



Curlyleaf Pondweed Sample from Spring Lake, May 20, 2024

Curlyleaf Pondweed and Eurasian Watermilfoil Delineations and Assessments in Spring Lake, Scott County, Minnesota, 2024

Curlyleaf Pondweed Delineation: April 17, 2024
Curlyleaf Pondweed Treatment: May 3, 2024 (19.34 ac)
Curlyleaf Pondweed Assessment: May 20, 2024
EWM Assessment: July 23, 2024

Prepared for:
**Spring Lake Association
and Prior Lake/Spring
Lake Watershed District**



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Size: 592 acres (MnDNR LakeFinder)
Littoral area: 290 acres
Maximum depth: 37 feet

Overview

Spring Lake is located within Scott County. An early season meandering survey in 2024 was used to characterize the status of curlyleaf pondweed (CLP) and Eurasian watermilfoil (EWM) on April 17, 2024. A total of 331 sites were sampled. A special emphasis was given to the nearshore area. Curlyleaf pondweed was sampled at 51 sites out of 331 sites on the April 17, 2024 delineation survey. Curlyleaf pondweed treatment was recommended for a single area totaling 19.34 ac. Eurasian watermilfoil was found at 12 sites with light growth during the April delineation. Due to low lake levels, much of the riparian area which is defined as from the shoreline out to 150 feet, was around 2 feet deep or less. There was very little treatable CLP in the riparian zone.

On May 20, 2024, a meander survey assessed growth of CLP and checked the status of EWM. CLP was controlled in the treatment area with some patches of heavy growth found on the south side of Spring Lake. EWM was observed at 4 sites with light growth.

On July 23, 2024 an assessment was conducted to characterize the status of EWM. A total of 155 sites were sampled. Curlyleaf pondweed was sampled at 3 sites out of 155 sites on the July 23, 2024 delineation survey. Eurasian watermilfoil was found at 11 sites with light growth during the survey.

Methods

Nearshore Meander Survey: A GPS meandering surveys were conducted using a meandering path around the entire lake. At each sample point, plants were sampled with a rake sampler.

Curlyleaf Pondweed Delineation: At the time of the spring curlyleaf delineation in April, only a fraction of the peak curlyleaf biomass is present compared to what could be present in June, at its peak. Therefore, CLP growth surveyed in April is delineated prior to curlyleaf developing peak biomass.

Predicting curlyleaf growth at its peak abundance in June is based on curlyleaf stem counts on a rake sampled in April. After a short sweep of about 1-foot (which samples about 0.1 m²), if one or two stems (10-20 stems/m²) were collected on the rake sweep, it was predicted that this area would produce only future light growth at its peak and was not delineated for treatment. Alternatively, sites where 3 stems (30 stems/m²) were collected per rake sample future potential growth was considered to be moderate. However, 4 curlyleaf stems (40 stems/m²) or more per rake sample generally indicated some plants had developed runners and would likely produce

heavy growth in the next few weeks and this site would be marked for potential treatment. Curlyleaf at heavy growth can have stem densities of 400 stems/m² or greater. This early season survey method used for determining curlyleaf pondweed spot herbicide treatments is similar to the methodology published in a peer reviewed journal (McComas et al, 2015)*.

Rake Sample	Early Season Density (stems/m ²)	Potential Future Growth	Map Color Code
1-2 stems	10-20 stems/m ²	Light	Green
3 stems	30 stems/m ²	Moderate	Yellow
4+ stems	40+ stems/m ²	Heavy	Red

CLP and EWM Assessment Methods

A CLP assessment and EWM delineation was conducted by Blue Water Science on May 20, 2024. 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 below.

At each meandered sample point, a sampling rake was lowered into the water and a plant sample was taken. The plant species were recorded and the density of each species was assigned. Densities were based on the coverage on the teeth of the rake. Density ratings ranged from 1 to 3 with 1 being sparse and 3 being heavy growth (Figure 1). Based on these sample sites, a plant distribution map was constructed.

Chart of Aquatic Plant Density Ratings



Figure 1. Aquatic plant density ratings from 1 to 3.

