



Pike Lake, West Basin, Scott County, Minnesota, August 6, 2019

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

[Early Season Plant Survey Conducted June 10, 2019]
[Late Season Plant Survey Conducted August 6, 2019]

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Prior Lake/Spring Lake
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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 2019. The aquatic plant community was first sampled on June 10, 2019 to characterize conditions of early season native aquatic plants including the non-native curlyleaf pondweed at it peak growing condition and to check for Eurasian watermilfoil beginning to grow. The second aquatic plant survey was conducted on August 6, 2019 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. Coontail was the dominant aquatic plant in both the June and August surveys. EWM was reduced in abundance and occurrence in 2019 compared to previous years (Figure S1).

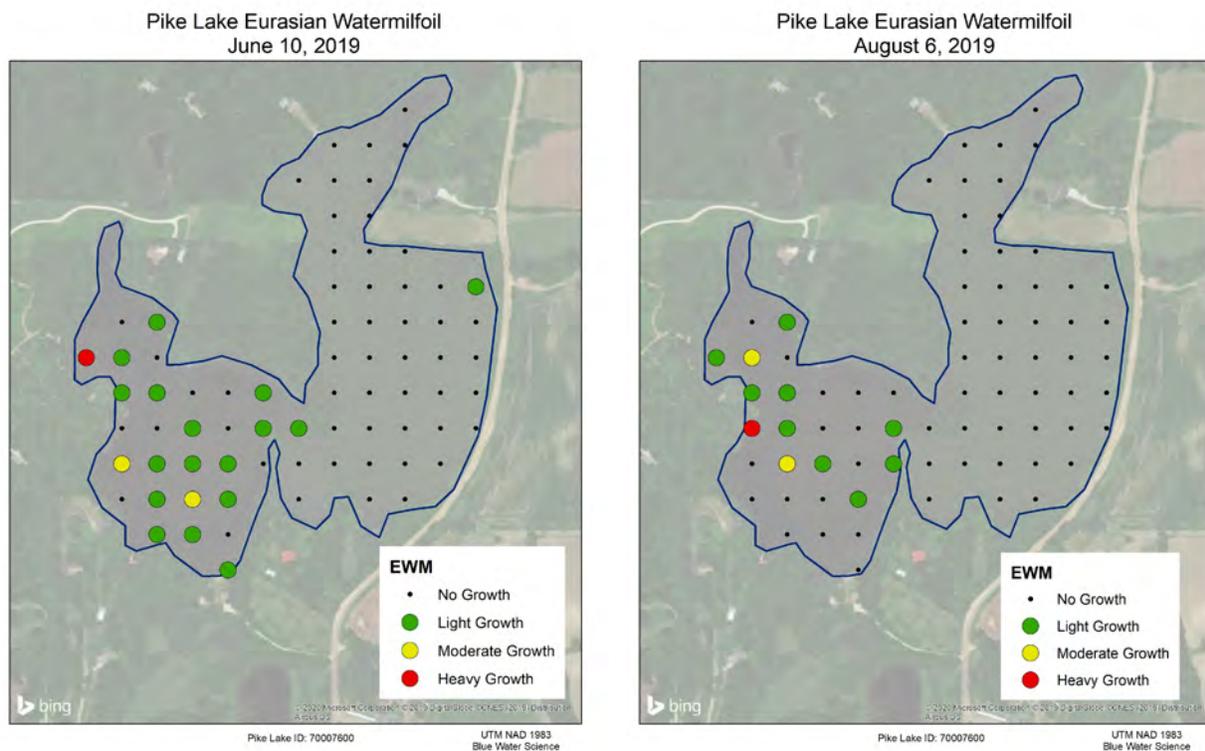


Figure S1. Pike Lake Eurasian watermilfoil growth on June 10, 2019 (left) and Eurasian watermilfoil growth on August 6, 2019 (right). Key: Green = light growth, yellow = moderate growth, and red = heavy growth.

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 10, 2019 and August 6, 2019. 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 3 with 1 being sparse and 3 being heavy growth.

