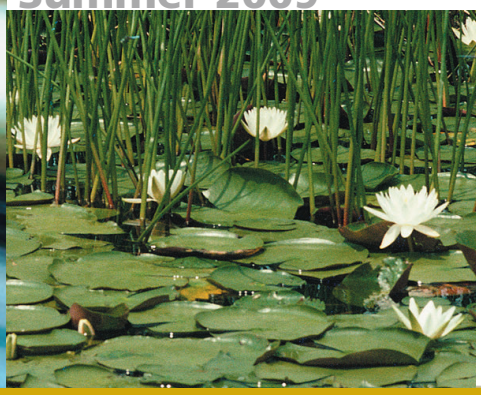
Summer 2009

AquaticsinBrief



Volume 3, Issue 3

Inside:

VIRGINIA LAKE MANAGEMENT

A Full Service Lake and Pond Management Company

Penny Pinching May be Hurting Your Pond

By **Terry Owens, Environmental Scientist**

Over the last couple of months Virginia Lake Management has seen an ongoing trend: requests to reduce the amount of time fountains are running in an effort to lower electricity costs and save money. While economically this makes a lot of sense, ecologically it may be setting your pond up for future problems. During the summer months, ensuring that your pond has proper aeration is critical to effective pond management. Increases in seasonal temperatures cause stratification of the pond. Stratification is the layering of water in a pond due to temperature differences. Imagine warm, shallow water floating on top of colder, deeper water. This causes multiple problems. First, the upper warmer layer of water does not hold oxygen very well creating a habitat unsuitable for aquatic life. Secondly, during periods of prolonged stratification the deeper water's oxygen is consumed by the organisms living there. The upper layer acts as a cap not allowing oxygen to be replaced. Over time, oxygen levels can become dangerously low and could eventually lead to suffocation of the species living in the waters.

It is these associated problems that make it so important to leave your fountain or aerator running during the summer months. These systems provide the dual benefit of both adding oxygen to the water and breaking those stratified layers. Constant movement of the water by the fountain or aerator keeps the water temperature more uniform not allowing those stratified layers to form. Warmer temperatures result in water losing its ability to hold oxygen. Increased oxygenation through increased aeration is critical to maintaining healthy levels of oxygen in your pond. It is for these reasons that we do not recommend decreasing the amount of time you run your fountain or aerator.

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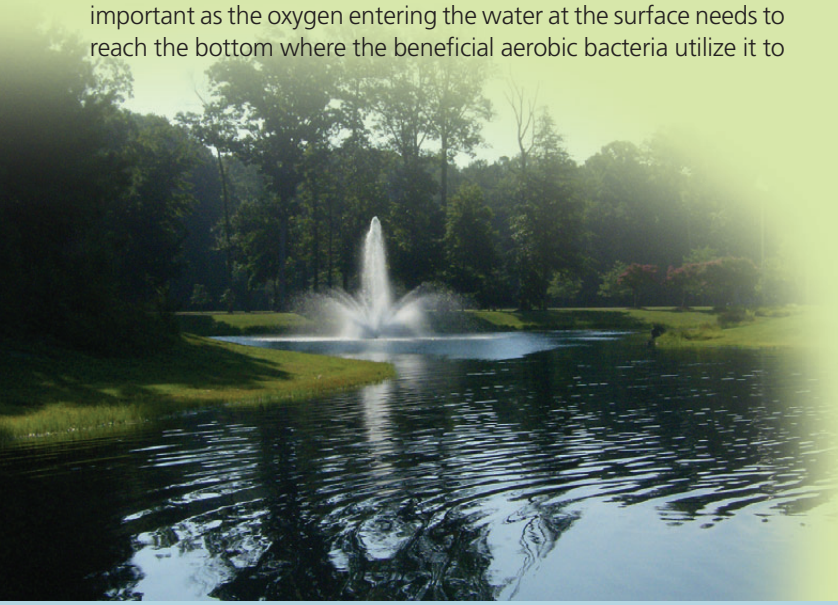
Aerating Fountains Add More Than Beauty….

By **Bill Morgan, National Sales Manager, AquaMaster**

In addition, they add sufficient amounts of oxygen to the water which supports and encourages the growth of beneficial aerobic bacteria. These beneficial bacteria breakdown organic matter and consume excess nutrients which help to balance and improve water quality and clarity by reducing odors, bottom sludge build-up, and algal blooms.