*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. <https://doi.org/10.1080/10402381.2015.1014583>

Results

Curlyleaf Pondweed Delineation Results: On April 17, 2024 a curlyleaf pondweed delineation survey sampled 331 sites. Curlyleaf pondweed was growing most frequently in 5-10 feet of water in Spring Lake. Curlyleaf pondweed was found at 51 out of 331 sample sites primarily with light to heavy growth. A single area of projected heavy growth was delineated for CLP treatment totaling 19.34 ac (Figure 2).

Spring Lake Curlyleaf Pondweed Delineation and Treatment
April 17, 2024

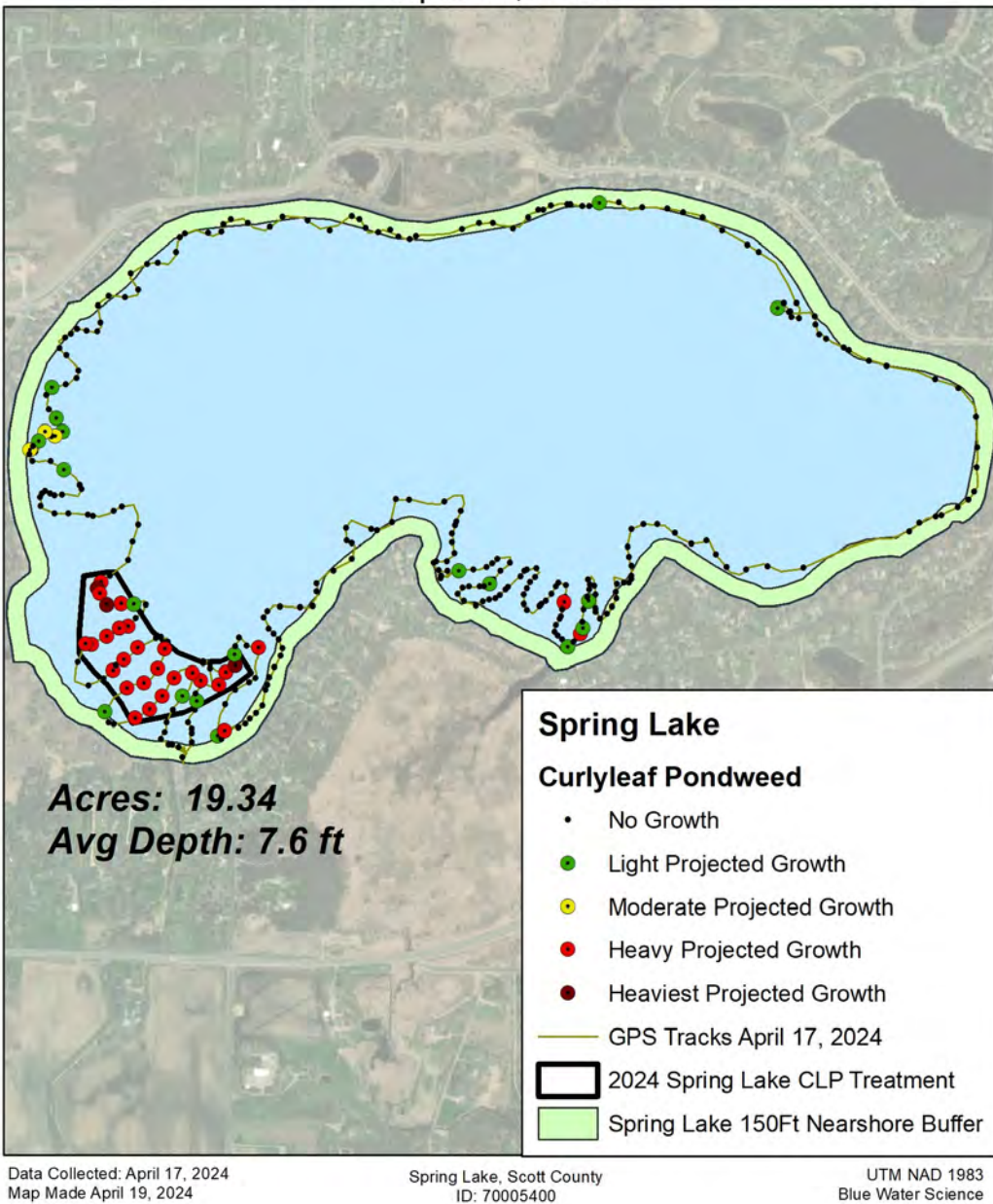


Figure 2. Spring Lake potential treatment areas of curlyleaf pondweed on April 17, 2024.

