



# Golden Sands

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## Lake Helen, Portage County August 4th & 11th 2020

### To Whom it may concern,

Golden Sands Resource Conservation & Development Council, Inc (RC&D) completed a Point Intercept Aquatic Plant Survey (PI Survey) on Lake Helen on August 4th & 11th, 2020. The survey consisted of 229 points. Golden Sands RC&D staff Chris Hamerla and Selina Walters completed the PI. Lake Helen was chemically treated for EWM on May 28, 2020. Figure 3 shows the tracks of the boat during application of the herbicide (courtesy of Schmidt's Aquatic, LLC - Hamilton Harvey). The 2020 PI survey was completed as follow up to the herbicide treatment. It was also a continuation of data following the 2013 Eurasian watermilfoil (EWM) treatment. In 2015 EWM was reconfirmed and had spread throughout the lake. Manual removal efforts were conducted in 2018 and 2019 but were discontinued in 2019 due to increased EWM populations. Completion of the 2019 PI confirmed an increase of EWM in the percent littoral frequency of occurrence from 3.59% in 2018 to 5.09% in 2019. During the 2020 PI no EWM was collected or observed.

Spiny naiad is also known to exist in Lake Helen and was detected during the 2019 PI but not in the 2020 survey. Spiny naiad is listed as a restricted invasive species in Wisconsin but has not been problematic in Lake Helen and is not typically managed in Wisconsin. Figure 1 shows the locations of spiny naiad.

While PI surveys give a good baseline of the aquatic plant community it is important to understand that each survey point on Lake Helen is 40 meters/43.74 yards away from the next point. Plant species may be more abundant than the survey depicts because the plants may be growing between survey points. This is where visual surveys and follow up meander surveys can help fill in the gaps. Following the PI, a meander survey was completed on August 12th to map any observed EWM. No EWM was observed. **Continued monitoring and hand pulling will be important actions moving forward.** Figure 2 shows the observed EWM population in Lake Helen 2019. No EWM was observed as of August 14th.

### Benefits of Aquatic Plants

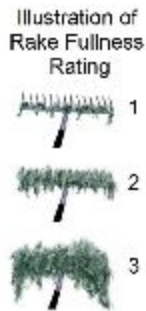
Aquatic plants are an important part of the state's wet ecosystems. They produce oxygen and help protect water quality. They help clarify water in wetlands, lakes and rivers by using nutrients like phosphorus and nitrogen that might otherwise be used to produce algal blooms. Aquatic plants help reduce wave action and current flow which reduces shoreland erosion and helps stabilize sediments in the waterbody. They also 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 can 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 (2019) 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. Zebra mussels were observed across the lake.

### 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. Lake Helen contains 229 sample points. Each GPS point is 40 meters/43.74 yards apart. Using a GPS, staff traveled by boat 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. 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 map with survey points and 2019 spiny naiad locations.) Other plants seen on the lake are recorded as a “boat survey”.

To learn more on 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.

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
Spatterdock	<i>Nuphar variegata</i>	submersed	Boat survey
Whitewater crowfoot	<i>Ranunculus aquatilis</i>	submersed	not observed in 2020
Turion duckweed	<i>Lemna turionifora</i>	free floating	Not observed 2020
Muskgrasses	<i>Chara sp</i>	submersed	63.84
Sago pondweed	<i>Stuckenia pectinata</i>	submersed	.45

Variable pondweed	<i>Potamogeton gramineus</i>	submersed	9.38
Illinois pondweed	<i>Potamogeton illinoensis</i>	submersed	9.82
<b>*Spiny naiad</b>	<b>* <i>Najas marina</i></b>	<b>submersed</b>	<b>Not observed in 2020</b>
Slender naiad	<i>Najas flexilis</i>	submersed	Not observed in 2020
<b>*Eurasian water milfoil</b>	<b>*<i>Myriophyllum spicatum</i></b>	<b>submersed</b>	<b>Not observed in 2020</b>
Flat-stem pondweed	<i>Potamogeton zosteriformis</i>	submersed	.45
Small pondweed	<i>Potamogeton pusillus</i>	submersed	Not observed in 2020
Fries' pondweed	<i>Potamogeton friesii</i>	submersed	Not observed in 2020
Common waterweed	<i>Elodea Canadensis</i>	submersed	Not observed in 2020
Northern watermilfoil	<i>Myriophyllum sibiricum</i>	submersed	Not observed in 2020
Southern naiad	<i>Najas guadalupensis</i>	submerged	Not observed in 2020
Leafy pondweed	<i>Potamageton foliosus</i>	submersed	Not observed in 2020
White-stem pondweed	<i>Potamogeton praelongus</i>	submersed	.89
Creeping spikerush	<i>Eleocharis palustris</i>	emergent	Not observed in 2020
Small duckweed	<i>Lemna minor</i>	free floating	Not observed in 2020
Hardstem bulrush	<i>Schoenoplectus acutus</i>	emergent	Visual
Dwarf watermilfoil	<i>Myriophyllum tenellum</i>	submersed	Boat survey
Needle spikerush	<i>Eleocharis acicularis</i>	emergent	Boat survey
Large duckweed	<i>Spirodeia polyrhiza</i>	free floating	Not observed in 2020

