

2009 MOOSUP POND PROJECT COMPLETION REPORT

November, 2009

Prepared for:

**Town of Plainfield
c/o Paul E. Sweet, First Selectman
8 Community Avenue
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Submitted by:

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AQUATIC CONTROL TECHNOLOGY, INC.
POND AND LAKE MANAGEMENT SPECIALISTS

INTRODUCTION

Moosup Pond is an important ecological, recreational, and economic asset to the local community. The pond supports a valued warm-water fishery and provides a variety of other recreational opportunities. In recent years, however, the pond has suffered from the growth of the non-native and invasive plant variable watermilfoil, as documented by the CT Agricultural Experiment Station in July 2008. Variable watermilfoil, like many other invasive plants found here in the Northeast, has the ability to rapidly colonize a pond, displacing native plant species, degrading fish and wildlife habitat, and impairing recreational use.

Due to concerns over the increasing densities of milfoil throughout the pond, the Town of Plainfield solicited bids for the development and implementation of a selective milfoil control program. Following the Town's competitive bid process, Aquatic Control Technology, Inc of Sutton, MA was selected to carry out the 2009 Aquatic Vegetation Management Program at Moosup Pond. As outlined in the Town's Request for Proposals (RFP) the program consisted of pre and post-treatment vegetation monitoring, and treatment of targeted milfoil growth with the aquatic herbicide Navigate (2,4-D).

The following is our 2009 Moosup Pond Variable Watermilfoil Control Project Completion Report. This report will serve to document the various tasks associated with the management program (i.e. permitting, herbicide treatment, and vegetation monitoring), and provide a discussion of future management recommendations.

POND DESCRIPTION

Moosup Pond is located in the Town of Plainfield in Winham County, CT. The pond consists of single basin oriented on the north/south axis. The total area of the pond is approximately 90 acres. The pond is an impounded or enhanced waterbody where the water level is controlled by a dam structure on the eastern shoreline of the pond. The outflow from the pond flows east along Tyler Brook until it empties into Snake Meadow Brook approximately 0.5 miles downstream. The Pond is moderately deep, with an average depth of about nine feet, and a reported maximum depth of 21 feet.

PERMITTING

As required, Aquatic Control filed for the necessary Pesticide Use Permit with the Connecticut Department of Environmental Protection – Pesticides Division (DEP) in the early spring (2009). In order to supplement the required permit information and ensure rapid review of the application, additional information concerning the private wells less than 50 feet from the pond shoreline were provided to the DEP. An approved Pesticide Use Permit was issued by DEP – Pesticides Division on June 2, 2009.

PRE-TREATMENT VEGETATION SURVEY

Monitoring of the aquatic plant community was an integral component of this management program. During our pre-treatment inspection on June 2, 2009 Aquatic Control Biologists carefully

toured the entire littoral zone of the pond to identify and map the dominant submersed vegetation species and determine specific herbicide treatment areas for the control of nuisance milfoil growth (see 2009 Pre-Treatment Vegetation Survey Map in Appendix A).

The rooted vegetation growth at the time of the pre-treatment survey was dominated by variable watermilfoil (*Myriophyllum heterophyllum*) and the native species waterweed (*Elodea nuttallii*) and Robbins pondweed (*Potamogeton robbinsii*). The milfoil growth was most widespread and abundant in the shallower inlet cove at the north end of the pond, where the estimated areal bottom cover ranged from 75%-100% . The other areas of milfoil growth scattered around the shoreline of the pond were less dense (20%-30% bottom cover) and more confined to within a few hundred feet from shore. As a result of the observed milfoil distribution, four separate treatment areas were designated, which totaled approximately 30 acres.