Curlyleaf Pondweed Assessment Results: A curlyleaf pondweed assessment survey was conducted with a meander survey on May 20, 2024. Curlyleaf pondweed was found at 31 meander sample sites (Figure 3). Curlyleaf pondweed was most common in 4-8 feet of water. Curlyleaf pondweed growth was a mix of light to heavy growth. Curlyleaf pondweed was treated on May 3, 2024. Control in 19.34 acres treatment site was mostly good.

Spring Lake Curlyleaf Pondweed Assessment
May 20, 2024

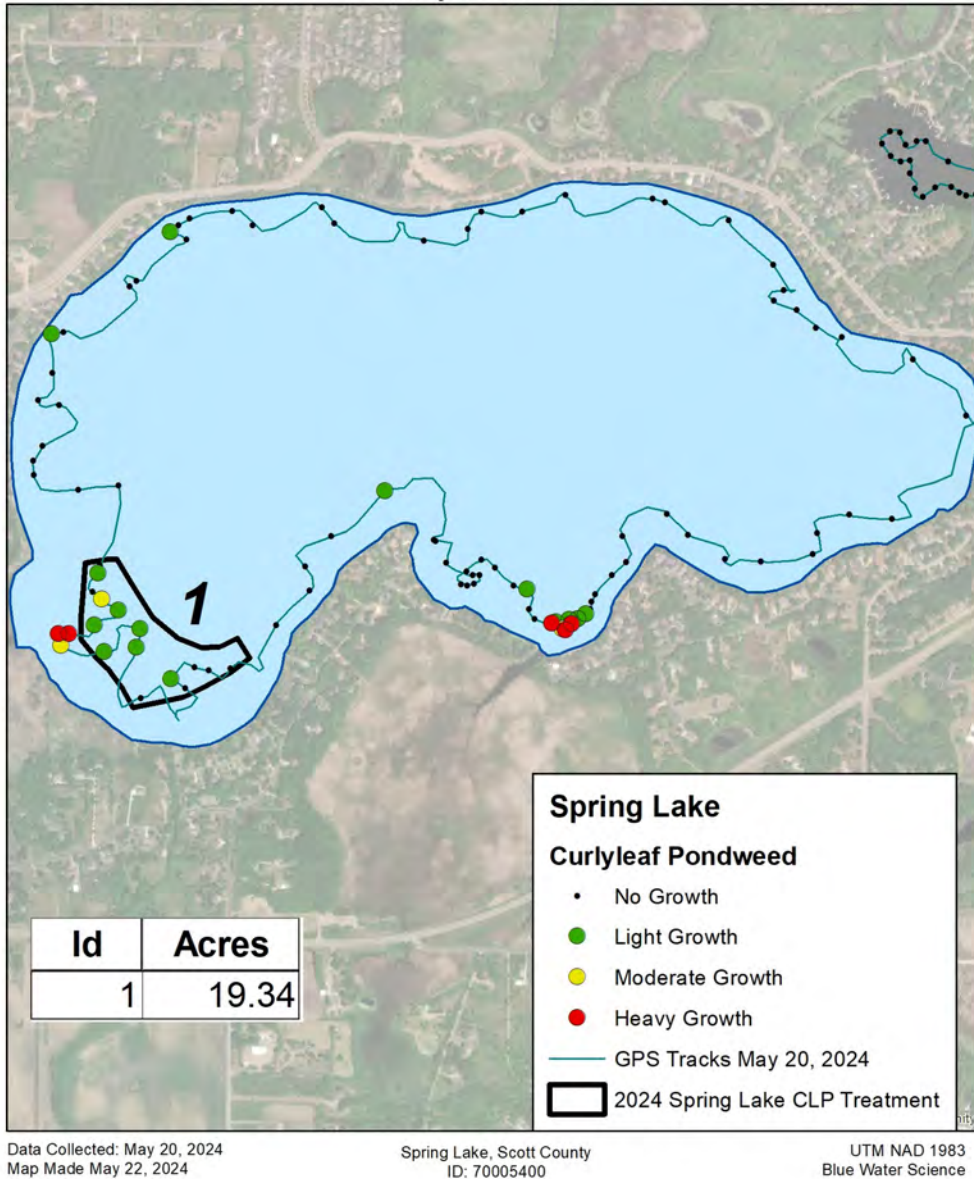


Figure 3. Spring Lake curlyleaf pondweed growth and densities on May 20, 2024.

Eurasian Watermilfoil Delineation Results: On July 23, 2024 an EWM delineation survey sampled 155 sites. Eurasian watermilfoil was growing most frequently in 4-7 feet of water in Spring Lake. Eurasian watermilfoil was found at 11 out of 155 sample sites with light growth (Figure 4). A treatment area of light growth but concentrated near a private marina was delineated for EWM treatment totaling 0.54 ac (Figure 5).

