RICE LAKE, STEARNS COUNTY:
2020 AQUATIC VEGETATION MANAGEMENT REPORT

Report by the Invasive Species Program- Division of Ecological and Water Resources
Minnesota Department of Natural Resources

Prepared by:
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Project Details

Lake: Rice (DOW# 73019600)

Lake Surface Area: 1,513 acres

Littoral Area: 958 acres

County: Stearns County

Survey Type: Point-intercept

Date of Survey (most recent): August 17, 2020

Observer[s]: MN DNR, Invasive Species Program (ISP): Emelia Hauck Jacobs (MN DNR), Chris Jurek (MN DNR)

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Report Details

C. Jurek and E. Hauck Jacobs. 2021. Rice Lake, Stearns County: 2020 MN DNR Aquatic Vegetation Report. Minnesota Department of Natural Resources, Division of Ecological and Water Resources, Invasive Species Program, 1035 South Benton Drive, Sauk Rapids, MN 56379. 14 pp.

Summary

The most recent aquatic vegetation point-intercept survey of Rice Lake (DOW #73019600) occurred on August 17, 2020. Plants were present throughout the lake to a depth of seven feet. Within the littoral zone (zone in lake from the 0-15 foot depth range), 71% of the points had native submersed taxa. The average number of native submersed taxa per sample point was 1.2. In total, fifteen native submersed taxa, one invasive taxa, and two floating-leaf taxa were observed during the 2020 survey.

Lake Description

Rice Lake is a 1513- acre lake located six miles east of Paynesville, MN in Stearns County. The lake has two invasive plant species: curly-leaf pondweed (*Potamogeton crispus*) and starry stonewort (*Nitellopsis obtusa*). The maximum depth of water in Rice Lake is 41 feet, and 63% of the lake is classified as littoral (areas of water depth between 0 to 15 feet, where aquatic plants are most likely to grow). The mean water clarity in 2020 was 6.1 feet (RMB Laboratories, Inc. 2021). According to surveys from the Minnesota Pollution Control Agency (MPCA, 2021), Rice Lake is classified as a eutrophic lake, based on its Trophic State Index (TSI) of approximately 60. For more information on water quality, go to Rice Lake water quality on the MPCA website

Management History

Invasive aquatic plant management in Rice Lake has only focused on starry stonewort (*Nitellopsis obtusa*) using copper and Hydrothol 191 (Endothall) since its discovery in 2016. The most recent treatment was for starry stonewort in 2020 was for 3.4 acres, organized by the Rice Lake Improvement Association (Table 1).

Survey Objectives

A point-intercept survey was used to assess the distribution of aquatic plants in Rice 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). Moreover, this survey will help the DNR and our partners to monitor

native plant communities and monitor the spread of starry stonewort in the lake. It is important to note that distributions of aquatic plants may vary from year to year due to effects such as differences in weather, as well as the effects from management efforts.

Table 1 - Invasive Plant Management Summary. Characteristics and history of partial lake invasive plant treatments for Rice Lake, Stearns County (DOW#73019600). Total acres: 1,513, Littoral acres: 958, 15% of Littoral acres: 144). Abbreviations are as followed: starry stonewort (SSW). Note: Total acres permitted does not reflect the actual treatment or known acreage of the taxa in the lake.

Date	Target Species	Total Acres Permitted	Number of Treatments	Herbicide	Licensed Commercial Applicator
2016	SSW	0.6	2	Tribune, Komeen Crystal	PLM
2017	SSW	0.6	4	Tribune, Komeen Crystal	PLM
2018	SSW	0.6	4	Chem One, Cutrine Plus	PLM
2019	SSW	3.36	4	Chem One, Hydrothol 191	PLM
2020	SSW	3.36	4	Chem One, Hydrothol 191	PLM

Survey Methods

In 2020, MN DNR surveyors used a point-intercept survey method developed by John Madsen in “Aquatic Plant Control Technical Note MI-02, 1999”. Sampling points were placed 120 meters apart using a Geographic Information System. A total of 200 points were sampled within the littoral zone on an established on a grid (Figure 1). Plant samples were collected by throwing and dragging a double-sided rake along the lake bottom at each point. Frequencies of occurrence percentages (i.e., how often a plant species was sampled in the lake) were calculated based on the littoral zone.

