
Mill Pond Lake, Becker County, MN 2022 Aquatic Vegetation Management Report



Prepared by:
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Project Details

Lake: Mill Pond (EQuIS# 03-0377-00-201)

Lake Surface Area: 155 acres **Littoral Area:** 155 acres **County:** Becker

Survey Type: Point-intercept aquatic plant surveys (2022)

Date of Survey (most recent): August 11, 2022 (PRWD)

Surveyor[s]: Beatrice Jaszczak & Blaine Henderson

Report Updated: December 2022

Author[s]:

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Report Details

G. L. Kemper. 2022. Mill Pond Lake, Becker County: 2022 Aquatic Vegetation Management Report. Water Resource Coordinator Pelican River Watershed District, 211 Holmes Street W., Detroit Lakes, MN 56501. 16 pp.

Summary

The purpose of this report is to provide an overview of aquatic plant distribution and the management of invasive aquatic plants in Mill Pond Lake, Becker County in 2022. Historical data on water quality, invasive aquatic plant management permits and point-intercept surveys are all summarized in this report. This summary will guide future invasive aquatic plant control projects and can evaluate changes in native plant communities.

Lake Description

Mill Pond Lake is a shallow natural environment lake. Technically, Mill Pond is a reservoir because of a downstream dam (Bucks Mill Pond Dam) which maintains the water level about 6 feet above the natural lake elevation. The east half of the lake is densely vegetated except for the channel where the Pelican River flows through. The west basin contains open water and reaches a maximum depth of 10 feet.

Mill Pond has no designated boat ramp, but the lake can be accessed via Lake Melissa with canoes, kayaks, or small watercraft. There are some single-family homes, primarily in the west basin.

Historically, a dam located downstream from where the current dam exists, was used to provide waterpower for the adjacent Mill Pond. This dam has been removed, however, the original dam embankments where the water wheel would have been, remain intact. The current dam sits approximately 100 feet upstream from the historic location and is used to control water levels on Mill Pond Lake, which is used as a MN DNR rearing pond.

In 2019, Becker County and the MN DNR began discussions of possibly removing the outlet structure and replacing it with rock weir rapids. The District is concerned the removal of the dam will allow for passage of common carp, which are a nuisance species and will cause ecological harm.

Water quality was monitored for a three-year period from 2007-2009, with total phosphorus levels at 20ppm and water clarity at 7.5 ft. The nutrient levels were found to be very similar to Lake Mellissa, which drains through Mill Pond Lake.

Due to its connection to Lake Melissa, the lake is also infested with Zebra Mussels and Flowering Rush. In past years, the Pelican Group of Lakes Improvement District (PGLID) has managed Flowering Rush in Mill Pond Lake by chemical and hand removal in an attempt to minimize propagation to downstream lakes (Pelican Lake).

Management History

In past years, the Pelican Group of Lakes Improvement District (PGLID) has managed Flowering Rush in Mill Pond Lake by chemical and hand removal in an attempt to minimize propagation to downstream lakes (Pelican Lake). In 2022, no Flowering Rush plants were treated due to little, or no plant growth found. PRWD

will continue to monitor the lake for AIS.




Survey Objectives

In 2022, a Point-intercept Survey assessed the distribution of aquatic plants in Mill Pond Lake. The primary purpose for this type of survey is to 1) develop baseline knowledge of the current plant community in a lake, and over time, 2) compare year to year plant variation (in plant presence and spatial location) and 3) track invasive aquatic plants. Moreover, this survey will help the PRWD and our partners to monitor native plant communities and evaluate possible responses to invasive aquatic plant management via herbicide control. It is important to note that distributions and occurrences of aquatic plants may vary from year to year due to natural variations (water clarity, snow cover, water temperatures, and natural fluctuation in plant species) or human induced alterations, such as, herbicide and shoreline management activities.

Survey Methods

PRWD surveyors used a point-intercept survey method developed by John Madsen in “Aquatic Plant Control Technical Note MI-02, 1999” during the 2022 Survey. Points were placed 72 meters apart using a Geographic Information System (GIS), comprising of 50 points on a grid (Figure 1). Plant samples were collected by throwing and dragging a double-sided rake along the lake bottom at each point. All plant taxa (submerged, floating-leaf, emergent and free floating) were recorded to species or genera during the survey following Skawinski (2018). Plant samples were assessed on the boat to determine species presence/absence and abundance. The abundance rake rating are as follows: 1: sparse, 2: common/ frequent/ occasional, and 3: abundant/matted (Table 3). Frequencies of occurrence percentages (i.e., how often a plant species was sampled in the lake) were calculated based on the littoral zone.

Table 1 - Quantitative rake abundance ranking (0-3) used to estimate plant abundance for each species based on rake coverage and/or visual observation (PRWD). A zero (0) ranking indicates no target plants were retrieved or observed in a sample.

Abundance Ranking	Rake Coverage	Description
1		Sparse; plants covering <25% of the rake head
2		Common; plants covering 25%-75% of the rake head
3		Abundant; plants covering >75% of the rake head

