Little Floyd Lake, Becker County, MN
2020 Aquatic Vegetation Management Report

Prepared by:
Gina L. Kemper
Water Resource Coordinator
Pelican River Watershed District

Project Details

Lake: Little Floyd (EQuIS# 03-0386-00-201)

Lake Surface Area: 215 acres **Littoral Area:** 95 acres **County:** Becker

Survey Type: Point-intercept aquatic plant surveys (2020)

Date of Survey (most recent): July 17, 2020 – July 30, 2020 (PRWD)

Surveyor[s]: Meagan Powers and Austin Aune

Report Updated: December 2022

Author[s]:

Gina L. Kemper, Water Resource Coordinator (PRWD), prwdmonitor@arvig.net, 218-846-0436

Report Details

G. L. Kemper. 2022. Little Floyd Lake, Becker County: 2020 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 Little Floyd Lake, Becker County in 2020. 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

Little Floyd is a small lake with 95 of its 215 acres are classified as littoral (<15 feet deep). Little Floyd Lake contains a moderately developed shoreline, and receives most of its water from North Floyd, which outlets to Little Floyd through the Becker CSAH 21 road. However, there are some small natural drainage ways that lead to the lake.

The littoral area (< 15ft depth) of the lake accounts for 95 acres (45%) with an extensive emergent (cattail and hardstem bulrush) vegetation area located on the northeast side. There is an abundant native plant community. There is one MN DNR public access on Little Floyd located on the south end.

Little Floyd Lake is classified as a mesotrophic lake based on the Tropic State Index average for phosphorous, chlorophyll-a, and water clarity. In-lake phosphorus concentrations can vary between 20ppb to 34ppb and are highly responsive to storm-events and heavy rainfall patterns. The 10-year (2008-2017) average is 25 ppb in-lake phosphorus concentration.

Little Floyd Lake has two outlets located on the south side. Historically, the lake had one outlet, located near the present-day public access, however, a new outlet was constructed in 1919, when Becker County Drainage System 13 was built to channelize the Pelican River between Little Floyd and Big Detroit Lake. In 1936, the Civilian Conservation Corps (CCC) built a concrete weir dam on Becker Drainage System 13. This structure controls Little Floyd, as well as North and Big Floyd water levels. The weir has a fixed crest which is set at a run out elevation of 1354.1 (NGVD 29) and is owned and operated by the MN DNR.

There are 86 parcels on Little Floyd, with high density areas which were platted and developed before statewide shoreland standards.

There are 55 parcels (64%) having greatly to moderately altered shorelines and 31 parcels (36%) having little to no shoreline alteration. There are 11 parcels along the south shore with seawalls.

Over the past 20 years, on the south end of the lake, two resorts have been converted to individual ownership. In addition, many of the seasonal cottages are being rebuilt or converted to year-round homes.

In the mid-2000's on the west side, Little Floyd had increased second-tier development pressure when the Iron Man golf course (back 9 holes) was developed into residential housing. During this same time, the north end was converted from pasture grassland into residential housing. There is a permanent special protection area owned by the Pelican River Watershed District which preserves the bluff and emergent aquatic vegetation area along the north side of Little Floyd.

Management History

The lake has no known Aquatic Invasive Species Plants (AIS) currently (2020), PRWD will continue to monitor the lake for AIS.

Survey Objectives

In 2020, a Point-intercept Survey assessed the distribution of aquatic plants in Little Floyd 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 2020 Survey. Points were placed 72 meters apart using a Geographic Information System (GIS), comprising of 49 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 3. 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

