Nests In Trees on an Island in Upper Prior Lake, April 30, 2020

Curlyleaf Pondweed Delineation and Assessment Surveys and Summer Point Intercept Survey for Upper and Lower Prior Lake, Scott County, 2020

Curlyleaf Pondweed Delineation: April 30, 2020
Herbicide Treatment: 24.26 acres May 12, 2020
Curlyleaf Pondweed Assessment Date: June 11, 2020
Point Intercept Surveys: August 17, 2020; September 2, 2020

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

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March 10, 2021

Curlyleaf Pondweed Delineation and Assessment Surveys and Summer Point Intercept Survey for Upper and Lower Prior Lake, Scott County, 2020

Summary

Early Season Curlyleaf Pondweed Delineation: Curlyleaf pondweed (CLP) distribution and abundance were delineated on April 30, 2020. Based on the curlyleaf pondweed densities in 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 24.26 acres were delineated for a herbicide treatment.

The curlyleaf pondweed treatment was conducted on May 20, 2020 using diquat, a total of 24.26 acres were treated in Upper and Lower Prior Lake.

Post Treatment Assessment: A follow-up curlyleaf assessment was conducted on June 11, 2020. The June 11 curlyleaf assessment found curlyleaf in the treatment areas was mostly well controlled. Outside of the treatment areas, there were a few spots where heavy curlyleaf pondweed growth was present, however most heavy growth was patchy.

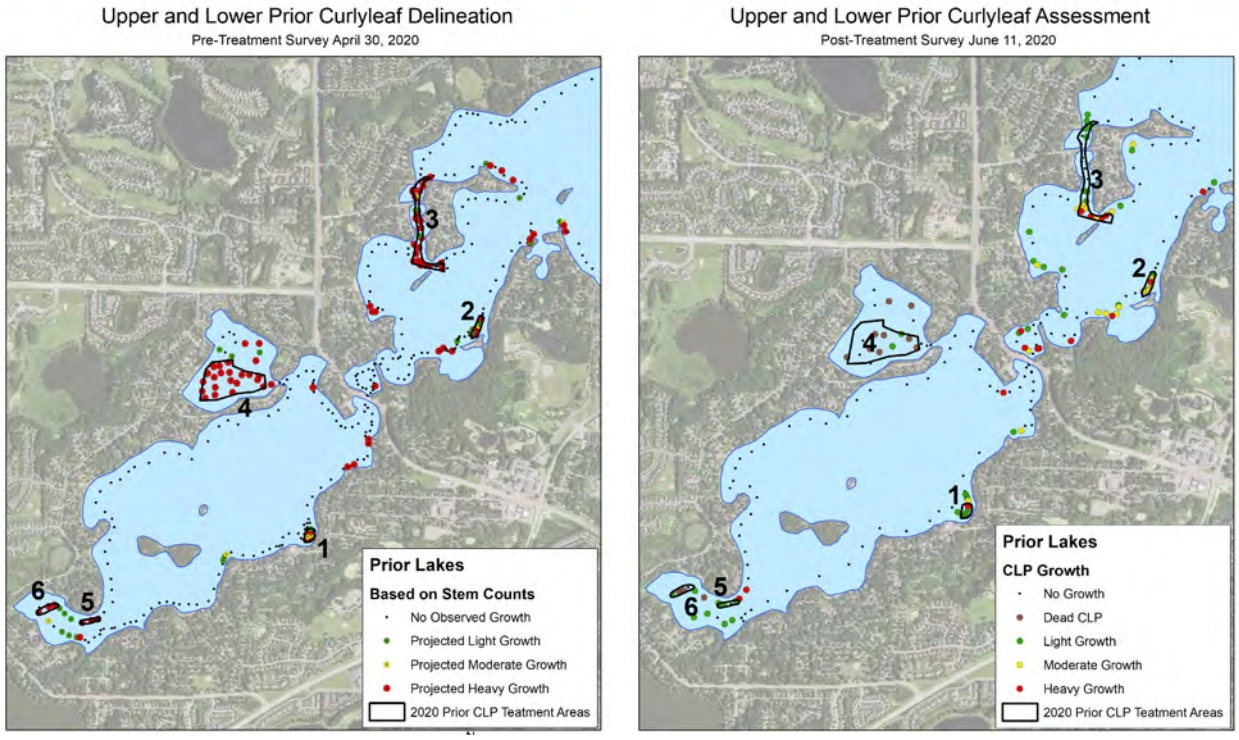


Figure S1. [left] Curlyleaf pondweed delineation survey conducted in Prior Lake on April 30, 2020. [right] Curlyleaf pondweed assessment survey conducted June 11, 2020.

Curlyleaf Planning for 2021: 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 S2) 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 2021.

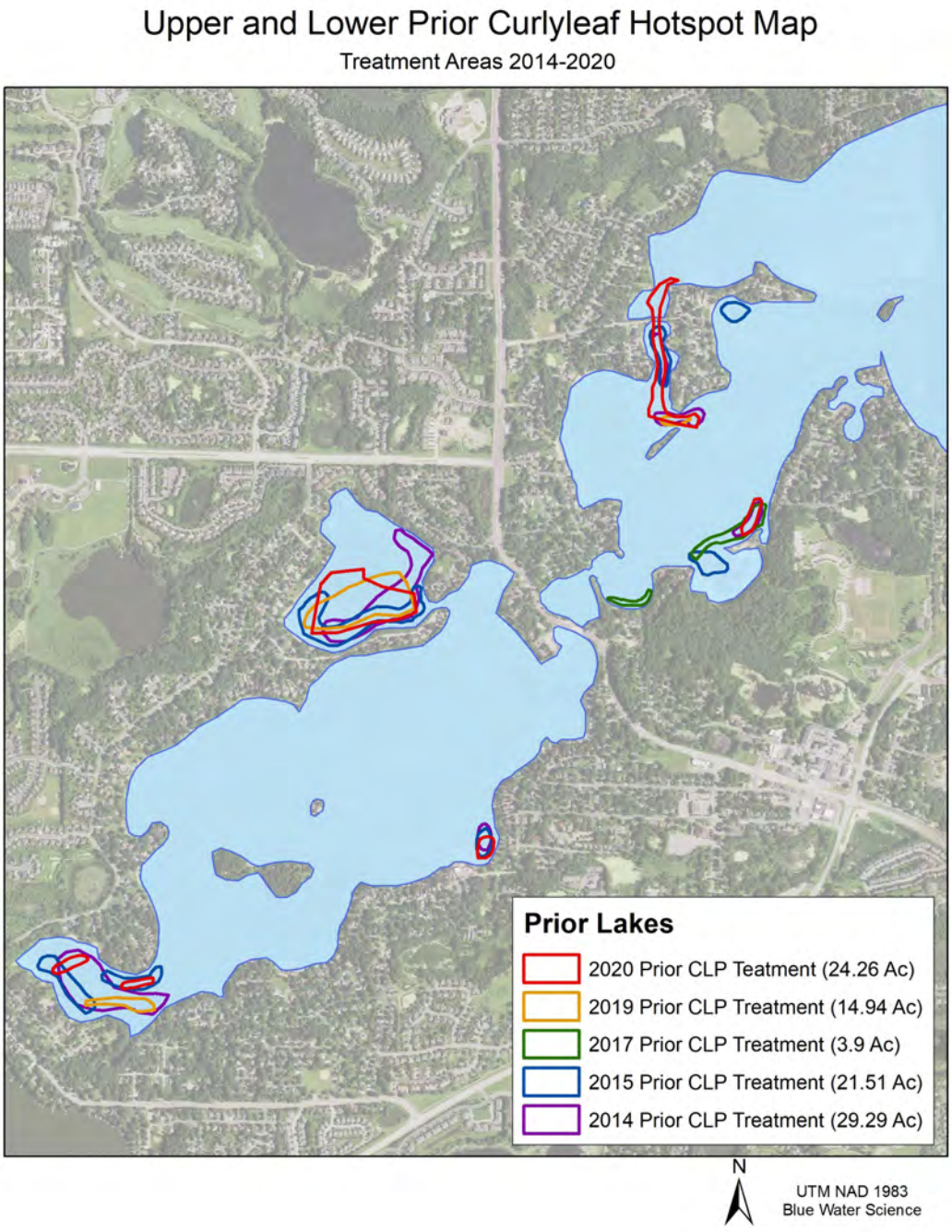


Figure S2. Prior Lake hot spot map for curlyleaf pondweed treatment areas from 2014-2020.