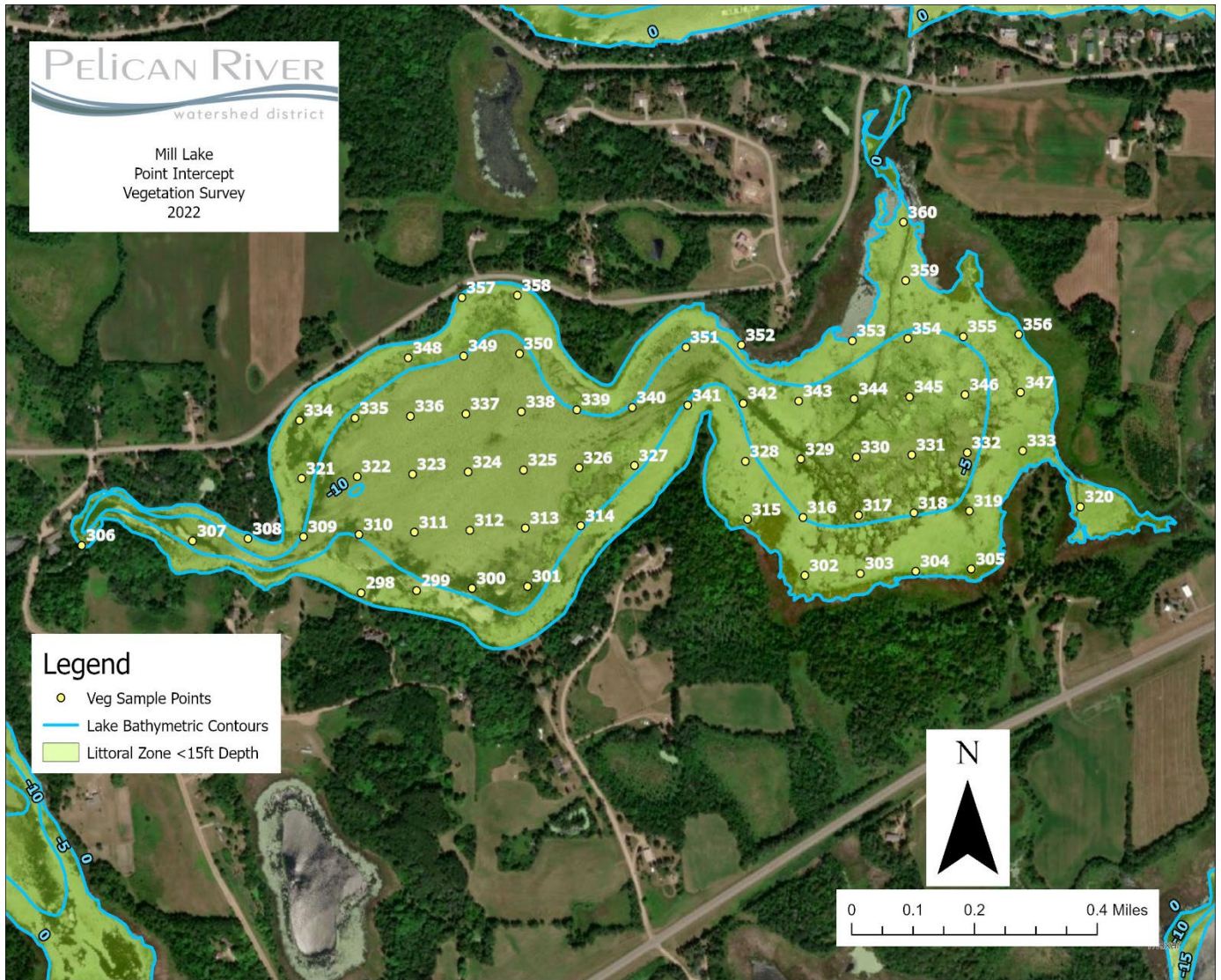


Figure 1 – Point-intercept Survey Grid. Point-intercept survey grid for Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). A total of 45 points were surveyed in 2022 at 72 meters apart.

