Chara Bed in Clearwater Lake, Wright County, MN, August 2024

Clearwater Lake, Wright County: 2024 Aquatic Point Intercept Survey

Point Intercept Survey: August 15, 27, 28, and September 5, 2024

Prepared for:
Clearwater Lake Property Owners Association

Prepared by:
Steve McComas
Jo Stuckert
Connor McComas
Blue Water Science
St. Paul, MN 55116

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Clearwater Lake, Wright County: 2024 Aquatic Point Intercept Survey

Summary

On August 15, 27, 28, and September 5, 2024, a summer point intercept survey was conducted on the 3,187 acre Clearwater Lake, Wright County. Plant growth was found to a depth of 20 feet and aquatic plants were estimated to cover 1,445 acres or 45% of Clearwater Lake. The most common submerged aquatic plant was chara. Chara was observed at 462 sites (1,141 ac of chara). The aquatic plant community in 2024 had 27 species of submerged aquatic plants. This is a good plant diversity condition for a lake in the North Central Hardwood Forest ecoregion setting. The number of individual plant species observed at sample points ranged from 1 to 8 with an average of 1.9 species/point (Figure 1).

Zebra mussels which were first confirmed in 2015, were found attached to aquatic plants at 463 survey sites. Zebra mussel distribution in Clearwater Lake was estimated at 1,144 acres (36% of the lake area)(Figure 1).

Eurasian watermilfoil was found at 1 site (Table 1). Starry stonewort was found in a protected bay during the point intercept survey but not on any point intercept sites.

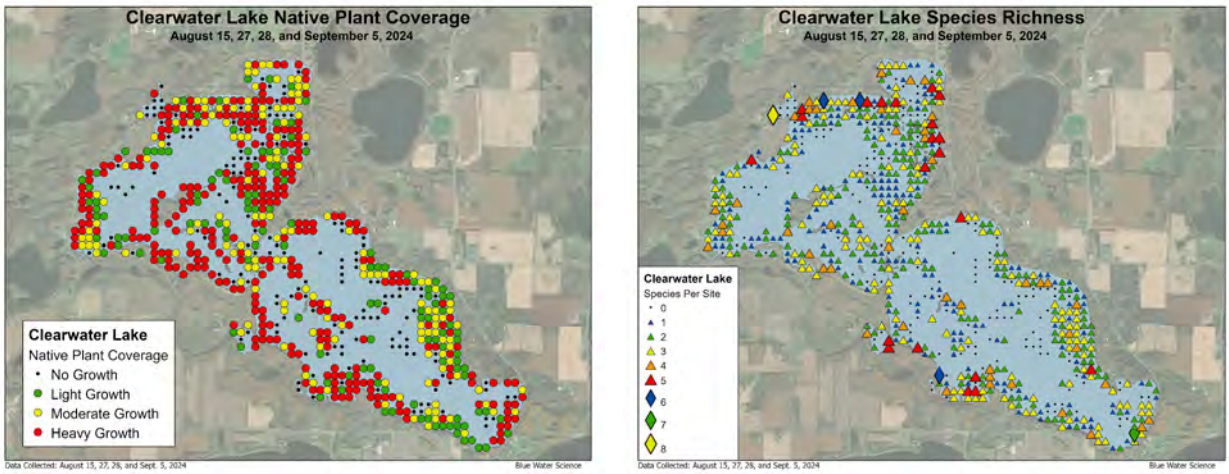

Figure 1. [left] Native plant coverage for each sample site for Clearwater Lake in late summer 2024. [right] Aquatic plant species richness for each sample site for Clearwater Lake in 2024

Table 1. Clearwater Lake aquatic plant occurrences and densities for the August 15, 27, 28, and September 5, 2024 survey. Density ratings are 1-3 with 1 being low and 3 being most dense. Statistics are based on the sites that were within the 20 feet of depth based on MnDNR lake contour map.

	All Sites (n=713)		
	Occur	% Occur	Density
Emergents			
Bulrush (*Scirpus sp*)	63	10	1.8
Cattails (*Typha sp*)	12	2	1.7
Wild rice (*Zizania palustris*)	9	1	1.6
Floatingleaf			
Duckweed (*Lemna sp*)	1	1	1.0
Spatterdock (*Nuphar variegatum*)	16	3	1.5
White waterlily (*Nymphaea sp*)	82	14	2.1

	All Sites (n=713)		
	Occur	% Occur	Density
Submerged			
Marsh marigold (*Bidens beckii*)	1	1	1.0
Coontail (*Ceratophyllum demersum*)	181	30	1.4
Brauns stonewort (*Chara braunii*)	2	1	1.5
Chara (*Chara spp*)	462	77	2.2
Moss (*Drepanocladus spp*)	1	1	1.0
Elodea (*Elodea canadensis*)	11	2	1.1
Water stargrass (*Heteranthera dubia*)	19	3	1.1
Marestail (*Hippuris vulgaris*)	1	1	3.0
Star duckweed (*Lemna trisulca*)	4	1	1.0
Northern watermilfoil (*Myriophyllum sibiricum*)	17	3	1.0
Eurasian watermilfoil (*Myriophyllum spicatum*)	1	1	1.0
Naiads (*Najas flexilis*)	1	1	1.0
Nitella (*Nitella sp*)	2	1	1.0
Starry stonewort (*Nitellopsis obtusa*)	3	1	2.3
Curlyleaf pondweed (*Potamogeton crispus*)	1	1	1.0
Fries pondweed (*P. friesii*)	4	1	1.3
Illinois pondweed (*P. illinoensis*)	120	20	1.1
Floatingleaf pondweed (*P. natans*)	1	1	1.0
Rivers pondweed (*P. nodosus*)	1	1	1.0
Whitestem pondweed (*P. praelongus*)	15	2	1.1
Claspingleaf pondweed (*P. Richardsonii*)	14	2	1.1
Stringy pondweed (*P. sp*)	3	1	1.0
Flatstem pondweed (*P. zosteriformis*)	23	4	1.1
Buttercup (*Ranunculus sp*)	8	1	1.1
Sago pondweed (*Stuckenia pectinata*)	26	4	1.0
Bladderwort (*Utricularia sp*)	111	18	1.2
Water celery (*Vallisneria americana*)	105	17	1.5

Table 2. Statistical data for point intercept surveys conducted in 2017, 2020, 2023, and 2024. Density ratings are 1-3 with 1 being low and 3 being most dense. Statistics are based on the sites that were within the 20 feet of depth based on MnDNR lake contour map. P=present.

	2017 (n=839)			2020 (n=854)			2023 (n=711)			2024 (n=713)		
	Occur	% Occur	Density	Occur	% Occur	Density	Occur	% Occur	Density	Occur	% Occur	Density
Bulrush (*Scirpus sp*)		P			P		65	9	2.0	63	10	1.8
Sagittaria (*Sagittaria sp*)					0.2							
Cattails (*Typha sp*)		P			P		21	3	1.2	12	2	1.7
Wild rice (*Zizania palustris*)		0.5			2.0		15	2	1.4	9	1	1.6
Duckweed (*Lemna sp*)										1	1	1.0
Spatterdock (*Nuphar variegata*)		0.5			1.1		26	4	1.3	16	3	1.5
White waterlily (*Nymphaea sp*)		0.5			4.3		88	12	2.0	82	14	2.1
Marsh marigold (*Bidens beckii*)										1	1	1.0
Coontail (*Ceratophyllum demersum*)		8.5			16.8		179	25	1.4	181	30	1.4
Brauns stonewort (*Chara braunii*)										2	1	1.5
Chara (*Chara sp*)		69.1			72.3		382	54	1.8	462	77	2.2
Moss (*Drepanocladus spp*)										1	1	1.0
Elodea (*Elodea canadensis*)		0.7			0.2		7	1	1.1	11	2	1.1
Water stargrass (*Heteranthera dubia*)		0.4			0.9		12	2	1.2	19	3	1.1
Marestail (*Hippuris vulgaris*)		P			0.2					1	1	3.0
Star duckweed (*Lemna trisulca*)										4	1	1.0
Northern watermilfoil (*Myriophyllum sibiricum*)		1.1			14.0		85	12	1.1	17	3	1.0
Eurasian watermilfoil (*Myriophyllum spicatum*)		1.1			0.4		2	1	1.0	1	1	1.0
Naiads (*Najas flexilis*)		0.2			0.5		65	9	1.1	1	1	1.0
Nitella (*Nitella sp*)							1	1	1.0	2	1	1.0
Starry stonewort (*Nitellopsis obtusa*)										3	1	2.3
Cabbage (*Potamogeton amplifolius*)					0.2		1	1	1.0			
Curlyleaf pondweed (*P. crispus*)		9.8			3.4		3	1	1.0	1	1	1.0
Fries pondweed (*P. friesii*)		7.8			13.5		40	6	1.0	4	1	1.3
Variable pondweed (*P. gramineus*)		2.2			2.5		1	1	1.0			
Illinois pondweed (*P. illinoensis*)		3.1			3.9		101	14	1.1	120	20	1.1
Floatingleaf pondweed (*P. natans*)										1	1	1.0
River pondweed (*p. nodosus*)										1	1	1.0
Whitestem pondweed (*P. praelongus*)		0.2			2.7		24	3	1.0	15	2	1.1
Claspingleaf pondweed (*P. Richardsonii*)		2.0			3.2		25	4	1.1	14	2	1.1
Stringy/Narrowleaf pondweed (*P. sp*)		1.4			3.9		10	1	1.0	3	1	1.0
Flatstem pondweed (*P. zosteriformis*)		6.0			4.6		17	2	1.0	23	4	1.1
Buttercup (*Ranunculus sp*)		2.4			4.3		3	1	1.0	8	1	1.1
Sago pondweed (*Stuckenia pectinata*)		5.2			5.3		83	12	1.2	26	4	1.0
Bladderwort (*Utricularia sp*)		5.1			10.8		36	5	1.0	111	18	1.2
Water celery (*Vallisneria americana*)		4.3			5.7		86	12	1.5	105	17	1.5

