Pike Lake, Scott County, Minnesota, 2017

Aquatic Plant Point-Intercept Surveys for Pike Lake, Scott County, Minnesota

[Early Season Plant Survey Conducted June 16, 2017]
[Late Season Plant Survey Conducted August 29, 2017]

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Prior Lake/Spring Lake Watershed District

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Aquatic Plant Point-Intercept Survey for Pike Lake, Scott County, Minnesota

Summary

Pike Lake (MnDNR ID #70-0076) is a 43 acre lake located in Scott County, Minnesota. Two aquatic plant point-intercept surveys were conducted in Pike Lake by Blue Water Science in 2017. The aquatic plant community was first sampled on June 16, 2017 to characterize conditions of early season native aquatic plants and to look for the non-native curlyleaf pondweed. The second aquatic plant survey was conducted on August 29, 2017 to observe how the native plant community changed over the season and to check the status of non-native Eurasian watermilfoil.

Pike Lake plant survey results indicated a low diversity of submerged aquatic plants with four species of submerged plants found in the survey spring survey and only two species found in the summer survey. Eurasian watermilfoil was the dominant aquatic plant in both the June and August surveys. (Figure S1)

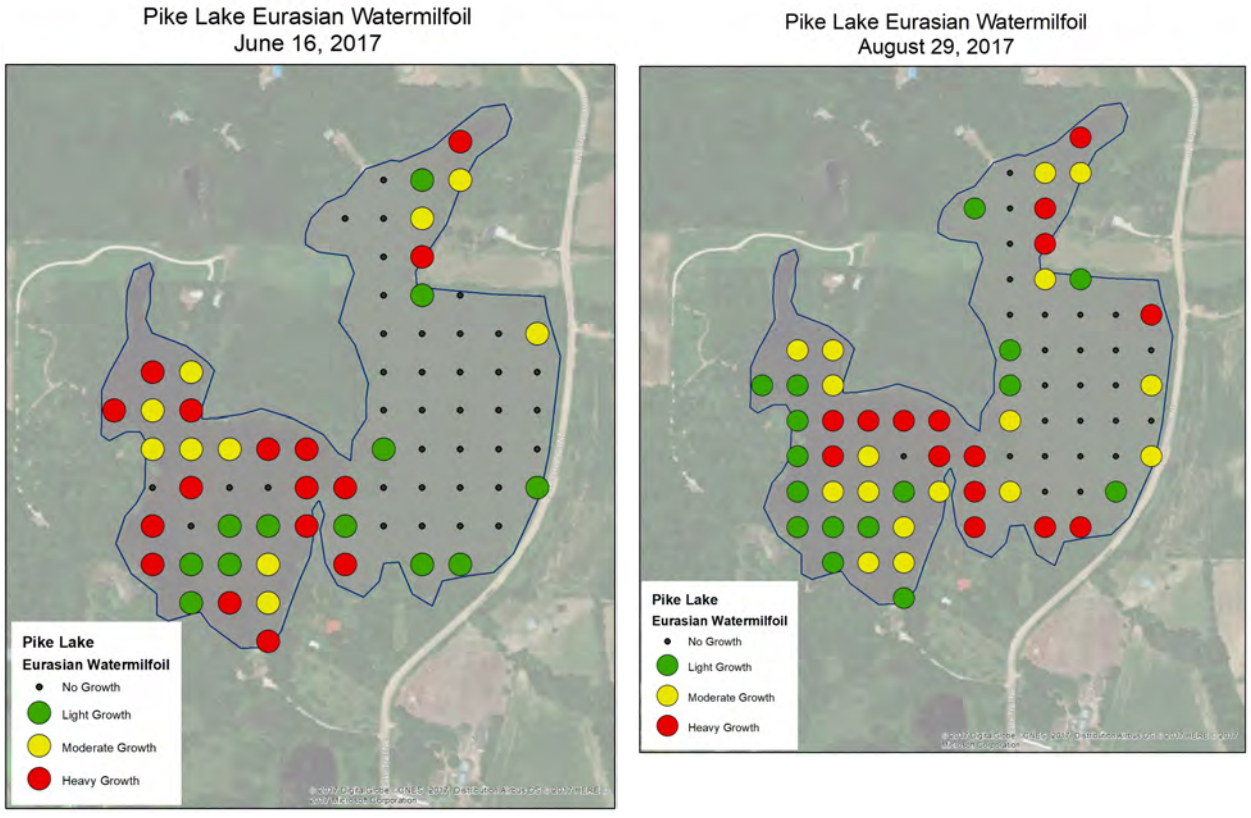


Figure S1. Pike Lake Eurasian watermilfoil growth on June 16, 2017(left) and Eurasian watermilfoil growth on August 29, 2017 (right). Key: Green = light growth, yellow = moderate growth, and red = heavy growth.