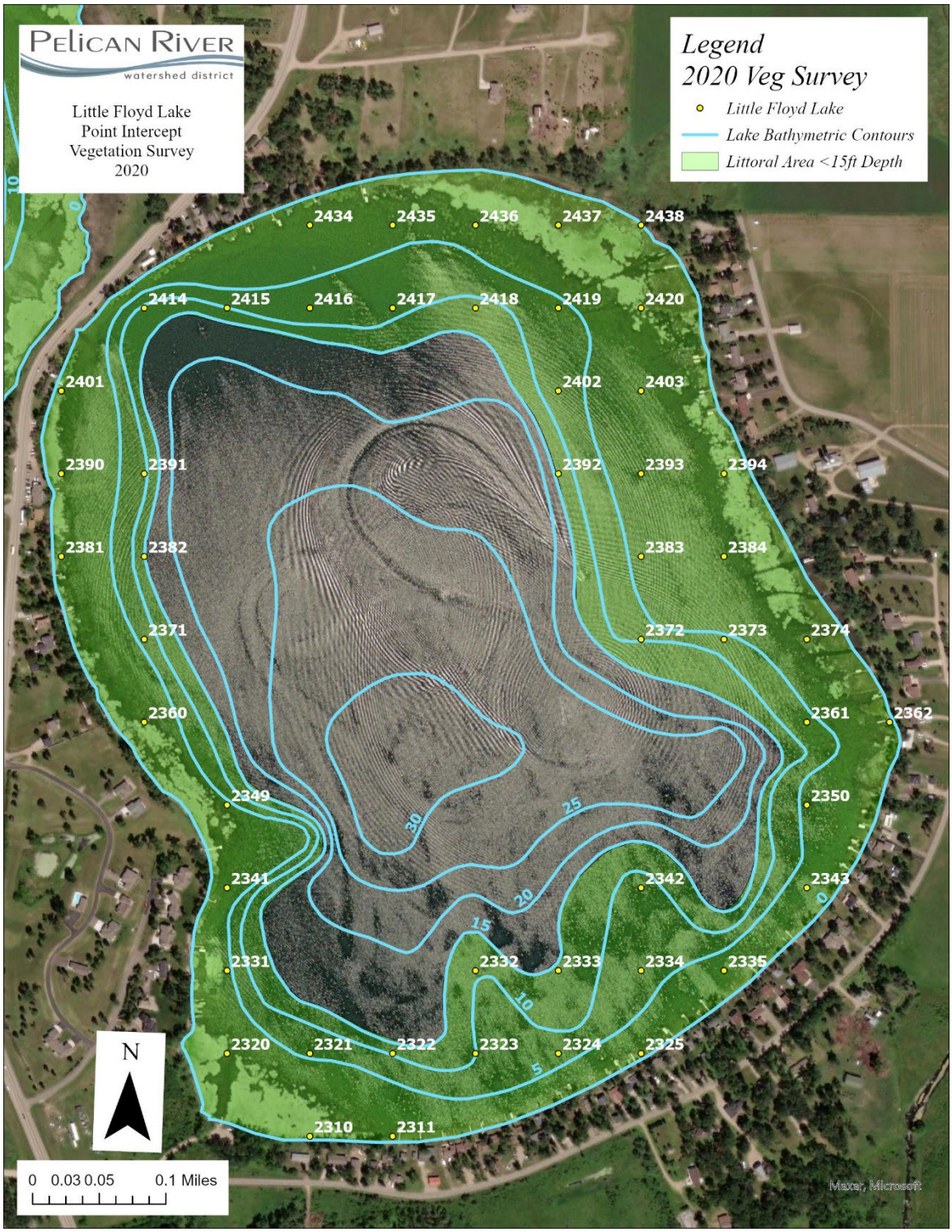

Figure 1 – Point-intercept Survey Grid. Point-intercept survey grid for Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). A total of 49 points were surveyed in 2020 at 72 meters apart.

