



Underwater View of Curlyleaf Pondweed in Comfort Lake in 2017

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## Curlyleaf Pondweed and Eurasian Watermilfoil Delineation, Treatment, and Assessment for Comfort Lake, Chisago County, 2017

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	<b>Delineation</b>	<b>Treatment</b>	<b>Assessment</b>
CLP	April 21, 2017	No Treatment	May 5, 2017
EWM	May 5, 2017	May 24, 2017 (3.2 acres)	June 13, 2017

**Prepared for:**  
Comfort Lake/Forest Lake  
Watershed District  
Forest Lake, Minnesota



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**March 20, 2018**

# Curlyleaf Pondweed and Eurasian Watermilfoil Delineation, Treatment, and Assessment for Comfort Lake, Chisago County, 2017

## Summary

**Curlyleaf Pondweed Delineation and Assessment Surveys:** Comfort Lake (MnDNR #13-005300) is a 218 acre lake in Chisago County, Minnesota. A curlyleaf pondweed delineation for distribution and abundance was conducted on Comfort Lake on April 21, 2017. In the delineation survey, curlyleaf was found at only 2 sites in Comfort Lake (Figure S1). No areas were delineated for treatment.

About 1 month later, in the May curlyleaf assessment, curlyleaf was found at only 1 site in Comfort Lake (Figure S1). Curlyleaf pondweed was very sparse in Comfort Lake in 2017. It is likely, one or more factors are limiting growth, but they are unknown at this time.

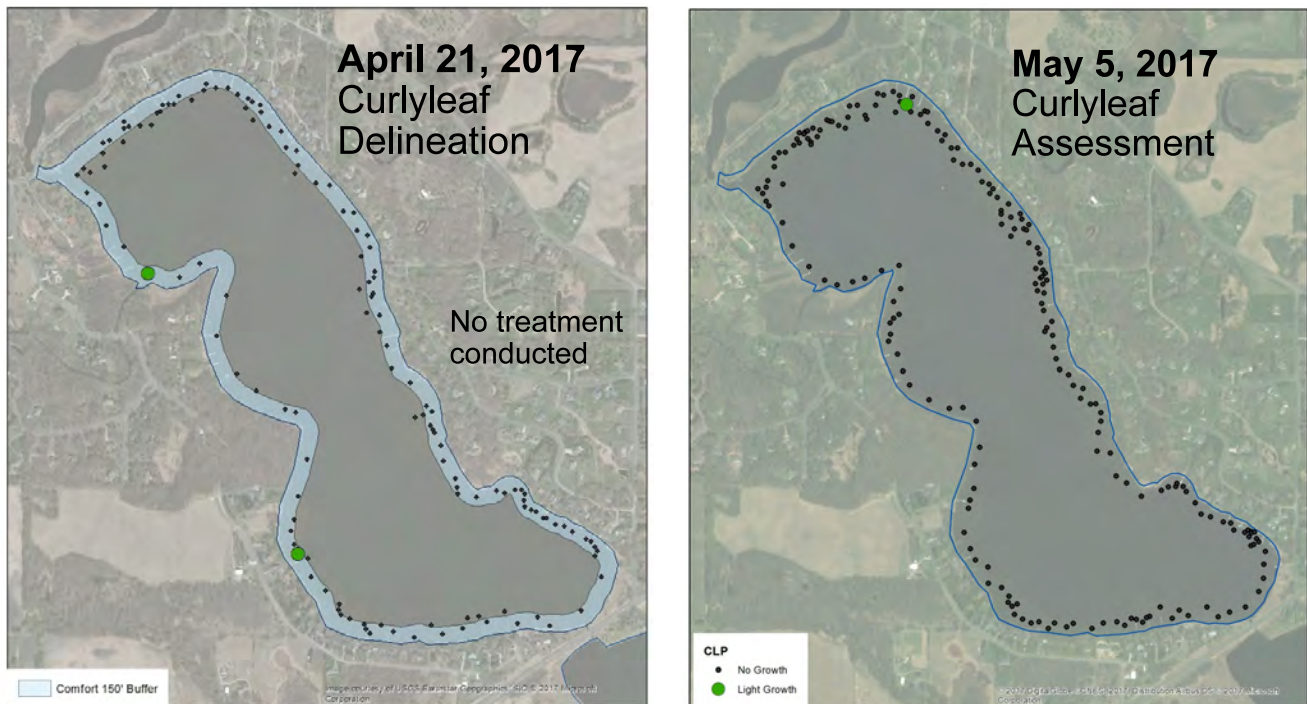


Figure S1. [left] DELINEATION: Map of curlyleaf pondweed distribution on the April 21, 2017 survey.

TREATMENT: No curlyleaf pondweed treatment was conducted in 2017.

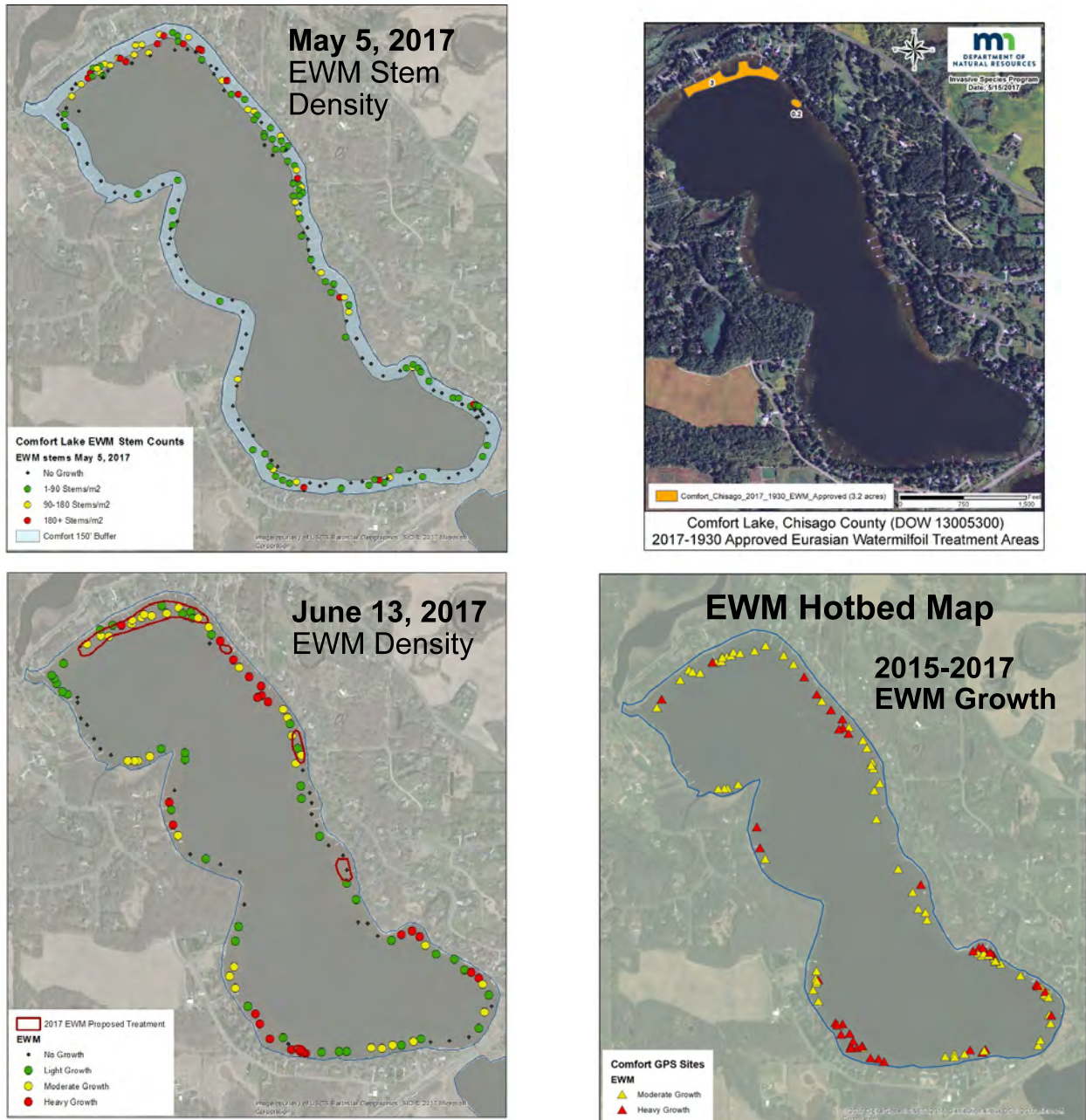
[right] ASSESSMENT: Map of curlyleaf pondweed assessment sites for May 5, 2017.

Key: black dot = no curlyleaf, green dot = light growth and blue shading = 150 foot contour around Comfort Lake.

**Eurasian Watermilfoil (EWM) Delineation, Treatment, and Assessment Surveys:** Eurasian watermilfoil was first observed in Comfort Lake in 2014. An Eurasian watermilfoil delineation for distribution and abundance was conducted on May 5, 2017 and EWM was found at 113 sites. Five treatment areas totaling 6.4 acres were delineated. Treatment was permitted for an area of 3.2 acres in 2 areas. Treatment was conducted on May 24 (Figure S2).

After the May 24 treatment, which was based on the 3.2 acres, EWM had decreased and was found at 94 sites in the June 13, 2017 assessment. EWM growth was mostly light to moderate with fair control in the treated areas (Figure S2). Heavy EWM growth was found on the NE side and in the southern end of Comfort Lake.

A hotbed map of EWM sites of moderate and heavy growth for 2015, 2016, and 2017 is shown in Figure S2. In the last 3 years EWM growth has been observed around much of the nearshore areas of Comfort Lake.



**Figure S2. [top-left] DELINEATION:** Map of EWM distribution from the May 5, 2017 survey. **[top-right] TREATMENT:** MnDNR approved EWM treatment map. Treatment occurred on May 24, 2017. **[bottom-left] ASSESSMENT:** Map of EWM sites for June 13, 2017. **[bottom-right] Hotbed map** of EWM growth over the years of 2015, 2016, and 2017 placed on a single map. **Key:** black dot = no EWM, green dot = light growth, yellow dot = moderate growth, and red dot = heavy growth.

**Curlyleaf Pondweed and Eurasian Watermilfoil Treatments from 2014 Through 2017:** A summary of curlyleaf pondweed and milfoil treatments from 2014-2017 is shown in Figure S3. Curlyleaf was only treated at 1 acre in 2015. Curlyleaf has been sparse in Comfort Lake. EWM was first observed in 2014 and it has spread around the lake in the last 3 years. A total of 7.5 acres was treated in 2016 and although 3.2 acres were treated in 2017, several acres were delineated but not treated. EWM is still new in Comfort Lake and may expand further in the next few years.

