Shields Lake, Washington County, Minnesota, May 17, 2024

Curlyleaf Pondweed Delineation and Assessment Surveys for Shields Lake, Washington County, Minnesota, 2025

Curlyleaf Delineation (Point-Intercept and GPS): April 10, 2025

No Curlyleaf Pondweed Treatment in 2025

Curlyleaf Assessment (Point-Intercept): May 13, 2025

Prepared for:

Comfort Lake/Forest Lake Watershed District
Forest Lake, Minnesota

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Summary

Curlyleaf Pondweed Delineation: Shields Lake (MnDNR ID #82-016200) is a 30 acre lake located in Washington County, Minnesota. Water clarity has a summer average of 4.5 feet in 2024 (source: CLFLWD, most recent full year available). A curlyleaf pondweed (CLP) point intercept survey was used to the delineate curlyleaf pondweed on April 10, 2025 by Blue Water Science. Results of the curlyleaf delineation survey found curlyleaf pondweed was most abundant in water depths of 4 to 9 feet(Figure 1). The maximum observed depth of CLP colonization was 11 feet. Curlyleaf pondweed, coontail, and elodea were the only aquatic plant species found on April 10, 2025. No treatment for CLP was conducted in 2026.

Curlyleaf Pondweed Assessment: A point intercept survey was used for the curlyleaf pondweed assessment and was conducted on May 13, 2025 by Blue Water Science (Figure 1). Results of the curlyleaf pondweed assessment found curlyleaf growing most abundantly in water depths of 3-7 feet. Several areas were producing heavy growth, occasionally matting at the surface in Shields Lake. Coontail was the only other submerged plant found in Shields Lake on May 13, 2025. Coontail and curlyleaf pondweed were observed to maximum water depths of 11 feet in May.

