

December 14, 2011

Heart Pond Association
 c/o Mr. Mark Schmeizl
 52 Westview Avenue
 Chelmsford, MA 01824

Re: 2011 Project Completion Report - Aquatic Vegetation Management Program at Heart Pond

Dear Mark:

Under contract to the Heart Pond Association, Aquatic Control Technology, Inc. permitted and implemented a nuisance aquatic vegetation management program at Heart Pond in 2011. In keeping with the recommendations outlined in our 2010 Baseline Biological Survey Report the program focused on the area selective control of non-native plant growth as well as nuisance native growth within high priority/use recreational areas. The specific management tasks performed during the 2011 management season consisted of a Reward (Diquat) herbicide treatment for the control of non-native curly-leaf pondweed (*Potamogeton crispus*) as well as native coontail (*Ceratophyllum demersum*) and waterweed (*Elodea canadensis*). In addition, diver hand-pulling was also conducted to mitigate the formation of dense contiguous patches of non-native fanwort (*Cabomba caroliniana*) growth at the western end of the pond.

The following report summarizes the events of the 2011 Aquatic Plant Management Program at Heart Pond.

2011 Management Program Chronology

- Performed pre-treatment inspection 5/25/11
- Prepare and file MA DEP *License to Apply Chemicals* 5/17/11
- Received approved MA DEP *License to Apply Chemicals*..... 5/23/11
- Initial Reward herbicide treatment for the control of curly-leaf pondweed, coontail, and waterweed 6/9/11
- Performed diver hand-pulling of dense areas of fanwort growth 9/13/11-9/15/11
- Performed post-treatment inspection..... 9/15/11

Pre Treatment Inspection:

- **Date:** May 25, 2011
- **Weather Conditions:** Partly cloudy with moderate winds.
- **Acres of Target Vegetation Observed:** Approximately 18 acres
- **Curly-leaf Pondweed Growth Description:** Moderate density growth (30%-50% bottom cover) along the central northern shoreline. The growth was approximately 12 inches from the water surface in 3-5 feet of water. Plants were mature, but no signs of axillary turion production was observed (plant reproduction).
- **Target Native Species Growth Description:** Dense growth (50%-75% cover) of coontail and waterweed were observed throughout the shallow water areas of the northeastern cove near the swimming beach. Plants were still immature as they were only about 1-2 ft. into the water column at the time of the survey.
- **Other Notes:**
 - Good water clarity at the time of the survey – Secchi disk depth recorded at 7.5 ft. indicative of low microscopic algae growth.

- Non-native curly-leaf pondweed growth had slightly increased in distribution from the 2010 Baseline Biological Survey.
- Dominant native plant species not target for control were robbins pondweed and floating-leaf waterlilies. Dense areas of waterlily growth were observed along the shallow inlet shorelines to the west and south. Robbins pondweed was scattered in the deeper water areas of the northern and southern shorelines.

Reward Herbicide Treatment:

- **Date:** June 9, 2011
- **Weather Conditions:** Cloudy, moderate wind
- **Herbicide Applied:** Reward (active ingredient: Diquat)
- **Treatment Area:** Approximately 18 acres
- **Target Aquatic Macrophytes:** Curly-leaf pondweed, coontail, and waterweed
- **Treatment Application Methods:** Sub-surface application of diluted herbicide concentrate through trailing weighted hoses from an 18 ft. aluminum spray-boat. Reward was distributed evenly throughout designated treatment areas with aid of GPS (see attached map).
- **Notifications:** Prior to treatment notification was made to the Association and the Chelmsford and Westford Conservation Commissions. Posters were provided to the Association by ACT, Inc. These signs were posted at all access points to the pond and along the shoreline by Association members prior to the treatment.

