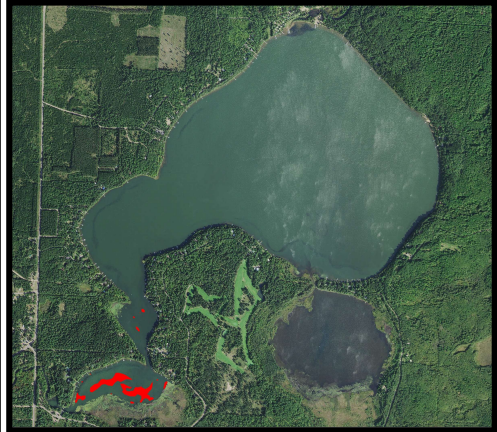


**Curly-leaf pondweed (*Potamogeton crispus*)
Bed Mapping Survey
Lower Eau Claire Lake – WBIC: 2741600
Douglas and Bayfield Counties, Wisconsin**



Canopied Curly-leaf pondweed – Lower Eau Claire Lake Outlet Bay – 6/12/25



Lower Eau Claire Lake aerial photo with 2025 CLP beds.

Project Initiated by:

The Town of Barnes – Aquatic Invasive Species Committee,
Lake Education and Planning Services, LLC, and the
Wisconsin Department of Natural Resources (Grant AIRR28724)



Curly-leaf pondweed with mature turion

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June 12, 2025

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INTRODUCTION:

Lower Eau Claire Lake (WBIC 2741600) is a 784-acre stratified drainage lake located in southwestern Bayfield and southeast Douglas Counties, Wisconsin in the Towns of Barnes and Gordan (T44N R9 and 10W S19, 24-25, 30, and 36). It reaches a maximum depth of 41ft in the hole southeast of the Eau Claire River Inlet and has an average depth of approximately 22ft (Figure 1). The lake is mesotrophic in nature with summer Secchi readings over the last ten years averaging 13.0ft (WDNR 2025). This good to very good clarity produced a littoral zone that reached approximately 20ft in 2025. The bottom substrate is predominately sand and sandy muck although areas of gravel are located throughout the lake – especially around exposed points and on shallow flats. The lake’s only nutrient-rich organic muck occurs in the bays near the lake outlet (Holt et al 1972).

