



Egrets and Heron Roosting in Trees on April 14, 2017 on Prior Lake

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## **Curlyleaf Pondweed Delineation and Assessment Surveys for Upper and Lower Prior Lake, Scott County, 2017**

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Curlyleaf Pondweed Delineation: April 14, 2017  
Herbicide Treatment: May 2, 2017 (2.55 ac, Diquat)  
Curlyleaf Pondweed Assessment Date: June 16, 2017

**Prepared for:**  
**Prior Lake/Spring Lake  
Watershed District  
Prior Lake, Minnesota**



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**February 2018**

# **Curlyleaf Pondweed Delineation and Assessment Surveys for Upper and Lower Prior Lake, Scott County, 2017**

## *Summary*

Curlyleaf pondweed (CLP) distribution and abundance were delineated on April 14, 2017. Based on the curlyleaf pondweed densities on both Upper and Lower Prior, several areas were delineated as having the potential for heavy curlyleaf growth by June (Figure S1).

Curlyleaf density was mostly light in April but there was the potential for heavy curlyleaf growth in some areas and 3.89 acres were delineated for a herbicide treatment.

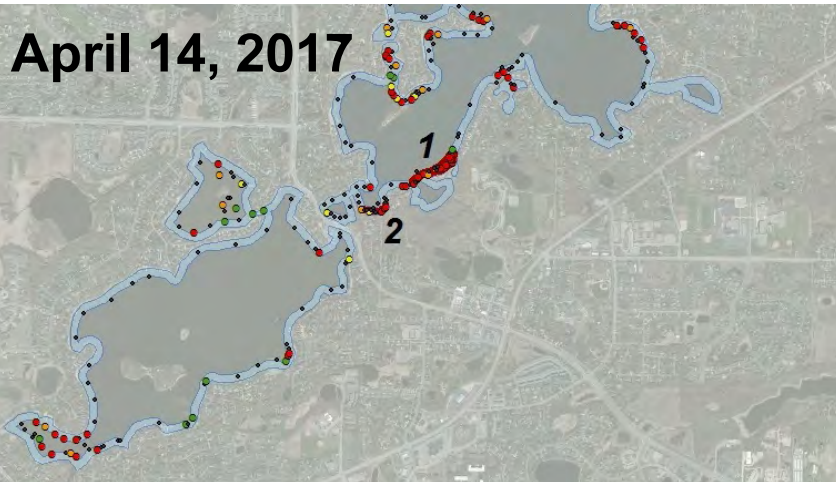
The curlyleaf pondweed treatment was conducted on May 2, 2017 using diquat and a total of 2.55 acres were treated in Lower Prior (Figure S3). PLM conducted the treatment.

A follow-up curlyleaf assessment was conducted on June 16, 2017. The June 16 curlyleaf assessment found, in the treated areas, the distribution and abundance of CLP was mostly controlled (Figure S4).



**Figure S1. Curlyleaf pondweed was sampled in Prior Lake on April 14, 2017. Here curlyleaf pondweed growth was light and with several curlyleaf stems on the rake.**

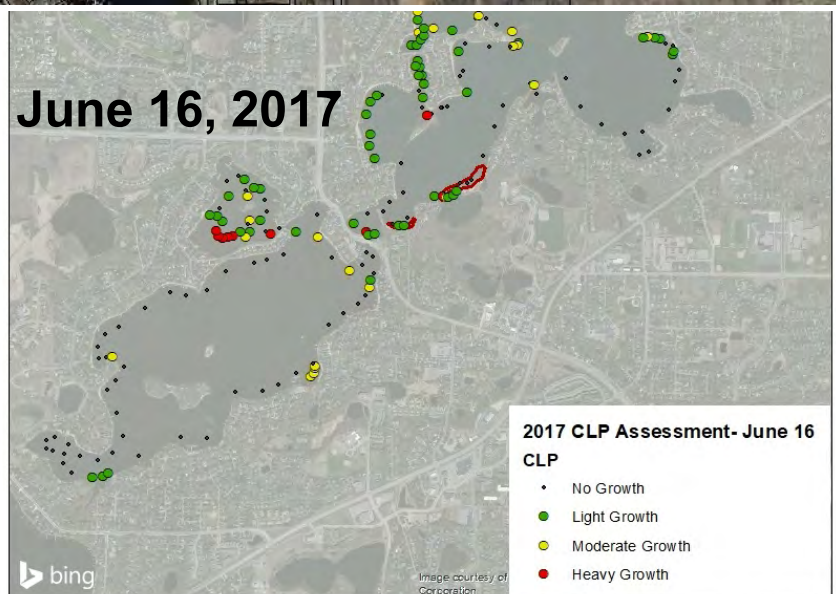




**Figure S2. DELINEATION:** Map of curlyleaf pondweed delineation sites for April 14, 2017 totaling about 3.89 acres (areas 1 and 2). The treatment area was later defined as 2.55 acres within area 1.  
Key: Green dots = light growth, yellow dots = moderate growth, and red dots = heavy growth. Blue shading = 150 foot contour around the lake.



**Figure S3. TREATMENT:** Lower Prior Lake curlyleaf pondweed was treated on May 22, 2017 in the green area totaling 2.55 acres using diquat.



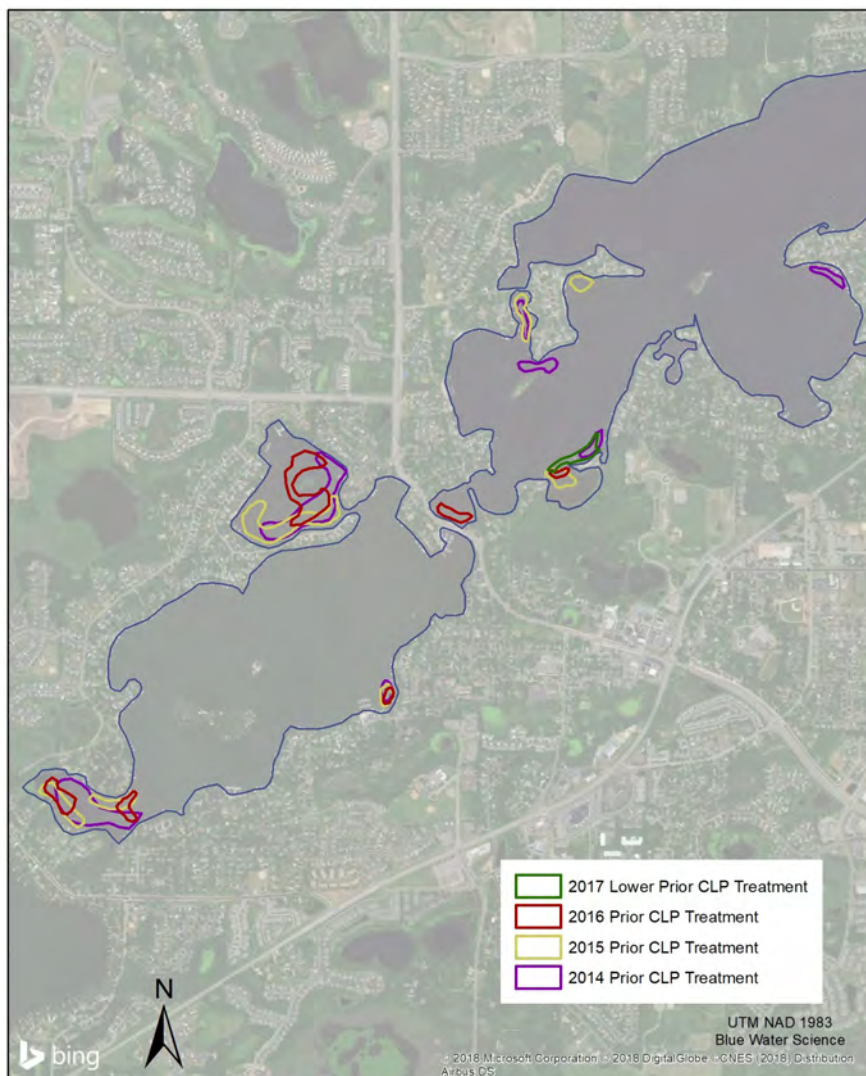
**Figure S4. ASSESSMENT:** Map of curlyleaf pondweed assessment sites for June 16, 2017. Colored dots indicate the growth of curlyleaf pondweed in June, 2017. Key: Green = light growth, yellow = moderate growth and red = heavy growth. Black = no CLP.

## Summary (concluded)

**Curlyleaf Planning for 2018:** Treating heavy growth of curlyleaf pondweed based on early season curlyleaf distribution is a challenge. Curlyleaf in April and May has just started to go into a rapid growth phase. However, not all early season curlyleaf growth will result in heavy curlyleaf growth in late May and June. It appears there are factors that limit curlyleaf growth and significant variables are associated with sediment conditions. The question is how to best delineate areas to treat what could be heavy growth in June but not overtreat areas where growth wouldn't be a nuisance for the season.

Currently, for Upper and Lower Prior Lake, the method has been to use past CLP growth history (Figure S5) combined with early season scouting. Then if curlyleaf growth has indications of producing potential heavy growth, those areas are delineated and treatment is considered. That is the approach to be considered for 2018.

Prior Lake Curlyleaf Pondweed Hot Spots 2014 - 2017



**Figure S5. Prior Lake hot spot map for curlyleaf pondweed treatment areas from 2014-2017.**



# Curlyleaf Pondweed Delineation and Assessment Surveys for Upper and Lower Prior Lake, Scott County, 2017

## Introduction

Upper and Lower Prior Lakes combined have an area of 1,343 acres with a total littoral area of 732 acres (MnDNR). An initial curlyleaf pondweed delineation was conducted on April 14, 2017. Curlyleaf was treated on May 2, 2017 and a follow-up curlyleaf pondweed assessment was conducted on June 16, 2017 to characterize the status of curlyleaf pondweed at it's peak growing period. Sample sites in the delineation survey are shown in Figure 1. Sample sites were selected based on areas where curlyleaf had been found over the years. A chart showing examples of curlyleaf growth conditions at peak biomass in June are shown on the next page.

