

Report, Proposal and Estimate for Pond remediation

Background

- Pond area: 0.40 acre
- Average water depth: 9.5'; Volume: 3.8 acre-feet (1,238,253 gallons)
- Source: primarily spring-fed: from both a piped inlet and non-point source flow. Contour of land suggests some surface runoff from surrounding land.
- Outlet: non-grated, a fixed standpipe ~15" diameter feeds drainage ditch

Observations from site visit

1. Watermeal - virtually entire surface of pond is currently covered
2. Eurasian Water Milfoil - all areas of pond bottom that were observed during the inspection appeared to be covered
3. Filamentous algae – a bottom-growing species that eventually rises to surface - appears to cover a smaller percentage of the pond surface

Control Strategies – I will provide explanations of the physical, biological and chemical control options available for the three main species of plants observed.

1- Watermeal

Watermeal is one of the most difficult aquatic weeds to control and its presence provides information as to the nature of the pond itself. Watermeal is most often found in very nutrient-rich ponds with stagnant or little water flow. The pond often has a mucky bottom indicating a thick layer of organic material. These ponds do not readily turn-over and can become starved of oxygen at the pond bottom, which slows decomposition of the organic matter and feeds vegetative growth.

Physical/Mechanical controls:

- Aeration – installation of a diffuse aerator (air bubbler) can be very beneficial for the pond and will distribute the pond's water temperature. It can help control Watermeal and improves the overall health of the pond. The aerator will oxygenate the pond bottom and will hasten the decomposition of the nutrient-rich (currently anaerobic) bottom debris, where Watermeal over-winters. Aerators also provide some turbulence at the surface, which inhibits the growth of Watermeal and forces it to the edges of the pond where it could be more effectively removed using seines. I would recommend the purchase of this type of aerator. A source of electricity needs to be provided at the pond for the aerator.
- Skimming – Watermeal can be physically removed from the pond using skimming techniques, such as seining. This is a very labor-intensive method and would need to be repeated often throughout the growing season. It has the advantage of removing the nutrients bound in the plant matter removed.

Biological controls:

- Grass carp may provide very limited control of Watermeal, but only after more preferred forage is eliminated.
- Discourage waterfowl access to pond

Chemical controls:

- A fluridone-based chemical (trade name WhiteCap SC™) is currently the only material recommended for the partial control of Watermeal.
- Treatment should be done when the plants first appear in the Spring, while they are actively growing and before they cover a large portion of the pond.
- Please note that any method that results in a weed kill will reduce the oxygen level in the pond due to decomposition, which could also result in a fish kill. This makes the use of an aerator an attractive proposition.
- Also note that the use of WhiteCap SC™ will effectively eliminate a number of other aquatic plants currently inhabiting the pond, including the Eurasian Water Milfoil, Cattails, Water Lilies, and some grasses, sedges and rushes.

2- Eurasian Water Milfoil

Eurasian Water Milfoil is an invasive, nonnative, nuisance plant that prefers fine organic sediment on the pond bottom. Overabundant growth of Water Milfoil is an indication of excessive nutrients in the pond system.

Physical/Mechanical controls:

- Harvesting or raking is not recommended because milfoil can reproduce rapidly from fragments.
- Drawdown may be used during the winter to freeze the rootstock but this is not a reliable strategy since it may facilitate the plant's spread to deeper portions of the pond.

Biological controls:

- Grass Carp find milfoil to be a preferred food and will provide control.

Chemical controls:

- Many chemicals provide effective control of milfoil, including WhiteCap SC™ mentioned above.

3- Filamentous Algae

Filamentous algae can frequently reach nuisance levels, resulting in a number of management concerns including aesthetics, and interfering with swimming and fishing. Any abundant aquatic plant growth can cause fish kills in late summer and fall when the dying growth consume oxygen from the pond water.