Clearwater Lake, Wright County:
2024 Aquatic Point Intercept Survey

Lake ID: 86-025200
Size: 3,187 acres
Littoral area: 1,596 acres
Maximum depth: 73 feet
Mean depth: 19.2 feet

Introduction

Clearwater Lake is located within Wright County. Aquatic plant surveys help characterize the distribution of aquatic plants, assesses changes in the plant community overtime, and helps to track aquatic invasive species. As a general rule, if plant coverage is 40% or greater of the lake area, good water clarity is likely present. That was one parameter of many to be determined with the plant survey effort.

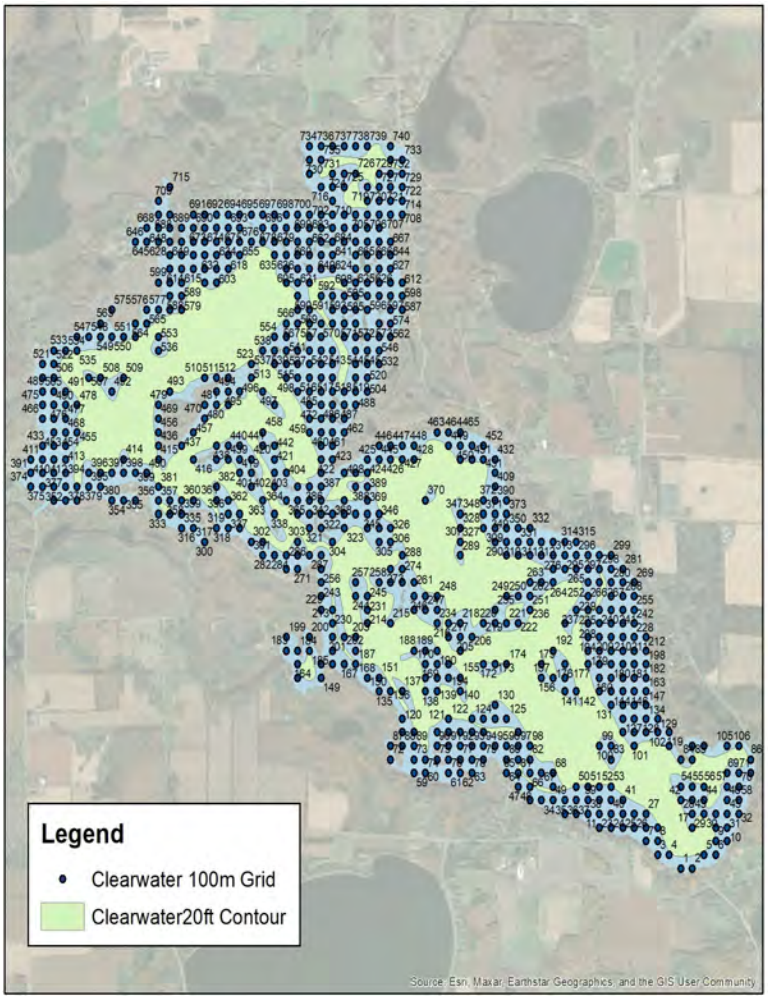

Figure 2. Sample locations for the point intercept aquatic plant survey based on 100 meter spacing. The 20 foot contour is shown in blue and the open water is shown in green.

Methods - Aquatic Plant Surveys

Point Intercept Survey: An aquatic plant survey of Clearwater Lake using a point intercept sampling method was conducted by Blue Water Science using 2 boats per day on August 15, 27, 28, and September 5, 2024. A map and sampling grid were prepared by Blue Water Science and a consisted of a total of 740 points that were distributed throughout the lake. Points were spaced 100 meters apart. Each point represented about 2.47 acres. At each sample point, plants were sampled with a rake sampler. In water less than 15 feet, a fixed-head rake sampler on a telescoping pole was used (Figure 3). In water deeper than 15 feet, a double-ended rake sampler on a rope was tossed into the lake to sample plants. Plants were sampled to depth of 20 feet. A plant density rating was assigned to each plant species on a scale from 1 to 3. A density of a “1" indicated sparse growth and a “3" rating indicated heavy plant growth.

Aquatic plant density ratings from 1 to 3.

Figure 3. Two different rake samplers used during the Clearwater Lake surveys.
[left] Fixed head sampler.
[right] Double headed throw rake.

Point Intercept Survey - August 15, 27, 28, and September 5, 2024

The submerged aquatic plants were common in Clearwater Lake for the 2024 point intercept plant survey. Chara was the dominant plant in Clearwater Lake. Coontail and illinois pondweed were also common. A total of 27 submerged aquatic plants, 3 floatingleaf aquatic plants, and 3 emergent plant were found (Table 3). Non-native Eurasian watermilfoil and curlyleaf pondweed were observed in Clearwater Lake at 1 site each.

The non-native starry stonewort was observed in a secluded bay in Clearwater Lake at 3 sample sites.

A summary of plant density and occurrence for individual species is shown in Table 3.

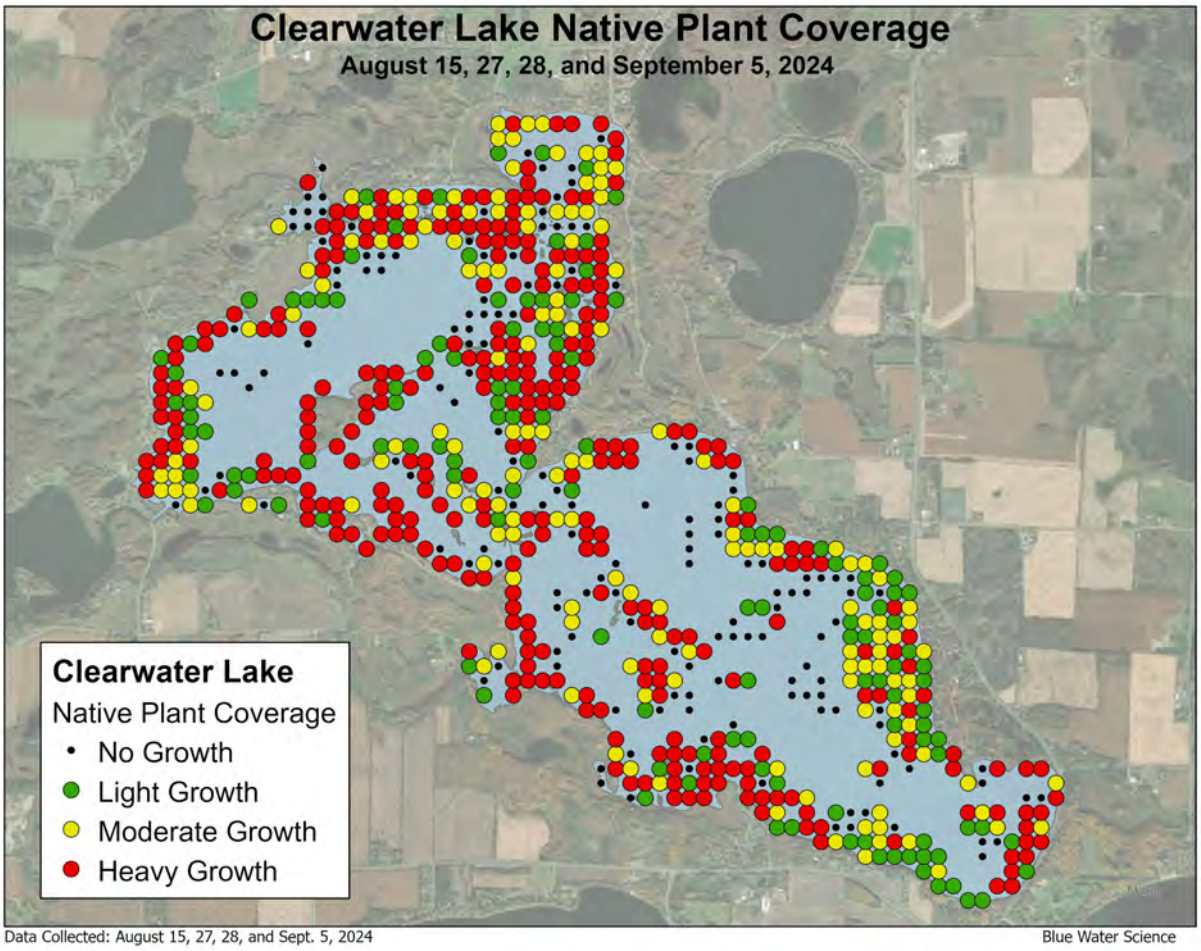

Figure 4. Native plant coverage at each sample site on Clearwater Lake during the 2024 point intercept survey.

