Hogback Lake Management Plan & Recommendations 2005

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Current Conditions in the Lake

Aquatic Vegetation

The Hogback Lake submersed plant community is relatively diverse and dominated by native species. Naiad is very abundant and appears to be causing a recreational and possible ecological problem as growth has increased during mid to late summer. Eurasian watermilfoil was not present during this evaluation, but continued monitoring will be necessary. Eurasian Watermilfoil has the capacity to quickly spread and dominate a system, especially given disturbances that may alter the system, such as increased nutrient loading or reduced water levels.

All the plants that have been identified in Hogback Lake are native North American species. At this time no exotic species, i.e., plants from other places, which cause considerably more problems than most native species have been found.

The native plant species in Hogback Lake benefit the lake, performing such functions as stabilizing sediments and providing habitat for fish and other aquatic organisms. In general, native species cause substantially fewer problems than the exotic plant species. At the time of the September 2005 vegetation survey, native plants dominate the lake at high densities. The reduced water levels in recent years may have contributed to their increase.

Management Strategies for Hogback Lake

Management Goals

- The primary management goal for the aquatic plant community should be to reduce native plant stature and density while maintaining species diversity and sufficient cover to provide fish habitat. Native plants should be managed to encourage the growth of plants that support the Hogback Lake fishery (by creating structure and habitat) provided that they do not interfere with recreational uses of the lake (e.g., swimming, water skiing, boating, and sailing) in high-use areas. Where they must be managed, management techniques that reduce the stature of plants without killing them (e.g., harvesting, contact herbicides) should be used whenever possible. Specific areas should be set aside where native plants will not be managed, to provide habitat for fish and other aquatic organisms.
- Control exotic aquatic plants where they are found and limit their potential for their introduction to the lake. The abundance of these species should be reduced to the maximum extent possible, and efforts should be made to reduce their recovery after treatment by frequent vegetation surveys and increased education about how exotics are spread.
- Conditions in Hogback Lake should not be allowed to deteriorate below present levels. Efforts to reduce nutrient and sediment loading should begin, with the realization that they will help prevent further deterioration but probably not improve water quality. Expansion of aquatic plant problems should trigger an adjustment in the aquatic vegetation management strategy. To support such responses, an annual record of vegetation, water quality and management should be maintained.

Strategies for Achieving Lake Management Goals

Aquatic Plant Management

Areas of the lake that support vegetation *will* grow plants, despite intense efforts to remove them. The goal of aquatic plant management is not to remove all vegetation, but to control the types of plants that grow in the lake and the height of plants, to minimize interference with human activities.

In general, native plants interfere less with recreation and other human activities than exotic species. In addition, native vegetation provides important benefits to a lake, including stabilizing sediments, providing habitat for fish and other aquatic organisms, and slowing the spread of exotic plant species.

Many of the native plant species are difficult to control using herbicides, and the MI-DEQ is reluctant to issue permits for their control. Mechanical harvesting of the dense native vegetation would be the best control method. Unlike Eurasian watermilfoil, most native plants do not regrow rapidly after harvesting, and a single harvest is often sufficient to control them for the entire summer. Normally low-growing species, such as muskgrass (Chara) should not be controlled unless unusually fertile growing conditions allow them to grow tall in areas of high recreational use.

The non-native plant species, Eurasian watermilfoil, should be controlled wherever or whenever it becomes present, using selective methods that minimize damage to native aquatic vegetation. This exotic species concentrate its biomass at the water surface where it strongly interferes with boating, swimming and other human activities. This growth form also allows exotic plants to displace native plants and form a monospecific (i.e., single species) plant community, which provides lower quality habitat than that provided by a diverse community of native plants. Control of exotic plant species will minimize interference of plant growth with human activities and allow recovery of the native vegetation of the lake.

Aquatic herbicides currently represent the most reliable, effective means for controlling Eurasian watermilfoil. There are currently two systemic herbicides, 2,4-D (Navigate) and fluridone (Sonar), that can be used to achieve long-term, selective control of Eurasian watermilfoil. Systemic herbicides are capable of killing the entire plant. Several contact herbicides, including diquat (Reward) can also provide short-term control of Eurasian watermilfoil. These herbicides kill only the shoots of the plant, and plants regrow relatively rapidly from their unaffected belowground parts.

Harvesting of Eurasian watermilfoil is not recommended. This plant spreads by fragmentation and regrows significantly more rapidly than most native plant species; thus continued harvesting typically leads to nearly complete domination of the aquatic vegetation by Eurasian watermilfoil.

