



GOLDEN SANDS

RESOURCE CONSERVATION & DEVELOPMENT COUNCIL, INC.

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Conservation That Works!

County K Marsh, Green Lake, Green Lake County Point Intercept Aquatic Plant Survey August 26, 2021

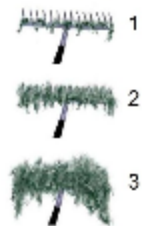
Golden Sands Resource Conservation & Development Council, Inc (RC&D) staff Chris Hamerla completed a Point Intercept Aquatic Plant Survey (PI Survey) on Green Lake's County K Marsh on August 26, 2021. The survey was completed to gather baseline data for the aquatic plant community as work is being done in County K Marsh to reduce turbidity, encourage a healthy plant community and, in turn, restore the ecosystem. This data can be used by lake managers and Wisconsin Department of Natural Resources staff to understand the impact of the management practices.

Benefits of Aquatic Plants

Aquatic plants are an important part of the state's wet ecosystems. They produce oxygen and help protect water quality. They help clarify water in wetlands, lakes and rivers by using nutrients like phosphorus and nitrogen that might otherwise be used to produce algal blooms. Aquatic plants help reduce wave action and current flow which reduces shoreland erosion and helps stabilize sediments in the waterbody. Perhaps most apparent, plants provide food, shelter and habitat for fish, invertebrates and all sorts of wildlife. Finally, diverse, healthy plant communities can help prevent invasive species from establishing. Invasive species are more likely to become established in disturbed areas.

Point Intercept Aquatic Plant Surveys

Illustration of
Rake Fullness
Rating



Point intercept (PI) surveys are completed by traveling to predetermined GPS points across the lake. Each PI lake map is based on the area and depth specific to that lake. The maps with GPS coordinates are obtained through the WDNR. The County K Marsh is part of greater Green Lake but this survey focused solely on the Marsh which contains 95 sample points. The County K Marsh PI map is shown in Figure 1. Using a GPS, staff traveled by kayak to each of the GPS points in County K Marsh. At each point a two-sided rake was used to sample roughly a one foot area of the lake bottom. Sediment type (sand, rock or muck), water depth in half foot increments and the aquatic plant community was recorded. Once the rake is brought to the surface the amount of plant material on the rake is assessed and recorded. The overall fullness of plants on the rake is rated a one, two or three (see illustration to the left for fullness ratings, and see Figure 1 for total rake fullness).

Then the individual species are ranked using a one, two or three. All data is recorded on the PI worksheet. Plants seen within six feet of the sample point are recorded as a "visual". Other plants seen on the lake are recorded as a "boat survey". To learn more about PI sampling methods and how data is collected please visit:

<http://www.uwsp.edu/cnr-ap/UWEXLakes/Documents/ecology/Aquatic%20Plants/PL-Protocol-2010.pdf>

Frequency of occurrence is the percentage of time a species is found out of the total number of points sampled. Not all sample points are capable of supporting plant growth. *Littoral frequency of occurrence* is how often a species is found out of the total number of points that support plant growth. (Shown in Table 1) The deepest depth where plant growth is found is called *maximum depth of plant growth*. *Species richness* is the total number of different species found on the rake while sampling points. *Floristic Quality Index (FQI)* is the ranking of the plants in the lake that compares to an undisturbed lake. The higher the FQI the closer the plant community is to that of an undisturbed system. Approximately 250 lakes across Wisconsin are used to calculate the statewide and ecoregion averages for comparison. Table 2 summarizes the lake's littoral frequency of occurrence, maximum depth of plant growth, species richness and FQI.

It should be noted that plant species may differ from year to year on the following Table 1. GPS coordinates are accurate only within twenty feet and plant communities can shift. Table 1 represents only those species which were detected on the rake during the survey.

Survey Observations

Three species were collected on the sampling rake during the survey (*Stuckenia pectinata*, *Nymphaea odorata* and *Vallisneria americana*). Though not observed in 2021, *Potamogeton crispus* and *Ceratophyllum demersum* had been observed in 2020. While *Vallisneria americana* was present on the sample rake, it was only a portion of a leaf. It is not clear if this sample had floated in from the main body of Big Green Lake or if this sample was indeed a rooted specimen. It should also be noted that Table 2 shows a maximum depth of plant growth to be four feet. That data is based off point 254 which is located near the County K bridge. The water is slightly clearer in that location. The plant was *Nymphaea odorata* and was on the edge of a large colony.

All carp exclusion fenced areas and areas with turbidity curtains had sections that were dislodged or had fallen down. Carp were observed sporadically throughout County K Marsh and several dozen were seen against the marsh side of the barrier at the County K bridge.

