To:	Rex Vaughn, Chair	**Date:**	July 22, 2025
	Cedar Lake Improvement Board		
From:	Natalie Crum, Project Manager	**cc:**	Josh Kieser, Field Manager
	Kieser & Associates, LLC (K&A)		Kieser & Associates, LLC
RE:	2025 Cedar Lake North Early-Season Vegetation Survey Results		

Date of Vegetation Survey: 7/1/2025-7/2/2025
Date of Treatment: 7/8/2025
NOTE: Herbicide treatments typically take at least 10 days for full effect.

Background

The LakeScan™ program combines detailed data collection with mapping capabilities and scientifically backed analysis metrics which enable K&A to identify successful lake management activities and highlight issues that may require attention. Vegetation surveys are based on a system where the lake is divided into Aquatic Resource Observation Sites (AROS) where plant density, distribution, and position in the water column are recorded by field personnel. Special attention is given to invasive plants and nuisance conditions.

Cedar Lake North LakeScan™ Early-Season Survey

The Cedar Lake North early-season LakeScan™ survey was conducted on July 1 and 2, 2025. The weather throughout the survey was mostly sunny with temperatures around 78°F and gentle northwestern winds around 4 mph. Visibility in the water column was good with a Secchi Disk reading of 7.3 feet.

The most common native species observed during the survey were *Chara* (*Chara sp.*), broadleaf pondweed (*Potamogeton amplifolius*), rush (*Juncus pelocarpus Meyer*), and Richardson's pondweed (*Potamogeton richardsonii*). *Chara* was the most commonly observed species and was found at moderate to high densities throughout a majority of observation areas and was noted causing recreational nuisance concerns in AROS 357 and 358 where the species was growing to the surface with dense green filamentous algae. Water quality samples in these AROS locations were collected during the survey to provide insights into possible nutrient loading concerns. *Chara* was also observed bubbling to the surface in AROS 567, likely caused by rising gas or another disturbance.

Broadleaf pondweed and Richardson's pondweed were observed at moderate densities around the lake, often flowering, but typically not dense enough to cause any nuisance concerns. In some shoreline and nearshore AROS locations (338, 429, 420, 419, 434, 432, and 461) tall pondweeds were growing to the surface which could cause some minor recreational nuisance conditions but would be expected to rapidly drop from the water column following flowering. Vegetation growth was the densest in the excavated trenches (#500 AROS numbers) which were typically dominated by *Chara*, American elodea

(*Elodea canadensis*), naiad (*Najas sp.*), sago pondweed (*Stuckenia pectinatus*), and Richardson's pondweed (Figure 1). Variable-leaf watermilfoil (*Myriophyllum heterophyllum* Michx.) was found only in scattered patches in the northern portion of the lake, not causing recreational nuisance concerns during the time of the survey (Figure 2).

The only submerged aquatic invasive species observed in Cedar Lake North during the 2025 early-season survey was hybrid Eurasian watermilfoil (*Myriophyllum spicatum x sibiricum*) (Figure 3). Hybrid Eurasian watermilfoil was found in single stand-alone clusters in AROS 370 and 379-381 and in the trenches along the western portion of the lake (AROS 566, 567, 574, 575, 577, 579, 580, 582, 583). In AROS 379-381, the milfoil appeared to be advancing shoreward out of the AROS 579 and 580 trench.