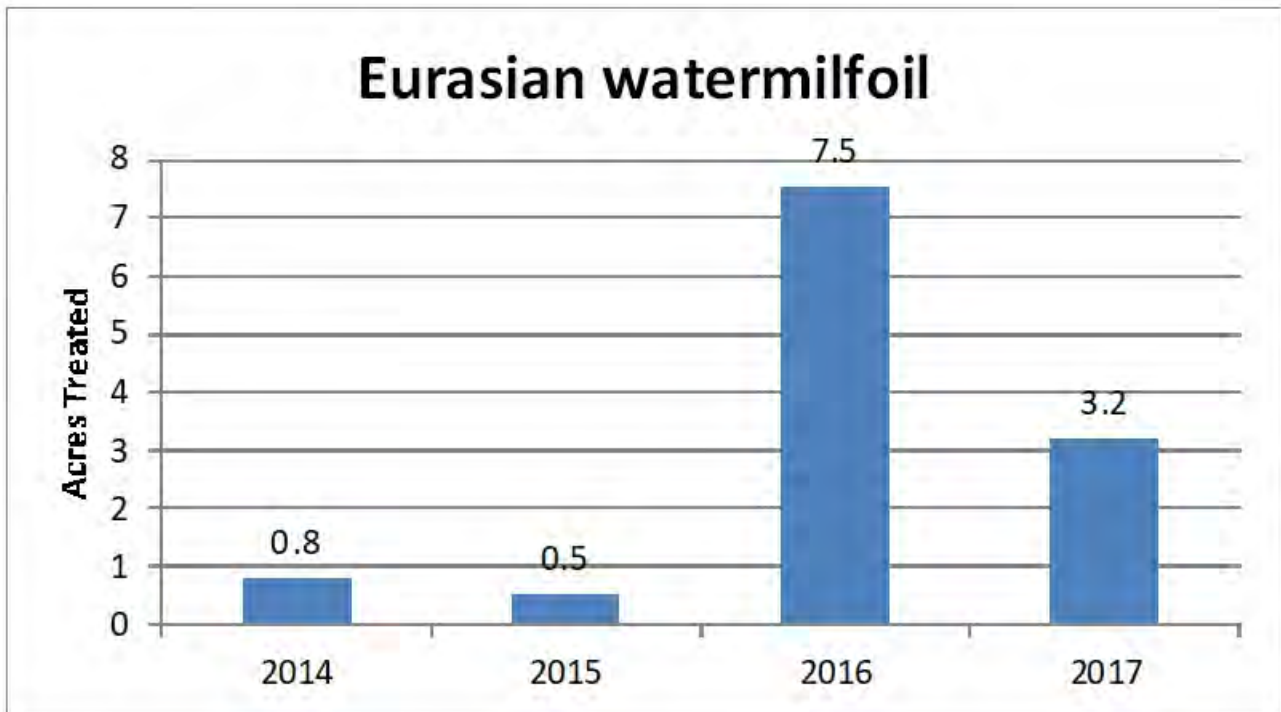
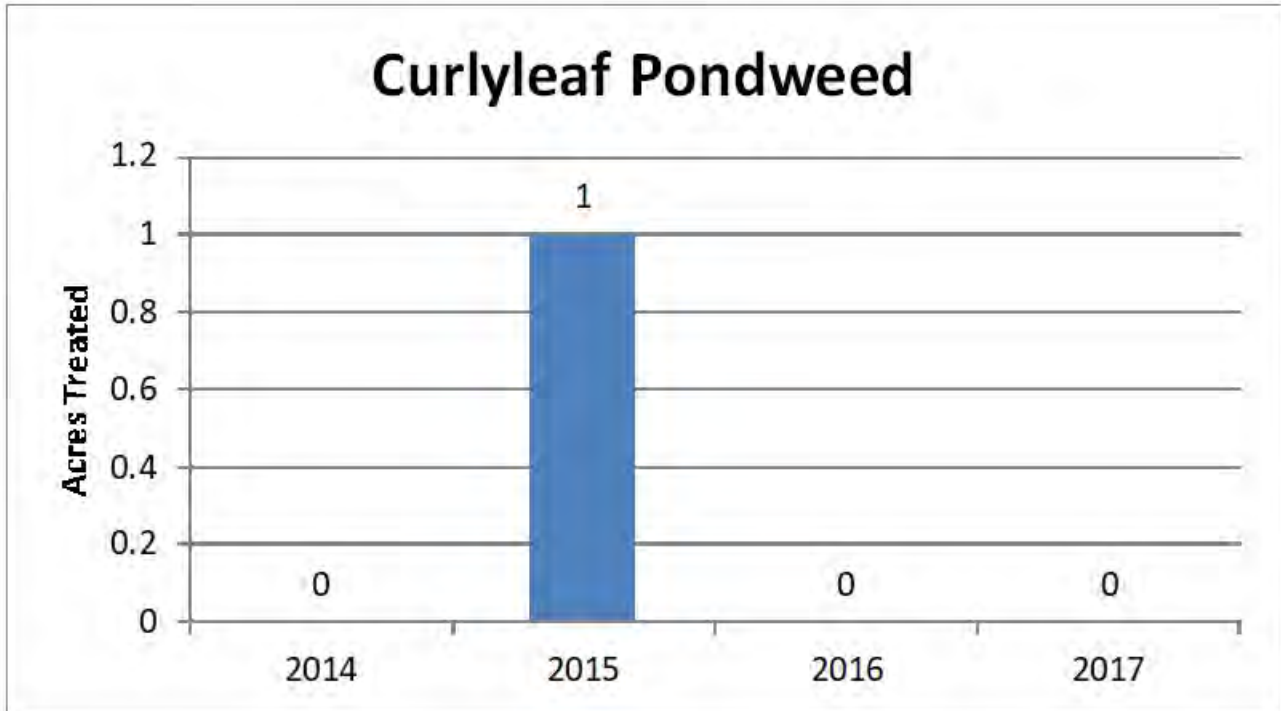
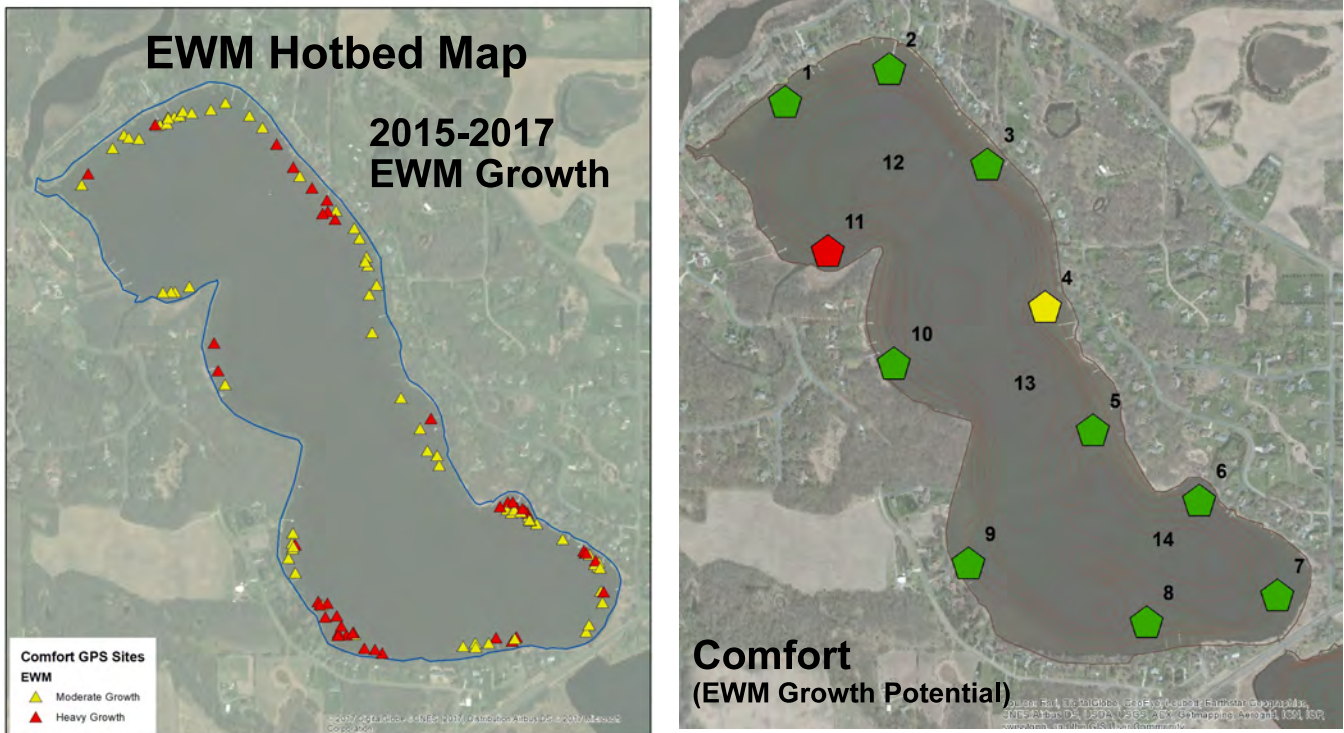


Figure S3. [top] Curlyleaf pondweed treated in 2014-2017. [bottom] Eurasian watermilfoil treated in 2014-2017.

**Milfoil Hotbeds and Growth Potential in Comfort Lake:** Areas of moderate and heavy growth for 2015 through 2017 are shown on the hotbed map in Figure S4. EWM has nearly ringed the lake with growth. However the lake sediment nitrogen concentrations are mostly low. High nitrogen is correlated with heavy milfoil growth. It is possible EWM is still in a rapid expansion mode that is typical of new invasive species or alternatively nitrogen may be coming in with runoff and plants are taking it up foliarly(through their leaves). Additional monitoring would help clarify the growth habits of EWM in Comfort Lake.



**Figure S4. [left] Hotbed map of EWM growth over the years of 2015, 2016, and 2017 placed on a single map. [right] EWM potential growth based on lake sediment analyses for Comfort Lake. Key: green = light growth, yellow = moderate growth, and red = heavy growth.**

# Curlyleaf Pondweed and Eurasian Watermilfoil Delineation, Treatment, and Assessment for Comfort Lake, Chisago County, 2017

Comfort Lake, Chisago County (ID: 13-0053)

Size: 218 acres (MnDNR)

Littoral area: 90 acres (MnDNR)

Maximum depth: 47 ft (MnDNR)

## Introduction

Comfort Lake has an area of 218 acres with a littoral area of 90 acres (MnDNR). The maximum depth of Comfort Lake is 47 feet. The growth of curlyleaf pondweed (CLP) has been heavy in the past, but lighter in recent years. Also Eurasian watermilfoil (EWM) is present in Comfort Lake and was first observed in 2014. In 2017, CLP was delineated in April. Curlyleaf was found with very light growth and was not treated in 2017. EWM was delineated in May and 3.2 acres of EWM were treated on May 24. The objectives of the surveys were to delineate the acreage of CLP and EWM, to treat where needed and then to assess the effectiveness of the treatments.

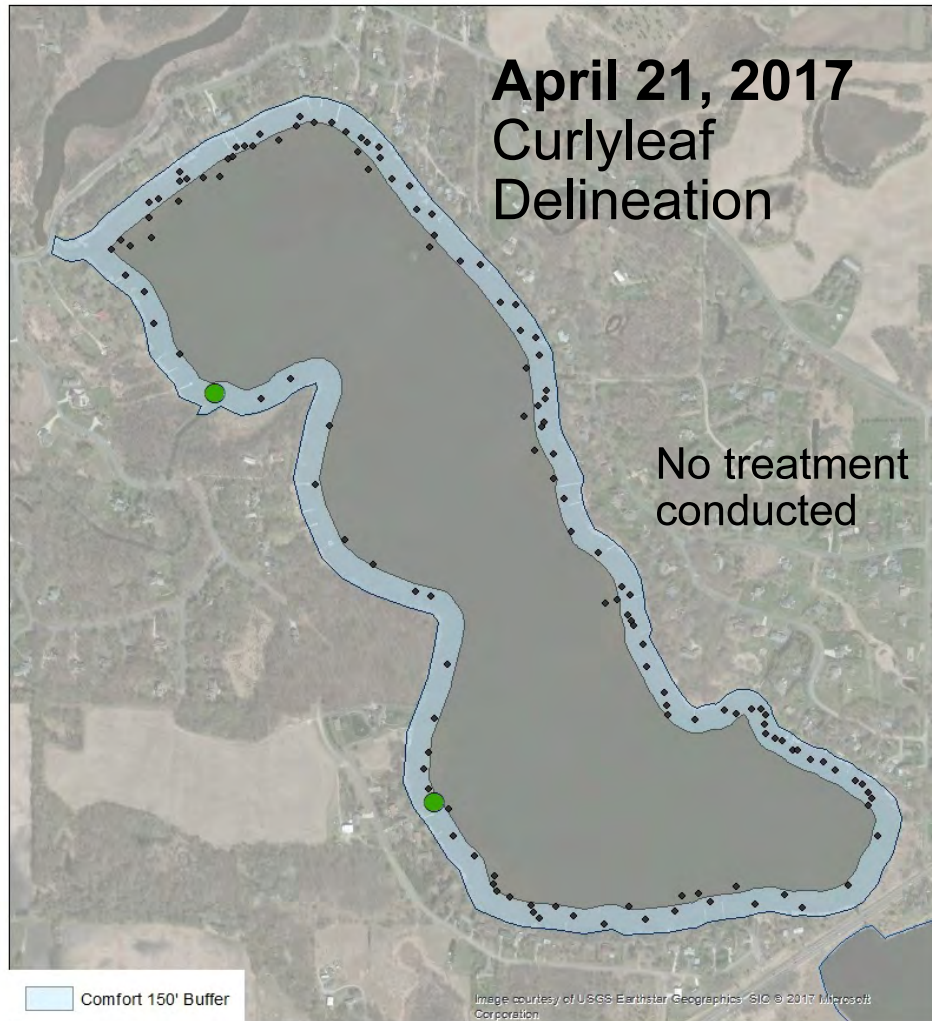
## Methods

**Curlyleaf Pondweed Delineation and Assessment Methods:** An initial CLP meandering delineation was conducted on April 21, 2017. The entire perimeter of the lake was checked for CLP. A total of 133 sites were sampled for aquatic plants. A follow-up CLP assessment was conducted on May 5, 2017 to characterize the status of CLP at its peak growing period. The same methodology that was used for the delineation was used for the assessment. A total of 200 sites were sampled for aquatic plants on May 5, 2017.

