

2005 PROJECT COMPLETION REPORT

**AQUATIC MANAGEMENT PROGRAM
FOSTER'S POND**

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INTRODUCTION

In 2004, the Foster's Pond Corporation hired Aquatic Control Technology, Inc. to conduct an aquatic plant survey and develop a nuisance aquatic vegetation management plan for Foster's Pond. Although Aquatic Control had performed hydro-raking at Foster's Pond since 1992, the increasing density and distribution of non-native fanwort (*Cabomba caroliniana*) prompted concerns among residents and spurred an interest in alternate fanwort control techniques. Based on the survey work performed at Foster's Pond in August, 2004, Aquatic Control developed a Nuisance Aquatic Plant Management Plan for Foster's Pond outlining options, recommendations, and goals for the future management of fanwort at Foster's Pond.

The Management Plan was submitted to the Foster's Pond Corporation in September 2004. The first priority of the proposed management plan was to "prevent further loss of open-water conditions or displacement of diverse assemblage of native plants". Based on the severity of the fanwort infestation encountered in 2004 a whole-lake Sonar treatment was recommended for 2005. The Foster's Pond Corporation successfully permitted a whole lake Sonar treatment with the Andover Conservation Commission and DEP during the winter months. After a successful fundraising effort, the program was initiated in May 2005.

Our 2005 Project Completion Report for the Sonar Treatment Program performed at Foster's Pond follows. This report will serve to document the herbicide application process, the post-treatment (FasTEST) results of monitoring Sonar (fluridone) residues in the pond and our observed response of the targeted fanwort weed during and immediately following completion of the treatment program. Attached to this report are several charts, figures and photographs that further help to explain the project and the observed results.

POND DESCRIPTION

Pond and Watershed Description

Foster's Pond is located in the Town of Andover in Essex County, MA. The pond is an enhanced/impounded waterbody controlled by a dam structure on the northernmost point of the pond; outflow from the pond runs into an extensive area of wetlands and thence to the Shawsheen River. The pond is relatively shallow with a reported average depth of approximately 7 feet and a maximum depth of 13 feet in the main open water area, and 15 feet in a dredged cove. The pond has an irregular shoreline that encompasses approximately 120 acres of open water. There are several emergent wetlands adjacent to open water portions of Foster's Pond.

For descriptive purposes the pond is broken into separate geographic areas throughout the balance of this report. The areas defined below are specifically outlined in Figure 1.

- Main Pond – largest open water area at southern end
- Outlet Cove – cove between channel and dam.
- Channel – connecting the main pond to the outlet cove
- Mill Reservoir – dredged northeast coves and adjacent wetlands

Fanwort Distribution

In August of 2004 fanwort was covering an estimated 50% of Foster's Pond. The majority of growth was found in the Channel at the northern end of the pond, along the shore in Mill Reservoir and the eastern half of Main Pond. Although Foster's Pond supported ten other submersed and floating-leafed vascular

plants, as well as filamentous green algae, the most common plant in Foster's Pond based on its coverage and biomass was fanwort. It was the most prevalent species found in 34 out of the 39 data point locations surveyed at that time. Average values from the data point sampling in 2004 suggested that on 8/16/04 Foster's Pond supported 79% plant cover, 53% fanwort cover and a 2.9 biomass index on a 0-4 scale. Common to abundant plant growth was generally encountered to water depths of 10 feet. Even scattered plants were found in depths between 10 and 13 feet.

2005 SONAR TREATMENT PROGRAM

The Sonar herbicide treatment program at Foster's Pond had several elements that are described in greater detail in the following sections. A chronological list of the major program elements is provided below:

- Vegetation survey..... 8/14/04
- Draft Management Plan submitted to FPC..... 9/21/04
- Final Management Plan submitted to FPC..... 10/19/04
- NOI filed with Andover Conservation Commission 11/2/204
- Order of Conditions Issued by Conservation Commission 1/21/05
- Superseding Order of Conditions Issued by DEP 3/22/05
- Andover BOH meeting & Pre-Treatment Inspection 5/16/05
- Fisheries & Wildlife approval of pre-treatment drawdown..... 5/19/05
- SONAR Herbicide Treatments..... 6/6, 6/21 & 7/14/05
- FasTEST Monitoring Rounds..... 6/16, 7/4, 7/27 & 8/11/05
- Post-treatment data point survey of aquatic plants..... 9/14/05

Treatment Timing and Dose

The initial treatment was scheduled and performed on June 6, 2005. Prior to the treatment the pond was lowered to a level even with the spillway of the impoundment dam. Although we had aimed for a lowering of 12 inches below the level of the spillway, this was not achieved due to heavy rainfall prior to the treatment and delays in the permitting process occasioned by an abutter's unsuccessful appeal of the Andover Conservation Commission's approval of the project. Fanwort was actively growing at this time, but it had not yet reached its peak biomass. Fanwort is most effectively controlled by Sonar at this point in the growing season due to the plants rapid uptake of the chemical as it strives to grow towards the water's surface. At the time of the first Sonar application, the fanwort in Foster's Pond was still a few feet below the surface in most of the infested areas.

A target Sonar concentration of 20 ppb (parts per billion) was established for Foster's Pond. Even though fanwort can be controlled with sustained doses of 10 ppb, the slightly higher concentration was recommended to account for any unforeseen chemical loss and extend the duration of effective fanwort control, while still attempting to limit impact to some of the heartier native plants. The establishment of this target concentration was based on our experiences with similar Sonar treatments throughout the Northeast. In the past we have had excellent treatment program success maintaining a range of 10-20 ppb for 60-90 days, allowing for the most effective fanwort control while limiting collateral damage to native plants. We were careful not to exceed the 20 ppb target concentration. Although Foster's Pond is not a public water source and is not a source for any resident's potable water supply, the FPC did not want to exceed the concentration which is allowable, in accordance with the product label and State regulations, in such water supplies. This concentration - 20 ppb - was set as the maximum in the Order of Conditions for the project.