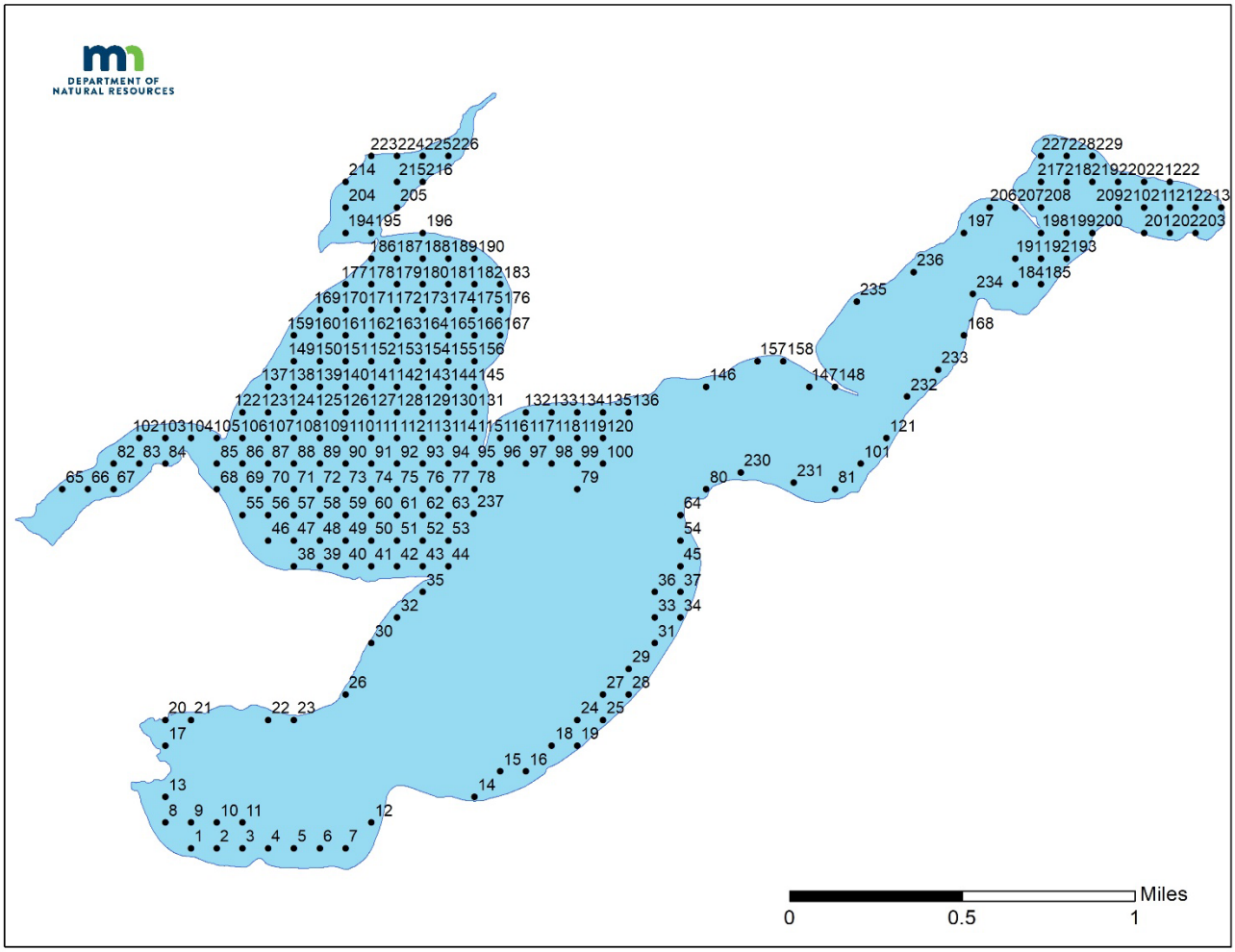


Figure 1 – Point-intercept Survey Grid. Point-intercept survey grid for Rice Lake, Stearns County (DOW#73019600).