Prior Lake Curlyleaf Pondweed Delineation and Treatment  
April 14, 2017

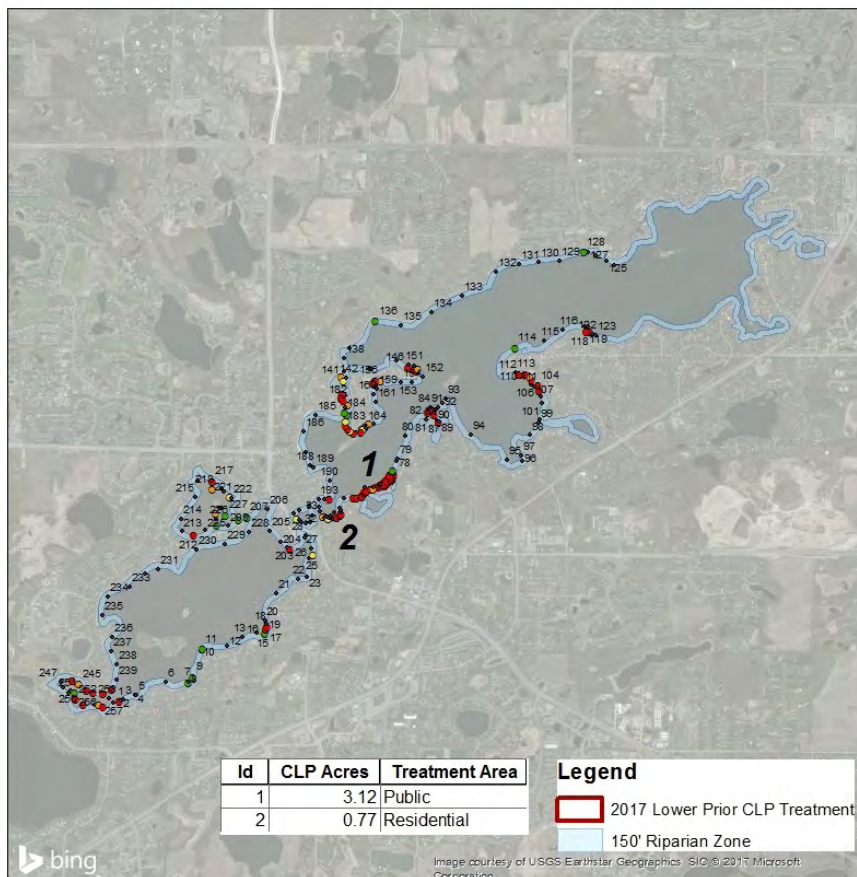


Figure 1. Sites of curlyleaf sampling for a delineation on April 14, 2017.

**Methods:** Curlyleaf pondweed densities in June are represented on a scale of 1 to 4 with 4 being densest.

## Curlyleaf Pondweed Growth Characteristics

(source: Steve McComas, Blue Water Science)

### Light Growth Conditions

Plants rarely reach the surface.

Navigation and recreational activities are not generally hindered.

Stem density: 0 - 160 stems/m<sup>2</sup>  
Biomass: 0 - 50 g-dry wt/m<sup>2</sup>  
Estimated TP loading: <1.7 lbs/ac

*MnDNR rake sample density equivalent for light growth conditions: 1 or 2.*



### Moderate Growth Conditions

Broken surface canopy conditions.

Navigation and recreational activities may be hindered.

Lake users may opt for control.

Stem density: 100 - 280 stems/m<sup>2</sup>  
Biomass: 50 - 100 g-dry wt/m<sup>2</sup>  
Estimated TP loading: 2.2 - 3.8 lbs/ac



*MnDNR rake sample density equivalent for moderate growth conditions: 2 or 3 or sometimes, 4.*

### Heavy Growth Conditions

Solid or near solid surface canopy conditions.

Navigation and recreational activities are severely limited.

Control is necessary for navigation and/or recreation.

Stem density: 280+ stems/m<sup>2</sup>  
Biomass: >100 g-dry wt/m<sup>2</sup>  
Estimated TP loading: >6.7 lbs/ac

*MnDNR rake sample density = 4.*



## Curlyleaf Pondweed Delineation on April 14, 2017 and Assessment on June 16, 2017 in Upper and Lower Prior Lake

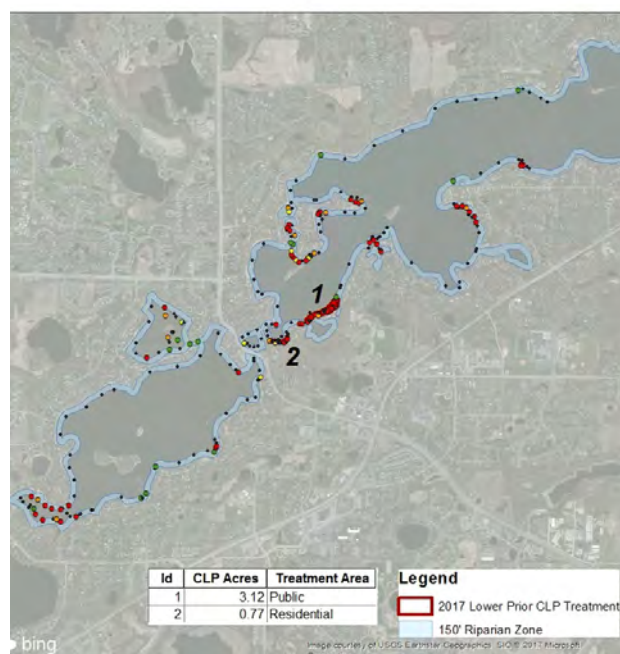
A delineation survey on April 14, 2017, sampled a total of 258 sample sites around Upper and Lower Prior Lake with rake sampling. Curlyleaf was found at low to moderate densities at 95 out of 258 sample sites. A total of 3.89 acres of curlyleaf growth in Lower Prior Lake areas were delineated as having the potential to develop moderate to heavy growth conditions by June (Figure 2).

A treatment area of 2.55 acres in Lower Prior was permitted for treatment based on criteria where treatment was either 150 feet or more from shore or treatment was in front of public property. The herbicide diquat was used for curlyleaf control.

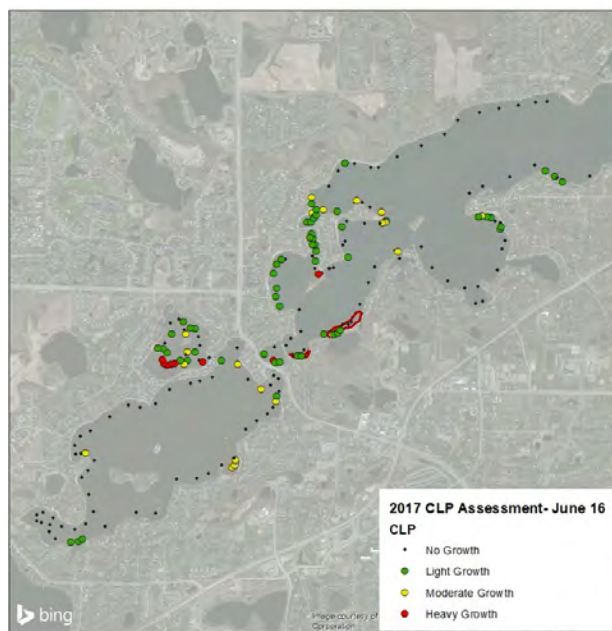
On June 16, 2017, a curlyleaf assessment was conducted. A total of 208 sites were sampled (Figure 2). Details for Lower and Upper Prior Lake are shown in Figures 3 and 4.

Individual sample site results are found in Appendix A.

Prior Lake Curlyleaf Pondweed Delineation and Treatment  
April 14, 2017



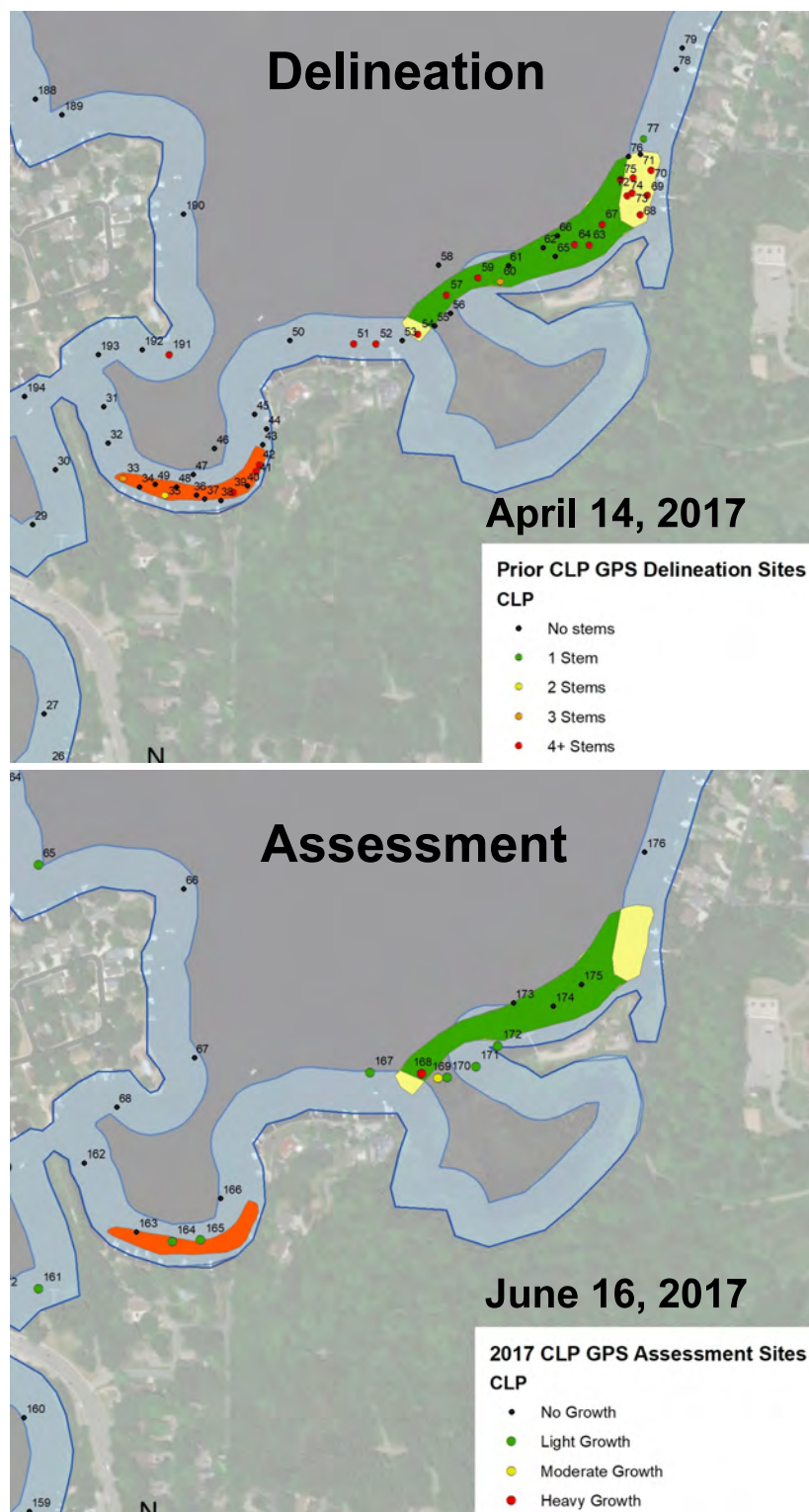
Prior Lake Curlyleaf Pondweed Assessment June 16, 2017



**Figure 2. Map of curlyleaf pondweed delineation is shown on the left (April 14, 2017) and the curlyleaf assessment is shown on the right (June 16, 2017).**



## Lower Prior Curlyleaf Pondweed Delineation and Assessment



Based on the delineation on April 14, 2017, a 2.55 acre area was treated with diquat on May 2, 2017 (green shading).