Aquatic Plant Point-Intercept Survey for Pike Lake, Scott County, Minnesota

Pike Lake, Scott County (ID: 70-0076)
Size: 43 acres (MnDNR)
Maximum depth: 9 ft (MnDNR)

Introduction

Two aquatic plant point-intercept surveys were conducted on 43 acre Pike Lake, located in Scott County, on June 16, 2017 and August 29, 2017. The objective of the surveys was to characterize and monitor the changing plant community.

Methods

Aquatic plant point-intercept surveys of Pike Lake were conducted by Blue Water Science. A total 74 points were sampled and points were spaced 50 meters apart on a grid that covered the lake (Figure 1). At each sample point, a sampling rake was lowered into the water and a plant sample was taken. The plant species were recorded and the density of each species was assigned. Densities were based on the coverage on the teeth of the rake. Density ratings ranged from 1 to 4 with 1 being sparse and 4 being heavy growth.

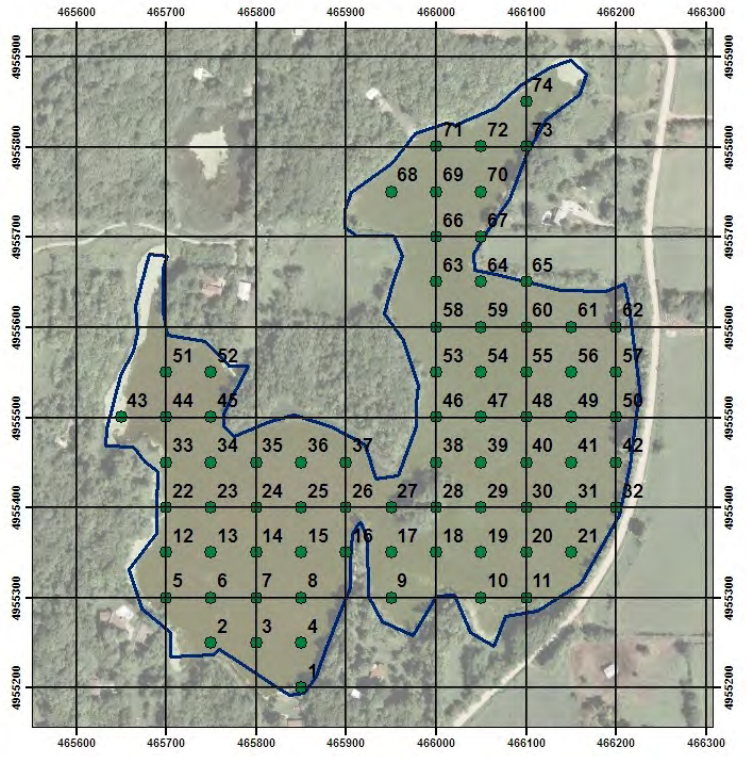


Figure 1. Sample grid map for the aquatic plant survey conducted on Pike Lake.

Results - Aquatic Plant Survey on June 16, 2017

Results of the early summer aquatic plant survey conducted on June 16, 2017 found two native submerged plant species and two non-native plant species were present in Pike Lake (Table 1). Coverage of curlyleaf and coontail found in the June survey are shown in Figure 2. Coontail growth was light to moderate. Curlyleaf pondweed was found at light densities in Pike lake while Eurasian watermilfoil was the dominant aquatic plant and was found at 38 sites (Table 1).

Table 1. Pike Lake aquatic plant occurrence and density for the June 16, 2017 survey based on 74 sites. Density ratings are 1-4 with 1 being low and 4 being most dense.

