



Moody Lake, Chisago County, Minnesota, May 13, 2025

Curlyleaf Pondweed Delineation and Assessment Surveys for Moody Lake, Chisago County, Minnesota, 2025

Curlyleaf Pondweed Delineation: April 10, 2025

Curlyleaf Treatment: No Treatment in 2025

Curlyleaf Pondweed Assessment: May 13, 2025

Prepared for:
Comfort Lake/Forest Lake
Watershed District
Forest Lake, Minnesota



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Curlyleaf Pondweed Delineation and Assessment Surveys for Moody Lake, Chisago County, Minnesota, 2025

Summary

Curlyleaf Pondweed Delineation: Moody Lake (MnDNR ID #13-0023) is a 45 acre lake located in Chisago County, Minnesota. Water clarity has a summer average of 4.0 feet in 2024 (source: CLFLWD). A point intercept survey was conducted on April 10, 2025 by Blue Water Science. Data from the point intercept survey was used to determine potential areas for curlyleaf pondweed treatment and to look for Eurasian watermilfoil. Results of the curlyleaf delineation found curlyleaf pondweed most abundant in water depths of 3-8 feet and produced a range of projected densities from light growth to heavy growth (Figure 1). No treatment for curlyleaf pondweed was conducted in 2025.

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 pondweed in Moody Lake had slightly expanded and was growing at light to heavy densities. Heaviest curlyleaf growth was observed on the north and west sides of Moody Lake, mainly in water depths of 3-7 feet. In May, Moody Lake had a fair diversity of native submerged aquatic plants, with coontail, elodea, flatstem pondweed and large-leaf pondweed present on the PI survey.