Survey Observations

In 2020, we found plants in Rice Lake ranging in water depth from 1 to 12 feet. Most plants were growing in the depth range between 2 and 5 feet. In the littoral zone, 71% of the surveyed points had submersed native vegetation (Table 2). In total, we found fifteen submersed taxa and two floating-leaf species during the survey (Table 3). Sago pondweed (*Stuckenia pectinata*) was the most commonly occurring plant at 33% of all sites in the littoral zone (Figure 2), followed by Muskgrass (*Chara sp*., Figure 3), coontail (*Ceratophyllum demersum*, Figure 4). Curly-leaf pondweed was relatively sparse at 4% (Figure 5), although a low frequency of curly-leaf pondweed can be explained because this plant dies back during late June to early July and was not captured on this survey during its peak abundance. Starry stonewort also was not

found during this survey indicating this species is localized at the public access. The aquatic plant community averages 1.2 species per a sampling site (Figure 6). Overall, this survey provides a summary of submerged aquatic plants in the lake, but underrepresents emergent, floating- leaf vegetation and other aquatic plants that were inaccessible to include with this survey (north end of lake).

Table 2 - Point-intercept Metrics. Summary of point-intercept metrics for Rice Lake, Stearns County (DOW#73019600). Shaded values were calculated from littoral depth range (0-15 feet).

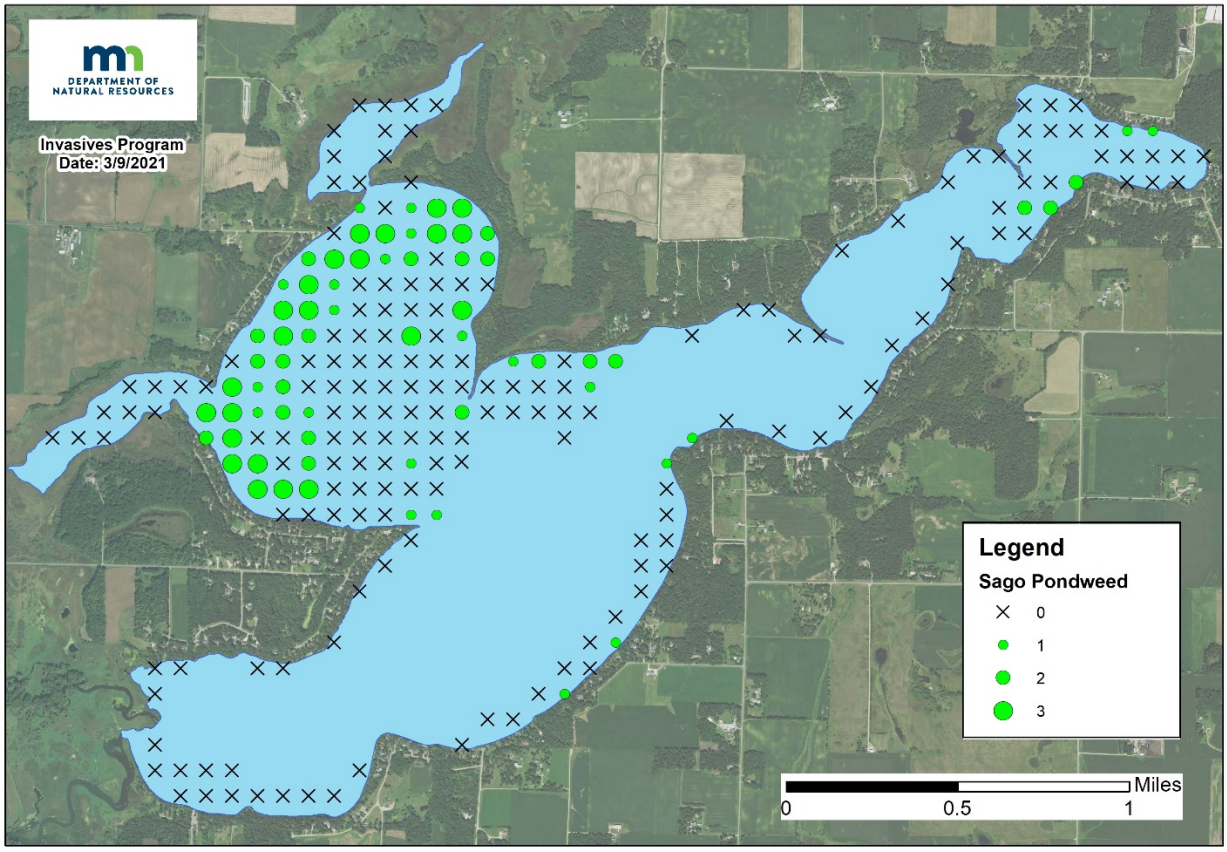
Metric	AUGUST 2020
Surveyor	MN DNR
Total # Points Sampled	202
Depth Range of Rooted Veg (ft.)	1 - 12
Max Depth of Growth (95%)	6.6
# Point in Max Depth Range	159
# Points in Littoral (0-15 feet)	200
% Points w/ Submersed Native Taxa	71
Mean Submersed Native Taxa/ Point	1.2
# Submersed Native Taxa	15
# Submersed Non-Native Taxa	1
% Points w/ Submersed Non- native Taxa	4

