



Professional Pond Management Products and Services  
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## Lake & Pond Resource LLC

“Providing Professional Resources for Management of Your Lake or Pond”

October 26, 2020

Grindstone Lake Association  
Karen Mumford

Re: 2020 Aquatic Invasive Species Assessment Survey and Report, Grindstone Lake, Sawyer County, Wisconsin

Dear Ms. Mumford and Board members:

In response to your request for aquatic invasive species assessment and surveying, Wisconsin Lake & Pond Resource, LLC (WLPR) visited Grindstone Lake in summer, 2020. The purpose of the visit was to assess the existing aquatic plant community and document any existing aquatic invasive species (AIS) and, if present, their need for future management.

### **Background Information**

Grindstone Lake is a 3176-acre natural drainage lake in western Sawyer County near the city of Hayward. Though no aquatic invasive species (AIS) are confirmed to be present in the Lake, two species are in nearby lakes directly connected to Grindstone Lake: curly-leaf pondweed (CLP) in Little Grindstone and Lac Courte Oreilles and Eurasian water-milfoil (EWM) in Lac Courte Oreilles and Little Lac Courte Oreilles.

Both AIS are known to grow dense, impacting the health and recreation of an infested lake. Locally, CLP and EWM grown dense enough in the nearby waters to require active management. Curly—leaf pondweed has been documented as large-scale infestation and actively managed in Lac Courte Oreilles for upwards of 10 years. A small population of CLP is present in Little Grindstone, a navigable widening of Grindstone Creek that connects to Lac Courte Oreilles. This population was managed in 2011-2013 with small-scale herbicide applications. Currently, CLP is still present in Little Grindstone but at low levels not requiring active management.

Eurasian water-milfoil is the AIS of primary concern for Grindstone Lake. EWM can quickly colonize locations once infested and create monotypic stands that impact the lakes ecology and recreational enjoyment. This species is a relatively new invader to the nearby lakes, first found in Little Lac Courte Oreilles in 2015 and Lac Courte Oreilles in 2017. Active management with small-scaled, targeted herbicide application have been used to prevent spread throughout the lakes.

EWM has not been identified in Grindstone Lake. The Grindstone Lake Association strives to protect the water from its introduction and was concerned that it may be present. To assess the lake for presence of AIS and potential 2021 management, a modified aquatic plant survey was completed on August 12 & 13 by Wisconsin Lake & Pond Resource.



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### **2020 Aquatic Plant Survey**

WLPR conducted the 2020 survey using a meander method around the entire perimeter of the lake and on the many off-shore rock and sand bars with rake throws and visual observations to verify the presence of AIS. Any potential locations of AIS, primarily EWM, would be recorded on a GPS. Observations of native aquatic plant species were recorded to create a list of those present within the lake. Results of the mapping survey are found on Figure 1 and Table 1.

Composition of the aquatic plant community appeared very healthy and of high diversity. The morphology of Grindstone Lake is that the ideal conditions for aquatic plant growth typically occurred in depth of 6-18ft. Many shallower areas were sand or rock flats that offered little habitat for diverse or dense aquatic vegetation. These areas typically saw scattered populations of smaller, low-growing aquatic species, such as variable pondweed, muskgrass, pipewort, or wild celery.

Overall, 32 different native aquatic plant species were noted (Table 1). A highly diverse aquatic plant community was identified with **no invasive species noted**. Most commonly found species were northern water-milfoil, flat-stem pondweed, coontail, and clasping-leaf pondweed. Northern water-milfoil (NWM) is closely related to EWM and closely resemble its appearance. During the survey there were many plants of northern water-milfoil noted growing in locally dense bands along drop-offs, especially along the south shore. In addition, parts of NWM were commonly found floating on the lakes surface. It's likely that these instances of NWM were a main cause of concern of an infestation of the invasive species Eurasian water-milfoil.

To compare the plant community within the Lake to similar lakes in Wisconsin, the Floristic Quality Index (FQI) can be used. FQI provides the ability to compare aquatic plant communities based on species presence. This value varies throughout Wisconsin, ranging from 3.0 to 44.6 with a statewide average of 22.2. To achieve this, each plant species, except for AIS, is assigned a coefficient of conservatism value (C values). A plant's C value relates to a plant species' ability to tolerate disturbance. Low C values (0-3) indicate that a species is very tolerant of disturbance, while high C values (7-10) indicate species with a low tolerance of disturbance. Intermediate C values (4-6) indicate plant species that can tolerate moderate disturbance.

Not only can this track changes over time within Grindstone Lake, but allows for comparison of the Lake to lakes with similar environmental conditions within a delineated area, called an eco-region. Grindstone Lake is located in the western portion of the Northern Lakes and Forests eco-region. Lakes within the Northern Lakes and Forest region are typically natural lakes created by glaciation with low shoreline development. Lessened development around the lake and overall use of these lakes leads to fewer disturbances and nearer undisturbed, natural conditions when compared to lakes in southern Wisconsin. Low disturbance leads to increased plant community metrics like FQI and coefficient of conservatism.