Table 3. Clearwater Lake aquatic plant occurrences and densities for the August 15, 27, 28, and September 5, 2024 survey. Density ratings are 1-3 with 1 being low and 3 being most dense. Statistics are based on the sites that were within the 20 feet of depth based on MnDNR lake contour map.

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Aquatic Plant Maps for Clearwater Lake

The number of aquatic plant species found at a sample point is referred to as species richness. The species richness in Clearwater Lake for each sample site is shown in Figure 5. The number of plant species at a sample point ranged from 0 to 8 with an average of 1.9 species per sample point. This is a good species richness. Additional native aquatic plant maps for individual plant species are shown on the page. Overall, aquatic plant growth in Clearwater Lake is mostly moderate.

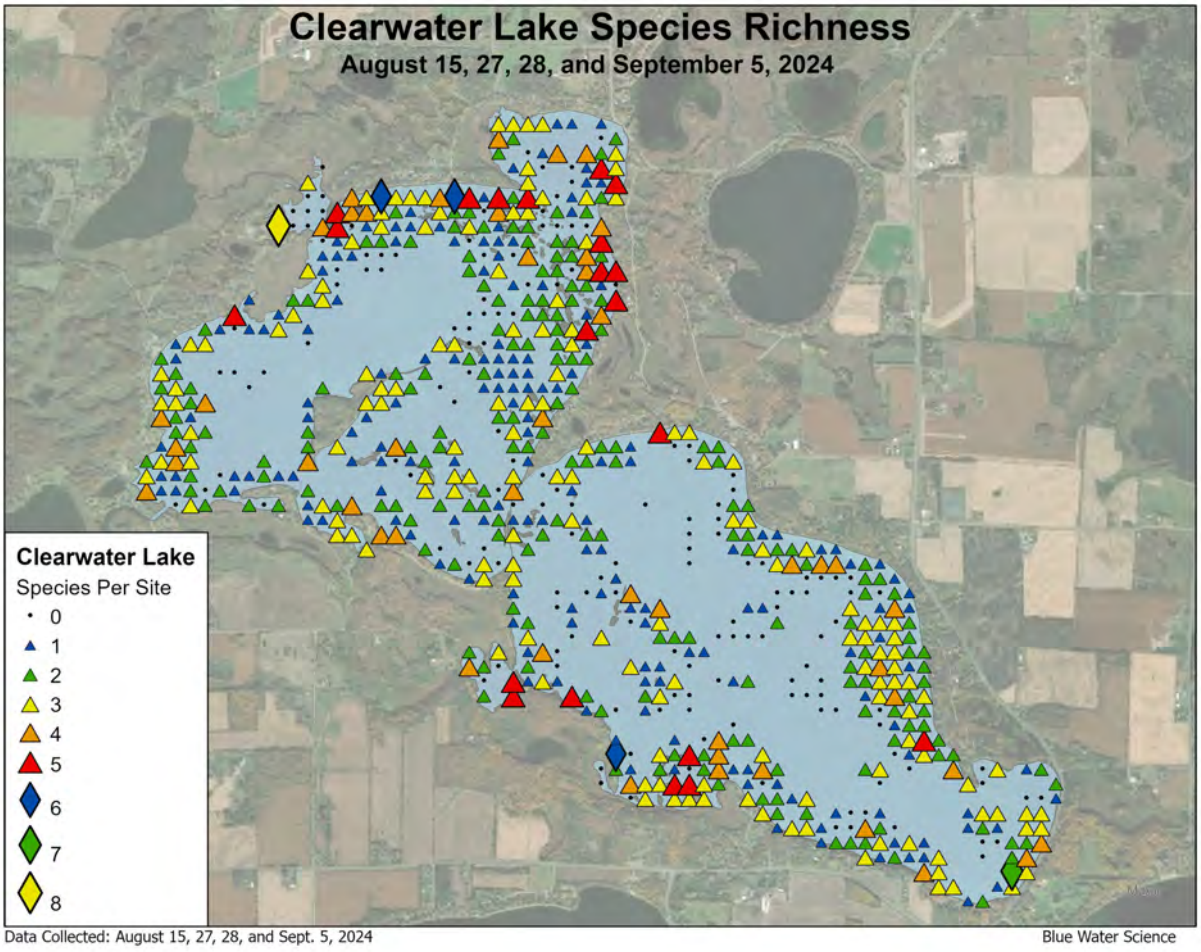
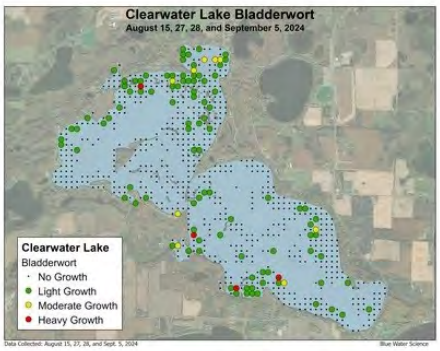
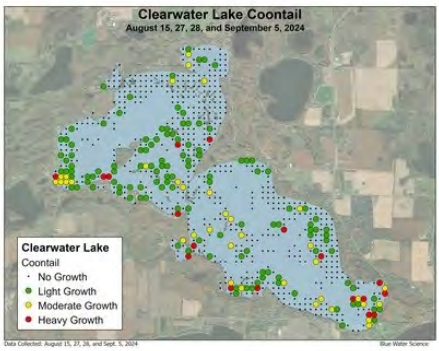
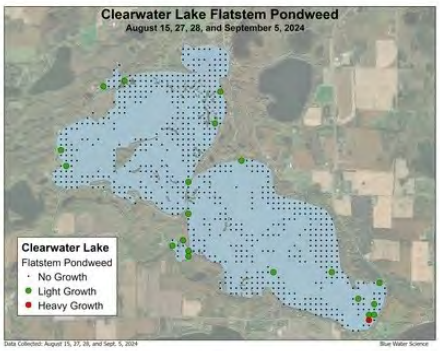


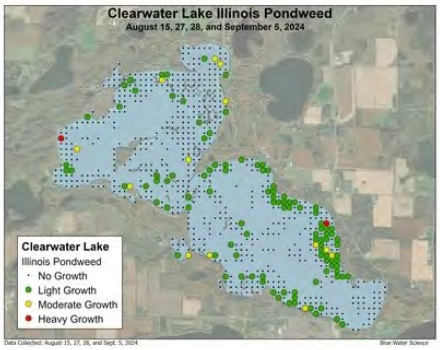
Figure 5. The number of aquatic plant species found at a sample point.

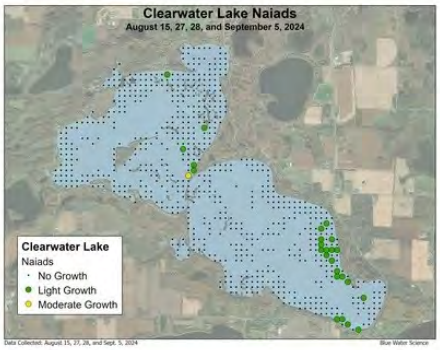
Aquatic Plant Abundance and Distribution

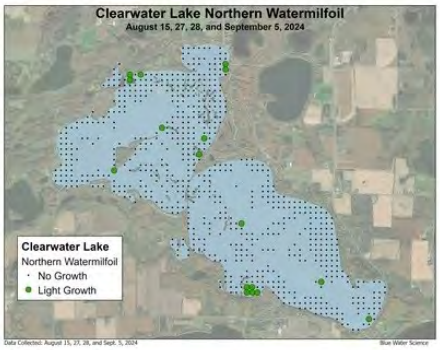


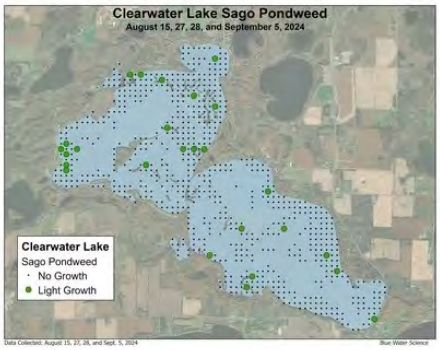


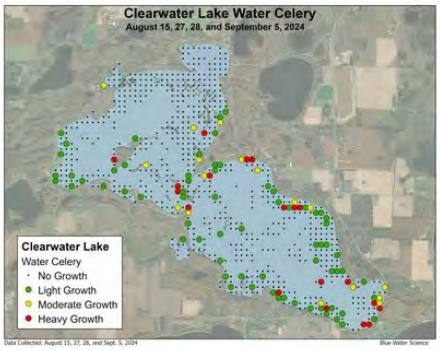


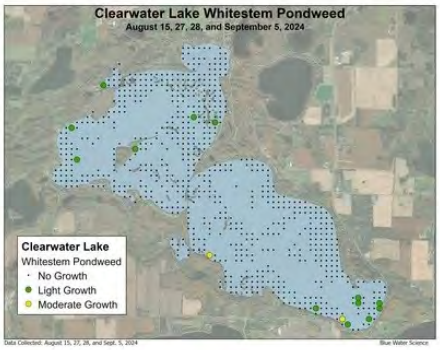












Clearwater Lake Point Intercept Survey MnDNR Statistics

A summary of plant statistics from the point intercept survey is shown in Tables 4 and 5 and Figure 6. Plants were observed in depths up to 20 feet and a total of 621 points were sampled from 0 to 20 feet of depth. However, 95% of plant occurrences were recorded from 1 to 12 feet representing 569 points (Table 4).

