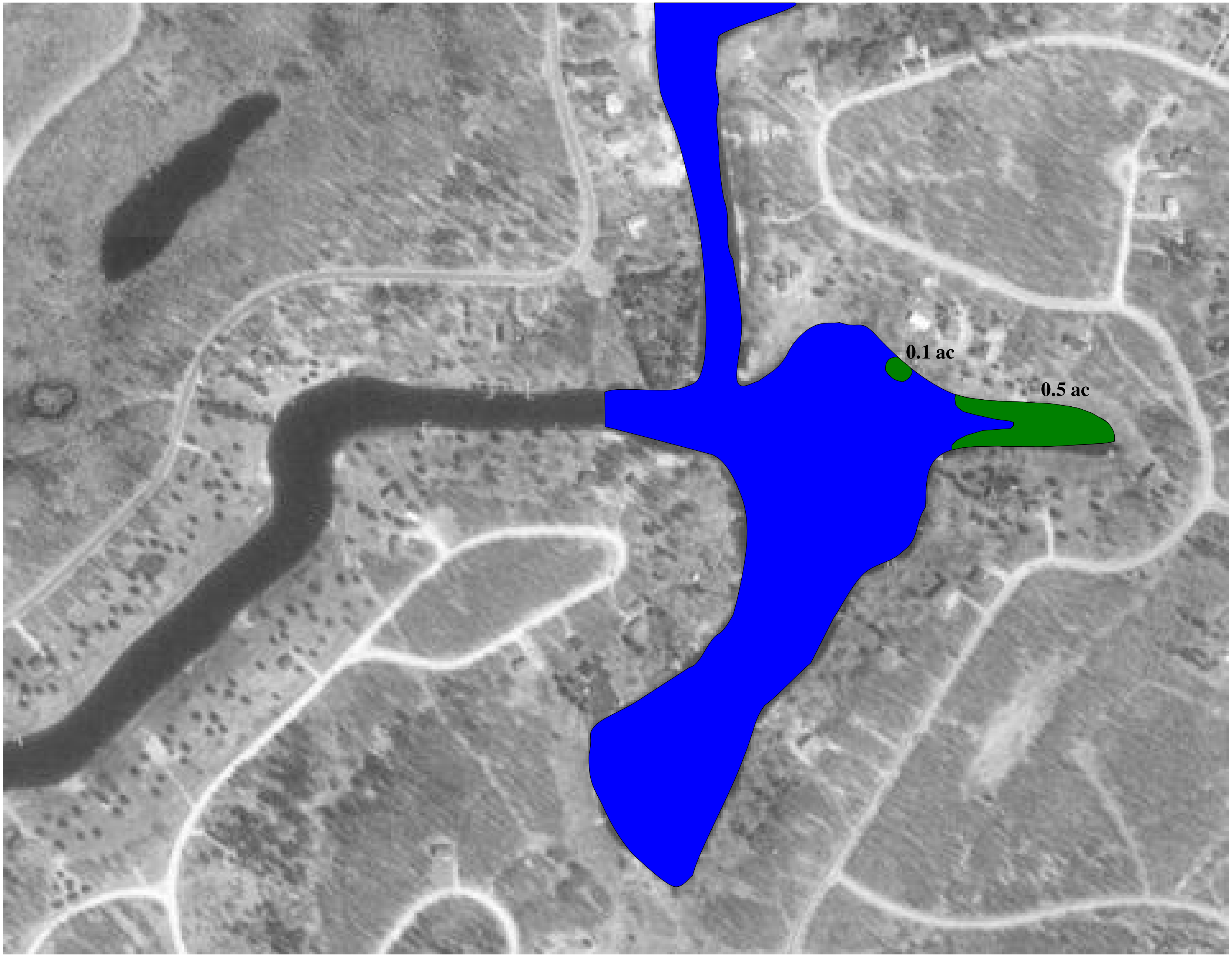


Figure 16. May 2010 distribution of curly-leaf pondweed in Spring Lake.

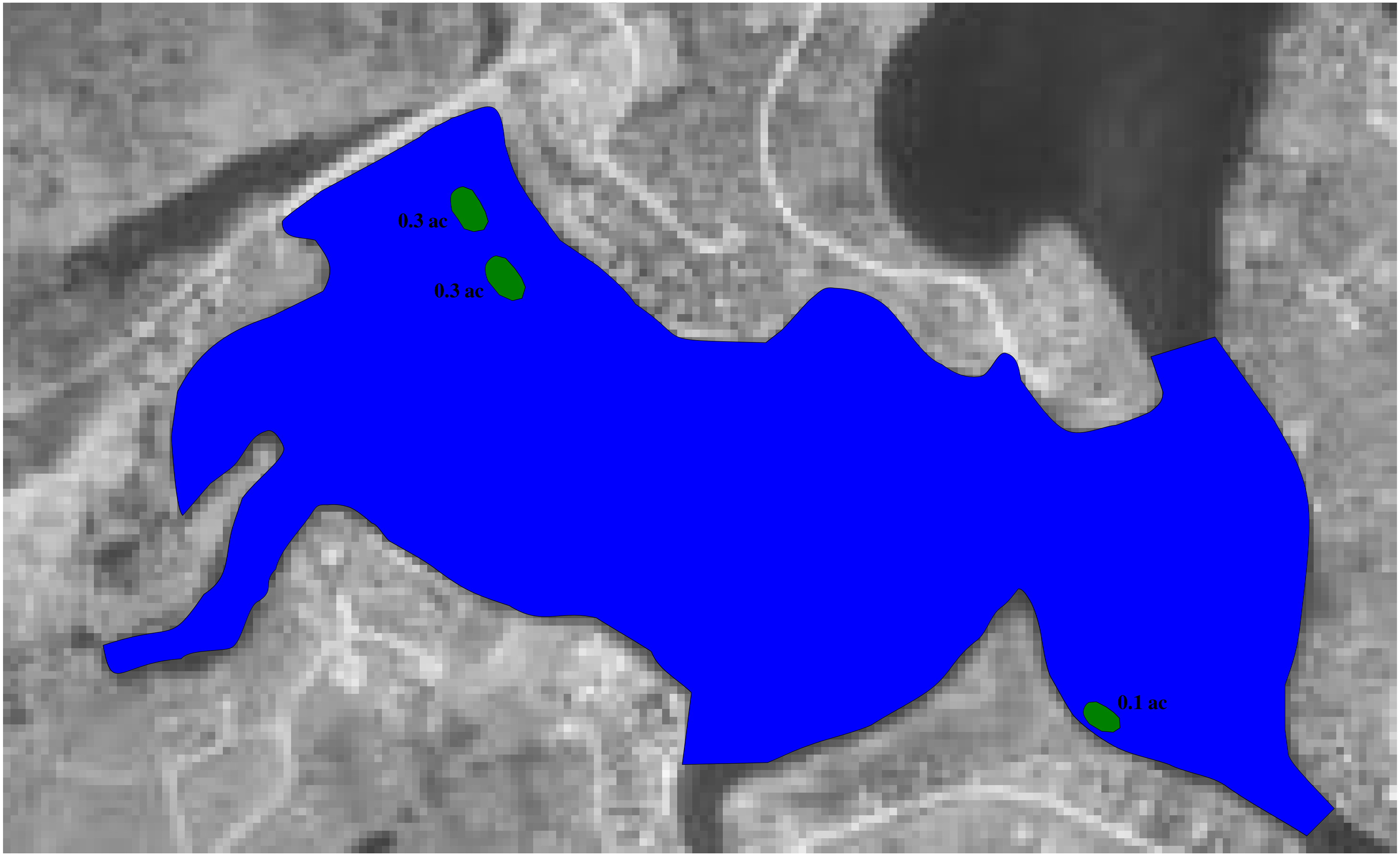


Figure 17. May 2010 distribution of curly-leaf pondweed in Peshtigo Lake.

