Assessment of 2008-2011 Coordinated Herbicide Treatments on Carmans, Grays, and Phelps Bays

Summary Report from the Aquatic Invasive Species (AIS) Task Force to the LMCD Board of Directors

BACKGROUND

In 2008, the Aquatic Invasive Species (AIS) Task Force created a Lake Vegetation Management Plan (LVMP) for a five-year demonstration project on Carmans, Grays, and Phelps Bays. The problems to be addressed in this LVMP included the following:

1. Eurasian watermilfoil (EWM) is the most problematic plant in the three bays because it interferes with most recreational activities, creates a shoreland cleanup and maintenance chores, and probably diminishes ecological health. Other invasive species, such as curlyleaf pondweed (CLP), should be controlled as well.
2. Native submersed plants also interfere with recreational use and riparian access in some areas; but it is recognized that some kind of rooted submersed plants will always be present, so control of native plants should be balanced with their protection.
3. Water lilies are sometimes problematic, although there is an appreciation that water lilies provide valuable habitat.
4. The overall plant management is poorly coordinated.

LMCD STRATEGIC PLAN

The Lake Minnetonka Conservation District (LMCD) Board of Directors has adopted a Strategic Plan for Lake Minnetonka. One objective in this Plan is to "Reduce the levels of existing AIS." A goal for this objective is for the LMCD to "Manage the three-bay treatment project on Carmans, Grays, and Phelps Bays." Per Agreement, the Lake Minnetonka Association (LMA) has served as the project manager from 2008-2011, with the LMCD contributing financially and utilizing the AIS Task Force as the technical committee, per the approved LVMP.

A task was established for this goal in 2011. In particular, to "Evaluate the three bay treatment project with the goals and objectives established in the 2008 LVMP." A detailed Report from the AIS Task Force, with recommendations as to expansion to other bays and funding options, is the deliverable to the LMCD Board. Representatives on this Task Force include appointed LMCD Board members (Kelsey Page and Jeff Morris), Hennepin County Environmental Services (Hennepin County), Lake Minnetonka Association (LMA), Minnehaha Creek Watershed District (MCWD), Minnesota Department of Natural Resources (MN DNR), Three Rivers Park District (TRPD), Lisa Whalen (former LMCD Board member), Dick Woodruff (former LMCD Board member), Gabriel Jabbour (Tonka Bay Marina), and Jay Green (Anglers For Habitat).

ASSESSMENT OF LVMP GOALS AND OBJECTIVES

A number of goals and objectives were established in the LVMP for the management of aquatic plants on Lake Minnetonka. A summary of these goals and objectives, including an assessment of the herbicide treatments conducted, are detailed below within this Report.

- **Goal A- EWM and other invasive plants, such as CLP, will be controlled throughout the respective bays in manner that is safe and effective to reduce interference with recreational activities, reduce lakeshore clean-up, and improve ecological health.**

Objective A-1. EWM will be controlled to levels of 20% occurrence (littoral zone) during the year of treatment (year 1) and maintained to frequencies below 20% in subsequent years (years 2-5). CLP levels will be evaluated in the early season of year 2, then controlled to levels of 20%

occurrence (littoral zone) during the year of treatment (year 1) and maintained to frequencies below in subsequent years (years 2-5). A metric relating to the density or matting coverage of EWM will be developed during year 1 and EWM will be controlled to less than that benchmark in years 2-5.

A great deal has been learned on this objective, which is summarized as follows:

- An initial assumption was that bay-wide treatments would take place in the first three years (2008-2010), with spot treatments planned on an as-needed basis in the final two years (2011-2012). This assumption has not held true. Whole bay treatments were required in 2011 in Carmans and Phelps Bays to reduce EWM occurrence to target levels.
- LMA representatives and lakeshore residents on the treatment bays report reduced interference with recreational activities and reduced lakeshore cleanup. The overall goal of controlling EWM and CLP in a safe and efficient manner to reduce these nuisance conditions appears to have been accomplished.
- Measuring the ecological health of the treatments bays proved extremely difficult. No conclusions regarding this aspect of the goal can be made.
- The objective of developing a measurement metric relating to density or matting coverage of EWM proved difficult and expensive and was dropped from the program after year one.
- Spot treatments in 2010 did not reduce the frequency of EWM in either Grays or Phelps Bays. The desired control objectives were achieved only in the years of whole bay treatments in 2009 (Grays and Phelps Bays) and 2011 (Carmans Bay).
- EWM frequency of occurrence typically increased within one year of partial or no treatment. It appears that bay-wide treatments will be needed on a reoccurring basis (approximately every two years) in order to achieve the 20% frequency control objective.
- Despite EWM frequencies above 45% in Grays Bay and Phelps Bay in 2010, whole bay treatments were not performed. The observed high occurrence frequency of EWM did not cause a reported increase in nuisance conditions, thus, the treatment objectives were modified.
- The herbicide treatment protocols have changed each year, in consultation with the technical committee. These changes have factored in: 1) the amount of herbicide to which the plants are exposed, and 2) the timing of the exposure. In 2008 and 2010, early season treatment of EWM and CLP was done through a combination of triclopyr and endothall. These treatments were not very effective for EWM control but appeared to be successfully control CLP. In 2009 and 2011, late season treatment of EWM was done utilizing triclopyr. These treatments were much more effective; although there was some damage to native species (see Goal B below for further details below).
- EWM frequencies (early season/late season) for 2007 through 2011 were as follows:

Bays	2007	2008	2009	2010	2011
Carmans	58/60	59/72	--/77	74/77	60/4
Grays	86/86	50/54	37/1	45/57 (*)	56/90
Phelps	65/67	60/69	29/20	50/51 (*)	41/24

Note: Yellow colored cells represent early season treatments and green colored cells represent late season treatments. Asterisk represent spot treatments.

- CLP frequencies (early season/late season) for 2007 through 2011 were as follows:

Bays	2007	2008	2009	2010	2011
Carmans	28/4	4/0	--/0	3/0	21/0
Grays	20/3	5/0	23/1	0/0	0/0
Phelps	36/5	1/7	40/3	0/0	24/1

Objective A-2. The water clarity in the bays will not be diminished as a result of the treatments.

This objective has been complied with. Data collected by the MCWD confirm that no declines in water quality in the treatment bays occurred during the four years of the project.

Objective A-3. An annual assessment of user perceptions with respects to treatments' impacts on reducing interference with recreational activities and a reduction in lakeshore cleanup chores will be conducted to provide an additional basis for evaluating treatment effects.

In 2008, the LMA polled all bay residents on the treated bays via e-mail. Questions that feedback was received on, which were coordinated through the technical committee, included:

1. Did EWM interfere with recreation?
2. Were there improvements in your lakeshore clean up chores?
3. What was the overall effectiveness of the treatments?

The total number of responses to this survey, 17, was low so little weight can be given to these responses. However, some anecdotal feedback has been received from bay residents that they have been pleased with the outcome of the treatments, which cannot be substantiated. A similar survey was not conducted in 2009-2011.

- **Goal B- Native submersed plants should be protected, except in localized areas where they pose a nuisance (see Goal C), although control will be allowed in localized areas where native plants inhibit access to open water or prohibit recreation (see Goal C).**

Objective B-1. The overall native submersed plants, as measured by the mean number of native plants per point (littoral zone), will be maintained or allowed to increase. The biomass of native submersed plants will be measured from 35 random sites (per bay) in year 1, and that will be used as a benchmark such that native submersed plant biomass will be maintained at or above that level in years 2-5.

A great deal has been learned on this objective, which is summarized as follows:

- The measurement of native plant biomass was not completed for any treatment years. The expense and time demands of biomass sampling were the main impediments to the completion of this objective.
- Biomass assessments would be valuable because of the discrepancy between the reported % frequency data and anecdotal reports of treatment effectiveness. For example, although the % frequency in Grays Bay increased to 90 in the fall of 2011, LMA representatives reported that

residents experienced a significant reduction in nuisance conditions. Likewise, the % of frequency data suggest minimal impact on native plants by 2011, but lake users reported significant loss of lily pads and other native plants in the treatment bays.