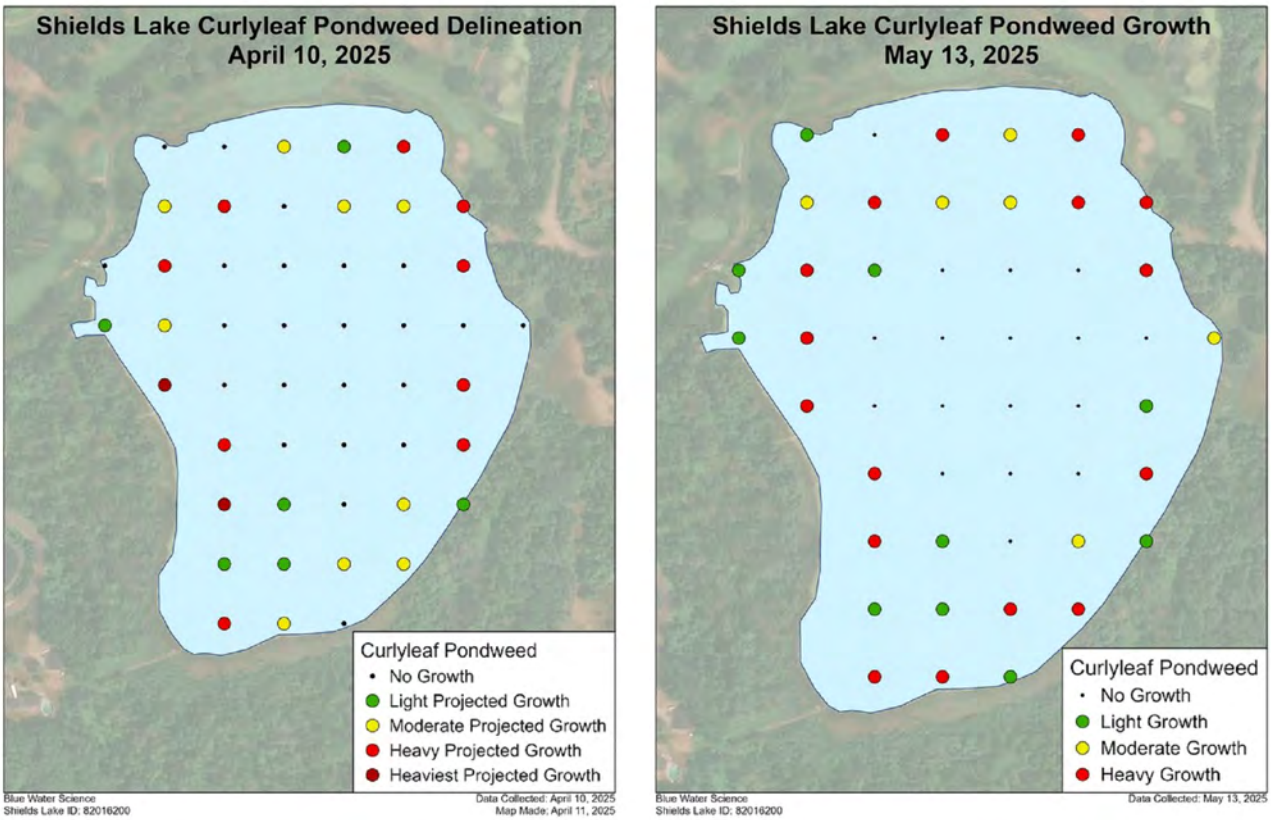


Figure 1. [left] Curlyleaf pondweed delineation on Shields Lake, surveyed on April 10, 2025. [right] Curlyleaf pondweed coverage (peak growing conditions) for Shields Lake on May 13, 2025.

Curlyleaf Pondweed Delineation and Assessment Surveys for Shields Lake, Washington County, Minnesota, 2025

Shields Lake, Washington County (ID: 82-016200)
Size: 29.6 acres (MnDNR)
Littoral area: 22 acres (MnDNR)
Maximum depth: 27 ft (MnDNR)

Introduction

A curlyleaf pondweed delineation using a point intercept survey was conducted on April 10, 2025 on 30 acre Shields Lake, Washington County. The objective of the delineation was to check the distribution and abundance of curlyleaf pondweed and document all aquatic plants. A second point intercept was conducted on May 13, 2025 to assess the status of CLP and to check the distribution and abundance of all aquatic plants.

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 treated. This delineation method was used for spot lake treatments in Gleason Lake and has worked for other lakes as well (McComas et al, 2015*).

Point Intercept Surveys and the Curlyleaf Pondweed Assessment: Two point intercept surveys were conducted by Blue Water Science on April 10 and May 13, 2025. Grid spacing was 50 meters. 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. Based on these sample sites, plant distribution maps were 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.*

Results for the Curlyleaf Pondweed Delineation on April 10, 2025

A point intercept survey was conducted to delineate curlyleaf pondweed on April 10, 2025 (Figure 1). Results from the survey found curlyleaf pondweed growing in water depths of 3 to10 feet, with abundant curlyleaf most common at water depths of 3 to 6 feet. Areas of significant curlyleaf pondweed growth were delineated (Figure 2) based on CLP stem densities that were projected to produce heavy growth at peak CLP abundance in June (Figure 2). However acreas of projected heavy growth were somewhat isolated and no treatment was recommended. Coontail was the only other species observed, coontail was found at light to moderate densities in water depths of 2-10 feet (Tables 1 and 2).