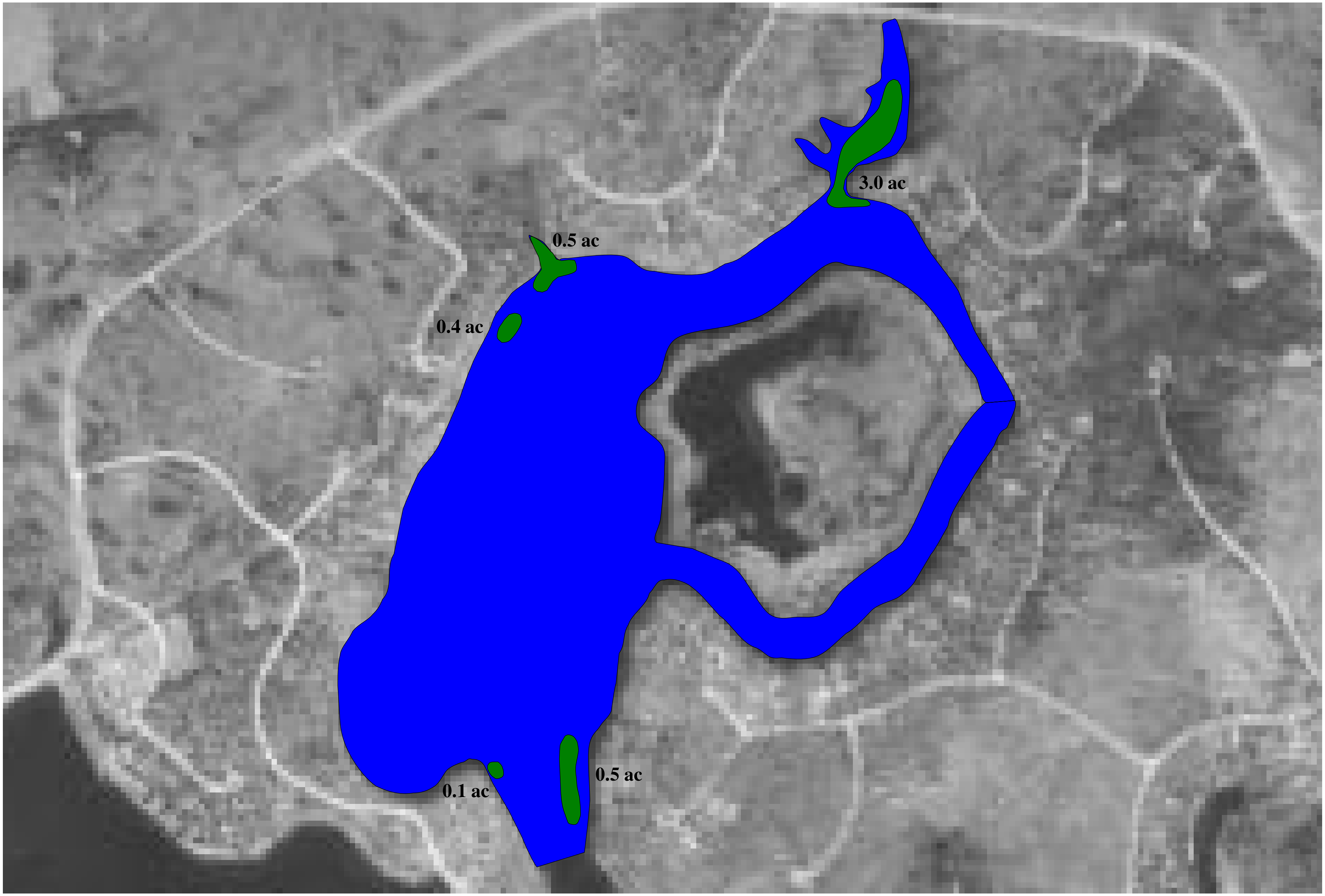


Figure 18. May 2010 distribution of curly-leaf pondweed in Little Blacksmith Lake.

Figure 19. May 2010 distribution of curly-leaf pondweed in Big Blacksmith Lake.

