



GOLDEN SANDS

RESOURCE CONSERVATION & DEVELOPMENT COUNCIL, INC.

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Conservation That Works!

Esadore Lake, Taylor County Point Intercept Aquatic Plant Survey August 17th, 2020

Golden Sands Resource Conservation & Development Council, Inc (RC&D) staff Chris Hamerla and Selina Walters completed a Point Intercept Aquatic Plant Survey (PI Survey) on Esadore Lake on August 17th, 2020. The survey was completed to follow up on the curly leaf pondweed (CLP), *Potamogeton crispus*, population found during an early detection survey completed on June 24, 2019. This survey was the second of two PI surveys completed in 2020. The first, completed June 9th and 11th, only focused on CLP location and abundance. No CLP was observed during either survey. During the previous survey a lake resident was snorkeling in the area where CLP had been observed in 2019. They monitored the area but didn't observe any CLP. In 2019 lake resident Rick Berry was made aware of the CLP and he snorkeled to remove any CLP. Currently his efforts appear to have been successful. Follow up monitoring will occur in spring of 2021.

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.

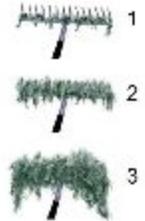
Aquatic Invasive Species

Aquatic invasive species (AIS) are plants or animals that are not native to a particular area and may 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

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. Esadore Lake contains 225 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 the lake map with survey points and CLP 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 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 or as a visual 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.

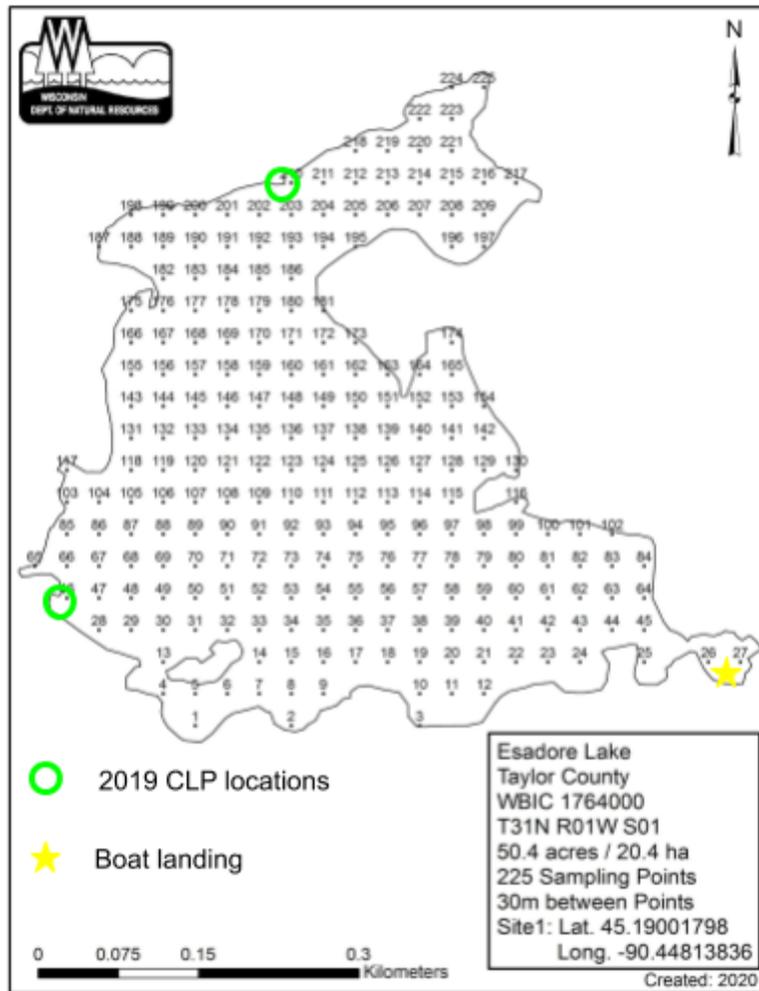
Common Name	Scientific Name	Plant type: floating leaf, free floating, submergent, emergent	% Littoral Frequency of Occurrence
Watershield	<i>Brasenia schreberi</i>	Floating Leaf	3.28
Coontail	<i>Ceratophyllum demersum</i>	Free floating, submergent	1.64
Three-way sedge	<i>Dulichium arundinaceum</i>	Emergent	1.5

Common Name	Scientific Name	Plant type: floating leaf, free floating, submergent, emergent	% Littoral Frequency of Occurrence
Needle spikerush	<i>Eleocharis acicularis</i>	Submergent/emergent	1.5
Pipewort	<i>Eriocaulon aquaticum</i>	Emergent	Visual only
Lake quillwort	<i>Isoetes lacustris</i>	Submergent	.82
Small duckweed	<i>Lemna minor</i>	Free floating	Visual only
Northern naiad	<i>Najas gracillima</i>	Submergent	19.67
Spatterdock/Bullhead pond L	<i>Nuphar variegata</i>	Floating leaf	.82
White water lily/Fragrant	<i>Nymphaea odorata</i>	Floating leaf	6.56
Pickerelweed	<i>Pontederia cordata</i>	Emergent	.82
Large leaf pondweed	<i>Potamogeton amplifolius</i>	Submergent	Visual only
Ribbon leaf pondweed	<i>Potamogeton epihydrus</i>	Submergent	.82
Fern leaf pondweed	<i>Potamogeton robbinsii</i>	Submergent	8.2
Arrowhead sp.	<i>Sagittaria sp.</i>	Emergent	.82
Bur-reed sp.	<i>Sparganium sp.</i>	Emergent	4.1
Cattail sp.	<i>Tyoha sp.</i>	Emergent	Visual only
Flat leaf bladderwort	<i>Utricularia intermedia</i>	Submergent	Visual only
Common bladderwort	<i>Utricularia vulgaris</i>	Free floating submergent	Visual only
Wild celery	<i>Vallisneria americana</i>	Submergent	4.1
Aquatic moss sp.	<i>Aquatic moss sp.</i>	Submergent	13.93
Freshwater sponge	<i>Freshwater sponge</i>	Submergent	.82
*Yellow iris	<i>*Iris pseudacorus</i>	Emergent	Visual only

Table 2: Lake Survey Summary

	Lake	Statewide Average	North Central Hardwoods Forests Ecoregion Average
Littoral Frequency of Occurrence (%)	28.69	74.3	76.0
Maximum Depth of Plant Growth	23	15.3	15.9
Species Richness	14	16.8	16.2
Floristic Quality Index (FQI)	23.09	24.1	23.3

Figure 1: 2019 CLP locations. No CLP was observed in 2020.



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