NAVIGATE HERBICIDE TREATMENT PROGRAM

The Navigate (2,4-D) herbicide treatment program at Moosup Pond involved several elements that are described in greater detail in the following sections. A chronological list of the major program elements is provided below:

- File CT DEP Pesticide Use Permit.....1/7/09
- Received approved CT DEP permit.....4/22/09
- Pre-treatment vegetation survey6/2/09
- Received amended CT DEP permit.....6/2/09
- Performed Navigate herbicide treatment6/8/09
- Inspection & collection of herbicide residue sample6/30/09
- Post-treatment vegetation survey9/15/07

The Navigate treatment was scheduled and performed on June 8, 2009. At the time of treatment the targeted milfoil was still vigorously growing, but not yet at its peak biomass. The majority of the growth was still 4-6 feet below the water surface in areas ranging in depths between 10-12 feet. Milfoil control is most effective when the target plants have not reach full maturity. During this stage of growth the plants rapidly uptake chemical as they strive to grow toward the water's surface.

The Navigate (2,4-D) herbicide was applied using Aquatic Control's Panther Airboat, which was equipped with a rotary cyclone spreader/seeder system. This application technique is very effective as it allows the pellet herbicide to be accurately metered out over the specifically designated treatment areas.

The previously established 30 acre treatment area was divided into a total of four different treatment sectors. By breaking the entire treatment area into smaller treatment sectors more accurate water volumes and treatment doses were calculated. These treatment sectors were loaded into a handheld WAAS enabled GPS unit to aid the navigation of the treatment vessel and ensure even distribution of the herbicide throughout all of the treatment sectors. The herbicide was applied at a rate of approximately 125 lbs./acre throughout the treatment areas.

At no time during the herbicide treatment or the days following treatment were there any observed or reported adverse affects on fish, wildlife, or human health.

Posting & Notifications

Approximately one week prior to the scheduled herbicide treatment date, Aquatic Control provided the Moosup Pond Association with treatment posters to be placed around the entire shoreline of the pond prior to treatment. The posters warned of the impending treatment as well as the temporary water use restrictions to be imposed following treatment. In addition to posting the shoreline of the pond, a treatment notice was provided to the pond association for publication in the local newspaper. The posted water-use restrictions were as follows: swimming, boating, and fishing – one day; irrigation, drinking and livestock watering – Do not use until further notice. Although there are no labeled swimming, boating, and fishing restrictions associated with the application of Navigate, it is in keeping with good pesticide use practices and our company policy to close the pond to all uses on the day of treatment as an extra precaution.

POST-TREATMENT VEGETATION SURVEYS

Like the Pre-Treatment Survey, a Post-Treatment Survey was conducted by an Aquatic Control Biologist following the Navigate herbicide treatment. The focus of the survey, performed on September 15, 2009, was to confirm that the targeted milfoil growth was controlled, document non-target impacts, if any, and again map all the dominant aquatic vegetation in the pond.

Observations of the designated treatment areas indicated that an estimated >90% of the targeted milfoil growth was controlled as a result of the Navigate herbicide treatment. The only milfoil growth within the designated treatment areas that remained viable post-treatment was a few scattered pockets of very low density growth within the shallow northern cove. Many of these plants were located inline with inlet flows and therefore may have been subject to a greater level of herbicide dilution resulting from natural inflow water exchange. This dilution and water exchange may have reduced plant uptake of the herbicide in these areas, which enabled heartier plants to grow through the effects of the herbicide.

All other non-target submersed plant species, both within the treatment areas and elsewhere around the pond were robust and unaffected by the treatment program. In fact, much of the native plant growth at the time of the post-treatment survey had significantly increased in distribution and density from conditions observed during the pre-treatment survey (see 2009 Post-Treatment Vegetation Map in Appendix A). The rooted plant growth, consisting of greater than 10 different species, was dominated by robbins pondweed (*Potamogeton robbinsii*), waterweed (*Elodea nuttallii*), tapegrass (*Vallisneria* sp.), and naiad (*Najas flexilis*). The only non-target impact that was observed post-treatment was some thinning of the floating waterlily community (*Brasenia schreberi*, *Nymphaea odorata*, and *Nuphar variegatum*) in the shallow northern inlet cove. These species are susceptible to Navigate (2,4-D) at higher doses; however, the dose used to target the milfoil is likely insufficient to cause widespread impacts to the waterlily community. At the time of the post-treatment survey we estimated that the waterlily canopy in the cove area was reduced by no more than 30-40%. It is not uncommon to see this plant community rebound to near pre-treatment densities in the years following treatment.