Aerating fountains or Surface Spray Aerators also induce greater mixing and circulation of the water. This discourages thermal stratification (temperature layering of the water). This is important as the oxygen entering the water at the surface needs to reach the bottom where the beneficial aerobic bacteria utilize it to consume excess nutrients enhancing the natural clean-up process of the lake or pond. Thermal stratification impedes this process.



Increased mixing and circulation also aids in deterring insect infestations as with mosquitoes.

Aerating fountains or Surface Spray Aerators are often confused with non-aerating display type fountains that, although attractive, do not provide enough aeration to support any biological impact on the water body. Display type fountains pump low volumes of water via high pressure. Aerating fountains pump higher volumes of water under lower pressure. To ensure aerating capability, look for gallons per minute (gpm) pumping rates of 250 or higher per horse power. Then, size at 1.5 – 2 HP per surface acre for beneficial aeration results.

To ensure aerating capability, look for gallons per minute (gpm) pumping rates of 250 or higher per horse power.

Sizing and placement are critical for success. Consult with your local Aquatic Management Distributor for proper selection, sizing, placement, installation, service, and routine maintenance of your Surface Spray Aerator or Display Fountain.

To sum up, Aerating Fountains not only add overall beauty to a landscape and raise property values. They provide function in the form of aeration which ultimately helps improve overall water quality. ■

Erosion: How it Affects our Lakes and Ponds.

By **Kyle Finerfrock, Environmental Scientist**

An erosion problem in your pond's watershed can have serious effects on the pond's health. Erosion is caused when exposed soil is left unprotected against the affects of wind and water. Over time soil particles can break apart and be washed into a lake or pond. Sedimentation is the deposition of soil particles into a waterway. As sediments build up, the average water depth decreases, and it may then be necessary to dredge your pond. This process can be very expensive and time consuming. The inflow of sediments also correlates to the inflow of nutrients into a pond. A lower water volume with excess nutrients can lead to algae and weed growth. Erosion can also cause turbidity issues. High turbidity in a pond can make the pond look unpleasant and can be unhealthy for the organisms inhabiting the pond.

Proper erosion control efforts can reduce sedimentation, minimize turbidity, and decrease nutrient loading. By adding rip rap or allowing a vegetation buffer zone with beneficial plants to grow around the edge of your pond, you can help to stabilize your shoreline significantly. Sediment fences are often used in construction areas where large amounts of terrain are exposed. Theses fences are effective in controlling runoff but must be inspected and maintained regularly to prevent any breaching. The use of fiber logs can offer a more natural looking erosion barrier. Planting shoreline vegetation in the logs can further enhance their effectiveness in reducing runoff into a pond.

Preventing erosion early before it becomes a problem is important in maintaining your pond's health for the future. Your lake management professional can help you put a good management plan in place which will include steps to protect against erosion and other issues. ■

An Alternate Aeration Solution

By **David Beasley, Fisheries Biologist**

Aeration is the ideal solution to maintaining a healthy aquatic ecosystem. Nutrients accumulate in ponds by both runoff and the natural cycle within ponds. Often times these nutrients are utilized by filamentous algae or vegetation, resulting in an unhealthy, unattractive body of water. Ponds also naturally stratify, setting up with a layer of warmer water above a layer of cooler water. Unfortunately the layer of cooler water is unexposed to atmospheric air, suffocating the bottom half of the pond. As the oxygen depletes, ammonia and nitrite levels increase and within a few months many ponds reduce their living space by 50 percent. Over the course of the summer, the bottom half of many ponds becomes toxic for most aquatic life. Without oxygen, organic matter accumulates forming a black muck throughout the pond's bottom. This is nature's natural way of transforming a pond into a wetland.

Windmill aerators are a good alternative source of aeration.