The emergent wetland invasive species purple loosestrife (*Lythrum salicaria* L.) was found in scattered patches in AROS 307, 332, 352-354, 392, and 399 (Figure 4), not causing management concerns at the time of the survey. No observations of *Phragmites* (*Phragmites australis*) could be reasonably identified from the boat survey.
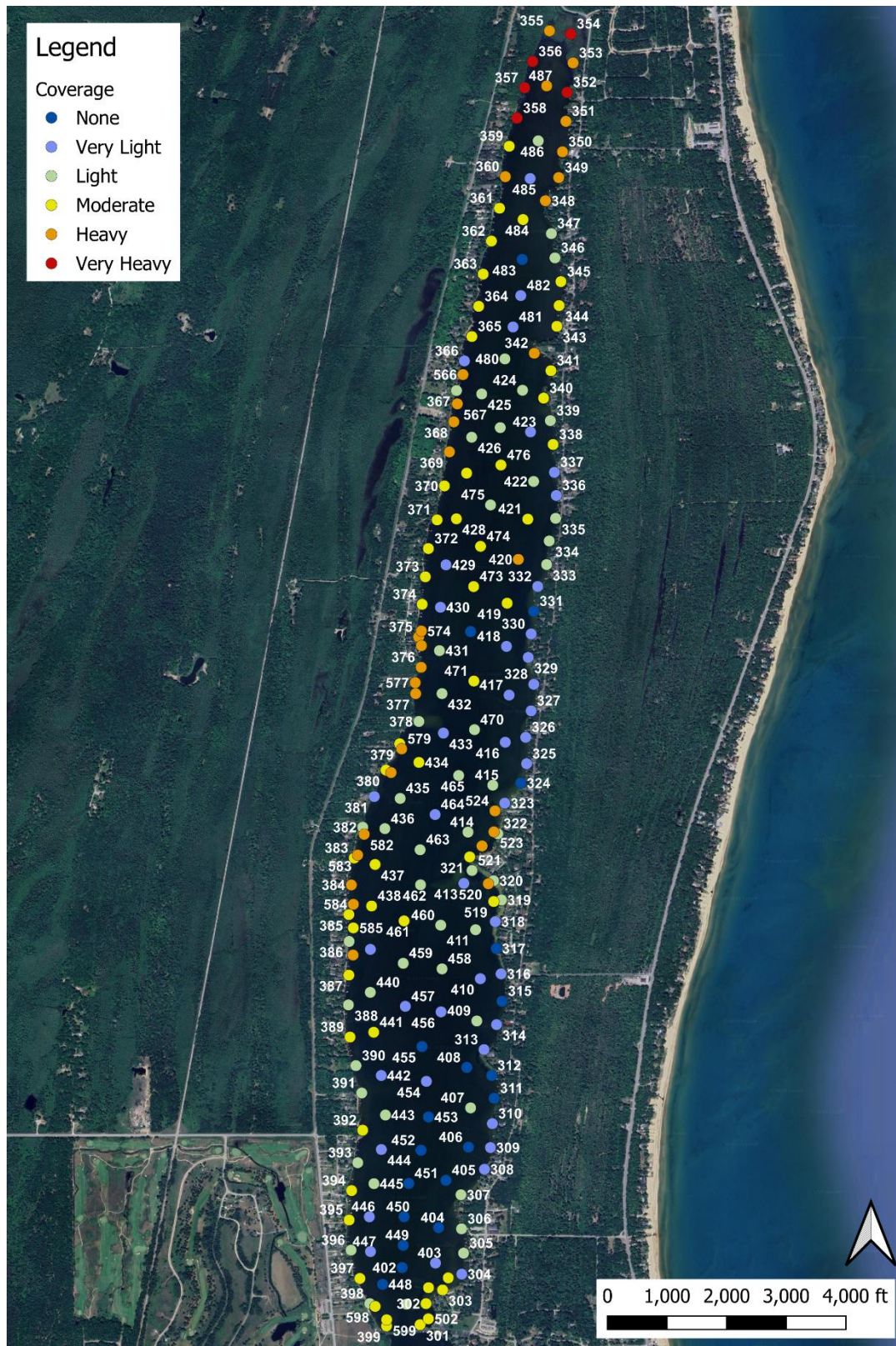
Figure 1. Early-season survey (7/1/2025-7/2/2025) vegetation 3D-Density (a function of observed coverage and height of all vegetation).
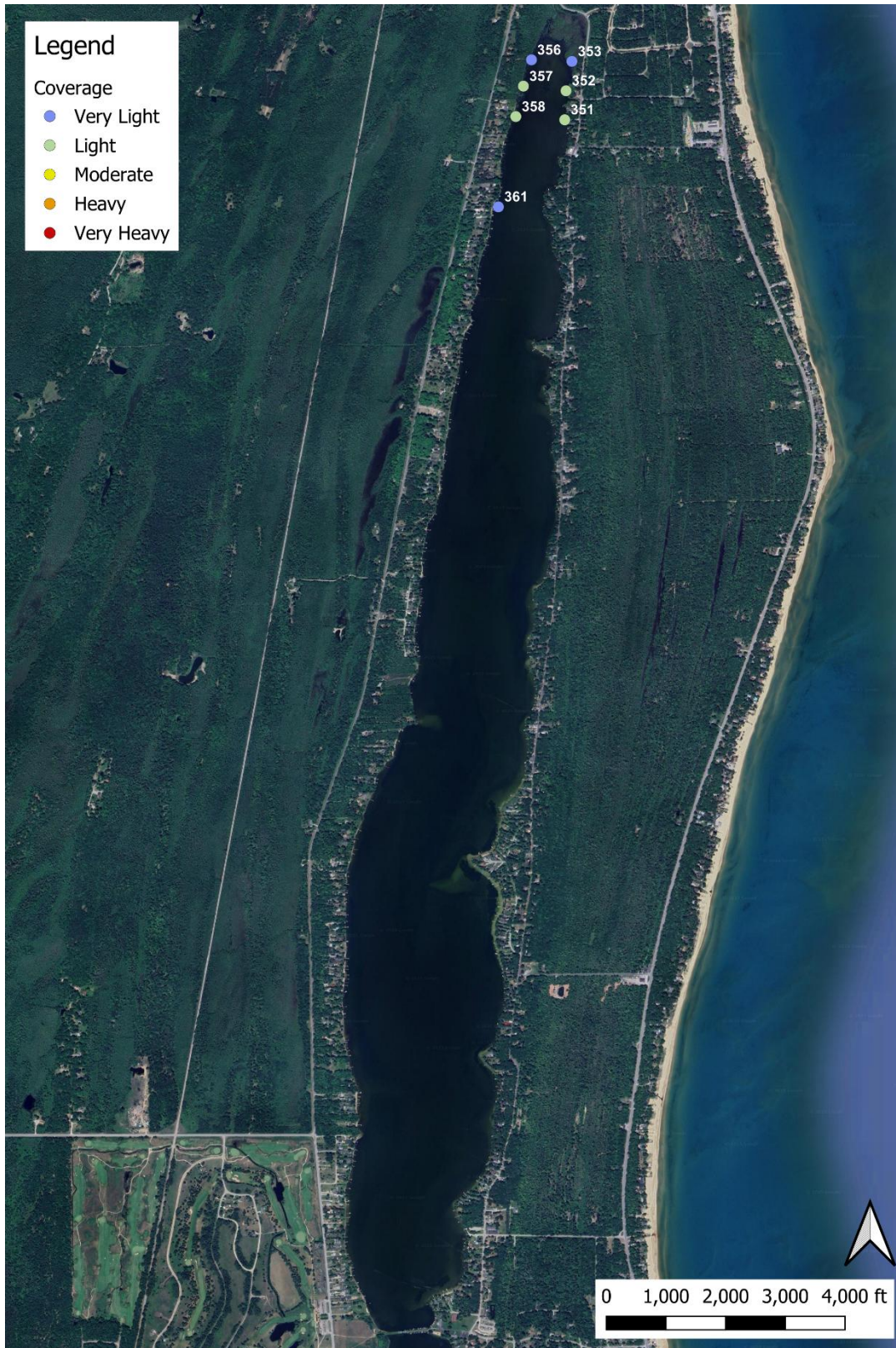
Figure 2. Early-season (7/1/2025-7/2/2025) variable-leaf watermilfoil coverage (a combination of the LakeScan™ density and distribution observations).