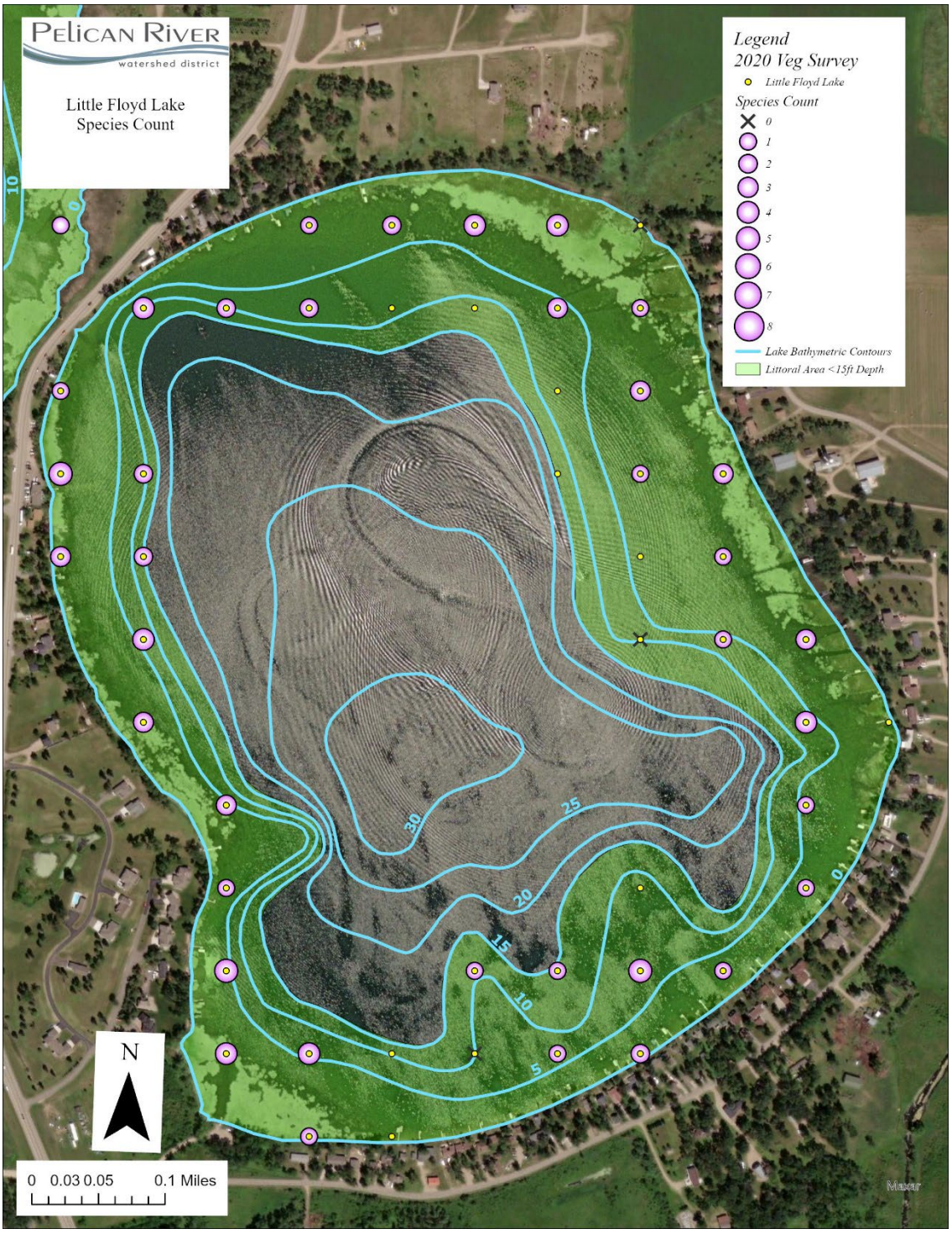

Figure 2 – Species Richness Distribution. Number of species at each site from the 2020 point-intercept survey in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 8 at each point, with an 8 indicating the richness in species presence and 0 indicating no species.

Survey Observations

The vegetation point-intercept survey of Little Floyd Lake (EQuIS# 03-0386-00-201) conducted by the PRWD occurred between July 17th and July 30th, 2020. Plants were rooted to a maximum depth (95%) of 15.1 feet, with depths ranging from 0 – 15 feet. However, since 861 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 15 feet. 76% of the points on Little Floyd had submersed native vegetation (Tables 4) with a mean submersed native taxa per point of 3.2. Little Floyd Lake has up to 6 submersed native taxa (Table 4).