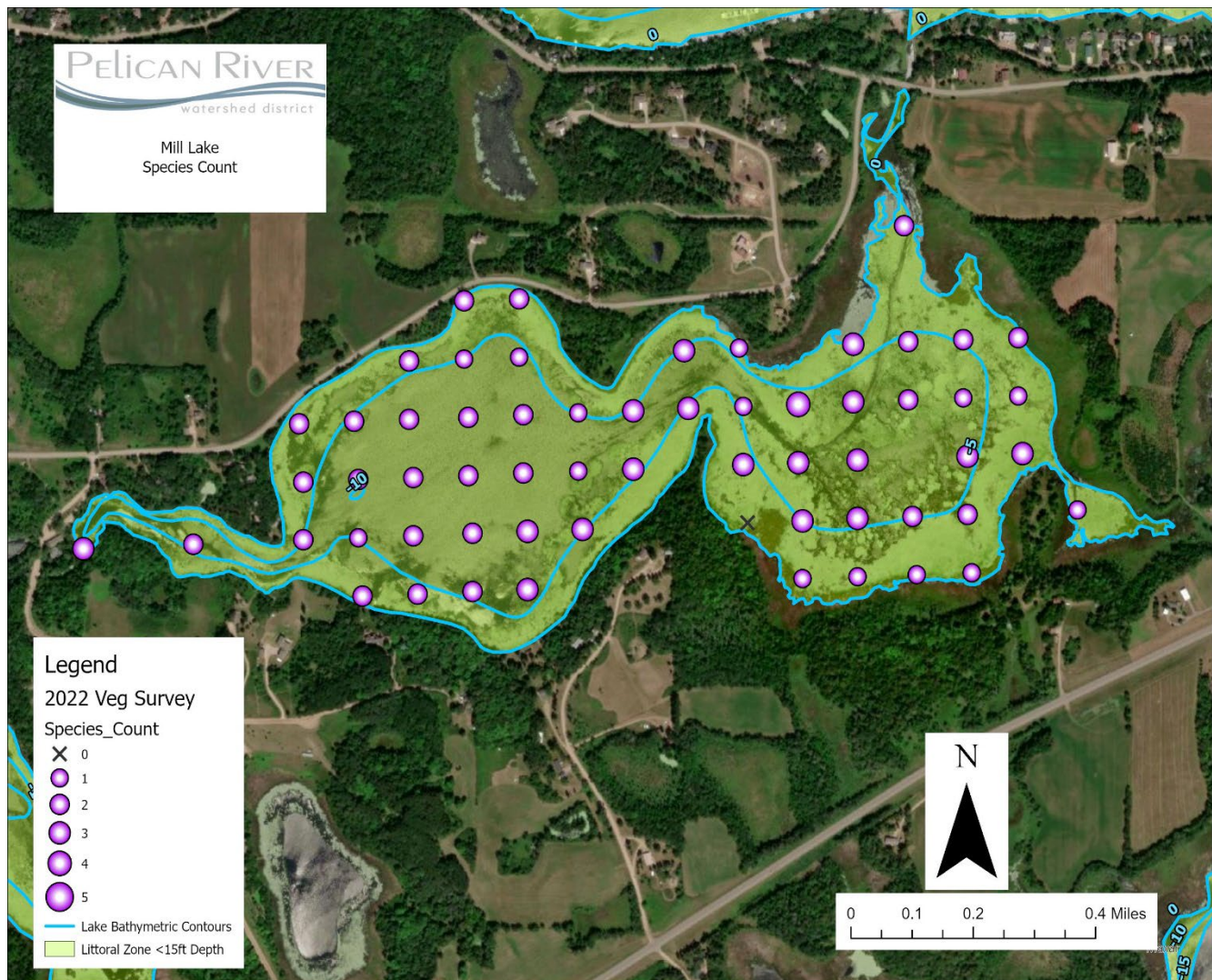


Figure 2 – Species Richness Distribution. Number of species at each site from the 2022 point-intercept survey in Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Densities ranged from 0 to 5 at each point, with a 5 indicating the richness in species presence and 0 indicating no species.

Survey Observations

The first vegetation point-intercept survey of Mill Pond Lake (EQuIS# 03-0358-00-201 conducted by the PRWD occurred on August 11th, 2022. Plants were rooted to a maximum depth of 10 feet, with depths ranging from 0 –10 feet. However, since all 155 acres is considered the littoral zone (< 15 feet deep and where aquatic plants are likely to be found) it was very rare to find any rooted plants deeper than 10 feet. 74% of the points had submersed native vegetation (Table 2) with a mean submersed native taxa per point of 4.2. Mill Pond Lake has up to 3 submersed native taxa (Table 3).

Table 2 - Point-intercept Metrics. Summary of PRWD point-intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Shaded values were calculated from littoral depth range (0-15 feet).

Metric	August 2022
Surveyor	PRWD
Total # Points Sampled	45
Max depth of growth	10
Depth Range of Rooted Veg (ft.)	0.0 – 10.0
Max Depth of Growth (ft.)	10
# of Vegetated Points in Max Depth Range	49
# Points in Littoral (0-15 feet)	50
% Points w/ Submersed Native Taxa	74
Mean Submersed Native Taxa/ Point	4.2
# Submersed Native Taxa	3
# Submersed Non-Native Taxa	0
% Points w/ Submersed Non- native Taxa	0

Based on the 2022 point-intercept survey, the native plant community within the littoral area in Mill Pond Lake was primarily dominated by Coontail (*Ceratophyllum demersum*) 82%, Sago Pondweed (*Stuckenia pectinate*) 54%, and Claspingleaf Pondweed (*Chara Contraria*) 2% (Figures 3,4 and 5). These aquatic plants are central to a healthy fish population, offering shelter and providing food and habitat to wildlife. Mill Pond Lake also has the following floating leaf and emergents: Water Lilies (*Schoenoplectus* sp.) 69%, Cattail (*Typha* sp.) 4%, Wild Rice (*Zizania palustris*) 16% and Star Duckweed (*Lemna trisulca*) 6% (Figures 6, 7, 8 and 9) These floating and emergent plants are especially good at preventing shoreline erosion, habitat and providing food sources for waterfowl. Plants also absorb nutrients and reduce algae, thereby improving water quality.

Mill Pond Lake has an average of ten species per sampling site. Figure 2 displays the spatial distribution and species richness (# of species per sample point) of all native species from the 2022 point-intercept survey.

Table 3 - Plant Frequency Occurrence. Percent frequency of occurrence for observed plant species within the littoral zone (0-15 feet) in intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201).

		August 2022 ^b
Taxonomic Name	Common Name	Frequency (%)
SUBMERSED NON-NATIVE		
<i>These plants spread or have been introduced beyond its native range and are either causing harm or have the potential to cause harm.</i>		
	None Observed	
SUBMERSED NATIVE		
<i>These plants are rooted plants with flaccid or limp stems and most of their vegetative mass is below the water surface, although small portions may stick above the water.</i>		
<i>Ceratophyllum demersum</i>	Coontail	82%
<i>Chara Contraria</i>	Clasping-leaf Pondweed	16%
<i>Stuckenia pectinata</i>	Sago Pondweed	54%
FLOATING LEAF		
<i>These plants are rooted in the lake bottom and have leaves that float on the water surface. Many have colorful flowers that extend above the water.</i>		
<i>Nymphaeaceae spp.</i>	Water Lilies	69%
EMERGENT		
<i>These plants extend well above the water surface and are usually found in shallow water, near shore.</i>		
<i>Schoenoplectus sp.</i>	Wild Rice	16%
<i>Typha sp.</i>	Cattail Species	4%
EMERGENT NON-NATIVE		
<i>These plants spread or have been introduced beyond its native range and are either causing harm or have the potential to cause harm.</i>		
	None Observed	
FREE FLOATING		
<i>These plants float freely on the water surface. The entire plant is suspended on the water, allowing the plant to be moved around the pond by wind and water currents.</i>		
<i>Lemna trisulca</i>	Star Duckweed	6%

^b Percent frequency for 2022 (PI Survey Method) calculated for 0-15 feet zone.