Sonar concentrations were regularly monitored after the initial application using the FasTEST analysis procedure that is offered by the manufacturer. Two booster applications were performed on June 21st and July 14th to raise the Sonar concentration back into the targeted range; no additional booster applications were performed. Average Sonar concentrations remained within the target range for a period of over 60 days. Although detected concentrations of Sonar in Mill Reservoir were somewhat lower than the targeted range due primarily to groundwater inflow, the efficacy of the treatment in this basin was not noticeably reduced.

Method of Application

Prior to treatment, we divided the pond into a series of basins as shown in Figure 1. Using the existing bathymetry map for the pond and measurements collected during our pre-treatment inspection, we calculated the water volume and amount of Sonar needed for each basin. The specific amount of Sonar required to achieve the target concentration in each basin was then mixed and applied accordingly.

The initial Sonar treatment and all subsequent applications were performed from Aquatic Control's 18-foot Airboat, equipped with a 100 gallon spray-tank, pump and specially designed, chemical injection system. The concentrated Sonar AS liquid herbicide was carefully measured-out for each treatment sub-basin and mixed in the spray-tank with pond water at a ratio of >50 to 1 of water to chemical concentrate. The rate of chemical flow and dispersal was carefully monitored in accordance with the speed of the boat and width between passes of the boat. Four weighted hoses to dispense the diluted Sonar (two on either side of the Airboat) were located towards the bow of the boat. All herbicide was dispensed sub-surface, thereby avoiding potential aerial drift and off-site impacts

During all three treatments we utilized a Differential GPS system as a navigational tool. This system has sub-meter accuracy. A map of the pond and the treatment basins was created using ArcView - GIS based software. This map was then downloaded into the GPS unit. This allowed us to follow our position on the screen of the GPS unit and evenly apply the herbicide by making parallel passes that were spaced approximately 100 feet apart (see Figure 1). The system worked flawlessly during all three treatments. As back up, temporary surface buoys were also used to mark the bounds of each basin during each treatment.

Posting & Notifications

Immediately prior to the initial application and each booster application, the Foster's Pond Corporation posted the shoreline with signs that warned of the temporary water use restrictions to be imposed. The restrictions, which were endorsed in advance by the Andover Board of Health, advised against boating, swimming, or fishing on the day of application and using pond water for irrigation purposes for a 90-day period following the initial application. Even though the Sonar AS label only carries a 30-day irrigation restriction, a 90-day closure was advised to accommodate the anticipated booster applications.

FasTEST Monitoring

The FasTEST analysis that is offered by SePRO (the manufacturer of Sonar) was utilized to monitor Sonar concentrations in Foster's Pond and to guide the timing of the booster applications. Surface samples were collected by FPC personnel at multiple locations in each pond basin from approximately 18 inches below the surface - refer to Figure 1 in the Appendix. All of the samples were then shipped to SePRO's laboratory via overnight delivery. Results were typically faxed to Aquatic Control within 48 hours of being shipped.

Samples were collected on 4 different occasions from four pre-established sampling locations (see Figure 1). Results of the in-pond surface samples are compiled in Table 1. These FasTEST results are also plotted in the chart found in the Appendix.

Table 1 - FasTEST Sampling Data – In-Pond Surface Stations

Date of Collection	1-Main Pond West	2-Main Pond East	3-Mill Reservoir	4-Outlet Cove	Average
6/16/2005	19.6	17.2	1.5	8.4	11.7
7/4/2005	11.7	11.6	6.5	11.7	10.4
7/27/2005	14.2	13.9	12.6	15.2	14.0
8/11/2005	11.9	9.6	6.6	13.2	10.3

The average Sonar concentration in Foster's Pond was about 11.7 ppb on June 16th, just ten days after the initial application. Although a concentration of 10 ppb or greater is still within the range of effectiveness for the control of fanwort, the drop in Sonar concentration prompted a booster application on June 21st. Almost two weeks after the first booster application the average Sonar concentrations remained within the target concentration range of 10-20 ppb, averaging 10.4 ppb. By that point, the fanwort had been exposed to lethal concentrations of Sonar for almost 30 days and the plants were showing positive signs of bleaching-out (evidence of chlorosis: symptomatic signs of Sonar exposure). To ensure that lethal concentrations of Sonar persisted for a contact time of 60 days or more, the third and final booster application was performed on July 14th. Results of the final 2 rounds of FasTEST samples collected on 7/27 & 8/11/05, showed that lethal concentrations of Sonar (>10 ppb) were maintained through August 11th throughout much of the pond. By that time fanwort had been exposed to lethal concentrations of Sonar for over 60 days and the majority of plants had collapsed and were decomposing on the bottom.

Treatment Program Summary

The Sonar treatment completely controlled fanwort growth at Foster's Pond, providing greater than 99% control of the nuisance weed. Only three applications were needed to maintain lethal Sonar concentrations in the pond over a 60 day period. By July 14th, the time of the second "booster" application, over one month after the initial treatment, the fanwort was displaying strong signs of chlorosis, indicating successful impact from the Sonar treatment.

A final comprehensive data point survey was conducted by Marc Bellaud, Senior Biologist with Aquatic Control, on September 14th. Steve Cotton of the Foster's Pond Corporation accompanied Marc on this survey. The survey revealed low density bottom coverage dominated by coontail (*Ceratophyllum*) and filamentous algae. Only one small patch of fanwort was encountered in the northern section of Mill Reservoir; the plants were described as highly chlorotic and unhealthy.

At no time during the course of our inspections or treatment of the pond did we directly observe or receive reports of any fish mortality or other ill effects of treatment on wildlife.

PRE AND POST-TREATMENT VEGETATION SURVEYS

Pre and post-treatment monitoring of the aquatic plant community was an integral component of this management program. The comprehensive aquatic plant survey performed on August 14, 2004 provided the most accurate pre-treatment assessment of the plant community at its peak biomass. The pond was also inspected prior to the initial treatment on June 6th to document early season plant conditions. On May 16th the fanwort was actively growing and in most areas already exceeded 25% coverage. The fanwort distribution was consistent with what was reported in the 2004 survey (Figure 3).