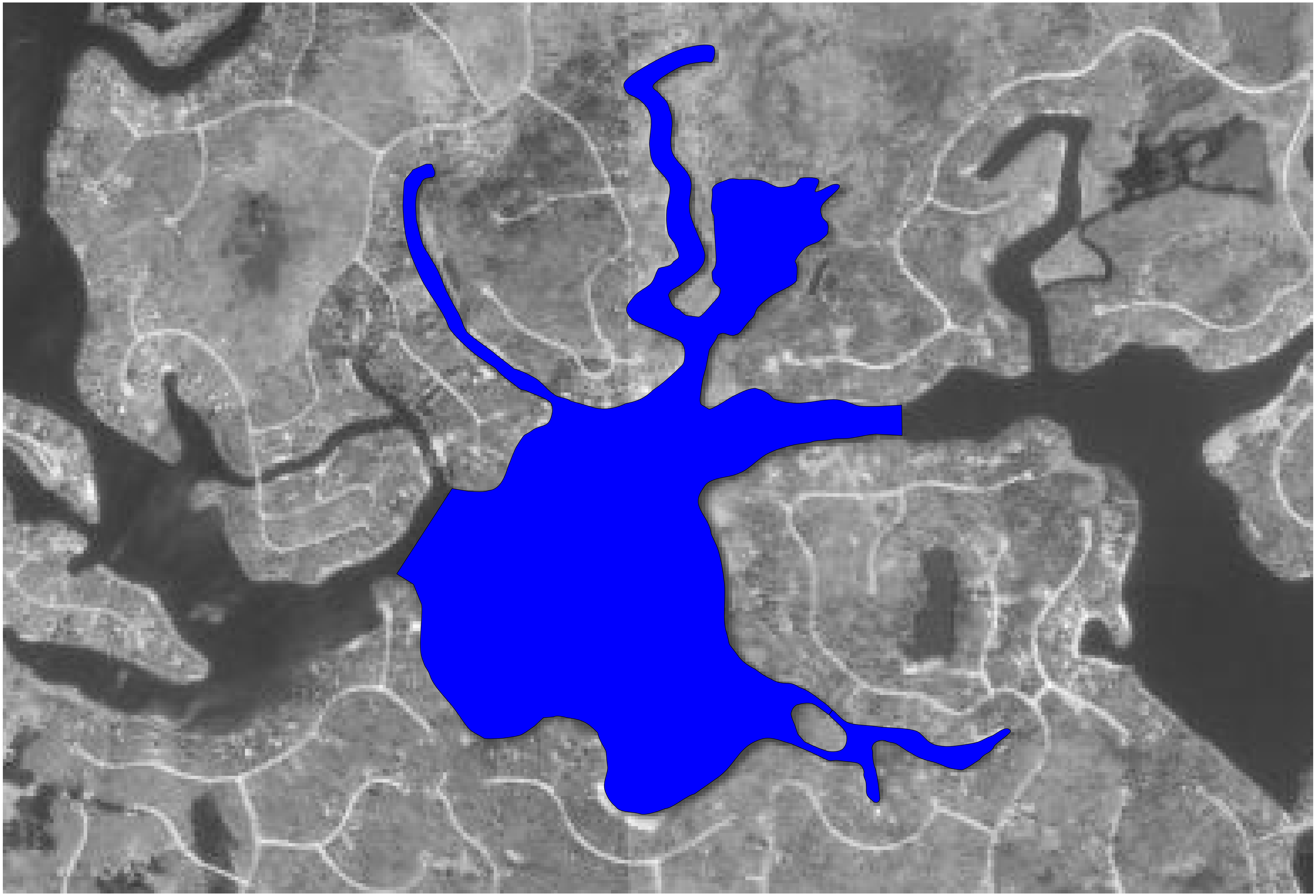
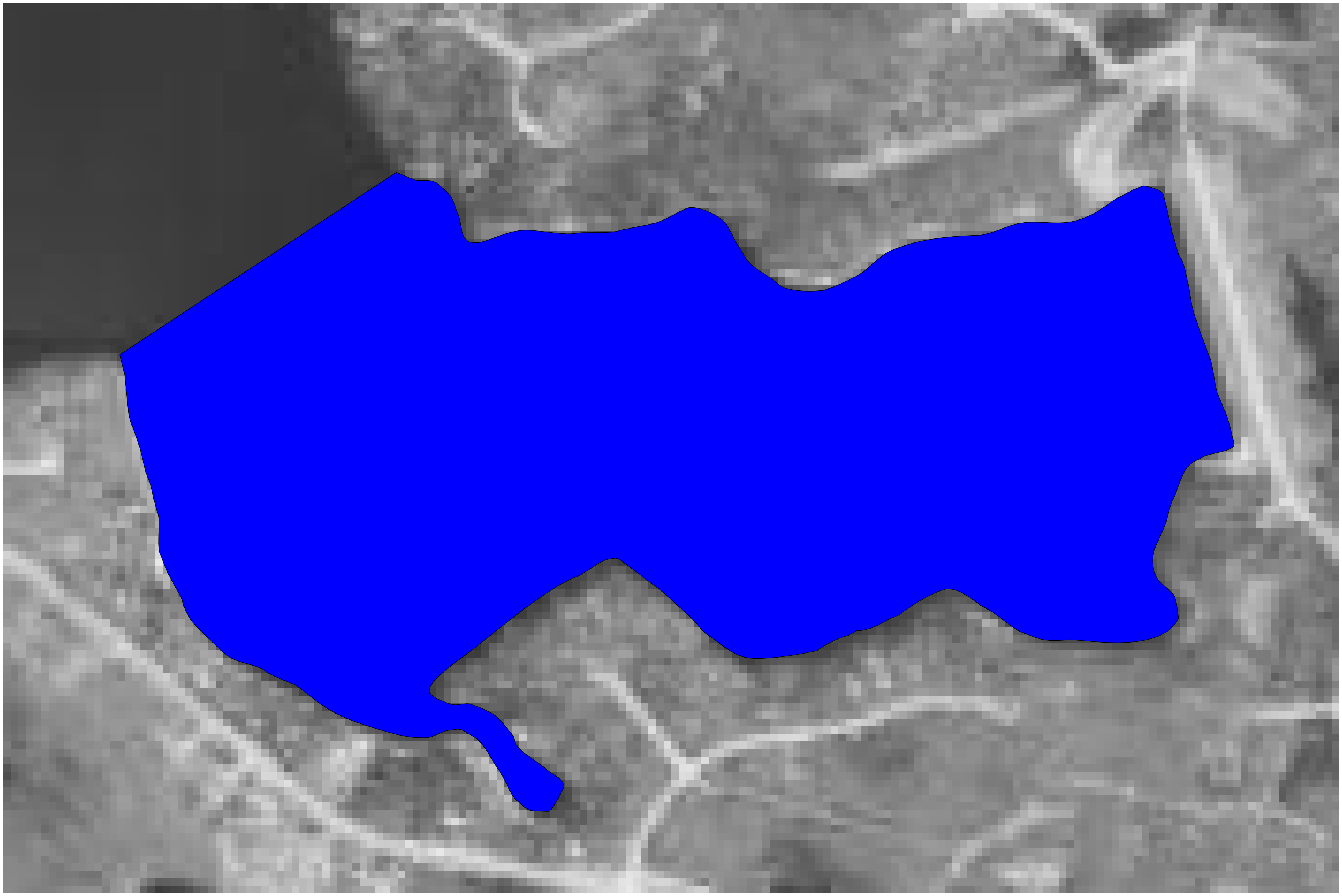


Figure 20. May 2010 distribution of curly-leaf pondweed in Sapokesick Lake.

Figure 21. May 2010 distribution of curly-leaf pondweed in Pywaosit Lake.



Conclusions and Recommendations

Eurasian Watermilfoil Management

Including the treatment of 50 acres in 2004, 2010 was the sixth year of Eurasian watermilfoil treatments on the Legend Lake system, and the third year of treating the full distribution of the plant. The extensive monitoring program that was implemented at the time large-scale treatments began has provided very valuable information. It has shown that the treatment strategy has been successful at minimizing negative affects to the health of the lake.

The October 2010 survey located 119.4 acres of milfoil compared to the 129.1 located the previous year. A total of 880 acres of Legend Lake has been infested with Eurasian watermilfoil at one point in time or another. The 119.4 acres located in the most recent survey represents an 86% decline overall. While this is short of the goal of 90% overall reduction, significant progress has been made.

Because of the aggressive nature of Eurasian watermilfoil, it is important to treat all know areas of milfoil or the plant can quickly repopulate an area. A similar treatment approach to the 2010 treatment is recommended in 2011. Because of its high degree of selectivity to Eurasian watermilfoil, the herbicide Navigate® should again be used to target the plant.

Contiguous beds less than or equal to 5 acres, or beds having an average depth greater than 8 feet, should be treated at 150 lbs/acre. Beds greater than 5 acres should be treated at 100 lbs/acre.

A full, focused point-intercept survey for Eurasian watermilfoil was conducted in the fall of 2010. The survey utilized maps with GPS points (in a 60 meter grid) to search for and plot milfoil locations. Although more time consuming, it seems to be a more thorough survey, and can locate milfoil that may have gone undetected by other survey methods. As milfoil becomes less abundant on Legend Lake, it is recommended that future surveys are done in this manner to better locate isolated beds of milfoil.

Curly-Leaf Pondweed Management

Curly-leaf pondweed (CLPW) is an invasive species that can greatly harm aquatic systems. The plant can grow in high densities, spread easily, and produce reproductive structures called turions that remain viable in the substrate for many years. Although there are reports that CLPW has been in Legend Lake for many years, the first identified plant was recorded in 2008. Since then, small treatments for curly-leaf pondweed have occurred. Because of the concerns that the August plant surveys were not accurately depicting curly-leaf pondweed distribution (CLPW is a cold water species that dies back by mid-summer), a survey focusing on CLPW was conducted in the spring of 2010. This survey found 19.64 acres of CLPW in six of the nine lakes throughout the Legend Lake system.

Curly-leaf pondweed has become a rising concern on Legend Lake. It is important that annual spring surveys are done to monitor the distribution and abundance of the plant. An additional system-wide survey should be done in June or July, when the plant is most easily identified, in order to map any new locations of the plant. It is recommended that the full distribution of CLPW be treated in the spring before the plant has a chance to produce turions. Since these turions can remain viable for many years, and are unaffected by treatments, annual treatments of CLPW are needed until all turions have sprouted. The Army Corp. of Engineers recommends treating CLPW for 3-4 consecutive years, although new studies are showing that it may take even longer for all turions to sprout. Given the small, isolated nature of the majority of the CLPW beds, the most appropriate herbicide is Aquathol Super K® (granular endothol). Also, CLPW has been observed to commonly grow later than Eurasian watermilfoil on Legend Lake, therefore treating prior to water temperatures of 60º Fahrenheit (a typical condition of DNR permits) may not be as effective. Careful monitoring of curly-leaf pondweed growth stages will be needed so that treatment can be done at the optimal time.

