Spring '07

Aquatics Updates

Virginia Lake Management Company

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PREPARING YOUR POND FOR SPRING

—Kevin Tucker, President

Our lakes and ponds tend to be forgotten about during the winter months, as most problems that we experience during the summer months are usually not evident during colder weather. This does not mean that all the problems of the previous summer have gone away. Rest assured, they will usually resurface when the weather warms up with the coming of spring.

One of the best tools we have to deal with the water quality issues in ponds is aeration. It is never too early or too late to consider enhancing your pond through the installation of aeration. Aeration comes in many forms, but the two most common are floating fountain aerators and submersed air diffused aeration systems. Each has its benefits, and often times both types of aeration can be used in combination to maximize these benefits to the pond.

Year round aeration is the single best management practice available to lake and pond owners. There is an inverse relationship between temperature and the total level of dissolved oxygen that water can hold. As water temperatures increase, the dissolved oxygen levels in the pond will naturally decrease. However, when the water temperature decreases, the dissolved oxygen levels in the pond will naturally rise. You can further enhance this increase in dissolved oxygen by running the aeration system during colder temperatures, thus adding even more dissolved oxygen to the water at a time when it is naturally able to accept more.

Additionally, if you already have surface aeration in place, you should consider allowing it to run 24 hrs a day, as the benefits of aeration to a lake or pond are actually higher at night. The photosynthesis and other biological processes at work in the pond during the day when there is direct exposure to sunlight actually help to naturally improve the dissolved oxygen levels in the water. At night, or on extremely cloudy days, the lack of sunlight slows down these processes, typically resulting in lower dissolved oxygen levels in the pond. The benefits of running your aeration system at night are profound, so put some thought into leaving it on all night.

If you have not been thinking about your pond lately, now is the time to start. Spring will be here before you know it!

Inside this issue:

Floating Plants

—Dustin Kennedy, Aquatic Biologist

As lawns, trees, and flowers start to green up for spring, so do the local lakes and ponds. Common duckweed (Lemma spp.) and watermeal (Wolffia spp.) are two of the more common floating plants native to the coastal plains of Virginia and the adjacent areas. They can sometimes be mislabeled as an algal bloom. As with algae, they will cause the surface of the pond to appear as if it is covered with a green mat.

Duckweed is a flat leaf-like plant that has a root structure hanging below and usually is found clumped together in large mats. It is very small and can reproduce very quickly. Watermeal is the smallest and simplest of all flowering plants. There is no root system present and it also reproduces very quickly. Both of these floating plants are able to completely dominate a body of water in a very short period of time.. When covered, the system could become choked out causing drops in dissolved oxygen, which could lead to fish kills.

Duckweed and Watermeal can be effectively treated using aquatically friendly systemic herbicides. Good long term pond management strategies are important to ridding a pond of these problem plants, and helping to insure that they do not come back.

Watermeal that has overtaken a pond is often mistaken for algae blooms. (left) White leaves of duckweed show chlorophyll degradation as a result of SONAR systemic herbicide treatment (above).

Canada Geese Management

—Kyle Finerfrock, Environmental Scientist

The Canada Goose, *Branta canadensis*, found all throughout North America is often incorrectly described as the "Canadian Goose". This species of geese was named after ornithologist John Canada who separated this species from other geese species and not after the country of Canada. Canada Geese can be characterized as migratory or residential. Typically when discussing goose management we are most often concerned with the residential geese populations, because of the problems that they can cause.

Canada Geese can be a nuisance in commercial and recreational areas especially around lakes and ponds. Canada Geese can consume up to three pounds of grass each day which leads to several problems. This large amount of turf destruction can be expensive to replace and can also lead to erosion problems. The consumption of three pounds of turf a day leads to a build up of goose feces. The buildup of feces can be a potential health problem to people and can also cause nutrient loading in the surrounding waterways. During mating times Canada Geese become aggressive and may try to attack people who they feel are threats to their young.

The management of Canada Geese is important both economically and for the health of the people living and working in these problematic areas. You can manage your Canada Goose problem several ways to effectively rid your property of annoying geese. Such solutions include: Chemical deterrents sprayed on the turf,

putting up fence barriers around a pond, and other methods where permits are required. These actions work well when managing a residential goose population especially when several are implemented together. Coming up with a proper plan and working with a lake management specialist will greatly increase your chances of success in your Canada Goose management efforts.

Nutrient Loading Control for the Spring Season

—Matt Dodson, Environmental Scientist

Throughout the winter months your aquatic system has been inundated with leaf litter and other organic debris that have washed in from the previous growing season. This accumulation can be aesthetically displeasing and can also clog your outflow structures leading to drainage and flooding issues. Now is a good time to make sure that your storm water drains are free to flow out in the event of a heavy rain. Spring showers can overwhelm a system where sediment and organic debris has sealed off the metal grates on concrete outflow structures.

As the season progresses and the water warms up, phosphates and nitrates that have been leached into the water column from decaying materials become a fresh nutrient source for nearly instantaneous algal blooms. Some lake owners may have already witnessed filamentous algal growth around the shallow areas of the pond. Algae have bloomed early this year due to the recent unseasonably warm winter.