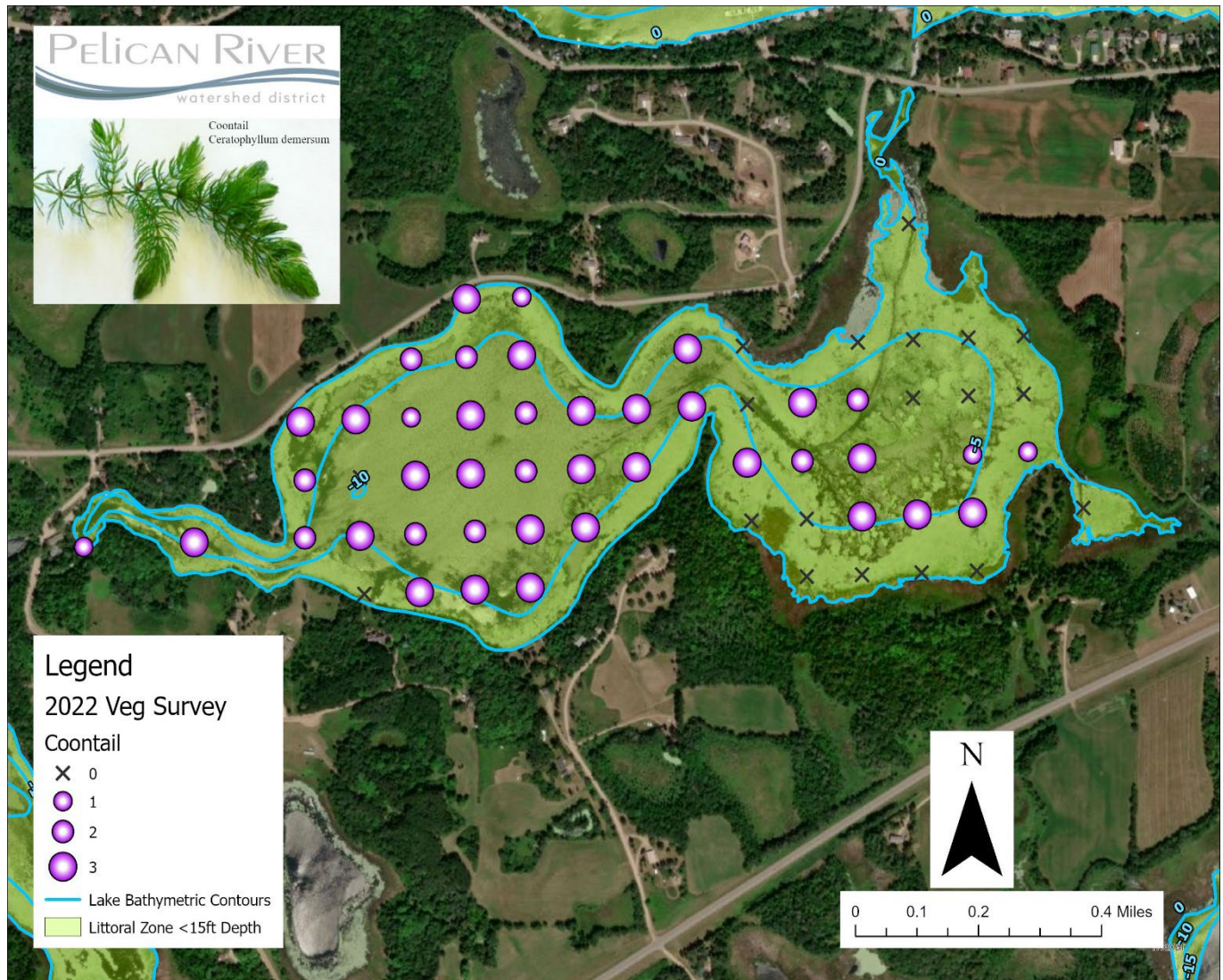


Figure 3 – Coontail Distribution. Plant distribution from the 2022 point-intercept survey for Coontail in intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

