1.0 INTRODUCTION

Pearl Lake, Waushara County, is a 101-acre seepage lake with a maximum depth of 45 feet (Figure 1.0-1). Curly-leaf pondweed (Potamogeton crispus, CLP) was first discovered in Pearl Lake in 1977 and Eurasian watermilfoil (*Myriophyllum spicatum*; EWM) in 1994. A hybrid variety of EWM and the native northern watermilfoil (*Myriophyllum sibiricum x spicatum*, HWM) was verified in 2022 in addition to confirmed pure strain (via genetics) in 2010. Unless otherwise specified, this report will refer to *EWM* as the collective population of invasive watermilfoil (EWM & HWM).

Figure 1.0-1. Pearl Lake - Waushara County, WI.

1.1 Recent EWM Management & Planning

The primary citizen-based organization leading management activities on Pearl Lake is the Pearl Lake Protection & Rehabilitation District (PLPRD). The PLPRD directed herbicide treatments, largely using 2,4-D, towards EWM annually from 2009 to 2020. In more recent years, manual removal efforts have also been employed.

The PLPRD is operating under a Comprehensive Management Plan created by Stantec Consulting Services Inc. which was finalized in 2023. The Plan outlines a strategy for actively managing EWM and continuing to monitor the population with annual surveys. CLP was also mentioned in the plan and due to the low observed populations at that time, no active management strategy was recommended for that species.

Following the management plan, in 2023, a treatment using ProcellaCOR targeted five EWM colonized locations totaling 8.8 acres. Although the treatment was designed to be a spot treatment, the potential whole-lake epilimnetic concentration of the active ingredient was recently calculated by Onterra and estimated to reach 0.3 ppb active ingredient (ai). Based on Onterra's experience, this concentration is sufficient for plant impacts to be observed throughout the lake, although less than what would be targeted as part of an intentionally planned whole-lake treatment (0.6-1.25 ppm ai).

Photograph 1.1-1. Onterra crew during 2025 Early Season EWM Mapping Survey on Pearl Lake. Photo credit Onterra.

The PLPRD was awarded an AIS Control Grant through the Wisconsin Department of Natural Resources (WDNR) to provide 65% of the cost in monitoring and managing the EWM population during 2025 and 2026 (ACEI-358-

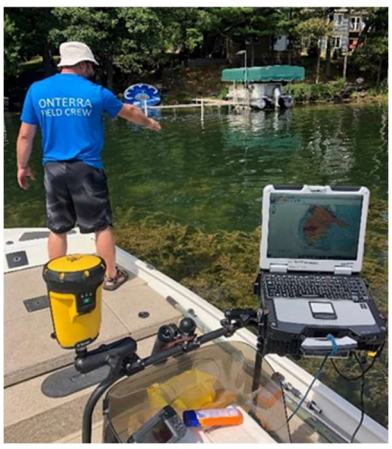
25). Onterra was contracted to complete the studies outlined, aimed at monitoring and planning the manual removal program during this 2-year project (Photograph 1.1-1). The results of the monitoring and management activities that occurred during 2025 along with a preliminary plan for 2026 are discussed within this first of two report deliverables for this grant-funded project.

1.2 Acoustic Modeling Survey

To better document the depth contours of the lake, Onterra conducted a probono acoustic-based bathymetry survey during the 2025 Late Season EWM Mapping Survey. This survey involved the systematic collection of continuous, advanced sonar data across Pearl Lake. The resulting data was modeled, shown on Map 1.

2.0 2025 EWM MANAGEMENT AND MONITORING STRATEGY

A pair of EWM mapping surveys (early-season and late-season) were used to coordinate and monitor the hand-harvesting efforts in Pearl Lake. During the EWM mapping survey, the entire littoral area of the lake is surveyed through visual observations from the boat (Photograph 2.0-1). The EWM population is mapped using sub-meter GPS technology by using either 1) point-based or 2) area-based methodologies. Large colonies >40 feet in diameter are mapped using polygons (areas) and are qualitatively attributed a density rating based upon a five-tiered scale from *highly scattered* to *surface matting*. Point-based techniques were applied to EWM locations that were considered as *small plant colonies* (<40 feet in diameter), *clumps of plants*, or *single or few plants*.



Photograph 2.0-1. EWM mapping survey on a Wisconsin Lake. Photo credit Onterra.

2.1 Early-Season 2025 EWM Mapping Survey

An Early Season EWM Mapping Survey occurred on Pearl Lake in early June 2025, with the primary purpose being to assess the EWM population and devise a prioritized manual removal strategy for the rest of the summer. GPS basemap of the survey results was provided to the manual removal firm, allowing the most recent EWM survey data to be used to guide their efforts while on the water.

Onterra ecologists conducted the early-season EWM mapping survey on June 4, 2025 (Map 2). The entire littoral area of the lake was surveyed with all previous EWM findings from Golden Sands RC&D's 2024 survey loaded onto the onboard GIS software in order to ensure known past EWM locations were thoroughly investigated. The crews noted filamentous algae and detritus (dead plant material) on the plants, complicating rapid plant identification. The survey crew was still able to see and map EWM due to excellent weather conditions, noting mostly sunny skies and almost calm winds during the survey. While EWM is usually not at its peak growth at this time of year, the water is typically clearer during the early summer allowing for more effective viewing of submersed plants, and EWM is often growing higher in the water column than many of the native aquatic plants at that time of year. The field crew also noted isolated CLP plants in a few areas of the lake, especially the south central (SC) shoreline.

During the course of the survey, the crew mapped numerous point-based EWM occurrences, with no EWM colonies being large enough to map using polygon-based mapping techniques. Two points were

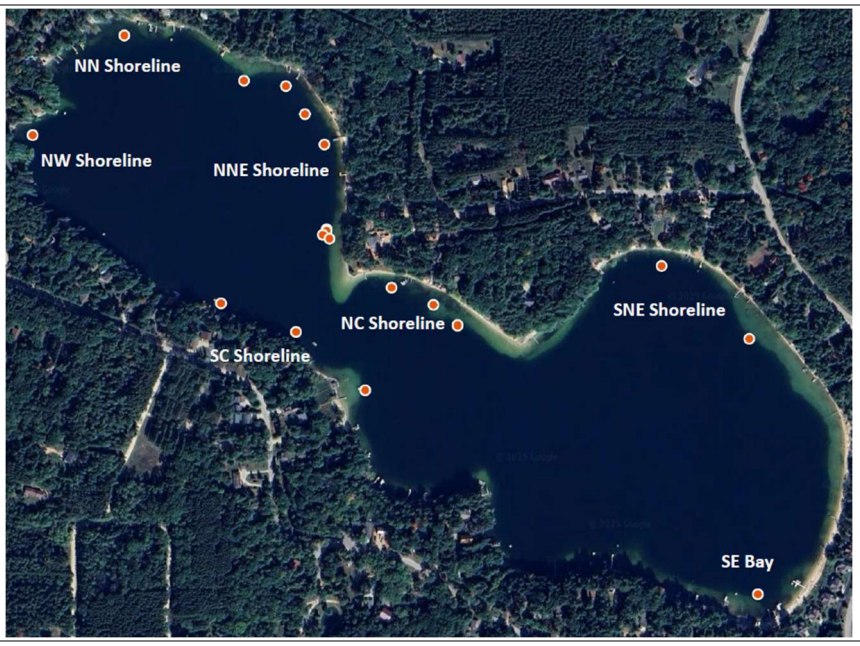
mapped as *small plant colonies*, a handful (8) were mapped as a *clump of plants*, and the rest were *single or few plants*. The majority of the *clump of plants* along with one *small plant colony* were found along the north northeast (NNE) shoreline while the other small plant colony was found on the southwest shoreline. *Single or few plant* occurrences were scattered around much of the near-shore areas of the lake.

2.2 Manual Removal Efforts

Five subsequent days of professional hand harvesting efforts took place from June 23, 2025 to June 27, 2025, which occurred following Onterra's early-summer EWM survey in June. The professional efforts took place at seven sites around the lake where EWM was identified in Onterra's June 2025 early-summer EWM Mapping Survey. Divers also reported encountering small amounts of CLP at the SC Shoreline site during harvesting and subsequently harvested that species when encountered as well. Divers reported that a total of 36.0 cubic feet of mostly EWM and some CLP were harvested between the five days of harvesting in 2025 (Table 2.2-1).

Table 2.2-1. 2025 Professional hand-harvesting activities in Pearl Lake. Table extracted from APM, LLC Dive Report (Appendix A)

Dive Location	Avg. Water Depth	# of Dives	Underwater Dive Time	AIS Removed (cubic feet)
NC Shoreline	12.7	3	6.6	6.5
NN Shoreline	6.0	1	1.5	0.5
NNE Shoreline	11.5	8	17.5	24.5
NW Shoreline	10.0	1	0.8	0.5
SC Shoreline	5.3	3	2.9	1.5
SE Bay	20.0	1	1.5	1.5
SNE Shoreline	7.0	2	2.4	1.0
Grand Total	**10.3**	**19**	**33.2**	**36.0**



2.3 Late-Summer 2025 EWM Mapping Survey

The late-summer EWM mapping survey was conducted on September 12, 2026, to qualitatively assess the hand harvesting efforts as well as to understand the peak growth (peak-biomass) of the EWM population throughout the lake in 2025. Map 3 provides an overview map, with Maps 4 and 5 zooming in to each basin. Map 2 displays a comparison of the 2025 early season and late season EWM mapping surveys.