	All Stations (n=74)	
	Occur	Average Density
Coontail (*Ceratophyllum demersum*)	19	2.2
Curlyleaf pondweed (*Potamogeton crispus*)	14	1.3
Eurasian watermilfoil (*Myriophyllum spicatum*)	38	2.9
Sago Pondweed (*Stuckenia pectinata*)	1	1.0

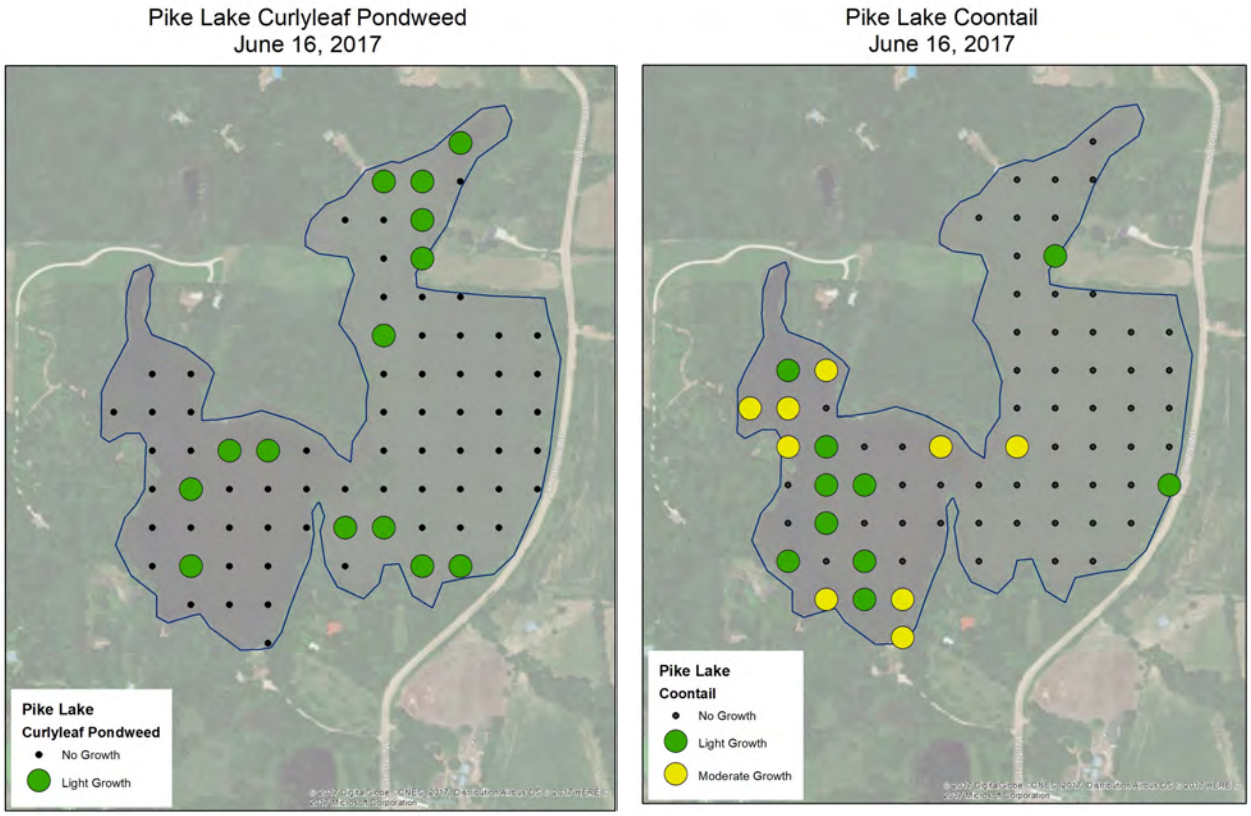


Figure 2. [left] Curlyleaf pondweed coverage on June 16, 2017. [right] Coontail coverage on June 16, 2017.

Eurasian watermilfoil was exhibiting heavy growth in June with some growth hitting the surface at 4-6 ft water depth which is a little out of the ordinary (Figure 3). It's more typical that Eurasian watermilfoil produce heavy growth later in the season.