**Eurasian Watermilfoil Delineation and Assessment Methods:** An initial EWM delineation was conducted on May 5, 2017. The entire perimeter of the lake was checked for EWM and a total of 200 sites were sampled for aquatic plants. An early herbicide treatment of 3.2 acres occurred on May 24, 2017. A follow-up EWM assessment was conducted on June 13, 2017 and a total of 124 sites were sampled for aquatic plants.

## Curlyleaf Pondweed Delineation on April 21, 2017

A CLP delineation was conducted using rake sampling on April 21, 2017, 133 sites were examined. At this time of the year curlyleaf was found at 2 sample sites in Comfort Lake (Figure 1). No CLP treatment was conducted in 2017.



**Figure 1. Map of curlyleaf pondweed distribution from the April 21, 2017 survey. Key: black dot = no curlyleaf and green dot = light growth.**

## Curlyleaf Pondweed Assessment on May 5, 2017

A CLP assessment was conducted on May 5, 2017 and a total of 200 sites were assessed with rake sampling. Curlyleaf was found at 1 sample site with light growth out of the 200 sites that were monitored (Figure 2). No CLP treatment occurred in 2017 and no significant CLP growth occurred in the spring.

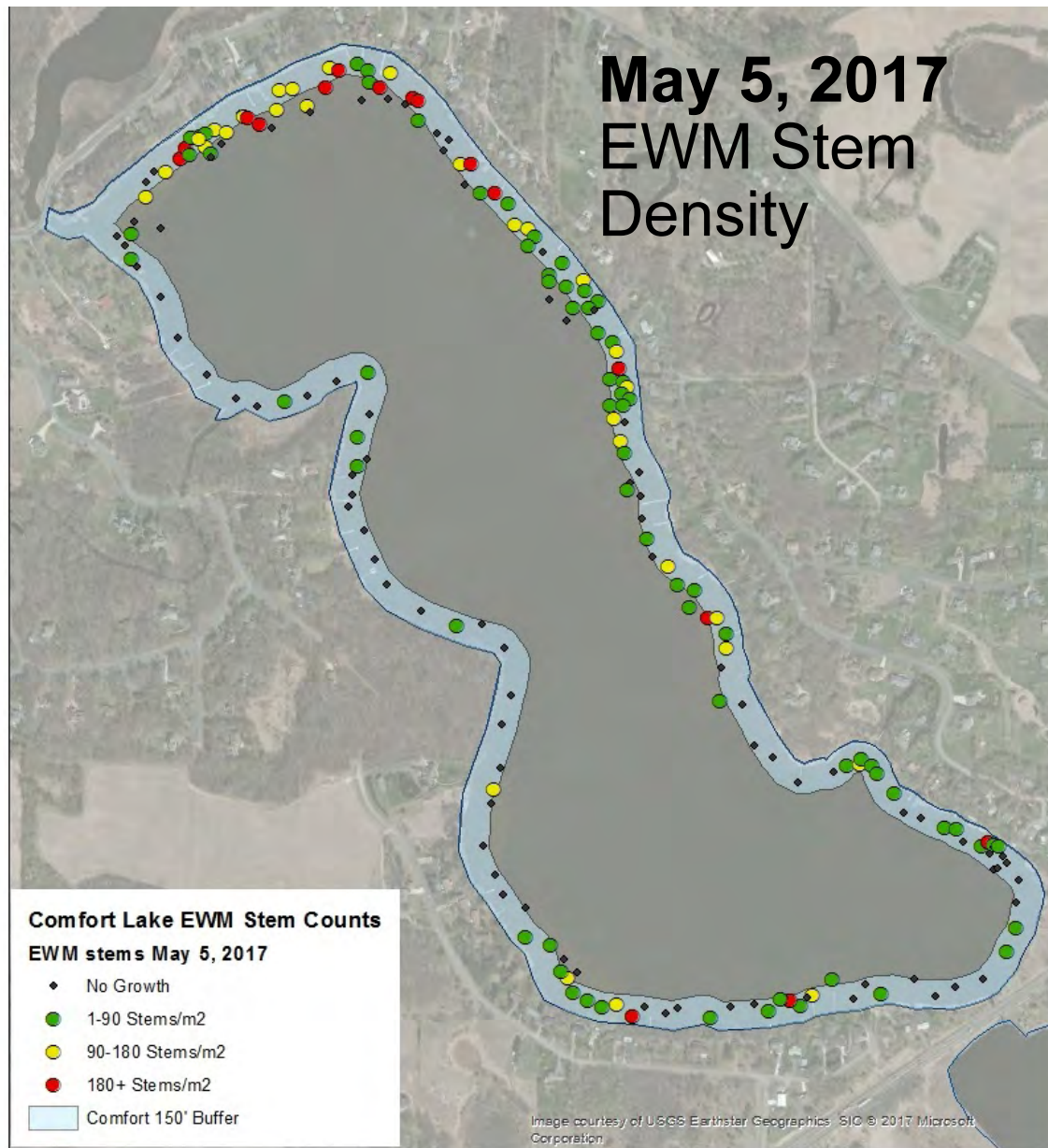


**Figure 2. Map of curlyleaf distribution in Comfort Lake on May 5, 2017.  
Key: black dots = sample locations and green dots = light growth.**



## Eurasian Watermilfoil Delineation on May 5, 2017

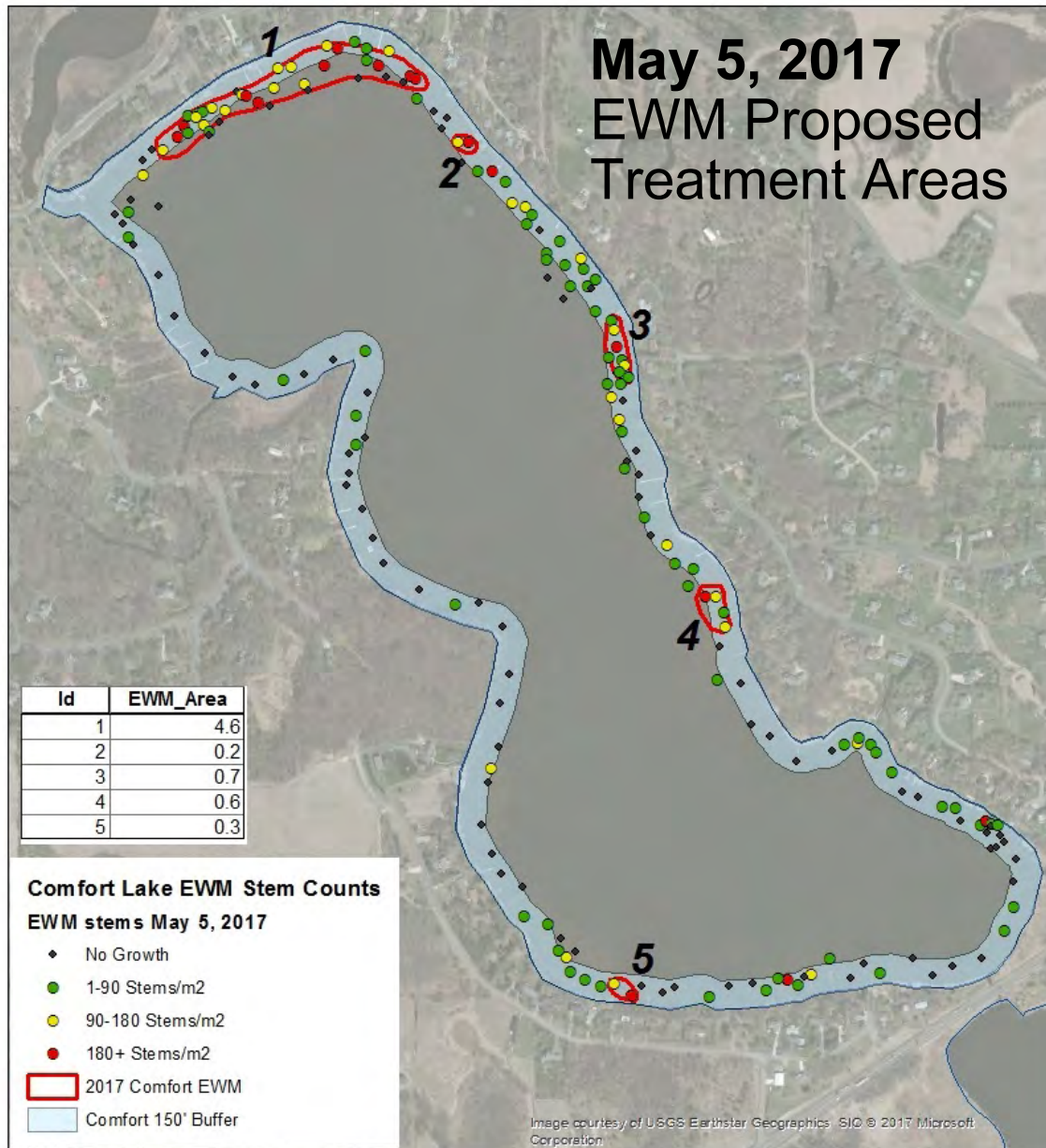
In early May it is a challenge to predict the peak EWM distribution that will occur in June and July. However, EWM growth on May 5, 2017 should be indicative of locations that could produce heavy growth later in the growing season. These areas could be treated before native plants began actively growing. A EWM delineation was conducted on May 5, 2017 and 200 sites in a meandering survey were sampled. EWM was distributed around the nearshore area of Comfort Lake. EWM was found at 113 sites out of 200 (Figure 3). Based on EWM distribution and abundance, 5 proposed treatment areas were delineated (Figure 4).



**Figure 3. DELINEATION: Map of EWM distribution from the May 5, 2017 survey.**

**Key: black dot = no EWM, green dot = light growth, yellow dot = moderate growth, and red dot = heavy growth.**

# Eurasian Watermilfoil Proposed Treatment Areas on May 5, 2017



**Figure 4. PROPOSED TREATMENT:** Map of EWM proposed treatment from the May 5, 2017 survey. Key: black dot = no EWM, green dot = light growth, yellow dot = moderate growth, red dot = heavy growth, blue shading = 150 ft buffer around Comfort Lake, and red outlined = proposed 5 treatment areas.

## Eurasian Watermilfoil Treatment, May 24, 2017

An early delineation on May 5 found 5 areas of moderate to heavy EWM growth totaling 6.4 acres. The objective of an early delineation was to treat EWM before native water lilies were actively growing.

However once the MnDNR inspected the proposed treatment areas it was determined that the lily growth may be impacted by the herbicides and the treatment areas were reduced to 2 sites totaling 3.2 acres (Figure 5). The 2 areas were treated with a 2,4-D herbicide (trade name: DMA-4) with 17.04 gallons applied in the 3 acre area and 1.14 gallons in the 0.2 acre area.