The field crew mapped one small *scattered* polygon sized colony (<0.1 acre in size) and numerous point-based occurrences around the lake. The number of point-based occurrences was about double that documented during the early season survey, likely as a result of EWM population expansion and small-statured plants that escaped detection during the early season survey. Of the point-based occurrences, one was identified as a *small plant colony*, four points were identified as *clumps of plants,* and the remaining were *single or few plants*..

The majority of the 2025 manual removal activity took place at the NNE shoreline site. The GPS locations (yellow transparent circles) shown in Figure 2.3-1 indicate areas where the manual removal efforts took place and the support boat was anchored. Manual removal efforts likely extended throughout these areas and between the GPS locations. At the NNE shoreline site, APM reported additional unmarked *small plant colony*-sized occurrences in deeper waters that went undetected during the early-season survey. Professional divers worked underwater for approximately 17.5 hours in this site, removing 24.5 cubic feet of EWM.

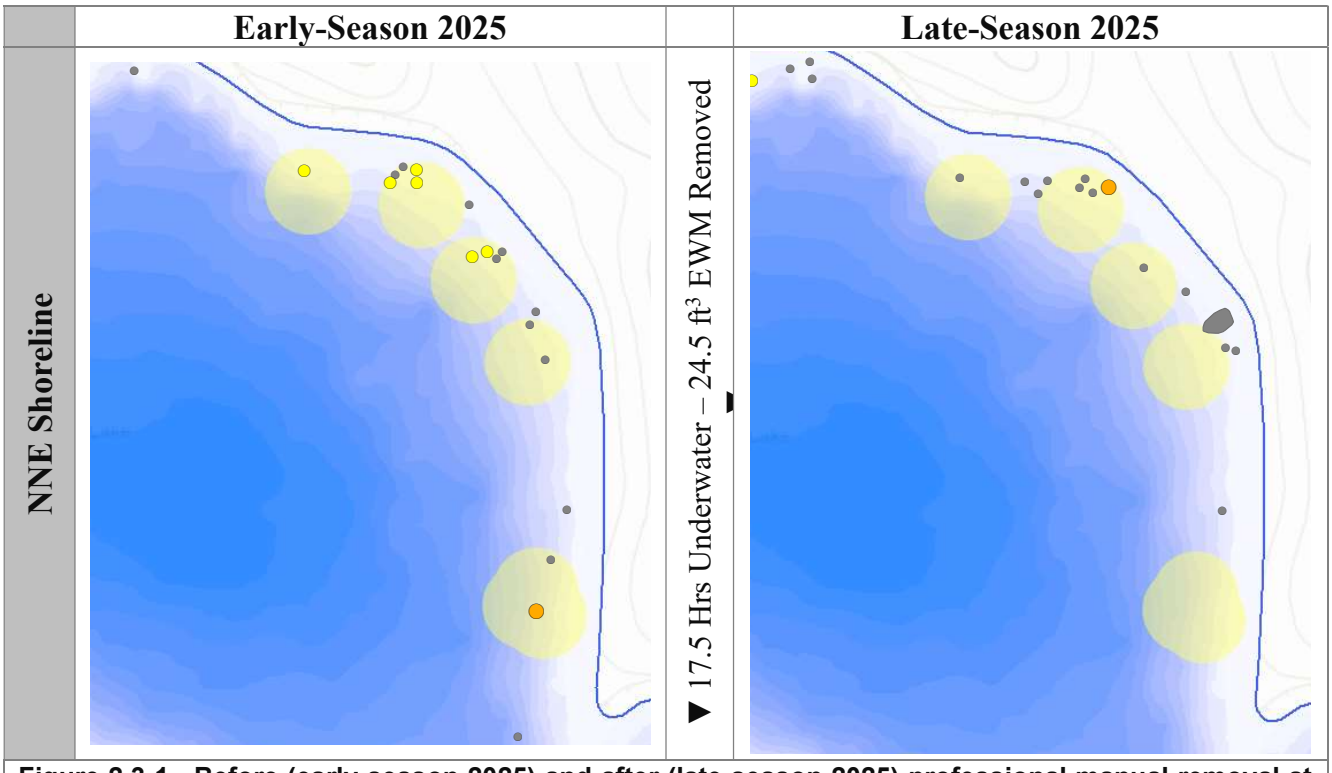


Figure 2.3-1. Before (early-season 2025) and after (late-season 2025) professional manual removal at the NNE Shoreline site.

The next two most targeted manual removal areas in 2025 were the north central (NC) shoreline and south central (SC) shorelines sites (Figure 2.3-2). Please note that these figures differ from the previous, with the Early Season Survey from each site on top, and the Late-Season Survey on bottom. During the 2-25 Early Season EWM Mapping Survey, only loose occurrences of EWM were noted in these areas. As the summer progressed, more individual plants could be observed, likely through a combination of population expansion and plants that went undetected during the early season survey. The 2025 Late Season EWM Survey also noted individual plant occurrences in these sites, although slightly different locations.

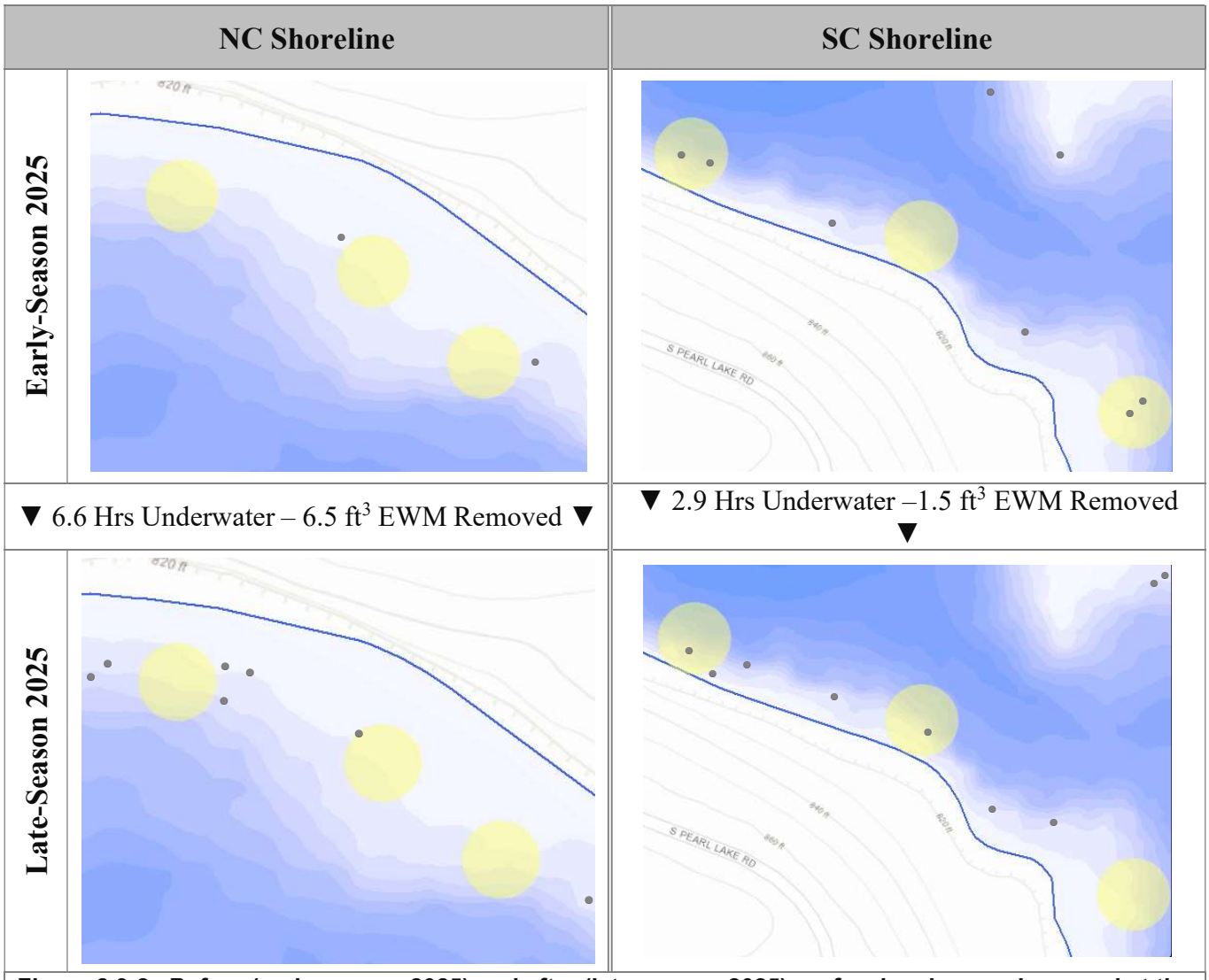


Figure 2.3-2. Before (early-season 2025) and after (late-season 2025) professional manual removal at the NC Shoreline site.