There are a number of measures that can be taken to remedy this over fertilization of your aquatic system. One very successful measure is to inoculate your lake with beneficial microorganisms that digest nutrients from the water column and convert them to unusable forms. These bacteria can improve water clarity, eliminate odors and black sludge and even 'starve' algae by eliminating its food source. Another method is to apply a flocculent and phosphorous binding agent. This material can be applied to a body of water to remove suspended sediment and sequester phosphates out of the water column.

In addition to managing the current nutrient load, measures must be taken to prevent future loading of the system. When applying fertilizers to your lawn or garden, one should maintain a fertilizer free buffer zone extending up the banks and over the berms of your pond. This rule also applies to weed and feed herbicide products. If you utilize a landscape or lawn service, it is wise to speak with your contractor about their fertilization methods and the impacts it has on your lake. In effect you could be paying for your algae to be fed and bloom, resulting in additional expenses to deal with a problem that could have been avoided in the first place. Often people do not realize that the responsibility of limiting nutrient loading is shared throughout the entire neighborhood or watershed that feeds a lake or pond. Storm water runoff from yards well away from the lake contributes as much or more fertilization as that from yards adjacent to the body of water.

It is important to educate ALL homeowners throughout the community to minimize fertilizer use and control their yard wastes.

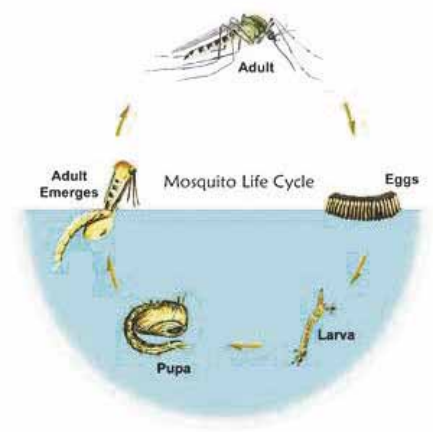
As the grass begins to grow and people begin to cut this spring, keeping lawn clippings from entering the lake can significantly reduce the nutrient source for algal blooms. It is highly recommended that yard wastes be composted as a responsible and sustainable alternative to allowing them to wash into storm water systems or sending them to a landfill. As a property owner or manager, following a few simple precautions to limit nutrient loading of your lake can pay off significantly in long term management.

Mosquito Control Solutions

—Dominic Nigrelli, Aquatic Specialist

Once again it's a season of itching and scratching as mosquitoes breed and begin reaching their adult stage. They can become quite a nuisance, not allowing your children to enjoy summer activities and ruining all outdoor plans! Well, it is time to take control of the situation by taking an appropriate early stage approach, before mosquitoes reach adulthood, and bring tribulations that could have been avoided!

There are three possible approaches that Virginia Lake Management offers in helping reduce future mosquito infestations: **subsurface aeration or floating fountains, fish stocking, and larvicide applications.** Introducing a decorative fountain or subsurface aeration system to your pond, will not only improve the quality of your pond, but also add an aesthetically pleasing look. They also help reduce seasonal pests like mosquitoes by disrupting surface tension and eliminating the stagnant water conditions that are needed for their eggs to develop. The mosquito goes through four distinct stages during its life cycle.
egg - hatches when exposed to water;
larva - (plural. - larvae) lives in the water; molts several times; most species surface to breathe air;
pupa - (plural - pupae) non feeding stage just prior to emerging as adult;
adult - flies short time after emerging and after its body parts have hardened.



Article continues on back page...

Mosquito Control Solutions (continued from previous page)

—Dominic Nigrelli, Aquatic Specialist

Fish stocking is another common method used to control mosquitoes. Healthy populations of fish like bass, bluegill, and minnows should control mosquitoes in ponds. Two species of fish that are specifically recommended for mosquito control in ditches, stagnant pools of very warm water in summer, ornamental ponds, and temporary ponds near your home are **mosquito fish *(Gambusia spp.) and* fathead minnow**. Both species of fish should be stocked in early spring to control mosquitoes. Both species will reproduce through mid summer which will help achieve mosquito control as the fish population expands. Mosquito fish tend to survive summer's stressful conditions of high heat and low oxygen better than fatheads. They would be better suited for a pond without aeration, and typically lower levels of oxygen.

Larvicides make up a third method of control. A variety of chemical insect growth regulators are available that prevent larvae from maturing to the flying adult stage. There are also biological larvicides based on the bacteria ***Bacillus thuringiensis israelensis*** *and* ***Bacillus sphaericus.*** These biogenous insecticides are utilized in a wide variety of applications in agriculture and also work well in the aquatic environment.

No matter which method or combination thereof are used to control mosquito breeding, each one should be introduced at the beginning of the spring season for maximum effectiveness. These measures will pay off greatly in reduced annoyance from insect bites throughout the summer.

Mosquito Fish provide an effective predatory control of larval populations.

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