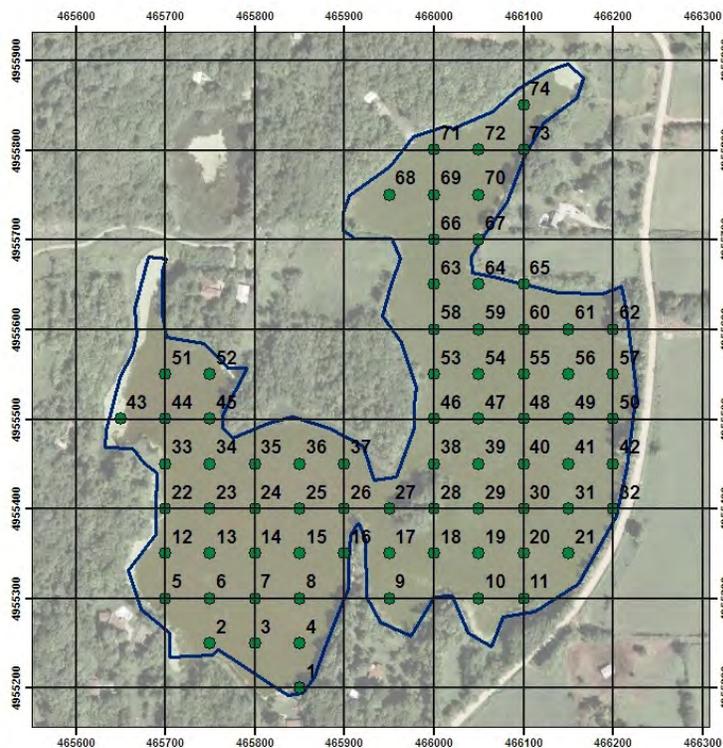


Figure 1. Sample grid map for the aquatic plant survey conducted on Pike Lake.

Results - Aquatic Plant Point Intercept Survey on June 10, 2019

Results of the early-summer/spring aquatic plant survey conducted on June 10, 2019 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. Eurasian watermilfoil growth was light to moderate, EWM was reduced compared to previous years at this time. Curlyleaf pondweed was found at light densities scattered around Pike Lake while coontail was the dominant aquatic plant and was found at 29 sites (Figure 3).

Table 1. Pike Lake aquatic plant occurrence and density for the June 10, 2019 survey based on 74 sites. Density ratings are 1-3 with 1 being low and 3 being most dense.

	All Stations (n=74)	
	Occur	Average Density
Coontail (<i>Ceratophyllum demersum</i>)	29	1.7
Curlyleaf pondweed (<i>Potamogeton crispus</i>)	11	1.0
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	20	1.2
Sago Pondweed (<i>Stuckenia pectinata</i>)	7	1.0