3.0 CONCLUSIONS AND DISCUSSION

In 2025, the EWM monitoring and management activities on Pearl Lake were completed as planned. Manual EWM removal efforts in 2025 proved to be effective in maintaining a low EWM population within Pearl Lake.

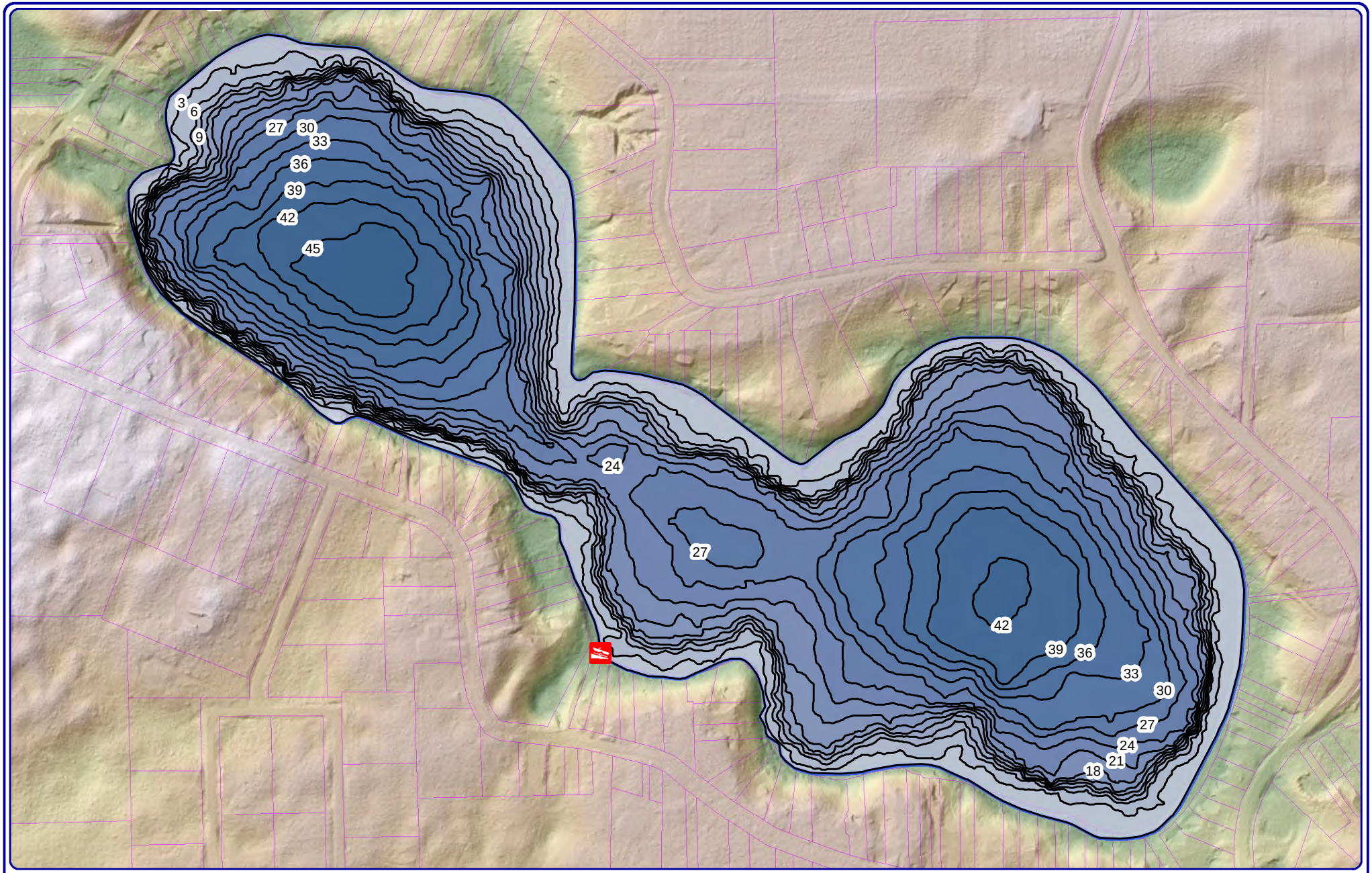
On March 18, 2026, Onterra and representatives of the PLPRD conducted a two hour virtual meeting to discuss general EWM management principles, the current state of the EWM population on Pearl Lake, and management direction for 2026. A handout of the presentation slides can be found in Appendix B.

An aspect of the teleconference discussed the role of traditional removal practices versus Diver-Assisted Suction Harvest (DASH). Traditional hand-harvesting allows more flexibility, as the DASH equipment is bulky and takes time to move. When EWM plants are spread out and relatively low density, traditional removal methods are often thought to be more appropriate. Without the restrictions of permitted areas, divers can pull plants anywhere in the lake, stuff them in permeable bags that will be brought to the surface when full. Only traditional hand-harvesting efforts were deployed in 2025.

DASH is a form of manual removal which involves divers removing target plants (i.e., EWM) and feeding them into a suctioned hose for delivery to the deck of the harvesting vessel. The DASH system is thought to be more efficient than manual removal alone as the diver does not have to go to the surface to deliver the pulled plants to someone on a boat. The DASH system is generally believed to cause less fragmentation, as the plants are immediately transported to the surface using the pumping mechanism. However, some PLPRD representatives have expressed concerns about the DASH methodology causing excessive fragments during the onboard EWM filtration and bagging process. Because DASH involves a mechanical mechanism, this activity requires permitting by the WDNR under NR109, with delineated areas on a map required and associated acreage-based permit fees.

Based upon the teleconference and Onterra's general guidance, four priority sites of higher current or recent EWM populations were identified for manual removal (Map 6). All remaining EWM occurrences would be appropriate for secondary manual removal efforts. While the PLPRD will continue to discuss the applicability of DASH to increase efficiency, the current EWM population of Pearl Lake is still thought to be manageable with traditional hand-harvesting efforts.

The primary 2026 manual removal efforts would occur in mid-June. Understanding that manual extraction of the complete EWM plant, including the roots, is a difficult and lofty task, Onterra also recommends the PLPRD also consider a second manual removal event later in the season to revisit previous manual removal sites to target rebounding EWM occurrences. This second manual removal event could also be directed at meaningful EWM occurrences that have developed over the course of the growing season after the early season survey occurred.



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www.onterra-eco.com

Sources:
Roads & Hydro: WDNR
Bathy: Onterra, 2025
Elevation/Hillshade: LiDAR
Pacels: V700
Map Date: March 18, 2026 - EJH