Figure 3. Early-season (7/1/2025-7/2/2025) hybrid Eurasian watermilfoil coverage (a combination of the LakeScan™ density and distribution observations).
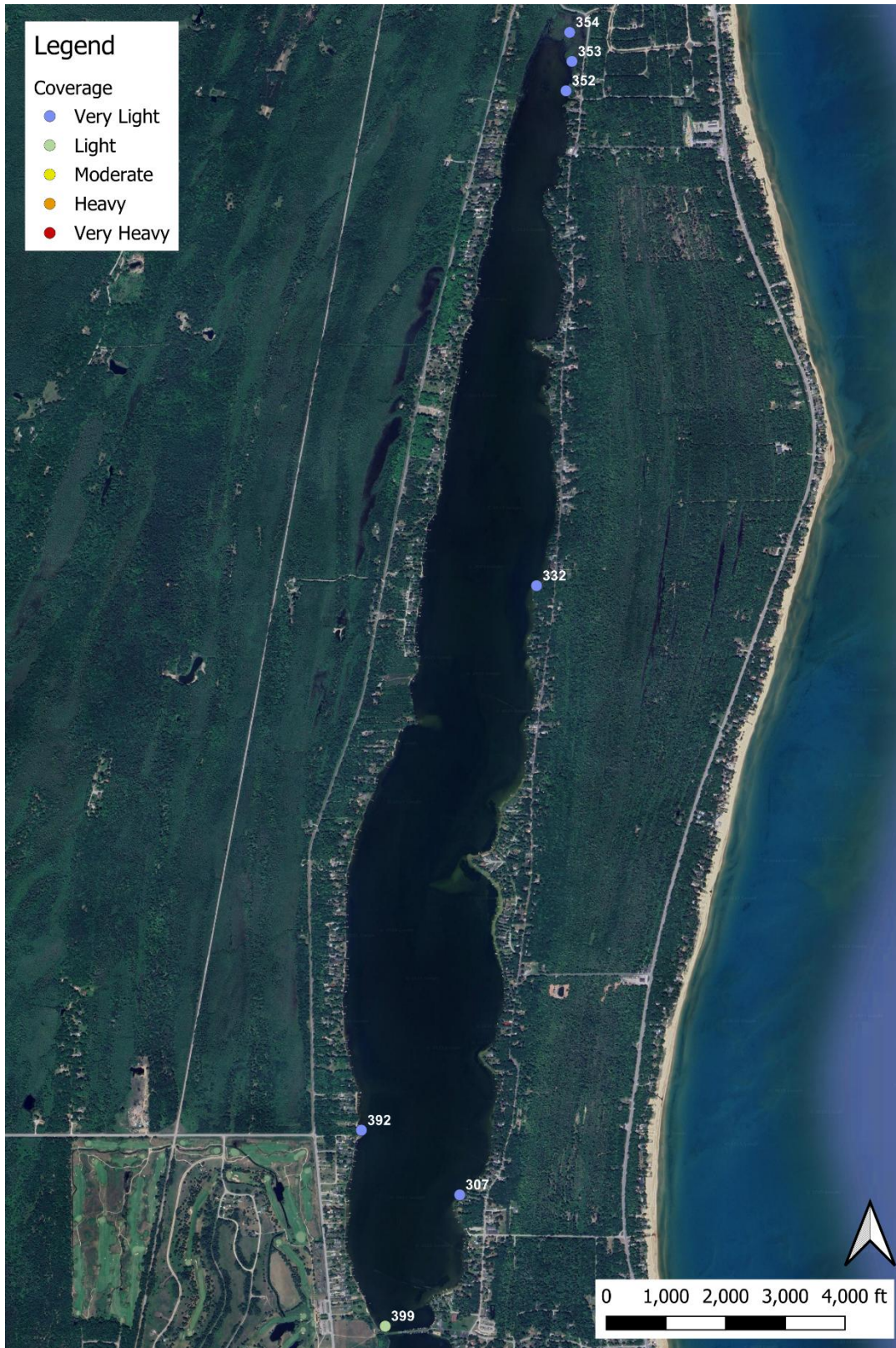
Figure 4. Early-season (7/1/2025-7/2/2025) purple loosestrife coverage (a combination of the LakeScan™ density and distribution observations).