The aquatic plant coverage of Clearwater Lake was estimated at 1,445 acres or 45% of the lake area. Since plant coverage exceeds the 40% coverage criterium for good water clarity, Clearwater is predicted to good water clarity in most years.

Table 4. Clearwater Lake aquatic plant statistics (using MnDNR format).

Total # Points Sampled	**706**
Depth Range of Rooted Veg	**0-20 feet**
Maximum Depth of Growth (95%) in feet	**11**
# Points in Max Depth Range	**573**
# Points in Littoral Zone (0-15 feet)	**595**
% Points w/ Submersed Native Taxa	**97**
Mean Submersed Native Taxa/Point	**1.9**
# Submersed Native Taxa	**23**
# Submersed Invasive Taxa	**3**
Max Depth of SSW in feet	**4**
% Frequency of SSW	**1**
Mode Rake Abundance of SSW	**3**
Max Depth of EWM in feet	**5**
% Frequency of EWM	**0**
Mode Rake Abundance of EWM	**NA**
Max Depth of CLP in feet	**3**
% Frequency of CLP	**0**
Mode Rake Abundance of CLP	NA

Table 5. Aquatic plants sampled by depth.

Depth (feet)	Number of Sites Sampled at that Depth	Percent Occurrence of Plants at that Depth
0	3	0%
1	4	0%
2	23	91%
3	114	99%
4	143	99%
5	102	99%
6	69	100%
7	44	100%
8	29	100%
9	14	100%
10	15	93%
11	13	100%
12	5	80%
13	6	83%
14	8	100%
15	3	33%
16	3	100%
17	2	0%
18	4	25%
19	5	0%
20	7	14%
All sites	616	

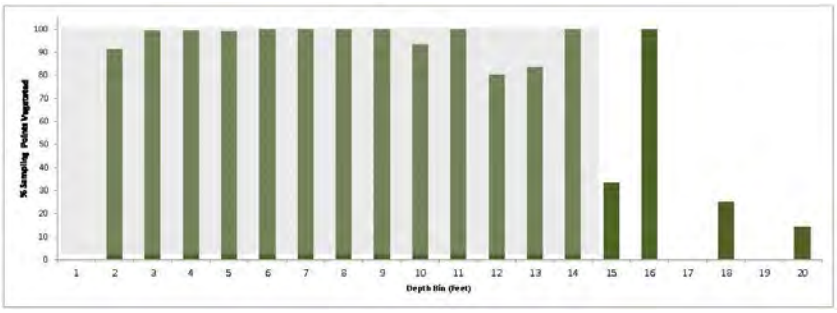


Figure 6. Growth depth of plant colonization out to 20 feet.

Representative Aquatic Plants in Clearwater Lake

A total of 27 submerged aquatic plant species were observed in the Clearwater Lake aquatic plant surveys. Representative aquatic plant conditions and species are in Figure 7.

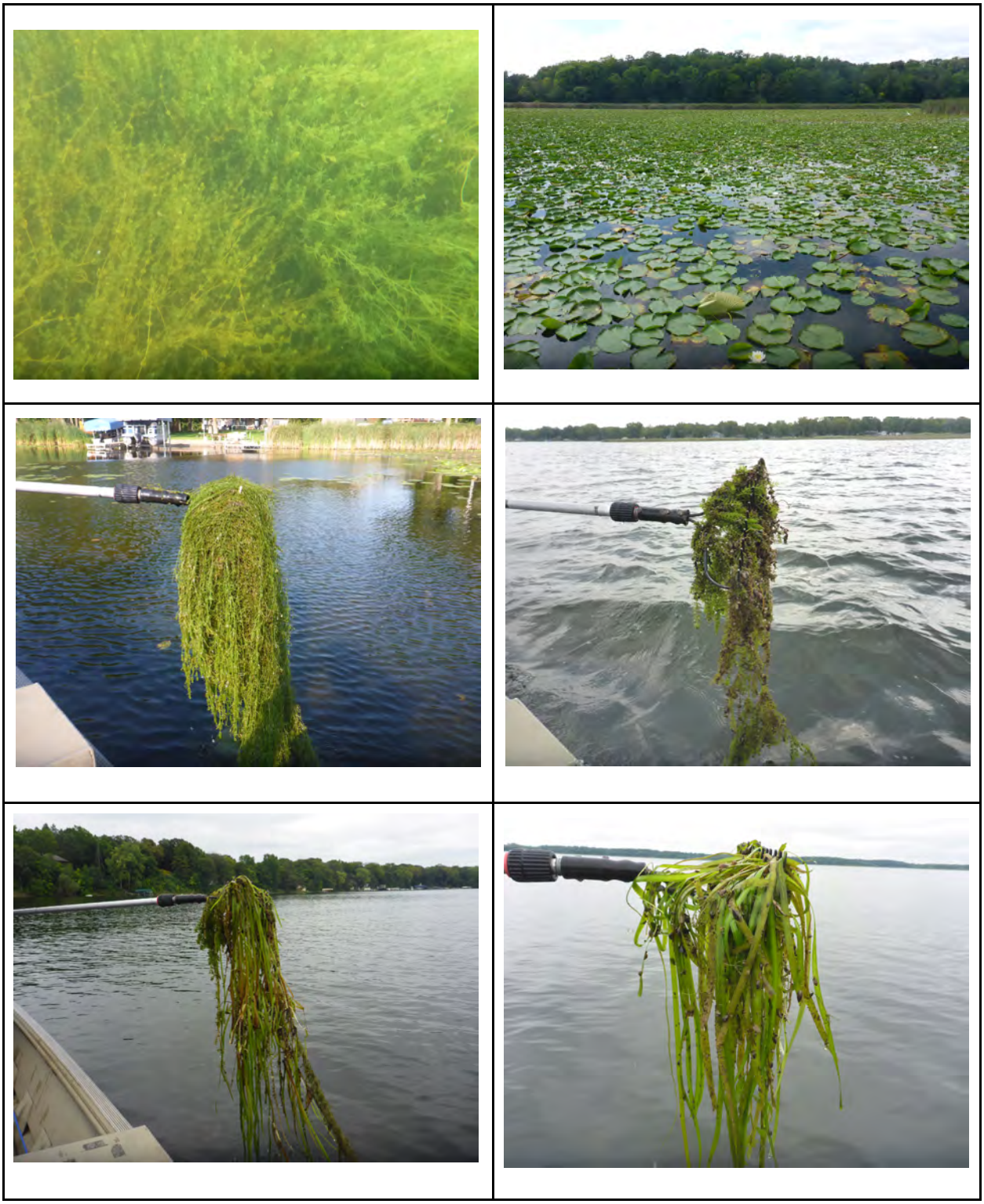
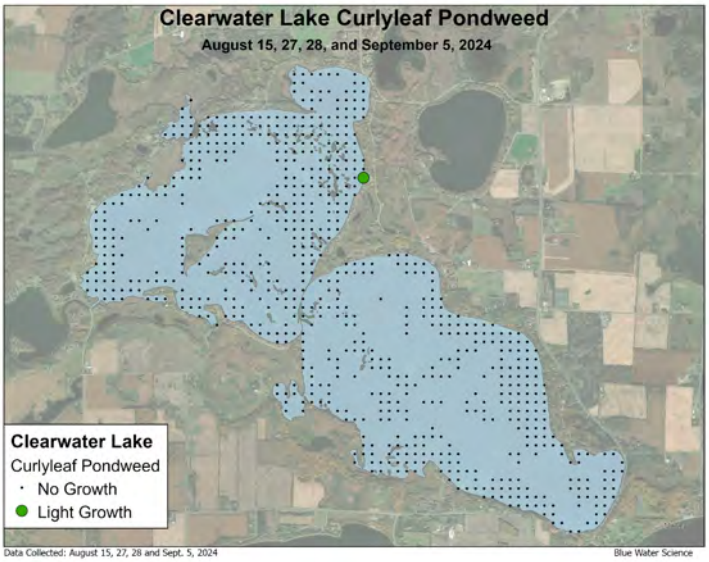
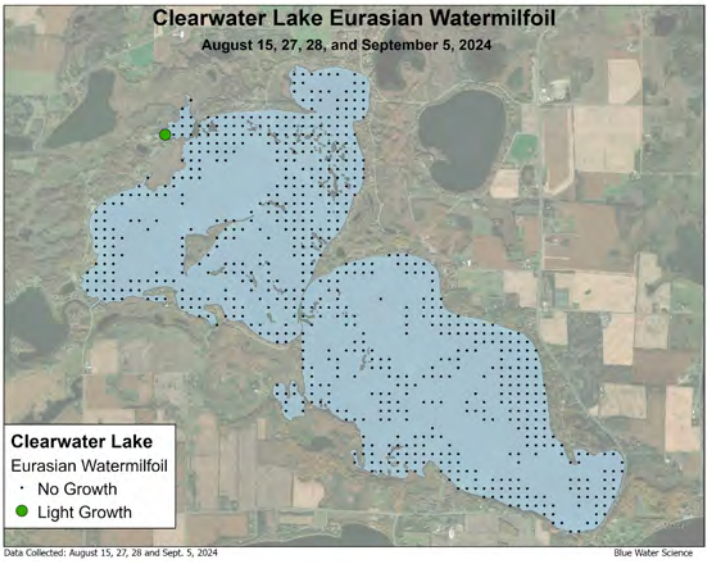