On September 14, 2005 Marc Bellaud replicated the pre-treatment survey by visiting pre-established data points which were located with the use of Aquatic Control's Differential GPS system (see Figure 2).

During this survey Marc encountered 9 different submersed plants as well as 8 floating leaf or emergent plants. A table of these plants is located below.

Table 2 – Aquatic Plants Documented in Foster’s Pond September 14, 2005

Macrophyte Species	Common Name	Abbreviation	Type	Distribution
Submersed				
<i>Ceratophyllum demersum</i>	Coontail	Cd	Submersed	Common in all basins
<i>Utricularia</i>	Bladderwort	U	Submersed	Scattered
<i>Nitella</i>	Stonewort	Ni	Submersed	Scattered
<i>Cabomba Caroliniana</i>	Fanwort	Cc	Submersed	Scarce-two occurrences (both chlorotic)
<i>Najas flexilis</i>	Bushy pondweed	Nf	Submersed	Scarce
<i>Isoetes</i>	Quillwort	I	Submersed	Scarce
<i>Myriophyllum sp.</i>	Milfoil	Mh	Submersed	Scarce
--	Filamentous algae	Fa	Submersed	Common in all basins
<i>Musci</i>	water moss	Mu	Submersed	Scattered
Floating Leaf & Emergent				
<i>Nymphaea odorata</i>	White waterlily	Ny	Floating leaf	Common in all basins (reduced density)
<i>Eriocaulon sp</i>	Spikerush	Eo	Emergent	Shoreline
<i>Typha sp.</i>	Cattail	T	Emergent	Shoreline
<i>Nuphar variegatum</i>	Yellow waterlily	Nu	Floating leaf	Shoreline
<i>Pontederia cordata</i>	Pickerelweed	Po	Emergent	Shoreline
<i>Scirpus sp.</i>	Rushes	Sc	Emergent	Shoreline
<i>Decodon verticillatus</i>	Water willow	Dv	Emergent	Shoreline
<i>Lythrum salicaria</i>	Purple loosestrife	Ls	Emergent	Shoreline

Although the number and abundance of plant species encountered at each data point on September 14th was considerably lower than what had been observed in 2004, plant coverage was maintained throughout much of the previously vegetated areas dominated by coontail. Densities and abundance of each plant varied between sites within the pond; however, the general plant assemblage was relatively homogeneous. For purposes of documentation we have distinguished between plant bed densities ranging from 0-50% and 50-100% to create baseline patterns from which the future health of the native plant beds in Foster’s Pond can be judged (see Figure 4). Occurrences of other submerged aquatic plants were too scattered and patchy to account for variations within the waterbody’s plant assemblages. There were no observed impacts to truly emergent species located on the adjacent wetlands and along shore. Floating-leaved waterlilies were considerably thinned-out and decaying waterlily rhizomes were noticed in many of the wetland areas, particularly in the Mill Reservoir area and the east and west coves off the Main Pond.

Prolonged low dose Sonar applications can have collateral affects on non-target species in the year of treatment. It has been our experience, however, that native plants typically rebound the year after treatment. In a system such as Foster’s Pond, we would expect a full recovery within a few growing seasons. It is also important to remember that the transect survey is quantitative in nature, and the systematic survey of pre-established data points is conducted to create a historical record of vegetation. Although every effort is made to scan the bottom for any notable growth while locating sample points, it is possible, and very likely, that other native plants were still present but were not found in the vicinity of the surveyed points and were therefore not recorded.

SUMMARY & FUTURE MANAGEMENT RECOMMENDATIONS

The 2005 Sonar herbicide treatment program performed at Foster's Pond achieved excellent control of the non-native fanwort growth. The plant was nearly eliminated from all of the targeted areas of Foster's Pond by the end of the summer. Because of the systemic-action of Sonar that translocates into the root structures and the success of similar treatments, we expect to see excellent carryover fanwort control throughout the 2006 season.

At least 2-3 years of effective fanwort control is usually achieved following whole-lake Sonar treatments as was done at Foster's Pond. Since ponds are dynamic systems and each one responds differently to treatment we cannot accurately predict the duration of fanwort control that will be achieved following a whole-lake Sonar treatment. Complete fanwort eradication is rarely, if ever, achieved following a Sonar treatment. Fanwort will eventually regrow in Foster's Pond. Based on monitoring performed at other lakes that have been treated with Sonar in the Northeast, we would not expect fanwort to return to nuisance densities for at least 2-3 years. When fanwort does begin to regrow following a whole-lake Sonar treatment, it usually occurs in a lower density, but it is widely distributed throughout areas that were previously infested. This suggests that regrowth is occurring from vegetative structures (i.e. root crowns) that were not completely destroyed rather than from reinfestation. This pattern of regrowth has even been observed where Sonar was applied at higher concentrations that were more injurious to native plants, but resulted in a slightly extended duration of control. The Sonar concentration that was applied to Foster's Pond is believed to be within the optimal target dose range that maximizes the duration of fanwort control, while lessening impacts to non-target native plants.

Recommendation 1: Volunteer Training on Recognition and Hand-Pulling (2006)

It may be possible to extend the duration of fanwort control at Foster's Pond by employing non-chemical management efforts on scattered fanwort regrowth or through smaller, spot-treatment programs. The primary non-chemical management strategy that should be employed is hand-pulling. The Foster's Pond Corporation should encourage members and pond residents to be educated on how to accurately identify fanwort and be trained on how to properly hand-pull fanwort plants. Since fanwort primarily propagates through vegetative fragmentation, hand-pulling can be effective at slowing the rate of fanwort reinfestation. Hand-pulling will likely be limited to widely scattered plants that are found rooted in less than 5 feet of water. All floating fragments of fanwort found in the pond should also be routinely removed, since these fragments are capable of developing adventitious roots and will eventually sink to the bottom and become reestablished. A more comprehensive hand-pulling effort using paid SCUBA divers may also be worth considering.