Nuisance floating vegetation such as lily pads and spatterdock can be managed through the use of herbicides or mechanical harvesting. Navigate (2,4-D) can be utilized for the control of Lily Pads (40 X 40 foot swimming area and/or 20 x 100 foot boat lane per individual) pending well data (depth and distance from treatment area). If a well is less than 30 feet deep then an isolation distance of 250 feet is required. An isolation distance of 75 feet from all wells is required when using this product. If Hogback Lake does not have wells than the isolation distances do not apply. Lily pads are hard to control; therefore a few years of consecutive treatments will be needed to reduce the overall abundance of the species.

Monitoring

It is important to maintain a record of lake conditions and management activities. Vegetation surveys monitor types and locations of plants in the lake, providing information that is essential to the administration of efficient, cost-effective control measures. Vegetation surveys also document the success or failure of management actions and the amount of native vegetation being maintained in the lake. Water quality monitoring can identify trends in water quality before conditions deteriorate to the point where remediation is prohibitively expensive or impossible. Records of past conditions and management activities also help to keep management consistent despite changes in the membership of the Lake Board. Records should include (at a minimum):

- Temperature, dissolved oxygen and Secchi disk depth should be measured in the lake and canals. Temperature and dissolved oxygen profiles should be obtained in the deep hole, so as to monitor the timing and extent of oxygen depletion in the hypolimnion (i.e., bottom water).
- Total phosphorus and nitrates should be measured in the surface and bottom water at least three times per season (spring, midsummer, and late summer) to monitor nutrient accumulation in the hypolimnion.
- Chlorophyll should be measured in at least one location to provide a better measure of algal (phytoplankton) growth in the lake.

- Lake vegetation should be surveyed and mapped at least twice a year (late-spring and late summer/early fall) to document the results of plant management efforts and provide information necessary for planning future management.

Nutrient Loading Abatement

Lakeshore property owners should be encouraged to use phosphorus-free fertilizers on lawns and other areas that drain into Hogback Lake or the adjacent wetlands. Lakeshore residents should also be encouraged to manage their waterside landscapes according to the recommendations outlined in publications on this topic available from the MSU Extension.

It is also important to remember that rooted plants derive most of their key nutrients from the sediments; thus they respond slowly, if at all, to reductions in nutrient loading. In fact, if reductions in nutrient loading lead to improved water clarity, the growth of rooted plants will probably increase.

Prevention

Boats and trailers transport a variety of troublesome exotic plants and animals that can be introduced to Hogback Lake. Preventing their inadvertent introduction to Hogback Lake can significantly lower the cost of future lake management. Education can be an effective preventative measure. Newsletter articles should alert lake residents to the threat from exotic nuisance plants and animals. Warning signs should be erected at the boat launch that encourages boaters to clean boats and trailers when launching or removing watercraft from the lake.

Aquatic Plant Management Options

Option 1 —Herbicide Treatment s for Native Vegetation

Currently, the native vegetation poses a nuisance to recreation, decreases the safety to lake users and has negative ecological impacts on Hogback Lake. Thus, it is warranted to use contact herbicides for their control. Typically, these treatments are restricted to a maximum water depth of 5 feet and to residential areas only. Treatment of native vegetation requires a higher concentration of herbicides than exotics and thus, is more expensive. The DEQ restricts the use of systemic herbicides to primarily exotic vegetation.

***Option 2* —Mechanical Harvesting**

Mechanically harvesting nuisance native vegetation is environmentally safe and can provide immediate relief from dense native vegetation that impedes recreational activities and aesthetic values. Given the diversity and density of native plants present, plants that are not affected by herbicides or are outside the treatment area can be reduced to a level that would significantly improve the existing situation.

Final Recommendations

We recommend a combination of mechanical harvesting and herbicide treatments of nuisance native vegetation. Herbicides will have impacts on most of the native plants that are presenting problems, but not all species will be affected by treatments. The first treatment should occur in mid to late June, once plant growth has begun to reach a high density and most plant species are present. Two to three weeks following the treatment, a survey to determine the impacts of treatment and areas for harvesting will be conducted.

Harvesting will provide immediate results in mid to near shore areas and will be effective at reducing the density and stature of the native plants not affected by the treatment and areas outside the treatment area. Harvesting should be conducted in mid-summer at the peak of plant growth where a second harvest may not be required. Low water levels may impede the operation of harvesting equipment in certain areas. Dumpsites for harvesting will need to be determined prior to harvesting

and may significantly affect the cost associated with harvesting if no on-site or near by dumpsites are available.