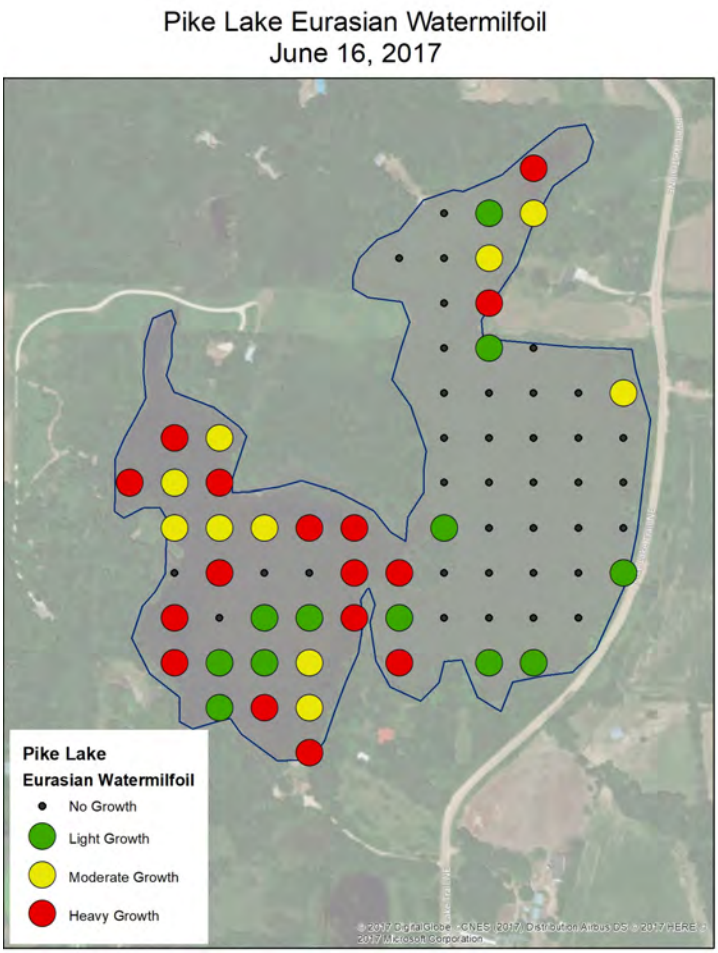


Figure 3. [top] Eurasian watermilfoil distribution and abundance on June 16, 2017.
[bottom] Eurasian watermilfoil growing to the lake surface on June 16, 2017.
Key: Green shading = light growth, yellow shading = moderate growth, and red shading = heavy growth.

Table 2. Individual site data for Pike Lake on June 16, 2017.

Site	Depth (ft)	Coon-tail	CLP	EWM	Sago	FA	No plants
1	4	3		4		2	
2	5	3		2		2	
3	5	2		4			
4	6	3		3			
5	5	2		4			
6	7		2	1			
7	7	1		1			
8	7			3			
9	5			4		4	
10	7		1	1			
11	7		1	2		2	
12	6			4			
13	7	1					
14	7			1			
15	6			1			
16	5			4			
17	6		1	2		1	
18	7		2			1	
19							1
20	9						1
21	8					1	
22	4						1
23	6	2	1	4			
24	7	1					
25	7						1
26	5			4			
27	5			4		3	
28	land						1
29							1
30							1
31							1
32	5	1		2		2	
33	5	3		3			
34	6	2		3			
35	6		1	3			
36	6		1	4			
37	5	3		4			
38	4	3		2			
39							1
40							1
41							1
42	7						1
43	4	3		4			
44	7	3		3			
45	5			4			
46	8						1
47							1
48							1
49							1
50	9						1
51	6	2		4			
52	5	3		3			
53	7						1
54							1
55							1
56							1
57	9						1
58	9		2				
59							1
60	10						1
61	8						1
62	5			3		3	
63	9						1
64	7			1	1		
65	6						1
66	9						1
67	4	1	1	4		4	
68	8						1
69	10						1
70	7		1	3			
71	9		1				
72	8		2	1		2	
73	4			3		3	
74	4		1	4		3	
Average		2.2	1.3	2.9	1.0	2.4	1.0
Occur (74 sites)		19	14	38	1	14	30
% occur		26	19	51	1	19	41

Results - Aquatic Plant Survey on August 29, 2017

Results of the summer aquatic plant survey conducted on August 29, 2017 found one native submerged plant species and one non-native plant species were present. Plant growth in August was restricted to water depths of 6 feet or less in Pike Lake (Table 3). Coontail was growing mostly in the shallower west basin of Pike Lake. Coverage of coontail found in the August survey is shown in Figure 4. Eurasian watermilfoil was found around the perimeter of the basin of Pike Lake. Eurasian watermilfoil was the dominant aquatic plant and was found at 48 sites (Table 3).

Table 3. Pike Lake aquatic plant occurrence and density for the August 29, 2017 survey based on 74 sites. Density ratings are 1-4 with 1 being low and 4 being most dense.