It is important for the LLPRD to stay current with curly-leaf pondweed management. The LLPRD should also continue to pursue Aquatic Invasive Species (AIS) control grant funding for treatment of curly-leaf pondweed.

Legend Lake and Hybrid Milfoil

Since hybrid (Eurasian X northern) watermilfoil is becoming more common in Wisconsin lakes, samples of milfoil were collected in the spring of 2010 from each lake in the Legend Lake chain for DNA analysis. Although samples varied in appearance from lake to lake, they were all determined to be true Eurasian watermilfoil. Since Legend Lake contains both Eurasian watermilfoil and northern milfoil, the chance of cross-pollination exists. It is important that steps are taken to minimize this risk. As in the past, it is recommended that follow-up treatments are conduced to target all Eurasian watermilfoil surviving the spring treatment, before it has a chance to mature and flower.

The management implications of hybrid milfoil are not very well understood. Many believe that the hybrid is more difficult to control than true Eurasian watermilfoil because of its similarities to northern milfoil. Different approaches are being used to manage hybrid milfoil, but these are only in the experimental stage. It is important for Legend Lake to stay up-to-date on any new developments for the management of hybrid milfoil.

It is also recommended that the Legend Lake milfoil be genetically tested annually for the presence of hybrid watermilfoil.

Monitoring Efforts

Monitoring efforts over the past five seasons have provided valuable data. The data indicates that the early-season treatment method has been successful at avoiding significant oxygen depletions or degraded water quality. Post-treatment plant surveys have also indicated that all native plants species present prior to treatment continue to be present following treatment – in most cases, with little or no decline in abundance.

Because prior data showed little, if any, negative effects on water quality of the Legend Lake system, monitoring efforts were drastically curtailed in 2010. Most notably, the number of sampling dates was reduced, as well as the extent of the 2,4-D concentration analysis. Dissolved oxygen and water quality data were only collected once per month in April, July, August and September. Results of the 2010 monitoring efforts were similar to past years in which more extensive monitoring efforts took place. Therefore, monitoring efforts can be further curtailed to reduce program costs.

Water chemistry
MITW Environmental Services has committed to collecting water chemistry data on the Legend Lake System. Data collected will include total phosphorus, Secchi depth, and chlorophyll concentrations. This data will be shared with the LLPRD.

Dissolved oxygen
LLPRD employees will be trained to collect dissolved oxygen data. Dissolved oxygen monitoring will follow the same schedule, but will be limited to one sample point (the deep basin) in each lake.

2,4-D concentration
2,4-D residual concentration monitoring will continue to be done by Cason & Associates. The sampling frequency will be reduced, and will primarily be used to determine when water use restrictions expire. Samples will be collected in each lake basin – 28 days after treatment. If results are greater than 70 ppb in a given basin, additional samples will be tested from that basin until results of less than 70 ppb are achieved.

Aquatic plant survey
In August, the DNR conducted a full point-intercept survey of the entire plant community on Spring and Sapokesick lakes. It is expected that the DNR will conduct another survey of this type in August of 2011. This data will be used to monitor long-term changes in the plant community.

Invasive plant mapping
Additional surveys to map the distribution of curly-leaf pondweed will be done throughout the entire Legend Lake chain in 2011. The first survey efforts will be done in May to monitor plant growth stages, and to assess the effectiveness of curly-leaf

pondweed treatments and hand pulling efforts. A second, system-wide survey will be done in June or July in order to map any new or recurring curly-leaf pondweed beds. A system-wide focused point-intercept survey for Eurasian watermilfoil, similar to the one conducted in October of 2010, will be conducted in October 2011. These surveys will be conducted by Cason & Associates. The data collected from these surveys help to assess program effectiveness and plan for future treatment needs.

Other Aquatic Invasives

Zebra mussels were found in Legend Lake in 2008. In 2009 some established colonies were observed. While there are no approved control strategies for zebra mussels, preventing the spread of zebra mussels to other lakes should be a priority.

Rusty crayfish have been found in Linzy Creek, a tributary to Moshawquit Lake. Moshawquit Lake is connected to Legend Lake via Moshawquit Creek on the east side of the system. Because of this direct connection, Legend Lake should be routinely monitored for the presence of rusty crayfish. It will be important for the LLPRD to include information on preventing the spread of zebra mussels and rusty crayfish in its AIS educational efforts.

Mechanical Harvesting

If areas of native plant growth become a nuisance, selected locations may be mechanically harvested in 2011 and beyond. Fragmentation is the primary means of spreading for Eurasian watermilfoil. Therefore it will be important to first determine if Eurasian watermilfoil is present in these locations, and determine the best course of action. The risk of spreading Eurasian watermilfoil will need to be weighed against the need for navigation.

Annual Program Review Meeting

The annual meeting between the LLPRD, MITW, WDNR, Consultants, County and Town representatives has been scheduled for December 6th, 2011 at the Legend Lake Lodge. The meeting will commence at noon and will adjourn by 3 p.m. The purpose of the meeting will be to present the data collected during the year, and to discuss and plan for the future management of aquatic invasive species in Legend Lake.

Appendix

Wah-Toh-Sah Site#1

Depth	April 14, 2010			July 7, 2010			August 6, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	51.9	13.22	120.10	78.8	8.44	102.40	78.9	8.63	105.60	67.8	8.90	106.90
1												
2	51.8	12.81	115.60	78.8	8.47	104.60	78.9	8.56	105.50	77.2	8.72	106.00
3												
4	51.8	12.80	116.00	78.7	8.32	101.60	79.0	8.56	105.60	77.2	8.72	106.00
5												
6	51.6	12.35	112.10	78.7	7.96	97.80	79.0	8.63	106.60	77.2	7.45	102.80
7												
8	51.4	12.33	111.50				78.9	8.53	105.50	77.1	7.68	93.00
9												
10	51.4	12.49	112.30				78.9	8.48	104.70	76.9	7.83	95.80
11												
12	51.2	12.69	114.30				78.9	8.07	98.80	75.9	4.46	53.60
13												
14										75.5	3.36	39.90

Wah-Toh-Sah Site #2

Depth	April 14, 2010			July 7, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	49.9	12.73	112.5	79.0	8.37	102.80	81.4	9.01	113.70	77.3	8.65	104.90
1												
2	51.4	12.15	111.0	79.0	8.19	100.80	81.4	8.80	111.50	77.3	8.60	104.40
3												
4	51.3	12.01	108.2	78.8	7.50	94.50	81.4	8.81	111.60	77.3	8.04	98.10
5												
6	51.2	11.80	105.5	78.7	8.17	99.90	81.2	8.40	104.10	77.3	8.00	97.20
7												
8	51.1	12.01	108.1	78.6	8.28	101.10	81.0	8.95	113.00	77.3	8.02	98.20
9												
10	51.1	11.38	102.3	78.4	7.83	94.90	81.0	8.75	110.50	77.2	8.09	97.20
11												
12	51.1	12.01	108.0	78.0	7.91	96.20	80.2	8.52	106.60	76.1	8.15	97.80
13												
14	51.1	11.95	107.3	76.2	7.74	92.20	79.7	7.74	96.20	75.8	7.82	94.90
15												
16	51.0	11.74	105.4	68.3	7.15	78.40	78.4	6.98	85.50	74.8	6.87	81.70
17												
18	50.9	11.64	104.2	66.0	6.56	70.70	74.8	5.42	63.90	73.8	6.02	70.10
19												
20	50.7	11.63	104.1	62.6	6.31	65.50	71.1	4.26	47.90	72.4	4.09	47.10
21												
22	46.9	9.49	80.6	59.6	4.61	46.20	66.1	2.24	24.00	68.4	0.34	3.60