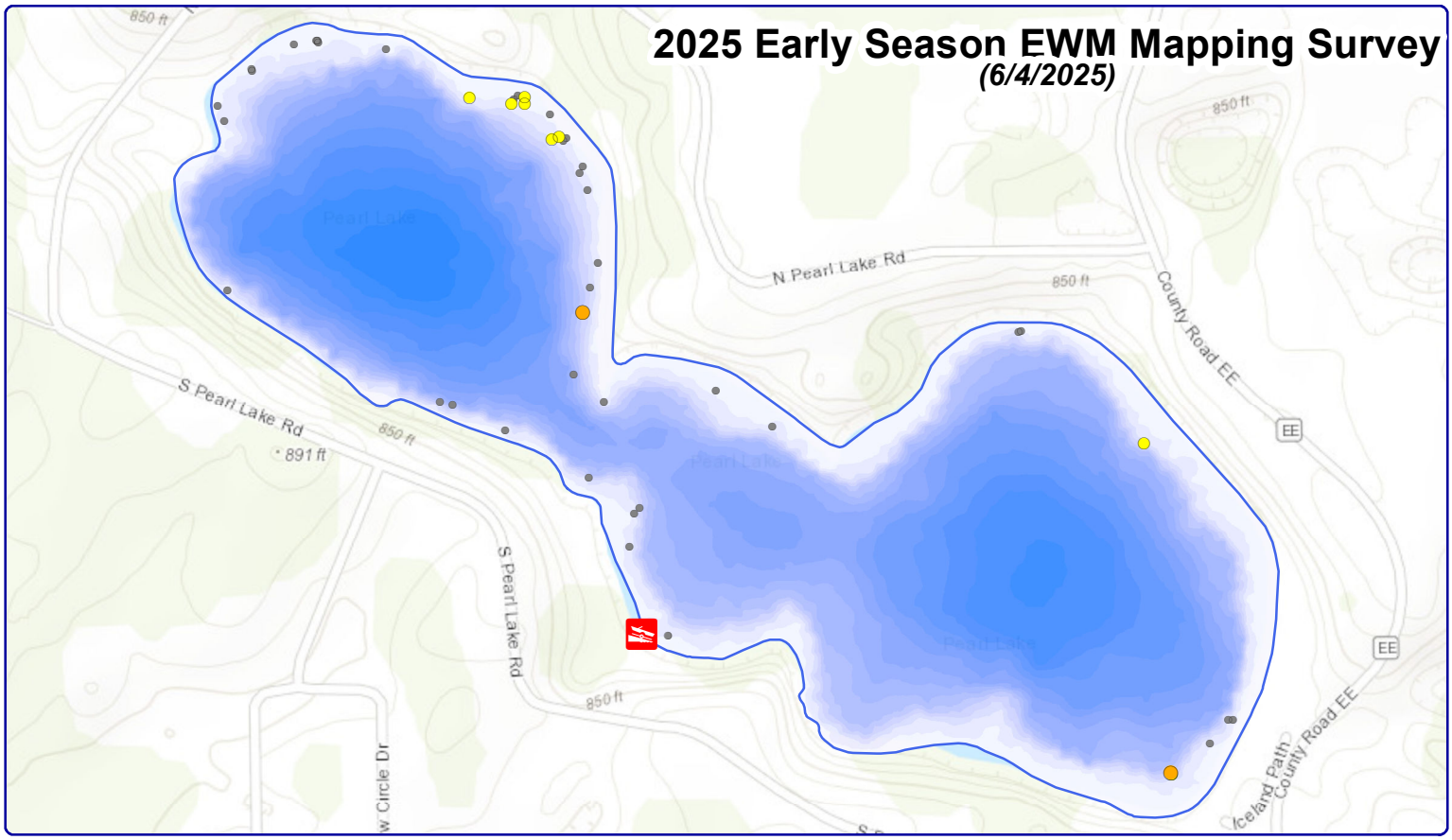
Project Location in Wisconsin

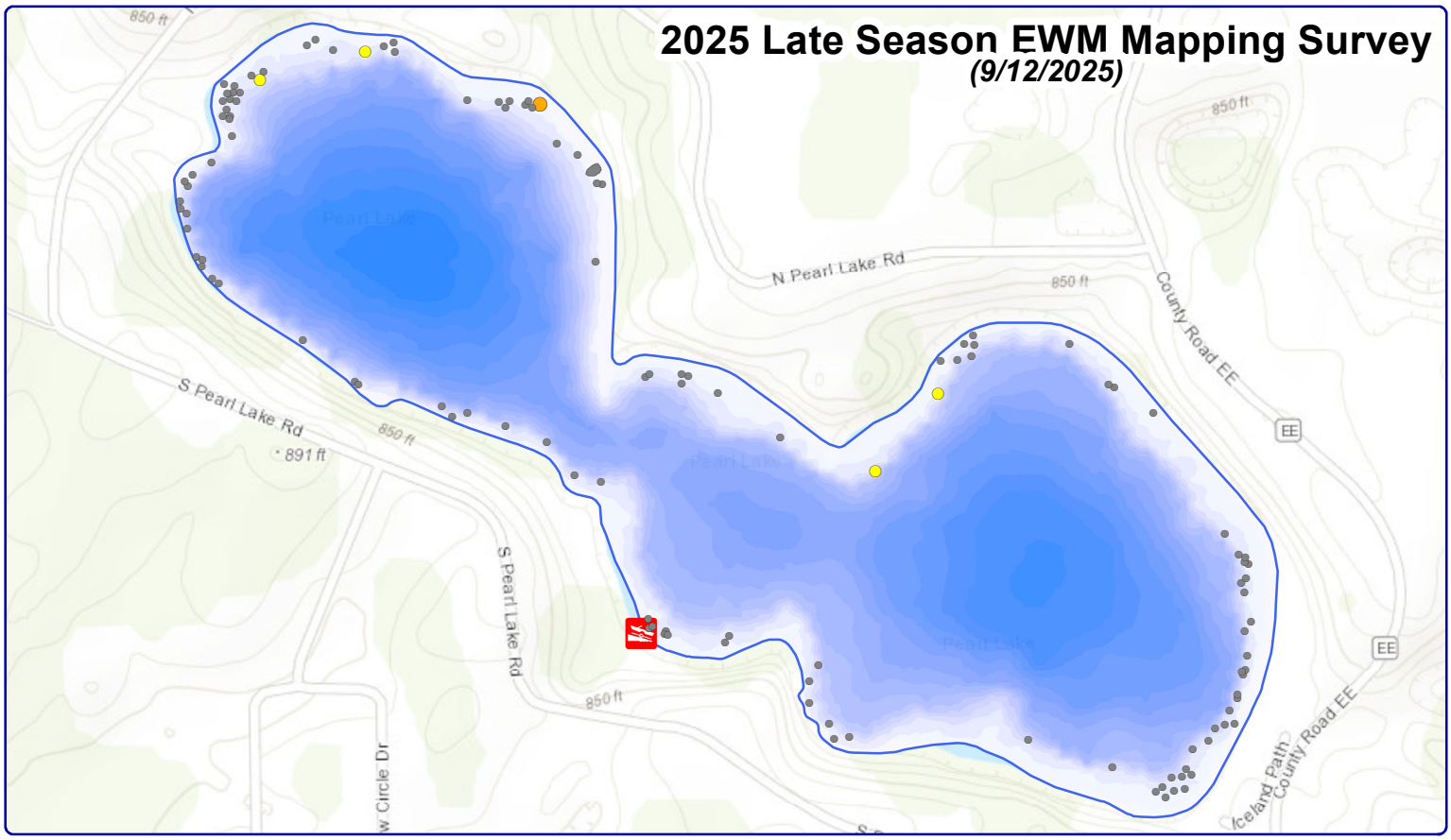
Map 1

Pearl Lake

Waushara County, Wisconsin

September 2025 Acoustic Bathymetric Model





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Sources:
Roads & Hydro: WDNR
Bathy: Onterra, 2025
Basemap: ESRI AGOL
Aquatic Plant Survey: Onterra, 2025
Map Date: October 6, 2025 - EJH


Project Location in Wisconsin

Legend

EWM Survey Results

- Highly Scattered *(None)*
- Scattered
- Dominant *(None)*
- Highly Dominant *(None)*
- Surface Matting *(None)*
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Map 2
Pearl Lake
Waushara County, Wisconsin
2025 EWM Survey Results
Early vs Late Season

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Sources:
Roads & Hydro: WDNR
Bathy: Onterra, 2025
Orthophoto: NAIP, 2022
Aquatic Plant Survey: Onterra, 2025
Map Date: October 3, 2025 - LLC

Project Location in Wisconsin

Legend

EWM Survey Results (September 12, 2025)

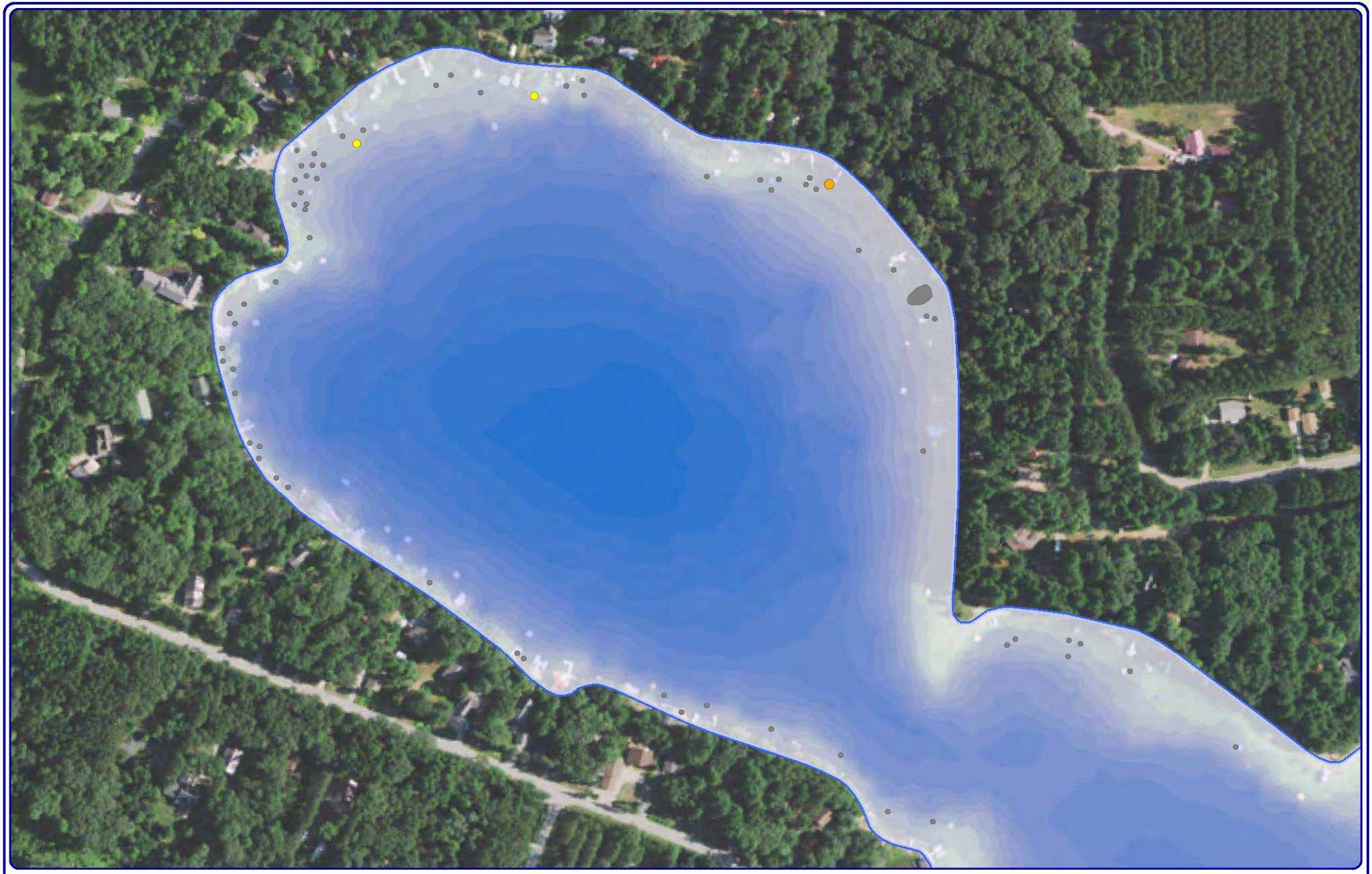
- Highly Scattered *(None)*
- Scattered
- Dominant *(None)*
- Highly Dominant *(None)*
- Surface Matting *(None)*
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Map 3 (Overview Map)