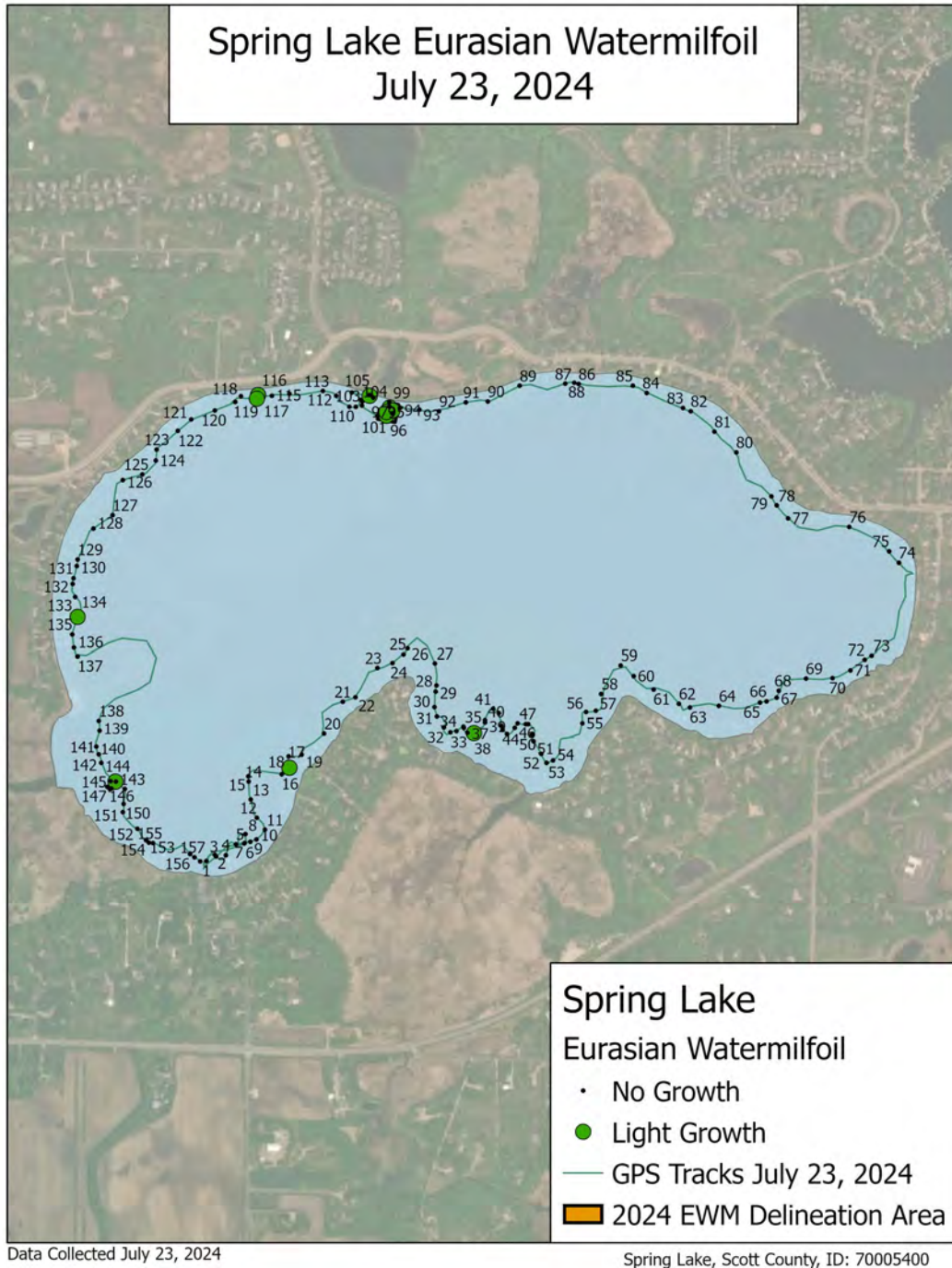


Figure 4. Spring Lake potential treatment areas of EWM on July 23, 2024 by a marina on the north side of the lake.