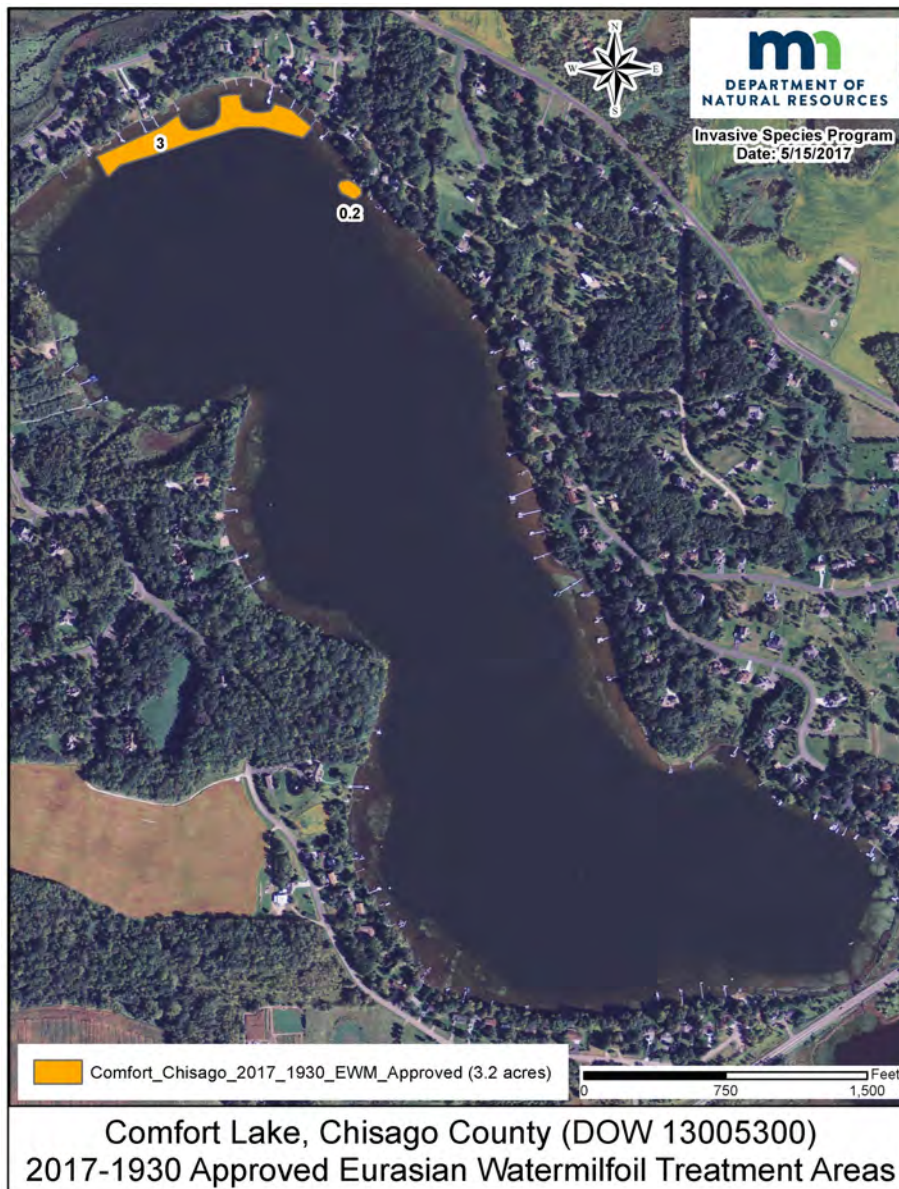


Figure 5. MnDNR approved treatment map of 3.2 acres of EWM were treated on May 24, 2017.

## Eurasian Watermilfoil Assessment on June 13, 2017

After treating 3.2 acres of EWM on May 24, an EWM assessment consisting of 124 points was conducted using rake sampling on June 13, 2017 (Figure 6). The treatment effectiveness in the 2 areas totaling 3.2 acres was fair, with light to moderate EWM growth still observed within the treatment area on the north end of Comfort Lake (Figure 6). Outside of the treatment areas, heavy EWM growth was found on the NE side and the southern end of Comfort Lake. Eurasian watermilfoil was found at 94 out of the 124 sample sites on June 13, 2017.

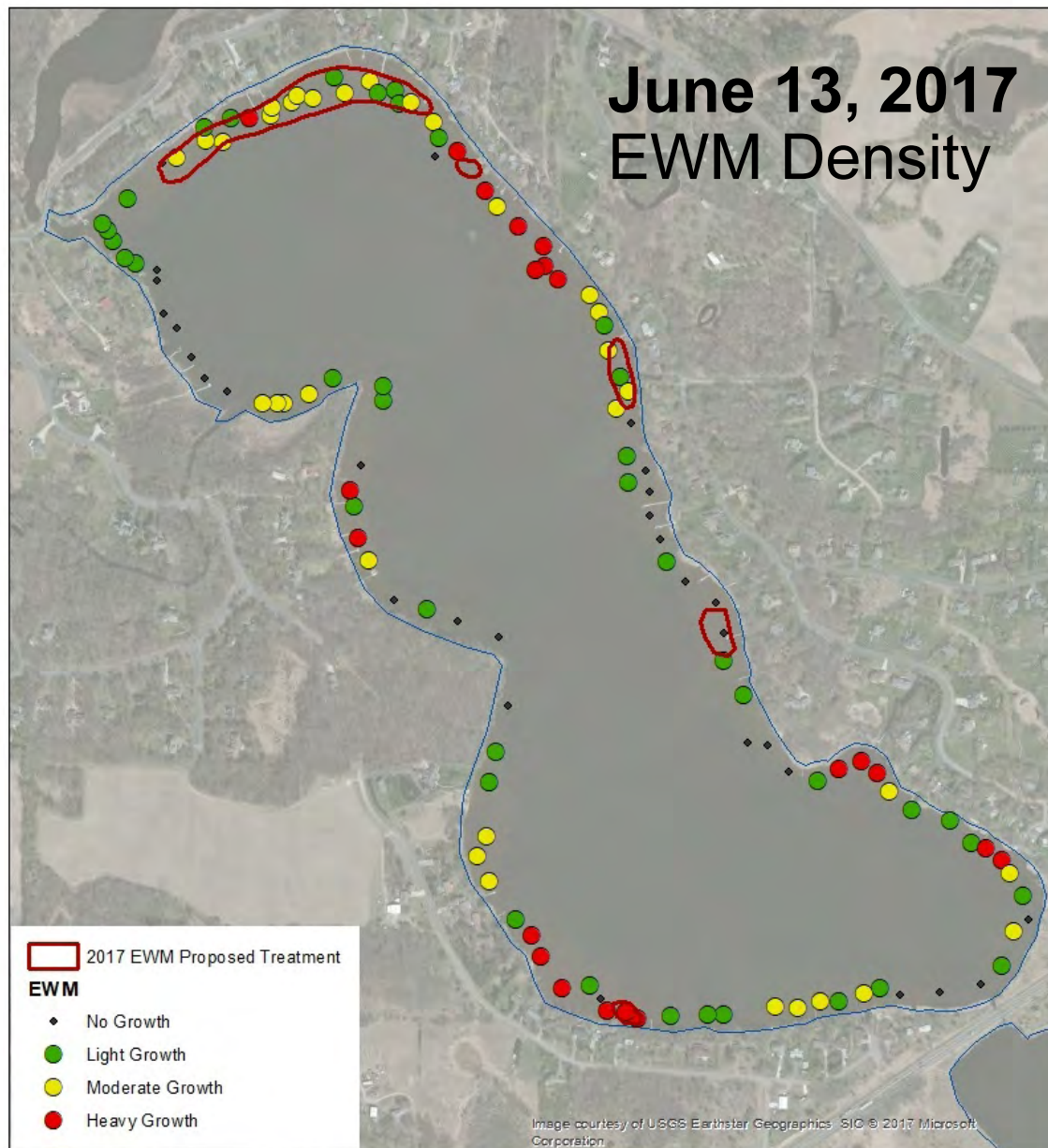


Figure 6. ASSESSMENT: Map of EWM sites for June 13, 2017.

Key: black dot = no EWM, green dot = light growth, yellow dot = moderate growth, and red dot = heavy growth.

## Curlyleaf Pondweed and Eurasian Watermilfoil in 2014 - 2017

Curlyleaf pondweed growth has been light from 2014 through 2017. Only 1 acre of CLP has been treated in the last 4 years. EWM growth was heavier in 2017 compared previous years even though less acreage was treated in 2017 compared to 2016 (Figures 7 and 8).

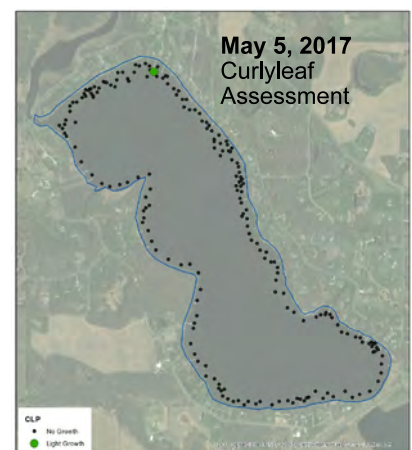
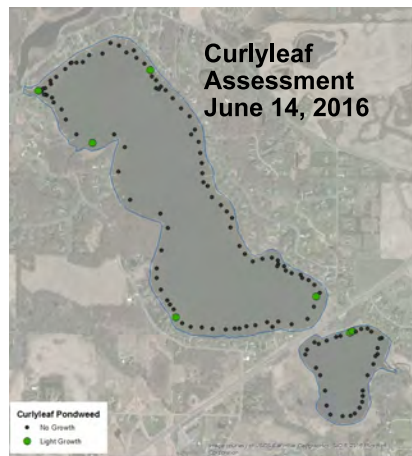
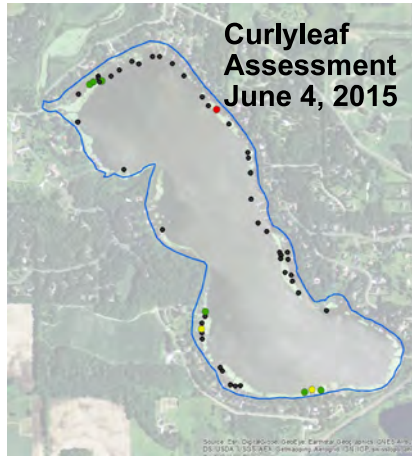
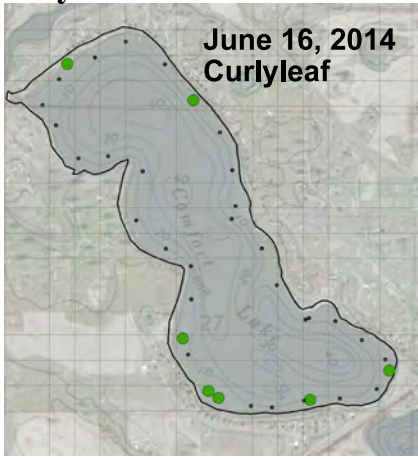
**Table 1. Acres treated in 2014 - 2017 for curlyleaf pondweed and Eurasian watermilfoil.**

	CLP (acres treated)	EWM (acres treated)
2014	0	0.8
2015	1.0	0.5
2016	0	7.5
2017	0	3.2



**Figure 7. EWM in Comfort Lake in June 2017.**

## Curlyleaf Pondweed 2014-17



## Eurasian Watermilfoil 2014-17

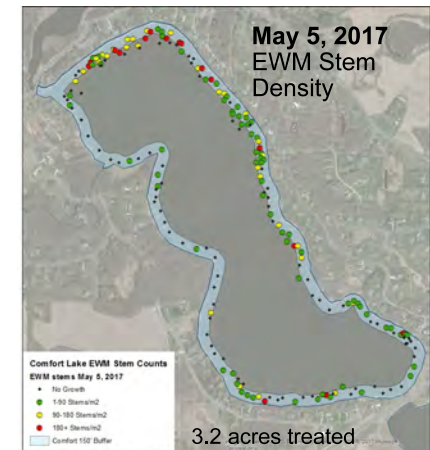
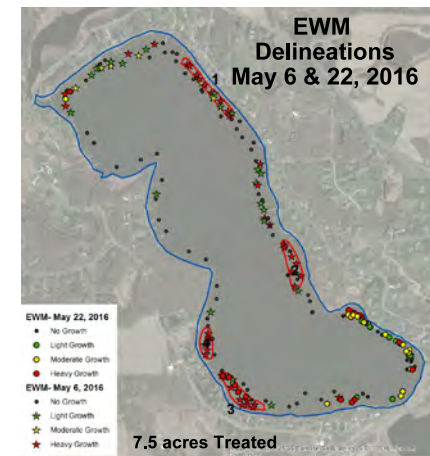
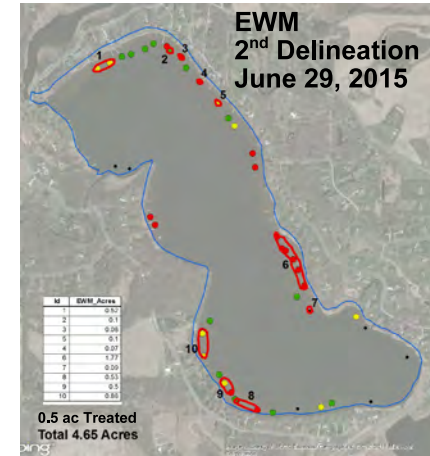
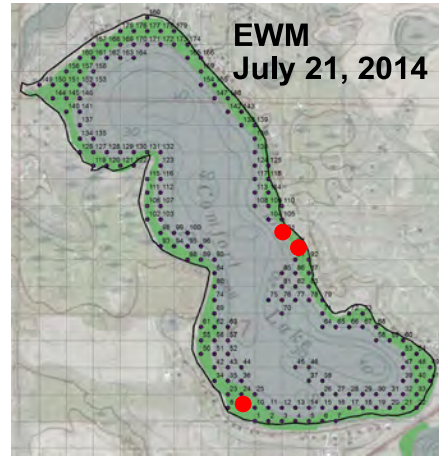


Figure 8. Curlyleaf pondweed and Eurasian watermilfoil maps for 2014, 2015, 2016, and 2017.