Pearl Lake

Waushara County, Wisconsin

Late-Season 2025 EWM Survey Results



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Sources:
Roads & Hydro: WDNR
Bathy: Onterra, 2025
Orthophoto: NAIP, 2022
Aquatic Plant Survey: Onterra, 2025
Map Date: October 3, 2025 - LLC

Project Location in Wisconsin

Legend

EWM Survey Results (September 12, 2025)

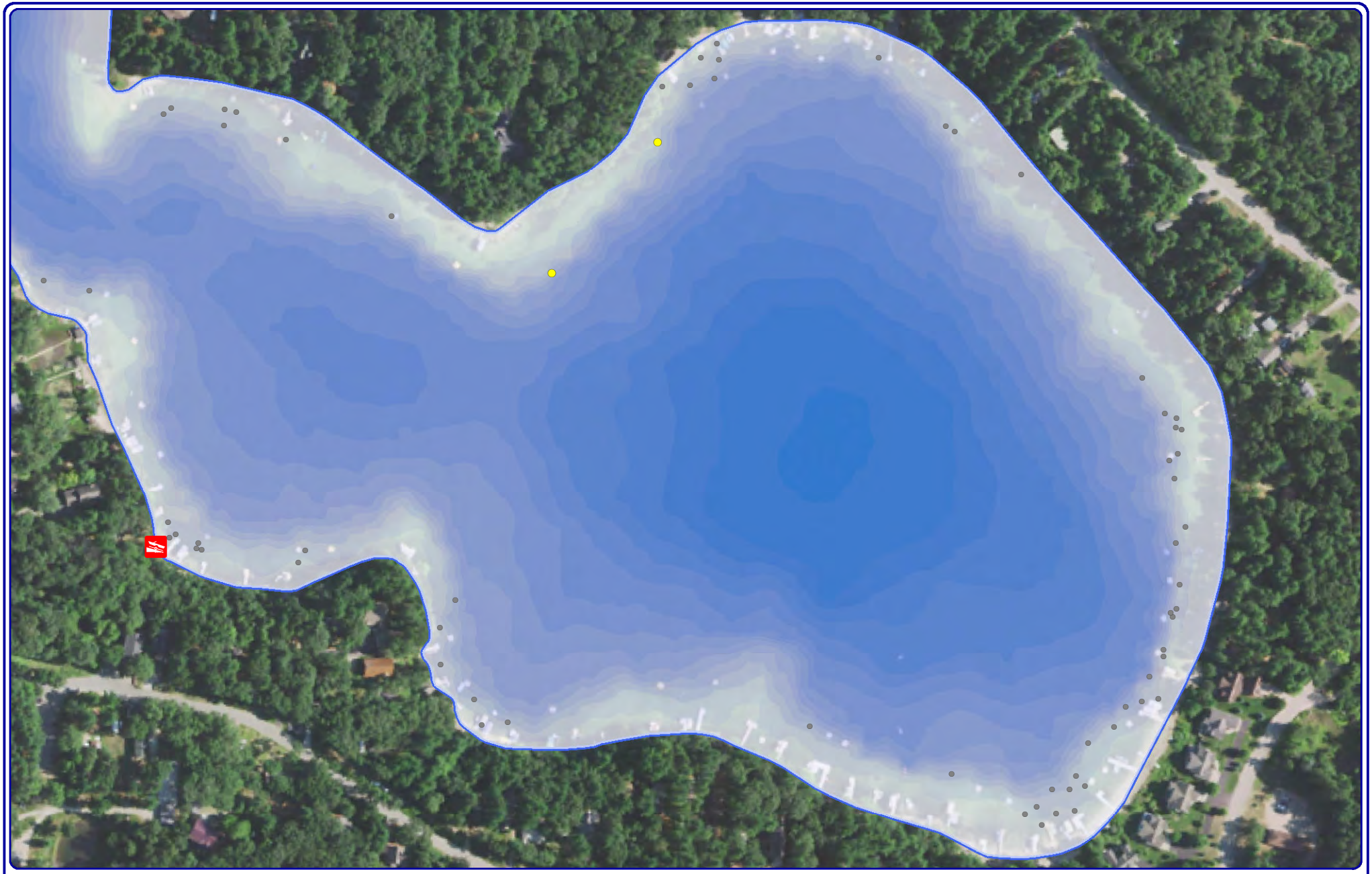
- Highly Scattered *(None)*
- Scattered
- Dominant *(None)*
- Highly Dominant *(None)*
- Surface Matting *(None)*
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Map 4 (West Inset Map)

Pearl Lake

Waushara County, Wisconsin

Late-Season 2025 EWM Survey Results



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Sources:
Roads & Hydro: WDNR
Bathy: Onterra, 2025
Orthophoto: NAIP, 2022
Aquatic Plant Survey: Onterra, 2025
Map Date: October 3, 2025 - LLC

Project Location in Wisconsin

Legend

EWM Survey Results (September 12, 2025)

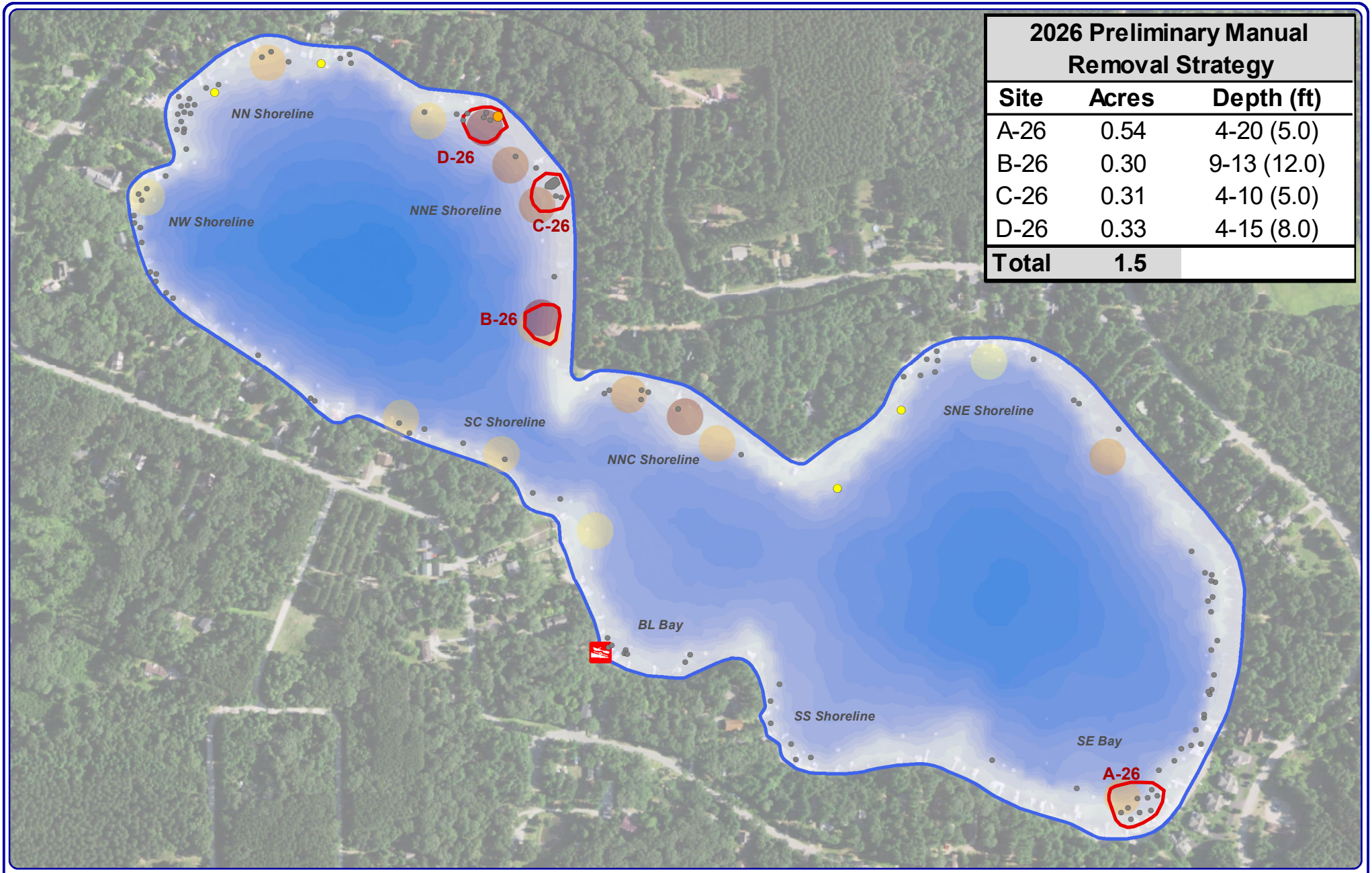
- Highly Scattered *(None)*
- Scattered
- Dominant *(None)*
- Highly Dominant *(None)*
- Surface Matting *(None)*
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Map 5 (East Inset Map)