Table S1. Treatment summary from 2009-2020.

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
2018	No treatment
2019	14.9 acres
2020	24.3 acres

Point Intercept Survey: A grid with points spaced 100 meters apart was put over the entire lake and sites were sampled throughout the growing zone. A total of 352 sites were sampled, plants were observed growing to a depth of 8 feet. Results of the summer aquatic plant point intercept survey found 15 submerged aquatic plant species in Lower Prior and 6 species in Upper Prior including CLP. Native plants were found around the perimeter of the basin of Prior Lake (Figure S3).

Native aquatic plants were estimated to cover 27% of the lake bottom (358 acres). Coontail was the dominant aquatic plant. The 10 aquatic plant species found in this survey represents a fair to good diversity for Prior Lake in late summer.

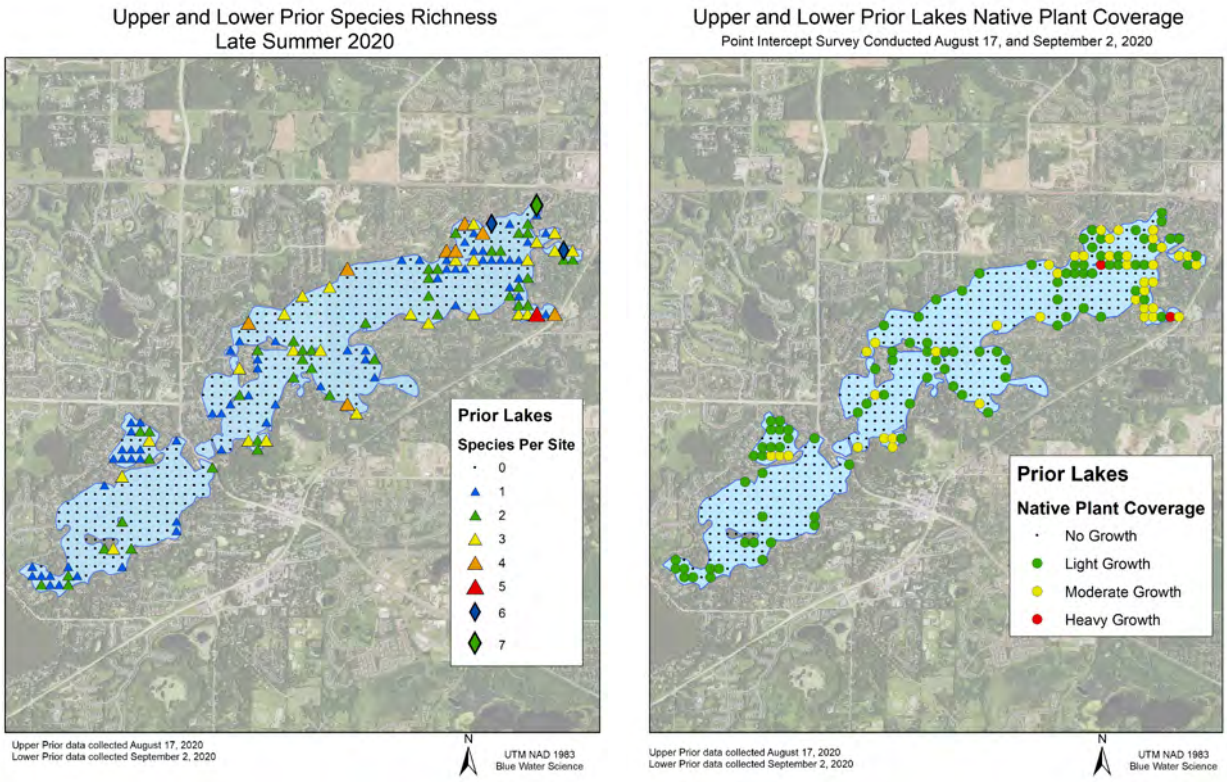


Figure S3. Point intercept survey results for species richness (left) and native plant coverage (right).

Curlyleaf Pondweed Delineation and Assessment Surveys and Summer Point Intercept Survey for Upper and Lower Prior Lake, Scott County, 2020

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 30, 2020 including both Upper and Lower Prior. Curlyleaf was then treated on May 12, 2020 and a follow-up curlyleaf pondweed assessment was conducted on June 11, 2020 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 summer point intercept aquatic plant survey was conducted in August and September to evaluate the entire plant community in Upper and Lower Prior Lake.

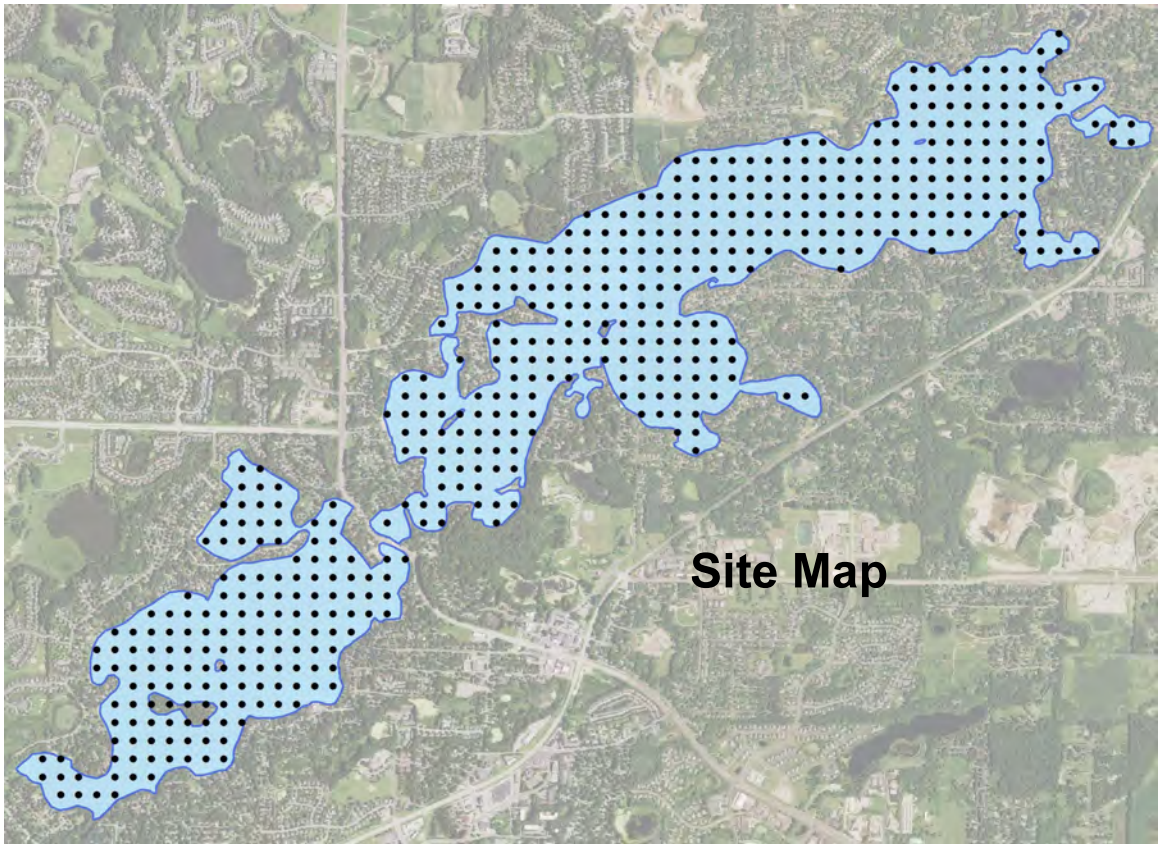


Figure 1. Point intercept 100 meter grid on Upper and Lower Prior Lake.

Methods

Curlyleaf Pondweed Delineation: At the time of the spring CLP delineations, only a fraction of the peak curlyleaf biomass is present. For spot treatments, the areas to be treated should be delineated prior to curlyleaf developing peak biomass. Curlyleaf stem counts on a rake sampler were used to identify areas that had a potential to produce dense curlyleaf. After a short sweep of about 1-foot (30 cm), 4 curlyleaf stems or more per rake sample generally indicated some CLP plants had developed runners and would likely produce heavy growth in the next few weeks. Alternatively, sites where 3 stems or less were collected per rake sample were not predicted to produce dense growth at the peak growing period. These areas were not targeted for treatment. This delineation method was used for spot lake treatments in Gleason Lake and has worked for other lakes as well (McComas et al, 2015*).