Aeration is the best tool used to keep ponds healthy and prosperous. Aerating is a form of preventive maintenance that has more benefits than just cutting down on algae growth. Aeration can make or break the health of an ecosystem; and every pond, no matter the location, has a need for aeration. Modern upgrades in technology allow for an efficient, alternative variety of aeration solutions. Windmill aerators are a good alternative source of aeration. With innovative advances in technology, windmills can operate more effectively with less maintenance than ever before. Every pond has individual needs and windmill aeration is not the answer for all ponds. In situations where aeration is needed 24/7, electric powered units are the right choice. In situations where nutrients need to be managed and the pond needs to destratify, windmills will work well. Windmills are great in remote locations where electric power is not available or in ponds where intense aeration is not necessary. In some situations teaming windmill units with electric powered aeration systems is a great choice. Many times windmill aeration can provide sufficient aeration throughout the day, but as the wind diminishes throughout the night, powered aeration on a programmable timer could be used to fill the void, reducing electric costs while helping the environment. Windmills can be customized with different color powder coated paints, making them aesthetically pleasing. Also using logos or art work, each windmill can be unique to the individual property. .

In an effort to further our commitment to providing energy-efficient and environmentally friendly products, Virginia Lake Management now offers wind powered aeration. Outdoor Water Solutions has worked together with a team of engineers to develop the most advanced technology available for wind driven aeration on the market today. "BalCam" technology revolutionizes the industry by significantly increasing the amount of air produced with a single diaphragm utilizing a new balanced camshaft system. These windmills have the longest warranty in the windmill aeration market with a industry leading five year warranty.

A windmill aeration system is an economic, safe, low maintenance and attractive option to reduce sediment and help decompose all organic materials in your pond. Whether you are showing that you support green energy with an aesthetically pleasing model or are using the unit to keep and aquatic ecosystem prosperous, windmill aeration should be considered. ■

Penny Pinching

Continued from cover

Ideally, your fountain should run constantly to ensure that it is offering the maximum benefit to your pond. However, if you are truly concerned about the amount of time your fountain is running, there are a few more effective ways of cutting energy without negatively affecting your pond. First, turn off the lights if your fountain has them. Lights offer an aesthetically pleasing aspect to your fountain but offer no benefit to the pond from an ecological standpoint. Simply turning off the lights or reducing the amount of time they are on can lower energy costs without impacting the pond's health. Setting your fountain's timer to power off intermittently during the day can also help with energy costs. We advise that these "off" periods last no longer than thirty minutes per three hours. Spacing out your shut off times for the fountain can lower run time without having as drastic of an effect on the pond. Most fountain owners are tempted to turn their fountain off at night; however, turning your fountain off for consistently long periods of time each day may be just enough for stratification to occur causing further pond damage.

These are just a few money saving tips that we can offer to help you save some money without sacrificing the health and quality of your pond. Always contact your pond manager if you have any questions about the on-going care of your pond and fountain aeration system. ■

In the Buff

By **David Ellison, Aquatic Biologist**

Vegetative buffer zones are important areas along the perimeter of your pond that will provide multiple benefits. There are many desirable wetland plants that will thrive along the edge of the pond, and many upland (dry) plants that will thrive along the land side edge of the buffer.

Buffer zones can reduce algae blooms by preventing excessive amounts of nitrogen and phosphorous entering the pond.

Reducing nutrients entering the pond, stabilizing the pond bank, and providing habitat and shelter for waterfowl and other aquatic creatures are among many of the benefits of having a healthy buffer zone.

Buffer zones can reduce algae blooms by preventing excessive amounts of nitrogen and phosphorous from entering the pond. As water enters the pond the plants assimilate nitrogen and phosphorous and utilize these nutrients for growth. This is vital to overall pond health as excessive amounts of these nutrients often cause algae blooms and lead to poor water quality.

Erosion along pond banks can also decrease water quality when soil from erosion enters the pond and adds extra nutrients to the pond, creating a turbid aquatic environment. A well maintained buffer will stabilize the substrate and prevent loss of the pond bank. The width of the buffer can vary, but should be more than a couple of feet to allow for multiple plants to protect the pond. Protection from predation is also available for many animals within the buffer zone.

In ponds with extremely shallow banks some aquatic plants will also provide the same benefit as plants along the aquatic-land interface. Pickerelweed is one such plant that takes up excessive nutrients, provides protection for fish and ducks, and

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Getting to Know Your Aquatic Weeds: Hydrilla

By **Lee Abernathy, Environmental Scientist**

Of the number of weeds that are found in your pond there are many that can cause more issues than others. One of these plants is hydrilla. Released in the United States in Florida waterways in the 1960's, hydrilla has now established in many states. The eradication of this invasive weed is costing millions of dollars each year. This weed spreads very quickly, clogging waterways, wrapping around boat propellers, and even getting tangled around the legs of unsuspecting swimmers, resulting in drowning. It is a submersed plant that can grow to the surface and form dense mats. It may be found in all types of water bodies from stagnant ponds to flowing mountain streams.