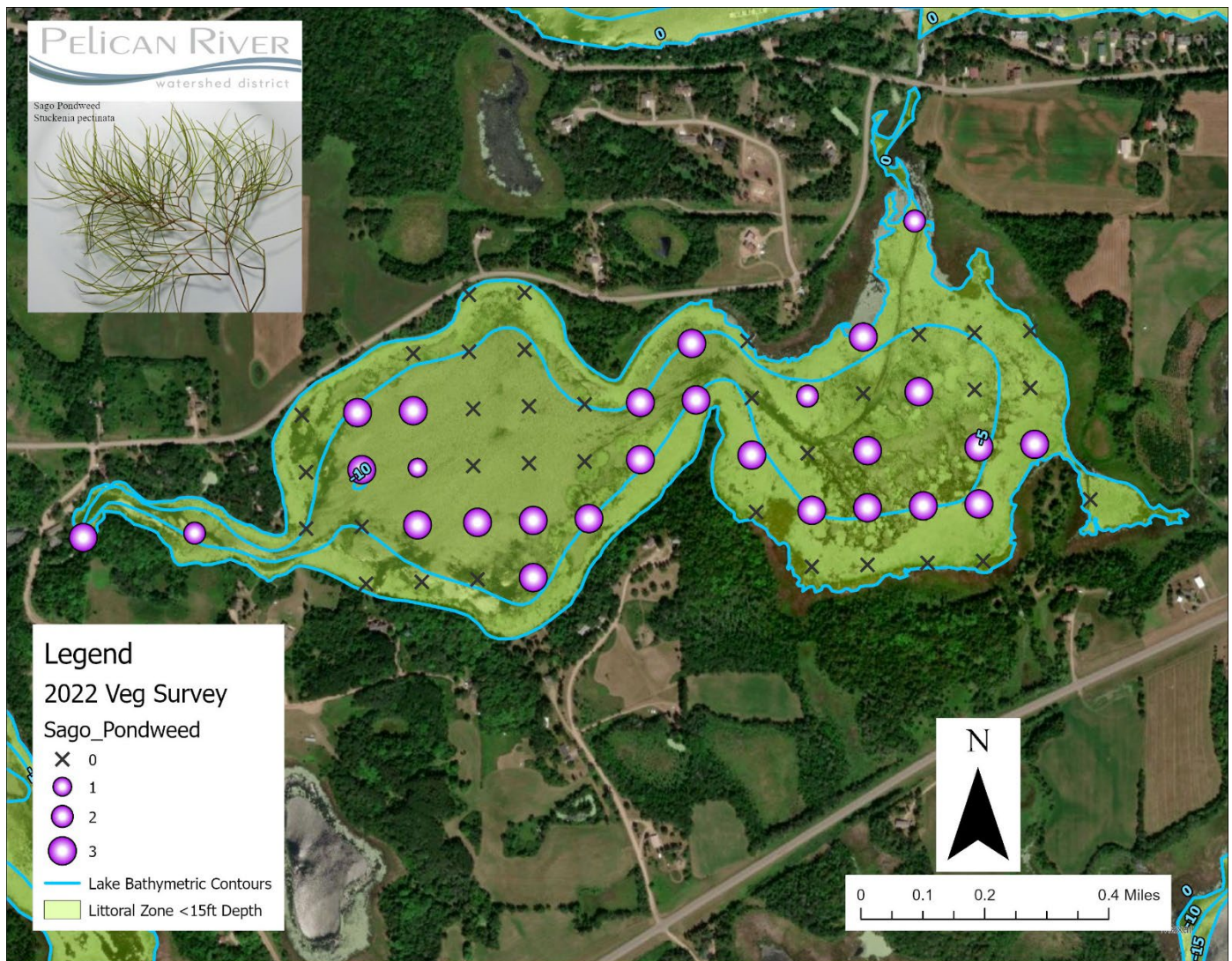


Figure 4 – Sago Pondweed Distribution. Plant distribution from the 2022 point-intercept survey for Sago Pondweed in intercepts Mill Pond Lake, Becker County (EQulS# 03-0377-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

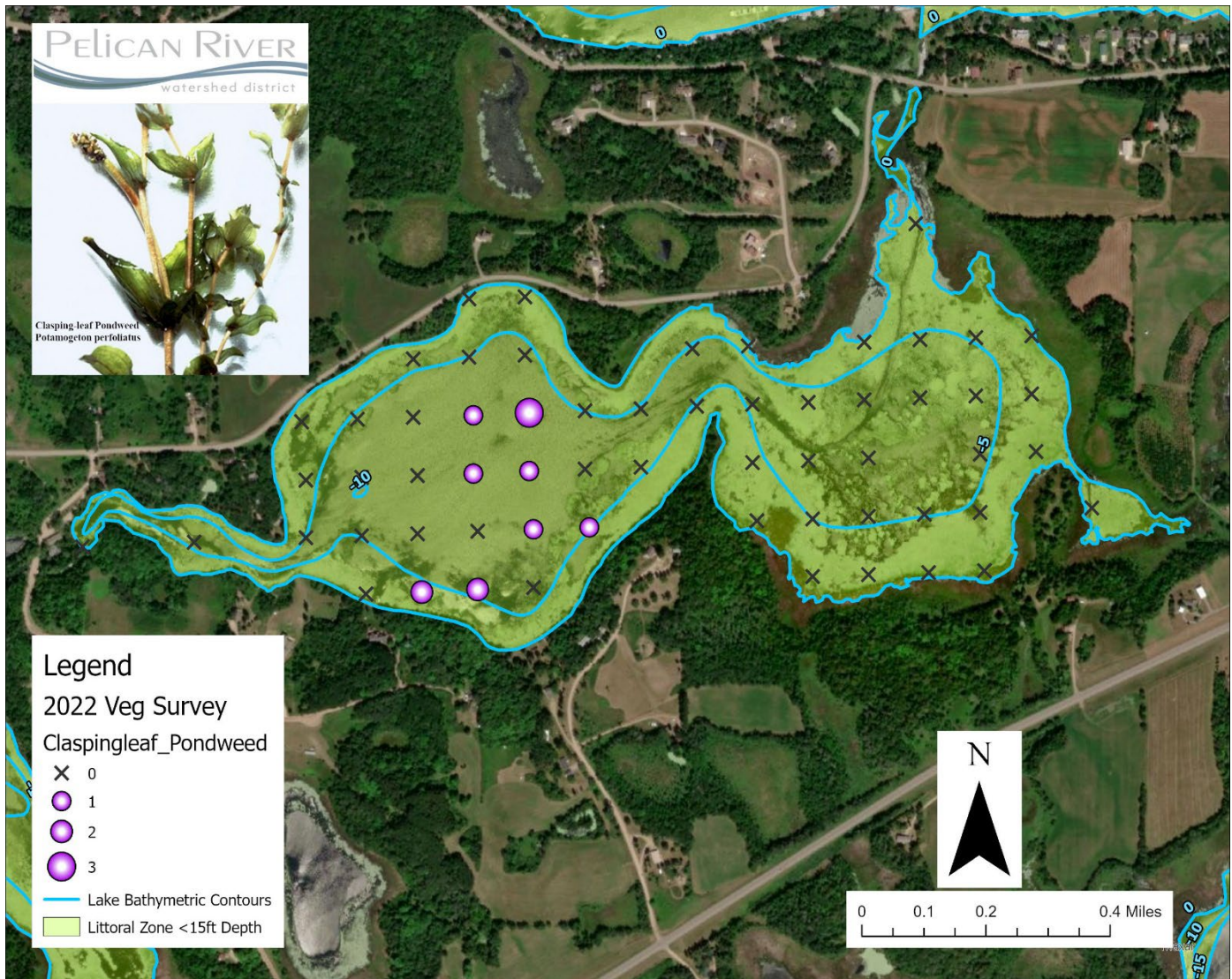


Figure 5 – Claspingleaf Pondweed Distribution. Plant distribution from the 2022 point-intercept survey for Claspingleaf Pondweed in intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