Results for LakeScan™ Metrics

Colored shading in Table 1 highlights how early-season plant survey observations align with management goals. Green shading indicates scores meeting management goals, while yellow and red shading represent scores needing improvement, with red scores being further away from the optimal management goals, potentially requiring a higher level of management attention. Descriptions of each of the six metrics are detailed below:

- **Species Richness** – the number of aquatic plant species present in the lake. More species are generally indicative of a healthier ecosystem.
- **Shannon Biodiversity Index** – a measure of species diversity and distribution evenness, indicative of the stability and diversity of the plant community.
- **Shannon Morphology Index** – a measure of aquatic plant morphology diversity and distribution evenness, indicative of fish and macroinvertebrate habitat quality.
- **Floristic Quality Index** – a measure of the distribution of desirable aquatic plants, with higher scores indicative of a favorable ratio between native and invasive aquatic plants.
- **Recreational Nuisance Presence** – the percentage of survey sites that identified aquatic plants inhibiting recreational activities.
- **Algal Bloom Risk** – the risk of algal bloom issues, based on the characteristics of the lake watershed.

Table 1. 2025 early-season survey scores in comparison to the previous year.

Category	Early Season 2024 Rating	Early Season 2025 Rating	Management Goal	LakeScan Metric
Species Richness	21	23	n/a	
Shannon Biodiversity Index	10.2	10.4	> 6.7	Shannon Biodiversity Index
Shannon Morphological Index	9.1	9.0	> 5.0	Shannon Morphological Index
Floristic Quality Index	27.6	27.9	> 20.0	Floristic Quality Index
Recreational Nuisance Presence	9%	1%	< 10%	Recreational Nuisance Presence
Algal Bloom Risk	Low	Low	Low	Algal Bloom Risk

The assessed LakeScan™ metrics for the early-season survey on Cedar Lake North indicate that the lake met each optimal management goal during the 2025 early-season survey. There were minimal variations in metrics between the 2024 and 2025 early-season surveys indicating a high level of lake stability. The most notable change between the two years is the decrease in *Recreational Nuisance Presence* from 9% to 1%, indicating more favorable recreation conditions in 2025.

It is important to note that the findings detailed in this "Interim" report are preliminary findings based on a single survey. The annual final report will include ratings based on both early- and late-season surveys, giving a more comprehensive view of lake conditions for the year. If you have any questions on these scores, please do not hesitate to contact us. Contact information is available at the end of this document.

A Final Note on LakeScan™ Surveys

When scheduling aquatic vegetation surveys, the LakeScan™ team focuses on three important considerations including: survey goals, survey effectiveness, and lake-user convenience.

Survey Goals: K&A attempts to survey before or within 14 days of early-summer chemical treatments to observe densities and distributions of treatment-targeted and non-targeted vegetation. A survey conducted during this timeframe can be utilized as an early indication of treatment effectiveness.

Survey Effectiveness: Weather plays a key role here. Rain and wind, in addition to creating safety hazards, obstruct the water surface and make it difficult to see plants in the water column. Rain can damage the onboard electronic equipment during the survey and wind can make it difficult to stay in one AROS without being blown into an adjacent AROS or into a dock while we focus on detailed characterization of vegetation.

Lake-user Convenience: The LakeScan™ team tries to avoid surveys on Fridays, Saturdays or Sundays due to boat activity on the lake. We also prefer to have early-summer surveys completed prior to the 4th of July, and late-summer surveys completed before Labor Day so that if any problems with nuisance species can be addressed before the holidays, if budgeted. Where desired, your team can also schedule mid-season checks. Feel free to contact us on costs for additional visits.

Questions?

Contact your LakeScan™ representatives:

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