	All Stations (n=74)	
	Occur	Average Density
Coontail (*Ceratophyllum demersum*)	31	2.8
Eurasian watermilfoil (*Myriophyllum spicatum*)	48	2.8

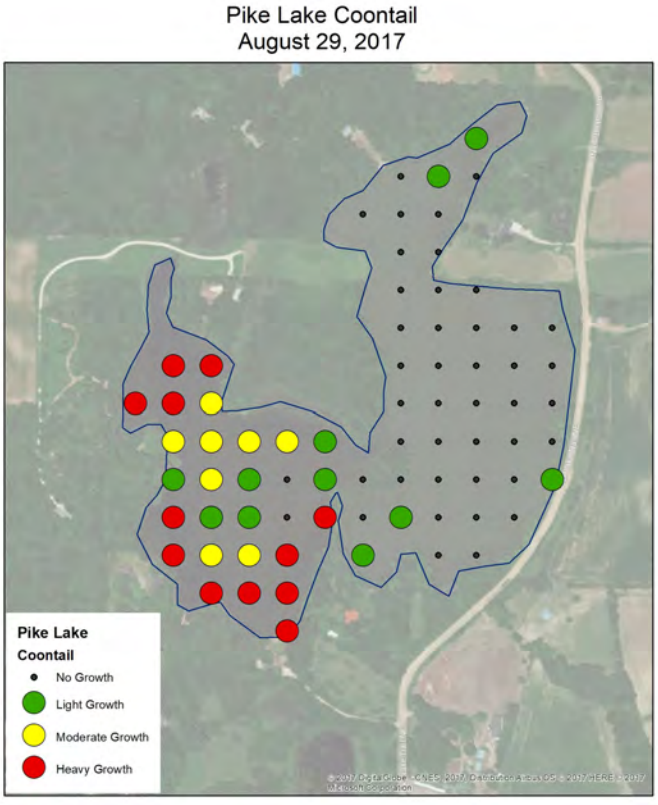


Figure 4. [left] Coontail coverage for Pike Lake on August 29, 2017.
Key: Green squares = light growth, yellow squares = moderate growth, and red squares = heavy growth.
[right] Coontail was the dominant native plant in Pike Lake in 2017.

Eurasian watermilfoil has expanded in distribution since the initial observation at a single site in August of 2012 (Figure 5). Eurasian watermilfoil was the most common and abundant plant in Pike Lake in 2017.

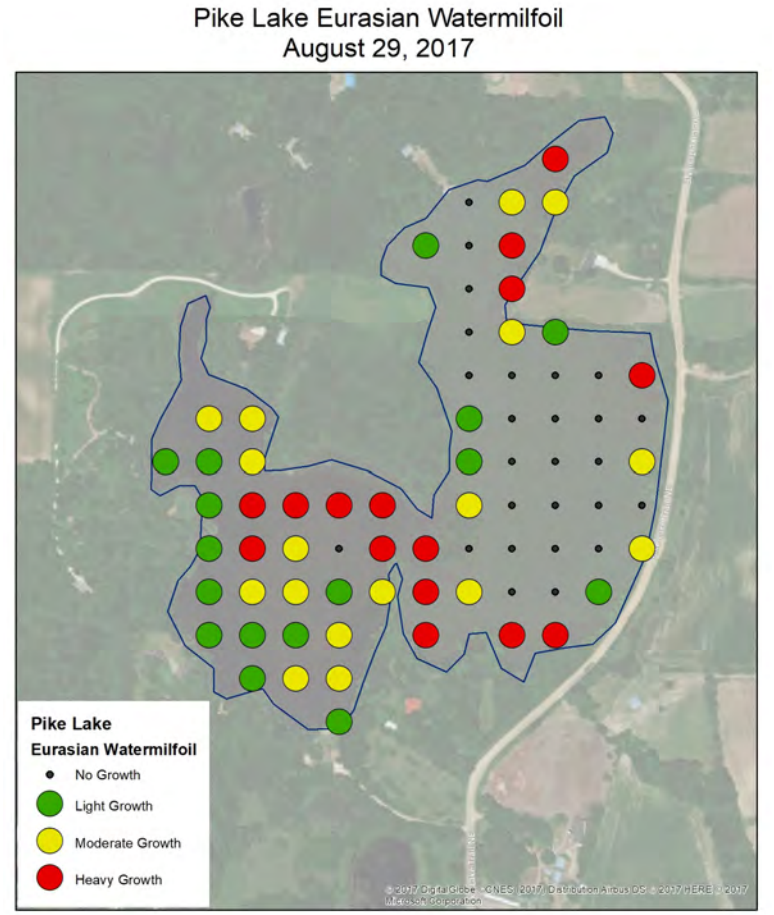


Figure 5. [top] Eurasian watermilfoil distribution and abundance on August 29, 2017.
[bottom] Eurasian watermilfoil growing to the lake surface on August 29, 2017.
Key: Green shading = light growth, yellow shading = moderate growth, and red shading = heavy growth.

Table 4. Individual site data for Pike Lake on August 29, 2017.