The current access may not be suitable for launching a mechanical harvesting machine. The harvesting machine requires approximately a depth of four feet to launch and needs at least 2 feet of water to efficiently cut. Some portions of the lake are too shallow to harvest and therefore will have to be addressed with herbicides or left unmanaged.

Lake: Hogback County: Osceola Survey Date : 20 September 2005

Standard Aquatic Vegetation Summary Sheet

		Total number of AVAS's for each Density Category					Calculations				Sum of Columns 5-8	Total No. of AVAS	Col 9 divided by Col 10
Code		A	B	C	D		A x 1	B x 10	C x 40	D x 80			
No	Plant Name	1	2	3	4		5	6	7	8	9	10	11
1	Eurasian watermilfoil											33	
2	Curly leaf pondweed												
3	Chara	9	6	1			9	60	40		109	33	3.30
4	Thinleaf pondweed		1					10			10	33	0.30
5	Flatstem pondweed												
6	Robbins pondweed												
7	Variable pondweed	1	4				1	40			41	33	1.24
8	White stem pondweed												
9	Richardsons pondweed												
10	Illinois pondweed												
11	Large leaf pondweed	1	16	6			1	160	240		401	33	12.15
12	American pondweed												
13	Floating leaf pondweed												
14	Water stargrass												
15	Wild celery												
16	Sagittaria (submersed)												
17	Northern watermilfoil												
18	Green watermilfoil												
19	Two-leaved watermilfoil												
20	Coontail												
21	Elodea												
22	Bladderwort												
23	Mini Bladderwort												
24	Buttercup												
25	Naiad		1	9	21			10	360	1680	2050	33	62.12
26	Brittle naiad												
27	Sago Pondweed												
28	leafy pondweed		7					70			70	33	2.12
29													
30	Water Lily	1	13	4			1	130	160		291	33	8.82
31	Spatterdock	1	7				1	70			71	33	2.15
32	Water shield		3	9	15			30	360	1200	1590	33	48.18
33	Lemna minor												
34	Greater duckweed												
35	Watermeal												
36	Arrowhead												
37	Pickerelweed												
38	Arrow arum		9	17				90	680		770	33	23.33
39	Cattail		7	4	3			70	160	240	470	33	14.24
40	Bulrush			6	6	1			240	480	720	33	21.82
41	Iris												
42	Swamp loosestrife												
43	Purple loosestrife	1					1				1	33	0.03
44													
45													

Total cumulative cover ###

Explanation of DEQ-Format Lake Vegetation Maps and Summary Sheets

The maps are in a standard format as required by the Michigan Department of Environmental Quality (DEQ). The maps divide the parts of the lake capable of growing aquatic plants into subareas and record the cover of each aquatic plant species found in each area. Vegetation summary sheets summarize the information from the maps in a form that the DEQ uses to make decisions about permits.

Notations on the map are interpreted as follows:

Number (= plant species) Letter (=approximate cover of this plant)

For Example:

"1b" indicates plant species #1 at a density of b

Species are usually numbered according to a standardized numbering system (at right). We often reproduce the species number key and species name abbreviations on the map itself. The cover codes a, b, c and d are used to describe the approximate coverage of each plant within the map area, as described in the following table.

Cover Code	Approximate Cover Range
a	1-2%
b	3-20%
c	21-60%
d	61-100%

Thus the example "1b" refers to Eurasian watermilfoil covering between 3 and 20 percent of the area of the lake in which this code appears.

Shading on the map is used to identify areas of overall plant coverage, locations of problem exotic species or areas requiring management. A key on the map should indicate exactly what is indicated by shading.

No	Plant Name
1	Eurasian watermilfoil
2	Curly leaf pondweed
3	Chara
4	Thinleaf pondweed
5	Flatstem pondweed
6	Robbins pondweed
7	Variable pondweed
8	White stem pondweed
9	Richardsons pondweed
10	Illinois pondweed
11	Large leaf pondweed
12	American pondweed
13	Floating leaf pondweed
14	Water stargrass
15	Wild celery
16	Sagittaria (submersed)
17	Northern watermilfoil
18	Green watermilfoil
19	Two-leaved watermilfoil
20	Coontail
21	Elodea
22	Bladderwort
23	Mini Bladderwort
24	Buttercup
25	Naiad
26	Brittle naiad
27	Sago Pondweed
28	[illegible]
29	
30	Water Lily
31	Spatterdock
32	Water shield
33	Lemna minor
34	Greater duckweed
35	Watermeal
36	Arrowhead
37	Pickerelweed
38	Arrow arum
39	Cattail
40	Bulrush
41	Iris
42	Swamp loosestrife
43	Purple loosestrife