## Overview of Eurasian Watermilfoil from 2015 - 2017

Eurasian watermilfoil was first observed in Comfort Lake in July 2014. Although control of EWM has been ongoing since 2014, EWM continued to expand around the lake. A map showing the occurrence of moderate to heavy growth of EWM in Comfort Lake from 2015 through 2017 is shown in Figure 9 (left). Eurasian watermilfoil was found around most of the nearshore area of Comfort Lake in 2017. Some nearshore areas in the north and south ends of Comfort Lake support consistently significant growth. These “hotbed” areas are shown in Figure 9.

Heavy milfoil growth has been correlated with high sediment nitrogen conditions and from a soils survey conducted in 2014, Comfort Lake has at least 1 area with high lake sediment nitrogen conditions (Figure 9-right). The potential for long term milfoil growth, based on lake sediment sampling, predicts mostly light growth with the potential for annual heavy growth limited to the northwest side of Comfort Lake (Figure 9-right).

For Comfort Lake, it is estimated the plants have the potential to grow down to at least 7 feet of water depth based on low Secchi transparencies, restricting milfoil growth to nearshore areas. Results of the sediment survey indicate growth would be primarily light on a long term basis.

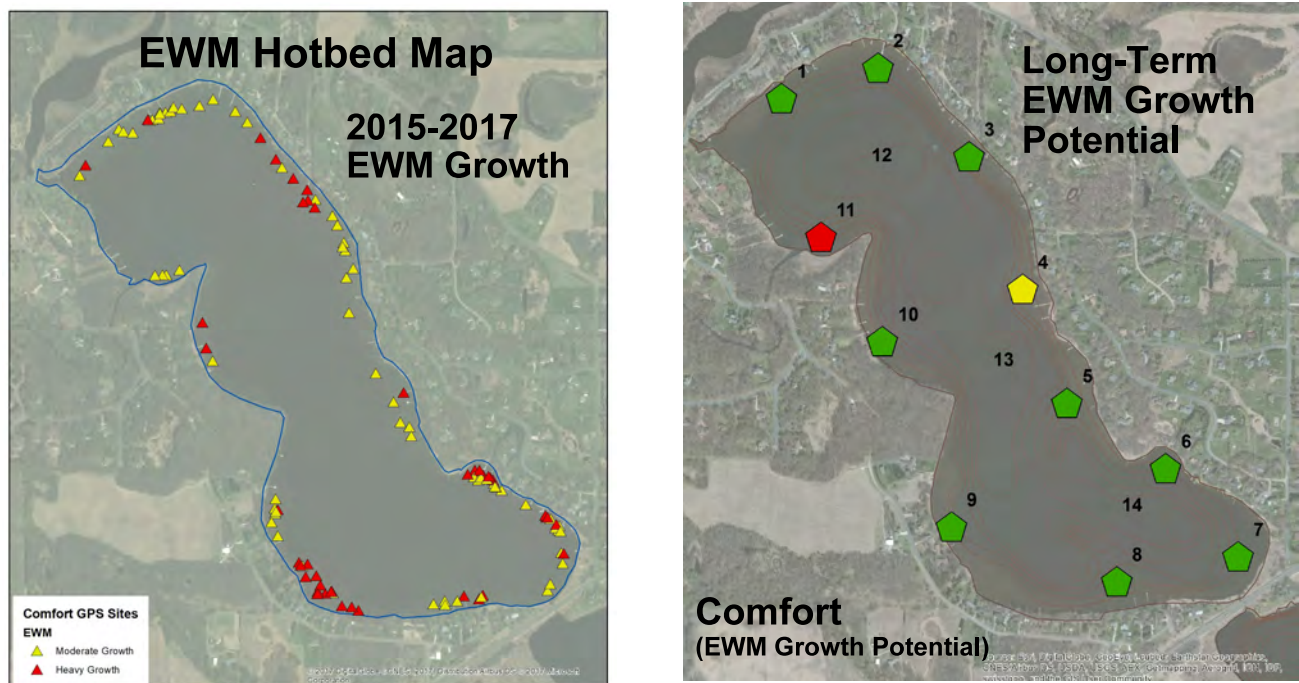


Figure 9. [left] Hotbed map of EWM growth over the years of 2015, 2016, and 2017 placed on a single map. [right] Eurasian watermilfoil potential growth based on lake sediment analyses for Comfort Lake. Key: green = light growth, yellow = moderate growth, and red = heavy growth.

# APPENDIX - A:

## Individual site data for plant delineation and assessments

**CLP Delineation: April 21, 2017: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Plant densities were rated on a scale from 1 to 4, with 4 the highest. However EWM stem collected on the rake were counted. EWM stem counts were then converted to densities where densities of 1 and 2 = 1-9 stems, density 3 = 9-18 stems, and density 4 = 18 stems or more. When stem counts were multiplied by 10 the result is stems/m<sup>2</sup>.**

Site	Depth (ft)	Cabbage	Coontail	CLP	EWM	EWM-stems	No Plants
157	4						
158	5				3	12	
159	5				3	10	
160	5						1
161	5				3	14	
162	5				4	18	
163	3				1	5	
164	3				4	20	
165	4				4	20	
166	2						
167	5				4	18	
168	5				3	16	
169	4				1	5	
170	5	1			3	10	
171	5				3	15	
172	5				1	8	
173	3				3	15	
174	4				3	12	
175	7						1
176	8						1
177	4						1
178	2				4	25	
179	4				1	8	
180	2				3	1	
181	4				1	14	
182	2				3	5	
183	5					12	
184	9						1
185	4						1
186	3				1	2	
187	4						1
188	2	1			1	2	
189	5				1	2	
190	2						1
191	4				1	7	
192	10						1
193	3				3	12	
194	3				1	5	
195	5				3	16	
196	9						1
197	3						1
198	4				3	12	
199	8						1
200	3						1
201	3	1			1	2	
202	3						1
203	9						1
204	3						1
205	3				1	5	
206	3				3	17	
207	3						1
208	6						1
209	3						1
210	4				1	14	
211	3				3	5	
212	3				3	2	
213	4						1
214	2				3	1	
215	5						1
216	11						1
217	4						1
218	3						1
219	5				1	2	
220	3				3	10	
221	2				3	9	
222	3				3	12	
223	4				1	3	
224	3						1

Site	Depth (ft)	Cabbage	Coontail	CLP	EWM	EWM-stems	No Plants
225	3						1
226	4	1			1	2	
227	6						1
228	4						1
229	7						1
230	4				1	5	
231	6		1				
232	4				3	13	
233	3						1
234	4						1
235	5		1				
236	6						1
237	3		2				
238	5						1
239	2				1	2	
240	4						1
241	3				1	2	
242	5						1
243	4		2		4	18	
244	4						1
245	4				1	8	
246	4						1
247	3				1	2	
248	12						1
249	2		3				
250	4						1
251	5				1	1	
252	3				1	8	
253	4				3	10	
254	4						1
255	3				1	1	
256	4		2				
257	3		2		3	11	
258	3						1
259	4						1
260	5				1	1	
261	12						1
262	5			1			
263	4				1	5	
264	3						1
265	3				1	5	
266	3		1		1	1	
267	12						1
268	10						1
269	4						1
270	11						1
271	13						1
272	3				1	2	
273	4						1
274	9						1
275	3		2				
276	4		2	1			
277	10						1
278	2		2				
279	9						1
280	4						1
281	3				1	5	
282	4				1	4	
283	4				1	2	
284	8						1
285	3						1
286	3				3	16	
287	4						1
288	6						1
289	3				1	7	
Average Occur		133	4	11	2	64	64
							58