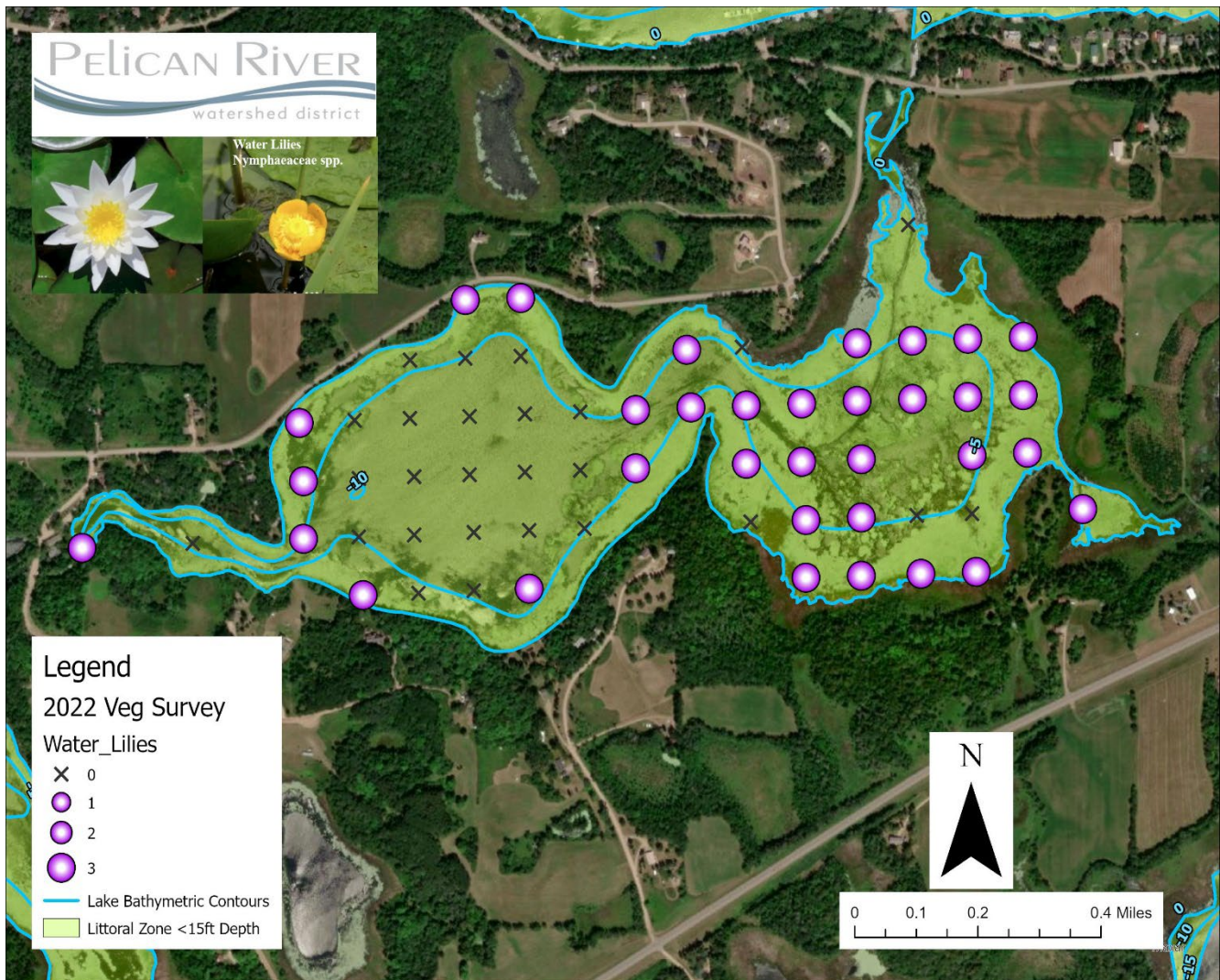


Figure 6 – Water Lilies Distribution. Plant distribution from the 2022 point-intercept survey for Water Lilies in intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