Figure 7. Representative aquatic plants and conditions in Clearwater Lake in 2024.

Aquatic Invasive Species Found in the Point Intercept Survey





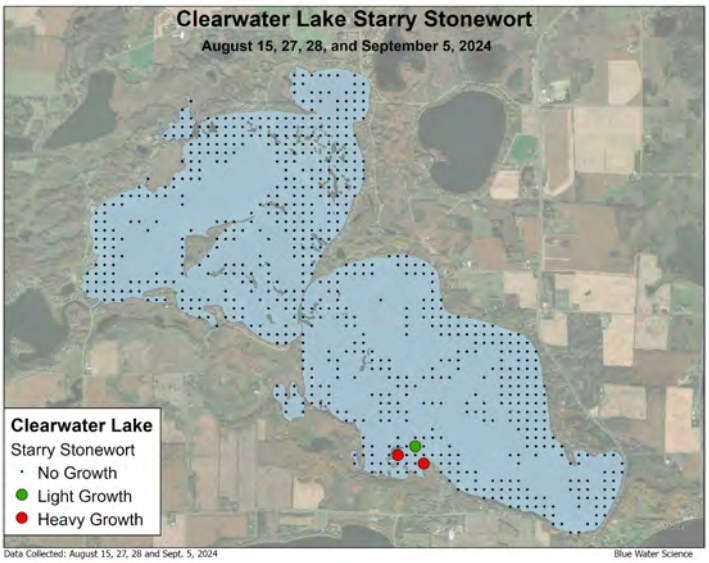
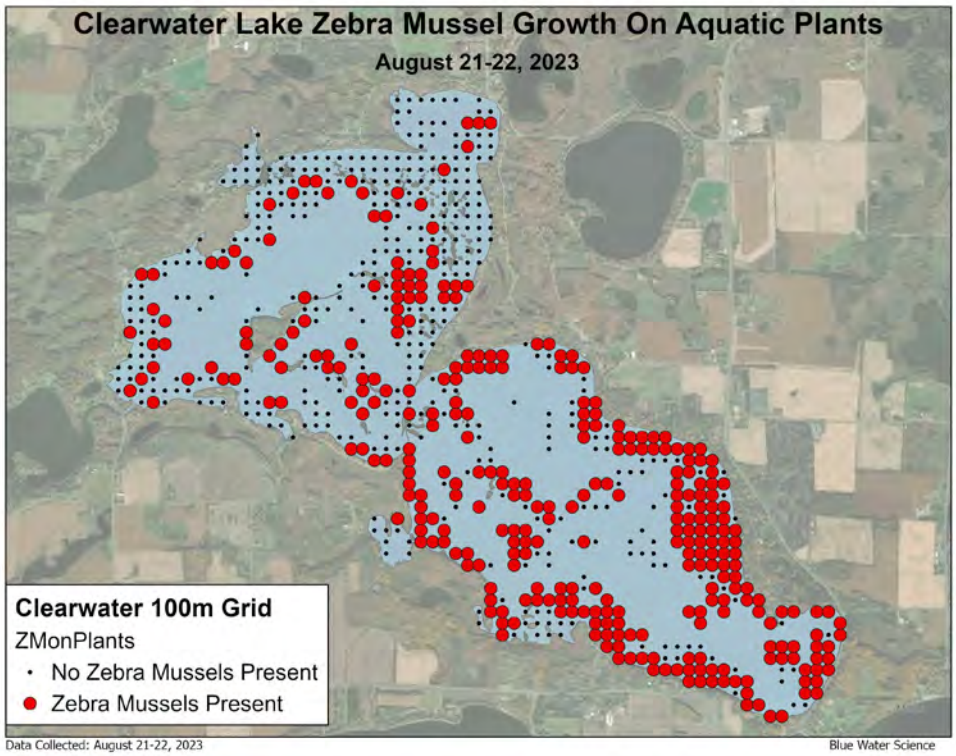


Figure 8. Three AIS plants were found in Clearwater Lake in the point intercept survey in 2024.

Zebra Mussel Distribution in Clearwater Lake

During the aquatic plant point intercept survey, the presence of zebra mussels (an AIS) attached to plants was noted. A map of zebra mussel distribution was prepared and is shown in Figure 9. In 2023, zebra mussels were found at 323 survey sites and are estimated to cover 798 acres or 25% of the lake area. In 2024, zebra mussels were found at 463 survey sites and are estimated to cover 1,144 ac or 36% of the lake area of Clearwater Lake. Zebra mussels were found to a depth of 20 feet.



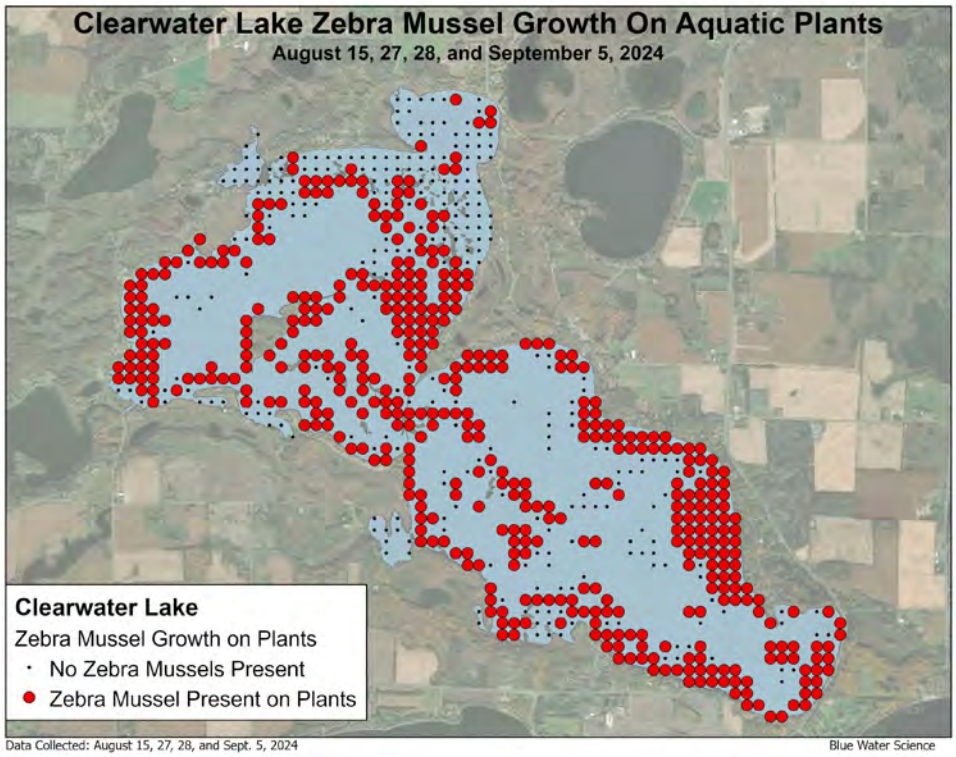


Figure 9. Zebra mussel distribution for August 2023 and August/September 2024 were based on observations of zebra mussels attached to aquatic plants collected during the point intercept survey.