- There was a decrease in the mean number of native species per point in 2008 and 2009 relative to 2007 (the pre-treatment year). Decreases in the number of native plants per sample point tended to occur following whole bay late season treatments. The native plant population appeared to recover by 2011. The MN DNR has accepted this temporary decrease as an acceptable level of risk.
- Objective B-1 was modified to indicate the critical objective is to maintain the native plant population over multiple years, not necessarily in the year of the treatment.
- The mean number of submersed native plants per littoral sampling point are summarized below:

Bays	2007	2008	2009	2010	2011
Carmans	1.6/1.6	1.2/1.8	--/1.7	2.0/2.1	1.7/1.9
Grays	2.9/2.9	2.4/2.7	2.3/2.3	2.8/2.8	1.8/3.2
Phelps	2.2/2.4	1.8/2.3	2.0/2.1	2.2/2.5	2.0/2.5

- **Goal C- Provide limited individual nuisance or access control when bay-wide selective control applications are performed.**

<u>Objective C-1</u>. Any subsequent chemical treatments within the same season shall be subject to inspection and shall be granted no more than 50 shoreline feet, or half their lake frontage whichever is less, by 50 feet lakeward plus a 15 foot channel to open water. Off shore treatment of native submersed plants shall not be permitted. Should native submersed plants rebound to a large extent causing recreational nuisance, this limitation will be revisited. These treatments for submersed plants other than CLP or EWM shall require a separate permit and shall require annual signatures for such treatment. No permit fee will be assessed to those already having paid a permit fee for early season control of non-native submersed plants.

This objective has been complied with.

- **Goal D- This plan will be considered as a framework for possible expansion in the future to other bays in Lake Minnetonka**

<u>Objective D-1</u>. This LVMP will be expanded to other bays in Lake Minnetonka, depending on a number of factors, included, but not limited to: a) the outcomes of the control and protection actions in the three bays (this plan), b) interest or demand from other bays, c) a significant change in the EWM or CLP situation elsewhere in Lake Minnetonka, and d) availability of financial resources.

After the treatments occurred in 2009, a request was made to expand the herbicide treatments to Gideon and St. Albans Bays. The Task Force recommendations were: 1) this was a three-bay project, for five years, and 2) that expansion would be premature due to the necessary scientific analysis to measure the goals outlined in the LVMP for remaining three years of this project. However, the Task Force stated that the LMA (or some other group) could propose a stand alone program and submit a permit

application(s) to the MN DNR. The MN DNR would then make a decision on whether to approve (or deny) the application(s). The LMCD Board concurred with this recommendation.

Subsequent applications were submitted by Gideon and St. Albans Bay residents, in partnership with the LMA, and approved by the MN DNR prior to herbicide treatments on these bays in 2011. These treatments are stand alone programs and are not being assessed in this Report.

EXPANSION TO OTHER BAYS (FUNDING SOURCES)

Over $500,000 has been invested in this project from 2008–2011 through public and private partnerships (see table below for further details). This does not include funds committed to this project for professional oversight and plant monitoring from the U.S. Army Corps of Engineers and the MN DNR.

Summary of Project Costs (2008-2011)			
Year	**Herbicide Treatments**	**Project Management**	**Total Costs**
2008	$148,131	$27,836	$175,967
2009	$116,999 (*)	$17,550	$134,549
2010	$87,386	$13,109	$100,495
2011	$85,580 (**)	$10,800	$96,380
Totals	**$438,096**	**$69,295**	**$507,391**
* A treatment was not done in Carmans Bay in 2009			
** A treatment was not done in Grays Bay in 2011			

The consensus of the Task Force was that the LMCD Board should not extend the current three-bay project beyond 2012, or expand this project to other bays, until a comprehensive vegetation management plan is developed for Lake Minnetonka. Some of the minimum components the plan could include are as follows:

- A focus on bays where nuisance growth of EWM covers 50% or more of the surface use area.
- Control activities should demonstrate a public navigational or recreational benefit for the general public.
- An assessment on closed bays vs. open bays for large scale herbicide treatments needs to be completed.
- A focus on bays that have plant fragments drifting to other bays should be prioritized.
- Possible funding sources (private and public) needs to be identified.