Site	Depth (ft)	Coontail	EWM	No plants
1	2	4	1	
2	4	4	2	
3	4	4	3	
4	4	4	3	
5	4	4	2	
6	5	3	2	
7	5	3	2	
8	4	4	3	
9	4	1	4	
10	3		4	
11	3		4	
12	5	4	2	
13	5	1	3	
14	5	2	3	
15	5		1	
16	3	4	3	
17	4		4	
18	5	2	3	
19	6			1
20	6			1
21	6		1	
22	2	1	1	
23	5	3	4	
24	5	1	3	
25				1
26	4	1	4	
27	4		4	
28	6			1
29				1
30				1
31				1
32	4	1	3	
33	3	3	1	
34	4	3	4	
35	4	3	4	
36	5	3	4	
37	5	2	4	
38	1		3	
39				1
40				1
41				1
42	7			1
43	2	4	1	
44	3	4	2	
45	4	3	3	
46	4		1	
47				1
48				1
49				1
50	4		3	
51	4	4	3	
52	4	4	3	
53	4		2	
54				1
55				1
56				1
57	6			1
58	6			1
59				1
60				1
61	6			1
62	3		4	
63	6			1
64	3		3	
65	6		1	
66	6			1
67	5		4	
68	5		1	
69	7			1
70	4		4	
71	6			1
72	4	1	3	
73	3		3	
74	3	1	4	
Average		2.8	2.8	1.0
Occur (74 sites)		31	48	26
% occur		42	65	35

Comparison of 2012, 2013, 2015, and 2017 Summer Surveys

Aquatic plant surveys were conducted in the late summer of 2012, 2013, 2015, and 2017. Coontail has been a common plant in the three surveys but Eurasian watermilfoil was the most abundant plant in 2015 and 2017. In the summer plant surveys, submerged aquatic plants are not found deeper than 6 feet of water depth due to low light penetration and elevated algae growth.

In 2015 Eurasian watermilfoil had expanded it's range from 2012 and was growing throughout Pike Lake. In 2017 Eurasian watermilfoil was growing more widespread and more abundantly. Initially, Eurasian watermilfoil was found only at one spot in the west basin in 2012 but results from previous surveys indicate Eurasian watermilfoil has expanded it's range and now is observed growing around most of Pike lake (Table 5 and Figure 6).

Table 5. The percent occurrence of aquatic plants for Pike Lake in 2012, 2013, 2015 and 2017. Percent occurrence is calculated based on the number of times a plant species occurs at a sampling station div ided into the total number of stations for the survey. For example, if milfoil was found in 25 out of 50 stations, its percent occurrence would be 50%.

	August 6, 2012 % Occurrence (74 sites)	September 7, 2013 % Occurrence (74 sites)	August 24, 2015 % Occurrence (74 sites)	August 29, 2017 % Occurrence (74 sites)
Duckweed (*Lemna sp*)	0	3	1	0
Coontail (*Ceratophyllum demersum*)	9	23	20	42
Elodea (*Elodea canadensis*)	1	0	9	0
Eurasian watermilfoil (*Myriophyllum spicatum*)	**0***	**0**	**27**	**65**
Northern watermilfoil (*Myriophyllum spicatum*)	1	1	0	0
Flat-stemmed Pondweed *(Potamogeton zosteriformis)*				
Sago pondweed (*Stuckenia pectinata*)	1	11	0	0