Table 2: Lake Survey Summary

	Lake Helen	Statewide Average	North Central Hardwoods Forests Ecoregion Average
Littoral Frequency of Occurrence (%)	69.20	74.3	76.0
Maximum Depth of Plant Growth	19	15.3	15.9
Species Richness	6	16.8	16.2
Floristic Quality Index (FQI)	15.11	24.1	23.3

Figure 1: 2019 Spiny naiad sites. None observed in 2020.

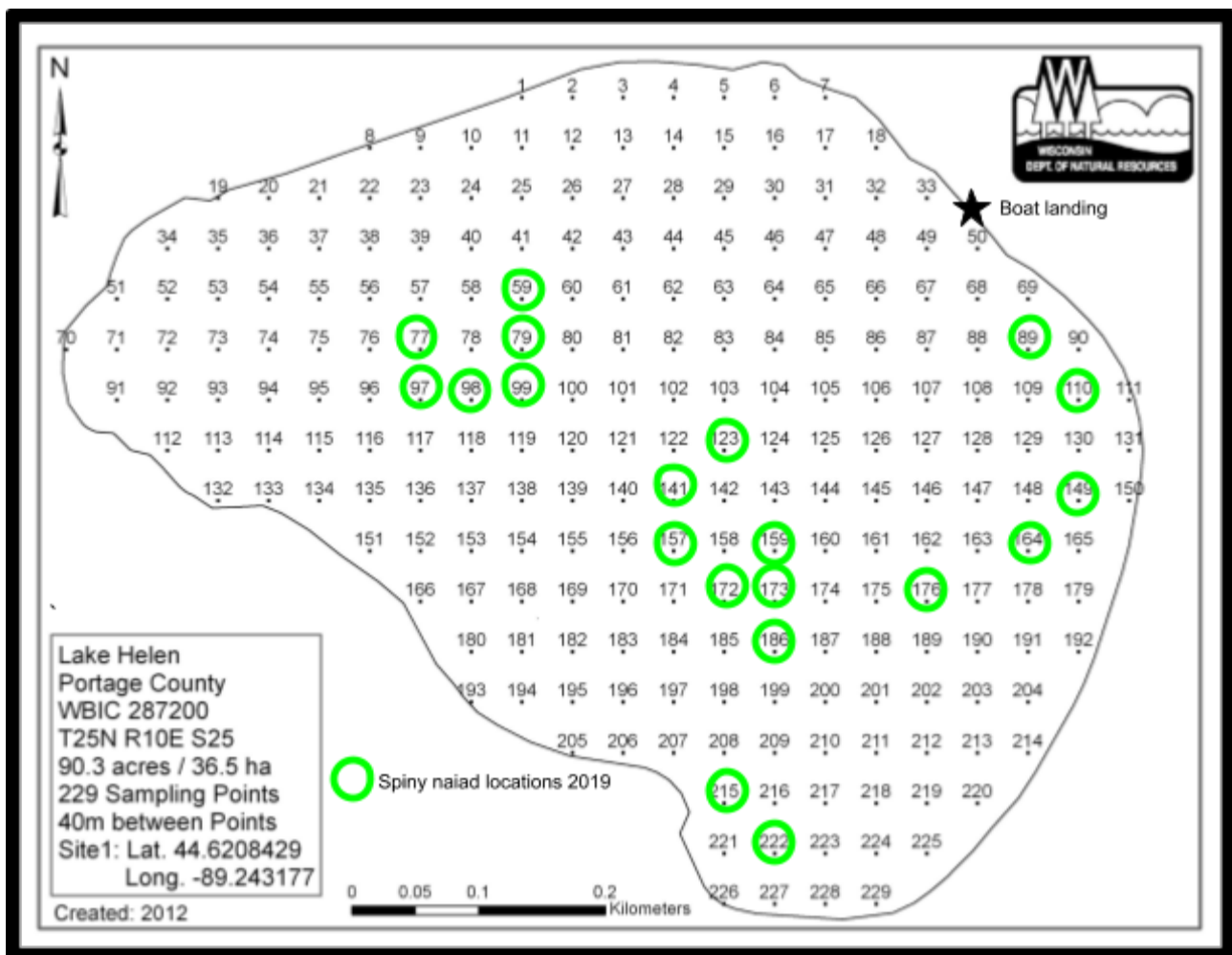




Figure 2: EWM sites/densities during 8/22/19 meander survey. No EWM observed after 2020 treatment.

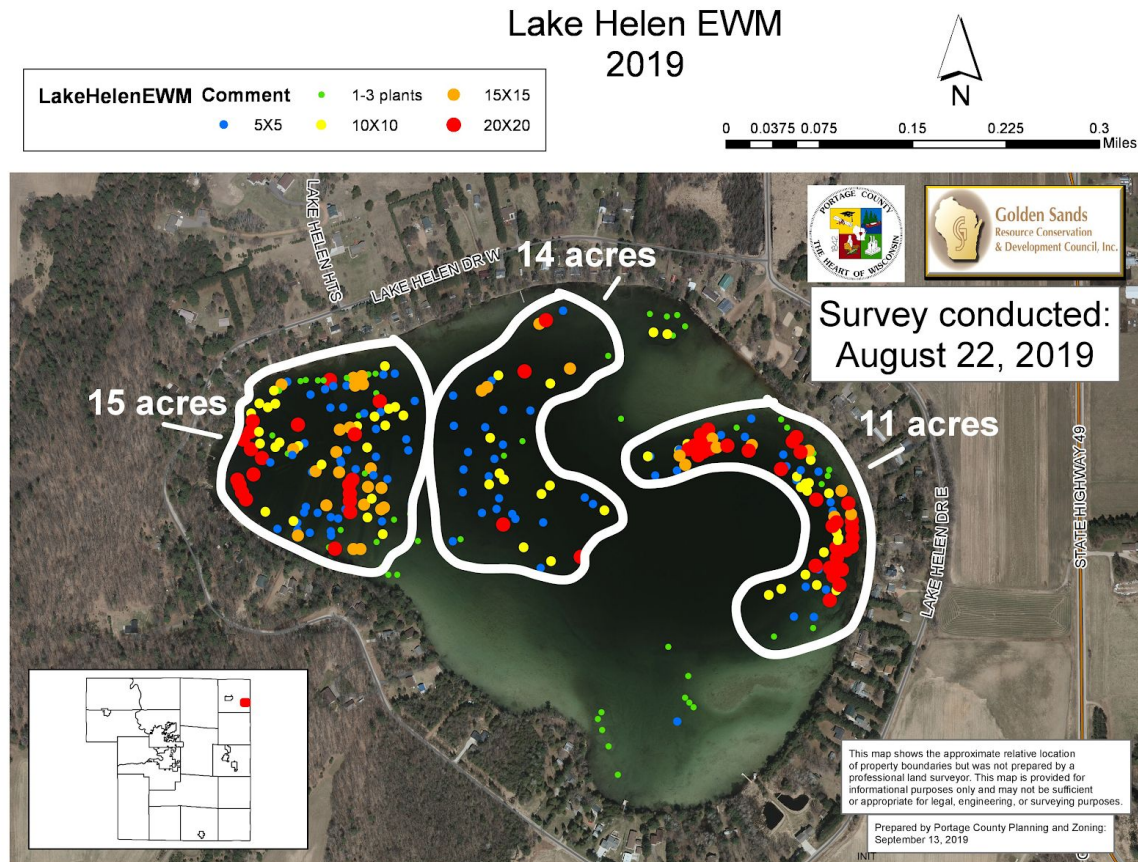


Figure 3: GPS tracks of the boat during herbicide application on May 28, 2020.



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