Pearl Lake

Waushara County, Wisconsin

Late-Season 2025 EWM Survey Results



2026 Preliminary Manual Removal Strategy

Site	Acres	Depth (ft)
A-26	0.54	4-20 (5.0)
B-26	0.30	9-13 (12.0)
C-26	0.31	4-10 (5.0)
D-26	0.33	4-15 (8.0)
Total	**1.5**	

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460 Feet

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www.onterra-eco.com

Sources:
Roads & Hydro: WDNR
Bathy: Onterra, 2025
Orthophoto: NAIP, 2022
Aquatic Plant Survey: Onterra, 2025
Map Date: March 2, 2026 - EJH

Project Location in Wisconsin

Legend

EWM Survey Results (September 12, 2025)

- Highly Scattered *(None)*
- Scattered
- Dominant *(None)*
- Highly Dominant *(None)*
- Surface Matting *(None)*
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

2025 Manual Removal
Site: Underwater Time

0.5 hrs

4.0 hrs

Map 6
Pearl Lake
Waushara County, Wisconsin

2026 Preliminary EWM Manual Removal Sites

A

APPENDIX A

Pearl Lake 2025 EWM Manual Removal Report

- ***Aquatic Plant Management LLC***

Pearl Lake EWM Removal Report 2025

PO Box 1134 Minocqua, WI 54548

Pearl Lake EWM Removal Summary

Dive Background: In June Aquatic Plant Management LLC (APM) conducted 5 days of Hand Harvesting Harvesting for Eurasian Watermilfoil (EWM) on Pearl Lake in Waushara County, WI. The team focused their efforts at 7 sites as prioritized by the Pearl Lake Protection & Rehabilitation District. In total APM was able to remove **36 cubic feet of EWM** from Pearl Lake.

Dive Results by Day

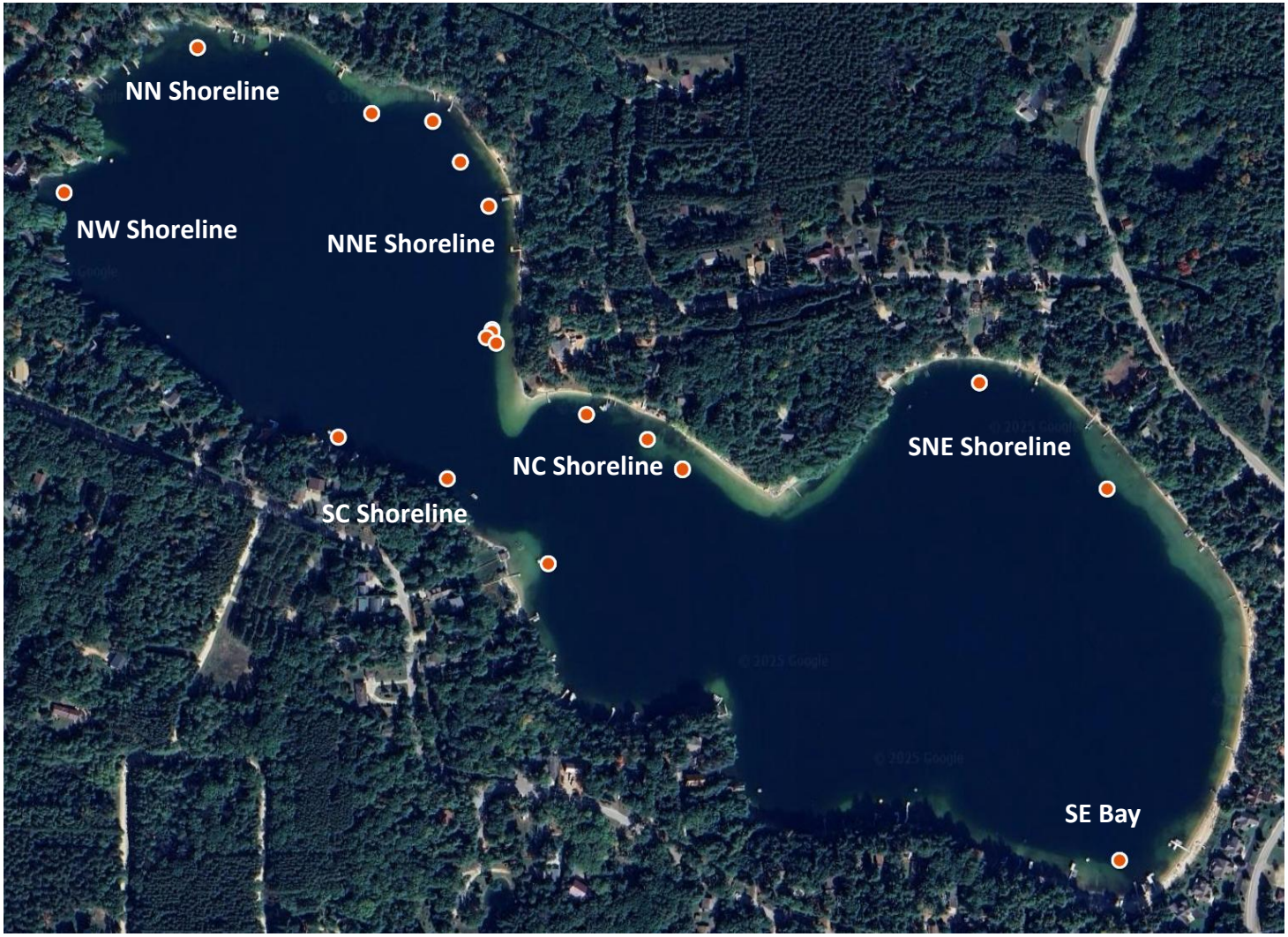
Date	Weather Conditions	Water Temp (F)	Underwater Dive Time (hrs)	AIS Removed (cubic ft)
6/23/2025	Thunderstorms	80	4.3	5.5
6/24/2025	Periods of rain	82	8.8	11.5
6/25/2025	Periods of rain	80	8.3	10.0
6/26/2025	Periods of rain	75	7.6	5.0
6/27/2025	Partly Cloudy	73	4.3	4.0
Grand Total			**33.2**	**36.0**

Dive Results by Site

Dive Location	Avg. Water Depth	# of Dives	Underwater Dive Time	AIS Removed (cubic feet)
NC Shoreline	12.7	3	6.6	6.5
NN Shoreline	6.0	1	1.5	0.5
NNE Shoreline	11.5	8	17.5	24.5
NW Shoreline	10.0	1	0.8	0.5
SC Shoreline	5.3	3	2.9	1.5
SE Bay	20.0	1	1.5	1.5
SNE Shoreline	7.0	2	2.4	1.0
Grand Total	**10.3**	**19**	**33.2**	**36.0**

Dive Highlights and Recommendations: The dive team spent the bulk of their time and found the most biomass along the Northeast Shoreline. At that site, the team discovered and harvested an unmarked small plant colony in ~20ft of water. In the SE Bay, the team found and removed some minimal curlyleaf pondweed in addition to the EWM. At the sites in the center of the lake the team discovered and removed additional unmapped clumps. Boat traffic was high in the center of the lake. Overall, Pearl Lake should continue to take an Integrated Pest Management (IPM) approach and evaluate different strategies to manage the EWM population on the lake. Continued monitoring and management efforts are important to prevent the spread of EWM throughout Pearl Lake.

