



FIELD NOTES

Lake: Huron River Chain of Lakes, Livingston and Washtenaw Counties, MI

Dates of Observation: 14 to 17 June 2017

Activity: LakeScan™ Category 700 Aquatic Vegetation VS 3.0 Survey

Key Points

The goal of the HRCL lake vegetation management program is to protect, preserve, and if possible improve the diversity of the plant community. Appropriate action will help to increase the resilience and to stabilize the ecosystem. Ebrid milfoil, curly leaf pondweed, starry stonewort, and flowering rush are all present in the Huron River Chain of Lakes system and are listed on the Michigan aquatic invasive species list. Any of these species possess the ability to overwhelm desirable vegetation, spoil critical habitats, and destabilize the lake ecosystem. There are; however, other species present in the lake that seem to extirpate other species and form monocultures that are not consistent with the goal of the lake management program. One of these, variable milfoil, is thought to be a native Michigan aquatic plant species and has not been observed to grow to nuisance levels until the past decade. Now it has been observed to grow to extreme nuisance levels in lakes throughout the Michigan lower peninsula. It has the capacity to out-compete all other species, including ebrid milfoil, and forms dense monocultures that reduce the biodiversity of aquatic plant communities. Genetic analysis performed at the University of Connecticut and Grand Valley State University reveal that the plant found in Michigan is indeed variable milfoil and not the hybrid type that has been found at nuisance levels in New England. It is currently listed as an aquatic invasive species in New England and the Pacific Northwest States. It is not known why this formerly inconspicuous plant has become so invasive in Michigan in the last decade, but it would be reasonable to include this on the Michigan aquatic invasive species list.

Findings

- ~ **Zukey Lake:** The water clarity was good and the species richness (total number of species present) was considered to be excellent. However, a very dense growth of variable milfoil was found to totally dominate the drop off zones AROS 600's and was observed growing in dense patches in Tier 4 (AROS 400's and 500's). Some of these patches have begun to flower and protrude above the water surface creating a significant nuisance. It is strongly recommended that a management intervention strategy or technology (MIST) program be created and applied to the variable milfoil in Zukey Lake. Ebrid milfoil, curly leaf pondweed, starry stonewort and flowering rush were also found in the lake, but these were not observed at unequivocal nuisance levels except in the canal areas. The canal areas were congested with a variety of nuisance species. A broad-spectrum control approach is necessary to protect navigation in those canals.
- ~ **Strawberry Lake.** Strawberry lake has become infested with dense ebrid watermilfoil. One half of all AROS are infested. Nuisance growth ranges from ecological nuisance levels to unequivocal nuisance levels that interfere with boating. Most of this growth is concentrated in water depths that range from 4' to 10' deep or AROS's ranging from 401 to 460.. A species selective management response (MIST) is recommended because no other species currently rivals ebrid milfoil in the level of nuisance growth that it exhibited.
- ~ **Strawberry/Gallagher/Loon Lakes Connector:** The nearshore areas in this channel is clogged with a mixture of native pondweeds, flowering rush, and accumulated aquatic plant debris that seem to be generated by boating in other parts of the lake. The critical habitat value of the nearshore areas appears to be severely compromised by the accumulation of these debris. Broad spectrum aquatic plant control can provide reasonable access for boaters and

boat docks located along much of the shoreline of these conveyances. Reasonable plant control in these areas

- ~ **Gallagher Lake:** The plant community diversity of Gallagher Lake is very good. However, there were some near-shore areas near residential development and the area near the island in that have been compromised by the production and growth of ebrid watermilfoil. Several areas were infested with a weedy form of Michigan native pondweeds. Unequivocal nuisance conditions were observed in 55% of all AROS and targeted control of ebrid milfoil will be necessary to protect this lake from further degradation.
- ~ **Gallagher Island Canals:** The diversity of the plant community in the Gallagher Island canals was remarkably good for a canal system. Nuisance conditions were only observed in half of all AROS and nearly all nuisance conditions were considered to be “ecological” since plants do not seem to interfere with navigation. This area may be susceptible to algae blooms and needs to be monitored by citizens for potential algae blooms that can form in the matter of days. Wild celery was also present in the lake at what may become nuisance levels. These conditions shall be considered during the August LakeScan™ plant community survey.
- ~ **Loon Lake:** Loon Lake is relatively shallow and seriously infested with the most notorious Michigan inland lake weed species. The exotic weeds, ebrid milfoil, starry stonewort and curly leaf pondweed were found nearly everywhere in this lake. All AROS were characterized as supporting unequivocal nuisance level plant growth. The plant community was reasonably diverse; however, so it is believed that targeted weed control can greatly improve conditions in this lake and stabilize the ecosystem.
- ~ **Whitewood Lake:** Plant growth is confined to the perimeter of Whitewood Lake because of lake depth. Less than 50% of the total AROS contained any form of nuisance plant growth but a third of the AROS supported unequivocal nuisance conditions. Nuisance conditions were attributed to curly leaf pondweed, which typically declines and drops from the water column prior to the Fourth of July Holiday, and variable milfoil. Variable milfoil is considered to be a Michigan native plant species, but is considered as invasive in New England and the Pacific NW. It has become a significant nuisance in many Michigan inland lakes during the past decade. It may be difficult to obtain a MDEQ permit for the control of this nuisance in Whitewood Lake because it is located in deeper water.
- ~ **Tamarack Lake Connector:** Nuisance conditions were observed in less than one third of the Tamarack Lake Connector AROS. This area had been treated with aquatic herbicides and most of the nuisance conditions that were observed during an earlier Pre-Treatment evaluation were ameliorated. Nuisance conditions that were observed during the Pre-Treatment survey included ebrid milfoil and starry stonewort. Sago pondweed was present in the channel during the LakeScan™ survey was considered to be growing at ecological nuisance levels in nearly one third of the AROS. No recreational or navigational nuisance levels were observed during the LakeScan Cat 700 VS.30 survey.
- ~ **Tamarack Lake:** The aquatic plant community in Tamarack has been overwhelmed by the exotic macroalgae species known as starry stonewort. It has extirpated most other plant growth in Tamarack Lake and is responsible for extreme nuisance conditions. Starry stonewort is predictably unpredictable and it is impossible to predict when it might bloom and grow to nuisance levels. However, it seems to be present as a dominant weed in in Tamarack lake throughout the entire summer. Starry stonewort is easy to kill but difficult to treat with selective algaecides. Starry stonewort can become so dense that there is significant risk of fish kill and anoxia if it is treated after the water warms to temperatures above 65° F. It is recommended that the starry stonewort biomass be harvested and cut to a lower level prior to treatment with an algaecide. This is an experimental approach but it is believed that it will help to reduce the risk of inadvertent outcomes of treatment. This is all likely to occur in early August.
- ~ **Baseline Portage Connector:** The Baseline Portage Lake channel is infested with several exotic and invasive aquatic plant species. Heavy water flow prevents some of these from breaking the water surface, but they still seem to have a significant impact on water flows and the ecology of the area. Flowering rush is the dominant weed and was growing at a level