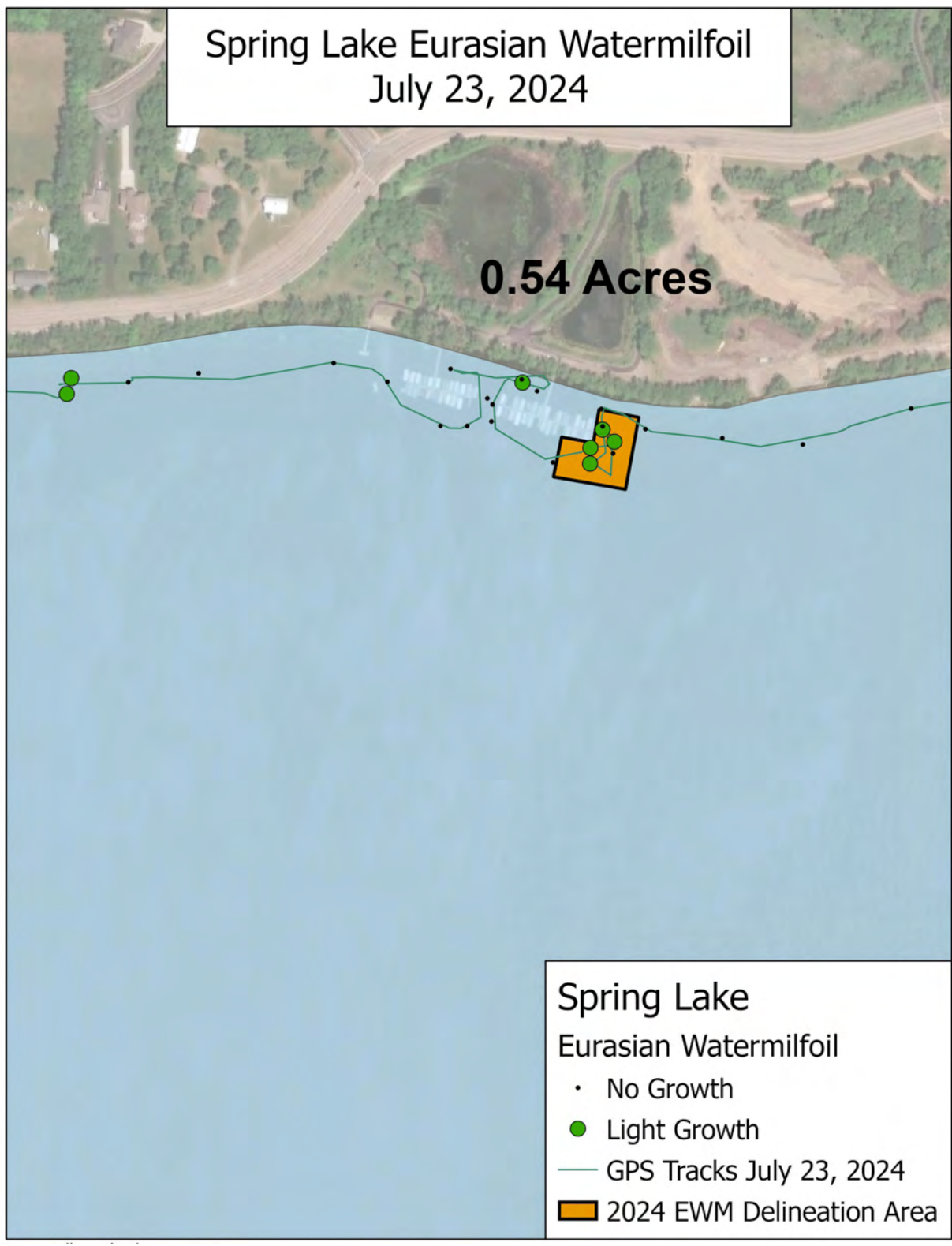


Figure 5. Spring Lake potential treatment area of EWM on July 23, 2024.

Lake Water Levels: The water levels in Spring Lake in the early summer of 2023 and 2024 were some of the lowest since 2015 (Figure 6). Delineating nearshore curlyleaf pondweed on April 17, 2024 was challenging due