Table 1: Species Present

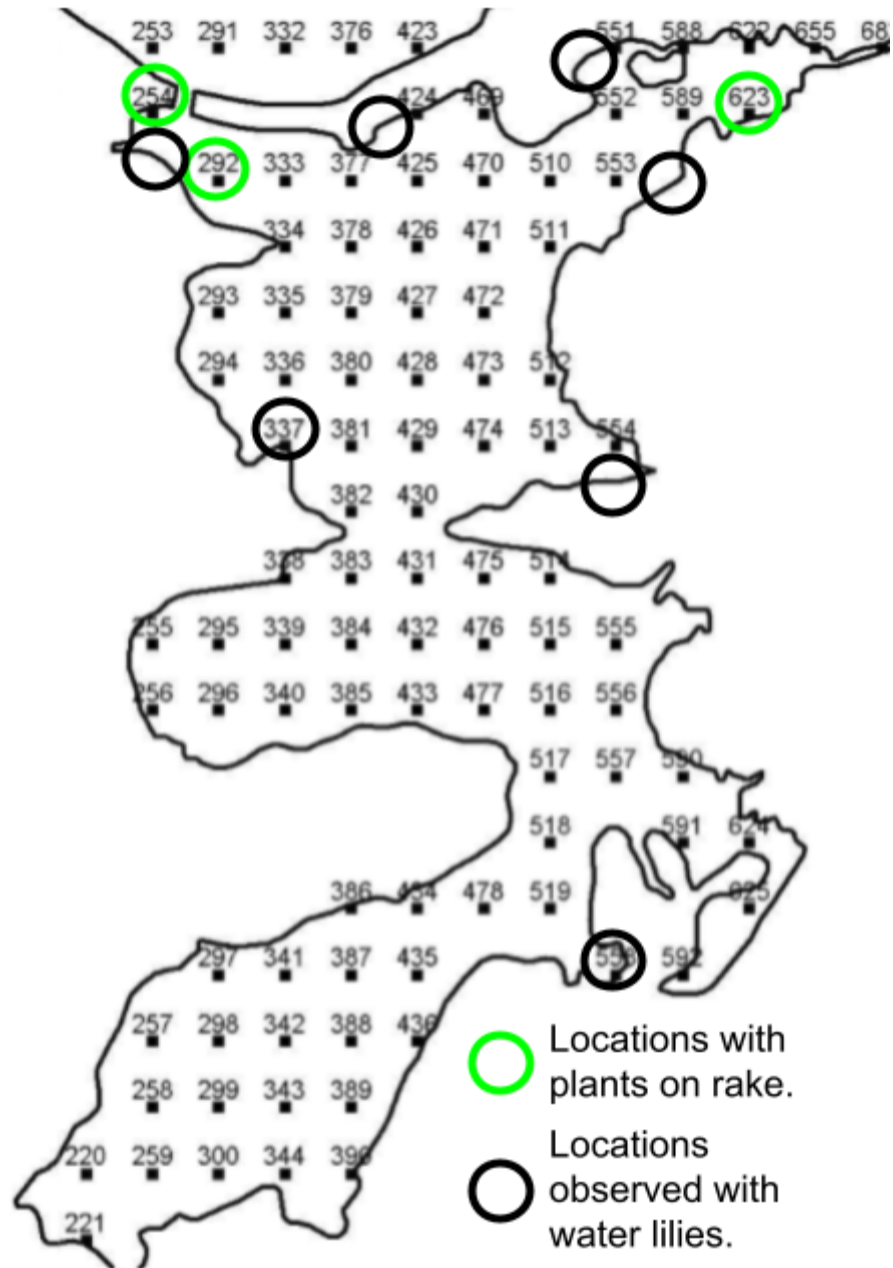
Common Name	Scientific Name	Plant type: floating leaf, free floating, submergent, emergent	% Littoral Frequency of Occurrence
Sago pondweed	<i>Stuckenia pectinata</i>	submergent	1.1
Water celery	<i>Vallisneria americana</i>	submergent	1.1
White water lily	<i>Nymphaea odorata</i>	floating leaf	3.3

% Littoral frequency of occurrence: This is calculated by taking the total number of times a species is recorded divided by the total number of points in the lake where plant growth is possible.

Table 2: Lake Survey Summary

	Lake	Statewide Average	North Central Hardwoods Forests Ecoregion Average
Littoral Frequency of Occurrence (%)	3.3	74.3	76.0
Maximum Depth of Plant Growth	4	15.3	15.9
Species Richness	3	16.8	16.2
Floristic Quality Index (FQI)	8.6	24.1	23.3

Figure 1: County K Marsh PI map with plant locations.



If there are any questions regarding the PI survey or results please contact Golden Sands RC&D, Chris Hamerla, chris.hamerla@goldensandsrcd.org (715) 343-6215 extension 704.