From species identified during the 2020 meander survey, Grindstone Lake has a FQI of 35.36, average coefficient of 6.25, and 32 total species identified (Table 2). Both the FQI and total species are well above the region and state-wide upper quartile limits, indicating a very healthy and diverse



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community. It’s important to note that the results here are representative of the survey technique used for the AIS assessment. Completion of a comprehensive whole-lake point-intercept aquatic plant survey will likely identify additional species.

Table 2: FQI and Average Coefficient of Grindstone Compared to Northern Lakes and Forests.

Quartile*	Average Coefficient			Floristic Quality			Species Diversity		
	Lower	Median	Upper	Lower	Median	Upper	Lower	Median	Upper
Wisconsin Lakes	5.5	6	6.9	16.9	22.2	27.5	8	13	20
Northern Lakes & Forests	6.1	6.7	7.7	17.8	24.3	30.2	7	13	20
<b>Grindstone Lake</b>	6.25			35.36			32		

\* - Values indicate highest value of the lowest quartile, mean, and lowest value of the upper quartile

It is encouraging that **no invasive species were noted in Grindstone Lake**. However, there are many locations in the Lake that have ideal habitat should an AIS like EWM be introduced. These locations are highlighted in Figure 1 and discussed below.

- A. Dense vegetation dominated by northern water-milfoil. Plants occupy primarily a narrow band from 8-16 feet with a small, soft-bottom pocket on the west side. There are other, smaller areas on Grindstone Lake scattered along drop-offs. These location are similar to areas on Lac Courte Oreilles that were first identified to have EWM.
- B. A combination of a large, diversely vegetated flat (east) and off-shore sand flat with scattered pockets of dense vegetation in locations similar to area A. These locations are the largest, most ideal habitat for aquatic plant growth in Grindstone Lake. Additionally, they are right outside the outlet to Little Grindstone and Lac Courte Oreilles, which is navigable. Boats from downstream can bring in EWM, which is present in the bay Grindstone Creek empties into, or CLP, which is present in Little Grindstone Lake.
- C. An off-shore rock and sand flat with vegetation on top and denser around the edges. During the survey this and other off-shore locations had coontail and northern water-milfoil growing densely in spots around the edges in 8-16 feet. These locations are small and easy to miss during brief surveys. Similar habitat on Lac Courte Oreilles has been documented with dense EWM growth.
- D. Additional off-shore flats similar to area C above.
- E. Excellent aquatic plant habitat with some of the only shallow, soft-bottom areas on the Lake. There is currently a diverse mix of submersed, floating-leaf, and emergent species located here. Proximity to the boat launch increased potential for AIS establishment.
- F. Little Grindstone Lake is a shallow, soft-bottom widening of the Creek and is ideal habitat for aquatic plant growth. Areas of CLP have been documented in the past in the norther portion. Its proximity and navigable connection to documented locations of EWM in Lac Courte Oreilles make this a primary location to monitor for EWM growth.



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### **NEXT STEPS**

Grindstone Lake is a premier waterbody with clear water, a diverse fishery and aquatic plant community, and excellent recreational opportunities. Currently no invasive aquatic vegetation is present. However, two species of non-native invasive plants are in waters immediately navigable from Grindstone Lake; curly-leaf pondweed and Eurasian water-milfoil.

With the proximity of existing AIS in connected waters it is important the GLA stay pro-active to prevent their introduction into Grindstone Lake and develop a plan for immediate action should they become established. It is important to continue to gauge the entire lake’s aquatic plant community through periodic point-intercept plant surveys. The last whole-lake survey and management plan update were completed in 2006/07. These are outdated and do not accurately reflect the current condition of the lake and recommended AIS management methods. A recommended timeline is as follows:

1. May- 2021: Early-season assessment for curly-leaf pondweed growth. Primarily for Little Grindstone Lake.
2. August - 2021: Whole-lake point intercept survey to document aquatic plant community and assess for AIS.
3. Winter - 2021/2022: Prepare aquatic plant management plan for 2022 and beyond.

If you have any questions, require any additional information, or would like a formal proposal on any of the above management options please contact us directly as follows:

Jim Scharl: (920) 872-2032 or [jim@wisconsinlpr.com](mailto:jim@wisconsinlpr.com)

Respectfully,

A handwritten signature in black ink, appearing to read "Jim Scharl", written in a cursive style.



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## Attachment A: Table & Figure

Table 1: FQI Breakdown by Species Identified, Grindstone Lake, Sawyer County.