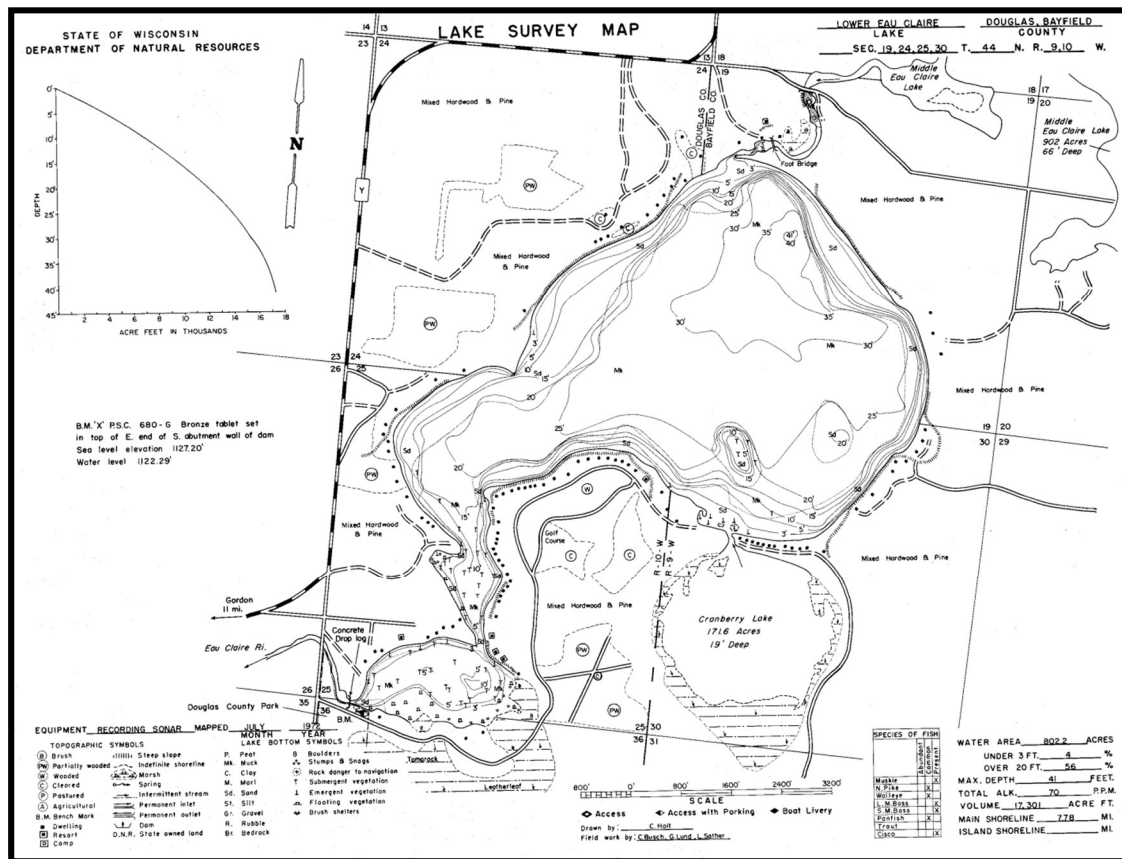


Figure 1: Lower Eau Claire Lake Bathymetric Map

BACKGROUND AND STUDY RATIONALE:

In 2005, concern over the spread of Eurasian water-milfoil (*Myriophyllum spicatum*) (EWM) into nearby Tomahawk and Sand Bar Lakes prompted members of the Town of Barnes Aquatic Invasive Species Committee (then the Eurasian water-milfoil Committee) and the Eau Claire Lakes Area Property Owners Association (ECLAPOA) to authorize an initial point-intercept survey to look for exotic plant species in the lake. This survey did **not** find EWM, Curly-leaf pondweed (*Potamogeton crispus*) (CLP), or any other exotic species in Lower Eau Claire Lake (Kudlas et al. – pers. comm.).

In an effort to determine if the lake remained free of these harmful exotic species, the TOB applied for and received a lake planning grant that authorized three plant surveys in 2022: June Curly-leaf pondweed point-intercept and bed mapping surveys, and an August warm-water point-intercept survey of all macrophyte species. The goals of these studies were to look for and, if found, quantify the density and distribution of any exotic species; and to gather baseline data on the richness, diversity, abundance, distribution, and density of the lake’s native vegetation.

These surveys ultimately did locate Curly-leaf pondweed in the outlet bay. However, as CLP occurred at generally low levels within expansive beds of beneficial habitat-forming native vegetation, it was decided to limit control of CLP to manual removal by volunteers in 2022 with plans to begin suction harvesting using the “Barnes Aquatic Invasive Species Sucker” or BAISS thereafter. To help guide this management, we were asked to conduct follow-up bed mapping surveys in 2023, 2024, and 2025 to assess the effectiveness of initial removal efforts and to look for new areas with CLP. This report is the summary analysis of our June 12, 2025 survey.

METHODS:

Curly-leaf Pondweed Bed Mapping Survey:

During the bed mapping survey, we searched the lake’s visible littoral zone. By definition, a “bed” was determined to be any area where we visually estimated that Curly-leaf pondweed made up >50% of the area’s plants, was generally continuous with clearly defined borders, and was canopied, or close enough to being canopied that it would likely interfere with boat traffic. After we located a bed, we motored around the perimeter of the area taking GPS coordinates at regular intervals. We also estimated the rake density range and mean rake fullness of the bed (Figure 2), the depth range and mean depth of the bed, whether it was canopied, and the impact it was likely to have on navigation (**none** – easily avoidable with a natural channel around or narrow enough to motor through/**minor** – one prop clear to get through or access open water/**moderate** – several prop clears needed to navigate through/**severe** – multiple prop clears and difficult to impossible to row through). These data were then mapped using ArcMap 9.3.1, and we used the WDNR’s Forestry Tools Extension to determine the acreage of each bed to the nearest hundredth of an acre (Table 1).