23												
24	44.2	7.15	58.8	57.1	1.34	12.70	61.5	0.36	3.60	64.0	0.29	3.00
25												
26	43.0	4.40	35.4	55.5	0.15	1.50	58.5	0.33	3.30	60.1	0.29	3.00
27												
28	42.3	2.65	21.2	53.6	0.13	1.20	56.6	0.29	2.80	56.8	0.27	2.60
29												
30	42.0	0.75	6.0	51.1	0.08	0.70	55.6	0.28	2.60	54.1	0.28	2.60
31												
32	41.9	0.71	5.6	48.6	0.08	0.70	53.0	0.20	1.70	52.6	0.27	2.60
33												
34	41.7	0.67	5.3	46.9	0.05	0.40	49.6	0.21	1.90	50.6	0.27	2.50
35												
36	41.7	0.66	5.2	45.7	0.04	0.40	48.3	0.20	1.80	49.1	0.24	2.10
37												
38	41.7	0.65	5.1	45.2	0.04	0.40	46.9	0.19	1.60	47.8	0.22	1.90
39												
40	41.7	0.63	5.0									

Wah-Toh-Sah Site #3

Depth	April 14, 2010			July 7, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	54.8	12.44	117.20	79.3	8.88	113.80	82.4	9.23	117.50	77.0	8.73	105.90
1												
2	53.5	13.76	127.20	78.7	8.84	110.00	81.7	8.82	112.30	76.5	7.88	94.90
3												
4	52.1	13.70	124.80	77.4	8.72	106.50	81.1	8.88	111.40	76.2	7.03	84.20
5												
6	51.6	14.02	126.30	73.0	8.11	95.40	77.9	8.93	105.70	69.9	4.03	41.10

Wah-Toh Sah Site #4

Depth	April 14, 2010			July 7, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	52.4	12.08	110.40	79.3	8.41	105.00	81.7	8.65	109.60	78.3	8.13	100.40
1												
2	52.3	12.04	110.20	79.3	8.23	101.40	81.7	8.48	107.50	78.0	8.13	98.50
3												
4	52.2	11.56	105.60	79.1	8.25	100.30	81.6	8.34	105.50	77.9	8.02	97.50
5												
6	51.8	11.71	106.70	79.0	8.05	100.20	81.6	8.04	101.60	77.7	8.06	98.90
7												
8	51.8	11.89	107.70	79.0	7.94	98.80	81.4	7.82	97.50	77.6	7.52	91.40
9												
10	51.7	11.30	102.70	78.8	7.65	94.40	81.3	8.08	102.10	77.3	7.47	90.40
11												
12	51.4	11.60	105.10	78.2	7.74	94.60	80.3	8.18	103.20	76.0	8.16	97.80
13												
14	50.9	11.75	105.20	75.8	7.85	96.10	79.7	7.16	87.80	75.2	7.66	90.90

Depth (ft)	April 14, 2010 Temp (F.)	D.O. (mg/l)	% Sat.	July 7, 2010 Temp (F.)	D.O. (mg/l)	% Sat.	August 4, 2010 Temp (F.)	D.O. (mg/l)	% Sat.	September 1, 2010 Temp (F.)	D.O. (mg/l)	% Sat.
15												
16	50.4	11.70	104.30	75.4	8.06	96.20	77.3	4.94	60.40	74.5	7.32	87.30
17												
18	50.2	11.60	103.00	71.4	7.64	84.00	76.0	4.77	57.30	74.0	6.58	77.10
19												
20	49.0	10.72	93.80	66.8	5.98	65.30	71.7	2.29	26.20	72.5	3.55	41.00
21												
22	47.3	7.90	67.30	62.5	3.12	32.40	65.4	0.43	4.60	68.2	0.36	4.00
23												
24	45.5	4.86	40.60	60.1	0.46	4.80	62.4	0.34	3.50	63.9	0.24	2.50
25												
26	44.3	2.95	24.20	58.1	0.12	1.10	59.4	0.24	2.40	59.6	0.23	2.30
27												
28	43.9	1.50	12.20	56.2	0.08	0.70	58.2	0.22	2.20	59.1	0.20	2.00

Main Channel Site #5

Depth	April 14, 2010			July 7, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	53.5	14.09	131.1	80.3	7.85	100.60	75.0	9.57	112.40	78.0	7.62	93.10
1												
2	53..4	12.90	118.8	78.8	7.33	92.40	81.5	8.24	104.40	77.4	7.74	93.60
3												
4	53.3	12.50	116.3	78.6	7.45	88.60	81.3	8.18	103.50	77.0	7.71	93.30
5												
6	52.7	12.33	113.7	78.1	6.64	82.20	80.8	7.90	99.40	76.5	8.10	96.80
7												
8	52.2	12.48	113.8									

Spring Site #6

Depth	April 14, 2010			July 7, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	52.3	12.23	112.3	79.6	7.71	95.00	76.9	8.75	106.10	77.7	7.32	89.40
1												
2	52.3	11.81	107.9	79.5	7.68	94.40	80.6	7.20	89.50	77.4	7.18	86.80
3												
4	51.9	11.57	104.8	79.2	7.36	91.40	80.8	7.02	90.30	77.6	6.85	83.10
5												
6	51.7	11.50	104.1	78.7	7.18	89.80	80.3	6.55	82.70	77.4	7.04	85.60
7												
8	51.7	11.54	104.5	77.6	6.97	85.10	78.6	4.26	52.50	77.3	7.26	88.10
9												
10	51.6	11.39	102.9	74.7	2.62	31.00	76.1	0.84	9.70	73.9	1.96	22.70
11												
12	51.4	11.26	101.8	68.1	4.53	49.00	73.3	0.21	2.40	72.4	2.14	25.30
13												
14	45.9	6.33	53.4	63.8	5.86	62.10	69.3	3.14	37.10	70.0	2.20	24.70
15												

16	42.8	4.25	34.1	59.8	5.59	55.90	64.7	3.17	34.40	65.7	3.66	39.20
17												
18	41.6	1.68	13.3	56.1	2.93	28.00	60.0	1.67	16.90	60.7	1.56	15.80
19												
20	41.3	0.67	5.2	52.6	2.21	20.20	56.7	0.33	3.10	57.3	0.41	4.00
21												
22	40.9	0.60	4.7	49.5	3.02	26.70	53.1	0.22	2.00	53.8	0.24	2.40
23												
24	40.6	0.54	4.2	47.3	0.11	1.10	50.4	0.21	2.00	51.0	0.22	2.10
25												
26	40.4	0.51	4.0	44.9	0.09	0.70	48.2	0.21	1.90	48.8	0.23	2.10
27												
28	40.3	0.50	3.9	43.7	0.08	0.60	46.3	0.21	1.80	47.2	0.23	2.00
29												
30	40.1	0.80	3.7	42.6	0.08	0.60	45.0	0.22	1.80	45.7	0.23	2.00
31												
32	39.9	0.48	3.7	42.0	0.08	0.60	43.9	0.21	1.80	45.0	0.23	1.90
33												
34	39.7	0.47	3.6	41.5	0.08	0.60	43.3	0.22	1.70	44.2	0.23	1.90
35												
36	39.6	0.46	3.5	41.2	0.08	0.60	42.7	0.21	1.70	43.4	0.22	1.80
37												
38	39.6	0.45	3.4	41.0	0.07	0.60	42.3	0.21	1.70	42.9	0.22	1.80
39												
40	39.6	0.44	3.3				42.0	0.20	1.70	42.4	0.22	1.80
41												
42	39.6	0.43	3.3				41.7	0.21	1.60	42.1	0.22	1.80