that might interfere with the navigation of boats with a deep draft. The impact on flow may cause starry stonewort to grow to extreme nuisance levels later in the summer. The impact on the fisher is probably significant. The water flow in this area is so high that it is not possible to apply aquatic herbicides for the selective control of these nuisance species. Therefore, it is recommended that mechanical means be used to harvest and remove as much of the flowering rush biomass from this channel as possible. Conditions need to be closely monitored to ensure that this strategy does not lead to the nuisance production of starry stonewort.

- ~ **Portage Lake Canals:** The canals and bays around Portage Lake had been treated with aquatic herbicides prior to the LakeScan™ survey, but an earlier PreTreatment investigation revealed that these areas are heavily infested with starry stonewort, ebrid milfoil, curly leaf pondweed, and variable milfoil. Treatment has ameliorated the nuisance conditions caused by all but the variable milfoil. Alternative management strategies are recommended for the variable milfoil in these areas and may be implemented as soon as the end of this year.
- ~ **Portage Lake:** The main body of the lake has not been treated or harvested. Nuisance conditions were not perceived in over half of the lake AROS, but nearly one quarter of the lake supported nuisance level production of ebrid or variable milfoil. The drop off zone of Portage Lake is badly infested with the growth of variable milfoil (AROS Tiers 4 and 5) and may produce a navigational nuisance before the end of the summer. The MDEQ does not routinely allow for the management of variable milfoil in deep water areas. However, it is possible that a permit might be secured to treat variable milfoil in Portage Lake as the LakeScan™ plant community data base is developed to support such a request. The filamentous algae blooms that were so conspicuous in Portage Lake during the previous two years were not present in 2017.
- ~ **Little Portage Lake:** Little Portage Lake is characterized by excellent plant community biodiversity but there is a significant infestation of ebrid milfoil. Corrective management action will be required to protect the lake from loss of this diversity and further degradation by this invasive species. Nuisance production was observed off shore in LakeScan™ biological tiers 4 and 5 or approximately 20% of all AROS. A species selective herbicide combination is recommended for the suppression of ebrid milfoil in most of the lake or AROS 431 to 466, 551 to 590, and 772 to 774. There are ten acres in Little Portage Lake, that abut developed properties where native vegetation was observed at nuisance levels that might interfere with navigation and swimming. Since it is not customary that the MI DEQ would permit the herbicide treatment of these species in these areas, mechanical harvesting is recommended to ameliorate nuisance conditions. The bay located on the south eastern shore of the lake, AROS 111 to 116 was infested with starry stonewort and species selective management is recommended for that invasive species.

Narrative

The Huron River Chain of Lake appears to be in reasonably good condition. However, there are several invasive plant species that have infested the system and may cause the lake to ecologically compromised and interfere with navigation and lake access. The unabated spread of these species can have a negative impact on lake use and surrounding property values. Dominant weed species include ebrid milfoil, curly leaf pondweed, starry stonewort, variable milfoil and flowering rush.

Management Prescriptives

The primary goal of the HRCL lake management plan is to protect and improve the diversity of the submersed plant community and thereby make the system more resilient to the invasion of other weedy species and to improve the stability of the ecosystem. Generally, various combinations of aquatic herbicides are used to specifically target offending plant species and promote the growth of desirable aquatic plants. These strategies shall be applied to most areas of the HRCL, but there are areas where flow, basin shape, and MDEQ permit restrictions restrict

access to species selective management strategies. These areas will be mechanically harvested to ameliorate nuisance conditions and restore ecosystem values. A combination of herbicides and harvesting shall be used to manage the unique conditions found in Tamarack and Little Portage Lakes.