***Eurasian watermilfoil first observed in 2012 but not on an official sample site.**

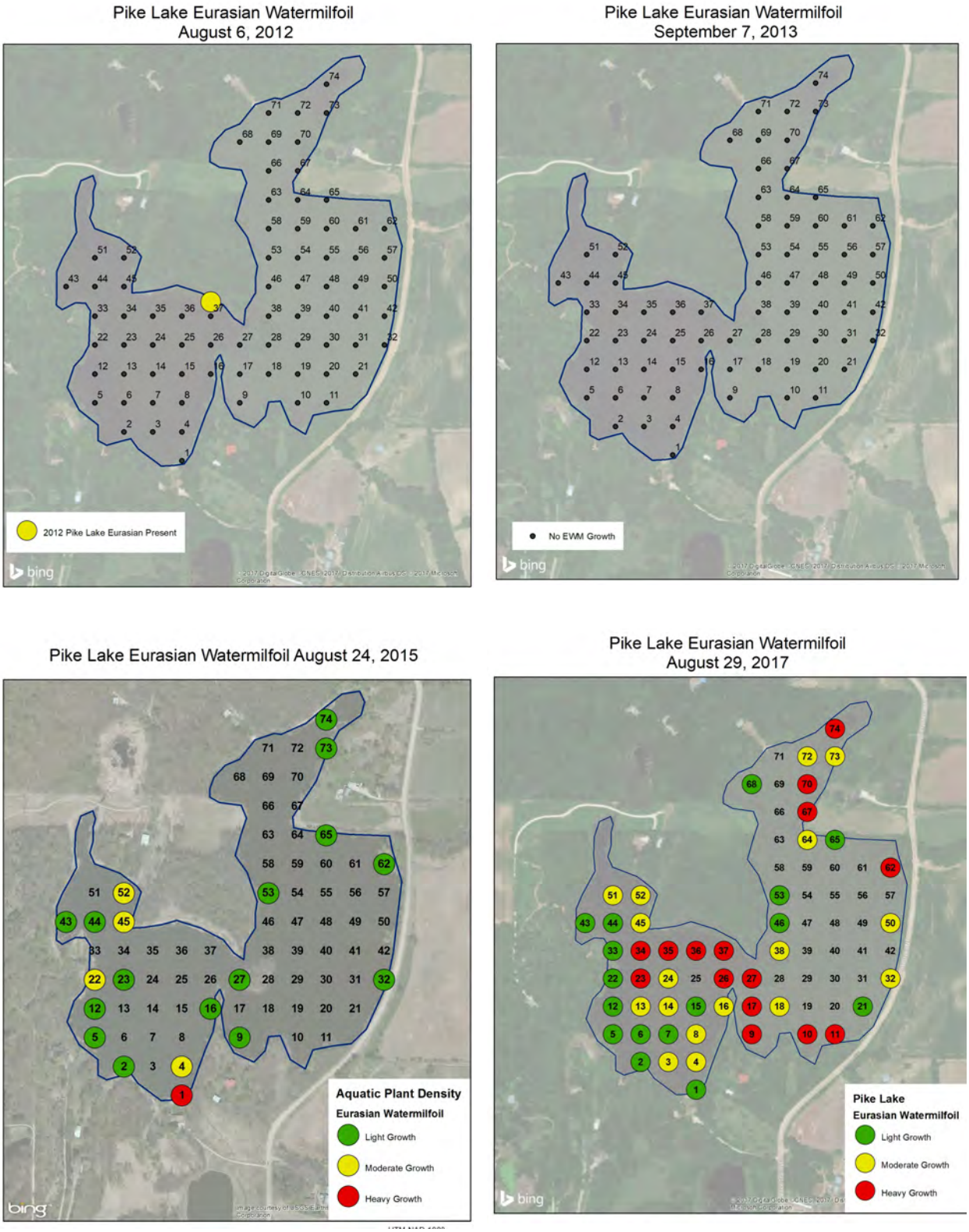


Figure 6. Eurasian watermilfoil distribution and abundance from 2012 - 2017 (no surveys conducted in 2014 and 2016).
Key: Green = light growth, yellow = moderate growth, red = heavy growth, and black = no growth.

General Findings of This Study

- Shoreline areas are mostly natural, emergent plants remain healthy and continue to offer good wildlife habitat.

- Coontail was the dominant native plant in Pike Lake during the spring and summer aquatic plant surveys.

- Eurasian watermilfoil was the dominant plant in 2015, 2017 and Eurasian watermilfoil's coverage has increased since the first observation of Eurasian watermilfoil in 2012.

- Eurasian watermilfoil was growing abundantly to the surface in some areas on June 16, 2017 which is earlier than typical for Eurasian watermilfoil and something to watch in the future.

- The reasons for low native plant abundance continues to be a combination of low light penetration and the impact of bottom feeding fish such as carp and other rough fish. West basin is shallower than the east basin. The west basin has more plant coverage than the east basin.

APPENDIX

Eurasian Watermilfoil Was Collected from a Site North of Point 37 in Pike Lake in 2012

