

Lake Mills - Aquatic Weed Control – MSBU

MSBU Background:

In December 2004, an application to create an MSBU for aquatic weed control in Lake Mills was received. In association with the processing of the application, the MSBU Program was asked to assist (in advance of finalizing the MSBU creation process) with the coordination of continued aquatic weed control recommendations which included the introduction of triploid grass carp and the continuance of an existing aquatic weed control contract. Through an advanced funding agreement, the requested services were initiated and provided in 2005. The advanced services included the installation of several fish barriers, the introduction of triploid grass carp, and three months of specific aquatic weed control services. Following completion of the prepaid action items, the continuation of service was on hold until the MSBU petition process was completed and the MSBU was created and assessment schedule was established. [Aquatic weed control treatments were on hold from September 2005 to October 2006 awaiting the availability of the assessment funding.] In January 2006, at the request of the Lake Mills lakefront property owners, an MSBU was established to provide continued aquatic weed control for Lake Mills. Per the governing ordinance, the contracted services rendered via the MSBU were initiated in October 2006. The assessments assigned for the first year included recoupment of prefunded services.

County Funding:

To date, due to the presence of a County maintained park on the lakefront, the County has contributed financially to the aquatic weed control of Lake Mills. The targeted cost share for the County is 10%. The financial contribution provided by the County for specific expenditures equates to cost sharing of approximately 14%. Most property owners on the lakefront pay a cost share of approximately 1.2%.

In addition, at no cost to the lakefront homeowners, Lake Mills is extensively monitored by County biologists (Lake Management (LM) Program) on a monthly basis to assess the hydrilla population, oversight of the aquatic herbicide contract for the treatment of torpedo grass and water hyacinth, and continued evaluation of grass carp mortality and stocking rates. LM Program also coordinated with Aquathol representative to donate product for test plots which resulted in the donation of tree pails of Aquathol for Lake Mills test plots. In a conference call with the current herbicide contractor, contractor applied product free of charge.

Hydrilla Control:

The most difficult aquatic weed to control and the most invasive aquatic weed - Hydrilla – is also the most costly to control. The growth of hydrilla is dependent on many factors – all of which have limited predictability. Given the size of Lake Mills, as well as its depths and contours, and the potential for hydrilla to develop resistance to herbicides the lake must be monitored frequently. Closely balancing the stocking of grass carp, along with spot herbicide treatments (as often as financially feasible) is considered the best combination of efforts for keeping hydrilla in check.

MSBU Assessments:

The increase noted in assessment is the direct result of the efforts required to monitor & control the growth of hydrilla in Lake Mills. The financing goal is to assess at a level that provides reasonable control for hydrilla and other aquatic weeds, and if at all possible, in a manner that minimizes significant fluctuations in the assessment amount. Having reserves in place for years that require more extensive treatments will assist in avoiding wide swings in rates and/or potential delays in essential treatment.

Expenditures and Lake Management Recommendations

Pre-MSBU: FY0405 & FY0506 December 2004 - September 2006

In the year following receipt of application, services were provided via prepayment (to be reimbursed in FY0607) submitted by private investors. Expenditures were as follows:

- | | | |
|----|-------------------|--|
| 1) | \$3,650.00 | Fish Barriers |
| 2) | \$3,465.00 | Purchase of grass carp |
| 3) | <u>\$1,191.00</u> | Monthly herbicide contract (3 months @ \$397.00/month) |
| | \$8,306.00 | Total expended in fiscal year 2005/2006 |

MSBU Year 1: FY0607 October 2006- September 2007 – Assessment \$262.00

In the first assessment year, the total assessment collected included repayment of pre-MSBU expenditures and advance collection for the first fiscal year [FY0607] of newly contracted services. Following collection of assessments, the prepayments were refunded to the investors. Monthly service inspections and treatments began in October 2006. During the spring of 2007, it was noted that the stocking level of grass carp was not yielding the anticipated level of hydrilla control. Responsively, additional grass carp were added and herbicide treatments were scheduled. The cost of the combined treatment was above the immediate funding level of the MSBU, however, funds were advanced [\$25,000] via the MSBU Program to enable the treatment provisions. Installment payments will be schedule to provide repayment to the County for the fund advance. Expenditures in FY0607 were as follows:

- | | | |
|----|--------------------|---|
| 1) | \$ 4,046.00 | Purchase of grass carp |
| 2) | \$ 3,010.00 | Monthly herbicide contract |
| 3) | \$21,124.00 | Hydrilla Treatment (435 gal@3ppm) |
| 4) | <u>\$ 4,225.00</u> | Hydrilla Spot Treatments/Shoreline |
| | \$32,405.00 | Sub-Total FY0607 |
| 5) | \$ 1,000.00 | Administration Fee |
| 6) | <u>\$ 95.00</u> | Tax Collection Fee |
| | \$33,500.00 | Total expended in fiscal year 2006/2007 |

[Additional expenses paid by the County: \$3,500 for herbicide product/application, \$1,200 service contract]

MSBU Year 2: FY0708 October 2007- September 2008

Lake Management (LM) Program recommendations for the current fiscal year [FY0708] are as follows:

- 1) Continued monitoring of hydrilla
- 2) Spot treatments of hydrilla
- 3) Continued aquatic herbicide maintenance for torpedo grass and water hyacinth
- 4) Replanting with native aquatic vegetation to reduce expansion of torpedo grass in treated areas. Required by FDEP Aquatic Plant Permit
- 5) Establish a Lake Association, electing a board of directors and having at least one annual meeting
- 6) Future grass carp stockings

Overstocking with grass carp fish can greatly disrupt the balance of a lake by consuming beneficial native plants resulting in algae blooms and potential fish kills. LM Program will closely monitor and gauge the re-growth of hydrilla in Lake Mills. Hydrilla will deposit bulb like seeds (tubers) into the sediment which can remain viable for up to six years. Tubers are produced in each growing season and are used to perennialize the plant as a means of propagation (re-growth). Since Lake Mills was heavily infested with hydrilla, 40% coverage in December 2003, many tubers were deposited in the lake bed during this time. Currently, there is a viable seed bank of tubers in the sediments actively growing. The recommendation for the management plan in Lake Mills is to integrate use of contact herbicides with grass carp fish as necessary.

LM Program recommends future resident-based volunteers involving native plantings along the shoreline. The intention of such an event is to transplant existing in-lake plants to various key areas in need along the shoreline. Residents should organize planting days to accomplish recommendation and contact LM Program to assist with outside volunteers aiding the residents in creating a beneficial shoreline for Lake Mills. It is especially important that as aquatic invasive plants (such as torpedo grass and water hyacinth) are being treated, native aquatic plants should be established within these areas. This also provides habitat for fish and wildlife, helps impend invasive exotics from re-establishing, and absorbs wave action thus preventing erosion of the shoreline. All of these best lake management practices are essential to providing a more environmentally stable lake for generations to come.

MSBU Year 2: FY0708 October 2007- September 2008 – Assessment \$170.00

Anticipated Assessment Revenue [per early payment discounts], interest, carry forward] \$13,755
Budgeted Expenses & Reserves \$13,755

1)	\$ 3,735.00	Purchase of grass carp
2)	\$ 2,700.00	Monthly herbicide contract
3)	<u>\$ 5,380.00</u>	Operating Contingency/Reserve
	\$11,815.00	Sub-Total FY0708
4)	\$ 880.00	Installment Payment
5)	\$ 1,000.00	Administration Fee
6)	<u>\$ 60.00</u>	Tax Collection Fee
	\$13,755.00	Total expenditure budget fiscal year 2007/2008

[Additional expenses to be paid by the County: \$2,100 for service contract]

Projected:

MSBU Year 3: FY0809 October 2008- September 2009 – Assessment \$225.00

MSBU Year 4: FY0910 October 2009- September 2010 – Assessment \$250.00

MSBU Year 5: FY1011 October 2010- September 2011 – Assessment \$250.00

Lake Mills Observations:

On November 21, 2006, based on the afternoon observations, hydrilla was present to a depth of 12 feet covering approximately 20% of the lake. In competition with hydrilla was eelgrass (*Vallisneria americana*) to 4 feet, and southern naiad (*Najas guadalupensis*) to 7 feet. It was estimated that 10% of the lake vegetation was in competition with Hydrilla. Other submersed aquatic vegetation noted during the survey was baby tears (*Micranthemum umbrosum*). With the exception of hydrilla, these submersed plants are all considered beneficial native aquatic plants. Hydrilla was observed competing with the native submersed aquatic plants in the shallow water, to a depth of 7 feet, and then the hydrilla becomes a monoculture (a single plant crop) to a depth of 7-12 feet. Considering that hydrilla is competing with the above native plants in shallow water (7 ft or less), is existing at a low density monoculture plant in deeper water (7-12 ft), and is not present in the deepest waters (13-22 ft), Lake Mills has an infestation of hydrilla that encompasses 20% of the lake, or 48.6 acres.

On April 25th, 2007, hydrilla was treated in twelve plots (B1-B17) some plots containing 2 or 3 subplots, around the circumference of Lake Mills by the aquatic management company using Aquathol K liquid at a rate of 3 ppm totaling 435 gal/Aquathol.

On May 9th and June 21st, 2007, hydrilla observed during these site surveys was significantly impacted by the April 25th treatment. The previously noted native submersed aquatic plants, eelgrass, southern naiad and baby tears were not impacted. The eelgrass seemed to be expanding in the inshore area, and although two other submersed plants were noted, the frequency of accuracy was not as great; however, these species when observed were healthy plants. No healthy hydrilla was observed. With this degree of control, the grass carp stocking rate should control re-growth. Additionally, with the treatment of the invasive aquatic plant, water hyacinth, the percent of these plants in the lake has been reduced significantly.

On August 23rd, 2007, after receiving several hydrilla calls, we inspected the lake with Mr. Bill Merckel. Upon our inspection, there was an estimated 5 acres of re-growth of hydrilla in the inshore area (depth less than 4 feet). Lake Mills was further treated on September 7th, 2007. Areas of re-growth and treatments are provided in Attachment 2. Since the hydrilla was restricted in the inshore area and open water contained no healthy hydrilla, LM Program believes that the current grass carp fish rate is impacting hydrilla. The key indicators are that in areas greater than 4 feet, hydrilla is sparse and is in competition with other submersed natives.

On September 6th, 2007, hydrilla was treated with aquatic herbicide in the inshore area for several key locations throughout Lake Mills. On September 26th, 2007, we inspected and reviewed the results of these Aquathol K liquid treatment plots. The hydrilla had been impacted in all the plots, with the best results on the plant in the treatment plots on the east side of Lake Mills. Although the hydrilla had been reduced in the other plots, the results we observed were less than we had anticipated.

On September 28th, 2007, Lake Mills was inspected with Dharmen Setaram, representative of United Phosphorus, Inc. (the company that manufactures Aquathol aquatic herbicides). Mr. Setaram stated that under these conditions, with Aquathol K liquid, it is difficult to achieve the high degree of success we were looking for in such small plots. He suggests using Aquathol Super K granular and agreed to donate three pails of product for Lake Mills test plots. In a conference call with the contractor, contractor indicated that they would re-treat the western plots and apply donated product at no additional costs.

On October 26th, 2007, 840 triploid grass carp fish were stocked in Lake Mills.

On November 27th, 2007, Lake Mills was treated with the donated product provided by Aquathol in three key areas of the lake. Aquathol Super K (granular) was used due to the dilution factor associated with inshore treatments.

On December 20th, 2007, we inspected the donated treatment sites, finding hydrilla to be healthy outside of the treatment plot from 2-8 feet in depth. In the treatment plots, hydrilla was stressed but healthier than expected as a result of the November 27th treatment. There was no impact observed on other submersed aquatic vegetation (SAV).

On January 22nd and March 4th 2008, SAV observed included hydrilla, eleocharis, algae and macro-algae (*Nitella sp.*) from 2-8 feet in depth. All SAV are beneficial natives with the exception of hydrilla. The dominant SAV was eleocharis followed by hydrilla and Nitella. For the lake's eastern shoreline, a shelf extends the 8ft contour line further out into the lake; Nitella is the dominant plant in this area. No SAV was observed in waters greater than 10ft in depth which represents over 60% of the lake bottom indicating the inability of SAV to establish beyond this depth. Factors contributing to this inability may include tannins within the lake reducing light penetration and/or use of grass carp fish.