# Comfort Lake CLP

April 21, 2017

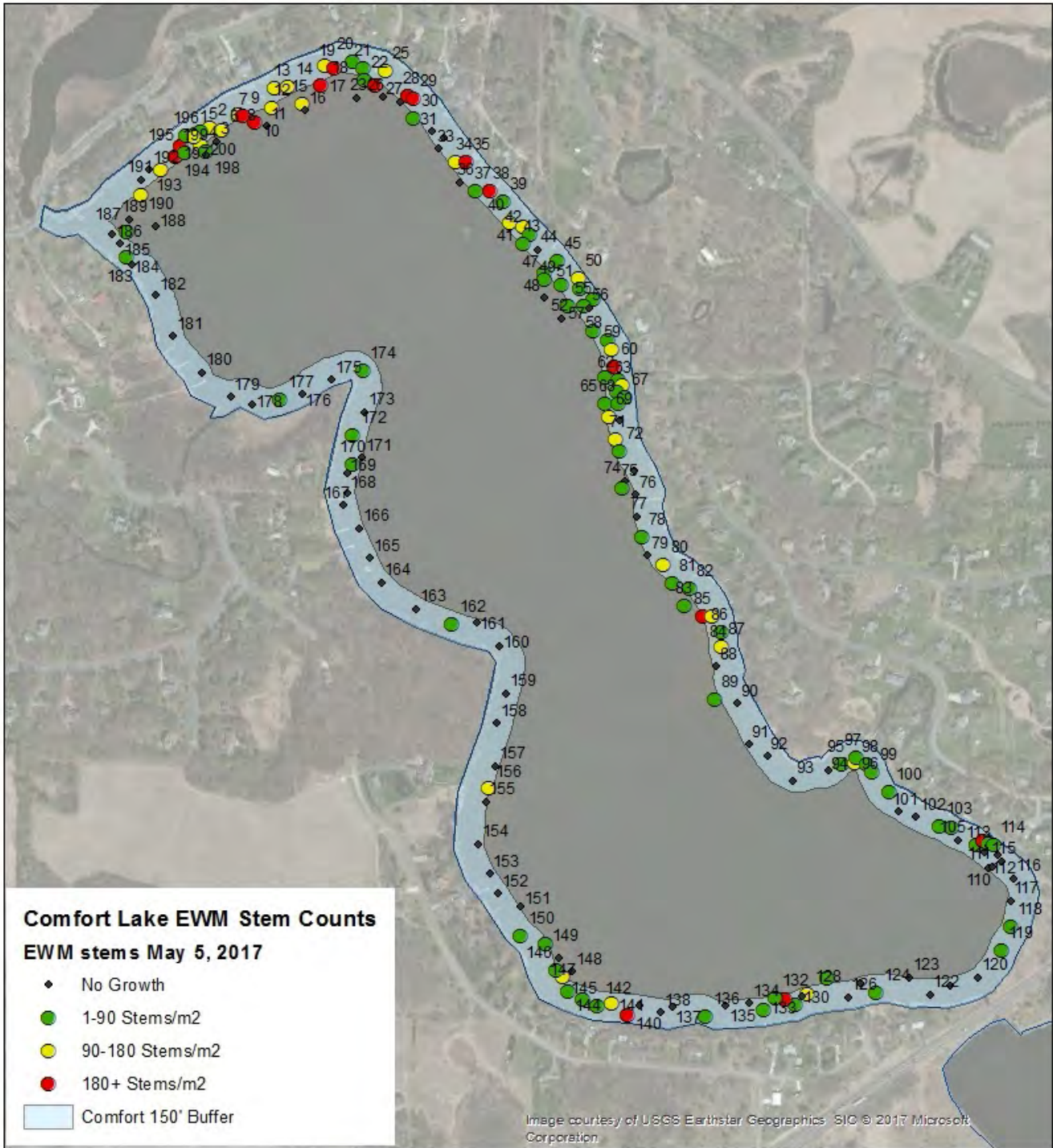


Comfort Lake ID  
13005300

UTM NAD 1983  
Blue Water Science  
Data Collected Sept. 14, 2016



# Comfort Lake EWM Stem Counts May 5, 2017



Comfort Lake ID  
13005300

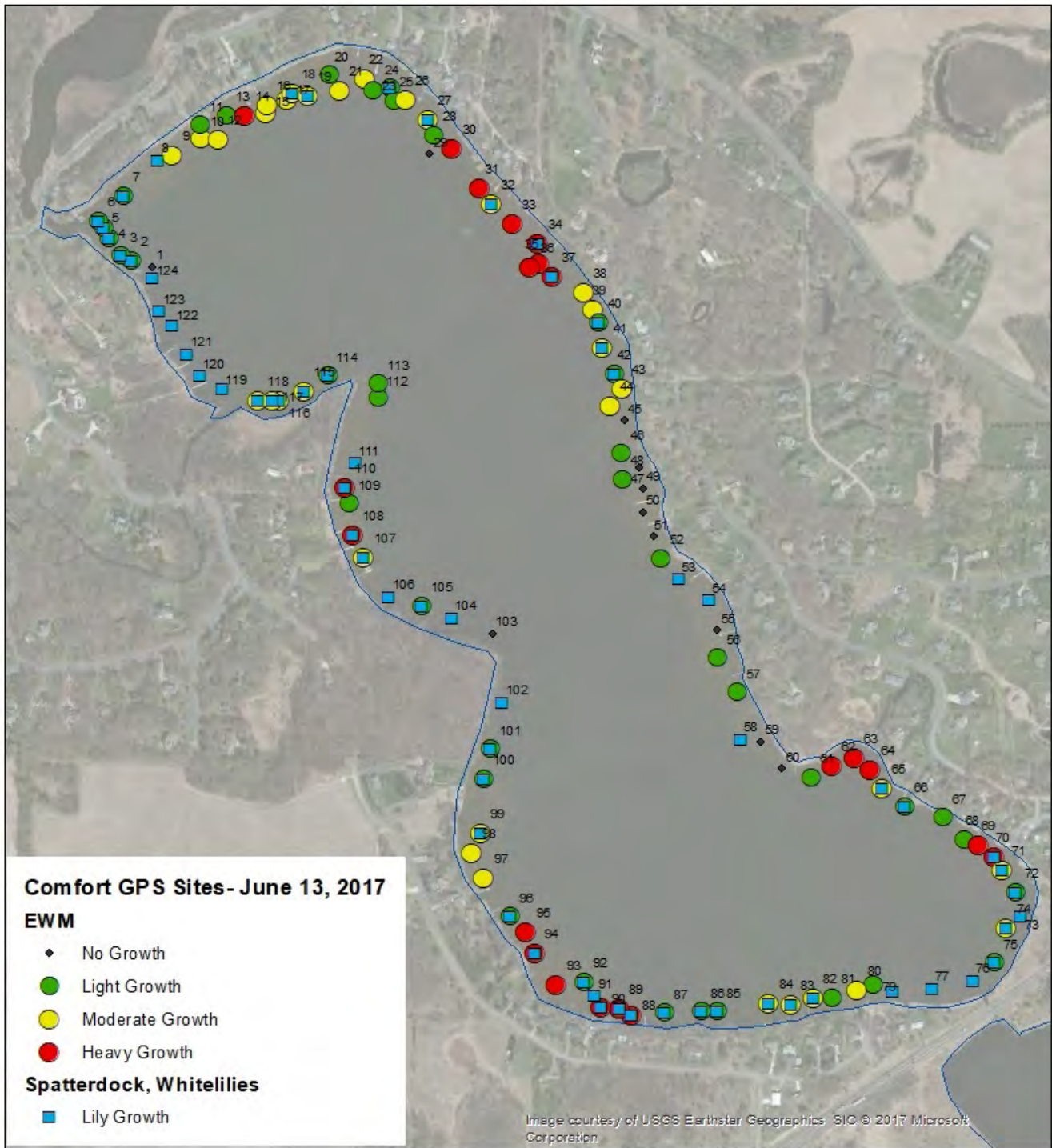
UTM NAD 1983  
Blue Water Science

**EWM Assessment: June 13, 2017: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

Site	Depth (ft)	Spatterdock	White lilies	Cabbage	Chara	Coon-tail	CLP	Elodea	EWM	Flat-stem	Stringy	No plants
1	9											1
2	4		2					1				
3	4		3					2				
4	4		2					2				
5	4	2						2				
6	4	2						2				
7	3	1				1		1		1		
8	3		1		1							
9	4							3				
10	5						1	3				
11	3			1			2	1	1		1	
12	5							3				
13	4							1				
14	5							4				
15	5							3				
16	5						1	3				
17	5							3				
18	5	2						3				
19	5	1						3				
20	4							2				
21	5			2				3				
22	5							3				
23	6							2				
24	4	2						2				
25	4							2				
26	4							3				
27	4	1						3				
28	4			1				2				
29	9										1	
30	4							4				
31	4							4				
32	4	1						3				
33	4							4				
34	3	2						4				
35	5							4				
36	5							4				
37	5	1						4				
38								3				
39								3				
40		1						2				
41	4	3						3				
42	4	3						2				
43	3							3				
44	5							3				
45	4										1	
46	4			2				2				
47	3			3				1				1
48	4											1
49	2											1
50	3											1
51	3			1								
52	3			2				1				
53	4	2										
54	3		1	1								
55	3											1
56	4			2				2				
57	4							1				
58	5		1									
59	4											1
60	7											1
61	4							1				
62	4							4				
63	4							4				
64	3							4				
65	4	1						3				
66	4	1						2				
67	4							2				
68	5							2				
69	3							4				
70	4	1						4				
71	4	1						3				
72	4	3				2	2	2		1		
73	4	4				1	1			2		
74	4	3					2	3				
75	4	2	2				1	1				
76	4	3				1	1			1		
77	4	3										
78	4	3				1						
79	4							2				
80	4							3				
81	4							1				
82	4	3						3				
83	4	3						3				
84	4	3						3				
85	4	1						1				
86	4	3						2				
87	3	2						2				
88	3		1					4				
89	4		2					4				
90	4		2					4				
91	4	4										
92	4	3						1				
93	4							4				

Site	Depth (ft)	Spatterdock	White lilies	Cabbage	Chara	Coon-tail	CLP	Elodea	EWM	Flat-stem	Stringy	No plants
94	3		1						4			
95	3								4			
96	3	1							1			
97	4								3			
98	4								3			
99	4	1							3			
100	4	2							2			
101	4	2							2			
102	4	2										
103	14											1
104	4	1	2			1						
105	4	2							2			
106	4	2										
107	3	2							3			
108	3	1	1						4			
109	4								2			
110	4	2	2						4			
111	6	1										1
112	6								1			
113	5								2			
114	4	2	2						1			
115	4	2	2						3			
116	4	3							3			
117	4	2	3						3			
118	4		2						3			
119	4	4				1	3					
120	4	3	3									
121	4	3						3				
122	4	3						3				
123	3		3			3	2					
124	4	3					1					
Ave		2	2	2	1	1	2	1	3	1	1	
Occur	124	54	20	9	1	8	13	1	94	3	2	11

# Comfort Lake EWM and Lily Growth June 13, 2017



Comfort Lake ID  
13005300

UTM NAD 1983  
Blue Water Science

**CLP Delineation: April 15, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake.**

Site	Depth (ft)	CLP - stems	EWM - stems	No Plants
135	4			0
136	5			0
137	3			0
138	7			0
139	6			0
140	10			0
141	10			0
142	14			0
143	3	1		
144	5			0
145	12			0
146	10			0
147	5		2	0
148	10			0
149	6			0
150	8			0
151	6			0
152	9			0
153	5			0
154	6			0
155	3			0
156	14			0
157	8			0
158	4			0
159	12			0
160	11			0
161	9			0
162	9			0
163	3			0
164	14			0
165	4			0
166	11			0
167	4			0
168	13			0
169	4			0

Site	Depth (ft)	CLP - stems	EWM - stems	No Plants
170	14			0
171	4			0
172	12			0
173	4			0
174	12			0
175	5			0
176	13			0
177	4			0
178	9			0
179	4			0
180	8			0
181	10			0
182	4			0
183	9			0
184	4			0
185	6		2	0
186	7			0
187	5			0
188	12			0
189	6			0
190	10			0
191	5		4	0
192	5		5	0
193	5			0
194	5			0
195	4			0
196	6			0
197	5		1	0
198	5		5	0
199	6		6	0
200	7			0
Average		1	4	0
Occurrence (66 sites)		1	7	64
% occur		2	11	97

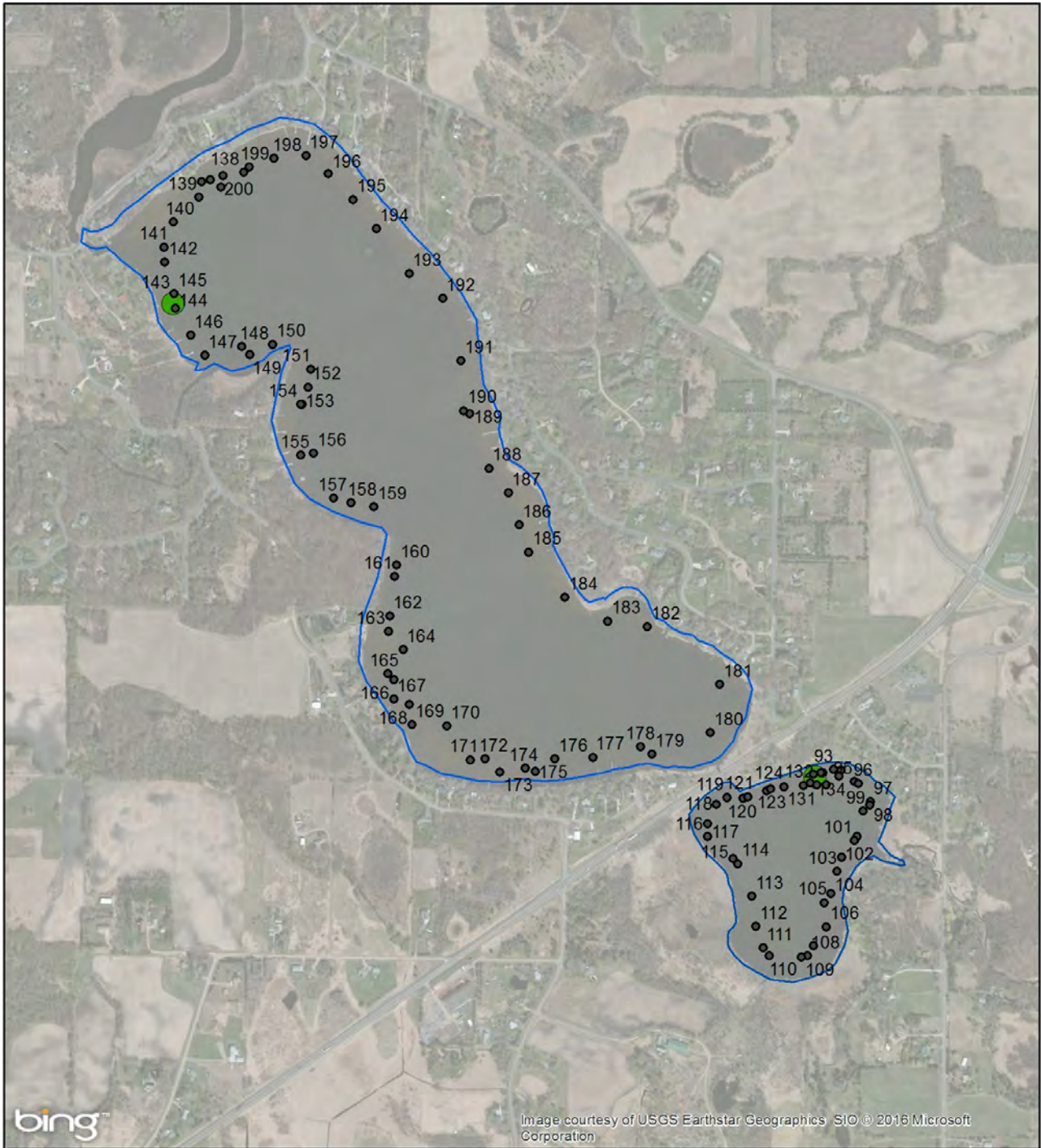
**CLP Delineation: April 15, 2016: Aquatic plant occurrences and densities based on rake sampling for Little Comfort Lake.**