Hydrilla stems are slender, branched and up to 25 feet long. Hydrilla's small leaves are strap-like and pointed. They grow in whorls of four to eight around the stem. The leaf margins are distinctly saw-toothed. Hydrilla often has one or more sharp teeth along the length of the leaf mid-rib. Hydrilla produces tiny white flowers on long stalks. It also produces 1/4 inch turions at the leaf axils and potato-like tubers attached to the roots in the mud. The tubers can lay dormant for several years making control of these plants difficult.

Hydrilla can be controlled in a number of ways. The most popular way of controlling this plant is through the use of aquatic herbicides. The use of contract herbicides may only result in temporary control, but choosing the correct systemic herbicide may provide more long-term control. Lake drawdowns (lowering the water level) are another method of control which exposes the plants causing them to die and decompose. Grass carp will consume hydrilla making the addition of grass carp to your pond also an effective control method that is more natural than the use of herbicides.

Due to the invasiveness of this plant, measures need to be taken for control at first sight. This plant can grow up to an inch a day and the more that it spreads, the harder it can be to control. Contact you aquatic specialists for the best method to control and eliminate hydrilla and any other nuisance aquatic weeds. ■

"What Is That Ugly, Nasty-looking Growth In My Pond?"

By **Randy Bolin**

Probably the most asked question in the lake management industry is "What is that ugly, nasty-looking growth in our pond, and why does it always come back?" The answer to that question ninety percent of the time is: "it is algae" and the majority of that time, it is what we refer to as "filamentous algae."

There are many different species of filamentous algae, but all have a similar appearance, and growth habit. These algae colonies begin their growth in the late winter and early spring on the bottom of the pond, as warmer temperatures and sunlight activate the spores and surviving cells. Most filamentous algae growth begins in less than 3 feet of water where sunlight penetrates to the pond bottom. Algae growth is sometimes referred to as a "bloom" because the algae grows so quickly. In the case of filamentous algae, single cells reproduce and join together into long, hair-like strands or colonies that grow toward the water surface. By mid-summer, these strands form large mats that trap gases and float to the surface. These floating mats normally begin to appear in early summer, and by late summer, it may cover the entire pond. Most forms of filamentous algae prefer stagnant, nutrient-rich, warm water conditions found during the summer in many ponds and lakes.

All types of algae are important to pond and lake ecology, because they serve as food sources for protozoa, insects, and fish; however, filamentous algae frequently reaches nuisance levels.

All types of algae are important to pond and lake ecology, because they serve as food sources for protozoa, insects, and fish; however, filamentous algae frequently reaches nuisance levels. Their abundant growth can result in a number of management concerns, including aesthetics, swimming nuisance, and interference with fishing. Abundant algae can also cause fish kills in late summer and fall as the dying algae consumes oxygen from the pond water. Where algae levels interfere with pond uses and goals, various control strategies can be used to prevent or reduce algae growth.

Any overabundant plant growth is a symptom of excessive nutrients (phosphorus and nitrogen). These nutrients are the essential parts of most fertilizers, which through runoff from barnyards, crop fields, septic systems, lawns, and golf courses greatly increase the high nutrient levels that exist in our ponds and lakes today. Long term control of filamentous algae or other aquatic weeds is best accomplished by reducing or redirecting nutrient sources from your pond and lakes. This can be done by reducing fertilizer applications near the pond, maintaining septic systems properly, redirecting nutrient-rich runoff away from the pond, and maintaining vegetative buffer strips around your pond or lake.