Map of Pearl Lake Dive Sites



Detailed Diving Activities

Date	Dive Location	Latitude	Longitude	Underwater Dive Time (hrs)	AIS Removed (cubic ft)	AIS Density	Avg Water Depth (ft)	Native Species	Native By-Catch	Substrate Type
6/23/2025	SE Bay	44.08526	-89.11257	1.50	1.5	Clumps	20.0	Elodea	0.5	Organic/Sand
6/23/2025	NNE Shoreline	44.08987	-89.12035	1.67	3.0	Small Plant Colony	13.0	None	0.0	Organic/Sand
6/23/2025	NNE Shoreline	44.08992	-89.12028	1.08	1.0	Scattered	13.0	Grasses	0.5	Organic/Sand
6/24/2025	NNE Shoreline	44.08994	-89.12028	3.50	1.0	Scattered	12.0	None	0.0	Organic/Sand
6/24/2025	NNE Shoreline	44.09103	-89.12032	2.58	1.0	Scattered	8.5	None	0.0	Organic/Sand
6/24/2025	NNE Shoreline	44.09142	-89.12067	2.67	9.5	Clumps	10.0	Grasses	2.5	Organic/Sand
6/25/2025	NNE Shoreline	44.09178	-89.12101	3.83	7.5	Clumps	15.0	Grasses	2.0	Organic/Sand
6/25/2025	NNE Shoreline	44.09185	-89.12176	1.08	1.0	Scattered	8.5	Elodea	0.0	Organic/Sand
6/25/2025	NN Shoreline	44.09243	-89.12390	1.50	0.5	Scattered	6.0	None	0.0	Organic/Sand
6/25/2025	NW Shoreline	44.09115	-89.12554	0.83	0.5	Single or Few	10.0	None	0.0	Organic/Sand
6/25/2025	NNE Shoreline	44.08982	-89.12023	1.08	0.5	Single or Few	12.0	None	0.0	Sand
6/26/2025	SNE Shoreline	44.08854	-89.11272	1.83	0.5	Scattered	6.0	None	0.0	Sand
6/26/2025	SC Shoreline	44.08899	-89.12217	1.00	0.5	Scattered	1.0	None	0.0	Sand
6/26/2025	SC Shoreline	44.08788	-89.11959	0.83	0.5	Scattered	7.0	None	0.0	Organic
6/26/2025	SC Shoreline	44.08863	-89.12083	1.08	0.5	Scattered	8.0	None	0.0	Organic/Sand
6/26/2025	NC Shoreline	44.08897	-89.11837	2.83	3.0	Clumps	12.0	Elodea	0.5	Organic
6/27/2025	NC Shoreline	44.08871	-89.11794	1.67	0.5	Highly Scattered	9.0	Elodea	1.0	Organic
6/27/2025	NC Shoreline	44.08919	-89.11912	2.08	3.0	Small Plant Colony	17.0	Elodea	0.5	Organic
6/27/2025	SNE Shoreline	44.08947	-89.11429	0.58	0.5	Scattered	8.0	None	0.0	Organic
Total	**19**			**33.22**	**36.0**					

B

APPENDIX B

March 18, 2026 EWM Information & Planning Meeting Presentation Handout - Onterra

1

Presentation Outline

- Introduction to Onterra
- Acoustic Bathy Survey (Probono)
- EWM Management & Perspectives
- Herbicide Treatment Discussion
- Manual Removal Discussion
- Pearl Lake 2025 Project
- Pearl Lake 2026 Planning

2

Onterra, LLC

- Founded in 2005, HQ in De Pere, WI
- Staff
  - Three aquatic ecologists
  - One paleoecologist
  - Four full-time field technicians
  - Five summer interns
- Services
  - Science and planning
- Philosophy
  - Promote realistic planning
  - Assist, not direct

3

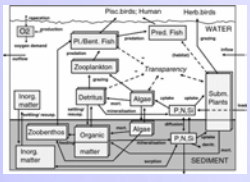
Acoustic-Based Bathymetric Study

- First step in our projects is to digitize the WDNR Lake Survey Map
  - Understanding accurate depth contours, especially for meander-based submersed vegetation surveys is extremely important
- 1958 Lake Survey map was extremely generic
- We recorded continuous 2-channel acoustic data and processed into a new bathymetric map (3-ft contours)

4

Complexity of Lake Ecosystems

- Aquatic ecology is a quest to understand as many of the variables as possible and their magnitude of influence
- Lake management is figuring out how to best support ecosystem function in the face of human presence and use
  - Not always an engineering problem to solve
  - Support the best version of the lake

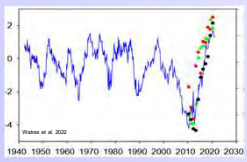


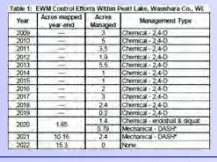
The process of taking a core group of decision-makers through a planning project is arguably more valuable than the resulting document itself

5

Factors that Impact Aquatic Plants

- **Natural Environmental Changes**
  - Natural population dynamics
  - Climactic conditions
  - Water quality parameters
  - Water levels
- **Aquatic Plant Management**
  - Herbicide Treatments





6

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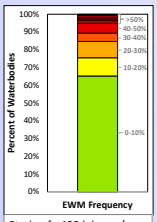
EWM Management in Lakes

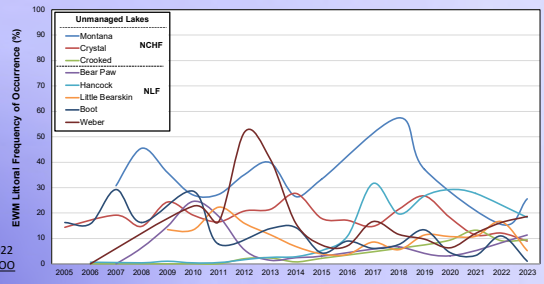
- Early perspective was that submergent EWM should not be in lakes and management should occur to reduce their populations
- Perspectives learned over time
  - EWM are commonly *rare,* and rarely *common* in WI Lakes
  - EWM populations do not always increase, but naturally fluctuate
  - EWM infrequently displace native species, but can alter aquascape
  - All management is temporary, and EWM are never eradicated once established
  - Management actions have consequences, and may impart more impact to the lake than the EWM itself
  - Current common EWM mgmt. strategies largely directed at alleviating nuisance conditions, not attempting to impact the overall EWM population



8

WDNR EWM Long-Term Monitoring Trends

Unmanaged



Pearl 2022
EWM LFOO
6.5%

9

NR107 (Herbicide) & NR109 (Mechanical)

Purpose

- Management of *nuisance-causing* aquatic plants in a manner consistent with sound ecosystem management and where the loss of ecological values is minimized

Onterra's Interpretation of Current Policy

- No herbicide use for native plants, even if nuisance causing
- EWM mgmt. needs to be specifically outlined in a management plan
- Encourages the management technique with the least ecological impact, which is often inferred as manual removal>mechanical>herbicide
- Herbicide use for EWM "may" be granted if demonstrating impairment to required navigation (density + riparian/use impact)

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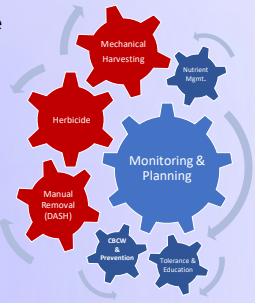
Integrated Pest Management (IPM)

Using a combination of methods that are more effective when applied collectively as part of defined strategy than when conducted separately



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EWM Management Perspectives

1. **No Coordinated Active Management (Let Nature Take its Course)**
   - Riparian manual removal, nutrient management, milfoil weevil augmentation
2. **Reduce EWM Population on a lake-wide level (Population Management – "Control")**
   - Will not *eradicate* EWM
   - Aggressive management may not be consistent with regulatory framework
3. **Minimize navigation and recreation impediment (Nuisance Mitigation)**
   - WDNR encourages the management technique with the least ecological impact, which is often inferred as manual removal>mechanical>herbicide

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Herbicide Treatment

- **Goal – multi-year EWM population control**
- **Meet concentration & exposure times (CETs) for mortality**
  - –Small (< 5 acres) spot treatments are often ineffective
  - –Protected areas more effective
  - –Spot vs whole-lake/basin treatments
- **Introduces greater need for risk assessment discussion**
  - –Impacts to native plants, particularly native watermilfoils and select dicots
  - –Potential impacts to early life stages of select fish species
  - –Unknown/under-studied impacts

Photo Credit: Schmidt's Aquatic, LLC

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Herbicide Treatment on Loon Lake

- Tracer Dye (Rhodamine WT)
- ~24 acres of 305 acre lake (7.8%)

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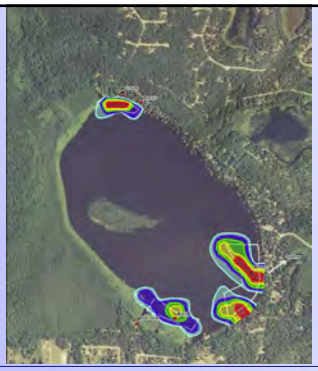
1 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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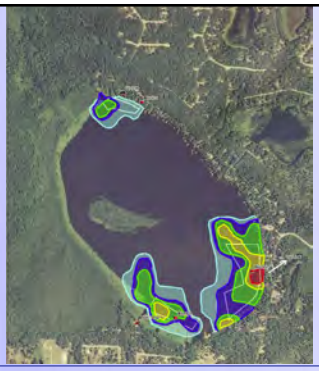
2.5 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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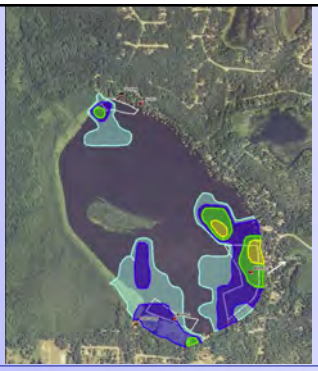
4 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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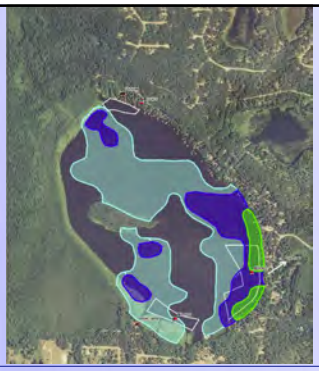
6 HAT

75-100%
50-75%
25-50%
10-25%
5-10%



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Ecological Definitions of Herbicide Treatment

Spot Treatment: Herbicide applied at a scale where dissipation will not result in significant lake wide concentrations; impacts are anticipated to be localized to in/around application area.