Recommendation 2: Bottom Weed Barriers (Future Consideration, as Conditions Warrant)

If small (< 5,000 square feet), dense beds of fanwort are identified, they may be effectively controlled through the installation of bottom weed barriers. These barriers have been effectively used on a number of nearby ponds in Massachusetts. Suitable barrier sites that are identified during future inspections will be marked for possible barrier installations.

Recommendation 3: Chemical Spot-Treatments (Future Consideration, as Conditions Warrant)

Larger areas of fanwort regrowth should be effectively managed through smaller, spot-treatments. Future "spot treatments" with pellet formulations of Sonar, or with new herbicides should be considered. Preventing fanwort from returning to pre-treatment densities needs to be a priority pond management objective. Maintaining a healthy native plant community is essential for fish and wildlife habitat and may help to slow the rate of fanwort reinfestation.

Recommendation 4: Treatment of Dredged Basin Off Glenwood Road (2006)

One area that needs to be addressed immediately is the small dredged basin off Glenwood Road on the north shoreline (Figure 5). This area was not included in the 2005 treatment because it was not believed to harbor any fanwort growth. It is separated from the rest of the pond by an earthen berm during low water conditions. We surveyed the basin on August 11th and again on September 14th. The basin is 3.9 acres and has a maximum depth of 15 feet and an estimated average depth of 10 feet. Aquatic plants are limited to the immediate shoreline edges. It appeared to support a diverse plant assemblage.

Unfortunately, there were a few established patches of fanwort found along 15-20 percent of the shoreline. There was also a small patch of a second non-native plant called Brazilian elodea (*Egeria densa*) on the southern shoreline. Both fanwort and Brazilian elodea propagate vegetatively and fragments could reinfest the remainder of Foster's Pond. Ideally this basin should be spot-treated with Sonar in 2006. The estimated program cost would be \$5500-\$6000. If treatment is not performed, then FPC members should regularly inspect the area and remove floating plant fragments and if possible initiate a hand-pulling effort.

Recommendation 5: Follow-Up Plant Survey (2006)

Follow-up monitoring should be performed during the 2006 season to fully evaluate the effectiveness of the 2005 Sonar treatment program. This will facilitate better predictions on the rate of fanwort regrowth. We would recommend replicating the comprehensive data point survey in August 2006. The cost for this survey and report would be \$1,750. This report will serve to document conditions during the year after treatment and provide the Foster's Pond Corporation with ongoing management recommendations.

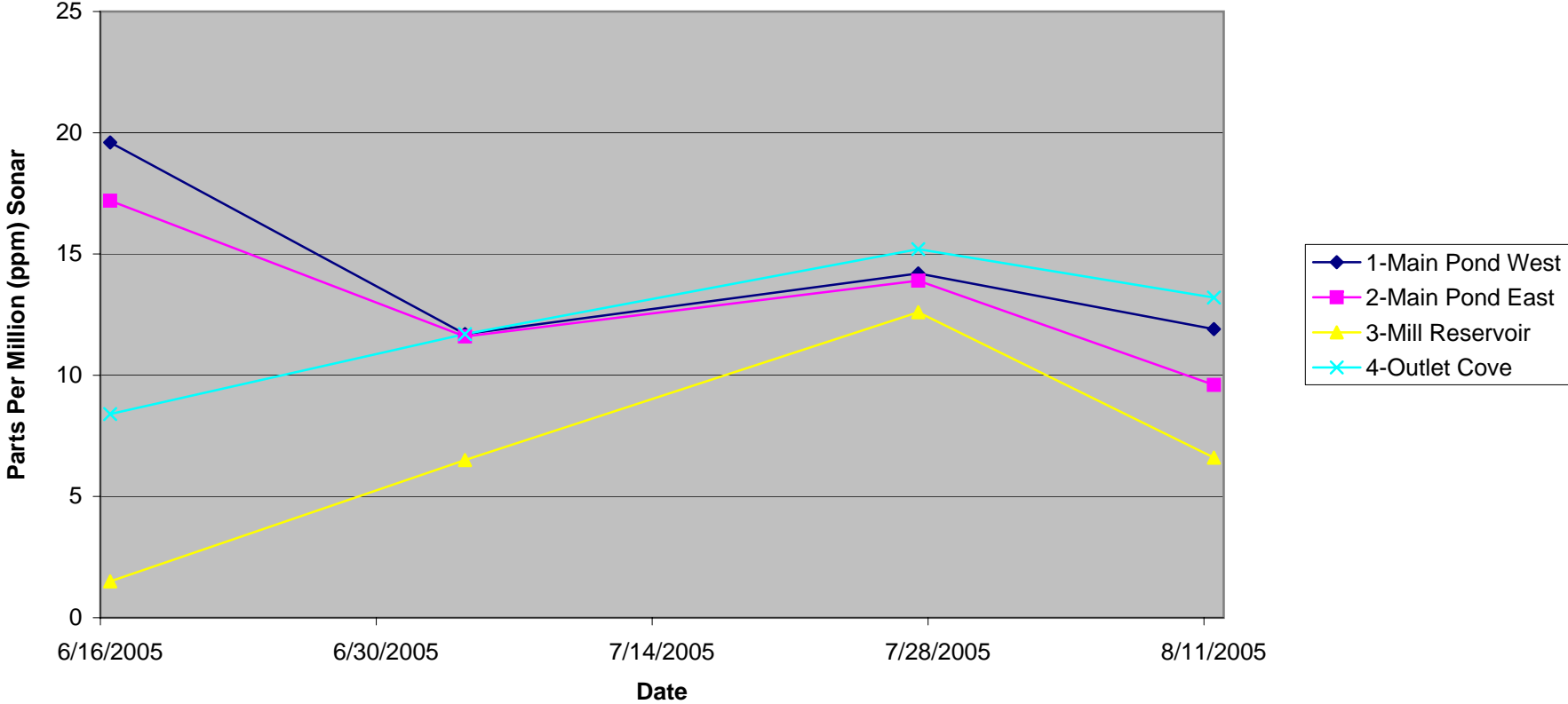
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Foster's Pond Vegetation Survey 2005