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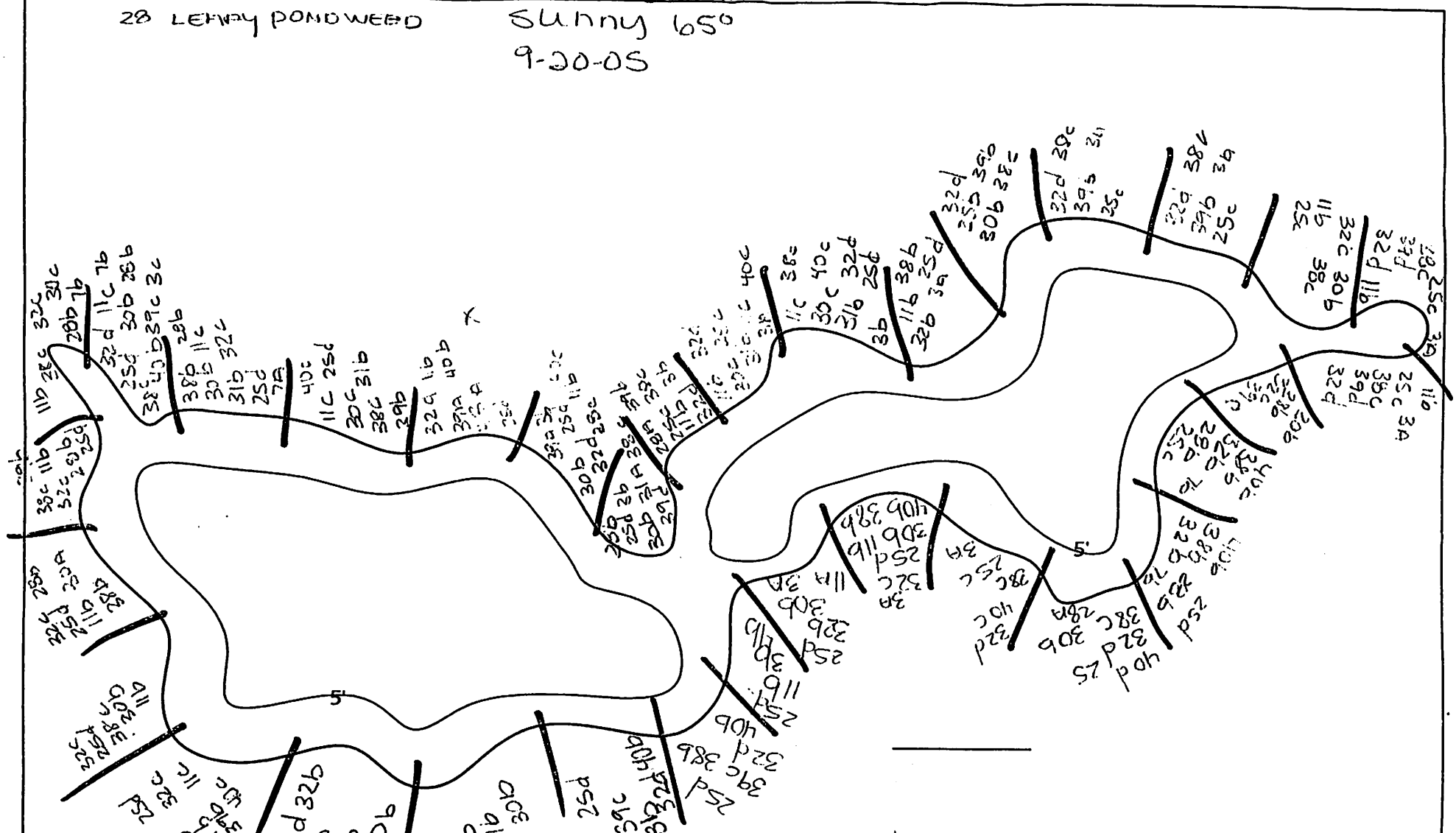
Steph / Jaime-e

28 LEAFY PONDWEED

Sunny 65°

9-20-05



HOGBACK LAKE

90 Surface Acres

Osceola County
Rose Lake Township
T19N R9W Sec 19,20

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