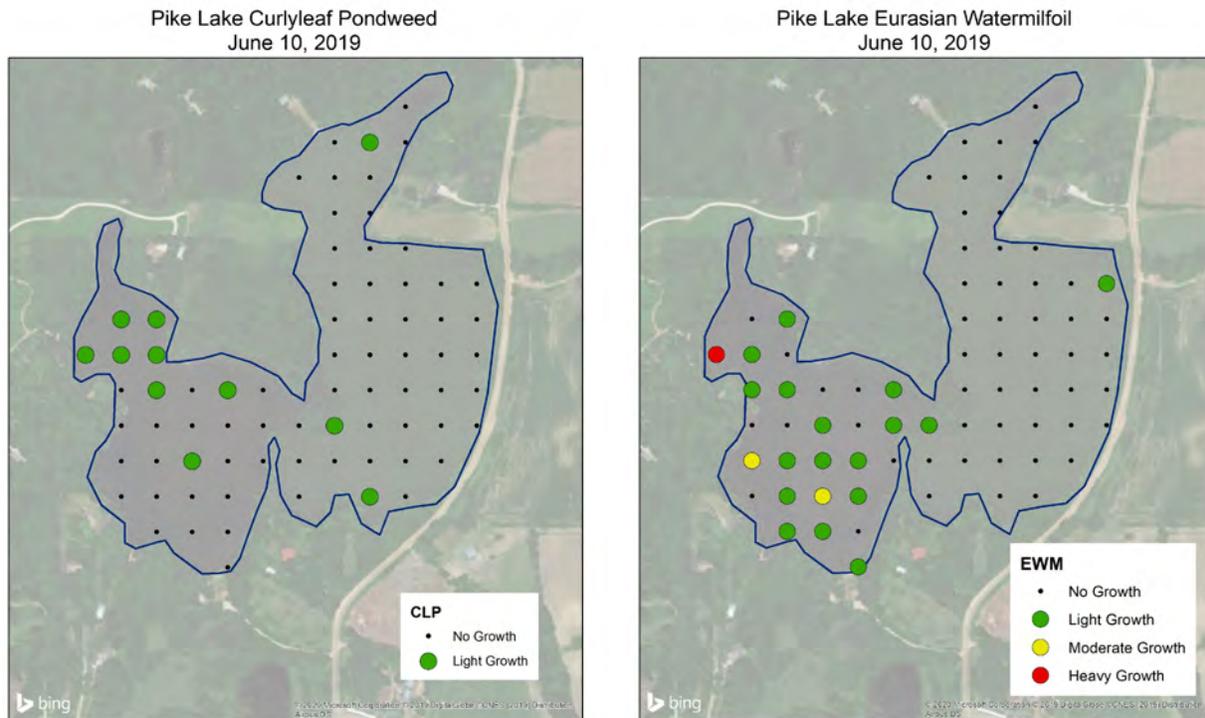


Figure 2. [left] Curlyleaf pondweed coverage on June 10, 2019. [right] Eurasian watermilfoil coverage on June 10, 2019.

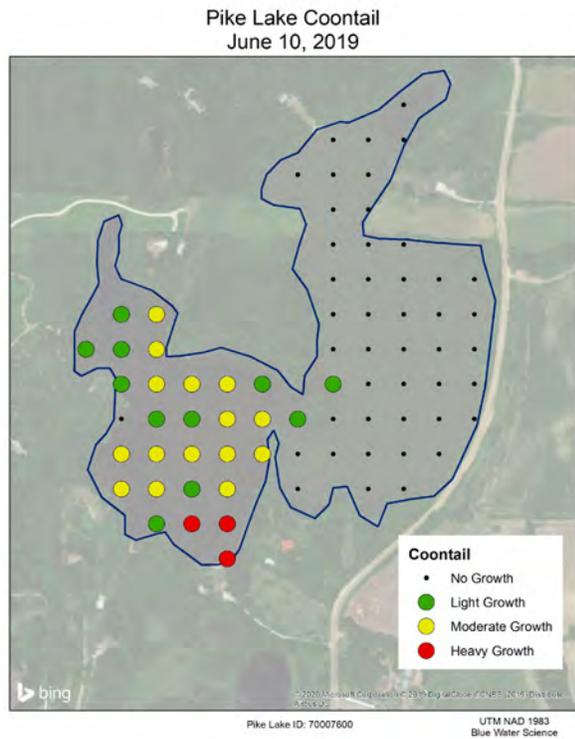


Figure 3. [left] Coontail distribution and abundance on June 10, 2019. [right] Coontail growing to the lake surface in the western basin on June 10, 2019. Key: Green shading = light growth, yellow shading = moderate growth, and red shading = heavy growth.

Table 2. Individual site data for Pike Lake on June 10, 2019.

Site	Depth (ft)	Coon-tail	CLP	EWM	Sago	No plants
1	4	3		1	1	
2	4	1		1	1	
3	6	3		1		
4	5	3				
5	5	2				
6	6	2		1		
7	6	1		2		
8	6	2		1		
9	5					1
10	6		1			
11	5				1	
12	5	2		2		
13	6	2		1		
14	6	2	1	1		
15	6	2		1		
16	5	2				
17	6					1
18	7					1
19	8					1
20	9					1
21	8					1
22	2					1
23	6	1				
24	6	1		1		
25	6	2				
26	5	2		1		
27	5	1		1	1	
28	7		1			
29	9					1
30	9					1
31	9					1
32	6					1
33	4	1		1		
34	6	2	1	1		
35	6	2				
36	6	2	1			
37	5	1		1		
38	6	1				
39	10					1
40	10					1
41	10					1
42	8					1
43	5	1	1	3		
44	5	1	1	1		
45	5	2	1			
46	8					1
47	10					1
48	10					1
49	10					1
50	7					1
51	5	1	1			
52	5	2	1	1		
53	6					1
54	9					1
55	9					1
56	9					1
57	8					1
58	8					1

Site	Depth (ft)	Coon-tail	CLP	EWM	Sago	No plants
59	9					1
60	9					1
61	7					1
62	3			1	1	
63	9					1
64	7					1
65	7					1
66	8					1
67	4				1	
68	8					1
69	9					1
70	7					1
71	8					1
72	8		1			
73	5					1
74	5				1	
Average		1.7	1.0	1.2	1.0	
Occur (74 sites)		29	11	20	7	38
% occurrence		39	15	27	9	