Site	Depth (ft)	CLP - stems	No Plants
93	3		0
94	4		0
95	6		0
96	6		0
97	7		0
98	8		0
99	7		0
100	8		0
101	8		0
102	7		0
103	8		0
104	5		0
105	7		0
106	8		0
107	8		0
108	8		0
109	8		0
110	8		0
111	8		0
112	8		0
113	10		0
114	9		0
115	11		0

Site	Depth (ft)	CLP - stems	No Plants
116	5		0
117	6		0
118	6		0
119	6		0
120	6		0
121	9		0
122	9		0
123	8		0
124	5		0
125	3		0
126	3	2	
127	3		0
128	3		0
129	2		0
130	3		0
131	8		0
132	7		0
133	7		0
134	4		0
Average		2	0
Occurrence (42 sites)		1	41
% occur		2	98

# Comfort Lake CLP Delineation Points

April 15, 2016



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**EWM Delineation: May 6, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

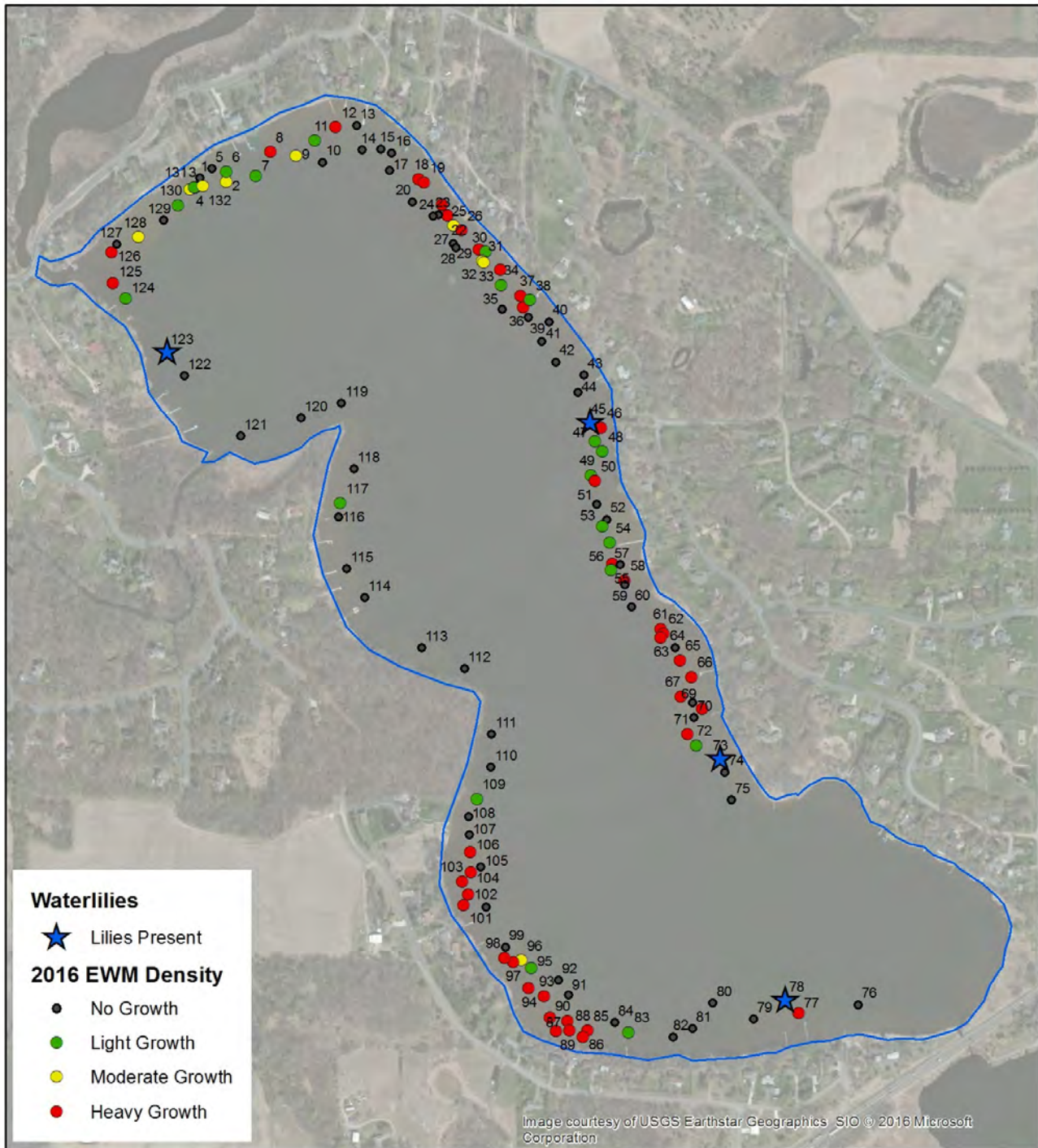
Site	Depth (ft)	EWM-stems	EWM-length (in)	EWM-density	Treat (T)	Patch (P)	Water lilies	Cabbage	Coontail
1	5								
2	5	3		3					
3	4	2	5	1					
4	4	3	6	3					
5	4	0							
6	4	2	24	1					
7	7	1	6	1					
8	4	10	12	4					
9	6	3	6	3					
10	11	0							
11	4	2	6	1					
12	4	8	20	4	T				
13	4	0						1	
14	6	0							
15	4	0							
16	4	0							
17	9	0							
18	4	4	12	4	T				
19	4	4	10	4	T				
20	10	0							
21	4	10	15	4	T				
22	4	4	10	4					
23	4	0							
24	6	0							
25	4	3	8	3					
26	4	20	10	4	T				
27	7	0							
28	8	0							
29	4	10	10	4	T				
30	3	1	6	1					
31	4	3	8	3					
32	4	3	8	3					
33	4	15	8	4	T				
34	4	1		1					
35	6	0							
36	4	6		4	T				
37	4	8		4	T				
38	3	1		1					
39	4	0						1	
40	4	0						1	
41	4	0							
42	7	0							
43	4	0							
44	9	0							
45	4	0					1		
46	4	20		4	T				
47	4	2	6	1					
48	3	2		1					
49	4	2		1					
50	4	20		4	P				
51	5	0							
52	3	0							
53	4	1		1					
54	3	1		1					
55	4	20	20	4	P				
56	5	2	6	1					
57	3	0		0					
58	5	10	20	4	P				
59	8	0							
60	13	0							
61	4	8		4	P				
62	5	10		4	T				
63	4	10		4	T				
64	3	0							
65	4	15	20	4	T				
66	3	12	10	4	T				
67	3	15		4	T				
68	4	0							
69	4	5	8	4					
70	4	0							



**EWM Delineation: May 6, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

Site	Depth (ft)	EWM-stems	EWM-length (in)	EWM-density	Treat (T)	Patch (P)	Water lilies	Cabbage	Coontail
71	4	8	8	4	T				
72	4	1	8	1					
73	3	0					1		
74	5	0							
75	12	0							
76	5	0							
77	4	6	10	4	P				
78	4	0					1		
79	4	0							
80	15	0							
81	11	0							
82	4	0							
83	4	1	6	1					
84	11	0							
85	4	20	20	4	T				
86	4	20+		4	T				
87	4	20+		4	T				
88	4	20+		4	T				
89	4	20+		4	T				
90	4	20+		4	T				
91	4	0							
92	5	0							
93	3	20+		4	T				
94	4	20+		4	T				
95	4	1		1					
96	4	3		3					
97	4	6		4	T				
98	6	12		4	T				
99	5	0							
100	10	0							
101	3	20		4	T				
102	4	20+		4	T				
103	4	20+		4	T				
104	4	6		4					
105	4	0							
106	3	20		4	T				
107	4	0							
108	4	0							
109	4	1		1					
110	11	0							
111	4	0							
112	7	0							
113	3	0							
114	10	0							
115	4	0							
116	5	0							
117	4	1		1	P				
118	4	0							
119	14	0							
120	7	0							
121	2	0							1
122	12	0							
123	5	0					1		
124	4	1		1				1	
125	4	6		4					
126	3	12		4	P				
127	4	0							
128	4	3		3	P				
129	3	0							
130	3	2		1	P				
131	3	2		1	T				
132	4	3		3					
Average		3	11	3			1	1	1
Occurrence (132 sites)		122	31	72			4	4	1
% occurrence		92	23	55			3	3	1

# Comfort Lake EWM Delineation Points May 6, 2016



UTM NAD 1983  
Blue Water Science

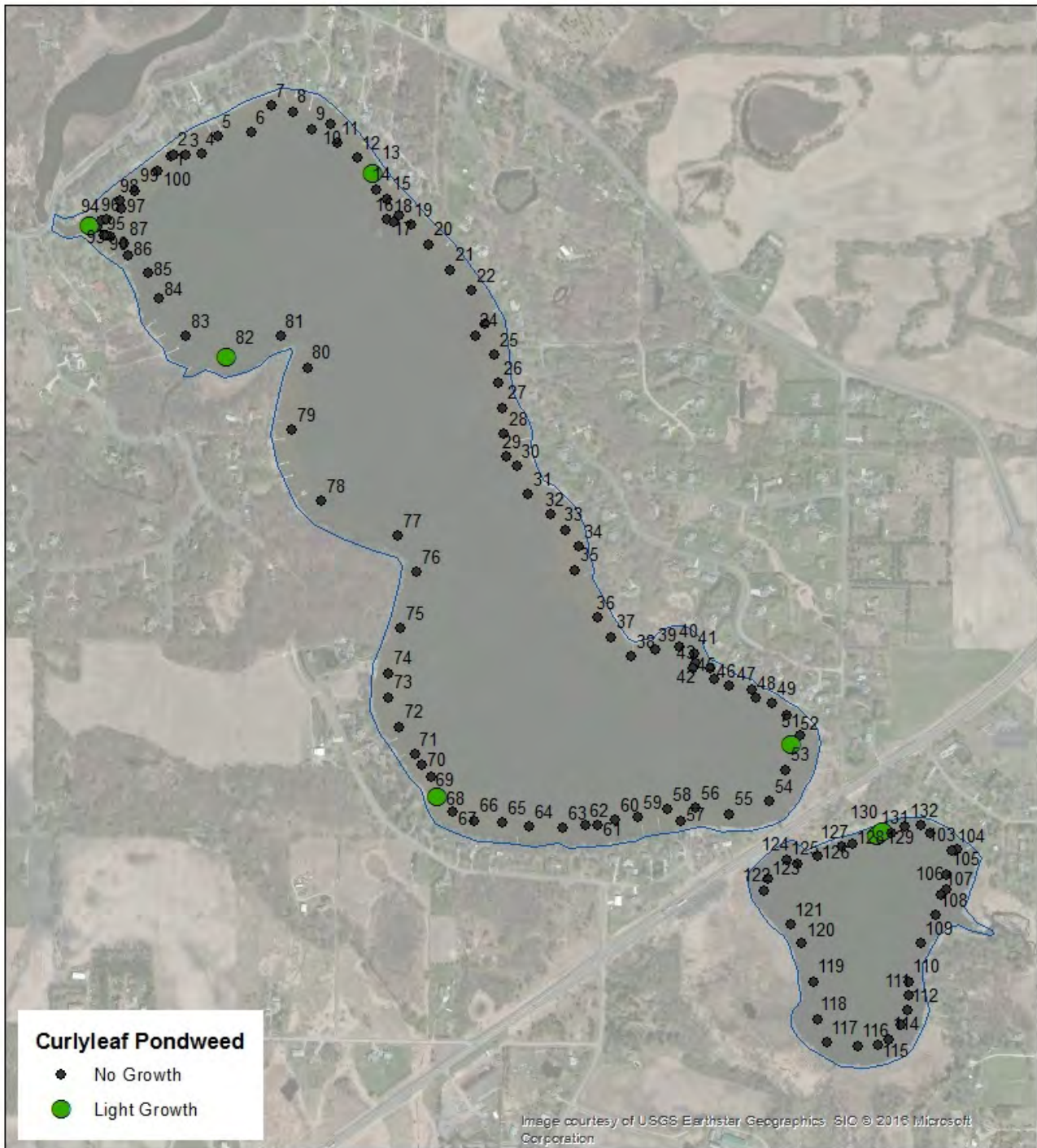
**CLP Assessment: June 14, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