Curlyleaf Pondweed Assessment: A CLP assessment was conducted by Blue Water Science on June 11, 2020. The assessment is a post-treatment evaluation, it involved surveying the entire lake nearshore area, observing CLP growth, and sampling aquatic plants with rakes. 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 were from 1 to 3 with 1 being sparse and 3 being a nuisance. Plant density chart is shown on the next page (Figure 2). Based on these sample sites, plant distribution maps were constructed.

Survey Methods for the Point Intercept Survey An aquatic plant point intercept survey of Prior Lake was conducted by Blue Water Science on August 17, 2020 and September 2, 2020. Sample points were spaced 100 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. Based on these sample sites, a plant distribution map was constructed.

*McComas, S.R., Y.E. Christianson, and U. Singh. 2015. Effects of curlyleaf pondweed control on water quality and coontail abundance in Gleason Lake, Minnesota. Lake and Reservoir Management. 31:109-114.

Curlyleaf Pondweed Delineation on April 30, 2020 and Assessment on June 11, 2020 in Upper and Lower Prior Lake

A delineation survey on April 30, 2020, sampled a total of 229 sites around Upper and Lower Prior Lake with rake sampling. Curlyleaf was found at 58 out of 229 sample sites including 32 sites with curlyleaf growth projected to be abundant in June. A total of 24.26 acres in Upper and Lower Prior Lake areas were delineated as having the potential to develop moderate to heavy growth conditions by June (Figure 2).

A total area of 24.26 acres of CLP in Prior Lake 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.

On June 11, 2020, a curlyleaf assessment was conducted. A total of 185 sites were sampled (Figure 2). Control was good in the treated areas. A few spots of moderate to heavy growth were observed in untreated areas (Figure 2). CLP conditions on June 11, 2020 are shown in Figure 2.

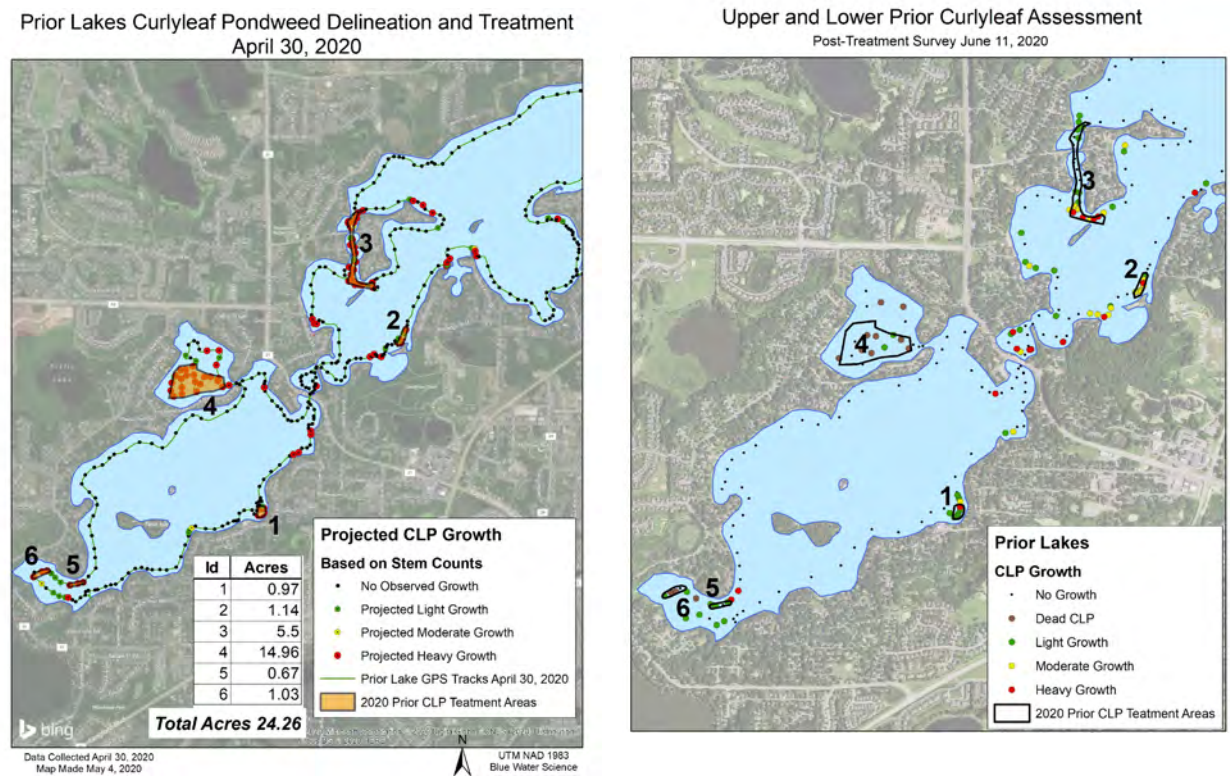


Figure 2. Map of curlyleaf pondweed delineation is shown on the left (April 30, 2020) and the curlyleaf assessment is shown on the right (June 11, 2020).

Point Intercept Aquatic Plant Survey for Upper and Lower Prior Lake

Results: A point intercept aquatic plant survey was conducted on Upper Prior Lake on August 17, 2020 as well as Lower Prior Lake on September 2, 2020. Plant distribution and species richness were greater in Lower Prior compared to Upper Prior (Figure 3). Aquatic plants grew to a water depth of 19 feet in Lower Prior and to 10 feet in Upper Prior. Compared to the 2018 aquatic plant survey, the depth of plant establishment increased by 2 feet in Upper Prior and decreased by 1 foot in Lower prior. Aquatic plants covered approximately 96 acres in upper prior in 2020 compared to approximately 69 acres in 2018. In Lower Prior, aquatic plants covered 262 acres in 2020 compared to 375 in 2018.

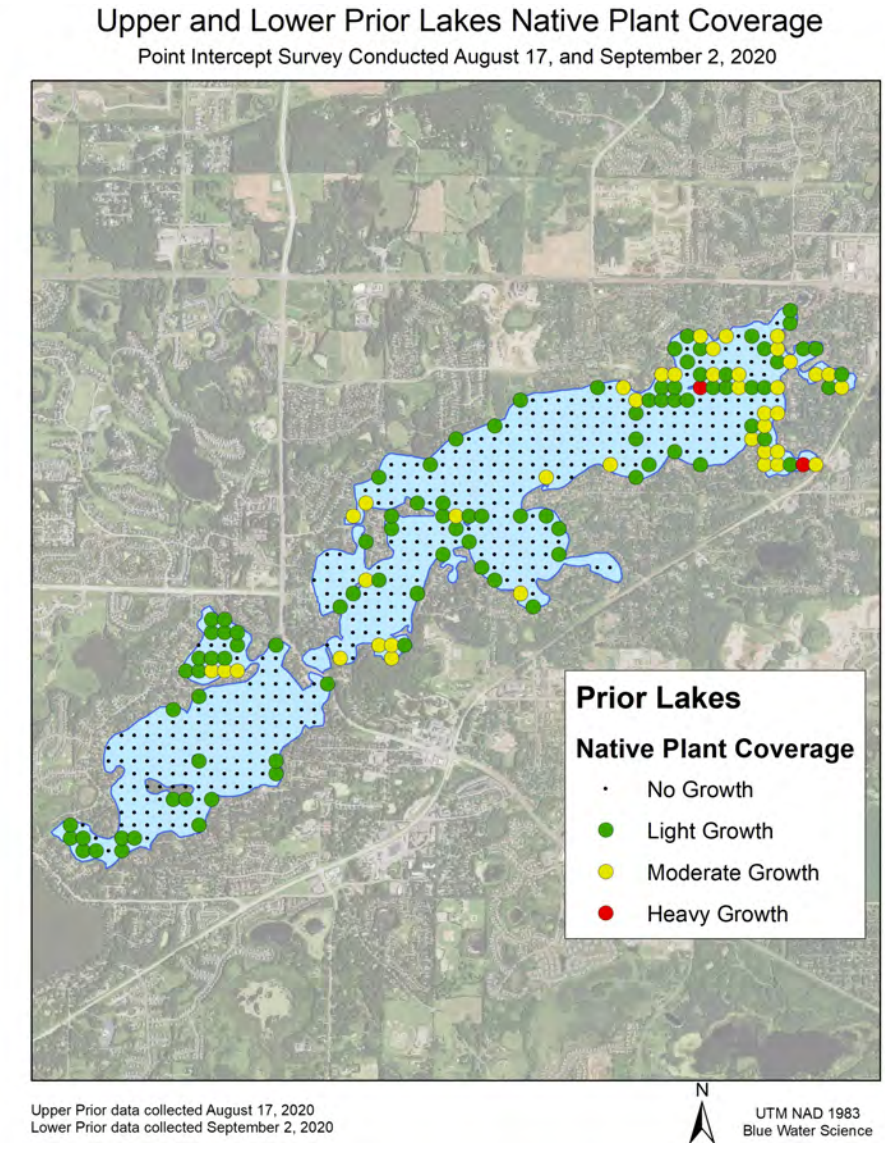


Figure 3. Native Plant Coverage in Prior lakes in late summer 2020.