Results-Aquatic Plant Point Intercept Survey on Aug 6, 2019

Results of the summer aquatic plant survey conducted on August 6, 2019 found two native submerged plant species and one non-native plant species were present. Plant growth in August was restricted to water depths of 5-6 feet or less in Pike Lake (Table 3 and Figure 4). Coontail was growing abundantly in the shallower west basin of Pike Lake (Figure 5). Coverage of coontail found in the August survey is shown in Figure 5. Eurasian watermilfoil was found 12 sites around Pike Lake, mostly in the shallow western basin (Figure 4). Eurasian watermilfoil growth was reduced compared to previous years, coontail was the dominant aquatic plant, often growing near the surface.

Table 3. Pike Lake aquatic plant occurrence and density for the August 6, 2019 survey based on 74 sites. Density ratings are 1-3 with 1 being low and 3 being most dense.

	All Stations (n=74)	
	Occur	Average Density
Coontail (<i>Ceratophyllum demersum</i>)	30	2.4
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	12	1.3
Sago Pondweed (<i>Stuckenia pectinata</i>)	5	1.0

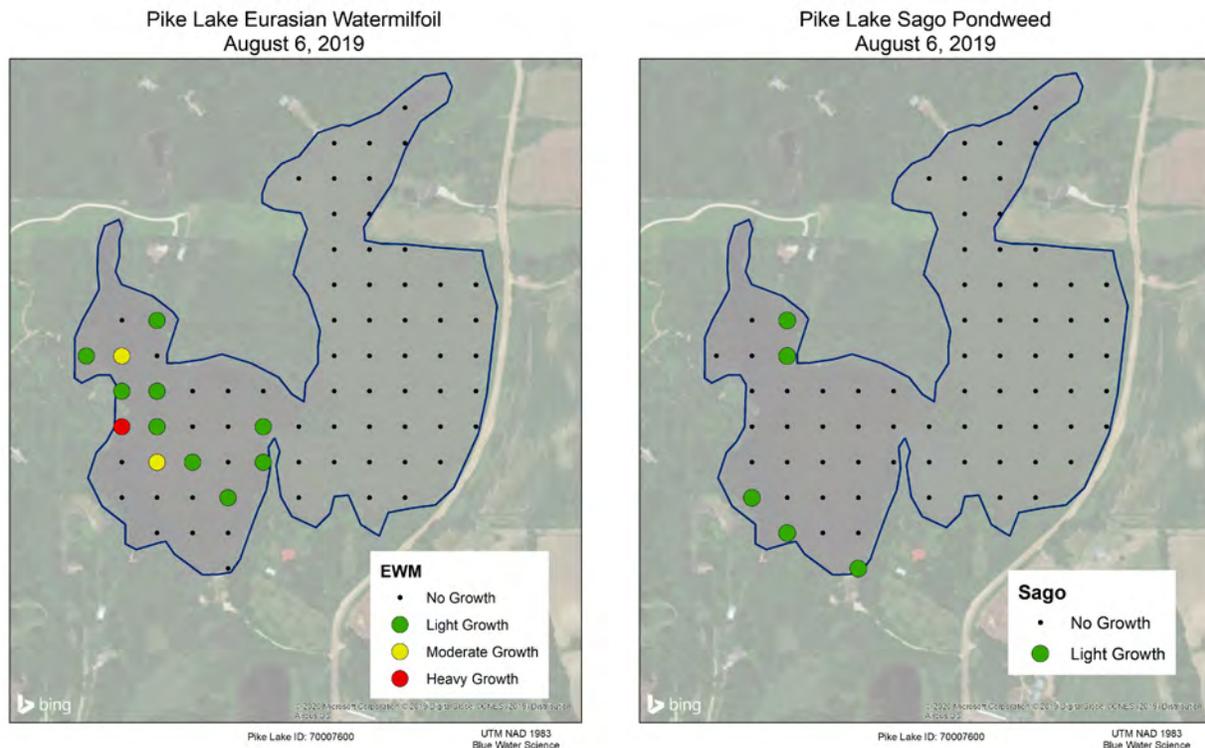


Figure 4. [left] Eurasian Watermilfoil growth and [right] sago pondweed for Pike Lake on August 6, 2019.