Diver Hand-Pulling:

- **Date:** September 13th-15th, 2011
- **Weather Conditions:** Sunny with light wind.
- **Areas of Fanwort Observed:** Several small (~200 ft²) moderate density patches in west end. Less than 0.5 acres total
- **Fanwort Growth Description:** The fanwort was relatively mature at the time of the hand-pulling effort, which was delayed due to microscopic algae growth conditions. More fanwort was observed than was previously documented during the 2010 visual vegetation survey. Plants were 4-5 ft. tall in 6-7 ft. of water. Most fanwort plants were not visible from the surface due to poor water clarity. Greatest areas of growth were at the west end of the pond.
- **Hand-Pulling Methods:** Over the course of three days two certified SCUBA divers trained in the identification and removal of non-native vegetation performed area selective hand-pulling of fanwort. The pulling effort was focused on the areas that presented the greatest threat to habitat, recreation, and the future formation of large contiguous areas of growth. The fanwort plants and their root systems were excavated from the bottom sediments and stored in a mesh collection bag. Full bags were stockpiled in a nearby support boat and then later disposed of at a designated upland disposal site. A total of 60 bags of plants were removed, which is estimated to be in the range of 6,000 fanwort plants.
- **Other Notes:**
 - A mild microscopic bloom was occurring at the time of the hand-pulling work, which slowed the removal effort. The bloom is further evidenced by the drop in Secchi depth transparency, which fell from 7.5 ft. pre-treatment to 5.75 ft.
 - Areas of dense filamentous algae growth was observed in shallow areas along the shoreline.

Post Treatment Inspection:

- **Date:** September 15, 2011
- **Weather Conditions:** Partly sunny with moderate winds.
- **Curly-leaf Pondweed Growth Description:** No viable curly-leaf pondweed was observed in the pond at the time of the final post-treatment survey. Although we feel that this years treatment effectively prevented the curly-leaf pondweed from developing turions, we fully expect that some level of regrowth from dormant turions produced in prior years will occur in 2012.

- **Target Native Species Growth Description:** Season long coontail and waterweed control was achieved within the designated treatment area. Low density growth of these two species was observed in other areas of the pond. This scattered low density growth was not problematic and in fact provided good habitat conditions for fish and other aquatic life.
- **General Native Plant Assemblage Conditions:** The dominant native plant assemblage in Heart Pond consisted of low to moderate density growth of waterlilies (*Nuphar variegatum* and *Nymphaea odorata*), tape grass (*Vallisneria sp.*), bladderwort (*Utricularia sp.*), and robbins pondweed (*Potamogeton robbinsii*). This native plant growth did not appear to have increased significantly from the 2010 vegetation survey. We therefore feel that under current growth conditions this plant assemblage provides desirable habitat and poses minimal threat to recreational activities.
- **Fanwort Growth Conditions:** Fanwort growth had increased in both density and distribution from the time of the 2010 Baseline Biological Survey. Areas of low density growth were observed along all shorelines of the pond. In most cases the level of growth was not impairing habitat or recreational value. Expansion of the fanwort may likely be hindered by reduced water clarity resulting from the microscopic algae growth. The fanwort growth should be closely monitored and managed, if necessary, in future years.
- **Other Notes:**
 - Water clarity was diminished by microscopic algae growth – Secchi disk depth recorded at 6.0 ft. was indicative of moderate microscopic algae growth.
 - Swimming area remained free of nuisance plant growth throughout the growing season.

2012 Recommendations:

- We believe that in an effort to achieve some level of sustained long-term control that continued management of the curly-leaf pondweed and nuisance levels of native plant growth should be continued in 2012. Regrowth following Reward treatment (contact herbicide) is expected; however, our experience shows that through annual management with Reward the target plant growth can be reduced over time. Often this incremental reduction can reach the point where the annual management effort can be reduced or shifted to a more intermittent basis. The cost of Reward treatment for the control of curly-leaf pondweed and the designated areas of native plant control in 2012 would be in the range of \$5,500.
- Continued monitoring of invasive and native aquatic plant species populations should be considered for 2012, if budget allows. We recommend budgeting in the range of \$750-\$1,250 for these tasks.

We hope this brief summary report will be of assistance to the Association. It has been a pleasure working with you this past year and we look forward to continuing the successful management program in the future.

Sincerely,

Aquatic Control Technology, Inc.



Keith Gazaille
Senior Biologist