Floating-leaf Species	Coefficient of Conservatism
White water lily	6
Spatterdock	6
Emergent Species	
Cattail	1
Common bur-reed	5
Creeping spikerush	6
Crested arrowhead	9
Floating-leaf bur-reed	10
Hardstem bulrush	6
Pickerel weed	8
Swamp loosestrife	7
Three-square bulrush	5
Submersed Species	
Clasping-leaf pondweed	5
Common waterweed	3
Coontail	3
Fern pondweed	8
Flat-stem pondweed	6
Floating-leaf pondweed	5
Frie's pondweed	8
Illinois pondweed	6
Large-leaf pondweed	7
Muskgrass	7
Needle spikerush	5
Nitella	8
Northern water-milfoil	6
Pipewort	9
Sago pondweed	3
Slender naiad	6
Small pondweed	7
Variable pondweed	7
White water crowfoot	8
White-stem pondweed	8
Wild celery	6
<b>Total Species</b>	<b>32</b>
<b>Mean C</b>	<b>6.25</b>
<b>Floristic Quality Index (FQI)</b>	<b>35.36</b>

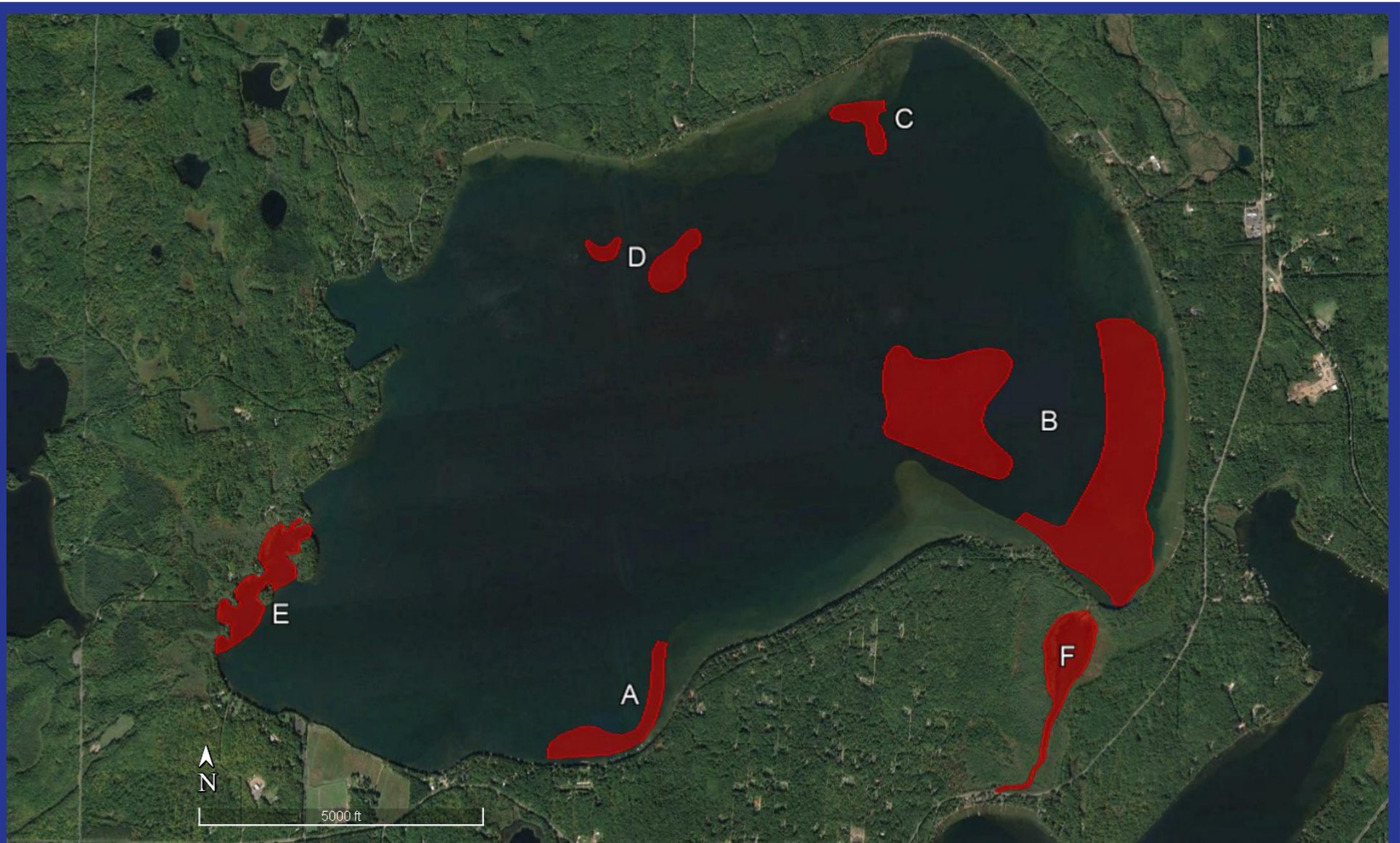


Figure 1: Potential AIS Establishment Areas