Hardwood Lake
Aquatic Plant Control Program
Annual Activity Summary

A publication of the Hardwood Lake Improvement Board

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Hardwood Lake Improvement Board
P.O. Box 358
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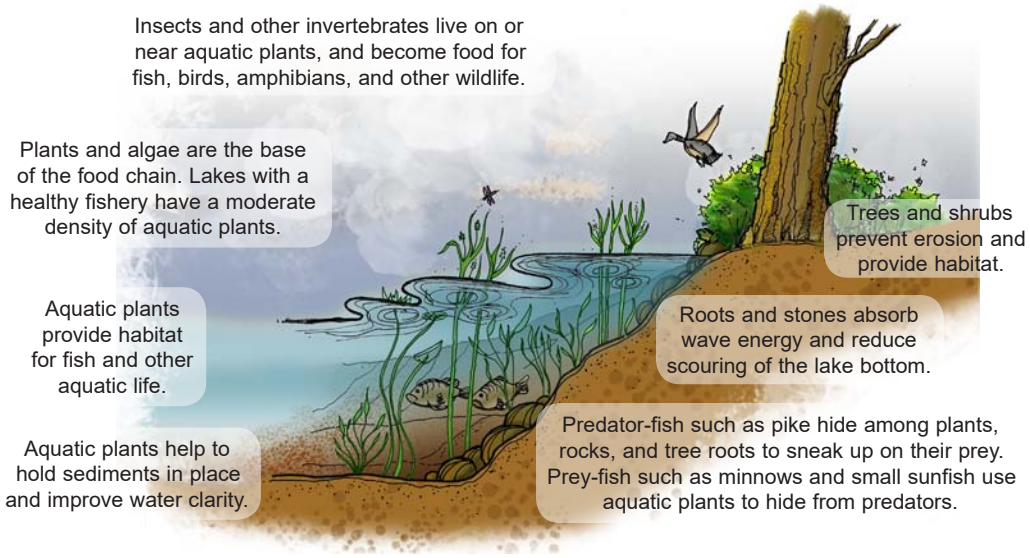
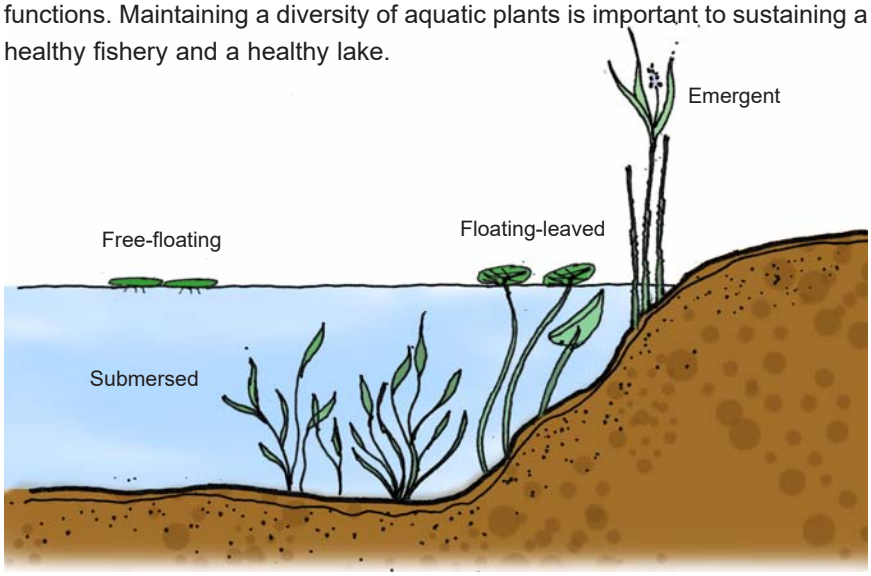
Since 1996, a nuisance plant control program has been ongoing on Hardwood Lake. The primary objective of the program is to prevent the spread of invasive aquatic plants while preserving beneficial plant species. The program is financed through special assessment of lake residents in accordance with the Lake Improvements portion of the Natural Resources and Environmental Protection Act. This report contains an overview of plant control activities conducted on Hardwood Lake in 2019.