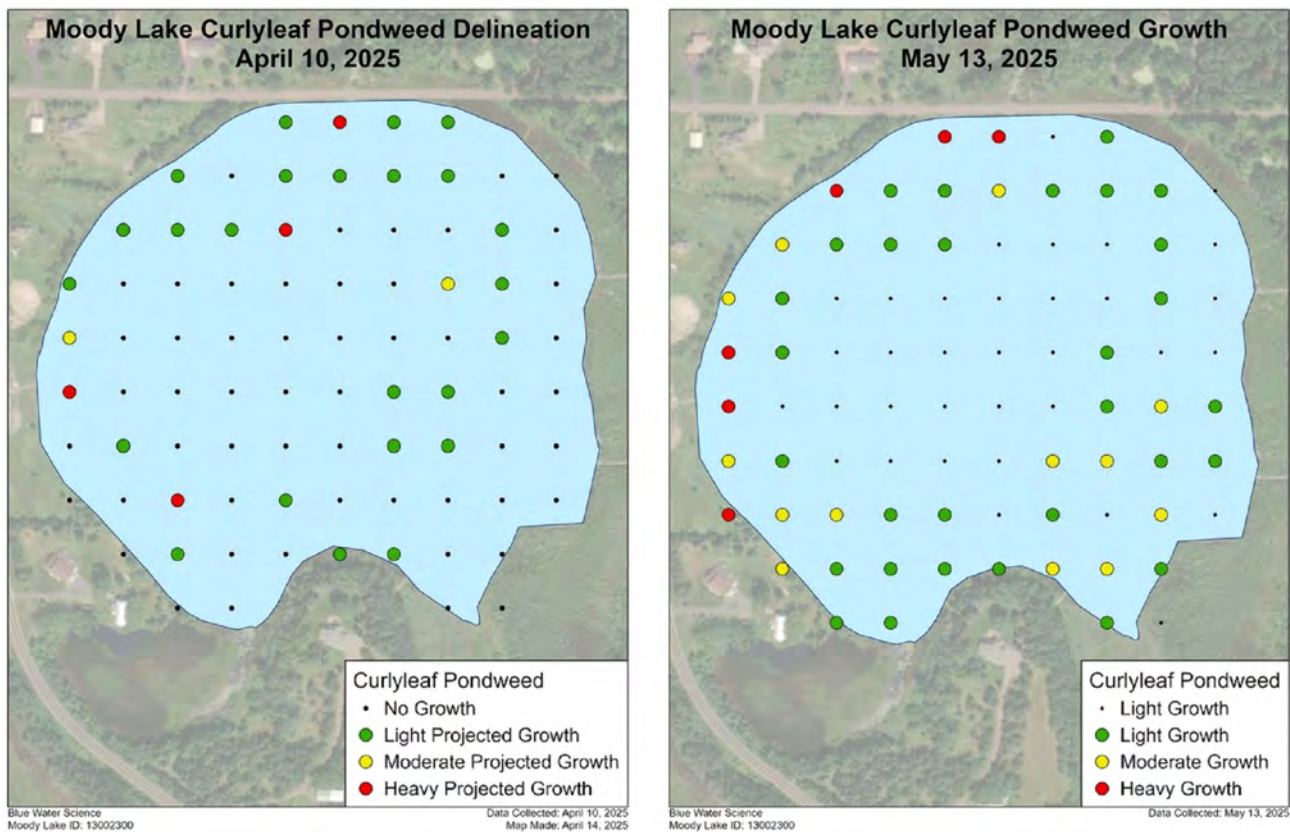


Figure 1. [left] Curlyleaf pondweed growth in Moody Lake, delineated on April 10, 2025. [right] Curlyleaf pondweed coverage for Moody Lake on May 13, 2025.

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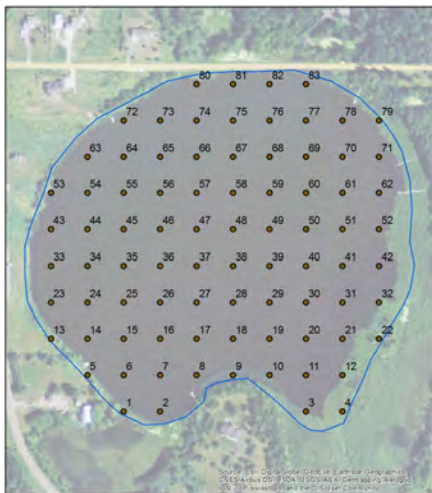
Moody Lake, Chisago County (ID: 13-0023)
Size: 45 acres (MnDNR)
Littoral area: 22 acres (MnDNR)
Maximum depth: 48 ft (MnDNR)

Introduction

A curlyleaf pondweed delineation using a point intercept (PI) survey was conducted on April 10, 2025 on 45 acre Moody Lake, Chisago County. The objective of the delineation was to check the distribution and abundance of curlyleaf pondweed. A curlyleaf pondweed assessment using a PI survey was conducted on May 13, 2025 again to check the distribution and abundance of curlyleaf pondweed, check for the presence of Eurasian watermilfoil, and to characterize all native 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.

Figure 2. Point intercept site map for Moody Lake.

*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 CLP Delineation: April 10, 2025

A point intercept survey was used to delineate CLP on April 10, 2025 in Moody Lake (Figure 3). Results from the survey found a mix of CLP stem densities at sites around the lake. No treatment occurred in 2025. Coontail and elodea were the only other submerged plant species observed (Tables 1 and 2).