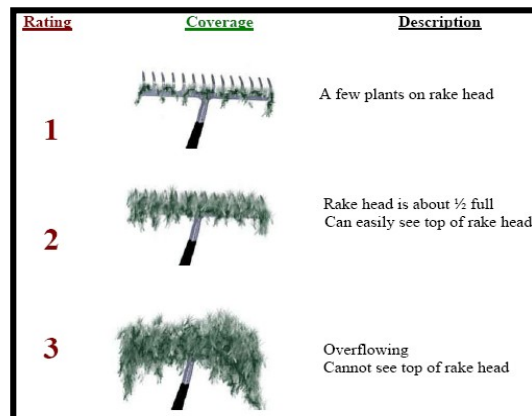


Figure 2: Rake Fullness Ratings (UWEX 2010)

RESULTS:

Summary of Past Curly-leaf Pondweed Bed Mapping Surveys:

During our original 2022 survey, we mapped six Curly-leaf pondweed beds totaling 0.11 acre (0.01% of the lake's 784 acres) (Figure 3). Each of these beds were located in the outlet bays over organic and sandy muck (Figure 4) (Appendix I). The biggest, Beds 2 and 3, were 0.06 and 0.05 respectively with all others totaling <0.01 acre and amounting to little more than small collections of canopied plants (Table 1).

Ice out in 2023 was late, but, following a rapid warm-up, lake temperatures shot into the 60's in only a few weeks. Presumably because of this, we found Curly-leaf pondweed on most lakes was stunted in growth, and we noted plants were falling over and dying earlier than usual on several other lakes we work on further south. Because of this, we decided to survey earlier than we had in 2022. Ultimately, we located seven beds covering 0.75 acre (0.10% of the lake's surface area) (Figure 3) (Appendix I) with all of them occurring in the outlet bay (Figure 4). This was a 0.64-acre (+582%) increase compared to 2022 (Table 1). Elsewhere on the lake, we saw no evidence of CLP, and test raking in the areas formerly covered by Beds 5 and 6 in the channel connecting the lake's outlet bay with the main lake failed to produce any plants.

The winter of 2023-24 was one of the shortest and warmest on record with little snowfall and late ice-on/early ice-off. This was followed by a prolonged cool spring that appeared to favor Curly-leaf pondweed growth as we found record levels and densities on the majority of lakes we surveyed. Lower Eau Claire was no exception as we found dense canopied CLP covered significant portions of the outlet bay (Figure 3) (Appendix I). We also found Bed 6 had reformed in the narrows between the main lake and the outlet bay (Figure 4). Collectively we mapped 15 beds covering 3.69 acres (0.47% of the lake's surface area). This was a 2.94-acre (+392%) increase over our 2023 totals, and a 3.58-acre increase (3,255%) compared to our 2022 survey (Table 1).

Summary of 2025 Curly-leaf Pondweed Bed Mapping Survey:

Another winter with relatively little snowfall and late ice-on/early ice-off appeared to again give Curly-leaf pondweed favorable growing conditions. On June 12, 2025, we searched 20.3km (12.6 miles) of transects throughout the lake's visible littoral zone paying careful attention to all areas that were previously found to have CLP (Figure 5). We had partly cloudy skies and calm conditions that allowed us to see down in the water column approximately 7-8ft.

Although we again saw no evidence of CLP in the main lake (Figure 3), we documented further expansion of CLP in the outlet bay as well as in the narrows between the main lake and the outlet bay (Figure 4) (Appendix I). In total, we delineated 14 beds covering 7.68 acres (0.98% of the lake's surface area). This was a 3.99-acre (+108%) increase compared to our 2024 totals, a 6.93-acre (+924%) increase relative to our 2023 survey, and a 7.57-acre (+6,882%) increase since the original 2022 survey (Table 1).