Many pond owners that lake management companies encounter on a daily basis fail to recognize or address the underlying nutrient causes of aquatic plant or algae growth. This is why we are frequently asked the question, "What is that ugly, nasty-looking growth in our pond, and why does it always come back?" ■

Virginia Lake Management Announces New Office in Delaware

Virginia Lake Management is proud to announce that we are once again expanding. We recently opened our Georgetown, Delaware office in an effort to build on our existing client base and allow us to more efficiently serve our existing clients in this area. This move further demonstrates our commitment to serving this region and our dedication to providing all of our customers with the excellent customer service that has been a cornerstone of our company since its inception. The Delaware office will help the Virginia Lake Management staff to continue to provide comprehensive, long term management plans for lakes, stormwater ponds, wetlands and other bodies of freshwater and to bring focus to our ever-expanding market. We currently serve Virginia, West Virginia, Delaware, Maryland, Pennsylvania and North Carolina. Opening the Delaware office will centralize operations for the company, build on our regional service base and allow growth into New York and New Jersey in the months to come. ■

Mosquito Riddance

By **Greg Blackham, Aquatic Specialist**

The war between humans and mosquitoes is a timeless one. Mosquitoes have spread more diseases and death worldwide than any other cause. It is well known they can spread West Nile virus, malaria, dengue fever and many others. They also rate very high on the top ten most annoying insect's list, completely able to ruin a nice day outside within minutes. They can breed in the smallest pockets of standing water, which brings us to our problem: your pond! With the potential to house millions of eggs, you could find yourself on the front lines!

There are many ways to drastically minimize the amount of mosquito activity on your pond. One of the easiest ways is to keep the water from remaining stagnant by adding a fountain or pump capable of disrupting the surface of the water.

A single female mosquito may lay anywhere from 100 to 300 eggs at a time, which occurs on average 5-7 times in her lifetime. An egg can become an adult in as early as 4 days, but the species generally found in ponds usually take longer, closer to two weeks. As an adult, they generally prey close to where they originated. They track their potential hosts by sight, scent and heat. Some are very picky eaters, possibly only targeting birds or people, while others will draw blood for egg development from anything they can find. Their entire life cycle is roughly a month, which is plenty of time to do a lot of damage.

There are many ways to drastically minimize the amount of mosquito activity on your pond. One of the easiest ways is to keep the water from remaining stagnant by adding a fountain or aeration system capable of disrupting the surface of the water. Another way is to add specific species of fish. Having more fish in your pond can play a significant role in reducing mosquito populations. Bass, bluegill, minnows and catfish all feed on mosquito larvae. Tadpoles can reduce larvae populations also, and when they become frogs or toads they will consume large amounts of adult mosquitoes. Gambusia affinis, also known as western mosquitofish, can consume massive amounts of larvae, but should be carefully considered. They have a tendency to replace native fish populations due to their aggressive nature and ability to starve other fish during their competition for food.

Altering the environment and structure of the pond is another method to minimize mosquitoes. Vegetation growing in the water and along the edge can create pockets of calm and shady water even if you have a large fountain agitating most of the surface. Overhanging bushes and trees also support ideal shady locations, so clipping these back is a good idea. Areas that flood frequently, but take a couple weeks to dry, along with shallow water, can create a big problem also. Digging shallow areas deeper and eliminating any gradual slope on the embankment is a very good idea; not only will it cut the mosquito population down, it will also help with algae and nuisance vegetation growth as well.

Biological larvicides and other insecticides can be an excellent way to control mosquitoes. There are many formulations for a variety of scenarios, with no known risks to the environment when applied at the proper rates. Usually this type of treatment will last around a month per application and can be used throughout the breeding season to achieve year-round mosquito control.

Using a combination of these techniques, I wish you a pleasant bite-free walk around your pond. Good Luck! ■

In the Buff

Continued from page 4

is aesthetically pleasing with the purple flowers it produces. Some of the desirable plants in a buffer zone from aquatic to upland plants are pickerelweed, rushes (soft, blue), Japanese silver grass, dwarf fountain grass, and other shrubs at the landward edge of the buffer.

Buffer zones should consist of moisture loving plants along the pond to plants requiring little saturation periods as you near the edge of the buffer. Trees should not be planted in buffer zones as their roots will often eliminate the plants that will be more beneficial in nutrient uptake than trees. Trees already in a buffer zone can remain to help stabilize banks, but should be trimmed so they do not take over the buffer. Also, fewer pesticides are often needed in ponds with well established buffers. Establishment of a buffer zone will provide long term benefits in maintaining a healthy pond. ■

When a Warranty is Not Enough . . .