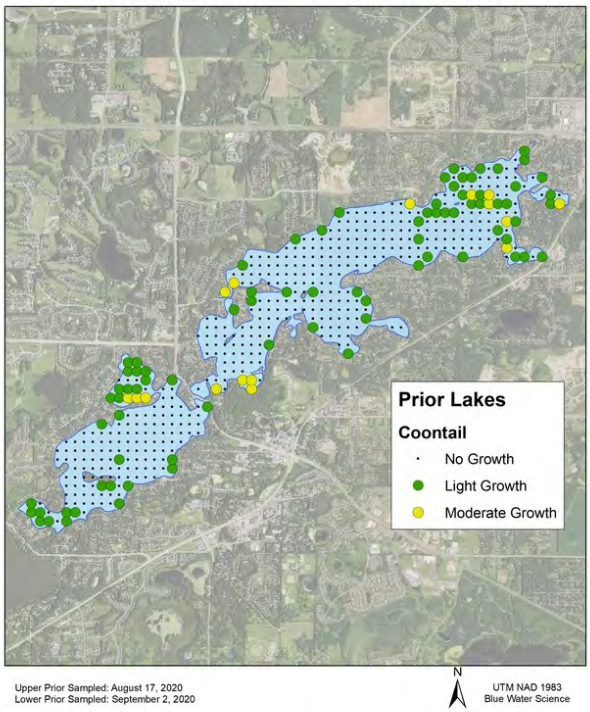
Table 1. Prior Lake aquatic plant data for 2020 point intercept surveys.

Upper Prior August 17, 2020	**All Stations (n=48)(10 feet)**		
	Occur	**% Occur out to 10 ft**	**Average Density**
Coontail (*Ceratophyllum demersum*)	33	69	1.1
Elodea (*Elodea canadensis*)	3	6	1.0
Water stargrass (*Heteranthera dubia*)			
Star duckweed (*Lemna trisulca*)			
Northern watermilfoil *(Myriophyllum sibiricum)*	6	13	1.0
Eurasian watermilfoil (*M. spicatum*)	5	10	1.0
Naiads (*Najas flexilis*)			
Nitella (*Nitella sp*)			
Cabbage (*Potamogeton amplifolius*)			
Curlyleaf pondweed (*P. crispus*)	3	6	1.0
Claspingleaf (*P. Richarsonii*)			
Stringy pondweed (*P. sp*)	2	4	1.0
Flatstem pondweed (*P. zosteriformis*)			
Sago (*Stuckenia pectinata*)			
Water celery (*Vallisneria americana*)			

Lower Prior September 2, 2020	**All Stations (n=162)(19 ft)**		
	Occur	**% Occur out to 19 ft**	**Average Density**
Coontail (*Ceratophyllum demersum*)	63	39	1.2
Elodea (*Elodea canadensis*)	1	1	1.0
Water stargrass (Hete*ranthera dubia*)	7	4	1.0
Star duckweed (*Lemna trisulca*)	3	1	1.0
Northern watermilfoil *(Myriophyllum sibiricum)*	4	2	1.0
Eurasian watermilfoil (*M. spicatum*)	32	20	1.2
Naiads (*Najas flexilis*)	2	1	1.0
Nitella (*Nitella sp*)	1	1	1.0
Cabbage (*Potamogeton amplifolius*)	4	2	1.8
Curlyleaf pondweed (*P. crispus*)	7	4	1.0
Claspingleaf (*P. Richarsonii*)	9	6	1.0
Stringy pondweed (*P. sp*)	3	1	1.0
Flatstem pondweed (*P. zosteriformis*)	32	20	1.1
Sago (*Stuckenia pectinata*)	1	1	1.0
Water celery (*Vallisneria americana*)	46	28	1.4

Upper and Lower Prior Coontail Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

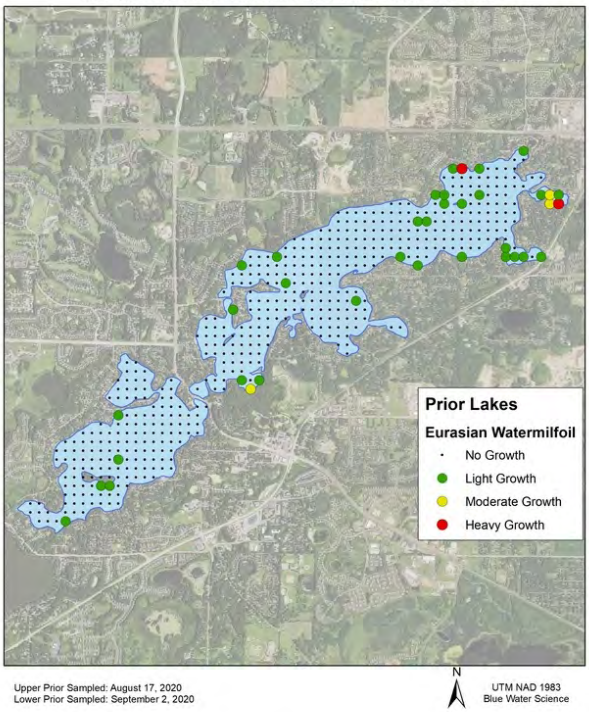


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Eurasian Watermilfoil Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

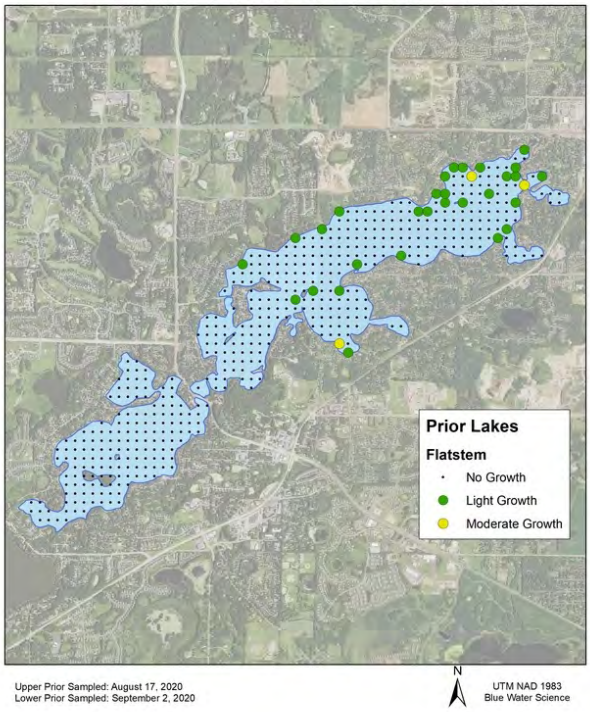


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Flatstem Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

