

LAKE BOON HUDSON & STOW, MASSACHUSETTS

MANAGEMENT PLAN

For the last two decades the residents of Lake Boon, located in the towns of Hudson and Stow, Massachusetts, have undertaken numerous studies to evaluate the condition of Lake Boon, its watershed, and the various management techniques available to reduce the aquatic plant growth.

The most recent diagnostic/feasibility study, A Nutrient & Limnological Investigation of Lake Boon, prepared by Environmental Science Services, Inc. updated the previous reports and recommended the management of the aquatic plants using both lake-level drawdown and herbicide applications. Lycott has reviewed the previous reports and the conditions of Lake Boon and recommends that the two communities move forward with herbicide and algicide treatments to manage the excessive aquatic plant growth. It is also recommended that this management technique be used in conjunction with an annual fall/winter lake-level drawdown of Lake Boon. Separate Notices of Intent are being filed for each technique.

The integrated management program is designed to manage the following aquatic plant species in Lake Boon: Fanwort (*Cabomba caroliniana*), Variable Milfoil (*Myriophyllum heterophyllum*), and Algae. The proliferation of Watershield (*Brasenia*) and Lilies (*Nymphaea & Nuphar*) in the third and fourth (eastern) basins will also be affected by the management program to a lesser degree.

The only herbicide that will effectively manage Cabomba is Sonar (fluridone) at a concentration of 20 – 50 ppb. It is recommended that the third and fourth (eastern) basins be treated with a concentration of 50 ppb of fluridone, which will manage the Cabomba and reduce the Lilies and Watershield. The initial treatment to this basin would be conducted with 5.7 gallons of Sonar.

In order for Sonar to effectively manage the target plants, the fluridone concentration needs to be maintained at a level of 30 – 50 ppb for approximately forty days. Weekly samples will be collected and forwarded to SePRO (manufacturer of Sonar) for FasTEST analysis to determine the fluridone concentration. If the concentration falls below the targeted 30 – 50 ppb, a booster will be undertaken. Booster treatments are needed for several reasons: (a) dispersion of the herbicide into the second basin, (b) absorption of the herbicide into the plants, and (c) decomposition by photodegradation. It is anticipated that another four gallons of Sonar will be needed to maintain the fluridone concentration at 30 – 50 ppb for forty days.

Experience has shown that Sonar does not effectively manage Variable Milfoil. As such a second herbicide, Reward (diquat), will be needed to manage this plant species. Reward will be used at a rate of 1 – 1.5 gallons per surface acre, or approximately fifty gallons to treat the third basin.

During the last several years the Cabomba and Milfoil have spread to the second basin around the shoreline of Lake Boon. It is recommended that both the second, third and fourth basins be treated. This will involve the use of approximately thirty gallons of Sonar and eighty gallons of Reward for both basins.

While every water body is different, typically Sonar treatments for the management of Cabomba are effective for a two-to-three year period. In all likelihood, approximately 50% of the Milfoil will return the second year. Annual management with 20 – 30 gallons of Reward will be required in subsequent years to maintain the Milfoil growth.

Historically, Lake Boon has experienced Microscopic Algae blooms during the summer months. This type of blue/green algae is generally managed with Copper Sulfate. It is anticipated that Copper Sulfate will be applied yielding a concentration of .3 ppm, and that two treatments per year will be required to maintain the water quality and preclude odors and potential fish kills associated with excessive algae.

The herbicides and algicides will be applied by licensed professionals upon receipt of the Orders of Condition and a license/permit from the DEP, Division of Watershed Management. The materials will be mixed in a tank on the boat and evenly distributed throughout the surface of the treatment area. Posters with water-use restrictions will be erected along the shoreline of the treatment area.

Many water bodies in Massachusetts are managed with herbicides and algicides on an annual basis. The Draft Generic Environmental Report (GEIR) that was submitted to Massachusetts conservation commissions has considerable information on these products.

If the excessive aquatic plant growth in Lake Boon is not successfully managed and reduced, it can create a number of impacts including the following:

- Rooted aquatic macrophytes act as nutrient pumps. These root systems seek out nutrients in the sediment and translocate them into the ecological system of the water body.
- The sediment build up in water bodies with excessive aquatic plant growth is approximately five times faster than in water bodies that do not have excessive plant growth.

- The water movement and interchange of oxygen is reduced due to the limitation of wave action and water circulation.
- Higher water temperatures are created leading toward reduced dissolved oxygen levels which in turn can increase bacteria growth.
- Fish populations are stunted.
- Significant increase in the evapotranspiration of the water. This reduces the hydrology budget of the water body and groundwater supply.

By reducing and precluding the spread of the aquatic vegetation, the lake will be maintained as a resource area considered “land under water body” under the Wetland Regulations. If the aquatic vegetation is left unmanaged, the resource area may be compromised, and more extensive management will need to be instituted in the future to maintain the lake as a viable water body.

The management of the lake will reduce the plant and algae growth and restore the wildlife and fisheries habitat. This management program will not adversely affect any non-target organisms or other resource areas such as bordering vegetated wetlands or bank.

Protecting the Interests of the Wetlands Act

The preamble of the regulations for land under water body clearly states that this resource area should be protected and maintained for the reproduction of fisheries and the health of the ecosystem and food chain.

The proposed management program will benefit the interests of the Wetlands Act by aiding in the restoration of fisheries and wildlife habitat which is being altered by the increased vegetative growth.

Benefits of the eight interests of the Wetlands Protection Act.

1. Protection of public and private water supply.
2. Protection of groundwater supply.

Management of the excessive aquatic plant growth in the lake, as with most water bodies, can aid both public and private water supplies by reducing the sediment buildup.

3. Flood control.

In many instances flood control is not positively or negatively affected by the management of the aquatic plants. However, as stated above, water bodies that are allowed to silt in continue to lose flood storage capacity. Additionally, heavy vegetative growth in water bodies can clog outlet structures. The management of the aquatic vegetation will help alleviate these problems.

4. Storm damage prevention.

Excessive aquatic vegetation can increase the risk of storm damage by hampering the outflow of water. The management of the excessive vegetation will help alleviate this problem.

5. Prevention of pollution.

Excessive aquatic vegetation in a water body increases the water temperature, turbidity and bacteria level and decreases the dissolved oxygen. By reducing the excessive plant growth, these conditions are minimized.

6. Protection of land containing shellfish.

This is not applicable to the management of the excessive aquatic plant growth in the pond.

7. Protection of fisheries.

The heavier the aquatic plant growth in a water body, the more stunted the fish population becomes. By reducing the aquatic plant growth to approximately 20% - 30%, a more balanced fish population results along with the increased circulation of water and increased dissolved oxygen levels.

8. Protection of wildlife habitat.

Most wildlife (ducks, geese, amphibians), favor a diversified habitat in a water body, but not excessive plant growth. By managing a percentage of the plant growth in a water body, the diversification of wildlife will be maintained.

These interests of the Act will be measured by conducting pre- and post-treatment surveys to determine the extent of the aquatic vegetative growth before the treatment, and the success of the management program following the treatment. Lycott will follow the label directions and post the shoreline of the treatment area with the water-use restrictions.

Limited Project Status

The management of the invasive aquatic vegetation in this water body is within the provisions of a limited project 10.53 (4). This section of the regulations specifies, "Such projects include, but are not limited to, the removal of aquatic nuisance vegetation to retard pond and lake eutrophication and the thinning or planting of vegetation to improve habitat value".