Table 3 - Plant Frequency of Occurrence. Percent frequency of occurrence for observed plant species within the littoral zone (0-15 feet) in Rice Lake, Stearns County (DOW#73019600).

Taxonomic Name	Common Name	JULY 2014	JULY 2020
SUBMERSED NON-NATIVE			
Potamogeton crispus	Curly-leaf pondweed	**17**	**4**
SUBMERSED NATIVE			
Ceratophyllum demersum	Coontail	**31**	**17**
Chara sp.	Muskgrass	**5**	**31**
Elodea canadensis	Canadian waterweed	**<1**	**2**
Fontinalis sp.	Watermoss	**0**	**2**
Heteranthera dubia	Water star-grass	**0**	**2**
Myriophyllum sibiricum	Northern watermilfoil	**1**	**9**
Nitella sp.	Nitella species	**0**	**4**
Najas sp.	Naiad species	**<1**	**3**
Potamogeton freisii	Fries' pondweed	**0**	**1**
Potamogeton praelongus	White-stem pondweed	**2**	**0**
Potamogeton richardsonii	Clasping-leaved pondweed	**1**	**3**
Potamogeton sp.	Narrow-leaved pondweeds	**0**	**6**
Potamogeton zosteriformis	Flatstem pondweed	**0**	**1**
Stuckenia pectinata	Sago pondweed	**66**	**33**
Utricularia sp.	Bladderwort species	**1**	**1**
Vallisneria americana	Wild celery	**<1**	**6**
FLOATING LEAF			
Nymphaea odorata	White waterlily	**3**	**2**
Nuphar variegata	Yellow waterlily	**<1**	**1**
FREE FLOATING			
Lemna sp.	Duckweed	**<1**	**1**