to the low water levels. We sampled to water depths of approximately 2 feet in the riparian (0-150 feet from shore). No treatable CLP was found in the riparian zone.

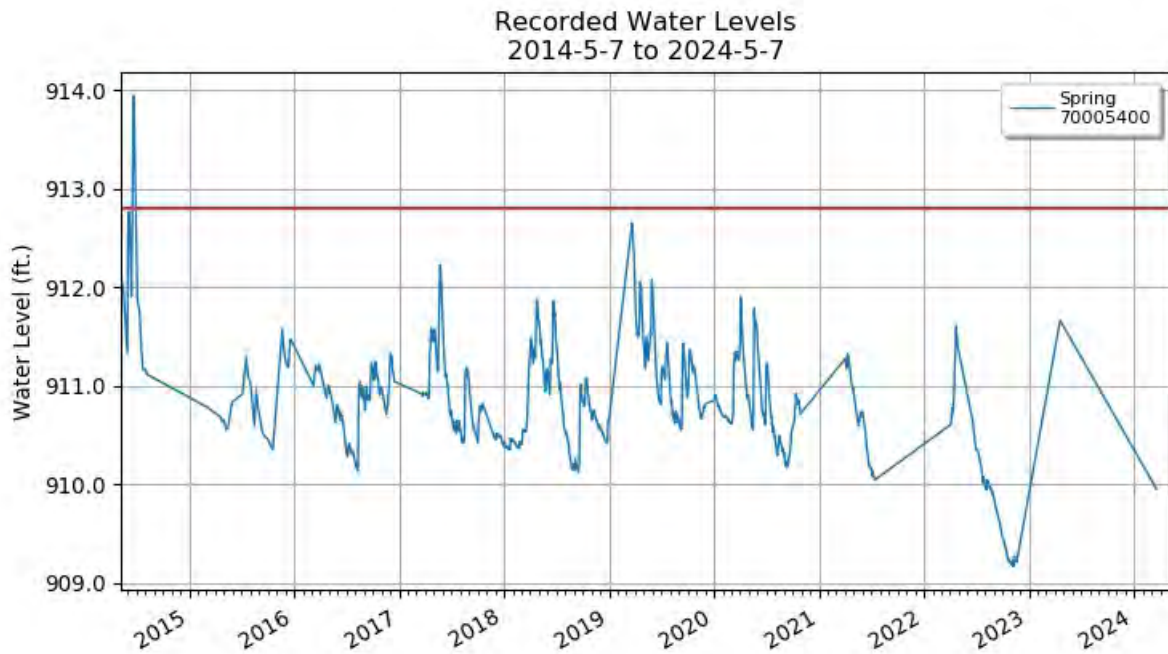


Figure 6. [top] Spring Lake water levels since 2015. [bottom] Shoreline of Spring Lake showing extended sandy shores.