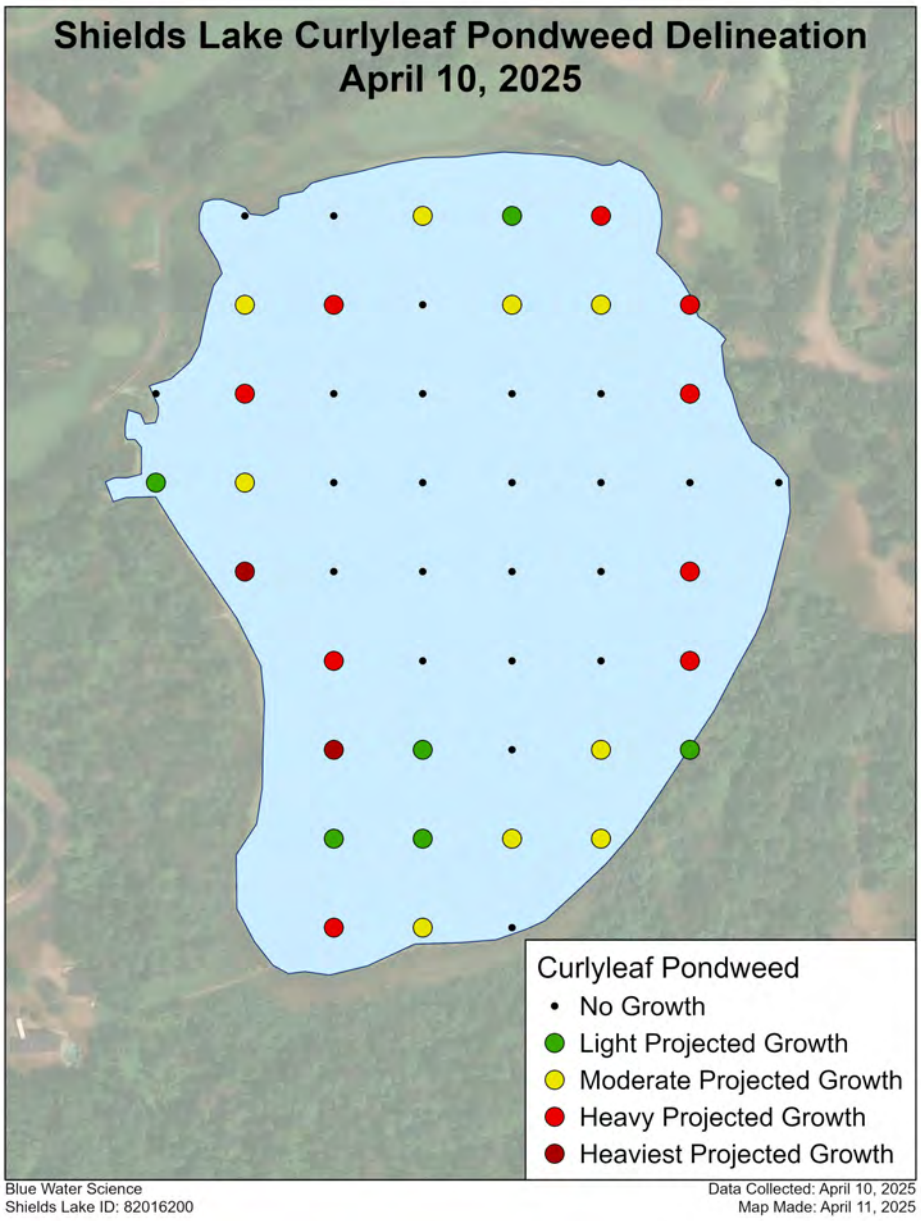


Figure 2. Curlyleaf pondweed potential treatment area in Shields Lake, delineated on April 10, 2025.

Point Intercept Survey on April 10, 2025: Results of the point intercept survey conducted on April 10, 2025 found curlyleaf pondweed growth distributed around most of Shields Lake in the nearshore growing zone (Table 1).(Figure 2).

Table 1. Curlyleaf pondweed occurrences and stem densities for the April 10, 2025 point intercept survey based on 49 sites.

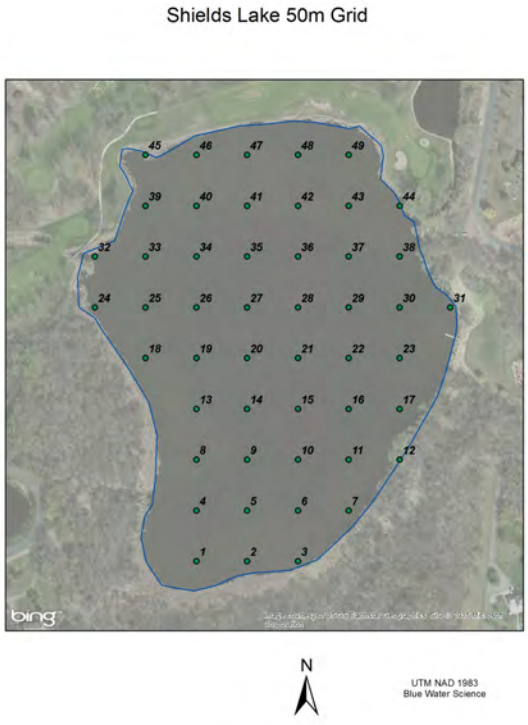
	All Stations (n=49)		
	Occur	% Occur	Density
Coontail *(Ceratophyllum demersum)*	17	35	1.2
Elodea *(Elodea canadensis)*	1	2	1.0
Curlyleaf pondweed - stems (*Potamogeton crispus*)	26	53	4.8 (avg stems)
Filamentous Algae	11	22	1.3