Site	Depth (ft)	CLP	CLP-dead	EWM	EWM-stems	EWM-dead	Spatter-dock	White lilies	Cabbage	Coontail	NWM	Stringy	No Plants	Within 50 ft of lilies
1	4			1	1								1	
2	4			2	6									
3	4													
4	5			1	3									
5	3			1	1								1	
6	5			1	4									
7	2			1	3									
8	4									1				
9	5												1	
10	3												1	
11	5												1	
12	4			1	4									Y
13	4	1											1	
14	4												1	
15	4												1	Y
16	12												1	
17	4												1	Y
18	8												1	
19	4												1	Y
20	4			1	1									Y
21	4												1	Y
22	4												1	Y
23	5												1	Y
24	12												1	
25	3												1	
26	3												1	Y
27	3												1	
28	3								1					
29	4												1	
30	3								1					
31	8												1	Y
32	3												1	Y
33	3								1					
34	3												1	
35	3												1	
36	3												1	Y
37	2												1	
38	10												1	
39	5											1		Y
40	3												1	
41	3			2	6		Y	Y						
42	6												1	
43	10												1	
44	4								2	2				
45	12												1	
46	12						Y	Y					1	
47	4												1	
48	9												1	
49	6			1	1					1				
50	3						Y	Y		2				
51	3						Y	Y		3				
52	6	1								1				
53	5						Y	Y		2				
54	5						Y	Y					1	
55	2						Y	Y						
56	4												1	
57	2					2							1	
58	5						1	1	1					
59	3						2	2						
60	4						2	2						
61	4						Y	Y					1	
62	8												1	
63	4						1	1						
64	4						Y	Y					1	
65	3					1	3	3						
66	3						2	2					1	
67	3									1				
68	3	1												
69	3		2											
70	4			1	1									
71	8												1	
72	4			1	1		3	3						
73	3		2											

**CLP Assessment: June 14, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

Site	Depth (ft)	CLP	CLP-dead	EWM	EWM-stems	EWM-dead	Spatter-dock	White lilies	Cabbage	Coontail	NWM	Stringy	No Plants	Within 50 ft of lilies
74	4						2	2						
75	6												1	
76	11												1	
77	15						Y	Y					1	
78	12												1	
79	4					1	2							
80	4												1	
81	6						Y						1	
82	4	1		1						3				
83	12												1	
84	5													
85	10												1	
86	6							1						
87	4			2										
88	4			1										
89	3												1	
90	4										1			
91	3							3						
92	3			1							1			
93	3			1							1			
94	3	1					2			2				
95	3						3			2				
96	3			1			2				1			
97	3						2				1			
98	2												1	
99	2			1							1			
100	2										1			
101	3									2				
102	4							1		2				
103	5									2				
104	6									2				
105	7									1				
106	6									1				
107	6									1				
108	6									1				
109	7									1				
110	3									4				
111	4									2				
112	6							2		2				
113	6									2				
114	5									2				
115	6									2				
116	6									2				
117	4							1		3				
118	5									3				
119	5									2				
120	5									2				
121	6									1				
122	5							1		1				
123	5									3				
124	5						1	1		2				
125	5									3				
126	6									2				
127	5									2				
128	5												1	
129	3	2						2		2				
130	3	1						2		3				
131	3									2				
132	3							2		3				
Average		1		1	3		2	2	1	2	1	1		
Occur (132 sites)		7		19	12		14	18	5	42	7	1	53	

# Comfort Lake Curlyleaf Pondweed Assessment June 14, 2016



Comfort Lake ID  
13005300

UTM NAD 1983  
Blue Water Science  
Data Collected Sept. 14, 2016

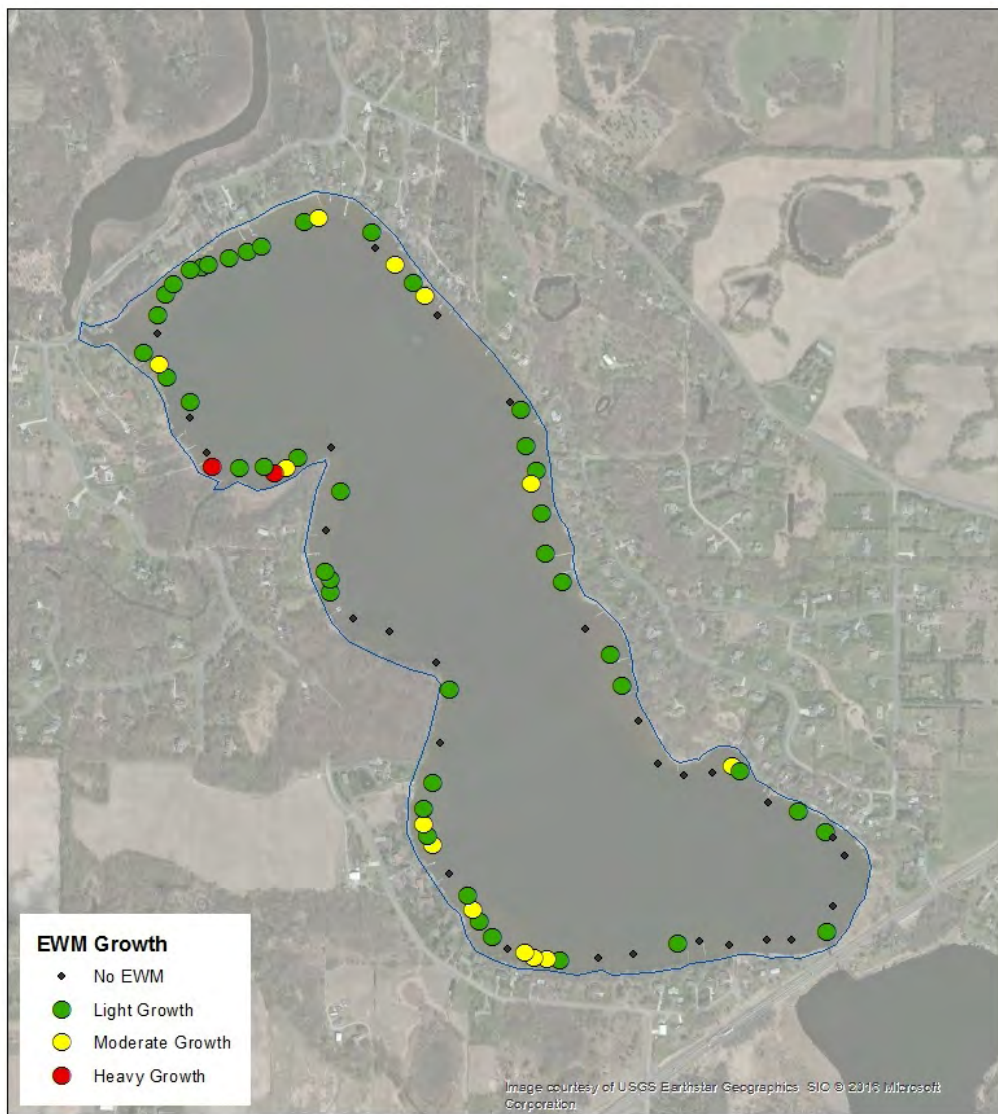
**EWM Assessment: September 14, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

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

**EWM Assessment: September 14, 2016: Aquatic plant occurrences and densities based on rake sampling for Comfort Lake. Densities are based on a scale of 1 to 4 with '1' being light and '4' representing heavy growth.**

Site	Depth (ft)	EWM	EWM-stems	Spatterdock	White lilies	Cabbage	Coontail	No Plants
75	4	1						
76	2	4			3			
77	5							
78	6							
79	5	1						
80	5	1						
81	4	3			2			
82	4	1			3			
83	5			2	3			
84	4	1		2	3			
85	3	1						
86	3	1						
87	2	1						
Average		2	4	2	3	1	2	
Occurrence (87 sites)		58	6	8	7	1	4	12

**Comfort Lake EWM  
September 14, 2016**

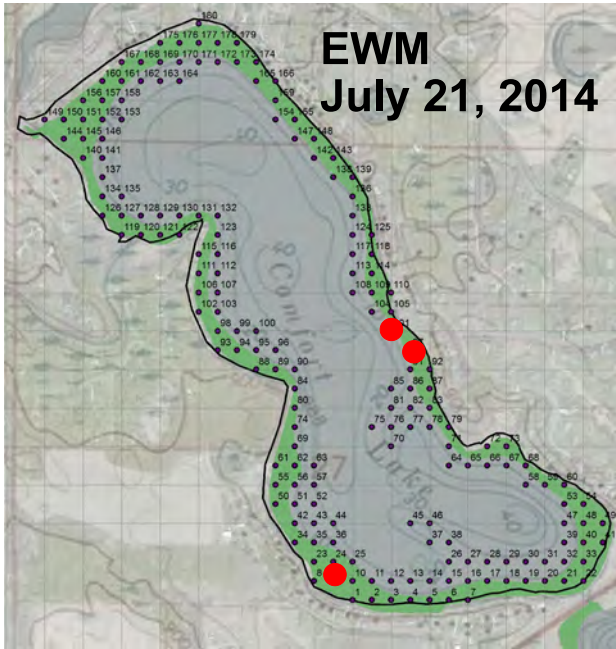


Comfort Lake ID  
13005300

UTM NAD 1983  
Blue Water Science  
Data Collected Sept. 14, 2016

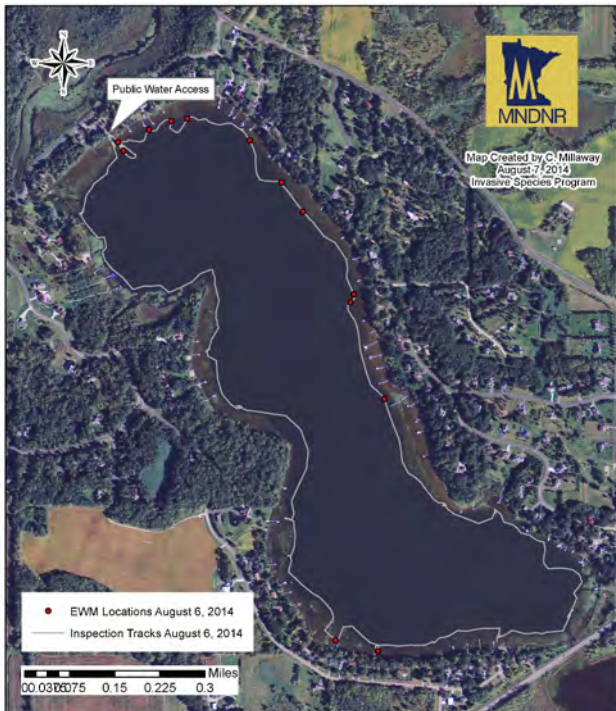
# APPENDIX B

## Background on the Eurasian Watermilfoil Discovery in Comfort Lake in 2014



During the point-intercept survey on July 21, 2014, Eurasian watermilfoil (EWM) was identified at three sites (Figure 7a). EWM was verified by the MnDNR on August 6, 2014 at 13 sites (Figure 7b). Due to the lateness of the season, only the EWM area at the public access was treated (Figure 7c). EWM will be monitored in the next few years to characterize distribution and abundance.

**EWM locations (red dots) on the July 21, 2014 point-intercept survey.**



Comfort Lake, Chisago County (13005300)  
Eurasian watermilfoil Inspection: August 6, 2014  
Invasive Species Program

**EWM delineation by MnDNR.**



**EWM treatment area in front of the public access.**