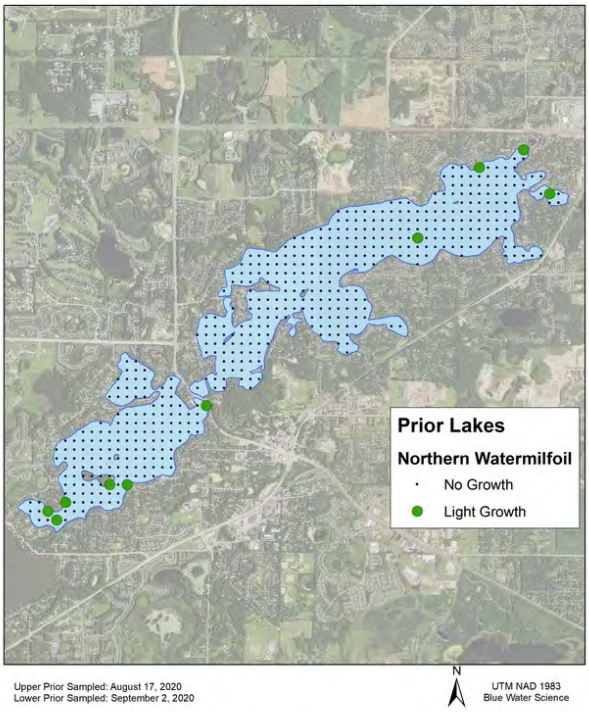


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Northern Watermilfoil Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

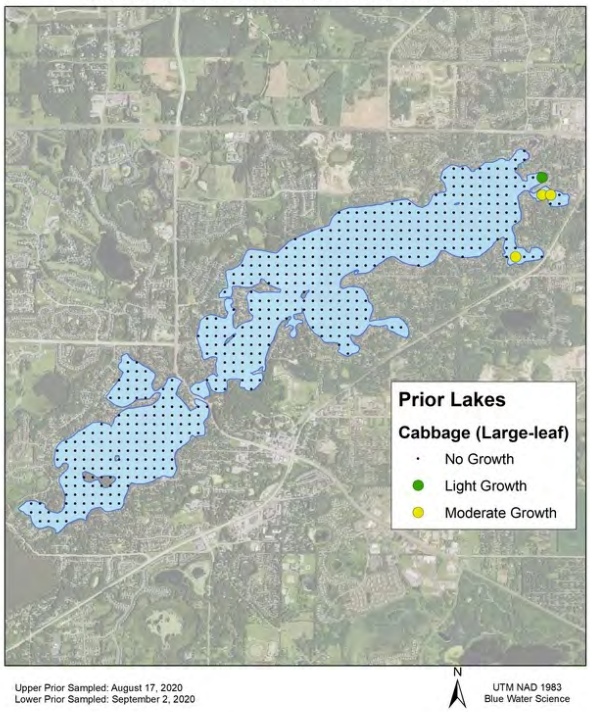


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Cabbage (Large-leaf) Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

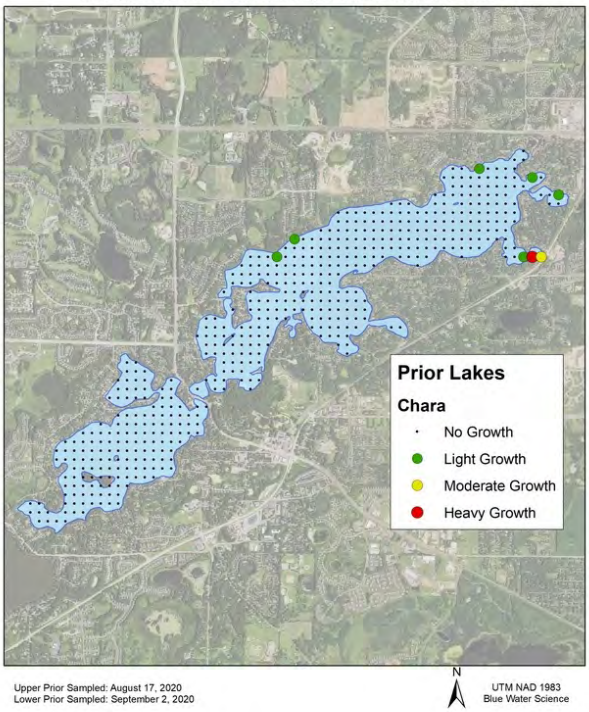


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Chara Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

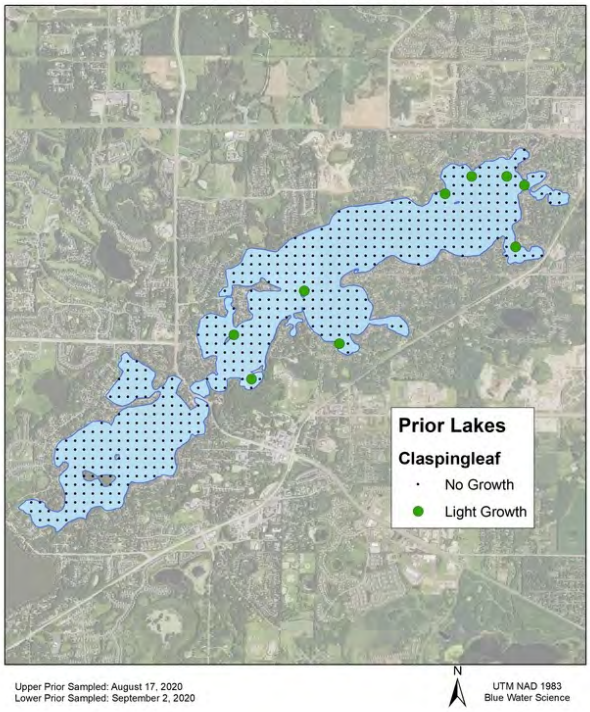


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Claspingleaf Pondweed Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