Pike Lake Coontail
August 6, 2019

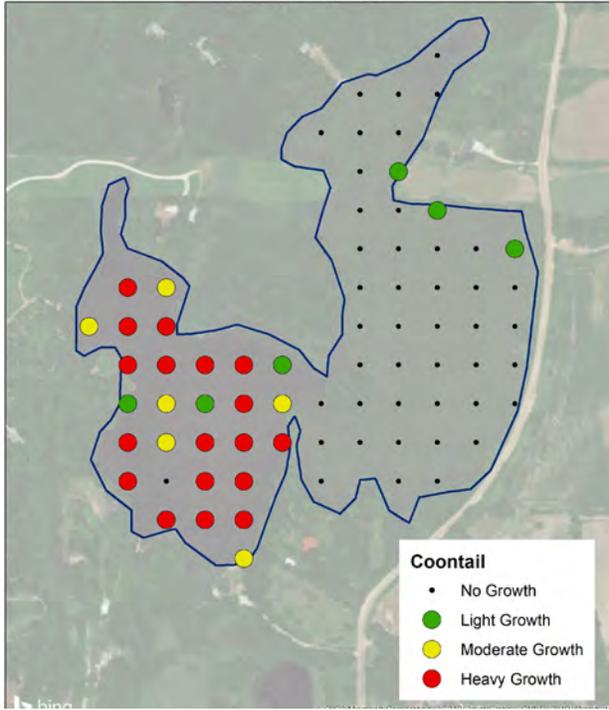


Figure 5. August 6, 2019 Pike Lake coontail growth: West basin (left) vs East Basin (right).

Table 4. Individual site data for Pike Lake on August 6, 2019.

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

Comparison of 2012, 2013, 2015, 2017, and 2019 Summer Surveys

Aquatic plant surveys were conducted in the late summer of 2012, 2013, 2015, 2017, and 2019. Coontail has been a common plant in the four surveys, including 2019, 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 5-6 feet of water depth due to low light penetration and elevated algae growth.

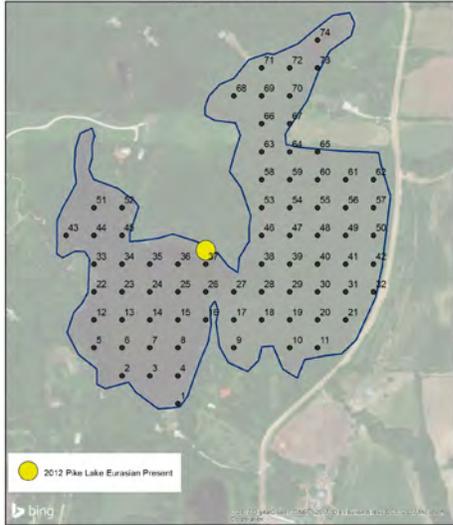
Initially, Eurasian watermilfoil was first found only at one spot in the west basin in 2012 but results from previous surveys indicate Eurasian watermilfoil has expanded its range. In 2015 Eurasian watermilfoil had expanded its range from 2012 and was growing sparsely around Pike Lake at 23% of sample sites. In 2017 Eurasian watermilfoil grew more widespread and more abundantly, found at 65% of sample sites. In 2019 Eurasian watermilfoil was reduced in abundance and occurrence compared to previous years but still present in the western basin, EWM was found at 16% of sample sites (Table 5 and Figure 6).

Table 5. The percent occurrence of aquatic plants for Pike Lake in 2012, 2013, 2015, 2017, and 2019. Percent occurrence is calculated based on the number of times a plant species occurs at a sampling station divided 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%.

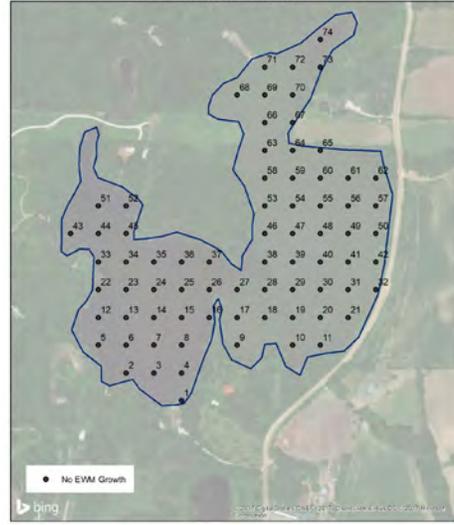
	August 6, 2012 % Occurrence (74 sites)	September 7, 2013 % Occurrence (74 sites)	August 24, 2015 % Occurrence (74 sites)	August 29, 2017 % Occurrence (74 sites)	August 6, 2019 % Occurrence (74 sites)
Duckweed (<i>Lemna sp</i>)	0	3	1	0	0
Coontail (<i>Ceratophyllum demersum</i>)	9	23	20	42	40
Elodea (<i>Elodea canadensis</i>)	1	0	9	0	0
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	0*	0	27	65	16
Northern watermilfoil (<i>Myriophyllum spicatum</i>)	1	1	0	0	0
Sago pondweed (<i>Stuckenia pectinata</i>)	1	11	0	0	7