By **Shannon Junior, Aquatic Ecologist**

I'm sure that we can all appreciate the importance of a good manufacturer's warranty for the products that we purchase. But it is never a good idea to assume that a warranty can take the place of regular maintenance activities. New cars come with a warranty, but most of us will still continue to change the oil, replace the air filter, check the tire pressure, etc. However, we frequently deal with clients that have neglected to properly maintain their fountains or aerators with the expectation that they are protected for any and all repairs that may be necessary during the warranty period. But even the best warranty will not cover damage to equipment caused by wear and tear, vandalism, "acts of God", or lack of maintenance.

Fountains and aerators need regular maintenance just as much as cars do. For fountains, we recommend monthly checks to be sure that the motor is running at normal amperage and voltage, the breakers and timers are functioning properly, the intake screen is clear of debris, and the anchors are secure. Most motors also require periodic oil changes and seal replacement. If you leave your fountain in the water during the winter, it should be run constantly and monitored for ice accumulation. If there are lights, the lenses should be cleaned frequently. Algae or sediment build-up on the lenses can cause the bulbs to overheat and burn out prematurely.

For submersed diffused air systems, it is imperative that the exhaust fan is checked frequently to be sure that it is running, particularly during the summer months. An inoperable fan can cause damage to the compressor from overheating. The air intake filter also needs to be checked periodically and cleaned or replaced as necessary. And the compressor should have the carbon vanes or pistons changed at the recommended maintenance intervals.

In certain circumstances, even properly maintained equipment needs repairs that are not covered under the manufacturer's warranty. Cable damage from abrasion or animal chewing would not be a warranty issue. In high debris ponds, fishing line or plastic bags can be sucked inside of the intake screen where they are not visible – if these items become wrapped around the shaft at the base of the motor, they can actually cause grooves in the shaft and seal failure. We once removed 16 plastic bags from the shaft of a fountain! This type of situation is considered abnormal wear and tear, which would not be covered under the warranty. One of our clients had to replace lenses on their fountain lights two months in a row because kids kept throwing rocks at them. For the most part, though, we have found that non-warranty damage is rare when the equipment is checked and maintained on a regular basis.

Of course, there is always the story of the Honda that ran for 100,000 miles without ever having the oil changed. We hear similar stories about fountains that were installed and neglected that managed to run for years without ever being touched by human hands. These stories are the exception rather than the rule. Just like a car, your fountain or aeration system will perform better, cost less to operate, and last longer if it is properly maintained. ■

Check Us Out…

Virginia Lake Management will be participating in the following events over the next couple of months. We encourage you to come see us! If you need information on attending any of these events, please call our office.

Jul. 25 The Pennsylvania/Delaware Valley Chapter of Community Associations Institute (Poconos Council) presents: *Lake and Recreation Safety*, Speakers: Shannon Junior, Aquatic Ecologist and Terry Owens, Environmental Scientist, Hawley, PA

Jul. 31 – Aug. 2 The Virginia Leadership Retreat, hosted by the Southeastern Virginia Chapter of Community Associations Institute and the Central Virginia Chapter of Community Associations Institute, The Boar's Head Inn, Charlottesville, VA

Sept. 17-19 Pond Boss Conference & Expo, Big Cedar Lodge, Ridgedale, MO

Sept. 24 The Chesapeake Region Chapter of Community Associations Institute Expo and Business Provider Showcase, Martin's West, Baltimore, MD

Sept. 25 The North Carolina Chapter of Community Associations Institute Annual Conference and Expo, The Renaissance at North Hills, Raleigh, NC

"Pond"er These Thoughts

Virginia Lake Management wants you to be prepared for summer. With this is mind, we recommend you consider the following tips as you enjoy the summer months on your lake or pond:

- Summer is not the only time our ponds need help. Although issues seem to "surface" in the warmer months, a year-round maintenance plan is the best thing to ensure a healthy pond all year long.
- Mosquitoes can ruin summer fun. Think about stocking your pond with minnows or other fish that help to control the mosquito population. This along with larvicides and proper aeration can eliminate a potentially big problem.
- If you live on a lake bank, remember to respect the natural buffer around the lake and never mow all the way to the water. Also, be sure to keep clippings and other debris out of the water as this adds nutrients and spurs algae growth.
- Summer is the perfect time to think about aeration. The warmer water temperatures can cause changes to the health of your pond. Keep the cooler water on the bottom constantly circulating and increase oxygen to the aquatic life by adding an effective and cost-efficient aeration system.

VIRGINIA LAKE MANAGEMENT

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