In the April delineation, native plants were generally not sprouted (Table 1).

Six weeks after treatment the treated area was assessed.

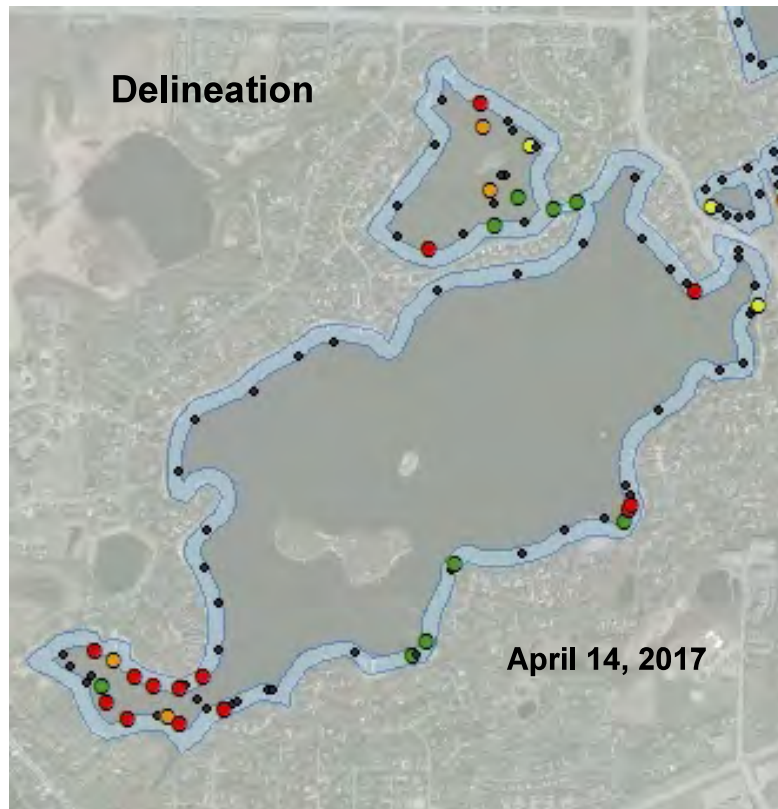
**Table 1. Treatment Area (2.55 ac)(green shading)**

Delineation (April 14, 2017)				Assessment (June 16, 2017)			
Site	Depth (ft)	CLP stems	Water Star- grass	Sites	Depth (ft)	CLP	Coon- tail
55	4			168	5	4	1
56	4			173	14		
57	5	5		174	12		
58	14			175	12		
59	6	5	3				
60	5	3					
61	12						
62	14						
63	10	17					
64	12	8					
65	12						
66	13						
67	7	15					
72	9	6					

**Figure 3. [top] CLP delineation and recommended treatment areas totaling 3.89 acres but 2.55 acres were treated which were funded by the PLSLWD. The 2.55 acre treatment area is shown with green shading. [bottom] CLP assessment map for June 16, 2017. The 2.55 acre treatment area is shown with green shading.**

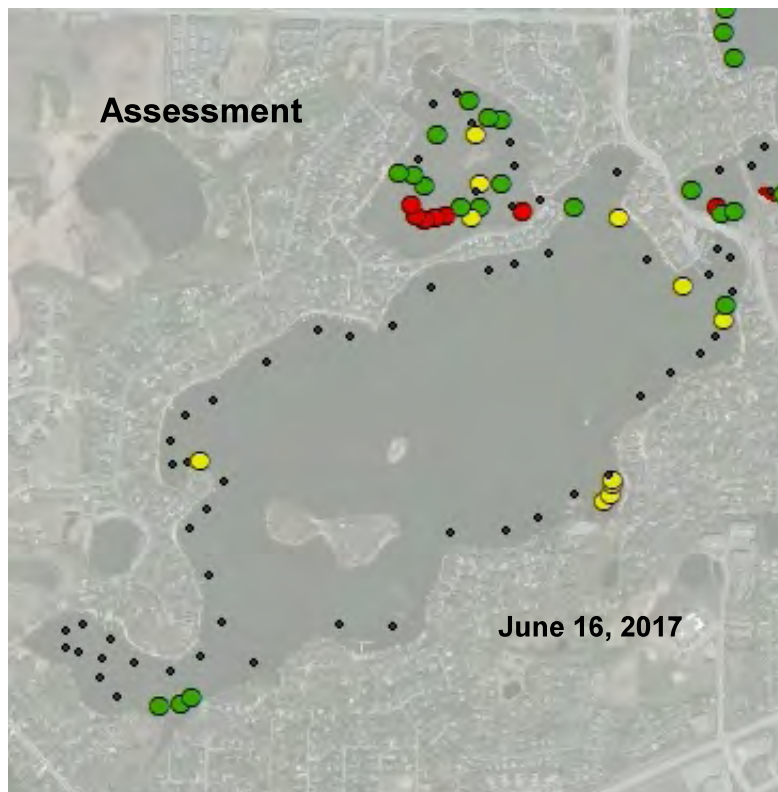


## Upper Prior Curlyleaf Pondweed Delineation and Assessment



**Curlyleaf pondweed in Upper Prior on April 14, 2017.**

Curlyleaf pondweed was not treated in Upper Prior Lake in 2017, but delineation and assessment surveys were conducted. The April 14, 2017 delineation found several areas (marked with red dots) in Upper Prior that would have been marked for treatment (Figure 4). About 4 weeks later, on June 16, another CLP check was conducted. Mud Bay (upper bay) had areas of heavy CLP growth and a small bay on the southeast side had moderate CLP growth. Somewhat surprising, the south west bay had only light CLP growth although the April 14 delineation predicted heavy June growth.



**Figure 4. [top] Upper Prior, April 14, 2017. Red dots indicate the potential for future heavy growth. [bottom] Upper Prior, June 16, 2017. CLP key: green dots - light growth, yellow dots = moderate growth, and red dots = heavy growth.**



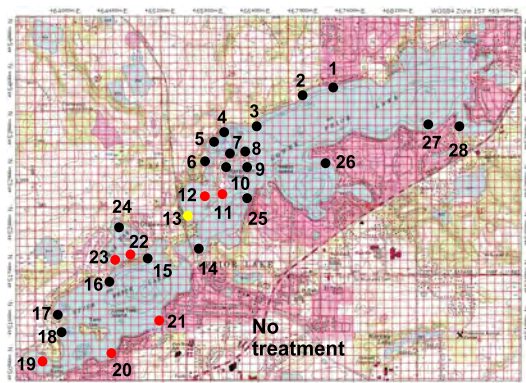
## June 16, 2017 Representative Curlyleaf Conditions



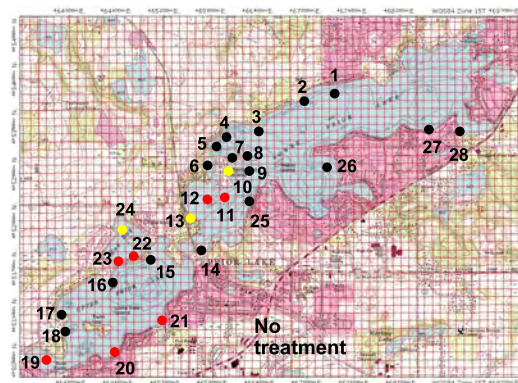
Figure 5. Curlyleaf growth in Prior Lake.



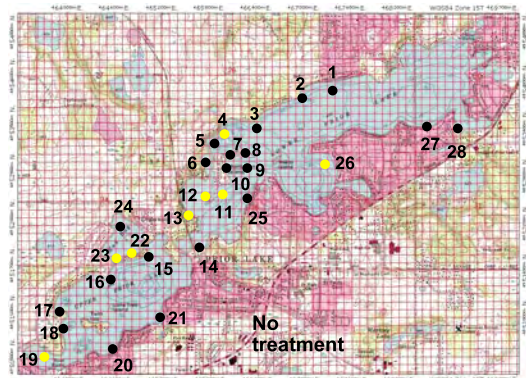
## Previous Herbicide Treatments from 2009 - 2017