Pike Lake, Scott County DOW 70-007600

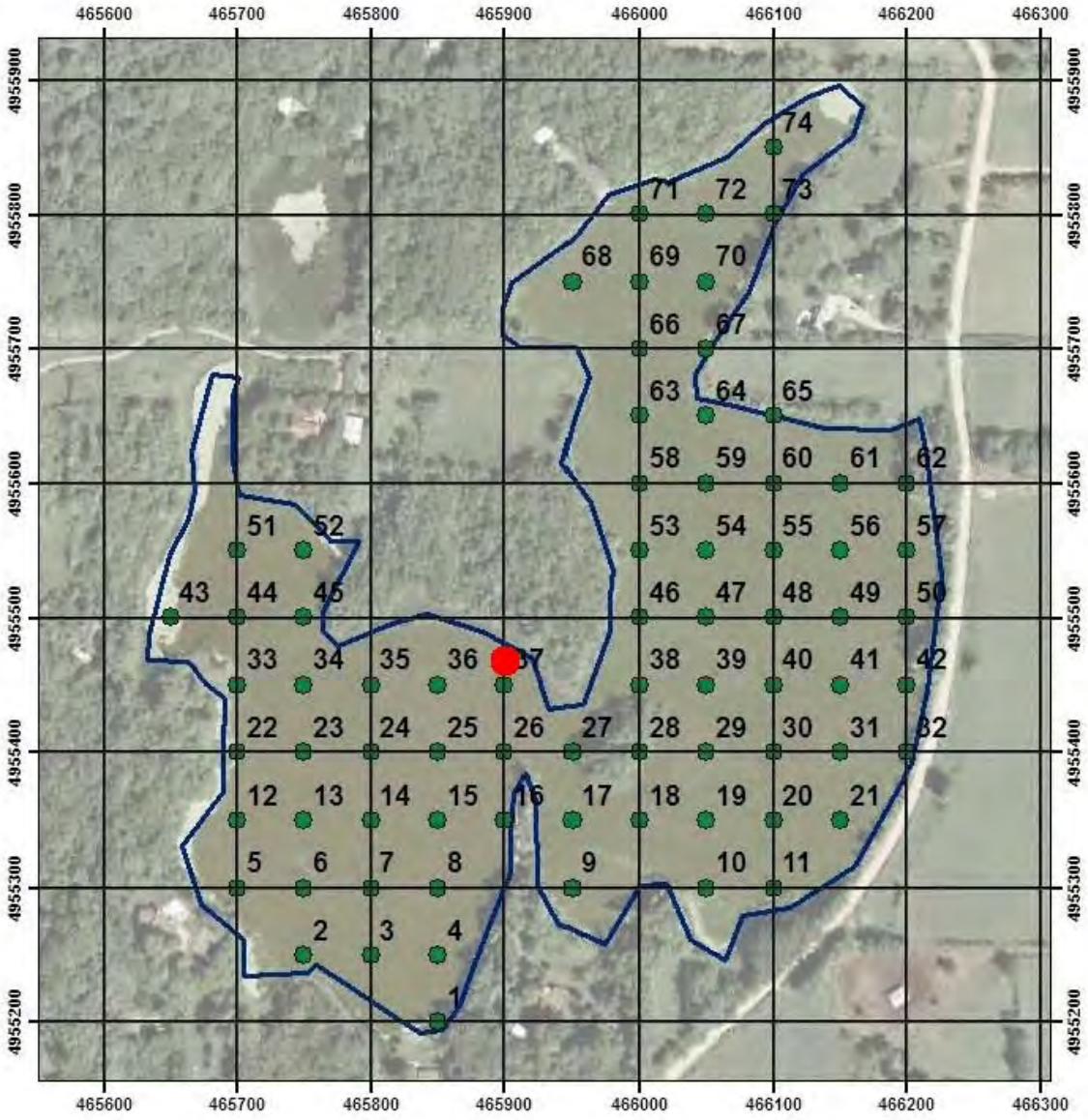
Suspected Eurasian watermilfoil, *Myriophyllum spicatum*, observation

Collected by:
Steve McComas,
Blue Water
Science

August 6, 2012

Eurasian watermilfoil collected in Pike Lake on August 6, 2012.

Pike Lake



Red dot indicates location of suspected Eurasian watermilfoil occurrence.

UTM NAD 1983
Blue Water Science

Aquatic Plant Survey Summaries from 2013.

Early season survey (June 13, 2013) found curlyleaf to be the most abundance plant.

	June 13, 2013 % Occurrence (74 sites)	September 7, 2013 % Occurrence (74 sites)	Changes from June to September (+/-)
Cattails (*Typha sp*)	1	1	0
Duckweed (*Lemna sp*)	0	3	+
Coontail (*Ceratophyllum demersum*)	5	23	+
Northern watermilfoil (*Myriophyllum sibiricum*)	0	1	+
Curlyleaf pondweed (*Potamogeton crispus*)	38	0	-
Stringy pondweed (*P. sp*)	4	0	-
Sago pondweed (*Stuckenia pectinata*)	16	11	-