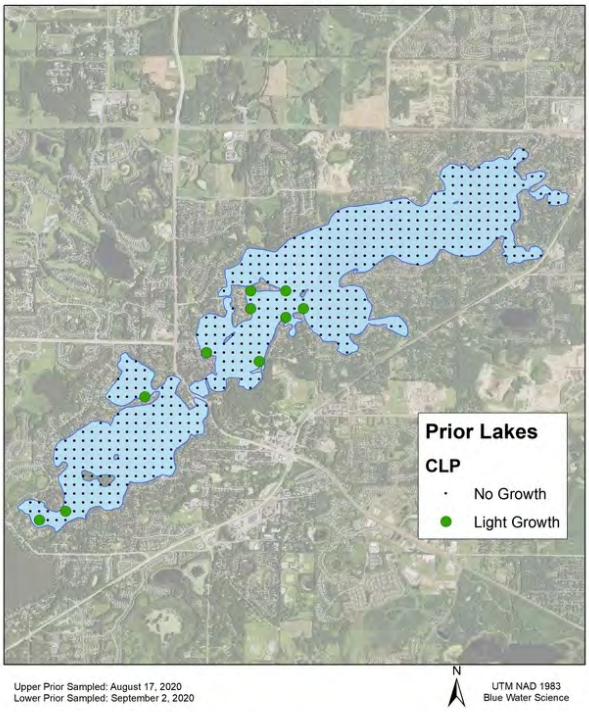


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Curlyleaf Pondweed Growth

Point Intercept Survey Conducted August 17, and September 2, 2020

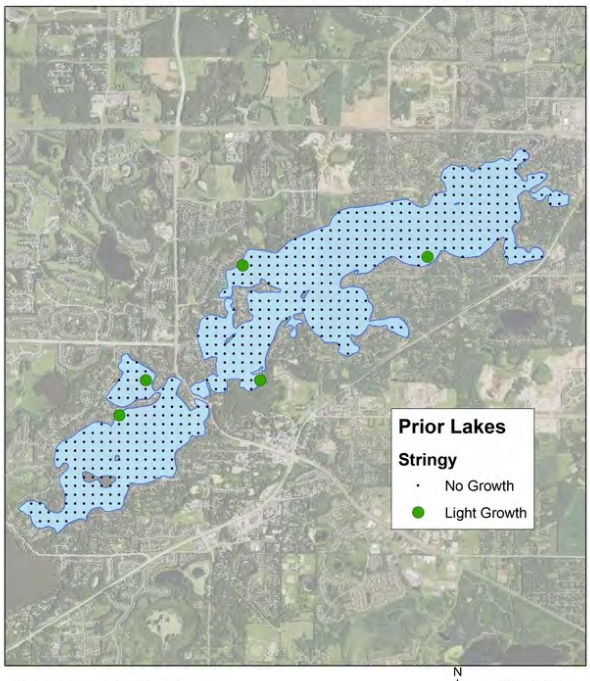


Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Stringy Pondweed Growth

Point Intercept Survey Conducted August 17, and September 2, 2020



Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

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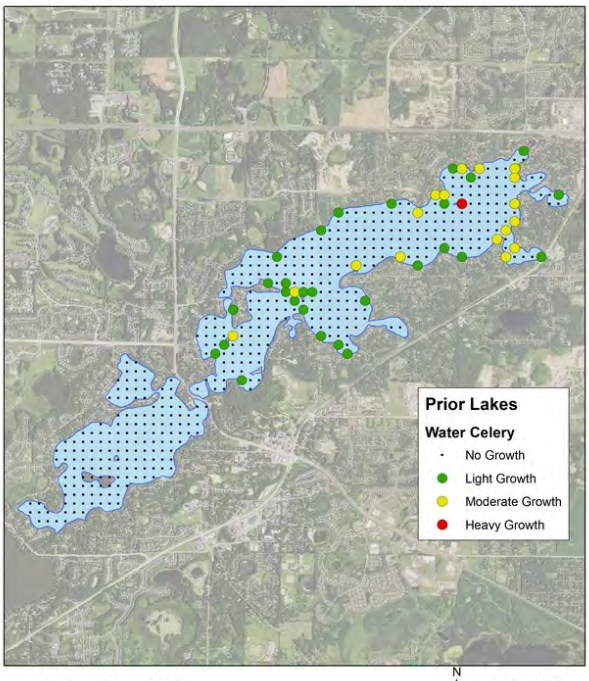
UTM NAD 1983
Blue Water Science

Upper and Lower Prior Water Celery Growth

Point Intercept Survey Conducted August 17, and September 2, 2020



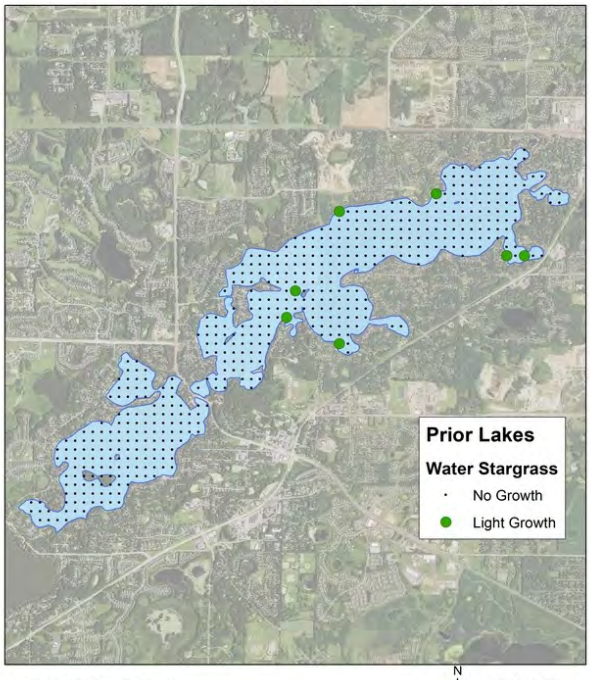
Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

N

UTM NAD 1983
Blue Water Science

Upper and Lower Prior Water Stargrass Growth

Point Intercept Survey Conducted August 17, and September 2, 2020



Upper Prior Sampled: August 17, 2020
Lower Prior Sampled: September 2, 2020

N

UTM NAD 1983
Blue Water Science

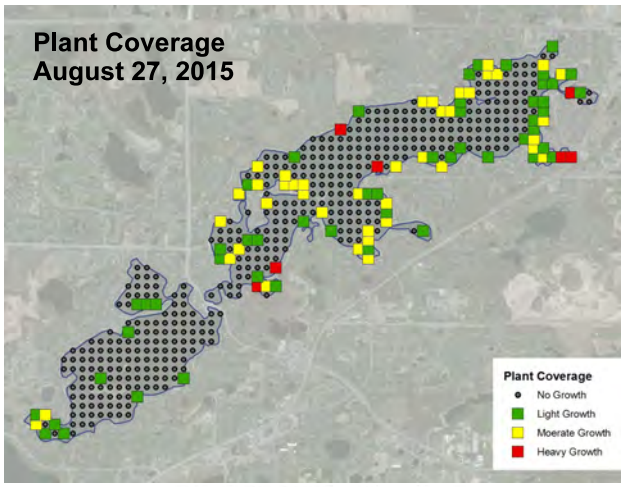
Point Intercept aquatic plant survey comparisons for 2015, 2018, and 2020

Table 2. Prior Lake aquatic plant data for 2015, 2018 and 2020 point intercept surv eys.

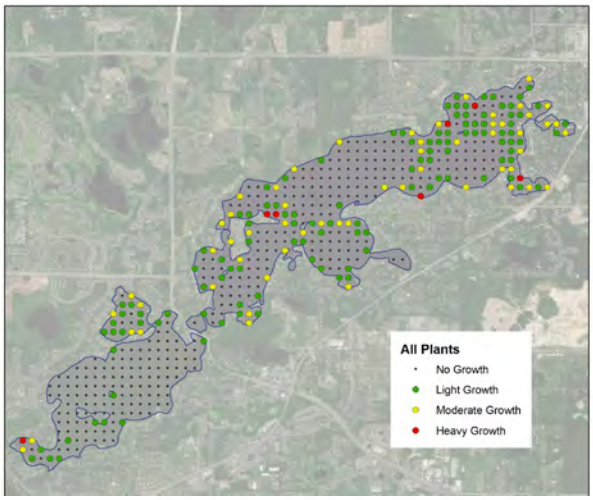
Lower Prior	Occurrence of Plants		
	2015	2018	2020
Estimated aquatic plant coverage (ac)	220 ac	375 ac	262 ac
Max depth of vegetation (ft)	15 ft	20 ft	19 ft
Duckweed (*Lemna sp*)		1	
Coontail (*Ceratophyllum demersum*)	62	129	63
Chara (*Chara sp*)	9		8
Elodea (*Elodea canadensis*)	5	2	1
Star duckweed (*Lemna trisulca*)		4	3
Northern watermilfoil *(Myriophyllum sibiricum)*	10	52	4
hybrid watermilfoil (*M. sp*)		2	
Eurasian watermilfoil (*M. spicatum*)	38	16	32
Naiads (*Najas flexilis*)		4	2
Nitella (*Nitella sp*)		2	1
Cabbage (*Potamogeton amplifolius*)	4	2	4
Curlyleaf pondweed (*P. crispus*)		10	7
Illinois Pondweed *(P. illinoensis)*	6	11	
Whitestem pondweed (*P. praelongus*)	7	4	
Claspingleaf (*P. Richarsonii*)	6	10	9
Stringy pondweed (*P. sp*)		1	3
Flatstem pondweed (*P. zosteriformis*)	10	26	32
Sago (*Stuckenia pectinata*)		1	1
Water celery (*Vallisneria americana*)	37	46	46
Water stargrass (*Zosterella dubia*)	3	22	7

Upper Prior	Occurrence of Plants		
	2015	2018	2020
Estimated aquatic plant coverage (ac)	33 ac	74 ac	82 ac
Max depth of vegetation (ft)	6 ft	8 ft	10 ft
Coontail (*Ceratophyllum demersum*)	5	29	33
Elodea *(Elodea canadensis)*	2	17	3
Eurasian watermilfoil (*Myriophyllum spicatum*)	11	17	5
Northern Watermilfoil *(Myriophyllum sibiricum)*			
Stringy pondweed (*Potamogeton sp*)		2	2
Sago pondweed *(Stuckenia pectinata)*	2	1	
Curlyleaf Pondweed (*P. crispus*)			3

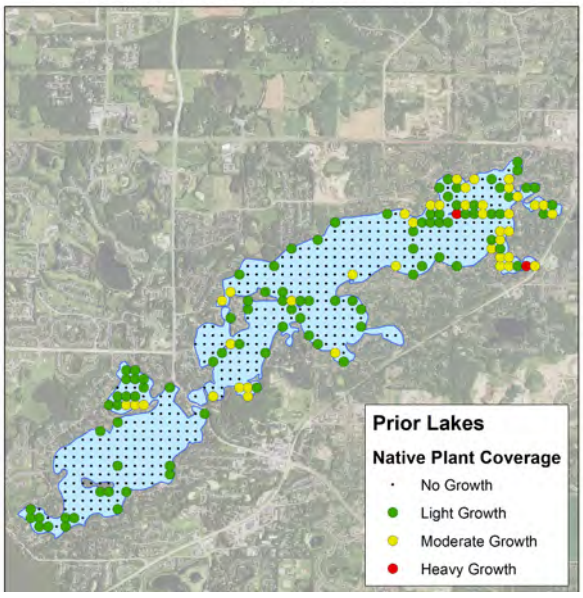
Aquatic Plant Distribution and Abundance for 2015, 2018, and 2020