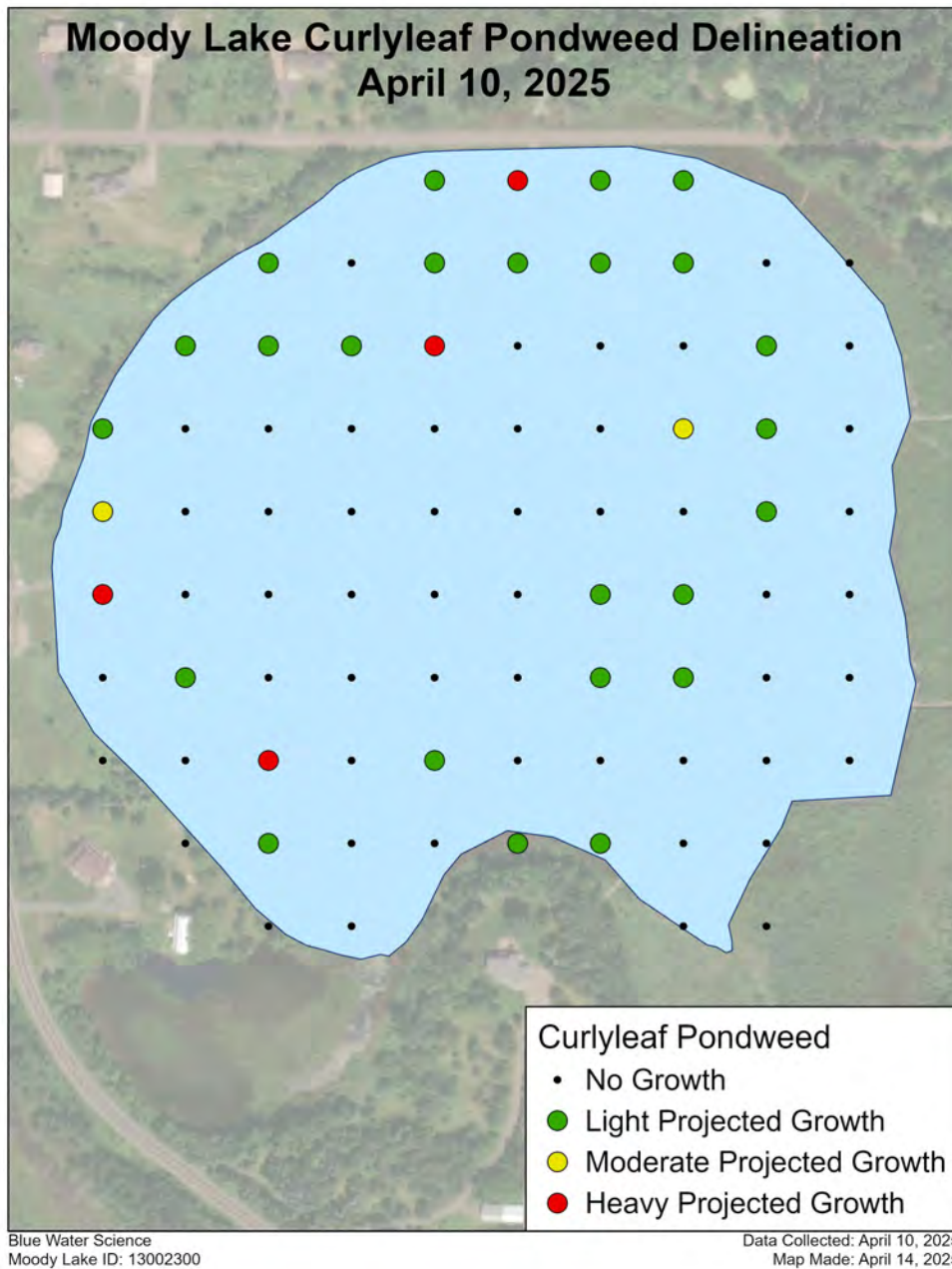


Figure 3. Curlyleaf pondweed growth from the point intercept survey conducted on April 10, 2025.

Table 1. Moody Lake aquatic plant occurrences and densities for the April 10, 2025 point intercept survey based on 83 sites. Density ratings are 1-3 with 1 being low and 3 being most dense.

| | All Stations (n=83) | | |
|--|---------------------|---------|-------------------------|
| | Occur | % Occur | Density |
| Coontail (<i>Ceratophyllum demersum</i>) | 47 | 57 | 1.3 |
| Elodea (<i>Elodea canadensis</i>) | 9 | 11 | 1.3 |
| Curlyleaf pondweed - stems (<i>Potamogeton crispus</i>) | 30 | 36 | 2.1 (avg stems/rake) |