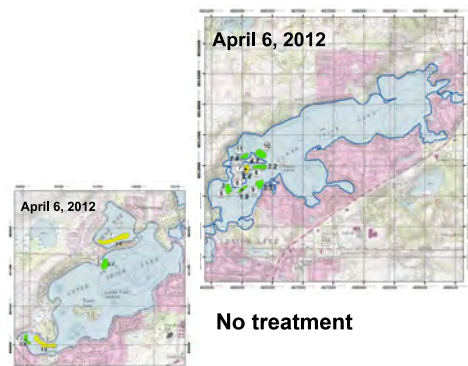
May 5, 2009



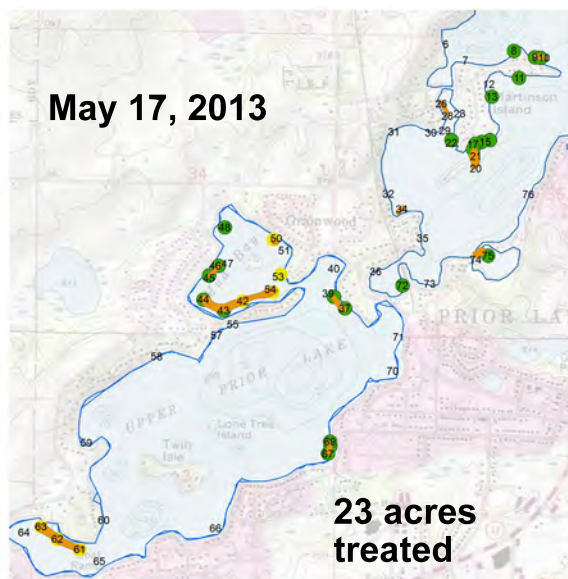
April 27, 2010



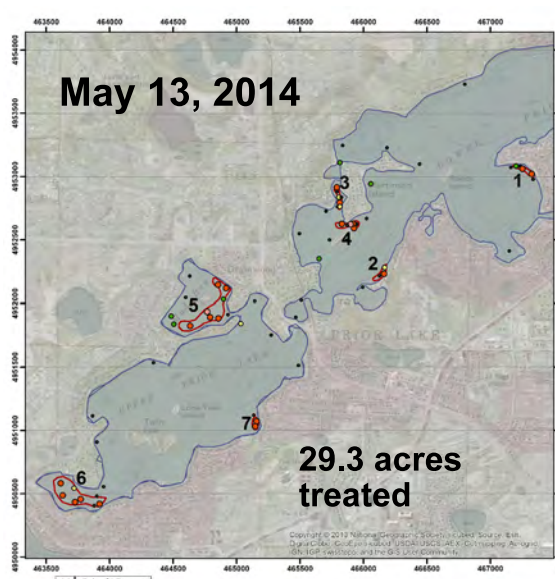
May 10, 2011



April 6, 2012

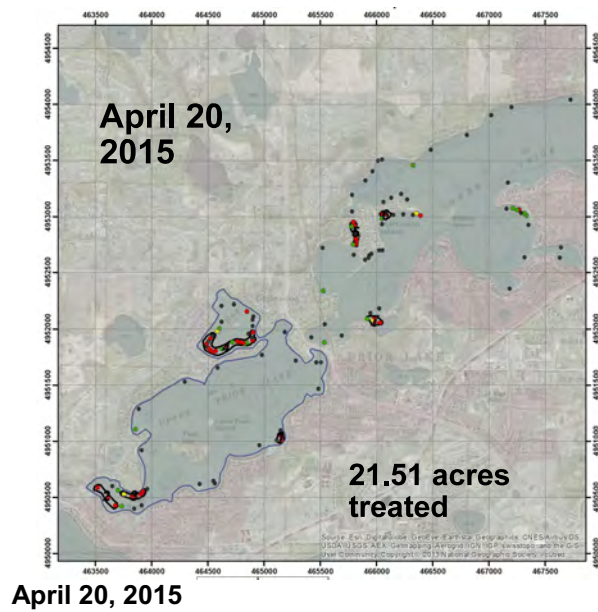


May 17, 2013

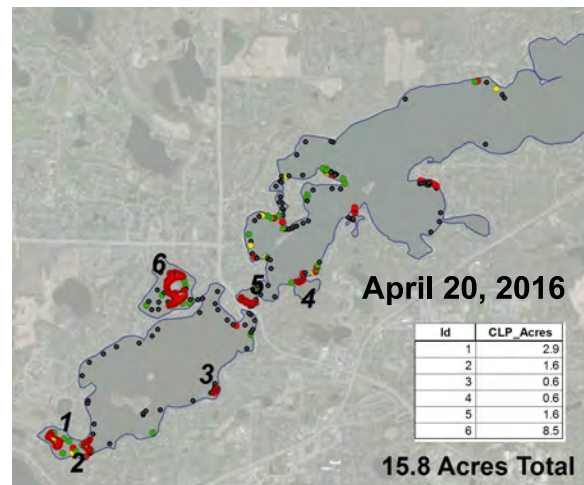
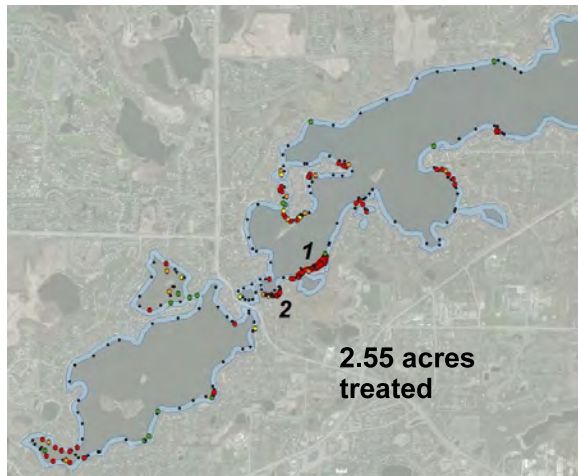


May 13, 2014

Figure 6. Previous herbicide applications locations from 2009 to 2017 on Upper and Lower Prior Lakes.



April 20, 2015



April 20, 2016

**Table 2. Treatment summary from 2009-2017.**

Year	Treatment
2009	No treatment
2010	No treatment
2011	No treatment
2012	No treatment
2013	23 acres
2014	29.3 acres
2015	21.5 acres
2016	15.8 acres
2017	2.55 acres

**Figure 6. Previous herbicide applications locations from 2009 to 2017 on Upper and Lower Prior Lakes.**



**Curlyleaf Planning for 2018:** Treating heavy growth of curlyleaf pondweed based on early season curlyleaf distribution is a challenge. Curlyleaf in April and May has just started to go into a rapid growth phase. However, not all early season curlyleaf growth will result in heavy curlyleaf growth in late May and June. It appears there are factors that limit curlyleaf growth and significant variables are associated with sediment conditions. The question is how to best delineate areas to treat what could be heavy growth in June but not overtreat areas where growth wouldn't be a nuisance for the season.

Currently, for Upper and Lower Prior Lake, the method has been to use past CLP growth history combined with early season scouting. Then if curlyleaf growth has indications of producing potential heavy growth, those areas are delineated and treatment is considered. That is the approach to be considered for 2018.



**Example of moderate growth of curlyleaf pondweed in Prior Lake on June 5, 2014.**



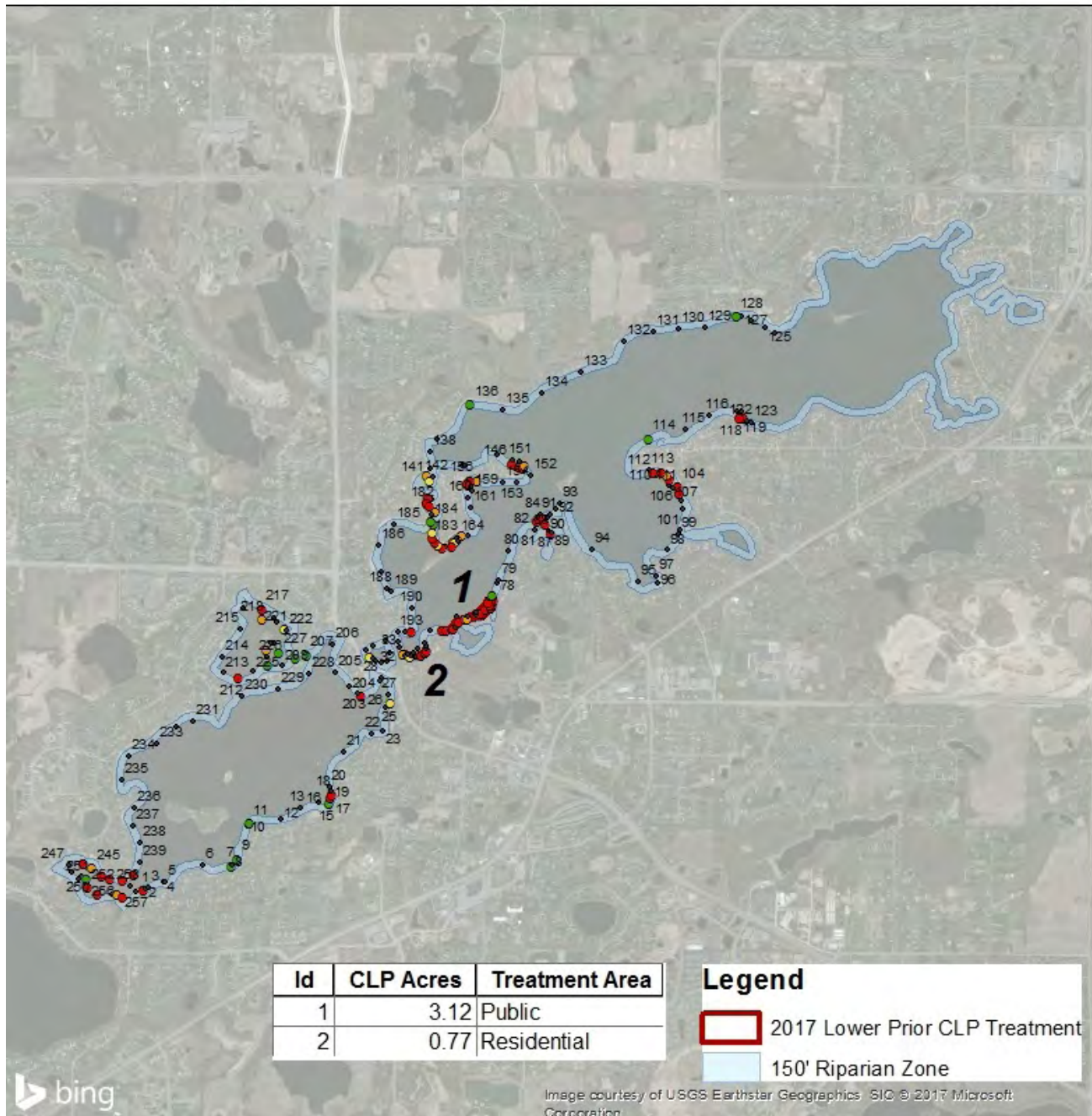
**Example of heavy growth of curlyleaf pondweed in Prior Lake on June 5, 2015.**



**Example of heavy growth of curlyleaf pondweed in Prior Lake on June 1, 2016.**

## Appendix A - 2017 Delineation and Assessment

### Prior Lake Curlyleaf Pondweed Delineation and Treatment April 14, 2017



Sample sites numbered for the April 14, 2017 delineation.



Sample sites and aquatic plant abundance for April 14, 2017.

Treatment Area	Site	Depth (ft)	Cabbage	Chara	Coontail	Curlyleaf - stems	Elodea	EWM	Water stargrass	Filament Algae	No plants
	1	8				6					
	2	9									1
	3	9									1
	4	8									1
	5	8									1
	6	10									1
	7	9				1					
	8	9									1
	9	9				1					
	10	7									1
	11	8				1					
	12	12									1
	13	12									1
	14	11									1
	15	6									1
	16	6				1					
	17	8			1	6					
	18	8				4					
	19	8									1
	20	9									1
	21	14									1
	22	12									1
	23	10									1
	24	9									1
	25	8									1
	26	8				2					
	27	12									1
	28	12									1
	29	12									1
	30	12									1
	31	12									1
	32	14									1
	33	10			1	3					
	34	9			2						
	35	8				2					
	36	10									1
	37	9			1						
	38	9									1
	39	8				14					
	40	9									1
	41	9			1	4					
	42	9				9					
	43	9			1						
	44	9									1
	45	11									1
	46	16									1
	47	15									1
	48	13									1
	49	11									1
	50	14									1
	51	8				13					
	52	8				14					
	53	7									1
	54	7				4					
T	55	4									1
T	56	4									1
T	57	5				5					
T	58	14									1
T	59	6				5			3		
T	60	5				3					
T	61	12									1
T	62	14									1
T	63	10				17					
T	64	12				8					
T	65	12									1
T	66	13									1
T	67	7				15					
	68	5				25					
	69	6				14					
	70	7				4					
	71	12									1
T	72	9				6		1			
	73	9				8		1			
	74	9				8		1			
	75	13				8					
	76	12									1
	77	12			1	1					
	78	11									1
	79	12									1
	80	20									1
	81	2									1
	82	7			1	9		1			
	83	10									1
	84	12									1
	85	5				6					
	86	6			3	6					
	87	7	3								

Sample sites and aquatic plant abundance for April 14, 2017.