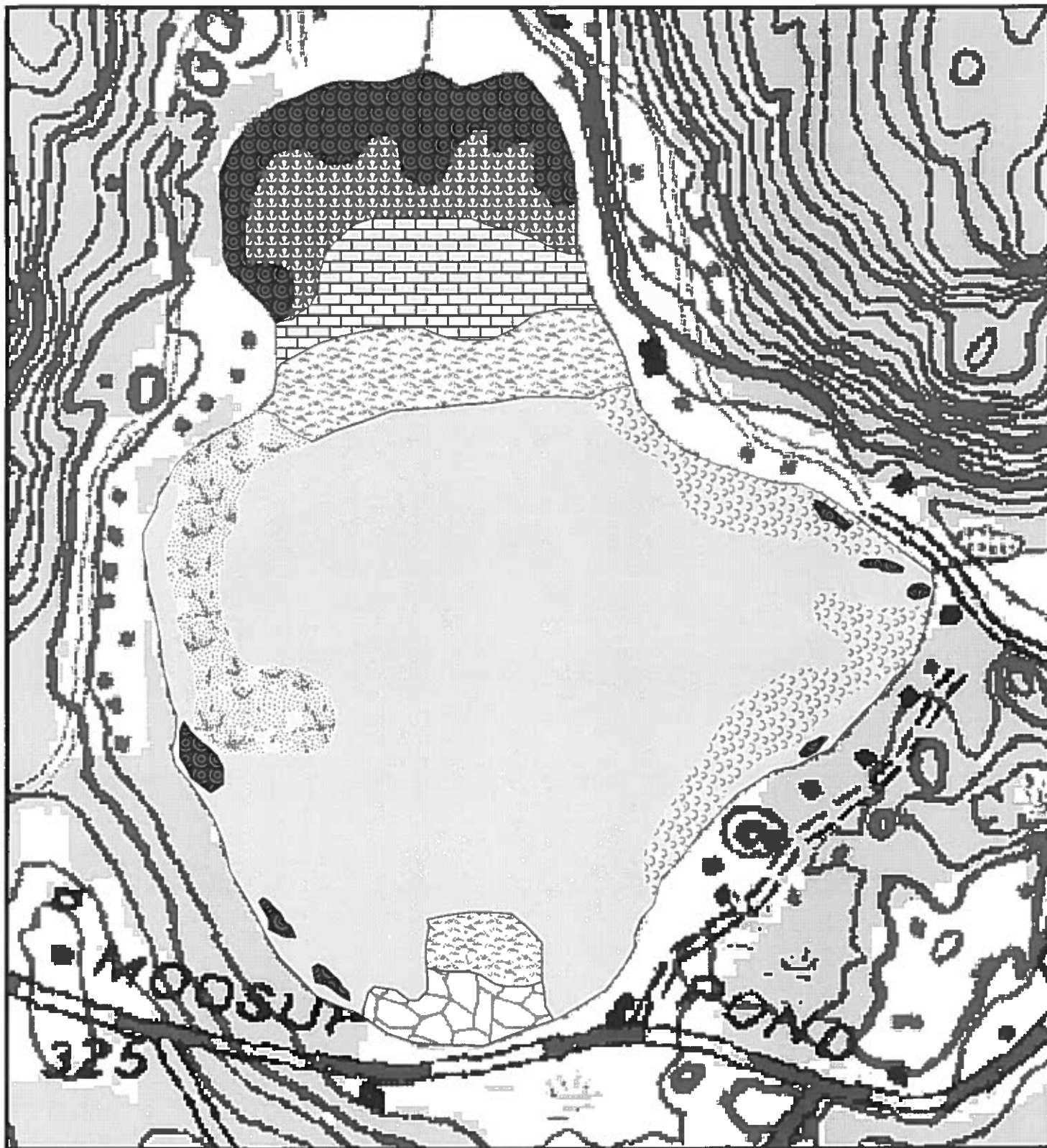
SUMMARY & FUTURE MANAGEMENT RECOMMENDATIONS