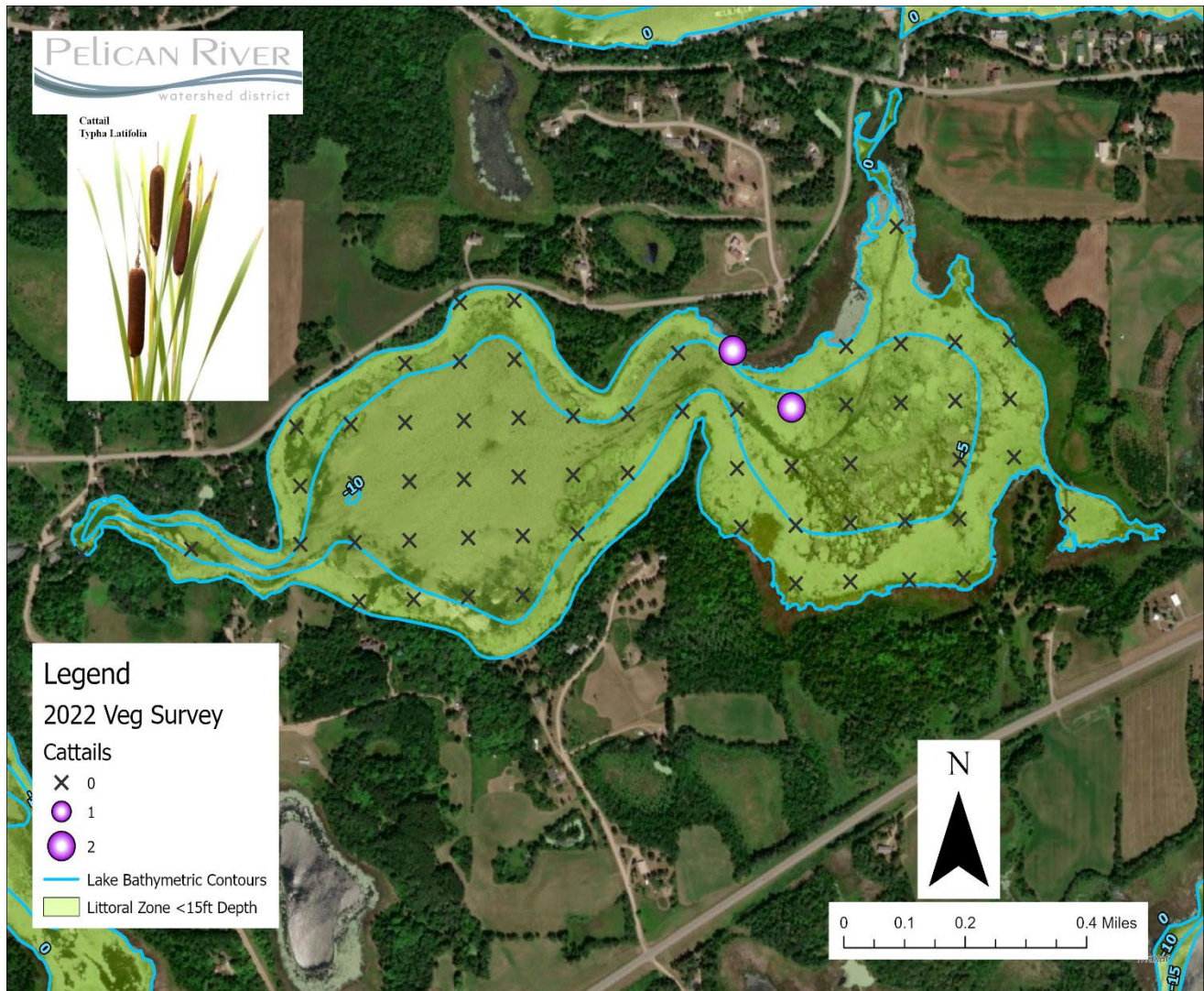


Figure 7 – Cattail Distribution. Plant distribution from the 2022 point-intercept survey for Cattail in intercepts Mill Pond Lake, Becker County (EQulS# 03-0377-00-201). Densities ranged from 0 to 2 at each point, with a 2 indicating dense plant presence and 0 indicating no plants.