Peshtigo Site #7

Depth	**April 14, 2010**			**July 7, 2010**			**August 4, 2010**			**September 1, 2010**		
(ft)	**Temp (F.)**	**D.O. (mg/l)**	**% Sat.**	**Temp (F.)**	**D.O. (mg/l)**	**% Sat.**	**Temp (F.)**	**D.O. (mg/l)**	**% Sat.**	**Temp (F.)**	**D.O. (mg/l)**	**% Sat.**
0	52.9	12.84	117.8	79.6	7.88	98.30	77.0	8.65	103.90	77.6	6.61	80.80
1												
2	52.8	11.96	109.8	79.4	7.85	97.10	80.7	7.03	88.60	77.6	7.06	85.30
3												
4	52.5	11.50	105.1	79.1	7.84	96.70	80.6	7.14	89.40	77.5	7.20	87.70
5												
6	52.5	11.38	104.2	77.7	6.99	85.10	80.4	6.76	84.50	77.1	7.35	88.90
7												
8	52.0	11.26	102.2	76.3	5.55	66.10	78.3	5.33	66.10	76.5	6.30	74.70
9												
10	51.8	11.19	101.4	74.2	3.60	41.80	75.0	1.82	21.60	73.5	4.03	48.30
11												
12	50.4	9.90	87.6	68.0	4.50	50.30	70.7	2.26	25.40	70.3	2.93	33.00
13												
14	48.1	9.90	85.6	63.1	5.62	58.40	67.3	3.96	43.10	67.5	4.21	46.10
15												
16	46.1	6.07	50.9	57.0	4.20	40.20	62.3	4.03	41.60	62.5	4.85	50.00
17												

18	43.7	2.63	21.5	54.3	0.37	3.70	58.4	0.44	4.40	57.6	1.20	11.60
19												
20	42.1	2.00	16.0	50.0	0.12	1.30	54.4	0.27	2.50	54.8	0.25	2.40
21												
22	41.4	0.98	7.7	47.3	0.11	0.80	50.8	0.29	2.60	51.2	0.27	2.40
23												
24	41.1	0.59	4.7	45.0	0.09	0.80	48.1	0.26	2.30	48.4	0.22	1.90
25												
26	40.8	0.51	3.9	43.3	0.08	0.70	45.9	0.25	2.10	46.4	0.23	1.90
27												
28	40.6	0.47	3.7	42.6	0.08	0.60	44.6	0.27	2.20	45.0	0.24	1.90
29												
30	40.6	0.47	3.6	42.0	0.08	0.60	43.6	0.25	2.00	44.2	0.22	1.80
31												
32	40.5	0.45	3.5	41.6	0.08	0.60	42.7	0.24	1.90	43.5	0.23	1.80
33												
34	40.6	0.44	3.4	41.5	0.08	0.60	42.2	0.24	1.90	43.0	0.22	1.70
35												
36	40.6	0.42	3.2	41.4	0.08	0.60	42.0	0.24	1.90	42.6	0.21	1.70
37												
38	40.6	0.40	3.2	41.4	0.07	0.50	41.9	0.23	1.80	42.3	0.22	1.80
39												
40	40.6	0.40	3.2	41.6	0.07	0.50						

Little Blacksmith Site #8

Depth	April 14, 2010			July 8, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	53.5	13.27	122.7	74.8	9.66	114.10	75.8	8.51	101.00	71.1	9.07	105.10
1												
2	53.2	12.22	113.2	79.7	7.42	91.90	80.8	7.34	92.00	77.7	8.18	99.90
3												
4	52.8	11.92	109.4	79.5	7.55	93.50	81.1	7.37	92.90	77.7	7.93	96.30
5												
6	52.5	11.90	108.6	79.2	7.55	93.20	81.0	7.34	92.70	77.6	7.76	95.00
7												
8	52.4	11.97	109.4	79.0	7.57	92.60	80.3	7.11	87.70	77.3	7.32	88.60
9												
10	52.3	12.09	110.3	78.2	4.81	59.20	79.7	6.03	74.10	77.0	7.17	85.90
11												
12	52.1	12.04	109.4	75.9	3.52	40.80	78.1	2.17	26.70	75.6	5.89	70.20
13												
14	52.0	11.76	107.0	72.7	1.12	13.20	76.4	0.28	3.40	75.0	3.96	46.90
15												
16	52.0	11.45	103.7	69.0	0.24	2.70	73.4	0.24	2.90	73.8	0.84	9.60

Big Blacksmith Site #9

Depth	April 14, 2010			July 8, 2010			August 4, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.

0 1	53.0	12.45	114.80	79.2	7.98	98.20	80.6	6.99	88.30	78.2	7.63	93.60
2 3	52.9	11.94	109.60	79.0	7.63	94.50	80.7	6.75	86.60	77.9	7.74	94.50
4 5	52.4	11.55	105.30	78.5	7.35	89.90	80.7	6.35	80.00	77.2	7.77	94.70
6 7	52.0	11.15	102.10	78.3	7.85	96.30	80.5	6.79	85.10	77.1	8.03	97.40
8 9	51.6	11.61	104.90	78.2	7.72	95.20	80.1	7.16	89.90	77.0	7.95	96.20
10 11	51.2	11.67	105.30	77.3	7.43	89.90	79.5	6.90	85.70	76.6	7.32	88.30
12 13	51.0	11.48	103.10	76.0	7.09	85.30	78.9	6.48	80.30	75.6	7.56	90.50
14 15	51.0	11.38	101.80	71.1	7.42	84.50	77.2	5.07	61.40	74.7	7.11	84.10
16 17	50.5	11.33	100.70	67.4	7.92	86.80	73.7	4.36	50.80	73.4	6.39	74.10
18 19	49.3	11.17	98.30	63.8	8.85	92.20	70.5	5.25	59.50	70.1	6.20	69.70
20 21	45.1	7.29	60.40	59.0	9.57	94.90	63.5	7.62	79.50	65.3	9.56	101.60
22 23	43.3	5.16	41.70	56.5	9.71	93.20	59.6	8.48	84.80	60.8	10.61	107.60
24 25	42.4	4.49	36.00	54.5	7.94	74.00	56.0	8.07	77.00	56.7	4.61	44.40
26 27	41.7	4.21	33.20	51.7	4.25	38.50	53.2	4.64	42.50	53.8	1.62	15.10
28 29	41.2	3.90	30.70	49.1	0.78	6.80	50.9	1.31	11.60	50.8	0.32	2.90
30 31	41.1	3.60	28.10	46.7	0.35	3.00	49.0	0.36	3.20	48.2	0.24	2.10
32 33	40.9	3.55	27.80	45.3	0.32	2.70	46.8	0.34	2.90	46.0	0.23	1.90
34 35	40.8	3.24	25.30	44.1	0.32	2.60	45.0	0.31	2.60	45.1	0.24	2.00
36 37	40.7	2.84	22.00	43.1	0.32	2.60	43.8	0.32	2.60	44.3	0.23	1.90
38 39	40.6	2.77	21.90	42.5	0.31	2.50	42.6	0.31	2.50	43.4	0.23	1.80
40 41	40.5	2.47	19.20	41.8	0.30	2.40	41.9	0.31	2.50	42.9	0.22	1.70
42 43	40.5	2.34	18.20	41.3	0.30	2.40	41.5	0.32	2.50	42.3	0.23	1.80
44 45	40.4	2.13	16.50	41.0	0.30	2.40	41.1	0.31	2.30	41.9	0.22	1.70
46 47	40.4	1.96	15.20	40.9	0.30	2.30	41.0	0.29	2.30	41.5	0.21	1.60
48 49	40.4	1.80	14.00	40.7	0.30	2.30	40.8	0.29	2.30	41.1	0.20	1.70