The 2009 Navigate herbicide treatment program performed at Moosup Pond achieved excellent control of the invasive variable watermilfoil growth. The targeted milfoil species

(*M. heterophyllum*) was nearly eliminated from all of the designated treatment areas identified in Moosup Pond. Based on the systemic nature of 2,4-D (Navigate) and its active translocation into the target plant's root system, we expect that the level of milfoil regrowth next year (2010) will be significantly less than what was documented pre-treatment this year (2009). Although the milfoil regrowth in 2010 may not significantly impair recreational and ecological values, we feel it is in the best interest of the pond, the Town, and the Association that area specific management be continued in an attempt to achieve long-term control. Continued annual management on a declining scale provides the best potential for long-term milfoil control and is the most cost effective and least disruptive approach. Although we fully anticipate that some level of milfoil control will be required in 2010, it is difficult if not impossible to predict the full extent of the management requirements. For this reason we feel that an early season vegetation survey/inspection will be required to accurately identify milfoil growth and determine herbicide treatment requirements.

In the interest of effective long-term control, we also recommend that Town and Association investigate appropriate strategies for preventing the reintroduction and propagation of these plants in the pond. Variable watermilfoil like many other invasive aquatic species, reproduces through vegetative fragmentation. As a result, even small plant fragments can remain viable, generate new roots, and ultimately produce a new plant. Because of this reproductive strategy, these plants can effectively be transported from pond to pond via trailered boats and can sometimes be spread within a waterbody as a result of heavy outboard motor traffic. We therefore suggest that the Town consider, at the very least, signage at the public boat ramp off of Moosup Pond Road to remind boaters to remove all plant fragments from their boats and trailers before entering and leaving the pond. It is also our understanding that the Town enforces a boat size and horsepower restriction on the pond. This restriction should help limit the spread of the existing milfoil infestation within the pond by limiting possible plant fragmentation caused by heavy boat traffic and excessive wakes.

The recommended management budget for 2010 is broken down by task in a cost schedule provided on the following page.



2009 Pre-Treatment Vegetation

Moosup Pond
Plainville, CT

Legend:

- waterlily canopy consisting of white and yellow lilies & watershield
- 40-50% variable milfoil with spotted and robbins pondweed & bladderwort
- 75-100% variable milfoil with low density spotted pondweed & bladderwort
- low density (20-30%) milfoil monoculture
- 20-30% milfoil with low density tapegrass, bladderwort, and waterweed
- 10-20% milfoil with nitella, bladderwort, waterweed, and tapegrass
- 50-75% of waterweed

0 170 340 680 Feet

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FIGURE

SURVEY DATE

MAP DATE

1

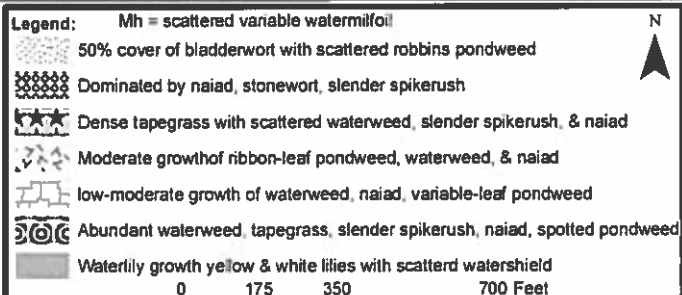
6/2/09

12/3/09



2009 Post-Treatment Vegetation

Moosup Pond
Plainville, CT



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FIGURE	SURVEY DATE	MAP DATE
2	9/15/09	12/3/09