Table 4 - Point-intercept Metrics. Summary of PRWD point-intercepts metrics Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Shaded values were calculated from littoral depth range (0-15 feet).

Metric	JULY 2020
Surveyor	PRWD
Total # Points Sampled	49
Max depth of growth	15
Depth Range of Rooted Veg (ft.)	0.0 – 15.0
Max Depth of Growth (95%) (ft.)	15
# Of Vegetated Points in Max Depth Range	46
# Points in Littoral (0-15 feet)	49
% Points w/ Submersed Native Taxa	76%
Mean Submersed Native Taxa/ Point	3.2
# Submersed Native Taxa	6
# Submersed Non-Native Taxa	0
% Points w/ Submersed Non- native Taxa	0

Based on the 2020 point-intercept survey, the submersed native plant community within the littoral area in Little Floyd Lake was primarily dominated by Macroalgae (Chara spp./ Nitella spp.) 90%, Coontail (*Ceratophyllum demersum*) 45%, Northern Watermilfoil (*Myriophyllum sibiricum)* 23%, Leafy Pondweed (Potamogeton foliosus) 8% (Figures 3, 4, 5, & 6). These aquatic plants are central to a healthy fish population, offering shelter and providing food and habitat to wildlife. Little Floyd Lake also has the following floating leaf and emergents: Common Bladderwort (*Utricularia macrorhiza*) 38%, and Water Lily 5% (Figures 7 & 8). These 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.

Little Floyd Lake has an average of three species per sampling site. Figure 3 displays the spatial distribution and species richness (# of species per sample point) of all native submersed species from the 2020 point-intercept survey.

Table 5 - Plant Frequency Occurrence. Percent frequency of occurrence for observed plant species within the littoral zone (0-15 feet) in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201).

		Jul-20
Taxonomic Name	**Common Name**	**Frequency (%)**
SUBMERSED NON-NATIVE *These plants spread or have been introduced beyond its native range and are either causing harm or have the potential to cause harm.*		
	NONE OBSERVED	
SUBMERSED NATIVE *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.*		
Chara spp./Nitella spp.	Macroalgae	90%
Ceratophyllum demersum	Coontail	45%
Drepanocladus spp.	Water Moss	5%
Myriophyllum sibricum	Northern Watermilfoil	23%
Potamogeton foliosus	Leafy Pondweed	8%
Potamogeton illinoensis	Illinois Pondweed	5%
Potamogeton praelongus	Whitestem Pondweed	3%
FLOATING LEAF *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.*		
Nymphaea odorata	Water Lily	5%
Utricularia macrorhiza	Common Bladderwort	38%
EMERGENT *These plants extend well above the water surface and are usually found in shallow water, near shore.*		
	Observed but not specified	8%
EMERGENT NON-NATIVE *These plants spread or have been introduced beyond its native range and are either causing harm or have the potential to cause harm.*		
	NONE OBSERVED	
FREE FLOATING *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.*		
	NONE OBSERVED	

b Percent frequency for 2021 (PI Survey Method) calculated for 0-15 feet zone.

Figure 3 – Chara Distribution. Plant distribution from the 2020 point-intercept survey for Northern Chara in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

Figure 4 – Coontail Distribution. Plant distribution from the 2020 point-intercept survey for Coontail in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