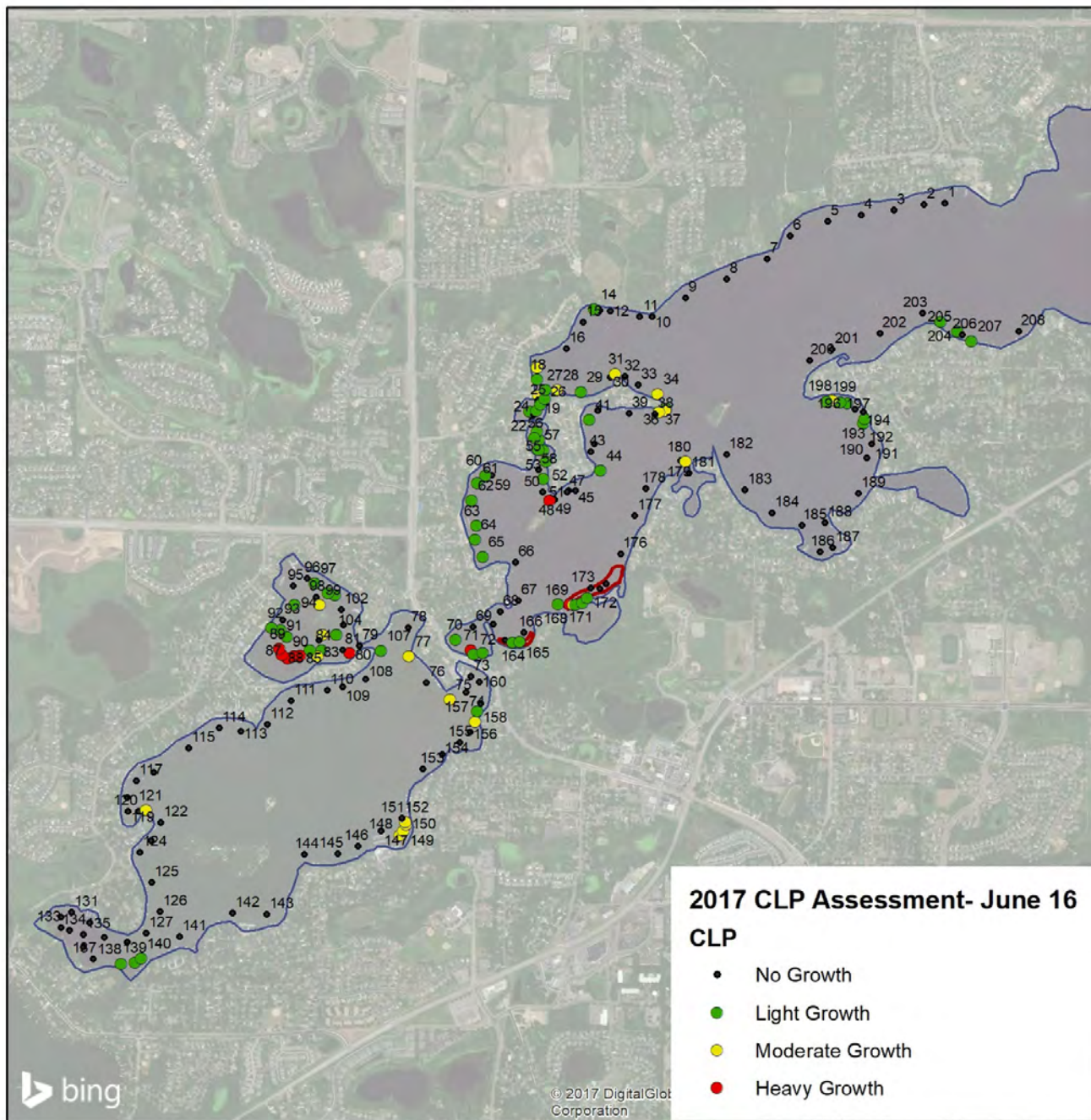
Treatment Area	Site	Depth (ft)	Cabbage	Chara	Coontail	Curlyleaf - stems	Elodea	EWM	Water stargrass	Filament Algae	No plants
	88	5				8					
	89	7	3		2						
	90	9									1
	91	11									1
	92	6									1
	93	14									1
	94	16									1
	95	16									1
	96	11						2			
	97	15									1
	98	12						2			
	99	12									1
	100	10									1
	101	16									1
	102	15									1
	103	12				9					
	104	7	1			4					
	105	14									1
	106	13									1
	107	9				6		1			
	108	7			1	3	1	2			
	109	8				6					
	110	12									1
	111	14									1
	112	11				9		1			
	113	6			1						
	114	12				1					
	115	20									1
	116	23									1
	117	10				10					
	118	7				7		1			
	119	6				10		1			
	120	12									1
	121	12									1
	122	12						3			
	123	11						2			
	124	6							1	2	
	125	8						1			
	126	14									1
	127	12									1
	128	10				1					
	129	22									1
	130	24									1
	131	16									1
	132	16									1
	133	14									1
	134	20									1
	135	18									1
	136	11				1		1		2	
	137	15									1
	138	9			1						
	139	5			1						
	140	9			2	3					
	141	9			1	2					
	142	9									1
	143	10									1
	144	12			1						
	145	9			1						
	146	12				4		1			
	147	8				7					
	148	8				10		1			
	149	8				3		2			
	150	12						1			
	151	15									1
	152	5		1							
	153	12						1			
	154	14									1
	155	10			1	3		1			
	156	9			1	4					
	157	10				9					
	158	12									1
	159	10			3						
	160	7									1
	161	12									1
	162	15									1
	163	12				3					
	164	13				3					
	165	11				8					
	166	11				2					
	167	12									1
	168	13									1
	169	7				18					
	170	3									1
	171	3				5					
	172	4				2					
	173	10				8					
	174	11				6					



# Sample sites and aquatic plant abundance for April 14, 2017.

Treatment Area	Site	Depth (ft)	Cabbage	Chara	Coontail	Curlyleaf - stems	Elodea	EWM	Water stargrass	Filament Algae	No plants
	175	12				2					
	176	10			2	1					
	177	9			1	3					
	178	8									1
	179	8				8		1			
	180	8				10					
	181	8				8					
	182	9				10		1			
	183	6									1
	184	8			2	1					
	185	12									1
	186	11			3						
	187	13									1
	188	12			2						
	189	11			2			1			
	190	17									1
	191	7				8					
	192	14									1
	193	13									1
	194	12									1
	195	11									1
	196	9									1
	197	11				2					
	198	14									1
	199	10									1
	200	8									1
	201	13									1
	202	6				4					
	203	8									1
	204	12									1
	205	12									1
	206	9									1
	207	6				1					
	208	7				1					
	209	6						2			
	210	6			1	1	1	2			
	211	5			1			1			
	212	6				8					
	213	5						1			
	214	6			2						
	215	6									1
	216	6						1			
	217	6				4					
	218	6				3					
	219	6									1
	220	6									1
	221	6				2					
	222	6									1
	223	6			1			1			
	224	5						1			
	225	5				3					
	226	6									1
	227	6				1					
	228	14									1
	229	13									1
	230	13									1
	231	13									1
	232	14									1
	233	13									1
	234	12									1
	235	11									1
	236	12									1
	237	11									1
	238	11									1
	239	9									1
	240	7				8					
	241	7									1
	242	7			1	7					
	243	6				12					
	244	7				10					
	245	6				3					
	246	5			2	10					
	247	5			3		1				
	248	5			2		1				
	249	6			2		1				
	250	6			1		1				
	251	7				1					
	252	7				12					
	253	6				7					
	254	6			1						
	255	6				3					
	256	4			1	11					
	257	7									1
	258	7									1
Average			2.3	1.0	1.5	6.0	1.0	1.3	2.0	2.0	
Occurrence (258 sites)			3	1	39	95	6	31	2	2	128

## Prior Lake Curlyleaf Pondweed Assessment June 16, 2017



Sample sites numbered for the June 16, 2017 assessment.



**Sample sites and aquatic plant abundance for June 16, 2017.**

Treatment Area	Site	Depth (ft)	Coontail	Curlyleaf	Elodea	EWM	Flatstem	Fila Algae	No Plants	Notes
	1		1				1			
	2		1				1			
	3		1				1			
	4		1				1			
	5		1				1			
	6		1				1			
	7		1				1			
	8		1				1			
	9		1				1			
	10		1				1			
	11		1				1			
	12		1				1			
	13		1				1			
	14	11		2						
	15	20								
	16	11				1				
	17	13		3						
	18	8		2						
	19	5		3						
	20	8	3							
	21	8	3							
	22	5	2	1						
	23	10	3							
	24	10	3	1						
	25	9	2	2						
	26	4	2	2						
	27	6	3	1						
	28	11	2	3						
	29	8	2	1						
	30	20							1	
	31	12		3						
	32	8	3							
	33	12	2							
	34	8		3						
	35	6		2						
	36	6		3						
	37	13		3						
	38	14	3							
	39	17							1	
	40	10				3				
	41	11		1		2				
	42	16	1							
	43	10								CLP dead
	44	7	2	1		2				
	45	16	1							
	46	11	1			1				
	47	10	1							
	48	11	1							
	49	6		4						
	50	11	2							
	51	12	2	1						
	52	9	3	1						
	53	9	2	2						
	54	8	3	2						
	55	9	3	2						
	56	6	3	1						
	57	9	3	1						
	58	12	2							
	59	15	1							
	60	15	1	1						
	61	14	1	1						
	62	10	3	1						
	63	14	1	2						
	64	10	2	2						
	65	12	2	1		1				
	66	18								
	67	17								
	68	14								
	69	10							1	
	70	12	1	1						
	71	8		4						
	72	10		1						
	73	13							1	
	74	13							1	
	75	8		3						
	76	15							1	
	77	7		3						
	78	10							1	
	79	8							1	
	80	6	1	4						

