

# PONDS

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## OLD FARM LAKE BOARD OF DIRECTORS

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Old Farm Lake and Silver Pond have been steadily deteriorating for many years. Beginning last year, the Board began to investigate the issues and options to restoring both back to healthy and self-sustaining ecological systems. Early this year, the Board engaged J.D. Barrett & Associates, a firm of landscape architects and environmental scientists based in Easton, CT with an excellent working relationship with the Town of New Castle, to examine the problem and recommend solutions. As part of this study, Aquatic Control Technology in Sutton, MA, a well-known firm that implements remedial plans for ponds throughout the Northeast, inspected our site. The final report was presented to the Board at a special meeting on October 9, 2002 with New Castle's Environmental Coordinator, Stephen Coleman, also attending.

It should be noted that many, if not most, man-made small lakes and ponds experience problems over time, with a cycle of 20 to 30 years not atypical. The accumulation of excess nutrients alters the normal functioning of ponds because it fosters bacteria growth, which consumes the oxygen in the water and impacts fish and plant life accordingly. Pond problems are usually the result of poor design by the pond builders or changes in residential land use practices or other environmental factors (e.g., our surrounding wetlands). In our case, it may be a little of all this and, to some extent, the lack of awareness of the need for a continuing maintenance program.

### **Old Farm Lake**

Declining water quality, significant weed growth and an abundance of algae are the problems here. Brazilian Elodea is the most aggressive weed in the lake and, if not dealt with, the entire lake could be inundated with the weed and look like a swamp within three to five years. It forms dense mats that choke out native aquatic plants and reduces the oxygen level in the water. This results in an increasingly poor habitat for fish, turtles and other aquatic plants. Even the carp in the lake are becoming a problem – too many, too large and eating too much of the “good” weeds. They will have to be thinned out in the not too distant future.

Options for treatment of the lake are: mechanical harvesting and chemicals. A third element is plantings, but this is common to both the lake and the pond and is discussed separately below. Another possible consideration is installation of two air-diffuser systems (not explicitly recommended by our consultant for the lake at this time – see below under Silver Pond).

Mechanical harvesting is a fundamental approach to weed control and is strongly recommended by both our consultant and the town as our first step. A backhoe with several different size rake attachments is mounted on a floating barge and used to harvest weeds to a depth of approximately seven feet. The weeds are extracted with the expectation of getting most of their roots. They are spread around the perimeter of the lake, dried and removed off-site. This is done in the fall before the weeds die and mat the lake bottom.

The anticipated cost of harvesting the lake is \$7,600 plus about \$1,000 to remove the dried weeds from our site. Your Board approved proceeding with this work immediately since the weeds need to be harvested before they die.

Annually thereafter, two approaches to managing this problem are accepted practice and possible. One is to repeat mechanical harvesting next year and then every three to five years thereafter (at the same cost as anticipated this year, \$8,600). The second option is to use one of two types of chemicals, both of which are approved by the state. Diquat, also known as “Reward,” is applied annually at an estimated cost of \$3,500 to attack and kill the new weeds that sprout in the spring. The other, Sonar, attacks and kills the root structures that remain after harvesting. It costs about \$6,000, but needs to be applied once every two or three years. No decision on this second step will be made until next spring (2003).

## **Silver Pond**

The problem here is not weeds, but murky, cloudy water and the accumulation of sediment that is reducing the depth of the water in the pond (now estimated at less than four feet). The pond also seems to have less inflow and outflow than Old Farm Lake, which contributes to its murkiness. The water problem prevents light from reaching the bottom of the pond to encourage plant growth. The increasing shallowness results in higher water temperatures, which encourage bacteria and discourage other forms of life.

Our consultants believe that pond dredging is the most desirable, if not only, option to restore Silver Pond because it will remove the accumulated muck and organic matter (the biggest source of nutrient for nuisance weeds) and restore the depth of the pond (to promote better plant growth and other aquatic life). After dredging, a "flocking" treatment using aluminum sulfate, or alum, is recommended. This consists of spreading the alum into the water, letting it strip the suspended sediment out of the water and sealing it on the pond floor by resting on top of it. This results in a minimum of nutrient source remaining in the pond and establishes a "clean" base from which the pond can rejuvenate itself over time. In addition, the installation of an air-diffuser system may be beneficial because it promotes water circulation thereby oxygenating the water and reducing its overall temperature.

Dredging, unfortunately, is a large, construction-type project involving the removal of an estimated 1,500 cubic yards of sediment (about 100 dump truck loads). The muck is difficult to handle because of its physical characteristics, so the recommended approach is to dig a large trench alongside the pond, carry-off the excavated dirt, dump the muck/sediment into the hole and cover it with top soil. The cost of this project is estimated at \$75,000.

While dredging is inevitable, your board has decided to employ the flocking treatment and to install a diffuser system to see if water quality can be sufficiently improved to forestall dredging for several more years. The alum treatment is anticipated to cost approximately \$1,500 and the air-diffuser system installation about \$3,000 (including electrical work). The aeration process will occur at night, between 6 PM and 6 AM and run year round. Your Board approved implementing both of these recommendations.

## **Plantings**

J.D. Barrett has developed an intensive landscaping plan consisting of edge plantings around both the lake and the pond in order to create a barrier and buffer to pollutants draining into the water. Elimination of the majority of lawn immediately adjacent to the water is extremely important for reducing the amount of nutrients that enter the water. The plan includes wetland plants that will be planted directly within the water and a combination of herbaceous plants, shrubs and trees around the water edges. The buffer plantings will greatly improve aesthetics and habitat value as well as assist in controlling embankment erosion and decreasing goose activity (Canadian geese prefer to have lawn right to edge of the water). Pursuant to the plan, the anticipated cost of the plants and their planting is estimated to be about \$50,000. The plan can be implemented over a period of years, which the Board plans to do.

Your Board approved spending \$10,000 next year to begin this aspect of the restoration/maintenance project. The specific plants and areas to be planted next spring (2003) have not yet been determined.

## **Conclusion**

Fixing and maintaining our lake and pond are long term, continuous processes. The Board has drafted this memo to inform you of this important issue, one that could easily cause controversy without adequate information about the process undertaken and the choices available to us. All permit applications were filed with the Town of New Castle and our plan as discussed above was approved (it therefore also complies with all state regulations).

Old Farm Lake Board of Directors  
October 16, 2002