Figure 3. Curlyleaf pondweed rake sample on April 10, 2025.

Point Intercept Survey on April 10, 2025 Plant Data for the Delineation: Low plant diversity was found in Shields Lake in the April 10, 2025 point intercept survey with curlyleaf pondweed and coontail being the only aquatic plant species observed (Table 2).

Table 2. Aquatic plant occurrence and stem density for the point intercept sample points in Shields Lake, April 10, 2025.

Site	Depth (ft)	CLP-stems	Coontail	Elodea	Filamentous Algae
1	5	7			
2	5	3	1		
3	3		1	1	
4	9	2	1		
5	10	1			
6	8	3			1
7	5	3	1		
8	5	14			1
9	11	1			
10	13				
11	9	3	1		
12	2	2			
13	7	6			
14	13				
16	14				
17	5	11	1		
18	5	14			
19	14				
23	9	6			
24	3	2	1		1
25	7	3			
26	12				
30	12				
31	3		2		
32	3		2		2
33	5	7			2
34	13				
35	17				
36	15				
37	12				
38	5	8			1
39	4	3	1		1
40	5	6			
41	6				1
42	6	3			2
43	5	3	1		
44	2	5	1		
45	2		2		
46	4		1		1
47	3	3	1		1
48	4	1	1		
49	3	6	1		
Average		4.8	1.2	1.0	1.3
Occur (49 sites)		26	17	1	11
% occur		53	35	4	22



Results of the May 13, 2025 Point Intercept Survey

Results of the May 13, 2025 assessment using a point intercept survey found two submerged plant species, curlyleaf pondweed and coontail(Table 3). The curlyleaf pondweed was observed in the lake both living and dead (Table 3 and Figure 4). Results from the assessment found native coontail growing out to a water depth of 11 feet (Table 4)(Figure 4).

The projected CLP growth from the April 10, 2025 PI survey was fairly accurate in predicting CLP growth at the peak growing period.

Table 3. Shields Lake aquatic plant occurrences and densities for the M ay 13, 2025 survey based on 49 sites. Density ratings are 1-3 with 1 being low and 3 being most dense.

	All Stations (n=49)		
	Occur	% Occur	Density
Filamentous Algae	14	29	1.6
Coontail *(Ceratophyllum demersum)*	25	51	1.5
Curlyleaf pondweed (*Potamogeton crispus*)	32	65	2.2