**Sample sites and aquatic plant abundance for June 16, 2017.**

Treatment Area	Site	Depth (ft)	Coontail	Curlyleaf	Elodea	EWM	Flatstem	Fila Algae	No Plants	Notes
	81	7							1	
	82	7		2						
	83	6		3		2				
	84	6		1						
	85	6		4						
	86	6		4						
	87	6		4						
	88	6		4						
	89	6		4						
	90	6		1						
	91	6		1						
	92	6		1						
	93	7							1	
	94	6		1						
	95	6							1	
	96	6							1	
	97	6		1						
	98	7							1	
	99	6	2	3						
	100	6		1						
	101	6		1						
	102	7							1	
	103	6							1	
	104	6		1						
	105	6		3						
	106	6							1	
	107	10		2						
	108								1	
	109								1	
	110								1	
	111								1	
	112								1	
	113								1	
	114								1	
	115								1	
	116								1	
	117								1	
	118								1	
	119								1	
	120								1	
	121	10		3						
	122	10							1	
	123	13	1						1	
	124	11							1	
	125	11							1	
	126	12							1	
	127	8							1	
	128	8								
	129	7	1							
	130	7	1							
	131	6	2							
	132	6	3					4		
	133	6	3					3		
	134	6	2		3					
	135	8							1	
	136	8							1	
	137	7	1		1					
	138	6	2	1						
	139	6		1						
	140	6	1	1						
	141	10							1	
	142	10							1	
	143	11							1	
	144	12							1	
	145	13							1	
	146	13							1	
	147	13							1	
	148	10		3						
	149	9		3						
	150	8		3						
	151	8		3						
	152	10							1	
	153	11							1	
	154	13							1	
	155	12							1	
	156	11							1	
	157	8		3		1				
	158	12		1						
	159	12							1	
	160	12							1	

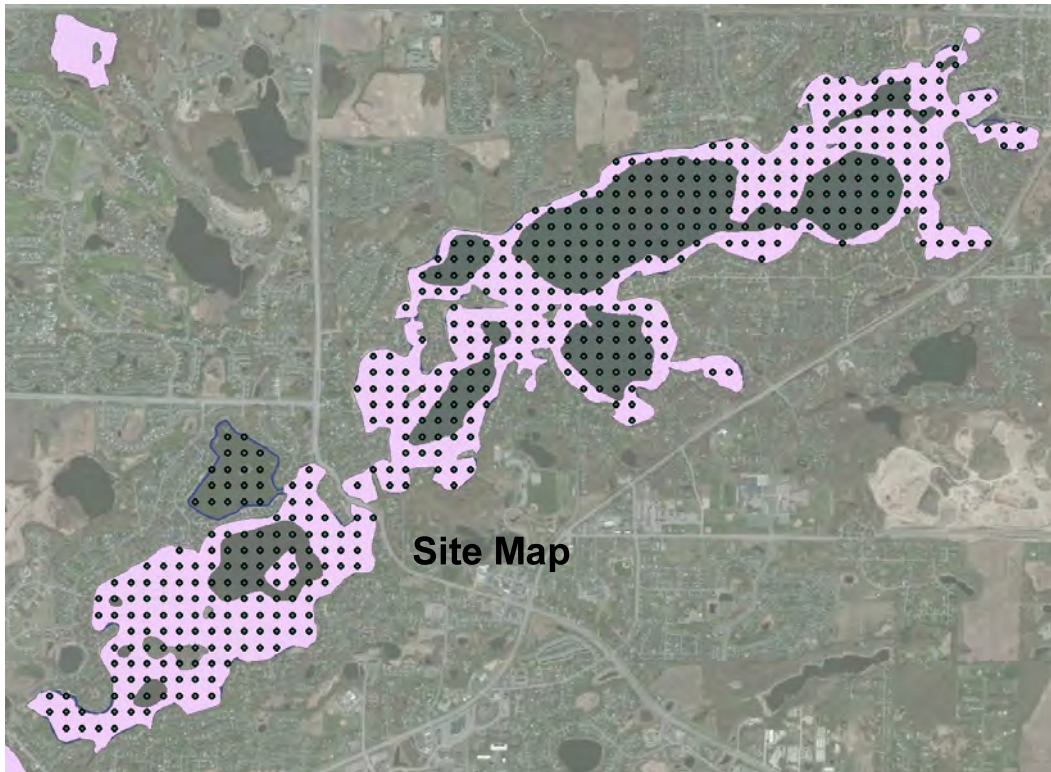


# Sample sites and aquatic plant abundance for June 16, 2017.

Treatment Area	Site	Depth (ft)	Coontail	Curlyleaf	Elodea	EWM	Flatstem	Fila Algae	No Plants	Notes
	161	10		1						
	162	15							1	
	163	13							1	
	164	14		1						
	165	14		1						
	166	16							1	
	167	11		1						
T	168	5	1	4						
	169	5		3		2				
	170	5		2						
	171	6		2		4				
	172	7	4	1						
T	173	14							1	
T	174	12							1	
T	175	12							1	
	176	16							1	
	177	14							1	
	178	13							1	
	179	14							1	
	180	5		3						
	181	7							1	
	182								1	
	183								1	
	184								1	
	185								1	
	186								1	
	187								1	
	188								1	
	189								1	
	190								1	
	191								1	
	192	11	2	2						
	193	11	2	2						
	194	5	2							
	195	9				1				
	196	11	2	1		2				
	197	10		2		1				
	198	7		3						
	199	10		2						
	200		1							
	201	12	2							
	202	14								
	203									
	204	8	3	1						
	205		3	1						
	206									
	207	8	3	1						
	208	13	2							
Average			1.3	2.0	2.0	1.8	1.0	3.5		
Occurrence (208 sites)			26	86	2	13	13	2	72	
% occurrence			13	41	1	6	6	1		

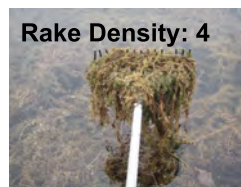
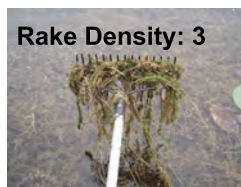
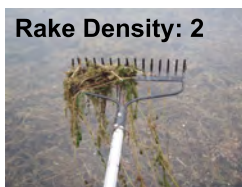
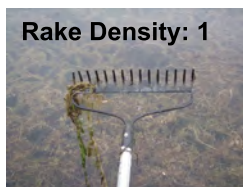
## Appendix B - Point-Intercept Aquatic Plant Survey - 2015

**Methods:** An aquatic plant point-intercept survey of Upper and Lower Prior Lake was conducted by Blue Water Science. A 100 meter grid was placed on the lake to create 516 points total, of those 516 points, 265 littoral zone points were sampled for plants. 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 5 with 1 being sparse and 5 being heavy growth. Based on these sample sites, several plant distribution maps were constructed.



Point-intercept sample site map for Upper and Lower Prior Lakes for 2015. Pink shading represents the littoral zone. Mud Bay (north of Upper Prior Lake) is less than 15 feet and should be shaded pink.

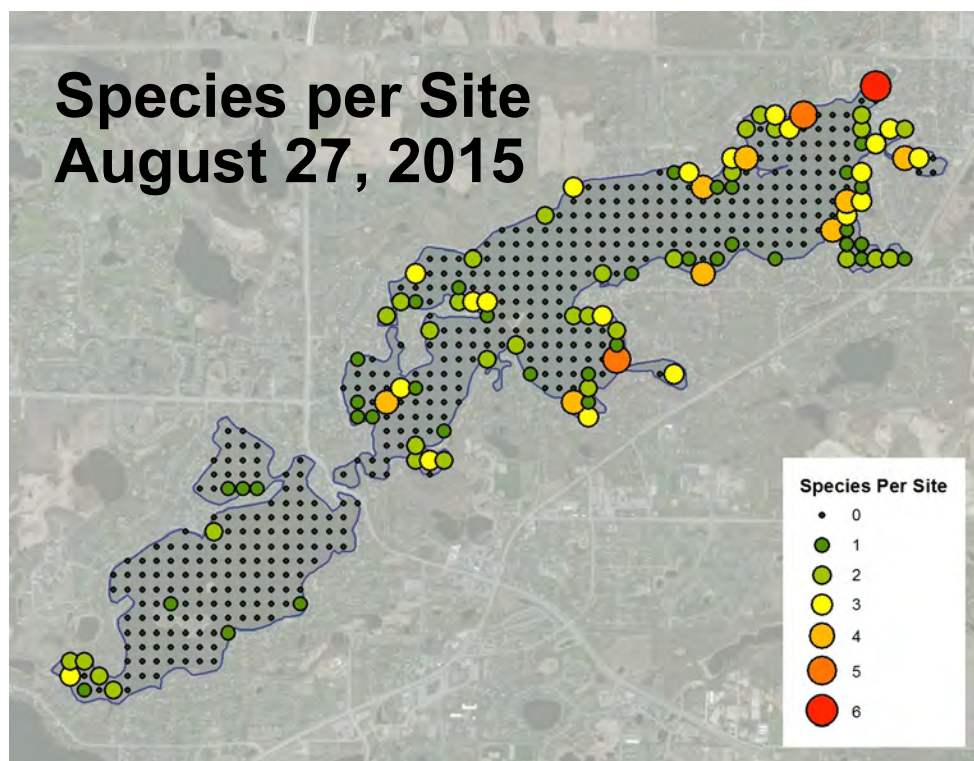
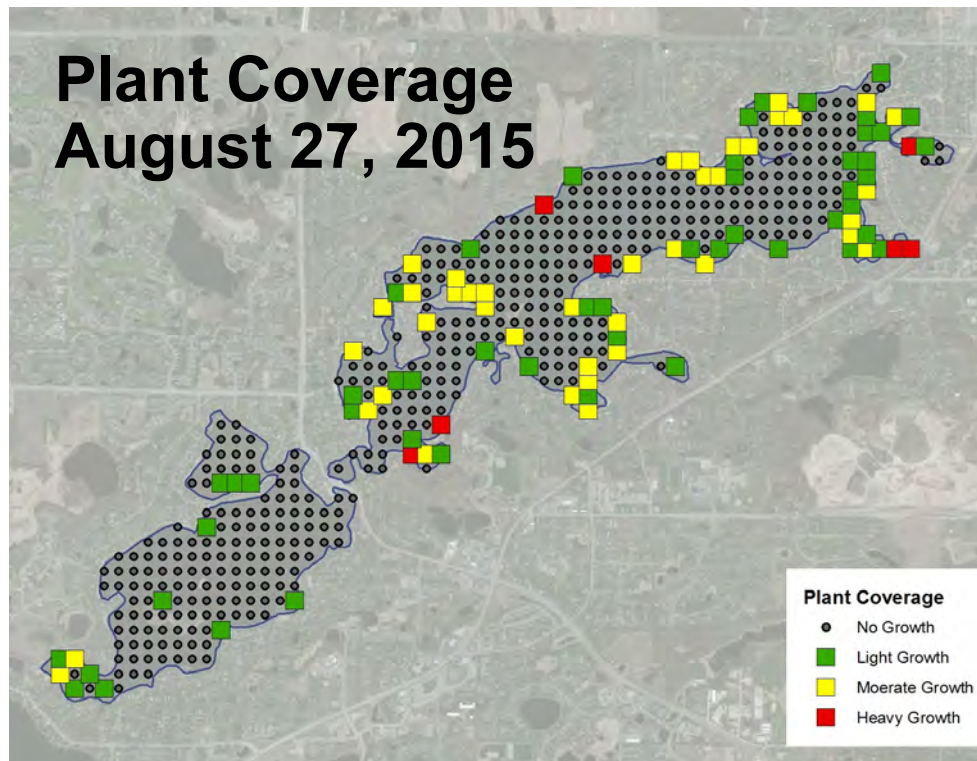
### Chart of Aquatic Plant Density Ratings



Aquatic plant density ratings from 1 to 5. A density rating of 4.5 or 5 is used for plants topping out at the surface.

