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Conservation That Works!

Richter Lake, Taylor County
Point Intercept Aquatic Plant Survey
August 25th, 2021

To whom it may concern,

Golden Sands Resource Conservation & Development Council, Inc (RC&D) staff Chris Hamerla and Kendra Kundinger completed a Point Intercept Aquatic Plant Survey (PI Survey) on Richter Lake on August 25th, 2021. The survey was completed as part of Richter Lake's efforts to become a part of the Citizen Lake Monitoring Network (CLMN). CLMN is a statewide volunteer network for the monitoring of water clarity, water chemistry, ice-on ice-off, aquatic invasive species, and native aquatic plants. Richter Lake also began collecting water clarity in 2021. No aquatic invasive species were identified during the PI survey.

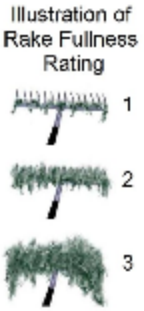
Benefits of Aquatic Plants

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.

Aquatic Invasive Species

Aquatic invasive species (AIS) are plants or animals that are not native to a particular area and dominate an area where they are introduced. They can be very successful because they fill a niche that isn't occupied, are able to tolerate a wider range of living conditions, they don't have any natural predators or diseases or perhaps they begin growing earlier. EWM, curly leaf pondweed and purple loosestrife are common examples of AIS. AIS can threaten an area both ecologically and economically. They can disrupt food chains and degrade habitat which negatively impacts fish, invertebrates and wildlife. Nuisance levels of AIS can reduce or even prevent recreational opportunities like fishing, boating, wildlife watching, etc... These reduced recreational opportunities have negative impacts to the local and statewide economy. AIS such as zebra mussels can negatively impact water quality, food chains, aquatic habitat, recreation and industry. Unfortunately the effects of AIS are difficult to foresee since the degree of impact can vary greatly from one place to another. One system may be completely taken over by AIS while AIS in another nearby system may become a part of the community and have little to no negative effects.

Point Intercept Aquatic Plant Surveys



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. Richter Lake contains 211 sample points. Using a GPS, staff traveled by kayak to each of the GPS points. 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). 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". (Figure 1 shows map with survey points and EWM locations.) 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 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 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.

Table 1: **Species Present**
% 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.