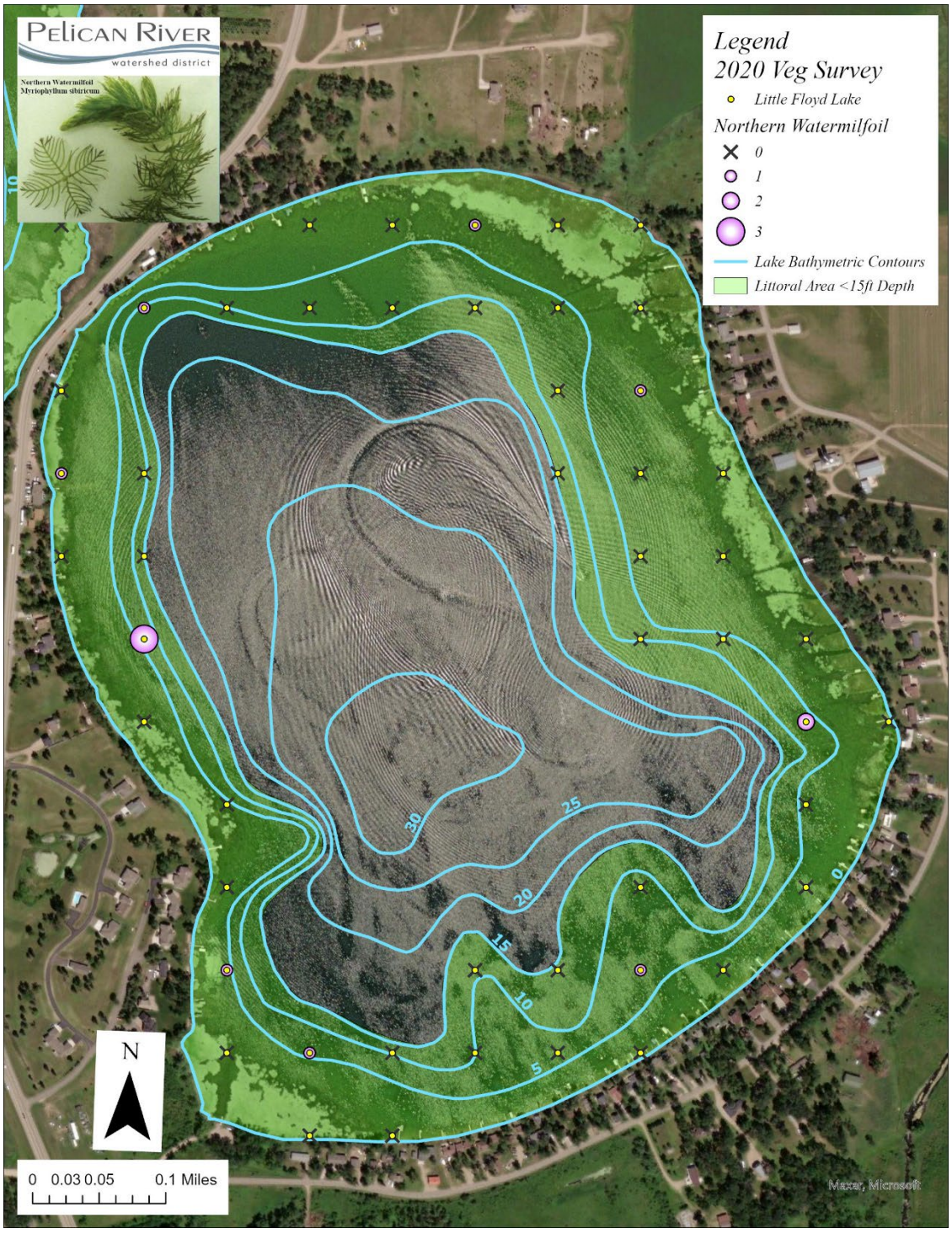

Figure 5 – Northern Watermilfoil Distribution. Plant distribution from the 2020 point-intercept survey for Northern Watermilfoil in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