Treatments <5 acres in size each typically dissipate too rapidly for systemic herbicides to be effective; PCOR manufacturer supports >10 acres

Whole-Lake (basin-wide) Treatment: Herbicide applied at a scale where dissipation will result in significant lake wide concentrations; impacts are anticipated to be within a defined Area of Potential Impact (AOPI).

Depending on herbicide, treating ~5% of lake = whole-lake treatment

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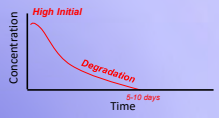
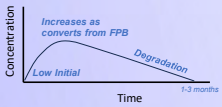
ProcellaCOR Degradation

Active Ingredient *Florpyrauxifen-benzyl (FPB)*

Hydrolysis

Acid Metabolite *Florpyrauxifen acid (FP acid)*





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Whole-Lake ProcellaCOR Treatment Example

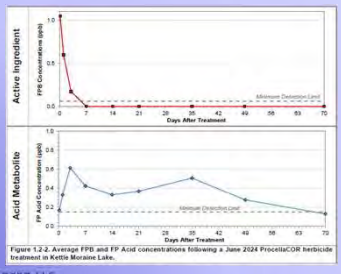
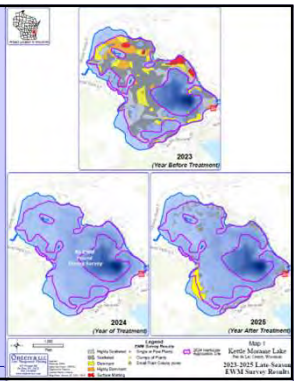


Figure 1.2-2. Average FPB and FP Acid concentrations following a June 2024 ProcellaCOR herbicide treatment in Kettle Moraine Lake.



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Spring 2023 PCOR Treatment

- 8.8 acres – total of 323 PDU
- Potential epilimnetic concentration: 0.3 ppb ai
- Onterra's typical target whole-lake treatment: 0.6-1.25 ppb ai

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Spring 2023 PCOR Treatment

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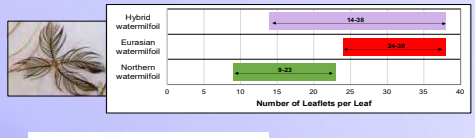
Herbicide Resistance



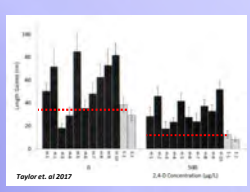


Table 1: EWM Control Efforts Within Pearl Lake, Waushara Co., WI.

Year	Acres mapped year-end	Acres Managed	Management Type
2009	—	3	Chemical - 2,4-D
2010	—	6	Chemical - 2,4-D
2011	—	3.5	Chemical - 2,4-D
2012	—	1.9	Chemical - 2,4-D
2013	—	5.5	Chemical - 2,4-D
2014	—	1	Chemical - 2,4-D
2015	—	1	Chemical - 2,4-D
2016	—	2	Chemical - 2,4-D
2017	—	3	Chemical - 2,4-D
2018	—	2.4	Chemical - 2,4-D
2019	—	0.2	Chemical - 2,4-D
2020	1.66	1.4 0.79	Chemical - endothall & diquat Mechanical - DASH
2021	16.16	2.4	Mechanical - DASH
2022	15.3	0	None

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Manual Removal Discussion

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Manual Removal – *Hand Harvesting & DASH*

- **Goal – to manage the EWM population or nuisance control**

Initial populations Low density & isolated occurrences Follow-up after treatments	In riparian footprint Navigation lanes or small areas

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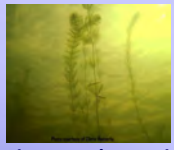
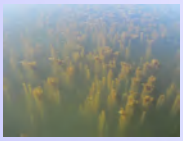
Onterra EWM Mapping





Point-Based Mapping
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Polygon-Based Mapping
- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting

Densities that can Impact navigation

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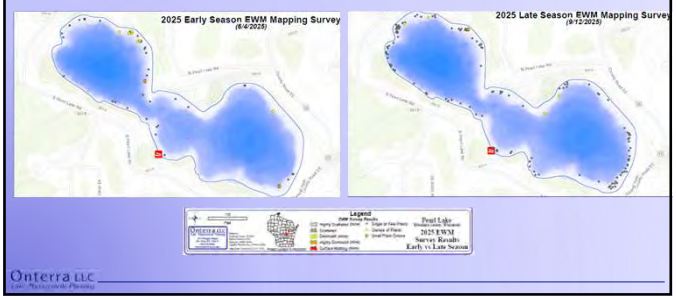
2025 EWM Mapping Survey Results



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2025 Manual Removal Efforts

Dive Location	Avg. Water Depth	# of Dives	Underwater Dive Time	AIS Removed (cubic feet)
NC Shoreline	12.7	3	6.6	6.5
NN Shoreline	6.0	1	1.5	0.5
NNE Shoreline	11.5	8	17.5	24.5
NW Shoreline	10.0	1	0.8	0.5
SC Shoreline	5.3	3	2.9	1.5
SE Bay	20.0	1	1.5	1.5
SNE Shoreline	7.0	2	2.4	1.0
Grand Total	10.3	19	33.2	36.0

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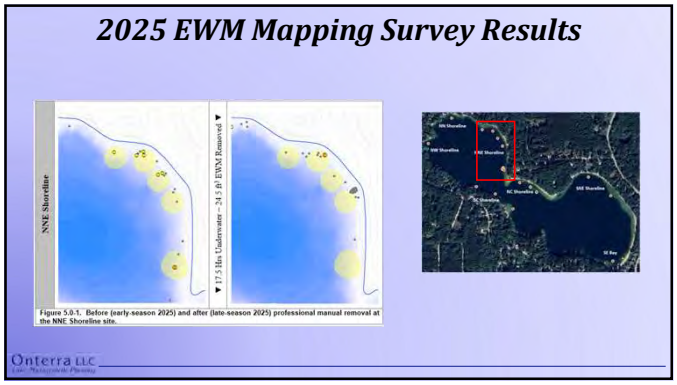
2025 EWM Mapping Survey Results
NNE Shoreline
▼17.5 Hrs Underwater – 24.5 ft² EWM Removed ▼
Figure 5.0-1. Before (early-season 2025) and after (late-season 2025) professional manual removal at the NNE Shoreline site.
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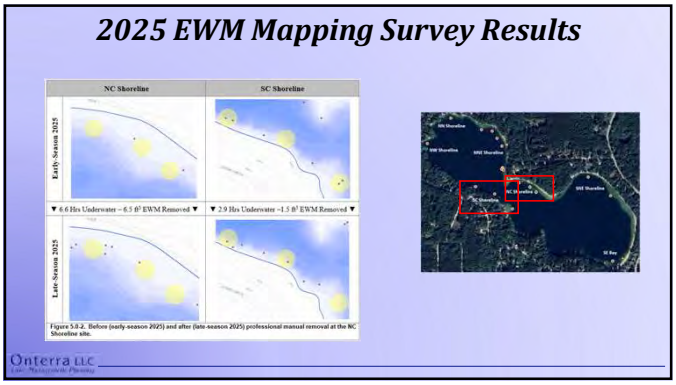
2025 EWM Mapping Survey Results
NC Shoreline
SC Shoreline
Early-Season 2025
Late-Season 2025
▼ 8.6 Hrs Underwater – 6.5 ft² EWM Removed ▼
▼ 2.9 Hrs Underwater –1.5 ft² EWM Removed ▼
Figure 5.0-2. Before (early-season 2025) and after (late-season 2025) professional manual removal at the NC Shoreline site.
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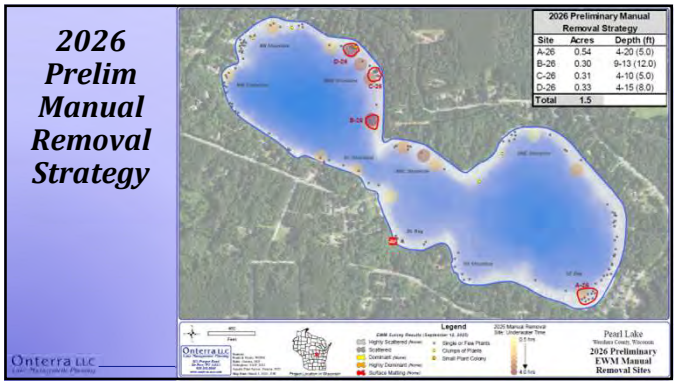
2026 Preliminary Manual Removal Strategy
Site Acres Depth (ft)
A-26 0.54 4-20 (5.0)
B-26 0.30 9-13 (12.0)
C-26 0.31 4-10 (5.0)
D-26 0.33 4-15 (8.0)
Total 1.5
Legend
Pearl Lake
2026 Preliminary EWM Manual Removal Sites
Onterra LLC

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Thank You
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Lake Management Planning
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