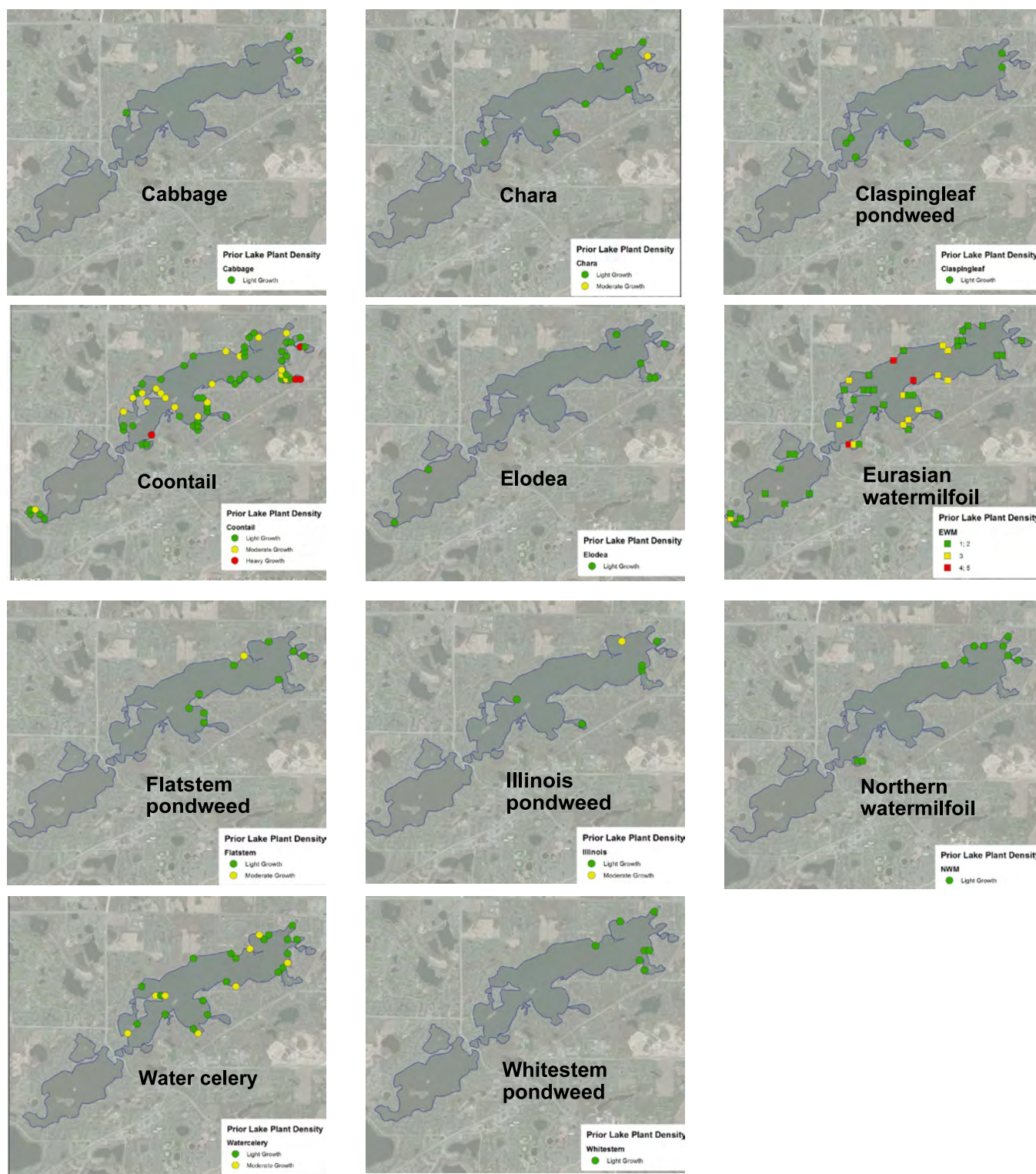


**Results:** A point-intercept aquatic plant survey was conducted on Upper and Lower Prior Lakes on August 27, 2015. Plant distribution and species richness were greater in Lower Prior compared to Upper Prior. Aquatic plants grew to a water depth of 15 feet in Lower Prior and to 6 feet in Upper Prior. Aquatic plants covered approximately 33 acres in Upper Prior and 220 acres in Lower Prior Lake.



[top] Plant coverage map for August 27, 2015.  
[left] Species per site map for August 27, 2015.

Individual aquatic plant species distribution and abundance in Prior Lake are shown below.



Aquatic plant coverage maps for selected plant species found in Upper and Lower Prior Lakes.



In Upper and Lower Prior Lakes, coontail was the dominant plant followed by Eurasian watermilfoil and water celery.

**Upper and Lower Prior aquatic plant occurrence and density for the August 27, 2015 survey based on 265 sites. Density ratings are 1-5 with 1 being low and 5 being most dense.**

Upper and Lower Prior	All Stations (n=265)		
	Occurrence	% Occurrence	Average Density
Coontail ( <i>Ceratophyllum demersum</i> )	67	25	2.1
Chara ( <i>Chara sp</i> )	9	3	1
Elodea ( <i>Elodea canadensis</i> )	7	3	1
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	10	4	1.2
Eurasian watermilfoil ( <i>M. spicatum</i> )	49	18	2.0
Cabbage ( <i>Potamogeton amplifolius</i> )	4	2	1
Curlyleaf pondweed ( <i>P. crispus</i> )	0	0	0
Illinois pondweed ( <i>P. illinoensis</i> )	6	2	1.7
Whitestem pondweed ( <i>P. praelongus</i> )	7	3	1.1
Claspingleaf pondweed ( <i>P. Richardsonii</i> )	6	2	1.2
Flatstem pondweed ( <i>P. zosteriformis</i> )	10	4	1.4
Sago pondweed ( <i>Stuckenia pectinata</i> )	2	1	1.5
Water celery ( <i>Vallisneria americana</i> )	27	10	1.0
Water stargrass ( <i>Zosterella dubia</i> )	3	1	1.0

In Lower Prior, coontail was the dominant plant. A total of 12 species were observed. In Upper Prior, Eurasian watermilfoil was the dominant species. A total of 4 species were found.

Aquatic plant species found at each sample site are listed below.

**Lower Prior aquatic plant occurrence and density for the August 27, 2015 survey based on 172 sites. Density ratings are 1-5 with 1 being low and 5 being most dense.**

Lower Prior	All Stations (n=172)		
	Occurrence	% Occurrence	Average Density
Coontail ( <i>Ceratophyllum demersum</i> )	62	36	2.2
Chara ( <i>Chara sp</i> )	9	5.2	1.7
Elodea ( <i>Elodea canadensis</i> )	5	3	1.0
Northern watermilfoil ( <i>Myriophyllum sibiricum</i> )	10	6	1.2
Eurasian watermilfoil ( <i>M. spicatum</i> )	38	22	2.1
Cabbage ( <i>Potamogeton amplifolius</i> )	4	2.3	1
Illinois Pondweed ( <i>P. illinoensis</i> )	6	4	1.7
Whitestem pondweed ( <i>P. praelongus</i> )	7	4	1.1
Claspingleaf ( <i>P. Richardsonii</i> )	6	4	1.2
Flatstem pondweed ( <i>P. zosteriformis</i> )	10	6	1.4
Water celery ( <i>Vallisneria americana</i> )	27	16	2.0
Water stargrass ( <i>Zosterella dubia</i> )	3	2	1.0

**Upper Prior aquatic plant occurrence and density for the August 27, 2015 survey based on 93 sites. Density ratings are 1-5 with 1 being low and 5 being most dense.**

Upper Prior	All Stations (n=93)		
	Occurrence	% Occurrence	Average Density
Coontail ( <i>Ceratophyllum demersum</i> )	5	5	1.6
Elodea ( <i>Elodea canadensis</i> )	2	2	1
Eurasian watermilfoil ( <i>Myriophyllum spicatum</i> )	11	12	1.4
Sago pondweed ( <i>Stuckenia pectinata</i> )	2	2	1.5

Point intercept sample sites and aquatic plant abundance for August 27, 2015. UP = Upper Prior and LP = Lower Prior.

Site	Lake	Depth (ft)	White lilies	Cab-bage	Chara	Clasp-ingleaf	Coon-tail	Elodea	EWM	Flat-stem	Hybrid milfoil	Illinois	NWM	Sago	Water celery	Water stargrass	White-stem	No plants
1	UP	7							1									
2	UP	6																1
3	UP	5					2	1										
5	UP	5	1				1		3									
6	UP	7																1
7	UP	6					1		1									
9	UP	11																1
10	UP	9																1
11	UP	5					1		1									
12	UP	4					3							1				
13	UP	9																1
14	UP	20																1
15	UP	35																1
16	UP	14																1
17	UP	11																1
18	UP	11																1
19	UP	10																1
20	UP	10																1
21	UP	14																1
22	UP	48																1
23	UP	16																1
24	UP	12																1
25	UP	11																1
26	UP	11																1
27	UP	10																1
28	UP	14																1
29	UP	12																1
32	UP	10																1
33	UP	11																1
34	UP	9							1									
35	UP	13																1
36	UP	29																1
37	UP	4							2									
42	UP	13																1
43	UP	12																1
44	UP	12																1
45	UP	10																1
46	UP	14																1
47	UP	12																1
48	UP	5							1									
56	UP	10																1
57	UP	8							1									
58	UP	12																1
59	UP	12																1
60	UP	14																1
61	UP	14																1
62	UP	12																1
71	UP	9																1
72	UP	11																1
73	UP	12																1
74	UP	13																1
75	UP	13																1
76	UP	14																1
85	UP	15																1
86	UP	11																1
87	UP	12																1
99	UP	15																1
100	UP	11																1
101	UP	12																1
112	UP	10																1
113	UP	11																1
114	UP	12																1
115	UP	7						1	2									
124	UP	8																1
125	UP	12																1
126	UP	16																1
127	UP	19																1
128	UP	22																1
133	UP	13																1
134	UP	13																1



Point intercept sample sites and aquatic plant abundance for August 27, 2015. UP = Upper Prior and LP = Lower Prior.