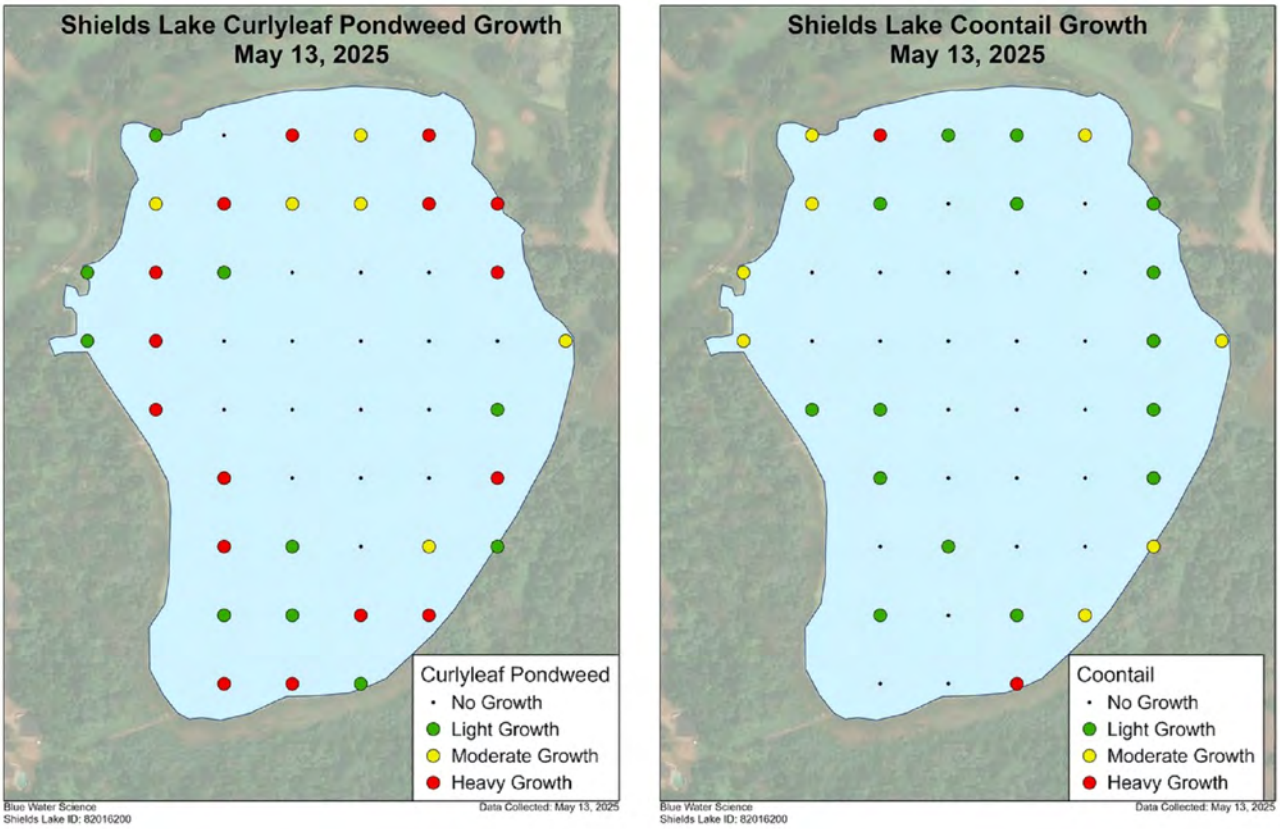


Figure 4. (Left) Curlyleaf pondweed coverage for Shields Lake on May13, 2025. (Right) Coontail coverage for Shields Lake on May 13, 2025.

Point Intercept Survey (May 13, 2025) Plant Data for the Assessment

Low plant diversity was found in Shields Lake with a total of 2 submerged aquatic plant species (Table 4). Aquatic plant richness was low.

Table 4. Aquatic plant occurrence and density for the point intercept sample points in Shields Lake, May 13, 2025.

Site	Depth (ft)	Coontail	CLP	Filamentous Alg	No plants
1	4		3		
2	3		3		
3	2	3	1	2	
4	9	1	1		
5	9		1		
6	7	1	3		
7	3	2	3		
8	5		3	1	
9	10	1	1		
10	13				1
11	9		2	2	
12	2	2	1	1	
13	6	1	3		
14	14				1
16	15				1
17	4	1	3		
18	5	1	3		
19	10	1			
20	17				1
23	8	1	1		
24	2	2	1	2	
25			3		
30	11	1			
31	3	2	2		
32	2	2	1	3	
33	5		3	1	
34	11		1		
35	17				1
36	16				1
37	14.5				1
38	4	1	3		
39	3	2	2	1	
40	5	1	3		
41	6		2		
42	6	1	2		
43	5		3		
44	3	1	3	2	
45	2	2	1	2	
46	3	3		2	
47	4	1	3	1	
48	4	1	2	1	
49	3	2	3	2	
Average		1.5	2.2	1.6	
Occur (49 sites)		25	32	14	7
% occur		51	65	56