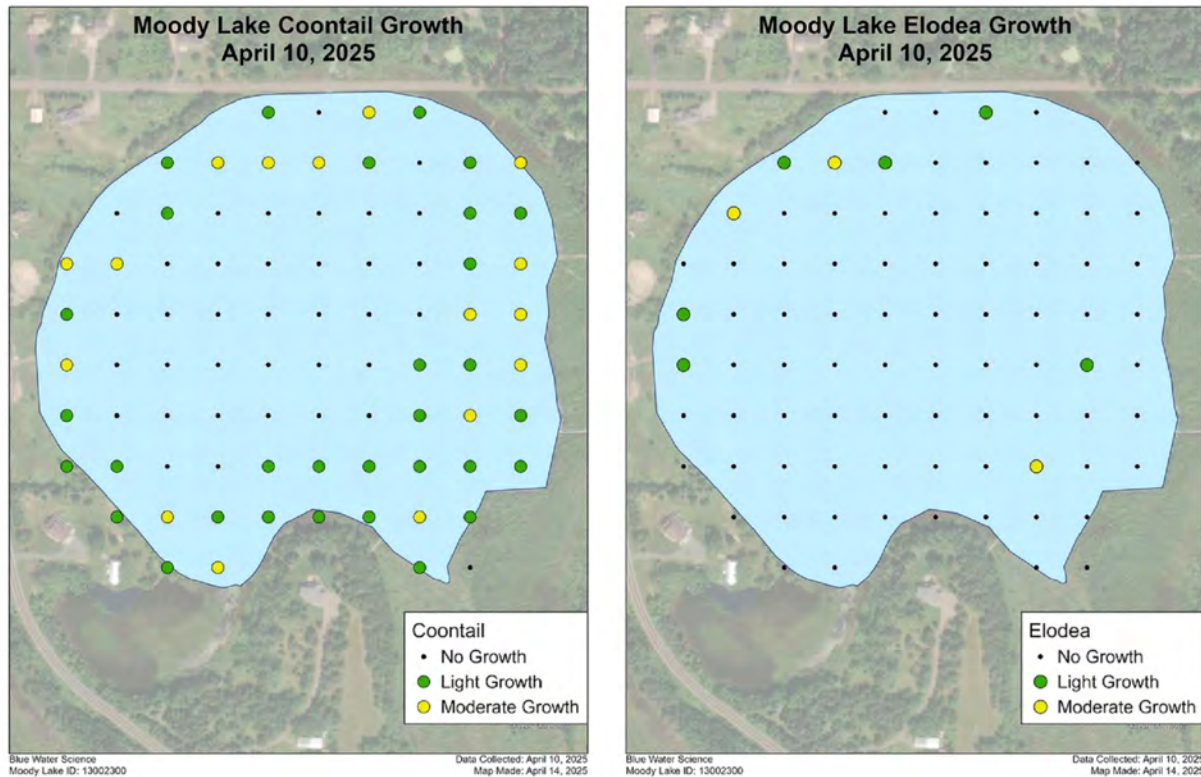


Figure 4. Coontail and elodea growth from the point intercept survey conducted on April 10, 2025.

Results for the May 13, 2025 Point Intercept Survey and CLP Assessment

Results of the May 13, 2025 assessment using a point intercept survey found five submerged plant species, coontail, curlyleaf pondweed, elodea, flatstem pondweed, and large-leaf pondweed with coontail and curlyleaf being the dominant native plants (Table 2). Flatstem pondweed and large-leaf pondweed were rare in Moody Lake. No CLP treatment occurred in 2025 and CLP was observed at 49 sites. The heaviest CLP growth was on the west and northwest side of Moody Lake growing most abundantly in water depths of 3-7 feet (Table 2 and Figure 5). Results from the assessment found native plants growing out to a max depth of 10 feet (Figure 6).