50	40.4	1.61	13.10	40.6	0.29	2.20	40.8	0.28	2.20	40.9	0.21	1.60

Sapokesick Site #10

Depth	April 14, 2010			July 8, 2010			August 6, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	55.4	12.56	118.80	80.0	6.41	80.50	77.3	6.57	80.70	78.9	7.33	89.70
1												
2	53.6	11.71	109.00	79.2	6.52	80.40	77.2	6.50	78.30	78.5	7.31	89.70
3												
4	51.8	11.17	100.90	78.2	6.35	77.80	76.8	6.14	73.70	77.4	7.31	88.80
5												
6	50.9	10.88	97.60	75.9	3.27	39.40	76.0	4.11	49.70	75.8	5.42	75.00
7												
8	50.7	10.69	95.30	69.1	0.37	4.20	66.4	1.09	12.40	69.7	3.78	42.20

Sapokesick Site #11

Depth	April 14, 2010			July 8, 2010			August 6, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	52.8	11.42	104.90	79.0	8.15	100.60	75.9	8.40	101.50	78.3	8.02	98.70
1												
2	52.3	11.34	103.60	79.3	7.50	97.80	78.0	7.46	91.40	78.3	7.84	96.00
3												
4	51.6	11.48	103.80	79.2	7.66	94.80	78.0	7.30	89.30	77.7	8.27	100.70
5												
6	51.5	11.48	103.80	78.8	7.67	94.40	78.0	7.37	90.30	77.5	8.23	101.10
7												
8	51.4	11.29	101.90	78.6	7.78	96.00	78.0	7.56	92.50	77.4	8.19	99.40
9												
10	51.1	11.41	102.40	77.3	6.08	75.70	77.9	7.53	91.60	76.1	8.47	101.10
11												
12	50.8	11.26	100.70	76.4	6.57	79.00	77.9	7.36	90.20	75.7	8.12	96.50
13												
14	50.7	11.47	102.40	73.8	7.58	88.40	77.9	7.32	89.20	75.2	7.84	93.10
15												
16	50.3	10.98	97.80	71.0	7.30	83.00	75.9	4.20	49.70	74.7	7.18	85.00
17												
18	50.0	11.12	98.60	66.4	6.80	73.40	71.2	3.21	36.50	73.8	6.31	74.60
19												
20	48.8	10.82	94.20	63.0	6.47	66.70	66.6	2.57	27.80	71.1	3.79	42.00
21												
22	47.8	10.56	91.00	60.1	5.96	59.80	63.0	2.23	23.30	66.1	2.33	24.70
23												
24	46.0	8.17	68.60	58.1	3.88	38.10	60.0	0.43	4.40	61.6	1.79	18.30
25												
26	44.2	2.82	23.20	55.5	0.58	5.50	57.1	0.28	2.70	58.7	0.53	5.00
27												
28	43.3	0.98	7.80	53.7	0.52	4.90	54.7	0.30	2.70	55.6	0.26	2.60
29												

30	42.6	0.43	3.40	51.9	0.22	2.00	52.7	0.24	2.10	53.9	0.20	1.80
31												
32	42.3	0.39	3.10	51.2	0.22	1.90	51.3	0.24	2.10	51.4	0.21	1.90
33												
34	42.1	0.37	2.90	50.7	0.22	1.90	50.3	0.24	2.10	50.4	0.20	1.80
35												
36				50.0	0.22	1.90						

Sapokesick Site #12

Depth	April 14, 2010			July 8, 2010			August 6, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	56.4	11.22	108.20	75.3	9.88	116.80	77.6	8.19	99.00	79.6	7.87	98.00
1												
2	54.2	11.94	111.10	79.6	7.11	88.40	77.5	8.45	102.90	78.1	8.30	102.20
3												
4	53.6	11.74	109.30	78.6	7.26	89.30	77.0	8.15	97.60	77.6	8.54	103.20
5												
6	52.3	12.85	117.30	78.2	7.07	87.70	76.7	8.35	101.20	74.5	3.67	44.00

Sapokesick Site #13

Depth	April 14, 2010			July 8, 2010			August 6, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	58.5	12.58	123.50	80.8	8.32	104.30	78.7	8.09	100.20	79.7	8.83	109.90
1												
2	55.9	12.10	115.80	79.0	8.21	102.20	78.4	8.03	98.80	78.0	8.92	109.00
3												
4	53.5	12.15	112.50	78.7	8.16	100.30	78.2	8.05	98.20	77.4	9.31	112.80
5												
6	52.4	12.40	125.10	78.5	7.99	98.10	78.1	7.95	97.40	77.3	9.38	113.90
7												
8	51.6	12.07	111.00	78.3	8.11	98.90	78.0	8.41	102.80			

Pywaosit Site #14

Depth	April 14, 2010			July 8, 2010			August 6, 2010			September 1, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	52.3	12.33	112.6	78.0	8.01	98.40	78.2	7.83	96.30	78.3	7.84	96.10
1												
2	52.0	11.67	105.8	78.5	7.96	93.30	78.4	7.57	92.10	78.0	7.78	93.90
3												
4	51.9	11.60	102.5	78.3	7.61	93.40	78.4	7.58	93.10	77.2	7.34	88.90
5												
6	51.3	11.55	104.0	78.1	7.56	92.80	78.4	7.56	92.60	76.8	7.79	94.00
7												
8	50.8	11.53	103.1	77.9	7.71	94.10	78.4	7.40	91.10	76.7	7.59	91.80
9												
10	50.5	11.34	100.9	77.9	7.73	94.40	78.3	7.59	93.30	76.6	7.82	93.90
11												

12	50.4	11.27	100.3	77.8	7.68	93.60	78.2	7.76	95.00	76.3	7.08	85.20
13												
14	49.4	11.17	98.3	77.0	7.35	88.90	78.1	7.66	93.70	76.0	7.75	93.00
15												
16	49.3	11.24	98.6	75.0	7.50	88.70	78.1	7.51	92.10	75.6	7.90	94.40
17												
18	49.3	11.03	96.5	72.3	7.98	92.50	77.8	7.15	87.20	75.1	7.32	86.50
19												
20	49.2	11.28	99.1	71.8	8.14	93.20	72.7	5.44	63.00	74.1	6.94	81.60
21												
22	49.0	11.11	97.4	63.9	8.82	92.90	68.2	5.63	61.90	72.5	5.47	62.90
23												
24	48.8	10.99	95.8	60.4	8.85	89.10	63.5	6.16	64.20	69.2	4.19	46.80
25												
26	48.5	10.88	94.6	58.5	8.24	81.10	66.3	5.61	60.90	64.2	3.24	33.90
27												
28	47.5	10.05	86.5	57.0	7.62	73.50	61.7	6.19	63.40	58.7	2.04	20.40
29												
30	44.2	7.45	61.0	54.6	5.91	56.20	58.4	5.52	55.00	56.3	0.38	3.60
31												
32	42.7	6.41	51.4	52.4	4.08	37.10	56.3	4.49	43.50	54.1	0.32	2.90
33												
34	42.2	5.84	46.6	50.1	1.53	12.60	54.0	1.37	12.80	52.8	0.25	2.30
35												
36	41.8	5.26	41.7	48.0	0.49	4.30	52.8	0.39	3.40	50.7	0.21	1.90
37												
38	41.5	5.39	42.5	46.9	0.42	3.60	50.0	0.28	2.50	49.4	0.21	1.80
39												
40	41.4	5.21	41.1	46.6	0.39	3.30	47.9	0.24	2.10	47.6	0.22	1.90
41												
42	41.3	4.99	39.3	45.4	0.37	3.10	47.3	0.22	1.90	45.7	0.22	1.80
43												
44	41.0	4.05	31.6	44.1	0.25	2.10	46.2	0.21	1.80	45.1	0.20	1.70
45												
46	41.0	3.87	30.3	43.2	0.22	1.80	45.2	0.21	1.70	44.5	0.19	1.60
47												
48	41.0	3.83	29.8	42.7	0.22	1.80	44.4	0.20	1.70	44.1	0.19	1.60
49												
50	40.9	3.39	26.6	42.4	0.22	1.70	43.9	0.20	1.70	43.8	0.19	1.60

