



# GOLDEN SANDS

RESOURCE CONSERVATION & DEVELOPMENT COUNCIL, INC.

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a 501(c)3 non-profit conservation organization

*Conservation That Works!*

## **South Harper Lake, Taylor County WBIC #2204100 Point Intercept Aquatic Plant Survey July 5th & 6th, 2022**

Golden Sands Resource Conservation & Development Council, Inc (RC&D) completed a Point Intercept Aquatic Plant Survey (PI Survey) on South Harper Lake on July 5th and 6th, 2022. The survey was completed by Golden Sands RC&D staff Chris Hamerla, Kendra Kunding, and Kevin Munkwitz. This survey was conducted to assess the native plant community as well as surveying for any new invasive species. No new invasive species were found. South Harper Lake is listed at 72 acres and has an approximate maximum depth of 32 feet.

### **Benefits of Aquatic Plants**

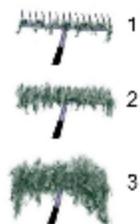
Aquatic plants are an important part of the state's wet ecosystems. They produce oxygen and help protect water quality. They help clarify water in wetlands, lakes and rivers by using nutrients like phosphorus and nitrogen that might otherwise be used to produce algal blooms. Aquatic plants help reduce 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. Eurasian watermilfoil, 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. South Harper Lake contains 288 sample points. 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 (see illustration to the left). Then the individual species are ranked using 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 a map with the survey points.) 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:

<https://dnr.wi.gov/lakes/plants/research/project.aspx?project=96832337>

*Frequency of occurrence* is the percentage of time a species is found on the rake 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. Only species which were found on the rake during the PI survey are used to calculate FQI and species richness. This helps to standardize surveyor efforts across the entire state and is why visual observations are not included. Table 2 summarizes the lake’s littoral frequency of occurrence, maximum depth of plant growth, species richness and FQI. It should be noted that a lake falling below the statewide average for that ecoregion isn’t necessarily “disturbed”. Many influences play a role in determining the species and abundance of plants in a lake. Water chemistry, acidity, hardness, clarity and bottom sediment are examples of natural influences. Increased nutrient runoff, use of chemicals, development and water control structures are examples of human influences.

It should also 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 species which were detected on the rake with a numerical value. Species observed but not collected on the rake are listed as visuals.

**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.

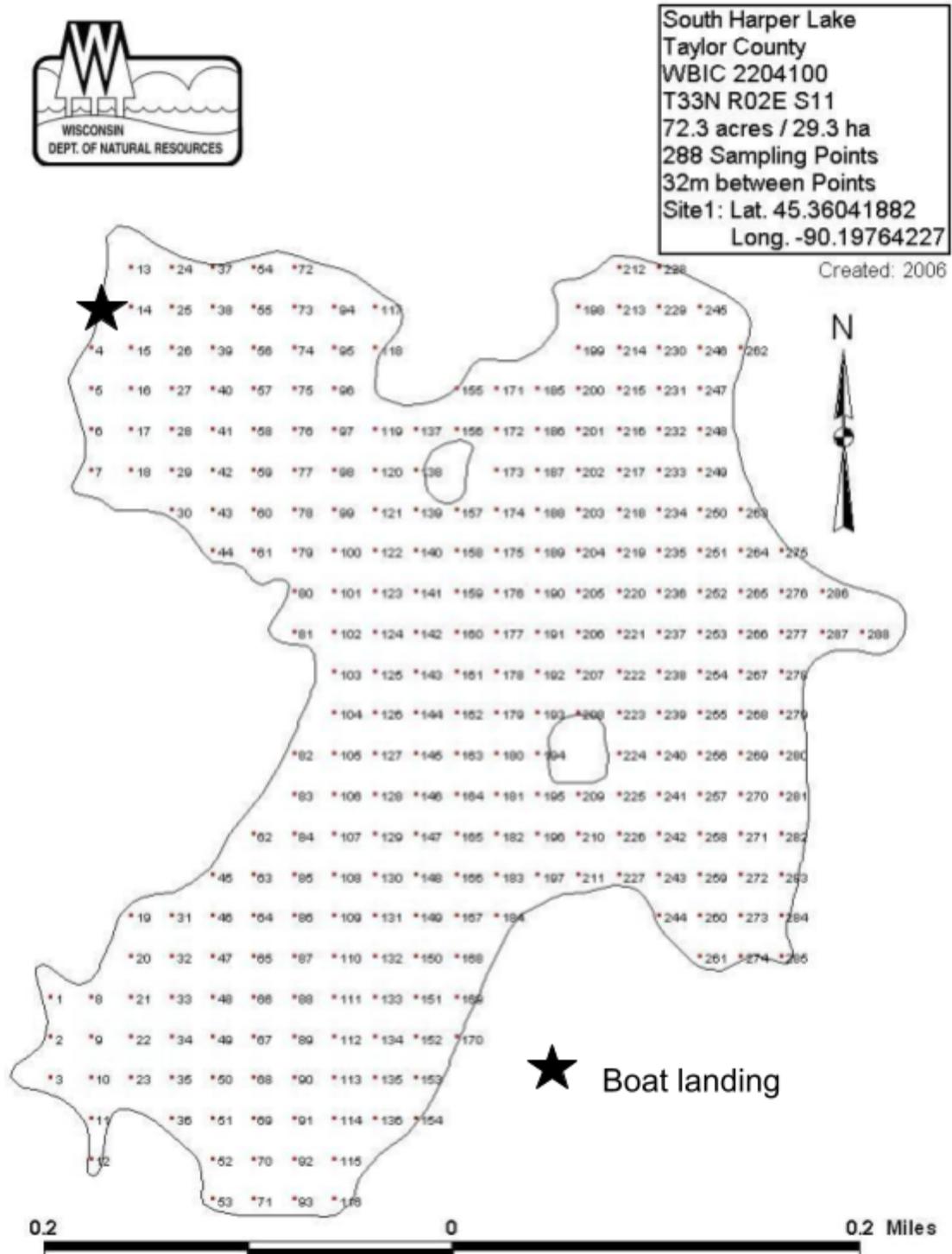
Common Name	Scientific Name	Plant type: floating leaf, free floating, submergent, emergent	% Littoral Frequency of Occurrence
Watershield	<i>Brasenia schreberi</i>	Floating Leaf	4.24
Coontail	<i>Ceratophyllum demersum</i>	Free Floating	1.21
Muskgrasses	<i>Chara sp.</i>	Submergent	67.27
Three-way sedge	<i>Dulichium arundinaceum</i>	Emergent	Visual
Needle spikerush	<i>Eleocharis acicularis</i>	Submergent/Emergent	3.64