Data Point	Water Depth (ft.)	Sediment Type	8/16/04 Survey Data			9/14/05 Survey Data				
			Dominant Vegetation	% Total Plant Cover	% Fanwort Cover	Biomass Index	Dominant Vegetation	% Total Plant Cover	% Fanwort Cover	Biomass Index
1	15			0	0	0	Fa (Po, Ty)	10	0	1
2	10		(Ny, Cc, U, Sc, Eo, Po)	0	0	0	(Ny, Sc, Eo)	0	0	0
3	3	G	Cc, Ny, Dv (T, Ls)	100	40	4	I, Fa, Dv (Ny, Nu, Ls, T)	50	0	2.5
4	13		Cc (Ny)	60	45	3	Cc (Ny)	15	5	1.5
5	8	M/G	Cc, Ny, Cd, Pg	80	55	3	Cd, Fa (Ny)	30	0	1.5
6	5.5	M	Cc, U, Cd, Ny, Fa	100	80	4	Ni, Fa (Ny)	60	0	2
7	9	M	Cc, U	80	70	2.5	Fa	10	0	1
8	7	M	Cc, U, Ny, Cd	100	80	3	Fa, Cd (Ny)	15	0	1
9	3	M	Cc, Ny, B, U, Fa, Cd	60	30	3	Fa (Ny)	90	0	2
10	7	G	Cc, Ny, B, U	60	30	3	Fa (Ny)	20	0	1
11	9.5	M	Cc	60	60	2	Fa	60	0	2
12	7	M	Cc, U, Ny, Cd	100	70	4	Fa, Cd (Ny)	20	0	2
13	9	M	Cc, U, Ny	100	90	3.5	Fa	10	0	1
14	11			0	0	0		0	0	0
15	6.5	M/G	Cc, Cd, U, Ny	100	70	3	Cd, Fa (Ny)	20	0	1
16	5	M	Cc, Ny, U, Cd	100	70	3.5	Fa (Ny)	10	0	1
17	11		Cd	10	0	1	Ni, Fa	10	0	1
18	9	M	Cc, U, Pe, Cd	100	80	3	Fa	10	0	1
19	5	M/G	Cc, Ny, U	80	55	3	Fa	10	0	1
20	9.5	M	Cc, U	100	95	3		0	0	0
21	7	M	Cc, Ny, U, Cd	100	85	4	Mu, Fa (Ny)	20	0	2
22	4.5	M	Cc, Cd, Ny, U	100	60	4	Fa, Cd (Ny)	80	0	2.5
23	6	M	Cc, Ny, Cd, U	70	40	3.5	Fa, Cd (Ny)	40	0	2
24	4	G/M	Cc, Cd, Ny, B, U	70	40	3	Fa, Cd (Ny)	30	0	2
25	4	M	Cc, B, U, Cd, Ny	100	80	3.5	Fa, Cd (Ny)	20	0	1.5
26	4	M	Cc, U, Pe, Ny	100	80	3.5	Fa, Cd, U	30	0	2
27	3	S/G	Cc, Pe, U, Ny, B, Sp	80	40	3	Fa, Cd, Mh, I	15	0	1.5
28	7	M	Cc, U, Pa, Ny	90	60	3	Cd, U, Fa	10	0	1
29	4.5	M/S	Cc, Ny, U	80	50	3	Fa (Ny)	10	0	1
30	5	M	Cc, Mb, Ny, U, Cd	100	50	3.5	Fa, Cd, Mu, Cc (dead) (Ny)	50	0	2
31	3	G/M	Cc, Mb, U, Pe, Ny, Cd, V	90	45	3.5	Fa, Cd (Ny, Eo)	50	0	2
32	6	S/M	Cc, Pe, U, V, Ny	100	70	3	Fa, Mu	20	0	1
33	7.5	M	Cc, Cd, Pp, Ny, U	90	60	3	Cd, Fa	40	0	1.5
34	7	M	Cc, Cd, Ny, U	90	60	3	Cd, Fa (Ny)	20	0	1
35	5.5	M	Cc, Ny, U, Cd	100	60	3.5	Cd, Fa (Ny, Nu)	30	0	2
36	6	M	Cc, Ny, B, Cd	100	70	3	Mu, Cd, U, Fa (Ny)	30	0	2
37	8.5	S/M	Cd, Cc, Ny, U	60	20	2	U, Nf (dead) (Eo)	20	0	1.5
38	6	S/M	Cc, U, Cd, Ny	90	55	3	U, Mu	10	0	1
39	3.5	S/M	Cc, Ny, U, Cd	75	40	3	Fa, U (Po)	20	0	1
Averages				78.85	53.46	2.88		25.51	0.13	1.38

FasTEST Results for Foster's Pond



FOSTER'S POND
Andover, MA

FIGURE 1

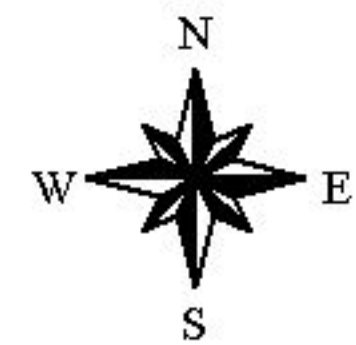
**Treatment Basins, FasTEST
Locations & DGPS Treatment Path**

Map Date: 12/14/05

LEGEND:

-  FasTEST Sample Locations
-  Treatment basins
-  Floating islands
-  Airboat treatment path (6/6/05)