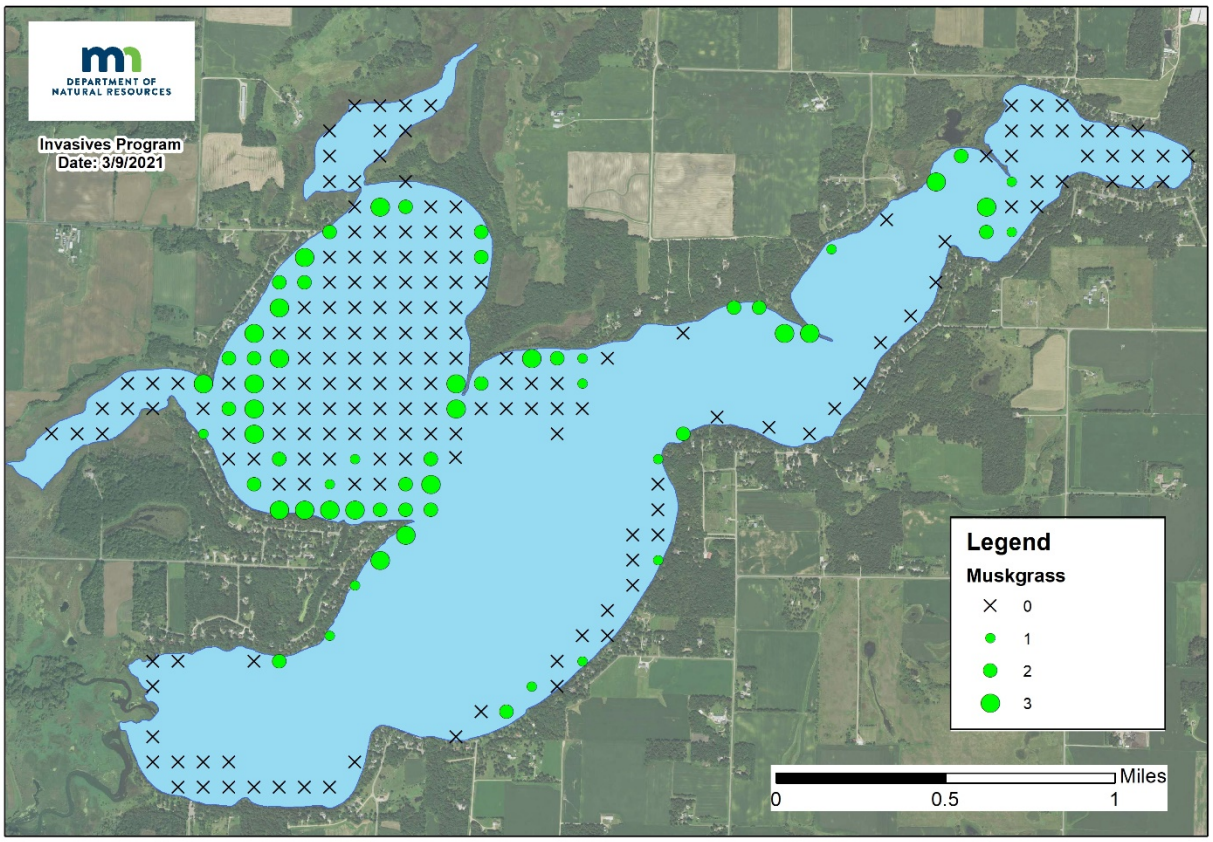
Comparison to previous years

In addition to the point-intercept survey conducted by the Invasive Species Program, RMB Laboratories conducted a point-intercept aquatic plant survey in 2014. The most commonly found plants in 2014 were sago pondweed, coontail, and curly-leaf pondweed. Curly- leaf pondweed occupied 17% of the lake in 2014, whereas it only occupied 4% of the lake in 2020. Sago pondweed was the most abundant plant in both 2014 and 2020. In 2017, the MN DNR Fisheries also conducted a vegetation transect survey. This method used 40 transects to sample aquatic vegetation nearshore. During this July survey, the most common submersed aquatic plants were northern watermilfoil (83%), coontail (80%), wild celery (55%), muskgrass (50%), clasping- leaf pondweed (20%) and curly-leaf pondweed (13%). A total of 12 submersed aquatic plants were observed and the maximum depth of vegetation was 9.5 feet.



Rice Lake, Stearns County (DOW 73019600)
MN DNR Point Intercept Survey August 17, 2020

Figure 2 – 2020 Sago pondweed Distribution. Plant distribution from the 2020 point-intercept survey for Sago pondweed in Rice Lake, Stearns County (DOW#73019600). Densities ranged from 0 to 3 at each point, with 3 indicating dense plant presence and 0 indicating no plants.