APPENDIX

Individual waypoint data for the April 17, 2024 meandering survey.

Waypoint	Depth (ft)	CLP	EWM
1			
9	6	2	
12	8	7	
14	7	7	
15	8		
16			
17	9		
19	8	7	
20	8	15	
21	9	2	
22	9		
25	8	5	1
26	6		
31	4	1	
33	4	6	
71	4		1
79	4	1	
87	6	2	
103	8		
119	6	5	
122	4		1
127	3	1	
130	4	4	
131	5	1	
135	7	2	
189	9	1	
203	8	1	
237	7		1
254	6	2	
257	6	1	
258	6	1	
259	6	3	
261	6	3	
262	5	2	
264	5	3	
267	4		
269	5	1	
290	8	6	
291	8	20	
292	8	6	1
293	9	20	
294	10	10	
295	11	1	
298	10		
299	10	14	
300	9	10	1
301	8	5	1
302	7	4	
303	5	5	
304	5		1
308	5	5	
310	7	10	1
311	9	8	1
312	11		
315	10	10	

Waypoint	Depth (ft)	CLP	EWM
316	8	7	
318	6	5	
319	5	5	1
321	5	2	
323	4		
324	5	5	1
325	5	8	
326	6	4	
327	8	4	
328	8	6	
329	6	2	
330	5		
331	4		
Average		5.3	1.0
Occurrence (331 sites)		51	12

Individual transect site data for the May 20, 2024 transect survey.

Site	Depth (ft)	Clasping-leaf	Coontail	CLP	Elodea	EWM	Stringy	Water stargrass	Whitestem	Fila algae	No plants
1	3						1			1	
2	6	1							1		
3	6	1							1		
4	8		1				1		1		
5	5								1		
6	12										1
7	3						1			1	
8	4							1		1	
9	2									1	1
10	4			1							
11	5	1									
12	8										1
13	5								1		
14	8										1
15	6	1									
16	11										1
17	8	1									
18	10										1
19	7	1									
20	14										1
21	4									1	1
22	12										1
23	4									1	1
24	15										1
25	5									1	1
26	9							1			
27	5									1	1
28	10										1
29	5								1	1	
30	13										1
31	4									1	1
32	10										1
33	5	1									
34	11										1
35	5										1
36	11	1								1	
37	5			1			1			1	
39	6						1				
39	9										1
40	9										1
41	4			1						1	
42	10										1
43	5	1		1			1	1		1	
44	8						1				
45	4	1					1				
46	7	1									
47	5	1	1	3							
48	8			2							
49	5	1								1	
50	8	1	1	1	1	1					
Average		1.0	1.0	1.4	1.0	1.0	1.0	1.0	1.0	1.0	
Occur (50 sites)		14	3	7	1	1	8	3	6	15	22
% occur		28	6	14	2	2	16	6	12	30	

Individual waypoint data for the May 20, 2024 meandering survey.

Waypoint	Depth (ft)	CLP	EWM	Claspingleaf
209	5			
210	7	1		
211	8			
212	7			
213	6			
214	7			
218	8	1		
226				1
231	4	1		
235	3	3		
236		1		
237		1		
238		3		
239		3		
240		2		
241		1		
242	5	1		
269	5			
279	5	1		
284	4	1		
284		1		
294	9	1		
296	8	2		
297	8	1	1	
298	7	1		
299	5	3		
300	4	3		
301	4	2		
302	6	1	1	
303	10	1	1	
304	8	1	1	
305	5			
Average		1.5	1.0	1.0
Occurrence (97 sites)		24	4	1

Individual waypoint data for the July 23, 2024 meandering survey.

Waypoint	Depth (ft)	CLP	EWM
1	5		
2	5	1	
4	5	1	
5	5	1	
17	7		1
18			
19	6		
35			
38	4		1
40	6		
42	5		
96	6		1
99	6		1

Waypoint	Depth (ft)	CLP	EWM
100	6		1
101	5		1
104	5		
105	4		1
110	8		
116	5		1
117	5		1
134	5		1
144	6		1
155			
Average		1.0	1.0
Occurrence (155 sites)		3	11