Orthophoto courtesy MassGIS

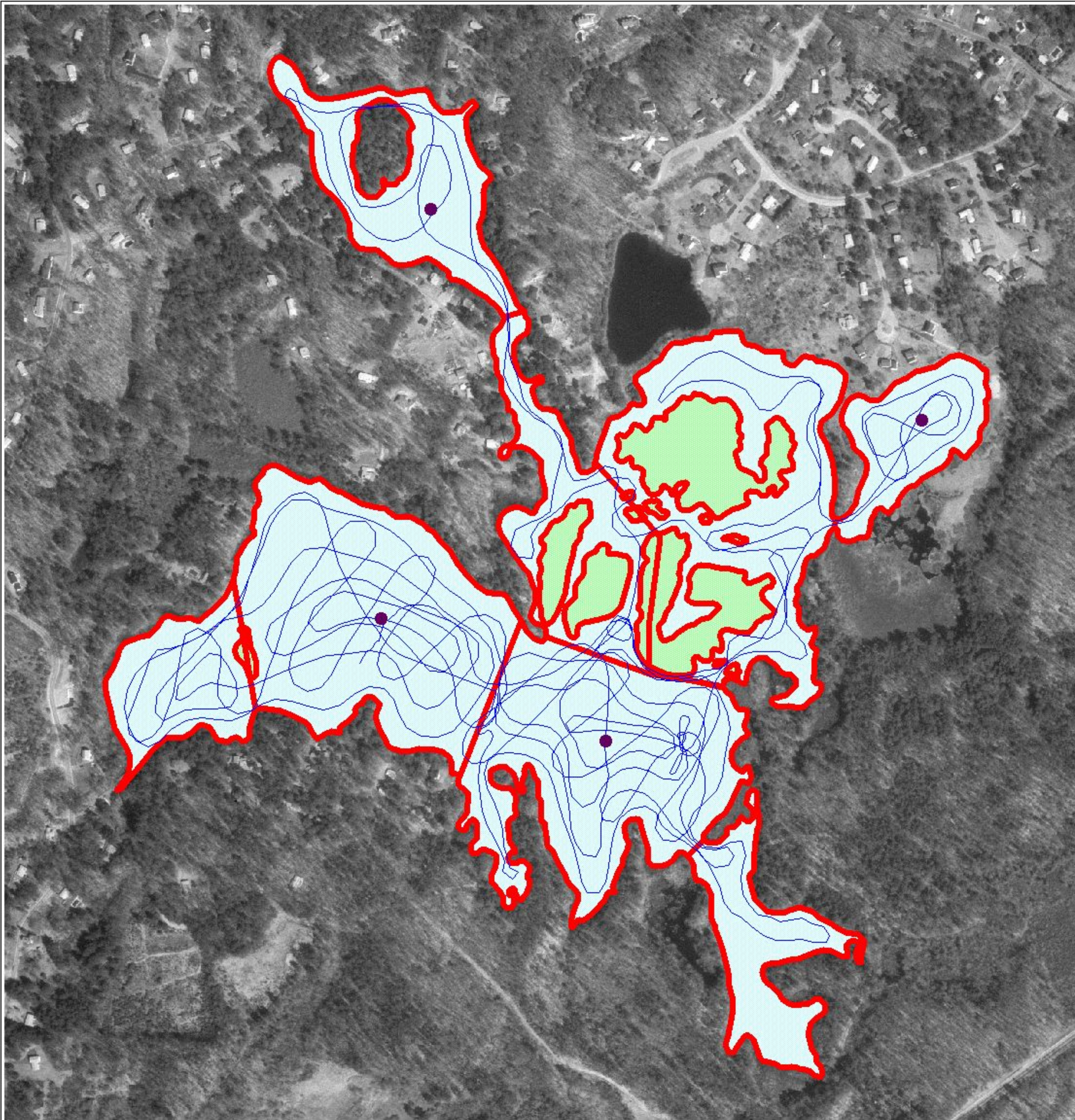


300 0 300 600 Feet



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FOSTER'S POND
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FIGURE 2

Data Point Survey Locations

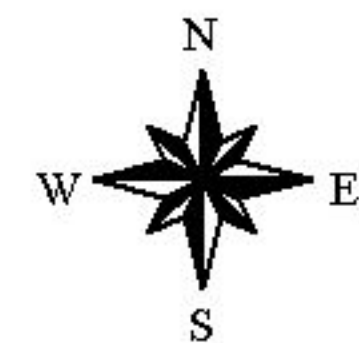
Survey Date: 9/14/05
Map Date: 9/20/04

LEGEND:

● Data Point Locations - geospatially referenced using DGPS

□ Pond shoreline drawn from Orthophoto available from MassGIS

Pond Surface Area approximately 120 acres

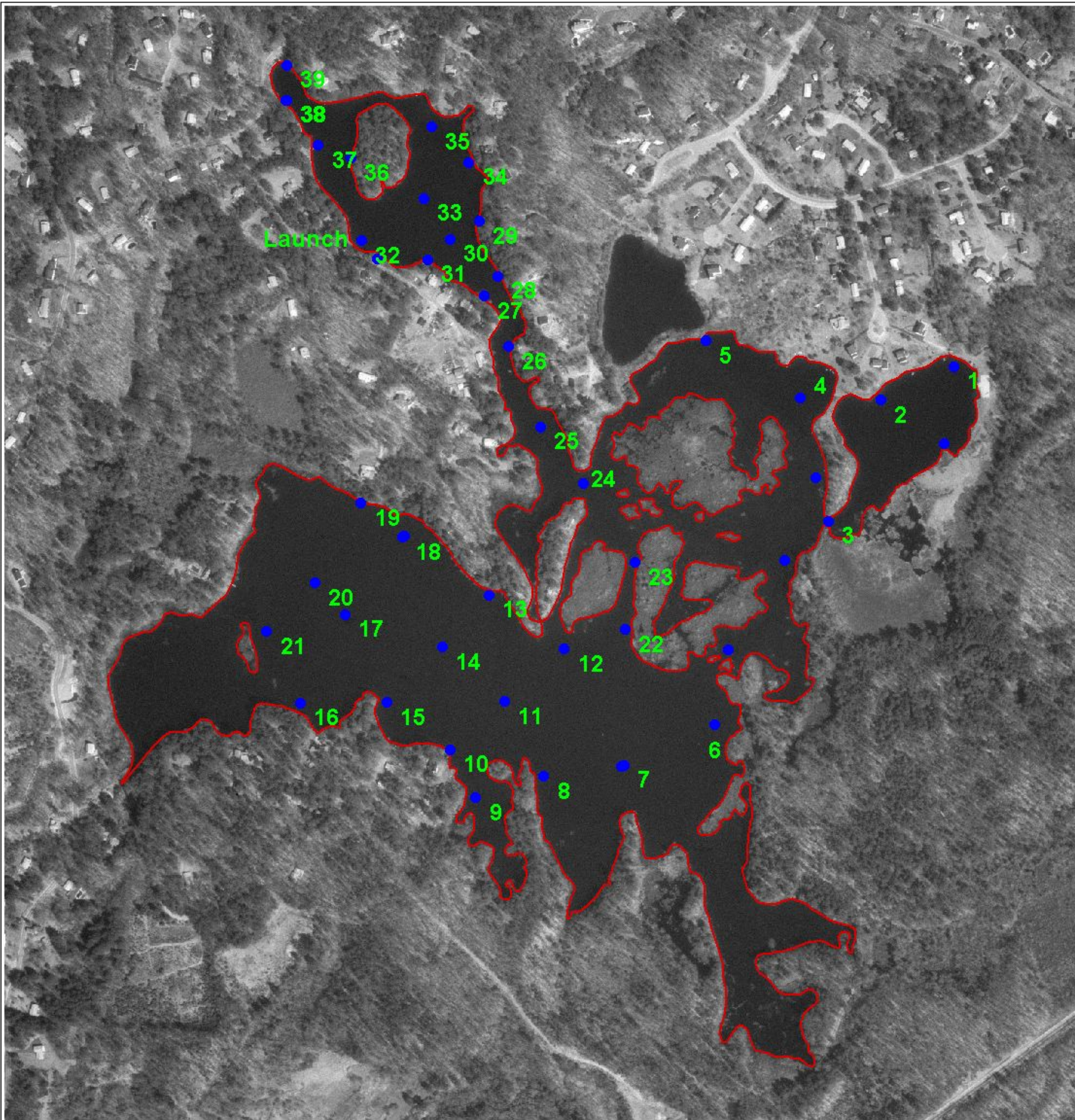


300 0 300 600 Feet



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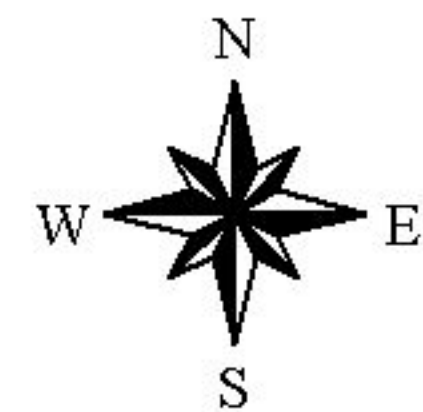
FOSTER'S POND
Andover, MA

FIGURE 3
Dominant Vegetation
Assemblages (2004)

Survey Date: 8/16/04
Map Date: 9/20/04

LEGEND:

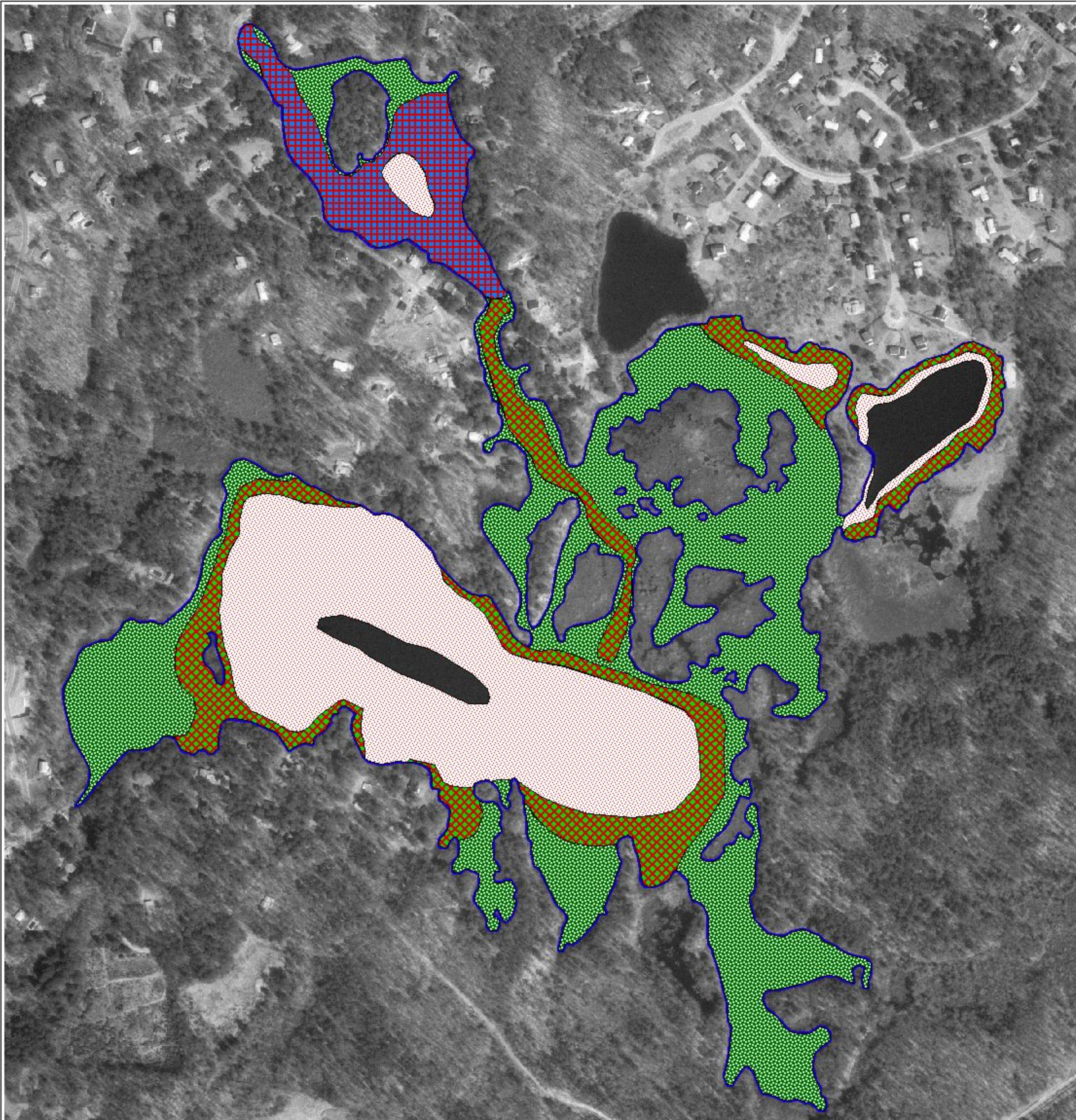
-  Common to abundant fanwort
lesser amounts of bladderwort
and coontail
-  Common to abundant fanwort lesser
amounts of pondweeds, bladderwort
and water marigold
-  Common to abundant fanwort and
waterlilies lesser amounts of
bladderwort and coontail
-  Abundant waterlilies
-  No significant vegetation cover