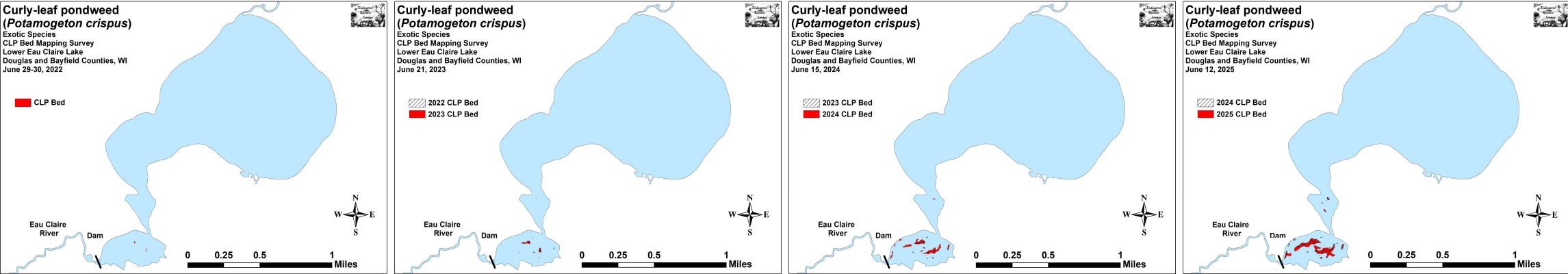


Figure 3: Lower Eau Claire Lake Curly-leaf Pondweed Beds – 2022, 2023, 2024, and 2025

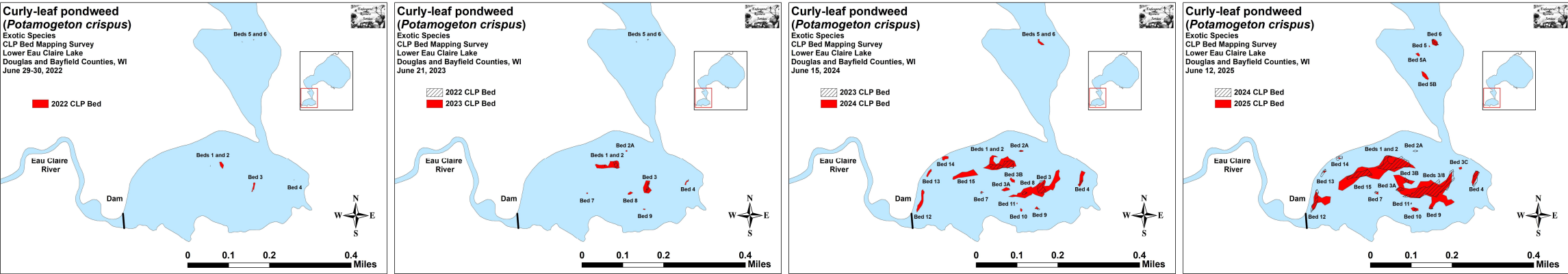


Figure 4: Outlet Bay - Lower Eau Claire Lake Curly-leaf Pondweed Beds – 2022, 2023, 2024, and 2025

Table 1: Curly-leaf Pondweed Bed Summary
Lower Eau Claire Lake – Douglas and Bayfield Counties, Wisconsin
June 29-30, 2022, June 21, 2023, June 15, 2024, and June 12, 2025