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

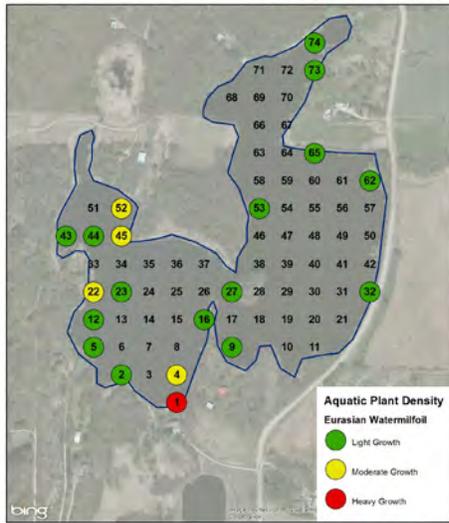
Pike Lake Eurasian Watermilfoil
August 6, 2012



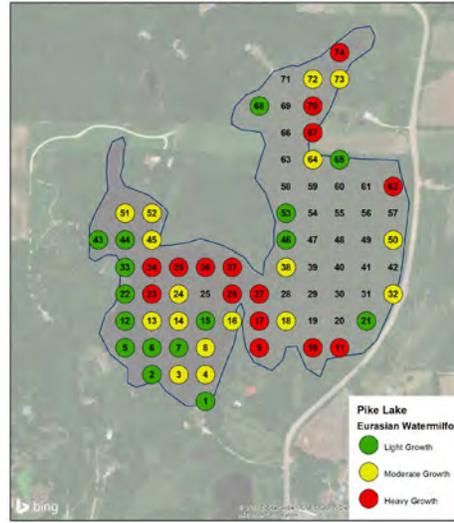
Pike Lake Eurasian Watermilfoil
September 7, 2013



Pike Lake Eurasian Watermilfoil August 24, 2015



Pike Lake Eurasian Watermilfoil
August 29, 2017



Pike Lake Eurasian Watermilfoil
August 6, 2019

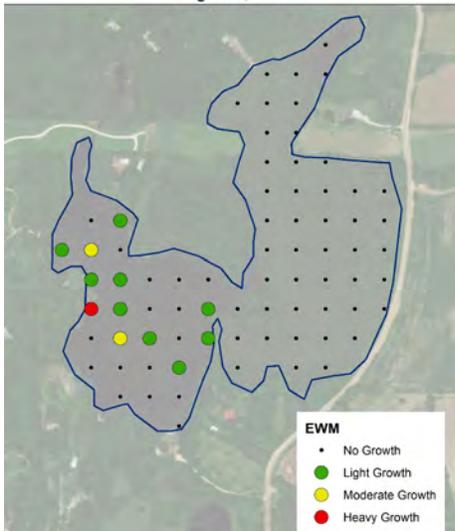


Figure 6. Eurasian watermilfoil distribution and abundance from 2012 - 2019 (no surveys conducted in 2014, 2016, and 2018). Key: Green = light growth, yellow = moderate growth, red = heavy growth, and black = no growth.

General Findings of This Study

- Shoreline areas are mostly natural, emergent plants remain healthy and continue to offer good wildlife habitat.
- The west basin of Pike lake is shallow and plants have been able to establish, growing throughout the summer.
- The western basin is able to maintain fair water clarity and abundant plants while the eastern basin is algae dominated and aquatic plants are rare in mid summer.
- Coontail was the dominant native plant in Pike Lake during the spring and summer aquatic plant surveys in 2019.
- Both EWM and CLP abundance and extent were reduced in 2019 compared to previous years.
- In 2019, Eurasian watermilfoil coverage, abundance and density was reduced compared to previous years. EWM was the dominant plant in 2015, 2017 and Eurasian watermilfoil's coverage had been steadily increasing since the first observation of Eurasian watermilfoil in 2012.
- Curlyleaf Pondweed growth was light and was not displaying nuisance conditions in June 2019.
- 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. Plants are still not growing deeper than 6 feet of water depth in Pike Lake.
- A turbid, algae dominated condition is typical for Pike Lake in late summer.