Physical/Mechanical controls:

- Harvesting or raking is possible but very labor intensive. It can be effective for a very small pond and has an added advantage of removing nutrients from the pond ecosystem.
- Aeration – installation of a diffuse aerator (air bubbler) can be used to help control algae. Adding oxygen to the bottom layers of the pond can decompose the organic layer and encourage phosphorous to bind within pond sediments, making it unavailable for algae use and growth.

Biological controls:

- The use of barley straw and other enzymatic or bacteria-containing additives have been shown to be effective in some limited cases, but results have been very inconsistent.
- Grass Carp will provide some level of control of filamentous algae from foraging but will provide even better control by promoting the growth of beneficial plankton algae, which color the water and restricts sunlight penetration to the pond bottom. Since filamentous algae growth initiates at the pond bottom and then is buoyed to the surface by trapped gases, this shading of the pond bottom prevents the initiation of its growth.

Chemical controls:

- Many different chemicals provide effective control of filamentous algae and can be resorted to if needed. Please note that WhiteCap SC™ mentioned above for Watermeal is not an effective control of filamentous algae.
- Dyes can also provide a measure of control of algae growth, according to the shading mechanism described above.

Long-term, the best approach to control overabundant growth is to reduce or redirect nutrient sources from the pond. Examples are:

- Run-off from lawns - limit the use of fertilizers on the lawn around the pond
- Septic systems – maintain septic system properly
- Waterfowl – should be discouraged from utilizing the pond
- Leaf litter – should be removed in the Fall before submerging, if possible

Please take time to assess any other potential sources of nutrients.

I have included a Proposal and Estimate on the following page for your consideration. Please note that the most effective treatment will be to combine all three strategies, although any combination may also be employed.

Sincerely,

Edward Osterhuber
Coon Hollow Lawn & Pond Services, LLC
560 Coon Hollow Road
Riegelsville, PA 18077
610-984-2896

Proposal and Estimate

(Please note that any or all combinations of these strategies can be employed)

A. – Biological Control - Stocking of Grass Carp

I will assist Pond owner in applying to the NJ Division of Fish and Wildlife for a permit to stock Grass Carp. If approved, this permit will indicate the number of grass carp allowed to be stocked. I believe that four (4) grass carp would be sufficient long term, although the state may recommend a higher number, especially if more immediate results are sought.

- Since an outlet grate is required to prevent the grass carp from exiting the pond, I will build and install it for a nominal charge.
- I will purchase four (4) Triploid Grass Carp from a NJ-approved hatchery and stock the pond this Fall.
- After ice-out in early Spring, I will remove excess floating vegetation from the pond using the most appropriate methods (probably by seining).

Estimate for this service:	\$120.00
Additional charge for grate:	<u>\$80.00</u>
Total:	\$200.00

B. – Physical Control - Aeration

Coon Hollow Lawn & Pond will purchase and install a diffuse aerator for the pond.

- Electricity (either 115V or 220V) would need to be available at the pond for an aerator.
- Pond aerators are typically on the expensive side but I have located an aerator from a dealer in Wisconsin for approximately \$500.00 – supplying 3 cu ft/min. to two separate air-stones. I will also provide a small enclosure for this unit.

Estimate for aerator:	\$600.00
Charge for enclosure:	\$100.00
Charge for installation & set-up:	<u>\$150.00</u>
Total:	\$850.00

C. – Chemical Control – Application of a Fluridone-based herbicide

Coon Hollow Lawn & Pond will provide chemical treatment of the pond – primarily for Watermeal but other pond weeds will also be eradicated. This service includes:

- Application of 24 oz. of WhiteCap SC™, a fluridone-based herbicide, beginning in the Spring when the first signs of Watermeal growth appear.
- Treatment will require manipulation of the water inlet and a slight drawdown of the pond for maximum effectiveness.

Estimate for 24 oz. WhiteCap SC:	\$450.00
Charge for drawdown and application:	<u>\$300.00</u>
Total:	\$750.00