Bed Number	2025 Acreage	2024 Acreage	2023 Acreage	2022 Acreage	2024-25 Change in Area	Depth Range and Mean Depth	Est. Range and Mean Rake-full	Canopied	Navigation Impairment	2025 Field Notes
1	3.12	0.99	0.42	<0.01	1.71	6-10; 8	<<<<1-3; 2	Near	Moderate	Canopied mat in nav. channel.
2	Merged	Merged	Merged	0.06	-	5-9; 6	<<<<1-3; 2	Yes	Moderate	Merged with Bed 1.
2A	0	0.02	0.01	0	-0.02	5-7; 6	<<<<1	Near	None	Only a handful of CLP seen.
3	3.39	1.48	0.26	0.05	1.77	4-13; 10	<<<<1-3; 3	Near	Moderate	Dense near-canopy mat.
3A	Merged	0.07	0	0	-	7-9; 8	2-3; 2	Near	Moderate	Merged with Bed 3.
3B	Merged	0.05	0	0	-	9-11; 10	2-3; 2	Near	Moderate	Merged with Bed 3.
3C	0.02	0	0	0	0.02	5-6; 6	1-3; 3	Yes	Minor	Dense microbed.
4	0.19	0.19	0.02	<0.01	0	3-5; 4	<<<<1-3; 2	Yes	Minor	Too narrow to be mod. impair.
5	<0.01	Merged	0	<0.01	<0.01	9-10; 9	1-3; 2	Near	None	Microbed in narrows.
5A	0.03	0	0	0	0.03	8-10; 9	<1-3; 2	Near	Minor	Microbed in narrows.
5B	0.11	0	0	0	0.11	8-10; 9	1-3; 2	Near	Minor	Microbed in narrows.
6	0.11	0.06	0	<0.01	0.05	7-10; 9	<1-3; 2	Near	Minor	Microbed in narrows.
7	0.02	0.01	0.01	0	0.01	4-7; 6	1-3; 3	Yes	Minor	Dense microbed.
8	Merged	Merged	0.03	0	-	7-14; 10	<<<<1-3; 3	Yes	Severe	Merged with Bed 3.
9	Merged	0.02	0.01	0	-	2-4; 3	<<<<1-3; 3	Yes	Minor	Merged with Bed 3.
10	0.08	0.02	0	0	0.06	7-8; 8	1-3; 3	Yes	Minor	Dense microbed.
11	<0.01	<0.01	0	0	0	7-8; 8	1-3; 3	Yes	Minor	Dense microbed.
12	0.57	0.22	0	0	0.35	3-6; 4	<<<<1-3; 1	Yes	Minor	Collection of microbeds.
13	0.01	0.06	0	0	-0.05	3-6; 4	<<<<1-3; 1	Yes	Minor	Collection of superclusters.
14	0.01	0.09	0	0	-0.08	3-6; 4	<<<<1-3; 1	Yes	Minor	Collection of superclusters.
15	Merged	0.42	0	0	-	7-10; 8	<<<<1-3; 2	Yes	Moderate	Merged with Bed 1.
Total Acres	7.68	3.69	0.75	0.11	+3.99					

DISCUSSION AND CONSIDERATIONS FOR MANAGEMENT:

Although Curly-leaf pondweed currently covers a low percentage of Lower Eau Claire Lake's surface area, the significant uptick in acreage we documented in 2024 and 2025 likely means the "BAISS" harvesting program will not be able to remove the majority of CLP plants. This uptick also likely means that CLP is causing at least a minor, and, in some areas, a moderate or severe impairment for watercraft trying to navigate through the beds with these uprooted plants further spreading turions.

Lower Eau Claire Lake continues to have a rich and diverse native plant community, and suction harvesting is likely the most environmentally friendly method of controlling Curly-leaf pondweed as it targets the CLP while leaving native plants in place. If suction harvesting is discontinued in the future or if it isn't possible to get to all of the CLP beds in the time available and the TOB considers chemical control, we strongly encourage a measured approach that is closely evaluated. CLP is an opportunistic species that can rapidly exploit disturbed areas. As herbicides eliminate native vegetation as well as the target species, it is possible that CLP could rapidly reestablish in the treatment areas and ultimately become worse rather than better in the years following treatment – an outcome we have seen in many other systems over the years.

Regardless of what, if any, future active management occurs on the lake, we remind lakeshore residents that they can help minimize CLP's opportunities to spread by maintaining the lake's native plants. To accomplish this, residents should refrain from removing rooted plants from the lake unless absolutely necessary as these barren patches of substrate not only release nutrients into the water column but also give CLP a place to establish where it has a competitive advantage. Avoiding motor start-ups in water <5ft deep would also help limit CLP's spread by not clipping or uprooting vegetation. This would also work to keep nutrients out of the water column as the lake's soft sediments are easily stirred up by prop wash.

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Appendix I: 2022, 2023, 2024, and 2025 June CLP Bed Maps