Water Quality Summary and Transparency for Clearwater Lake

SUMMARY | WATER QUALITY | BIOLOGY | HYDROLOGY | STEWARDSHIP

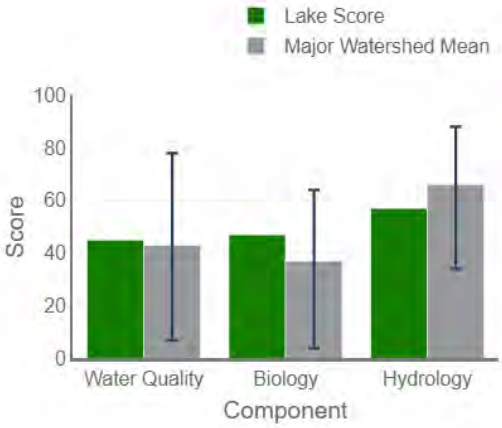
Lake Health Score (▲): 50

Lake Health Grade: C

Lake Health Score Major Watershed Mean (●): 50

Lake Health Score Major Watershed Min/Max: 20/75

Lake Health Component Scores



Water Quality Score: 45

Water Quality Score Major Watershed Mean: 43; **Min/Max**: 7/78

Biology Score: 47

Biology Score Major Watershed Mean: 37; **Min/Max**: 4/64

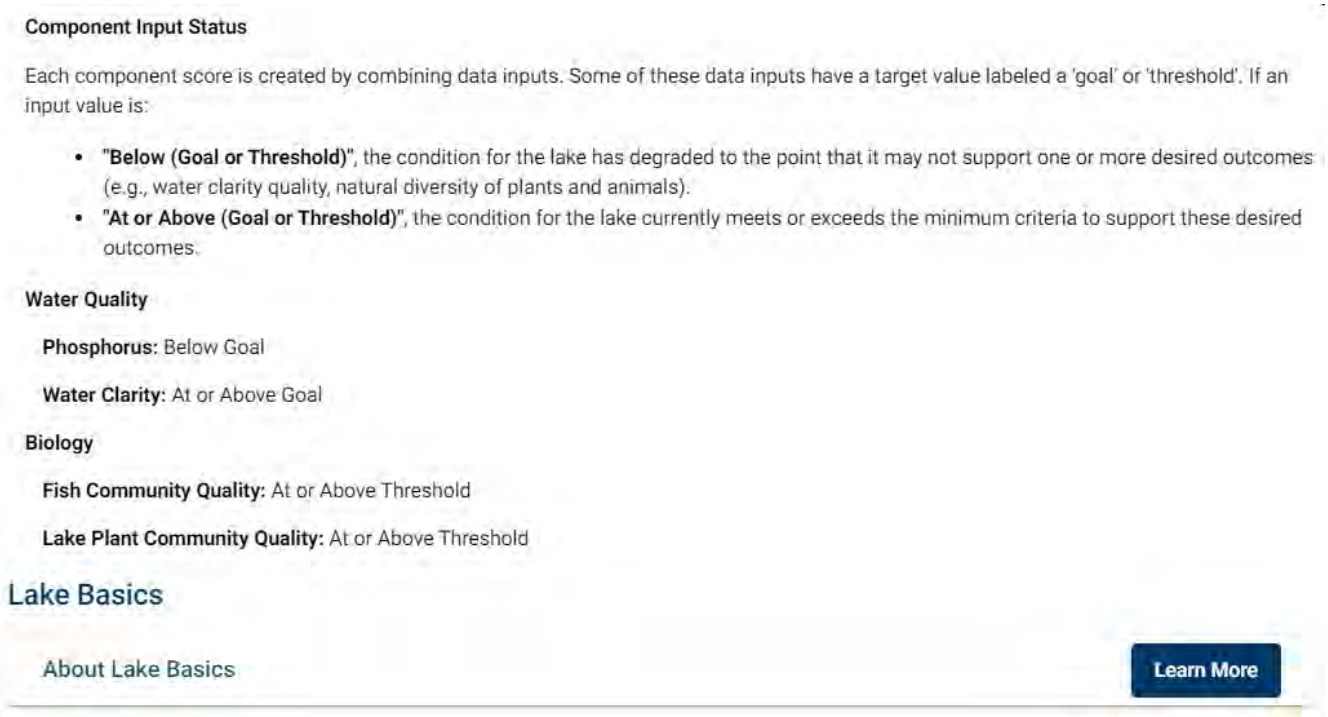
Hydrology Score: 57

Hydrology Score Major Watershed Mean: 66; **Min/Max**: 34/88

Clearwater (86025200) Basics

Excel CSV

Area (acres)	3,187
Lakeshed Area (acres)	101,708
Maximum Depth (feet)	73
Maximum Depth (meters)	22.3
Mean Depth (feet)	19
Mean Depth (meters)	5.9
Littoral Area (acres)	Not Evaluated
Shoreline (miles)	22.3
Water Body Class	Lake or Pond
Managed Fisheries Lake	Yes
Lake Finder	Open Lake Finder to Lake
Basin	Mississippi Headwaters (0701)
Major	Mississippi River - St. Cloud (17)
Catchment ID	1700600
County (Majority)	Wright
County (Percent)	Wright: 80%
County (Percent)	Stearns: 20%



Conclusions

Clearwater Lake has average water quality. Although zebra mussel filtering activity has increased water clarity in the last few years, the abundance of a diverse native aquatic plant population will help sustain good water quality in the long term.

APPENDIX

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bulrush	Cattails	Wild rice	Duck weed	Spatterdock	White lilies	Bladderwort	Buttercup	Chara	Clasping-leaf	Coontail	CLP	Elodea	EWM	Flatstem	Floating-leaf	Fries	Illinois	Mares tail	Marsh marigold	Moss	Naiad	Nitella	NWM	River	Sago	Stonewort - Braun s	Star duckweed	SSW	String	Water celery	Water stargrass	White stem	ZM on plants
1	4									1																								1
2	4									1													1											1
3	5											1							1												1			1
4	5									1													1										1	1
5	7																														3			1
6	6								1			2																			3			1
7	5									1									1				1								1			1
8	6									1													1										2	1
9	8								1		1	2		1		3									1								1	1
10	4											1															1				1			1
11	4									2									1													1		1
12	4									1																								1
13	6									1																					1			1
14	5									1																								1
15	8																															1		1
16	8							1																							1	1		1
18	8											3				1																		1
19	7								1			3		2		1																		1
20	4									3																								1
21	5									1									2															1
22	7																		1												1			1
23	5									1																							1	1
24	6									2									1												1			1
25	8																														3			1
26	13							1				2																			1			1
27	11											1																						1
29	27																																	
30	8							1																								1		1
31	8									3		1																						1
32	7											1		1																	3		1	1
33	4									1																								1
34	4	1								1									1															1
35	4									3									1												1			1
36	5									3																								1
37	26																																	
38	27																																	
39	10							1				2																		1		1		1
40	9									1																					2			1
41	31																																	
42	14											1																						1
43	13											1																					1	1
44	14											2																						1
45	7															1															3	1		1
46	7											2																			2		1	1
47	3									3									1												1			1
48	4									2																					1			1
49	4									3									1															1
50	6																															1		1
51	deep																																	
52	deep																																	
53	14											2																						1
54	11											3																						1
55	11											2				1																	1	1
56	9									1		3											1											1
57	6									3		1																			1			1
58	6								1	3																					2			1
59	2		3																															1
60	5							1		1		1																						1
61	3						3	1																	1									
62	3						3	1																	1									
63	3						3	1																	1									
63	4					2		1				3		1		1													1						
64	4									3									1												1			1
65	6									3																					3			1
66	4									3									1															1
67	5									3																								1
68	6									2		1							1															1
69	23																																	
70	22																																	
71	10											3																						1
72	0																																	
73	7							1		1		3																			1			1
74	11							3		1		1																						1
75	5					2				2		2																						1
76	4						3	1				1													1		1							
77	7						1	1				1													1						1			
78	5	2				2						3																						1
79	4									3																				3				
80	4									3																								1
81	18																																	
82	13									1																								
83	15																																	
84	6											1																			2	1		1
85	24																																	
86	6											2																			2			1
87	0																																	
88	3	3								3																								1
89	13											2																						1
90	4	3								1																								
90	4	1								2																								1
91	4																													3				
91	5							1				1																				1		
92	5																																	
93	4									3		1																						
94	4	1						1		3									1															1
95	4									3																								1
96	5									3																								1
97	8							1		1		1																		1				1
98	9							2				2																						1
99	8									2									1															1
100	8							1																	1						3			1
101	33																																	
102	7							1				1											1								3			1
103	22																																	
104	4						1			3																					1			1
105	4									3																								
106	6											3				1																		1
107	4	3					1			2				1					1												1			1
108	23																																	
109	5									3									1												1			1