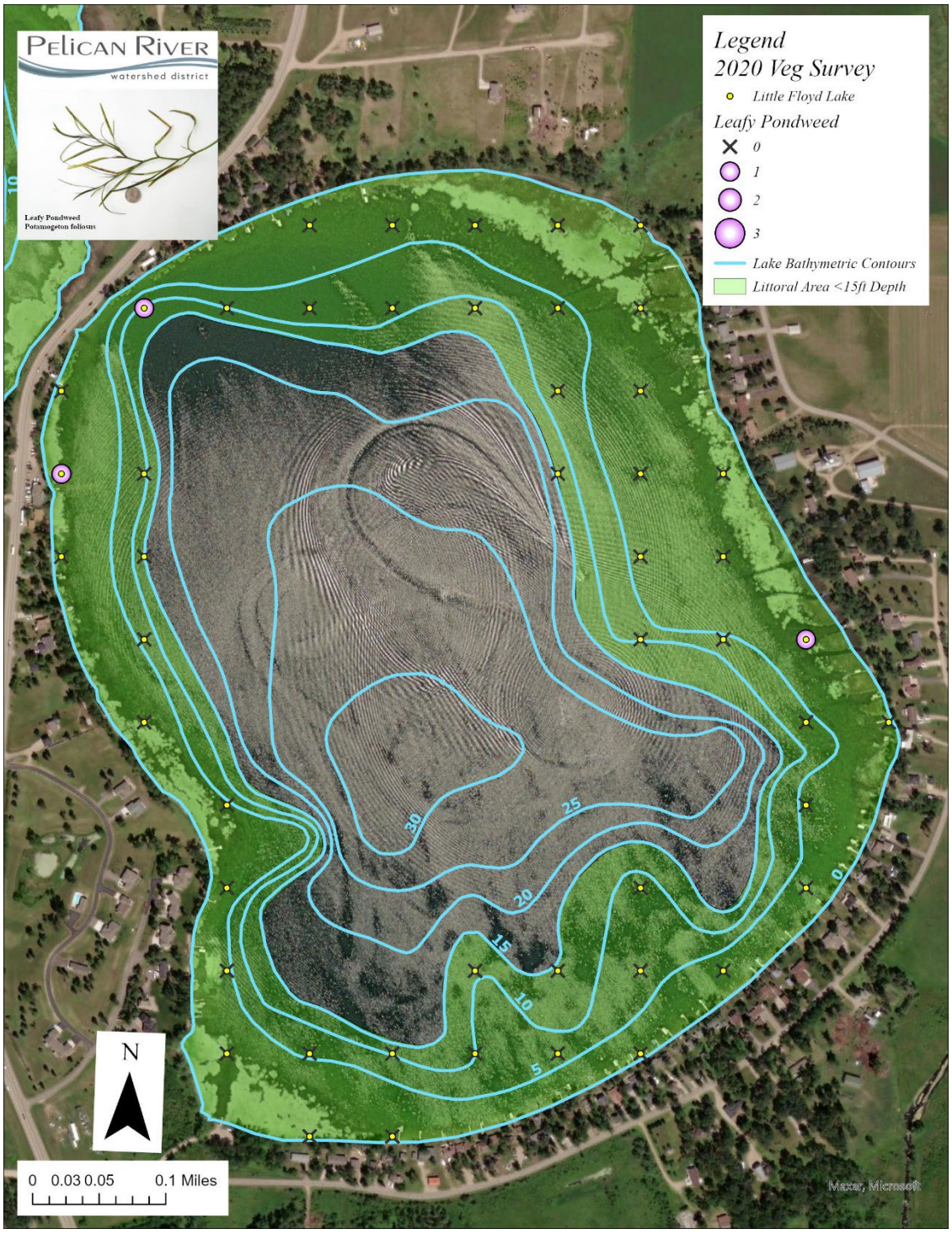

Figure 6 – Leafy Pondweed Distribution. Plant distribution from the 2020 point-intercept survey Leafy Pondweed in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

Figure 7 – Common Bladderwort Distribution. Plant distribution from the 2020 point-intercept survey for Common Bladderwort in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