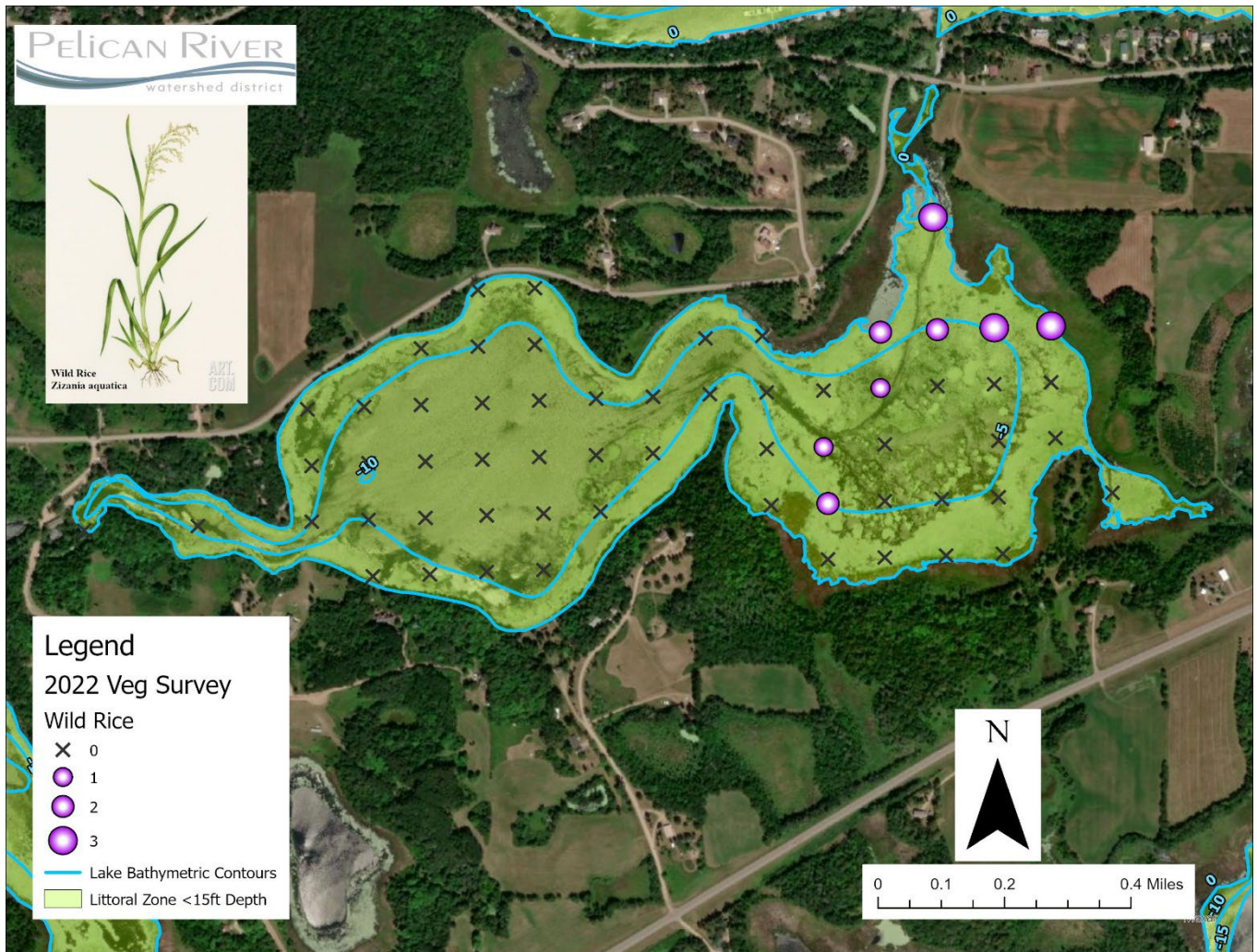


Figure 8 – Wild Rice Distribution. Plant distribution from the 2022 point-intercept survey for Wild Rice in intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

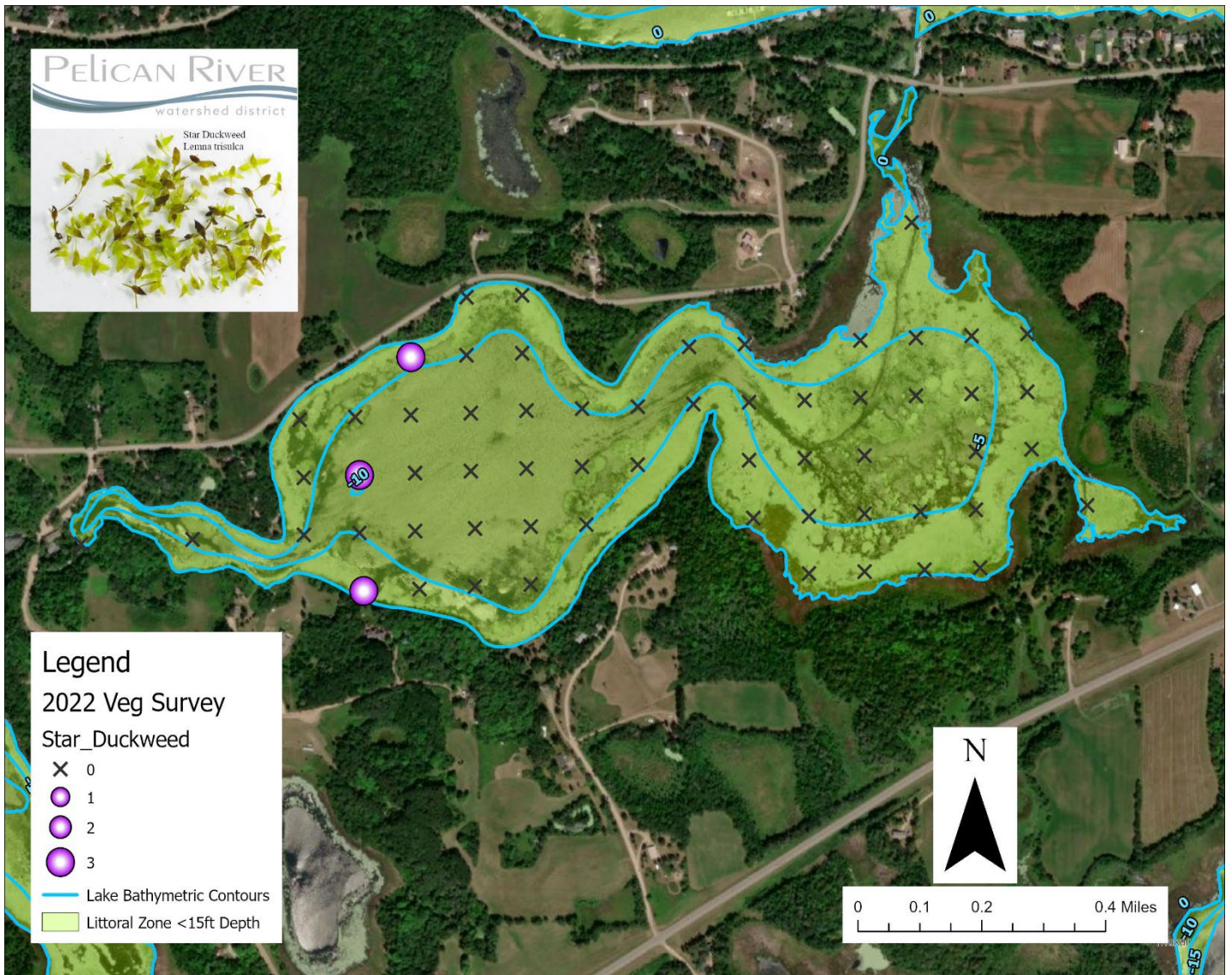


Figure 9 – Star Duckweed Distribution. Plant distribution from the 2022 point-intercept survey for Star Duckweed in intercepts Mill Pond Lake, Becker County (EQuIS# 03-0377-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

Literature Cited

Skawinski, Paul M. (2018). *Aquatic Plants of the Upper Midwest*. (Third Edition). Wisconsin: Paul M. Skawinski.

Madsen, J. (1999). *Point-intercept and line intercept methods for aquatic macrophytes management*. APCRP Technical Notes Collection (TN APCRP-M1-02). Vicksburg, MS: U.S. Army Engineer Research and Development Center.