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bulrush	Cattails	Wild rice	Duckweed	Spatterdock	White lilies	Bladderwort	Buttercup	Chara	Clasping-leaf	Coontail	CLP	Elodea	EWM	Flatstem	Floating-leaf	Fries	Illinois	Mares tail	Marshmarigold	Moss	Naiad	Nitella	NWM	River	Sago	Stonewort - Braun s	Star duckweed	SSW	String	Water celery	Water stargrass	White stem	ZM on plants
110	4	2								3																								1
111	4	1						1		3									1								1								1
112	4	2																											1						1
113	5									3		1							1												1			1
114	9							3				1		1																					1
115	15																																		
116	6									3																									1
117	6									2									1				1												1
118	5																		1				1												1
119	4									3									1																1
120	4									3																									1
121	4									3																									
122	25																																		
123	8							1		3		1																					1		
124	8							1				1																							1
125	4									1						1																			1
126	10									2									1																1
127	7									3						1																1			1
128	6									1									1				1				1					1			1
129	4									1																						1			1
130	20																																		
131	22																																		
132	7									1																									1
133	5									2									1																1
134	5									1									1																1
135	5									3																									1
136	5									3																						1			1
137	26																																		
138	7									1																									1
139	33																																		
140	41																																		
141	29																																		
142	30																																		
143	12											2																				1			1
144	33																																		
145	7									2									1																1
146	6									3									1				1												1
147	5									1									1																1
148	8									1									1																
149	9								2			3				1			2														1		
150	5								1			1							2								1							2	1
151	5									3									1																1
152	7									2									1																1
153	6							1		3		1																							1
155	33																																		
156	41																																		
158	35																																		
159	8									3																									1
160	8							1				3							1																1
161	5									1									1				1				1								1
162	6									2									2																1
163	6									3									1													1			1
164	22																																		
165	7					1		1		3		1				1																			
166	5									3																									1
167	4						2	1		3																									1
168	4									3																									1
169	5									3																									1
170	6									3																									1
171	7								1	2		1																							1
172	20																																		
173	8									3																									1
174	8							1		1																									1
175	39																																		
176	30																																		
177	6							1		2																									1
178	9											1																			1				1
179	6									1									1				1												1
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182	5									1													1												1
183	7					1		1								1																	1		
184	11							2				1																							
185	21																																		
186	12									1		3																							1
187	20																																		
188	7									2		2							1																1
189	4									3																									1
190	5									3																									1
191	50																																		
192	26																																		
193	10									1		2																							1
194	6									1									2													1			1
195	6									2									1				1									1			1
196	5									1								1														1			1
197	6									3																									1
198	5									1									1																1
199	5						1			3																									
200	12											2				1																1			
201	6									3																									1
202	6							1		3		1																				1			1
203	49																																		
204	24																																		
205	6									2																									1
206	6									3																									1
207	8									2																									1
208	6									3									1																1
209	5									2									1				1												1
210	5									3		1							1																1
211	5									1													1												1
212	4									2									1																1
213	6							3		3		2																							1
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215	9							1				1																				1			1
216	7											2						1																	1
217	6									3									1																1
218	4	1								3																									1
219	27																																		
220	29																																		
223	26																																		
224	10							1		1		1																							1
225	9							1		1									1																1
226	8									2																									1
227	5									2		1							1																1
228	5									3									1																1

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bul-rush	Cat-tails	Wild rice	Duck weed	Spat-ter-dock	White lilies	Blad-der-wort	Butter cup	Chara	Clasp-ing-leaf	Coon-tail	CLP	Elo-dea	EWM	Flat-stem	Float-ing-leaf	Fries	Illinois	Mares tail	Marsh mari-gold	Moss	Naiad	Nitella	NWM	River	Sago	Stone wort - Braun s	Star duck-weed	SSW	String	Water celery	Water star-grass	White stem	ZM on plants
229	3									3																								1
230	6							1		3																								1
231	8											2																						1
232	24																																	
233	4									3																								1
234	4									3																1					1			1
235	24																																	
236	10											3														1								1
237	32																																	
238	11									1		1																						1
239	10							2		2		1																						1
240	7									2									1				1											1
241	6									1		1							1															1
242	6									2									1															1
245	8									2																								1
246	3		3							3																								1
247	7									3																								1
248	4									2		1							1						1									1
243	4									3																						1		1
249	14											1																						1
250	9											1																						1
251	30																																	
252	11							1		2		1																						1
253	6																		1															1
254	6									1									3				1									1			1
255	5									2																								1
256	4									3																								1
258	33																																	
259	4									3																								1
260	2																																	
261	5							1	1	1		2																						1
262	34																																	
265	19																																	
266	11							1				1																						1
267	23																																	
268	7									1																						1		1
269	5									1																								1
270	5									3																								1
271	6							2				3		1																				1
272	6									2						1																2		1
273	30																																	
274	8											2																						1
275	36																																	
276	54																																	
277	31																																	
278	40																																	
279	11																		1												1			1
280	7									2																					1			1
281	5									1																								1
282	4									3																								1
283	5									3									1															1
284	33																																	
285	6											1		1																		2			1
286	31																																	
287	6											1							1												3			1
292	6									1									1												3			1
293	7									3		1							1												1			1
294	5									1																					3			1
295	9							1				2							1												3			1
296	11							1		1		1																			1			1
297	7																														2			1
298	4									2									1															1
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300	4						3	1		2																								
301	4									3									1															1
302	12																																	
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304	4							1		3																								1
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308	6									2																								1
309	6									2									1															1
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312	5									3									1															1
313	4									3									1												2			1
314	4									1																								1
315	4									2																								1
316	3						3	1		1																								
317	5						3			1		1																						
318	4						1			3		1																				1			1
319	4						2	1		3		1																							1
320	3									3																								1
321	3									2																					1			1
322	4	3								2									1															1
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323	5							1		3																								1
324	45																																	
325	4									3																					1			1
326	4	1								3																								1
328	33																																	
329	5							1		2																								1
330	4									1									1															1
331	4									1																								1
332	4																		1															1
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335	4						2			3																					1			
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339	5																														3			1
340	3									1																					1			1
341	4									2																								1
342	4									3																								1
343	2									3																								1
344	4							1		2																								1
244	40																																	
345	10							1				2							1															1
346	4									3																								1
349	6									3									1							1								1
350	5									3									1												1			1
351	4																																	
352	5											1						2													1			1
353	4									1		1																						
354	6						2					1																						

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bul-rush	Cat-tails	Wild rice	Duck weed	Spat-ter-dock	White lilies	Blad-der-wort	Butter cup	Chara	Clasp-ing-leaf	Coon-tail	CLP	Elo-dea	EWM	Flat-stem	Float-ing-leaf	Fries	Illinois	Mares tail	Marsh mari-gold	Moss	Naiad	Nitella	NWM	River	Sago	Stone wort - Braun s	Star duck-weed	SSW	String	Water celery	Water star-grass	White stem	ZM on plants
355	13																																	
356	8						1																								1			
357	5									3																								1
357	7						2					3				1																		
358	5						2			3		1																						
359	6									3									1															1
360	6							1		1		1							2															1
361	7									3		1																						1
362	3									3									1															1
363	5									3		1																						1
364	5									2		1																						1
365	8										1																				3			1
366	18											2																						1
367	20																																	
368	24																																	
369	23																																	
371	30																																	
372	5									2																					1			1
373	4									1									1															1
374	4				1		3					2																			1			
375	6											2																						
376	10											2																						1
377	5											2						1																1
378	19																																	
379	4									3																					1			1
380	4											1																						
381	5									3		1																						1
382	6									3																								1
383	5									3		1							1															1
384	4									2		1							1															1
385	9									1		2																						1
386	39																																	
387	3									1						1															1	1		1
388	30																																	
389	11											1																						1
390	39																																	
391	2						3					3																			1			1
392	7											2																						1
393	10											2																						1
394	5											1																			1			1
395	17																																	
396	14											1																						1
397	8											1																						1
398	4	2								3																								1
399	8											3																						1
400	6											3																						1
401	18																																	
402	4	2								3									1															1
403	5									1		1																				1		1
404	6									3		1							1															1
405	4									2													2								1			1
406	30																																	
407	4									1									1												2			1
408	7									1		1																			3			1
409	36																																	
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411	3						3			2		1																						1
412	2									2		1							1								1							1
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414	5									3		1																						1
415												1													1						1	1		1
416	4									3																								1
417	4									2																								1
418	deep																																	
419	6									3																								1
420	6									3		1																						1
421	4		3							1																								1
422	23																																	
423	3																						1											1
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425	5									2																					1			1
426	5									3																								1
427	5									3									1															1
428	6									3																								1
429	38																																	
430	6									1		1																			2			1
431	6									3									1															1
432	5									3		1							1															1
433	3									3																								1
434	2									3						1			1								1							1
435	3						2					1																						1
436	4									3		1																						1
437	3									3																					1	1		1
438	14											1																						1
439	5									1		2															1				2			1
440	6									1		1																						1
441	6									1		1																						1
442	5						2			2		1																						1
443	5									3		1																						1
444	3									3													1											1
445	4									1									1												1			1
446	4									3																					1			1
447	4									3									1															1
448	4									3																								1
450	33																																	
451	5									3									1															1
452	4									3									1															1
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454	2	1	3				1			1																								1
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456	5									1																					3			1
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459	42																																	
460	4									2		1							2															1
461	4									2																								1
462	3									1																					2			1
463	6											1				1			1		1										2			1
464	7									1		1																				3			1
465	7									1		1																				3			1
466	3	3								3		1																				1			1
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468	12											1																						
469	4									3																								1
470	5									3																								1