Table 2. Moody Lake aquatic plant occurrences and densities for the May 13, 2025 survey based on 83 sites. Density ratings are 1-3 with 1 being low and 3 being most dense.

| | All Stations (n=83) | | |
|--|---------------------|---------|---------|
| | Occur | % Occur | Density |
| White waterlily (<i>Nymphaea ordata</i>) | 14 | 17 | 1.0 |
| Coontail (<i>Ceratophyllum demersum</i>) | 49 | 59 | 1.9 |
| Curlyleaf pondweed (<i>Potamogeton crispus</i>) | 49 | 59 | 1.5 |
| Elodea (<i>Elodea canadensis</i>) | 4 | 5 | 1.0 |
| Flatstem pondweed (<i>P. zosteriformis</i>) | 1 | 1 | 1.0 |
| Large-leaf (<i>P. amplifolius</i>) | 2 | 2 | 1.0 |

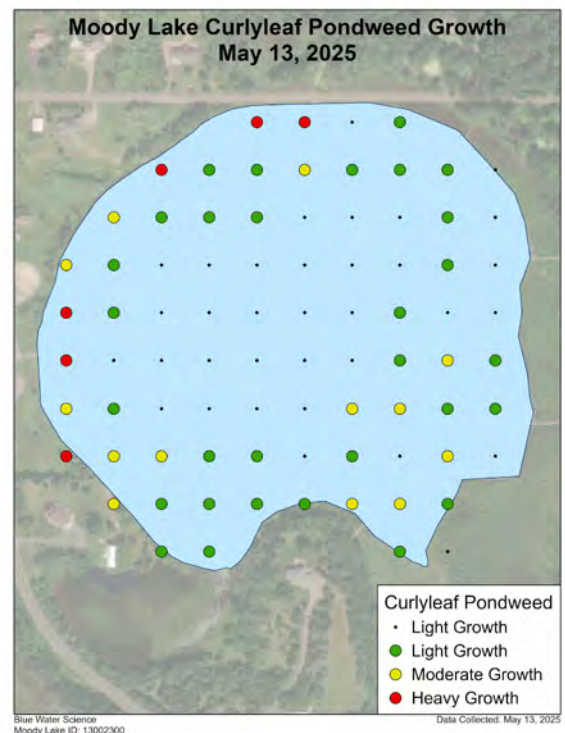


Figure 5. Curlyleaf pondweed coverage for Moody Lake on May 13, 2025.