300 0 300 600 Feet



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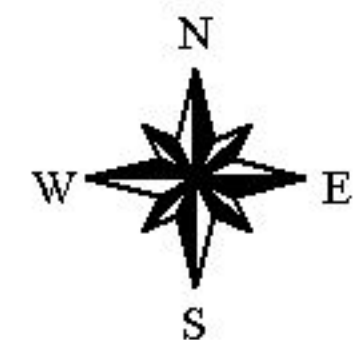
FIGURE 4
Dominant Vegetation
Assemblages (2005)

Survey Date: 9/14/05
Map Date: 12/15/05

LEGEND:

-  Dominated by coontail and filamentous algae with lesser amounts of aquatic moss and quillwort (cover >50%)
-  Dominated by White waterlilies (coverage >50%)
-  Dominated by coontail and filamentous algae with lesser amounts of bladderwort, nitella & quillwort (cover 10-50%)
-  No vegetation
-  Floating Islands

Orthophoto courtesy MassGIS



300 0 300 600 Feet



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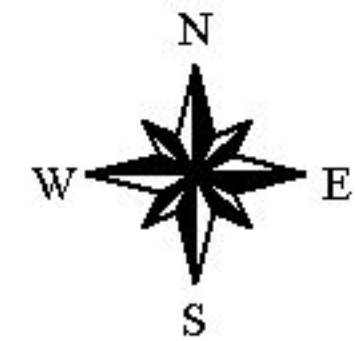
FIGURE 5
Glenwood Road
Basin (2005)

Survey Date: 9/14/05
Map Date: 12/15/05

LEGEND:

-  Glenwood Road Basin
approx. 3.9 acres
-  Areas infested with fanwort
and Brazilian elodea

Orthophoto courtesy MassGIS



300 0 300 600 Feet



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FOSTER'S POND – Andover, MA

Photodocumentation for 2005 Sonar Herbicide Treatment Program



BEFORE – channel leading to Mill Reservoir
8/16/04



BEFORE – Channel 8/16/04



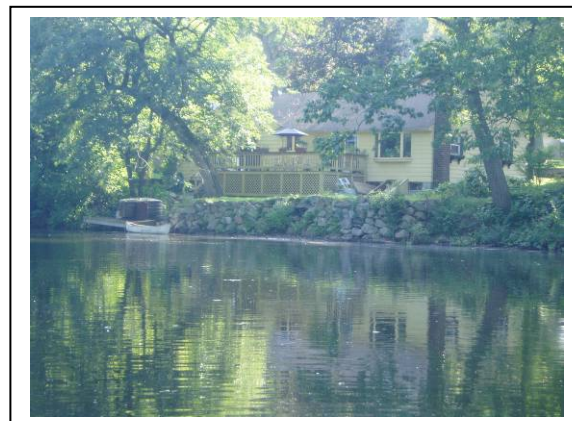
BEFORE – Channel 8/16/04



AFTER – channel leading to Mill Reservoir
9/14/05



AFTER – Channel 9/14/05



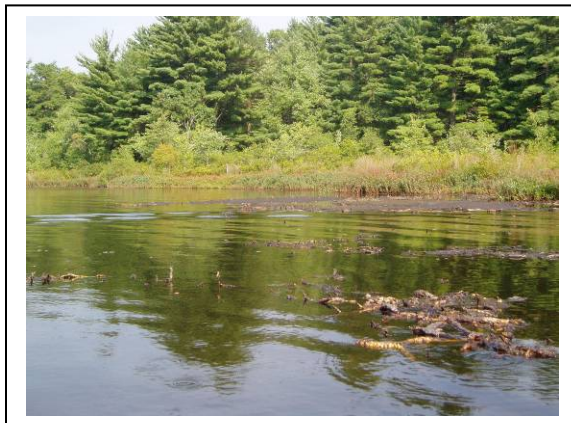
AFTER – Channel 9/14/05

FOSTER'S POND – Andover, MA

Photodocumentation for 2005 Sonar Herbicide Treatment Program



9/14/05 – Main Pond



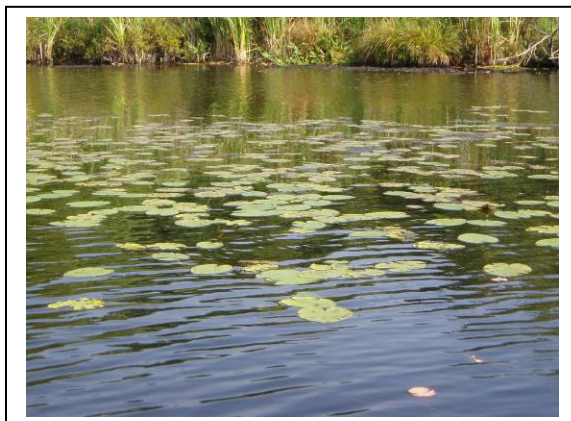
9/14/05 – adjacent wetland in Mill Reservoir



9/14/05 – floating island in eastern cove of Main Pond supporting several different plant species



9/14/05 – southwest cove of Main Pond



9/14/05 – thinned-out waterlily growth seen in Mill Reservoir



9/14/05 – sparse fanwort growth seen in basin off of Glenwood Drive