Prior Lake All Plant Growth
August 17 & 21, 2018



Upper and Lower Prior Lakes Native Plant Coverage
Point Intercept Survey Conducted August 17, and September 2, 2020

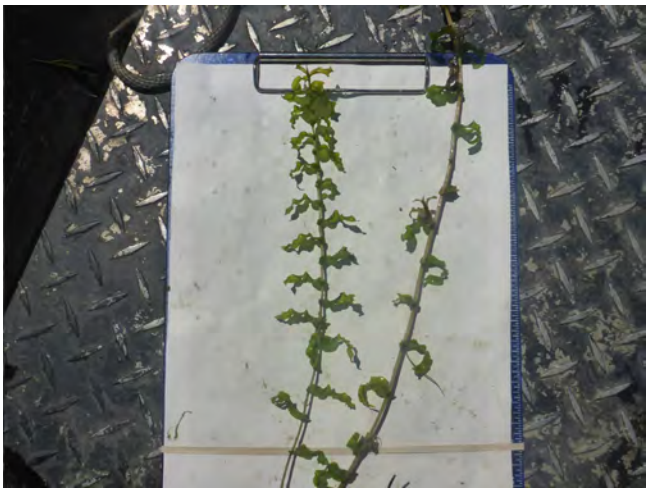


Supplemental Material

Common Aquatic Plants in Prior Lake

Chara (*Chara sp*)

Claspingleaf pondweed (*Potamogeton richardsonii*)



Coontail (*Ceratophyllum demersum*)

Curlyleaf Pondweed (non-native)(*Potamogeton crispus*)

Eurasian watermilfoil (non-native)
(*Myriophyllum spicatum*)

Flatstem pondweed (*Potamogeton zosteriformis*)(WDNR)

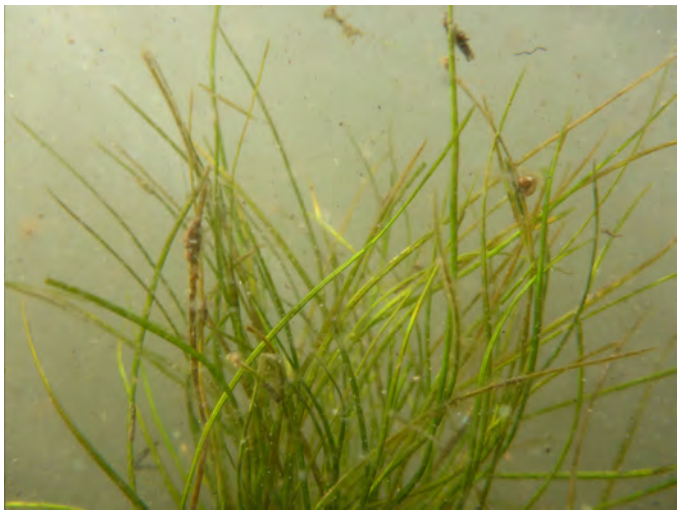
Naiad (*Najas sp*)

Sago pondweed (*Stuckenia pectinata*)

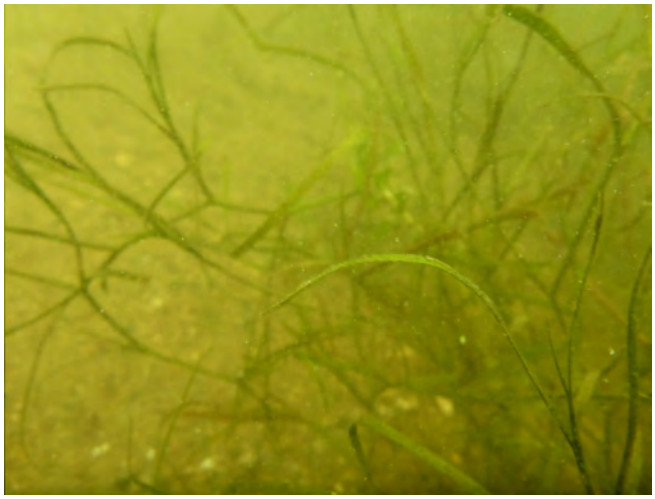
Water celery (*Vallisneria americana*)

Northern watermilfoil (*Myriophyllum sibiricum*)

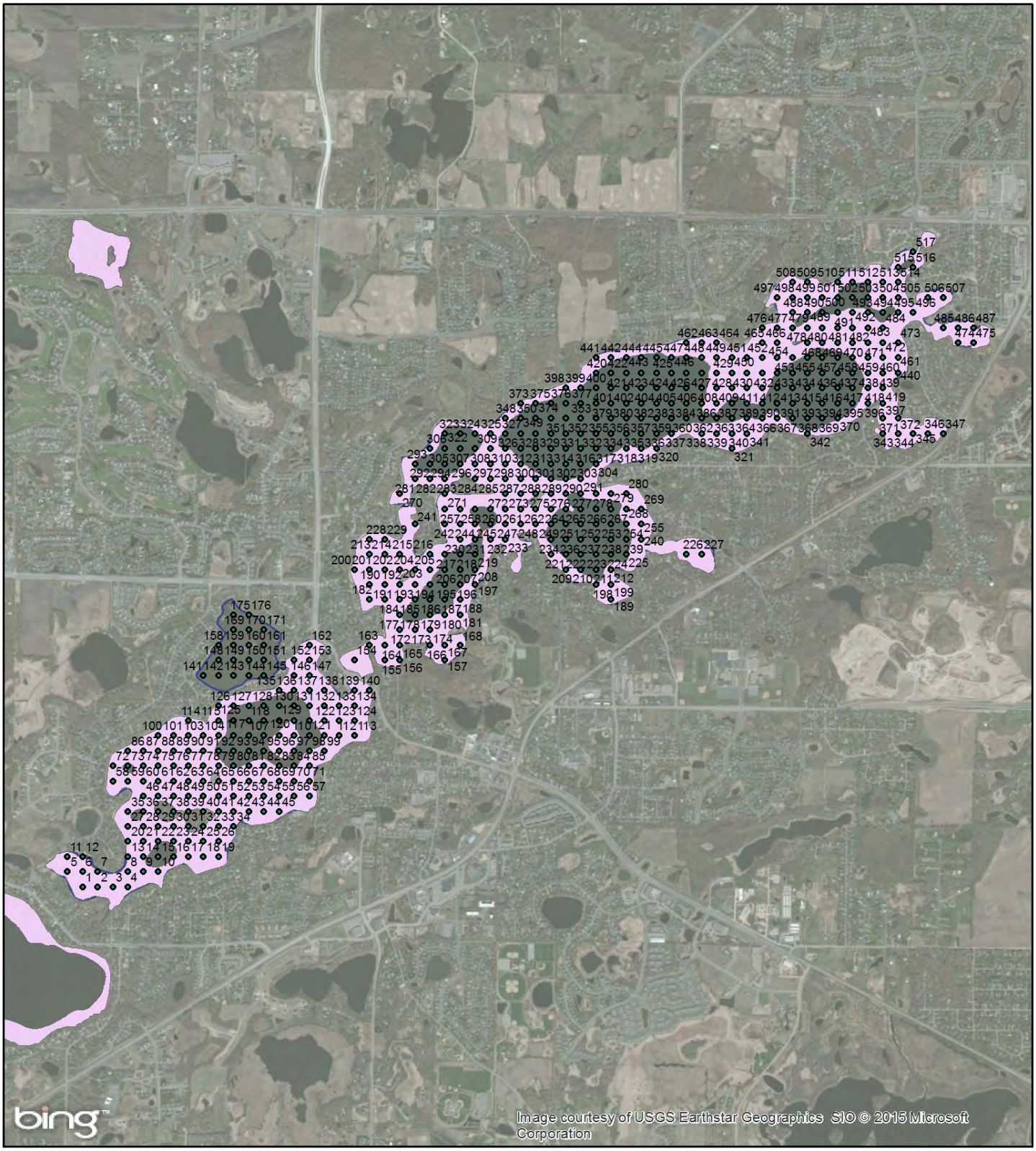
Stringy pondweed (*Potamogeton pusillus*)