Sapokesick Site #11

Depth	May 13, 2010			May 19, 2010			May 27, 2010			June 2, 2010			June 10, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	55.5	9.93	93.70	65.6	10.43	112.10	75.9	8.95	106.70	74.5	8.50	100.40	69.5	8.10	90.30
1															
2	55.5	9.81	93.60	64.0	10.12	106.40	75.9	8.86	106.60	74.6	8.40	99.20	69.1	7.87	87.80
3															
4	55.5	9.81	93.30	63.0	10.15	105.70	75.8	8.72	104.70	74.6	8.30	98.00	68.8	7.82	86.40
5															
6	55.5	9.78	92.90	62.4	10.03	103.90	75.6	9.06	108.10	74.6	8.20	97.40	68.7	8.08	89.70
7															
8	55.5	9.75	92.40	61.1	10.56	105.00	68.1	10.28	113.40	74.5	8.30	97.40	68.4	7.62	83.70
9															
10	55.5	9.75	92.40	59.5	10.32	101.30	65.3	10.52	113.40	74.5	8.45	99.40	68.4	7.52	83.20
11															
12	55.5	9.73	91.20	58.2	10.17	100.80	63.1	10.89	113.00	67.1	10.05	110.20	68.2	7.57	83.40
13															
14	55.5	9.70	92.70	57.7	10.59	103.20	60.7	10.30	104.20	63.8	10.35	108.10	67.1	8.62	93.80
15															
16	55.5	9.71	92.10	56.7	9.94	95.50	59.2	9.97	99.10	61.5	10.28	105.00	64.7	7.82	82.80
17															
18	55.5	9.72	92.20	56.2	9.85	94.20	57.5	10.33	100.50	59.3	10.19	102.10	60.6	9.15	92.50
19															
20	55.5	9.71	92.10	55.7	9.80	94.10	56.6	10.04	97.20	57.6	9.92	96.20	58.5	8.94	88.00
21															
22	55.5	9.63	90.20	55.5	9.69	92.10	55.8	9.44	89.90	56.3	9.06	87.20	57.3	8.14	79.00
23															
24	55.5	9.62	90.30	55.3	9.67	91.50	54.7	7.11	67.40	55.3	7.36	70.00	56.2	6.54	62.30
25															
26	54.8	8.77	82.70	54.2	8.01	74.00	52.9	3.83	34.80	53.7	3.69	34.50	55.2	4.27	40.40
27															
28	48.0	0.48	4.00	53.3	6.59	60.90	51.5	1.53	13.90	52.1	0.65	5.90	53.4	1.28	11.70
29															
30	45.0	0.12	1.00	48.3	0.72	5.50	48.9	0.22	1.90	49.7	0.12	1.10	51.6	0.76	7.00
31															
32	44.5	0.10	0.90	44.7	0.16	1.50	47.4	0.12	1.10	48.3	0.09	0.70	49.3	0.41	3.70
33															
34	44.6	0.09	0.80	44.2	0.14	1.10	46.0	0.09	0.80	47.0	0.07	0.60	48.1	0.44	3.70
35															

36	44.7	0.09	0.80	44.1	0.11	1.00	45.7	0.09	0.70				47.4	0.41	3.50
37															
38	44.7	0.08	0.70												

Sapokesick Site #12

Depth	May 13, 2010			May 19, 2010			May 27, 2010			June 2, 2010			June 10, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	55.9	9.47	91.70	66.1	10.54	111.60	78.0	8.89	108.10	74.9	7.18	85.50	70.0	9.00	101.10
1															
2	56.0	9.66	94.70	64.4	10.49	108.60	75.5	8.98	107.60	75.0	7.33	86.90	69.7	8.73	97.90
3															
4	55.0	9.66	91.70	62.5	11.23	116.60	74.4	9.24	107.80	74.8	7.30	87.00	68.9	8.49	93.70
5															
6	55.0	9.52	90.10	62.0	12.17	124.70	73.8	10.40	122.30	74.6	6.55	75.50	68.7	8.45	93.60

Sapokesick Site #13

Depth	May 13, 2010			May 19, 2010			May 27, 2010			June 2, 2010			June 10, 2010		
(ft)	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.	Temp (F.)	D.O. (mg/l)	% Sat.
0	55.7	9.96	94.70	68.7	10.24	112.80	78.3	8.71	107.70	75.0	7.78	92.00	69.8	9.65	107.60
1															
2	55.7	9.86	94.10	65.4	10.86	114.60	7639.0	8.79	104.50	74.7	7.96	94.90	69.0	9.08	101.10
3															
4	55.6	9.78	92.20	63.2	10.60	110.00	76.1	8.34	101.60	74.6	7.90	93.40	68.8	9.13	100.80
5															
6	55.5	9.70	92.20	62.5	11.50	120.50	74.9	8.46	99.90	74.5	7.39	98.50	68.6	9.09	100.60
7															
8	55.5	9.70	92.20				71.4	12.24	141.30	74.5	8.10	95.80	68.3	8.93	98.70

Pywaosit Dam Site #15

Depth	May 13, 2010			May 19, 2010			May 27, 2010			June 2, 2010			June 10, 2010		
(ft)	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.
0	55.2	10.12	96.80	67.7	10.32	113.30	75.7	9.05	108.50	74.9	8.13	95.60	70.2	9.07	102.80
1															
2	55.5	9.81	93.10	64.3	10.47	110.10	75.6	9.11	108.30	74.9	8.00	95.00	69.3	8.02	89.20
3															
4	55.5	9.63	92.90	63.2	10.60	109.10	75.1	8.90	104.90	74.9	7.73	91.50	69.0	8.32	92.50
5															
6	55.5	9.54	91.60	62.9	9.27	96.40	71.3	9.57	110.00	74.8	7.20	85.20	68.8	8.22	91.20

7															
8	55.5	9.42	89.50	62.8	9.37	97.40	70.8	9.02	101.60	74.7	7.74	91.40	68.7	8.75	94.00

Sapokesick Site #16

Depth	May 13, 2010			May 19, 2010			May 27, 2010			June 2, 2010			June 10, 2010		
(ft)	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.	Temp (C.)	D.O. (mg/l)	% Sat.
0	53.9	10.46	99.30	67.4	10.32	113.80	77.0	8.70	106.20	75.2	7.38	88.00	71.1	8.48	95.80
1															
2	55.3	10.00	94.30	65.9	10.19	109.80	75.3	8.44	100.60	75.2	7.02	84.00	69.7	7.93	88.90
3															
4	55.3	9.96	94.10	63.1	10.71	112.20	73.2	8.86	104.10	75.1	7.24	85.70	69.3	7.83	87.50
5															
6	55.3	9.83	93.40	62.4	10.83	111.80	71.6	10.11	115.70	74.8	7.00	82.70	69.0	7.93	88.30
7															
8							67.1	8.63	93.60				68.7	7.65	84.60