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

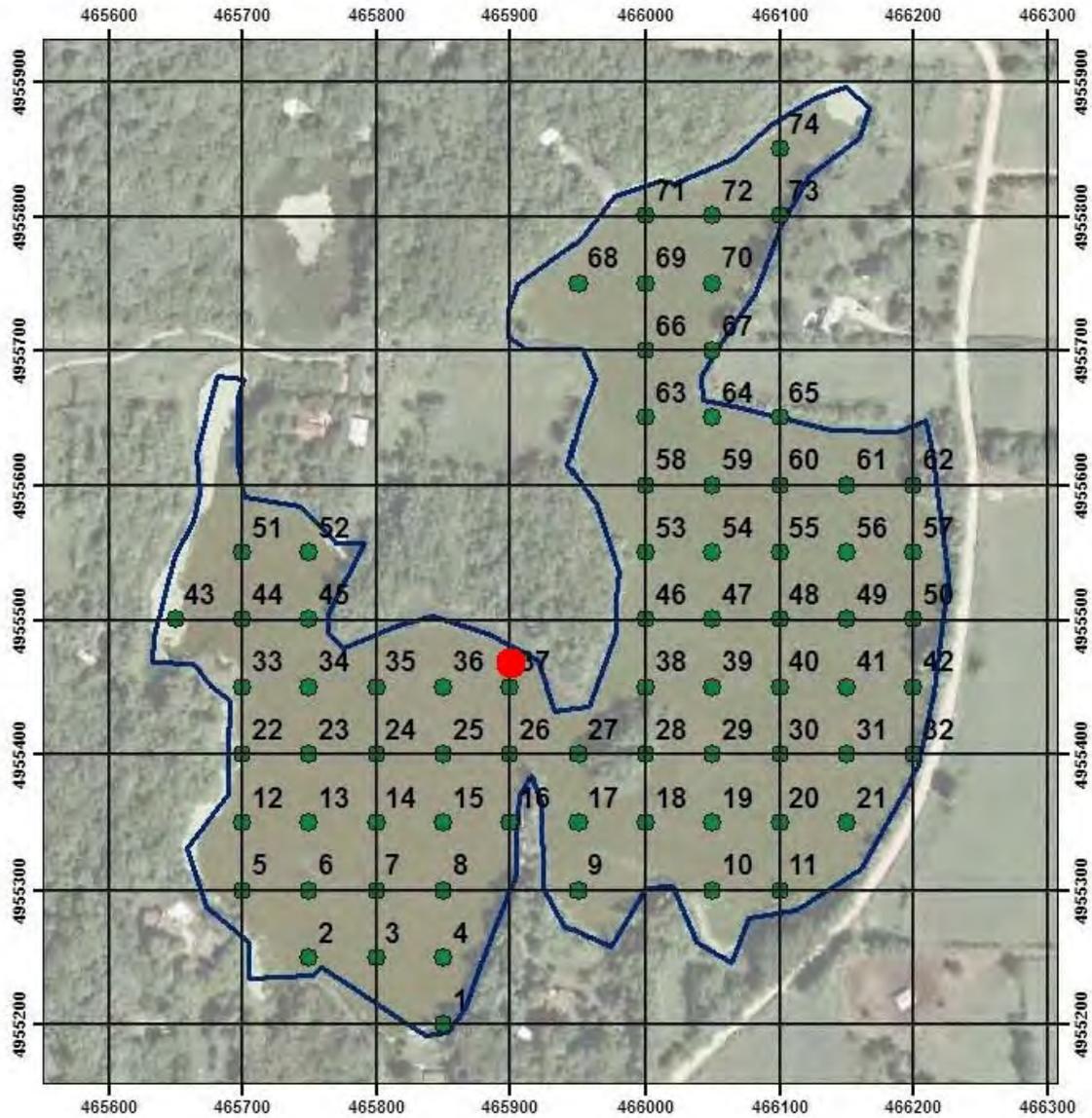
August 6, 2012





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