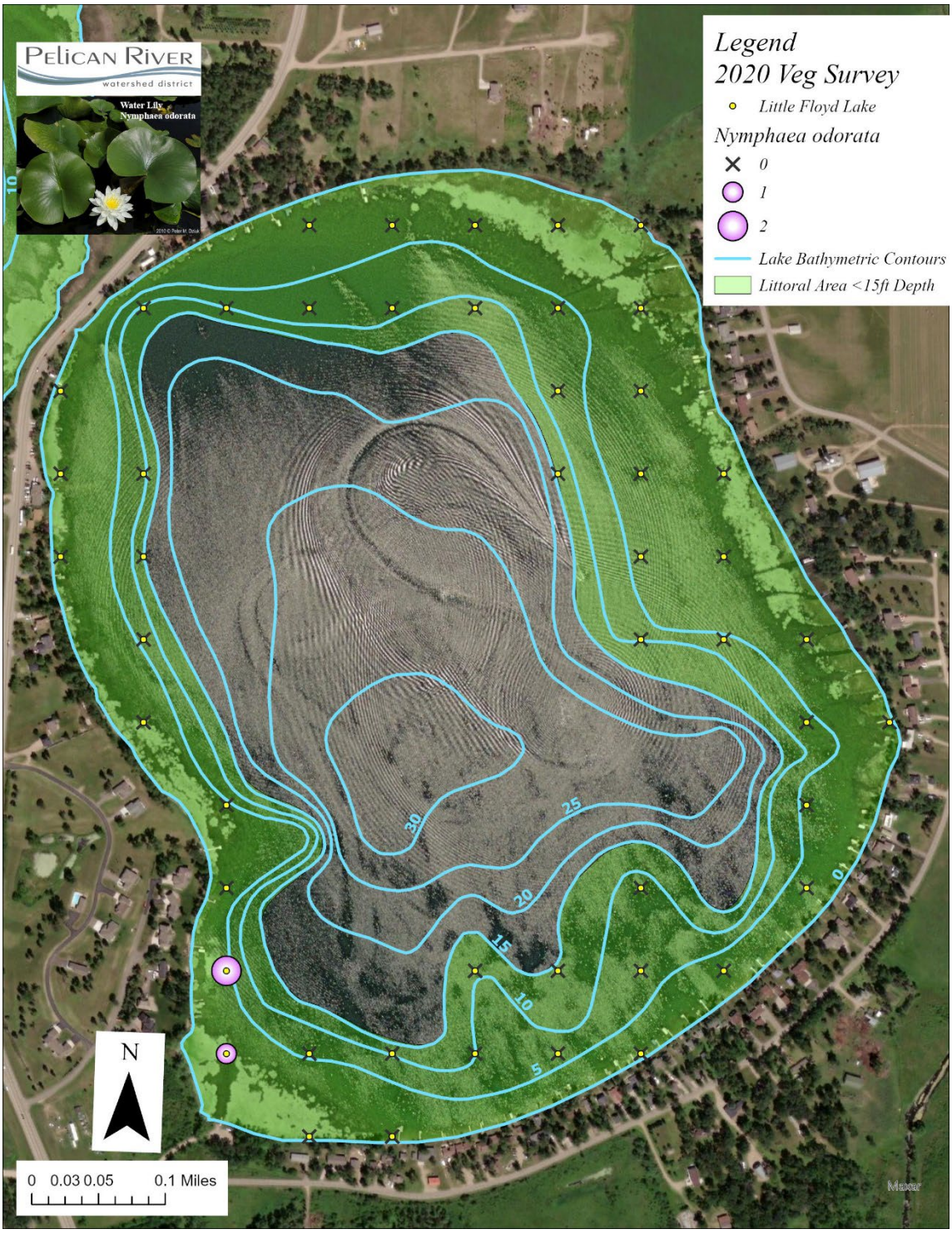

Figure 8 – Water Lily Distribution. Plant distribution from the 2020 point-intercept survey for Water Lily in Little Floyd Lake, Becker County (EQuIS# 03-0386-00-201). Densities ranged from 0 to 3 at each point, with a 3 indicating dense plant presence and 0 indicating no plants.

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.