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bulrush	Cattails	Wild rice	Duck weed	Spatterdock	White lilies	Bladderwort	Buttercup	Chara	Clasping-leaf	Coontail	CLP	Elodea	EWM	Flatstem	Floating-leaf	Fries	Illinois	Mares tail	Marshmarigold	Moss	Naiad	Nitella	NWM	River	Sago	Stonewort - Braun s	Star duckweed	SSW	String	Water celery	Water stargrass	White stem	ZM on plants
471	5									1		1																						1
472	4	3								1																								1
473	3									3																								1
474	3									1		1													1							1		1
475	3									3						1										1								1
476	3	1					1			1																								1
477	4	3								1																								1
478	5							1		1									2							1								1
479	4									3																								1
480	3						2			3																							1	1
481	4						2			3		1																						1
482	11											1																						1
483	deep																																	
484	4									1													1											1
485	4									3																								1
486	3							1		3																1								1
487	3							1		3		1																						1
488	3									3																1								1
489	3							1		3																								1
490	3									3																1						1		1
491	7									2		1																						1
493	3						3			1																								1
494	3	1					3			1																								1
495	5	3					1			1																								1
496	3									3		1																						1
497	27																																	
498	7											3																						1
499	4									1																								1
500	14											1																						1
501	4									3																								1
502	4									3																								1
503	3									3																								1
504	3									1																						3		1
505	5							1				1							3															1
506	14									1		1																						1
510	4	3								3																						1		1
511	4									3																								1
512	3									3		1																						1
592	24																																	
513	4									3		1																						1
514	32																																	
515	5									3		1																						1
516	5									3																								1
517										3																								1
518	4									3																								1
519	4									3									1						1									1
520	9											3																						1
521	4									1																						1		1
522	5									3																								1
523	3									1																								1
524	20											1																						1
525	5									3		1																						1
526	3									3																								1
527	3									2																								1
528	5									3																								1
529	4									3																								1
530	4									1																						3		1
531	8									1									1															1
532	4									3																						1		1
533	3									3																								1
534	5							1				1																					1	1
537	5									1		1													1									1
538	4									3		1														1								1
540	28																																	
541	7									3																								1
542	4							1		3																								1
543	4									1																						2		1
544	4									1													1											1
545	7							1		3		1																						1
546	3									3																								1
547	3						3			1																								1
548	3									3																								1
550	3									2																								1
551	5									3																								1
552	7							1		3		1																						1
553	8									3																								1
554	26																																	
555	27																																	
556	7									3		1																						1
557	10							1		1		1																						1
558	6							1				1							1															1
539	0																																	
559	4	1								1																								
560	4	3					1			2																								1
561	3						2			3						1													1				1	
562	4									1																						2		
563	4						3	1		1									1													1		1
564	3									3																								1
565	5	2						1		2																								1
566	30																																	
567	31																																	
568	35																																	
570	5									3																							1	1
571	4	1								2																								1
572	3							1		2																								1
573	3									3																								
574	3						3			2																			1			1		
575	3									1																								1
576	2	3								1																								
577	2	3								1																								
578	5	2								1		1																						1
579	6									1																								1
580	22																																	
581	10									1		1																						1
582	3	1								1																								1
583	4	3								1																								
584	4	1					2			1																								
585	3	3								1																								
535	5	1						1		3																								1
586	3						1			3																								
587	3												1						1					1					1			1		
588	3							1		2									1															1
589	21																																	
589	21																																	
590	5									3		1																						1

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bul-rush	Cat-tails	Wild rice	Duck weed	Spat-ter-dock	White lilies	Blad-der-wort	Butter cup	Chara	Clasp-ing-leaf	Coon-tail	CLP	Elo-dea	EWM	Flat-stem	Float-ing-leaf	Fries	Illinois	Mares tail	Marsh mari-gold	Moss	Naiad	Nitella	NWM	River	Sago	Stone wort - Braun s	Star duck-weed	SSW	String	Water celery	Water star-grass	White stem	ZM on plants
591	5									3																								1
593	7									3																								1
595	4							1		3																								
596	3									3																1								
597	4									3																								
598	3																																	
599	2	1	1				2			2																								
600	4									3																								1
601	19																																	
602	27																																	
603	22																																	
604	7							1		2																								1
605	5									2																								1
606	6	3								2									1															1
607	4	1								3																								1
608	3							1		2																								1
609	17																																	
610	9	3				1	1			1																								
611	3			2		1	3			1	2																							
612	3	1		2						1	1								2															
613	3									3																								1
614	4									3																								1
615	16											1																						1
616	29																																	
617	27																																	
618	27																																	
619	4									1									1															1
621	3									3																								1
622	18																																	
623	5							1		3	1															1								1
624	3						1			3																								
625							3			2																								
626	3	2					3			1	1																							
627	3						3			1																								
629	4									3																								
630	3	1						1		2																								
631	5									3									1															
632	6							1		2																								1
633	4									3																								1
634	5							1		2																								1
635	5									2																								1
636	1		1																															
637	3									3																								
638	3									3																								1
639	3									3																								1
640	4							1		3																								
641	3					1				1																								
642	3					2				1																								
643	3	2						1						1																				
644	2						3			1	1			1		1																		
645	5			1			1					1			1	1															2	1	1	
646	28																																	
647	19																																	
648	2			1			2													3							1						
649	3			2			1	1		3									1														
650	1		1																															
651	3									3																								
652	3	1						3		2																								1
653	3									1																								1
654	3									3																								1
655	2	2					2			2																								1
656	4									3																								1
657	3	2								3																								1
658	3						3	1		3																								
659	3							1		3																								
660	3									3																								1
661	3	1								3																								1
662	3	2								2																								
665	22																																	
666	1		1																															
667	3						2			1	1			1																				
668	22																																	
669	35																																	
670	24																																	
671				1			3	1		1						1																		
672	3			1			3												1						1								
673	3	2					2	1		2																								1
674	3						1	1		3																								
675	2	1								3																								
676	3									2																								
677	3									1									2							1								1
678	2		1				2			3																								
679	9							2				2																						
680	22																																	
681	3	2					2	1		2																								
682	3						3	1		2																								
684	1		1																															
683	2						2	1		2																								
685	11							1				2																						1
686	4									2																								1
687	3	2								2																								
688	22																																	
689	20																																	
690	5		1				2				1														1		1							
691	3			1			1			1																								1
692	2	1	1				3			1														1	1		1							
693	3	2						1		2																								
694	3					1	2			2																								
695	3					2	3			2																								
696	3					1				1									1			1												
697	3			3				1			1								1				1				2							
698	4					2	2	1		3		1																						
699	3									3																								
700	3	3				2	1	1		2																								
701	2						3			2																								
702	2	1				1	3	1		2																								
703	3						1	1		3																								
705	7									3																								1
706	5							1		3	1																							
707	4									2	1																							
708	3									1									1													1		
709	3						1	1		3																								
709	3	2								3																								1
710	4						3	2		2																								1
711	26																																	

Individual Site Data for the Point Intercept Survey for Clearwater Lake for August 15, 27, 28, and September 5, 2024.

Site	Depth (ft)	Bul-rush	Cat-tails	Wild rice	Duck weed	Spat-ter-dock	White lilies	Blad-der-wort	Butter cup	Chara	Clasp-ing-leaf	Coon-tail	CLP	Elo-dea	EWM	Flat-stem	Float-ing-leaf	Fries	Illinois	Mares tail	Marsh mari-gold	Moss	Naiad	Nitella	NWM	River	Sago	Stone wort - Braun s	Star duck-weed	SSW	String	Water celery	Water star-grass	White stem	ZM on plants
712	6									2																								
713	4									2																								
714	3	1					3				1														1	1								
716	16											2																						
717	4	2						1		3																								
718	28																																	
719	22																																	
720	15											1																						
721	4	1					2	1		1									2															
722	3	1					2																		1									
723	8							1		1																								
724	19																																	
725	16											1																						
726	10							2		2		1							1															
727	7							2			1								2								1							
728	7							2		2																								1
729	3	1						1		3																								1
730	5					2	2	1									1																	
731	10							1				2																						
732	20																																	
733	5							1		3																								1
734	7						1	1		2																								
735	4						3			2		1																						
736	3	1					1			2																								
737	3						1	1		2																								
738	4									3																								
739	5									3																								1
740	3									3																								
Average		1.8	1.7	1.6	1.0	1.5	2.1	1.2	1.1	2.2	1.1	1.4	1.0	1.1	1.0	1.1	1.0	1.3	1.1	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.0	2.3	1.0	1.5	1.1	1.1	
Occur (out to 20 ft) (616 sites)		63	12	9	1	16	82	111	8	462	14	181	1	11	1	23	1	4	120	1	1	1	26	2	17	1	26	2	4	3	3	105	19	15	463
% occur		10	2	1	0	3	13	18	1	77	2	29	0	2	0	4	0	1	19	0	0	0	4	0	3	0	4	0	1	0	0	17	3	2	