Aquatic Plant Maps for Individuals Species - May 13, 2025

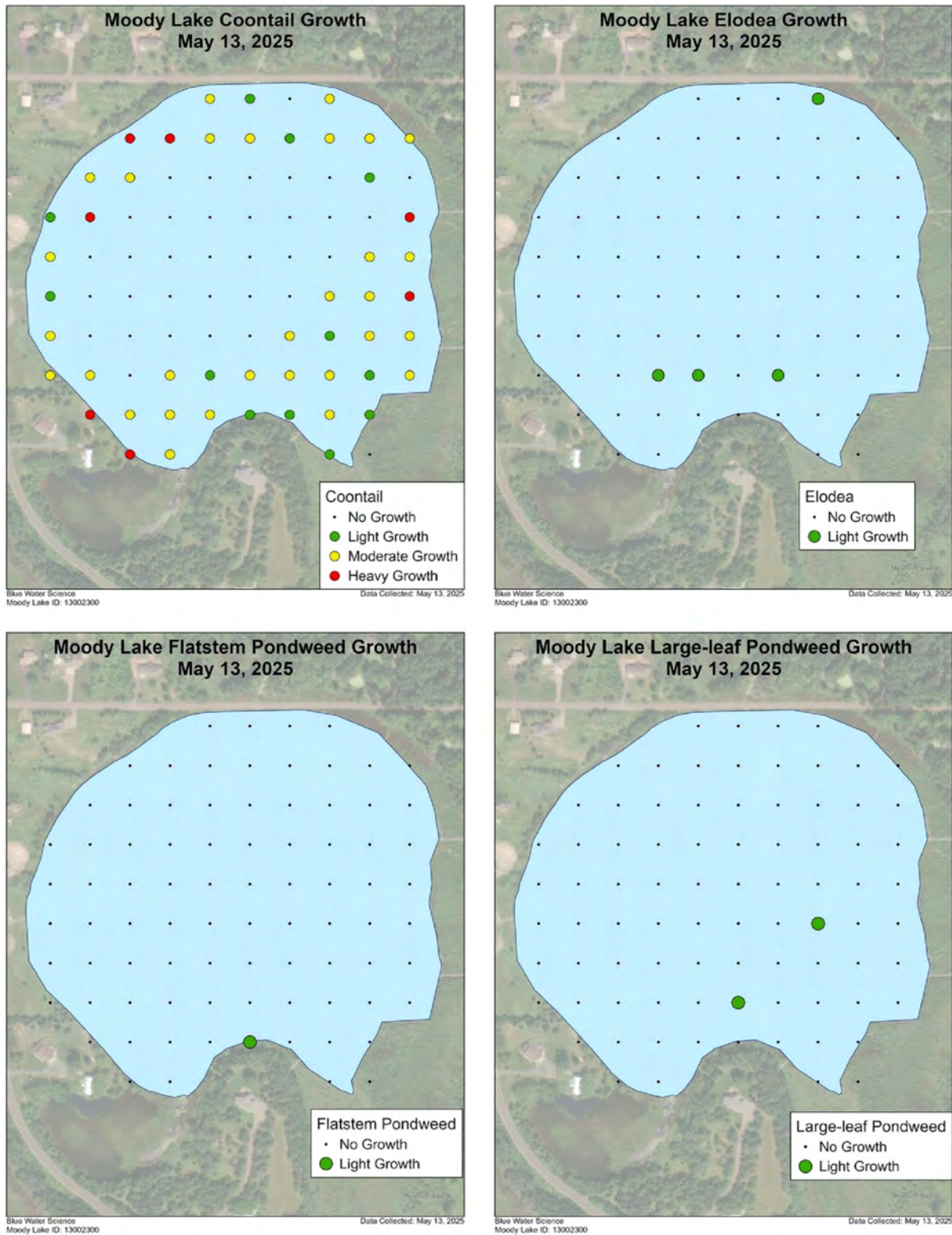


Figure 6. Aquatic plant distribution and abundance for individual species on May 13, 2025.

APPENDIX

Moody Lake aquatic plant occurrence and densities for the April 10, 2025 survey. Density ratings are 1-3 with 1 being the low and 3 being most dense.

| Site | Depth (ft) | CLP-stems | Cattails | Coontail | Elodea |
|------|------------|-----------|----------|----------|--------|
| 1 | 1 | | | 1 | |
| 2 | 4 | | | 2 | |
| 3 | 2 | | | 1 | |
| 4 | | | 1 | | |
| 5 | 3 | | | 1 | |
| 6 | 6 | 1 | | 2 | |
| 7 | 6 | | | 1 | |
| 8 | 6 | | | 1 | |
| 9 | 3 | 1 | | 1 | |
| 10 | 4 | 2 | | 1 | |
| 11 | 5 | | | 2 | |
| 12 | 2 | | | 1 | |
| 13 | 1 | | | 1 | |
| 14 | 6 | | | 1 | |
| 15 | | 4 | | | |
| 16 | 13 | | | | |
| 17 | 7 | 1 | | 1 | |
| 18 | 7 | | | 1 | |
| 19 | 6 | | | 1 | |
| 20 | 6 | | | 1 | 2 |
| 21 | 5 | | | 1 | |
| 22 | 5 | | | 1 | |
| 23 | 5 | | | 1 | |
| 24 | 10 | 1 | | | |
| 25 | 21 | | | | |
| 27 | 18 | | | | |
| 28 | 11 | | | | |
| 29 | 9 | 1 | | | |
| 30 | 7 | 1 | | 1 | |
| 31 | 5 | | | 2 | |
| 32 | 4 | | | 1 | |
| 33 | 5 | 7 | | 2 | 1 |
| 34 | 14 | | | | |
| 35 | 29 | | | | |
| 39 | 11 | 2 | | | |
| 40 | 9 | 1 | | 1 | |
| 41 | 6 | | | 1 | 1 |
| 42 | 5 | | | 2 | |
| 43 | 5 | 3 | | 1 | 1 |
| 44 | 14 | | | | |
| 45 | 25 | | | | |
| 46 | 30 | | | | |
| 47 | | | | | |
| 49 | 21 | | | | |
| 50 | 12 | | | | |
| 51 | 6 | 2 | | 2 | |
| 52 | 5 | | | 2 | |
| 53 | 4 | 1 | | 2 | |
| 54 | 6 | | | 2 | |
| 55 | 16 | | | | |
| 56 | 31 | | | | |
| 60 | 11 | 3 | | | |
| 61 | 7 | 1 | | 1 | |
| 62 | 5 | | | 2 | |