Aquatic plants are an important component of lakes. They produce oxygen during photosynthesis, provide food, habitat and cover for fish, and help stabilize shoreline and bottom sediments.



There are four main aquatic plant groups: submersed, floating-leaved, free-floating, and emergent. Each plant group provides important ecological functions. Maintaining a diversity of aquatic plants is important to sustaining a healthy fishery and a healthy lake.



Environmental Consultant
Progressive AE

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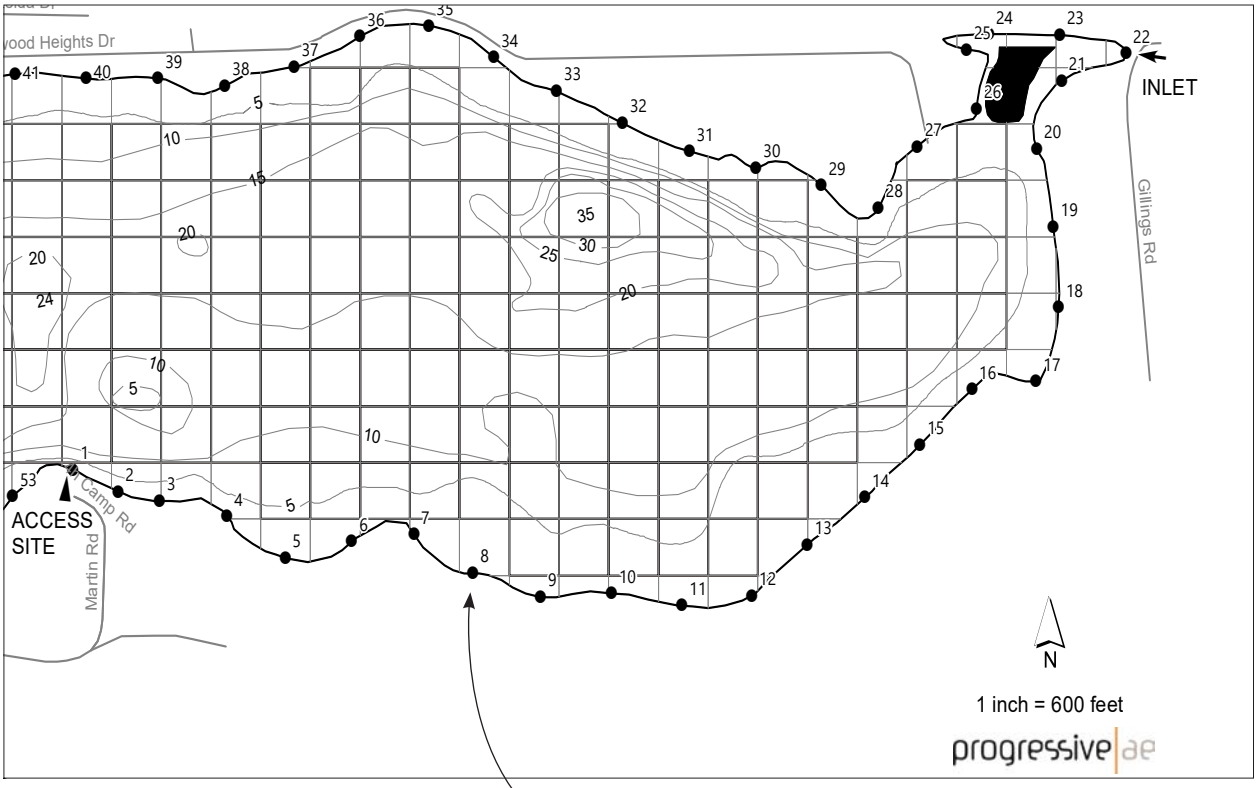
Plant control in Hardwood Lake involves the select use of herbicides and mechanical harvesting to control invasive plant growth. Plant control activities are coordinated under the direction of an environmental consultant, Progressive AE. Biologists from Progressive conduct GPS-guided surveys of the lake to identify problem areas, and detailed treatment maps are provided to the plant control contractors, Aquatic Services for herbicide treatments and West Michigan Aquatic Weed Removal for mechanical harvesting. Follow-up surveys are conducted throughout the growing season to evaluate results and the need for additional treatments. In 2019, surveys of the lake were conducted on May 29, June 27, July 25, and August 13.