Water stargrass (*Heteranthera dubia*)



Prior Lakes Site Map- 516 Points



Point Intercept Site Data for Upper Prior Lake, August 17, 2020

Site	Depth (ft)	Coontail	CLP	Elodea	EWM	NWM	Stringy	Benthic algae	No plants
1	6	1	1					1	
2	6	1						1	
3	5					1		1	
4	7	1			1				
5	5	1						2	
6	6	1						1	
7	5					1		1	
8	8	1	1						
9	10	1							
10	10								1
11	5	1						1	
12	5							1	
13	7					1			
16	13								1
17	11								1
18	12								1
19	9	1							
20	9								1
24	13								1
25	12								1
26	11								1
27	12								1
29	13								1
30	12								1
31	4	1			1				
32	4	1			1	1			
33	12								
34	8	1				1			
35	13								1
41	11								1
42	14								1
43	13								1
44	12								1
45	10								1
46	17								1
47	12								1
48	13								1
49	13								1
50	13								1
55	15								1
56	13								1
57	9	1							
58	10								1
59	12								1
60	14								1
64	10								1
65	7	1			1				
71	8	1							
72	10								1
85	18								1
86	11								1
87	13								1
99	17								1
100	13								1
103	11								1
112	12								1
113	11								1
114	8	1							
124	11								1
125	8	1			1		1		
133	8								1
134	12								1
135	15								1
138	15								1
139	12								1
140	6	1				1			
141	5	1							
142	6	1							
143	5	2							
144	5	2							
145	5	2	1						
147	12								1
148	6	1							
149	6	1							
150	5	1							
151	6								1
152	8								1
153	10								1
161	5	1		1			1		
162	8	1							
169	6	1							
170	6	1		1					
171	5	1		1					
175	5	1							
176	6	1							
Average		1.1	1.0	1.0	1.0	1.0	1.0	1.1	
Occur (85 sites)		33	3	3	5	6	2	8	47
% occur		39	4	4	6	7	2	9	

Point Intercept Site Data for Lower Prior Lake, September 2, 2020

Site	Depth (ft)	Cab-bage	Chara	Chara-stone	Clasp-ingleaf	Coon-tail	CLP	Elodea	EWM	Flat-stem	Float-ingleaf	Fries	Naiads	Nitella	NWM/ Hybrid	Sago	Star duck-weed	Stringy	Water celery	Water star-grass	ZM present	No plants
154	15																					1
155	8					2															1	
156	12																					1
157	6					2			2												1	
163	8																					1
165	14																					1
166	7					2			1										1		1	
167	7				1	2															1	
168	7								1							1		1				
172	18																					1
173	17																					1
174	8																					1
177	19																					1
180	18																					1
181	11						1															
182	10						1															
183	9																		1			
188	17																					1
189	11					1				1									1		1	
190	14																					1
192	5																		1		1	
193	17																					1
197	11					1																
198	9				1					2									1	1	1	
199	19																					1
200	10																					1
201	14																					1
203	12																					1
204	4				1														2		1	
205	14											1										1
209	12													1					1		1	
210	24																					1
211	20																					1
212	13																					1
213	16																					1
215	14																					1
216	11																					1
217	18																					1
219	24																					1
220	13					1															1	
221	24																					1
224	20																					1
225	20																					1
226	25																					1
227	24																					1
228	13																					1
229	11																					1
230	16																					1
232	18																					1
233	10						1													1	1	
234	21																					1
240	14					1																
241	7					1			1										1		1	
242	12						1															
246	15																					1
247	15																					1
248	10						1												1		1	
255	16																					1
256	8					1															1	
257	18																					1
258	20																					1
259	23																					1
261	7									1									1		1	
262	18																					1
263	20																					1
264	16																					1
268	9								1													
269	12					1													1		1	
270	8					2															1	
271	9					1	1														1	
272	9					1	1												1		1	
273	6																		2	1	1	
274	7				1														1		1	
275	12					1				1									1		1	
276	17																					1
277	13																					1
278	16									1											1	
279	14																					1
280	13					1															1	
281	13					2															1	
282	17																					1
283	18																					1

Site	Depth (ft)	Cab-bage	Chara	Chara-stone	Clasp-ingleaf	Coon-tail	CLP	Elodea	EWM	Flat-stem	Float-ingleaf	Fries	Naiads	Nitella	NWM/ Hybrid	Sago	Star duck-weed	Stringy	Water celery	Water star-grass	ZM present	No plants
284	10																		1		1	
285	14																					1
286	4								1										1		1	
287	17																					1
288	22																					1
289	22																					1
291	22																					1
292	30																					1
295	17																					1
296	16																					1
304	17																					1
305	14					1			1	1								1			1	
317	20																					1
318	7									1									2		1	
319	21																					1
320	15																					1
321	10					1			1										1		1	
324	21																					1
325	7		1						1										1		1	
336	24																					1
337	16																					1
338	8								1	1									2		1	
339	18																					1
340	19																					1
341	15					1												1			1	
342	13					1			1										1		1	
343	7								1										2	1	1	
344	8	2				1			1												1	
345	8		1			1			1				1							1		
346	7			3																		
347	6			2		1			1										1			
348	24																					1
363	23																					1
364	25																					1
365	17																					1
366	13																		1			
367	25																					1
368	24																					1
369	23																					1
370	21																					1
372	5				1														2		1	
373	11		1			1				1											1	
374	22																					1
381	8					2			1												1	
387	13					1									1						1	
395	21																					1
396	10									1									2		1	
397	11					1															1	
398	10					1				1									1		1	
399	20																					1
409	12																					1
410	20																					1
417	25																					1
418	13					1															1	
419	7									1									2		1	
422	24																					1
429	12					1			1												1	
430	11								1												1	
432	20																					1
438	20																					1
439	11					2															1	
440	6					1													2		1	
441	10					1				1									1	1	1	
442	20																					1
443	24																					1
444	25																					1
445	24																					1
446	20																					1
447	25																					1
449	20																					1
450	8									1									2		1	
451	13					1				1											1	
452	13					1															1	
453	16					1															1	
454	16					1															1	
455	24																					1
456	34																					1
458	22																					1
460	19																					1
461	15																					1
462	12																		1		1	
463	15																					1
464	14					2																
465	14					1															1	
466	8								1	1									1		1	

Site	Depth (ft)	Cab-bage	Chara	Chara-stone	Clasp-ingleaf	Coon-tail	CLP	Elodea	EWM	Flat-stem	Float-ingleaf	Fries	Naiads	Nitella	NWM/ Hybrid	Sago	Star duck-weed	Stringy	Water celery	Water star-grass	ZM present	No plants
467	6								1	1									3		1	
468	14					1															1	
469	17					1															1	
470	12					2															1	
471	18					1															1	
472	16					1															1	
473	9									1		1							2		1	
474	8					1			2													
475	7					2			3													
476	10								1	1									2	1	1	
477	7				1				1	1									2		1	
478	20																					1
479	14					1															1	
480	14					2															1	
481	11					1			1												1	
482	11					2				1											1	
483	21																					1
484	18																					1
485	6	2							1								1					
486	6	2				1		1	2						1		1					
487	4			1					1										1			
488	16					1															1	
489	20																					1
490	25																					1
491	23																					1
492	19																					1
493	19																					1
494	22																					1
495	16					1															1	
496	9				1					2							1				1	
497	15					1				1											1	
498	19																					1
499	15					1															1	
500	8				1	1				2									1		1	
501	22																					1
502	25																					1
503	21																					1
504	10				1					1											1	
505	10									1									2		1	
506	13			1																	1	
507	14	1				1				1											1	
508	11					1			1	1									1		1	
509	6								3	1									2		1	
510	10		1			1			1	1					1				2		1	
511	22																					1
512	19					1															1	
513	21																					1
514	9									1									2		1	
515	30																					1
516	14					1															1	
517	6					1			1	1	1		1		1				1		1	
Average		1.8	1.0	1.8	1.0	1.2	1.0	1.0	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.4	1.0	1.0	
Occur (218 sites)		4	4	4	9	63	7	1	32	32	1	2	2	1	4	1	3	3	46	7	88	112
% occur		2	2	2	4	29	3	0	15	15	0	1	1	0	2	0	1	1	21	3	40	