| Site | Depth (ft) | CLP-stems | Cattails | Coontail | Elodea |
|------------------|------------|-----------|----------|----------|--------|
| 63 | 5 | 2 | | | 2 |
| 64 | 7 | 1 | | 1 | |
| 65 | 10 | 2 | | | |
| 65 | | | | | |
| 66 | 8 | 9 | | | |
| 66 | | | | | |
| 67 | 14 | | | | |
| 68 | 28 | | | | |
| 69 | 21 | | | | |
| 70 | 5 | 2 | | 1 | |
| 71 | 4 | | | 1 | |
| 72 | 5 | 2 | | 1 | 1 |
| 73 | 6 | | | 2 | 2 |
| 74 | 7 | 1 | | 2 | 1 |
| 75 | 8 | 2 | | 2 | |
| 76 | 11 | 2 | | 1 | |
| 77 | 12 | 2 | | | |
| 78 | 6 | | | 1 | |
| 79 | 2 | | | 2 | |
| 80 | 4 | 1 | | 1 | |
| 81 | 5 | 4 | | | |
| 82 | 6 | 1 | | 2 | 1 |
| 83 | 5 | 1 | | 1 | |
| Average | | 2.1 | 1.0 | 1.3 | 1.3 |
| Occur (83 sites) | | 30 | 1 | 47 | 9 |
| % occur | | 36 | 1 | 57 | 30 |

Moody Lake aquatic plant occurrence and densities for the May 13, 2025 survey. Density ratings are 1-3 with 1 being the low and 3 being most dense.