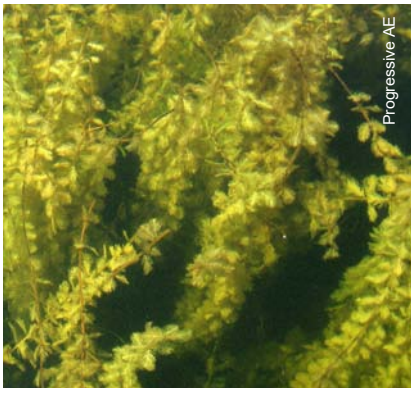
GPS reference points established along the shoreline of Hardwood Lake are used to guide plant surveys and to accurately identify the location of nuisance plant growth areas.

In addition to the surveys of the lake to identify invasive plant locations, a vegetation survey of Hardwood Lake was conducted on August 13, 2019 to evaluate the type and abundance of all plants in the lake. The table below lists each plant species observed during the survey and the relative abundance of each. At the time of the survey, eight submersed species, one free-floating species, two floating-leaved species, and seven emergent species were found in the lake. Hardwood Lake maintains a good diversity of beneficial, native plants species.

HARDWOOD LAKE AQUATIC PLANTS
August 13, 2019

Common Name	Scientific Name	Group	Percent of Sites Where Present
Thin-leaf pondweed	*Potamogeton* sp.	Submersed	58
Coontail	*Ceratophyllum demersum*	Submersed	56
Wild celery	*Vallisneria americana*	Submersed	18
Eurasian milfoil	*Myriophyllum spicatum*	Submersed	12
Water stargrass	*Heteranthera dubia*	Submersed	4
Slender naiad	*Najas flexilis*	Submersed	4
Flat-stem pondweed	*Potamogeton zosteriformis*	Submersed	2
Large-leaf pondweed	*Potamogeton amplifolius*	Submersed	2
White waterlily	*Nymphaea odorata*	Floating-leaved	84
Yellow waterlily	*Nuphar* sp.	Floating-leaved	64
Duckweed	*Lemna minor*	Free-floating	6
Cattail	*Typha* sp.	Emergent	28
Pickerelweed	*Pontederia cordata*	Emergent	26
Bulrush	*Schoenoplectus* sp.	Emergent	18
Iris	*Iris* sp.	Emergent	10
Swamp loosestrife	*Decodon verticillatus*	Emergent	6
Purple loosestrife	*Lythrum salicaria*	Emergent	2
Phragmites	*Phragmites australis*	Emergent	2

Primary plants targeted for control in Hardwood Lake include Eurasian milfoil and starry stonewort. Both of these plants are non-native (exotic) species that tend to be highly invasive and have the potential to spread quickly if left unchecked.



Eurasian milfoil (*Myriophyllum spicatum*)

Starry stonewort (*Nitellopsis obtusa*)

Plant control activities conducted on Hardwood Lake in 2019 are summarized in the table below.

HARDWOOD LAKE
2019 NUISANCE AQUATIC PLANT CONTROL SUMMARY

Treatment Date	Plants Targeted	Acres Treated
June 10	Eurasian milfoil, algae	11
June 26	Algae	25
July 15	Eurasian milfoil, curly-leaf & native pondweed, algae	4
July 31	Eurasian milfoil, starry stonewort	12
August 20	Algae	25
Total		77

More information on Hardwood Lake can be found on the Hardwood Lake Association's website (www.hardwoodlake.org).