Common waterweed	<i>Elodea canadensis</i>	Submergent	3.64
Slender waterweed	<i>Elodea nuttallii</i>	Submergent	3.03
Pipewort	<i>Eriocaulon aquaticum</i>	Submergent	1.21
Quillwort	<i>Isoetes sp.</i>	Submergent	3.03
Dwarf water-milfoil	<i>Myriophyllum tenellum</i>	Submergent	0.61
Slender naiad	<i>Najas flexilis</i>	Submergent	3.64
Northern naiad	<i>Najas gracillima</i>	Submergent	15.15
Spatterdock	<i>Nuphar variegata</i>	Floating Leaf	0.61
White water lily	<i>Nymphaea odorata</i>	Floating Leaf	1.21
Large-leaf pondweed	<i>Potamogeton amplifolius</i>	Submergent	2.42
Ribbon-leaf pondweed	<i>Potamogeton epihydrus</i>	Submergent	3.64
Small pondweed	<i>Potamogeton pusillus</i>	Submergent	7.27
Fern pondweed	<i>Potamogeton robbinsii</i>	Submergent	1.82
Spiral-fruited pondweed	<i>Potamogeton spirillus</i>	Submergent	0.61
Arrowhead	<i>Sagittaria sp.</i>	Submergent/Emergent	0.61
Water bulrush	<i>Schoenoplectus subterminalis</i>	Submergent	1.21
Bur-reed	<i>Sparganium sp.</i>	Emergent	3.64
Common bladderwort	<i>Utricularia vulgaris</i>	Free Floating	Visual
Wild celery	<i>Vallisneria americana</i>	Submergent	3.03
Aquatic moss	-----	Submergent	3.03
Freshwater sponge	-----	Free Floating	2.42
Filamentous algae	-----	Free Floating	1.21

Table 2: Lake Survey Summary

	Lake	Statewide Average	North Central Hardwoods Forests Ecoregion Average
Littoral Frequency of Occurrence (%)	85.5	74.3	76.0
Maximum Depth of Plant Growth	13	15.3	15.9
Species Richness	22	16.8	16.2
Floristic Quality Index (FQI)	30.4	24.1	23.3

Figure 1: South Harper Point Intercept Aquatic Plant Map



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 or Kendra Kunding, [kendra.kunding@goldensandsrcd.org](mailto:kendra.kunding@goldensandsrcd.org) (715) 343-6215 Ext. 705.