Rice Lake, Stearns County (DOW 73019600)
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Figure 3 – 2020 Muskgrass Distribution. Plant distribution from the 2020 point-intercept survey for muskgrass in Rice Lake, Stearns County (DOW#73019600). Densities ranged from 0 to 3 at each point, with 3 indicating dense plant presence and 0 indicating no plants.

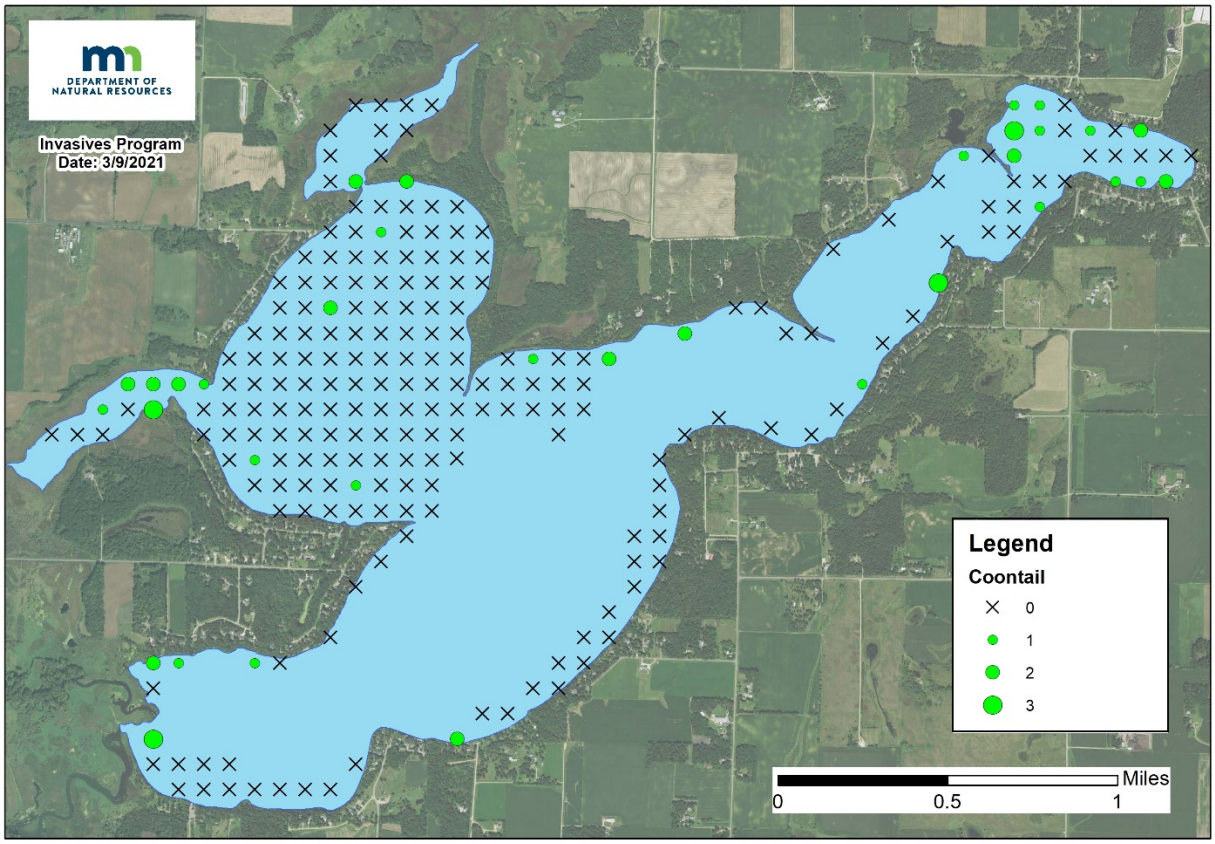

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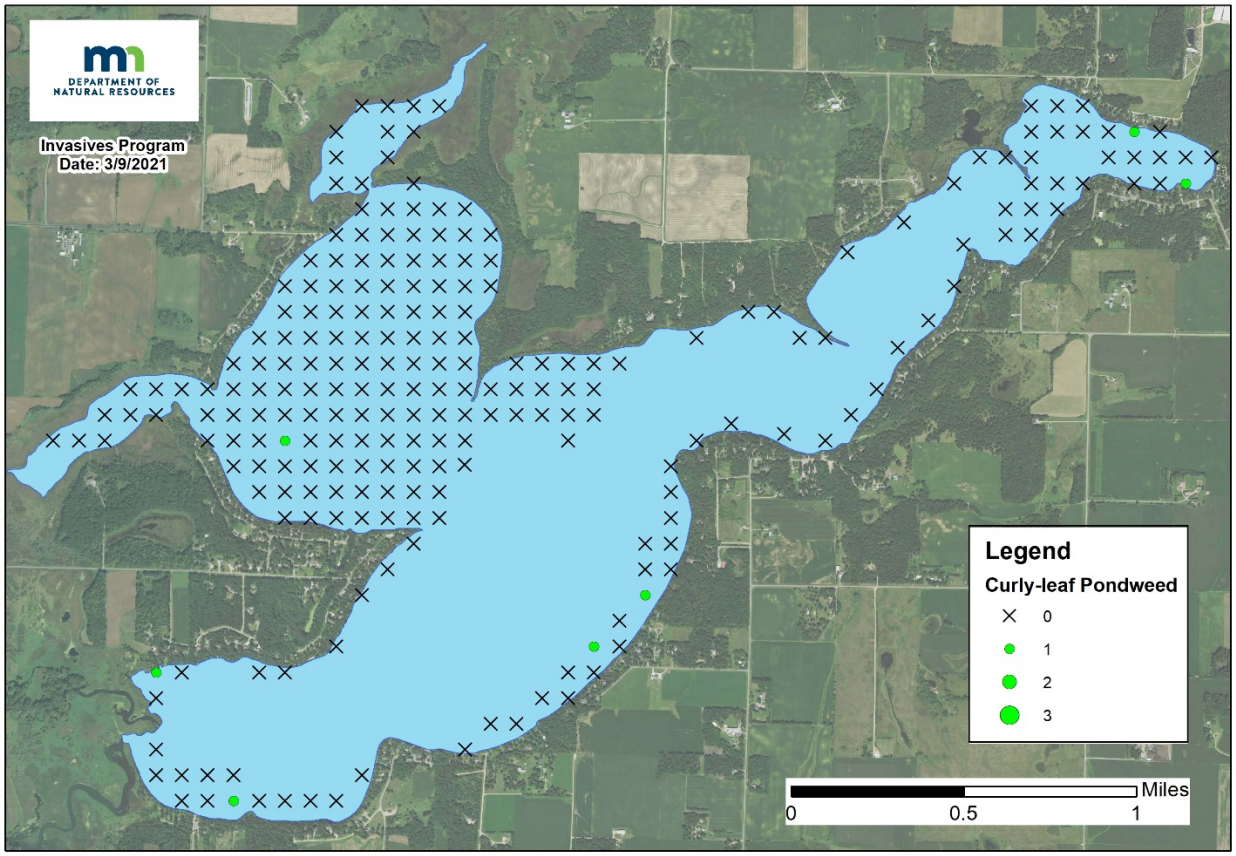
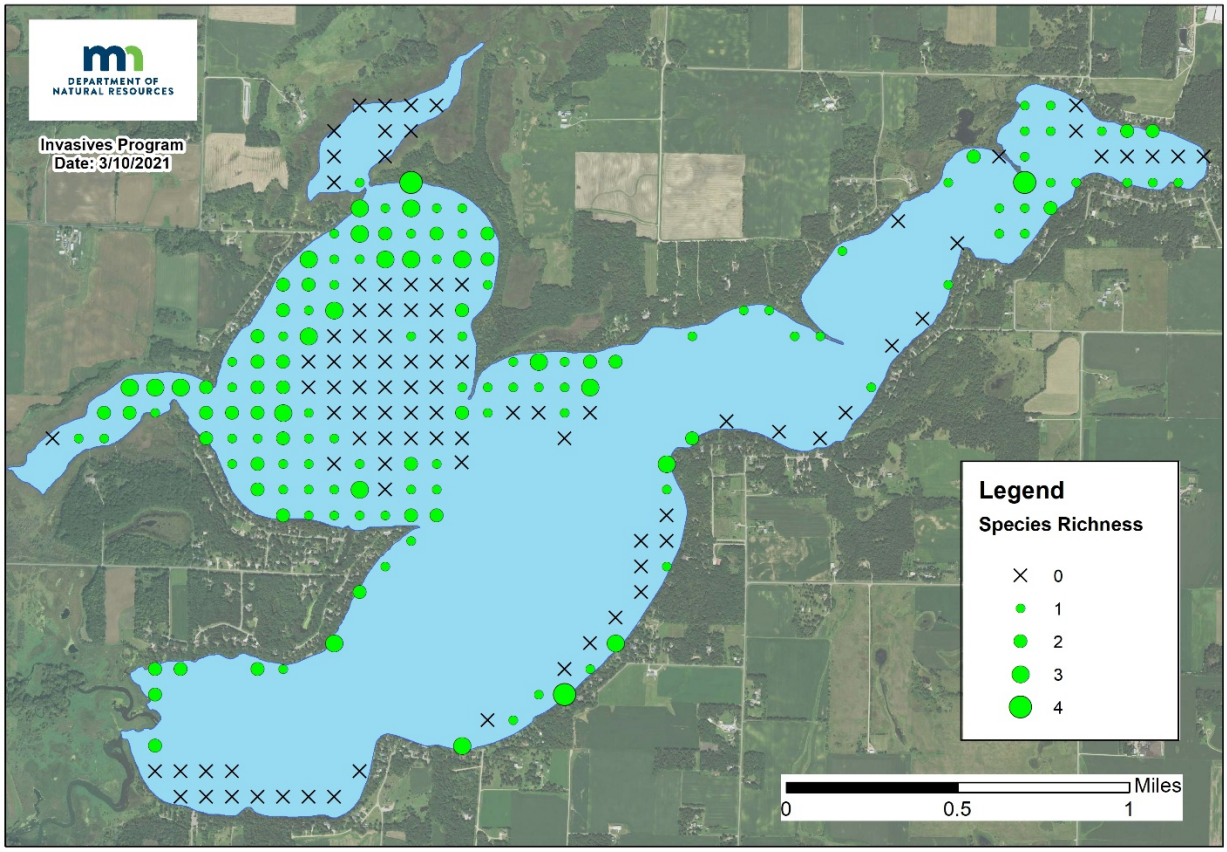
Figure 4 – 2020 Coontail Distribution. Plant distribution from the 2020 point-intercept survey for coontail in Rice Lake, Stearns County (DOW#73019600). Densities ranged from 0 to 3 at each point, with 3 indicating dense plant presence and 0 indicating no plants.



Rice Lake, Stearns County (DOW 73019600)
MN DNR Point Intercept Survey August 17, 2020

Figure 5 – 2020 Curly-leaf pondweed Distribution. Plant distribution from the 2020 point-intercept survey for curly-leaf pondweed in Rice Lake, Stearns County (DOW#73019600). Densities ranged from 0 to 3 at each point, with 3 indicating dense plant presence and 0 indicating no plants.



Rice Lake, Stearns County (DOW 73019600)
MN DNR Point Intercept Survey August 17, 2020

Figure 6 – Number of species per site. Map of number of species from the 2020 point-intercept survey in Rice Lake, Stearns County (DOW#73019600).

Literature Cited

Crow, G.E. and C.B. Hellquist. (2000). *Aquatic and wetland plants of Northeastern North America*. (Vols. 1 & 2). Madison, WI: The University of Wisconsin Press.

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.