***** means a non-native species, potentially invasive.

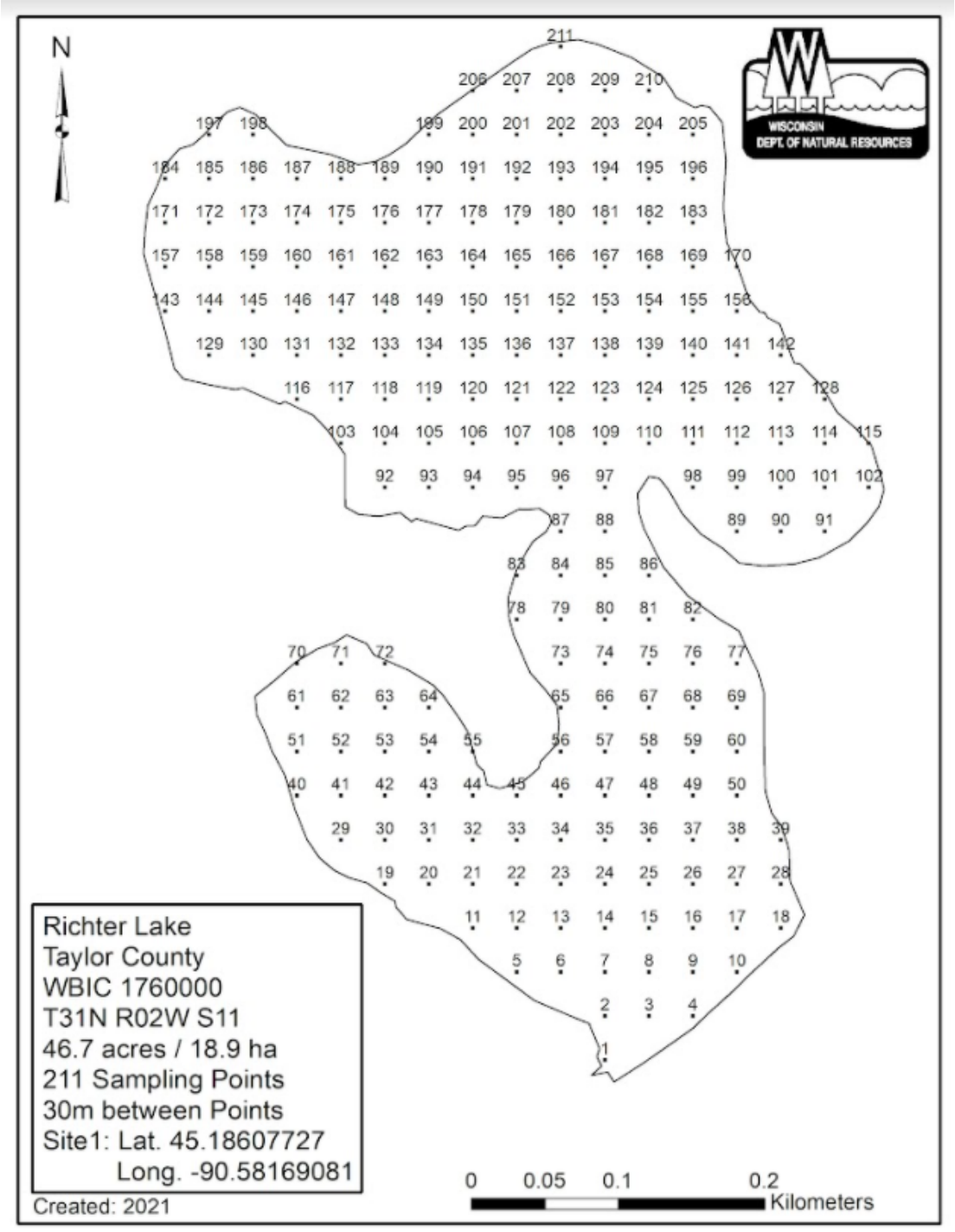
Common Name	Scientific Name	Plant type: floating leaf, free floating, submergent, emergent	% Littoral Frequency of Occurrence
Coontail	*Ceratophyllum demersum*	submergent	2.08
Marsh cinquefoil	*Comarum palustre*	emergent	2.08
Needle spikerush	*Eleocharis acicularis*	emergent	2.08
Creeping spikerush	*Eleocharis palustris*	emergent	Visual
Common waterweed	*Elodea canadensis*	submergent	4.17
Water horsetail	*Equisetum fluviatile*	emergent	Visual

Small duckweed	*Lemna minor*	free floating	Visual
Spatterdock	*Nuphar variegata*	floating leaf	Visual
White water lily	*Nymphaea odorata*	floating leaf	33.33
Large-leaf pondweed	*Potamogeton amplifolius*	submergent	14.58
Small pondweed	*Potamogeton pusillus*	submergent	4.17
Fern pondweed	*Potamogeton robbinsii*	submergent	70.83
Grass-leaved arrowhead	*Sagittaria graminea*	emergent	Visual
Common arrowhead	*Sagittaria latifolia*	emergent	Visual
Cattail	*Typha sp.*	emergent	Visual
Common bladderwort	*Utricularia vulgaris*	free floating	Visual
Filamentous algae	----------	free floating	2.08
Slender riccia	*Riccia fluitans*	free floating	Visual

Table 2: **Lake Survey Summary**

	Richter Lake	**Statewide Average**	**North Central Hardwoods Forests Ecoregion Average**
Littoral Frequency of Occurrence (%)	**79.17**	**74.3**	**76.0**
Maximum Depth of Plant Growth	**11.5**	**15.3**	**15.9**
Species Richness	**8**	**16.8**	**16.2**
Floristic Quality Index (FQI)	**14.7**	**24.1**	**23.3**

Figure 1: Richter Lake PI grid



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 ext. 704 or Kendra Kundinger, kendra.kundinger@goldensandsrcd.org (715) 343-6215 ext. 705.