Site	Lake	Depth (ft)	White lilies	Cab-bage	Chara	Clasp-ingleaf	Coon-tail	Elodea	EWM	Flat-stem	Hybrid milfoil	Illinois	NWM	Sago	Water celery	Water stargrass	White-stem	No plants
135	UP	17																1
138	UP	16																1
139	UP	13																1
140	UP	13																1
141	UP	5																1
142	UP	5																1
143	UP	5												2				
144	UP	5							1									
145	UP	5							1									
146	UP	13																1
147	UP	13																1
148	UP	5																1
151	UP	6																1
152	UP	9																1
153	UP	9																1
154	LP	12																1
157	LP	land																1
158	UP	6																1
161	UP	6																1
162	UP	9																1
163	LP	13																1
164	LP	15																1
165	LP	15																1
166	LP	7					1		5									
167	LP	8					2		3				1					
168	LP	6							2				1					
169	UP	5																1
171	UP	6																1
172	LP	16																1
173	LP	17																1
174	LP	6				1										1		
175	LP	6																1
176	LP	7																1
177	LP	17																1
180	LP	16																1
181	LP	8					4											
182	LP	12					2											
183	LP	8													3			
184	LP	17																1
188	LP	d																1
189	LP	12					2		2						3			
190	LP	14					1											
192	LP	6				1	2		3		1							
193	LP	14																1
197	LP	d																1
198	LP	9				1	2		3						2			
199	LP	15					2											
200	LP	land																1
201	LP	16																1
203	LP	14																1
204	LP	4			1	1									2			
205	LP	11							1									
208	LP	d																1
209	LP	20																1
210	LP	18																1
212	LP	13					1		3									
213	LP	15																1
214	LP	15																1
215	LP	14																1
216	LP	11																1
217	LP	19																1
218	LP	22																1
219	LP	d																1
220	LP	12					1											
224	LP	13					3											
225	LP	16																1
226	LP	22																1
227	LP	14					1		2			1						
228	LP	11					3											
229	LP	13																1

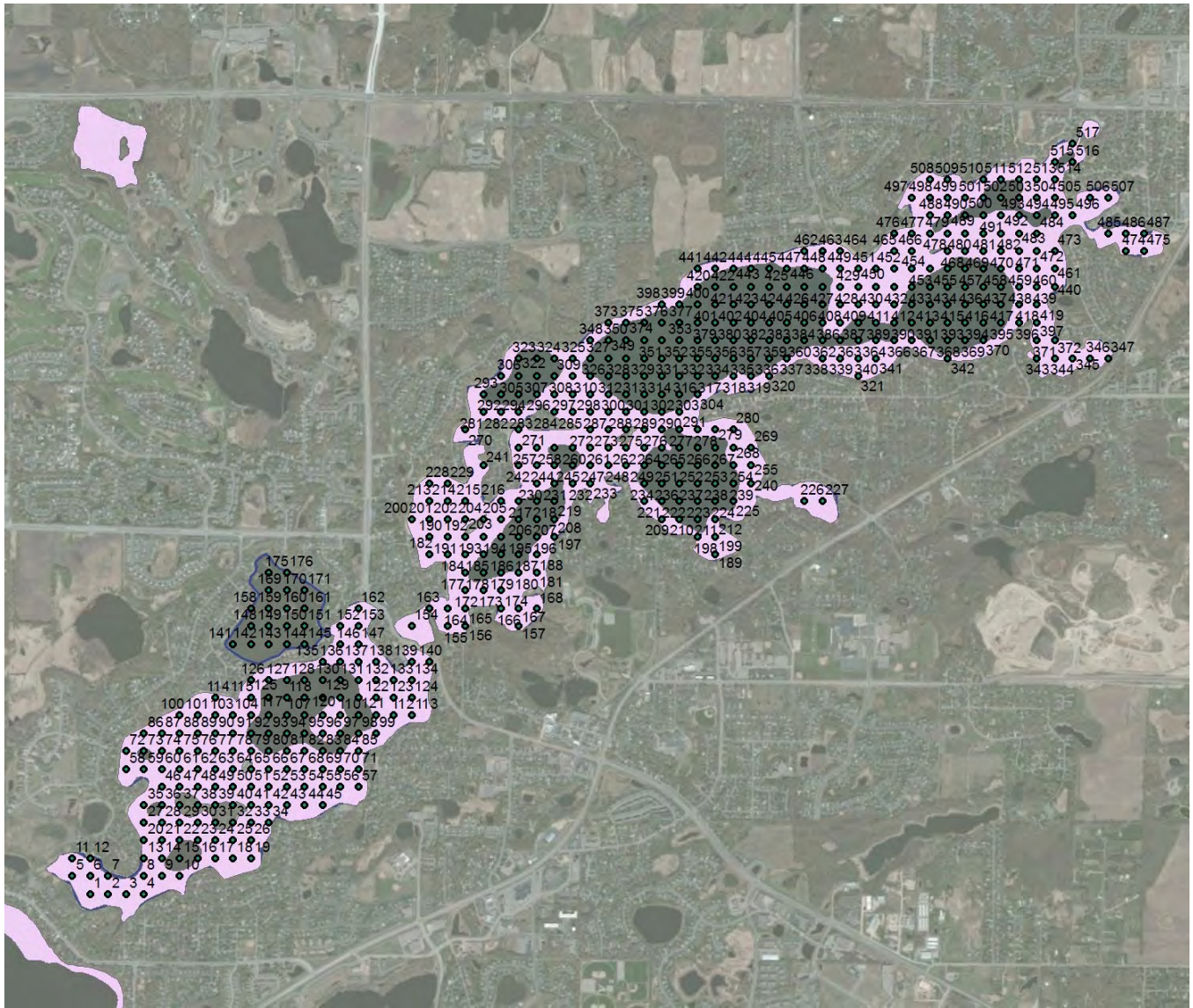
Point intercept sample sites and aquatic plant abundance for August 27, 2015. UP = Upper Prior and LP = Lower Prior.

Site	Lake	Depth (ft)	White lilies	Cab-bage	Chara	Clasp-ingleaf	Coon-tail	Elodea	EWM	Flat-stem	Hybrid milfoil	Illinois	NWM	Sago	Water celery	Water stargrass	White-stem	No plants
230	LP	16																1
231	LP	d																1
232	LP	d																1
233	LP	6							2						1			
234	LP	19																1
238	LP	23																1
240	LP	11			1		1		3	2					2			
242	LP	17																1
246	LP	15																1
247	LP	12																1
248	LP	12					3		1									
255	LP	14					2											
256	LP	8					3		1									
257	LP	22																1
259	LP	D																1
266	LP	22																1
269	LP	14					3			1								
270	LP	9		1			3											
272	LP	10					3											
273	LP	d																1
278	LP	8							3	2								
279	LP	13					2		1									
280	LP	11					2		2						1			
281	LP	11					2		1									
282	LP	13					3											
283	LP	d																1
284	LP	10							1						3			
285	LP	13					3		2						1			
286	LP	6							2			2			3			
293	LP	d																1
294	LP	d																1
295	LP	15																1
296	LP	14					3											1
304	LP	17																1
305	LP	11					1		3						1			
317	LP	17																1
318	LP	8							4	1								
319	LP	19																1
320	LP	15					3											
321	LP	9			1		1		3						3			
322	LP	20																1
323	LP	d																1
324	LP	20																1
325	LP	7					1		2									
326	LP	d																1
337	LP	21																1
338	LP	8							3						1			
339	LP	17					1											
340	LP	d																1
341	LP	14					1											
342	LP	15					2											
343	LP	7					2										2	
344	LP	7					3											
345	LP	8					2	1										
346	LP	8					4	1										
347	LP	8					4											
348	LP	19																1
360	LP	27																1
361	LP	23																1
364	LP	19																1
365	LP	14					1											
367	LP	24																1
369	LP	24																1
370	LP	21																1
371	LP	9					3											
372	LP	7					1											
374	LP	d																1
375	LP	d																1
376	LP	d																1
395	LP	20																1

Point intercept sample sites and aquatic plant abundance for August 27, 2015. UP = Upper Prior and LP = Lower Prior.

Site	Lake	Depth (ft)	White lilies	Cab-bage	Chara	Clasp-ingleaf	Coon-tail	Elodea	EWM	Flat-stem	Hybrid milfoil	Illinois	NWM	Sago	Water celery	Water stargrass	White-stem	No plants
396	LP	7			2					1					2		1	
397	LP	9					3											
398	LP	9					2		4									
399	LP	16																1
418	LP	d																1
419	LP	7						1				1			2			
420	LP	d																1
439	LP	11					2		2			1					1	
440	LP	6							1						3		1	
441	LP	12					2		1						2			
442	LP	15																1
443	LP	16																1
444	LP	d																1
445	LP	d																1
446	LP	d																1
449	LP	21																1
450	LP	9							3	1					1		1	
451	LP	14					3											
452	LP	13					2											
460	LP	18																1
461	LP	14					2											
462	LP	16																1
463	LP	13					3											
464	LP	11							3				1		1			
465	LP	13					1		2									
472	LP	14					2											1
473	LP	9				1									2	1		
476	LP	14					1		1	3								
477	LP	9			2				1				1		3			
478	LP	18																1
484	LP	18																1
485	LP	6		1			4			1			1					1
486	LP	3					2	1	2									
488	LP	16																1
495	LP	12					2											1
496	LP	11					2			1			1					1
497	LP	15					2		1									
498	LP	20																1
499	LP	14					3	1										
500	LP	4			2							3			2			
501	LP	21																1
505	LP	10				2									2			
506	LP	12			3							2			1			
507	LP	12		1			2											1
508	LP	14					2		1									
509	LP	7											1		3		1	
510	LP	7			1				1	1			2		1			
511	LP	17																1
512	LP	20																1
513	LP	21																1
514	LP	13					3						1					1
515	LP	34																1
516	LP	28																1
517	LP	6		1	2								2		2	1	1	
Average			1.0	1.0	1.7	1.2	2.1	1.0	2.0	1.4	1.0	1.7	1.2	1.5	2.0	1.0	1.1	
Occur (254 sites)			1	4	9	6	67	7	49	10	1	6	10	2	27	3	7	171
% occur			0	2	3	2	25	3	19	4	0	2	4	1	10	1	3	





**Point-intercept sample site map for Upper and Lower Prior Lakes for 2015. Pink shading represents the littoral zone. Mud Bay (north of Upper Prior Lake) is less than 15 feet and should be shaded pink.**