| Site | Depth (ft) | White lily | Cab-bage | Coon-tail | CLP | Elodea | Flat-stem | FA - benthic | FA - float | No plants |
|------|------------|------------|----------|-----------|-----|--------|-----------|--------------|------------|-----------|
| 1 | 3 | 1 | | 3 | 1 | | | | 3 | |
| 2 | 4 | 1 | | 2 | 1 | | | | 3 | |
| 3 | 2 | 1 | | 1 | 1 | | | | | |
| 4 | 0 | | | | | | | | | 1 |
| 5 | 4 | 1 | | 3 | 2 | | | | 3 | |
| 6 | 6 | | | 2 | 1 | | | | 2 | |
| 7 | 6 | | | 2 | 1 | | | | 2 | |
| 8 | 4 | | | 2 | 1 | | | 1 | | |
| 9 | 2 | 1 | | 1 | 1 | | 1 | | | |
| 10 | 3 | 1 | | 1 | 2 | | | 2 | | |
| 11 | 4 | | | 2 | 2 | | | | 1 | |
| 12 | 3 | 1 | | 1 | 1 | | | | | |
| 13 | 3 | 1 | | 2 | 3 | | | | 1 | |
| 14 | 6 | | | 2 | 2 | | | 1 | | |
| 15 | 8 | | | | 2 | | | | | |
| 16 | 8 | | | 2 | 1 | 1 | | | | |
| 17 | 7 | | | 1 | 1 | 1 | | | | |
| 18 | 7 | | 1 | 2 | | | | | | |
| 19 | 7 | | | 2 | 1 | 1 | | | | |
| 20 | 6 | | | 2 | | | | 1 | | |
| 21 | 5 | | | 1 | 2 | | | | 2 | |
| 22 | 4 | 1 | | 2 | | | | 1 | | |
| 23 | 4 | 1 | | 2 | 2 | | | | 3 | |
| 24 | 10 | | | | 1 | | | | | |
| 25 | 25 | | | | | | | | | 1 |
| 26 | 25 | | | | | | | | | 1 |
| 27 | 19 | | | | | | | | | 1 |
| 28 | 10 | | | | | | | 1 | | |
| 29 | 8 | | | 2 | 2 | | | | | |
| 30 | 6 | | | 1 | 2 | | | | | |
| 31 | 6 | | | 2 | 1 | | | | 2 | |
| 32 | 4 | | | 2 | 1 | | | | | |
| 33 | 6.5 | | | 1 | 3 | | | 1 | | |
| 34 | 16 | | | | | | | | | 1 |
| 35 | 26 | | | | | | | | | 1 |
| 39 | 18 | | | | | | | | | 1 |
| 40 | 7 | | 1 | 2 | 1 | | | | | |
| 41 | 6 | | | 2 | 2 | | | 2 | | |
| 42 | 5 | | | 3 | 1 | | | | 1 | |
| 43 | 6 | | | 2 | 3 | | | | | |
| 44 | 11 | | | | 1 | | | | | |
| 45 | 27 | | | | | | | | | 1 |
| 50 | 11 | | | | 1 | | | | | |
| 51 | 6 | | | 2 | | | | | | |
| 52 | 5 | | | 2 | | | | | | |
| 53 | 4 | 1 | | 1 | 2 | | | 1 | | |
| 54 | 7 | | | 3 | 1 | | | | | |
| 55 | 16 | | | | | | | | | 1 |
| 56 | 23 | | | | | | | | | 1 |
| 60 | 16 | | | | | | | | | 1 |
| 61 | 6 | | | | 1 | | | | | |
| 62 | 5 | | | 3 | | | | | | |
| 63 | 6 | | | 2 | 2 | | | 1 | | |
| 64 | 8 | | | 2 | 1 | | | | | |
| 65 | 10 | | | | 1 | | | | | |
| 66 | 10 | | | | 1 | | | | | |
| 67 | 22 | | | | | | | | | 1 |

| Site | Depth (ft) | White lily | Cab-bage | Coon-tail | CLP | Elodea | Flat-stem | FA - benthic | FA - float | No plants |
|------------------|------------|------------|----------|-----------|-----|--------|-----------|--------------|------------|-----------|
| 68 | 27 | | | | | | | | | 1 |
| 69 | 17 | | | | | | | | | 1 |
| 70 | 5 | | | 1 | 1 | | | | | |
| 71 | 0 | | | | | | | | | 1 |
| 72 | 4 | | | 3 | 3 | | | 2 | | |
| 73 | 6 | | | 3 | 1 | | | 2 | | |
| 74 | 6 | | | 2 | 1 | | | 1 | | |
| 75 | 6 | | | 2 | 2 | | | 1 | | |
| 76 | 10 | | | 1 | 1 | | | | | |
| 77 | 9 | | | 2 | 1 | | | | | |
| 78 | 6 | | | 2 | 1 | | | | | |
| 79 | 2 | 1 | | 2 | | | | 1 | | |
| 80 | 3 | | | 2 | 3 | | | | 2 | |
| 81 | 4 | 1 | | 1 | 3 | | | | 2 | |
| 82 | 4 | | | | | | | | | |
| 83 | 4 | 1 | | 2 | 1 | 1 | | 1 | | |
| Average | | 1.0 | 1.0 | 1.9 | 1.5 | 1.0 | 1.0 | 1.3 | 2.1 | |
| Occur (83 sites) | | 14 | 2 | 49 | 49 | 4 | 1 | 16 | 13 | 15 |
| % occur | | 17 | 2 | 59 | 59 | 5 | 1 | 19 | 16 | |