

GRASS CARP - MIRACLE FISH OR UNWANTED EXOTIC PEST

Kevin Tucker, President, Virginia Lake Management Company

As responsible lake managers, we are tasked with managing lakes and storm water ponds in a manner that is not only cost effective and beneficial for the customer, but also environmentally friendly and ecologically balanced for the specific ecosystem in question. As such, we often implement strategies that are multi-faceted, utilizing the benefits of many tools in combination to get the job done. Ecological balance is rarely obtained by utilizing only one methodology, and without balance, there is rarely good results.

"Biological controls" come in many forms, and refers to the use of natural or biological introductions to a given water body to help achieve a desired management objective. Triploid (sterile) Grass Carp (white amur) are often used by lake owners and managers alike to help control unwanted aquatic vegetation, due to their ferocious appetite for vascular plants growing in or around a lake. These fish are regulated by the VA Dept of Game & Inland Fisheries, and a permit is required in order to have them stocked in your lake or pond. They are also required to be sterile, so that they do not over produce and potentially cause harm to lakes and down stream waters by over eating and destroying the beneficial wetland and aquatic plants that are a vital part of our waterways.

So, what is a pond owner or lake manager to do if they wish to promote biological solutions to their lake problems and minimize the amounts of algaecides and herbicides applied to their water? Should they stock sterile grass carp? The answer is far from simple...

As environmental stewards, we seek to avoid the introduction of exotic plants, fish, or any aquatic life that is non-native and not indigenous to our area, as that will typically upset Mother Nature's balance and cause unintended consequences down the road. Grass carp are not native to North America, so we have to be careful if we decide to use them as a management tool. The fact that they are sterilized at the time they are grown is a step in the right direction, but other measures need to be considered.

First, do not over stock. A lake or pond is not supposed to be a "bathtub", baron of all forms of vegetation. 20-30% coverage of native aquatic and wetland plants is needed for a healthy and balanced pond. Beneficial shoreline vegetation along with some of the native submersed species should be supported and allowed to prosper. Therefore, if using grass carp to control unwanted aquatic weeds and vegetation, you should only stock enough to eat a particular quantity of plants per day, but not enough to wipe out all of the plants that inhabit the pond.

Second, if your pond has an outflow device that would allow the fish to escape during heavy flow after significant rain events, then you should install a screening structure in front of that outflow to prevent the fish from swimming down stream. The grass carp are drawn to fast moving / flowing water, and would likely leave the pond at the first chance if conditions were right. Not only would you have wasted your money and efforts if the fish escape, you will have also created the potential for down stream destruction of valuable aquatic habitats, something that must be prevented at all costs.

Finally, grass carp are primarily bottom feeders. As such, they have a tendency to stir up the sediment on the bottom. Often times in shallow ponds, this results in excessive turbidity (cloudy, dirty, brown looking water). Even if they eat all

of your unwanted weeds, if you end up with a dirty looking pond all the time, all you have done is replace one problem with another.

There are many other things to consider when stocking fish of all types. When managing a lake, these and all other parameters should be considered while formulating a long term plan. A little education and foresight goes a long way towards achieving the desired results and overall satisfaction, while minimizing unwanted environmental impacts.

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EROSION CONTROL AND YOUR POND

Lee Abernathy, Environmental Scientist

There are many problems that can plague your pond. These can range from algae to submersed weeds to decreased dissolved oxygen. Another problem that is sometimes overlooked is erosion. Erosion around your pond is caused by wind, rain, critters that tunnel, etc. and can be very detrimental to the health of your pond. An increase in sediments correlates, in most cases, to an increase in the amount of nutrients entering the pond. The excess nutrients are taken up by algae resulting in an unsightly bloom. This bloom can cause further problems by decreasing the amount of dissolved oxygen in the pond following the decomposition of the algae when it dies. Excess sediment also causes the pond to become shallower and makes dredging necessary sooner.

Erosion is a problem that must be controlled to insure the health of your pond and often goes unnoticed until there is a problem. It can be seen on the banks of the pond where there



is no vegetation to hold the substrate. You may notice washouts or slumping of the land in the case of a pond having a steep bank, all caused by erosion.

Maintaining vegetation on the banks and around the edge of the pond is the simplest solution. This will hold the substrate in place and prevent excess nutrients from entering the pond. Vegetation will absorb those extra nutrients and help keep your pond clear of algae. Planting native vegetation can be very beneficial, as native plants easily thrive in these areas and do not cause problems like some exotic plants. Pickerel weed, for example, is a beneficial native plant that grows at the water's edge and is also pleasing to the eye.



Placing rip rap stone around your pond will stabilize the banks, preventing them from sliding into the pond. This simply involves putting stone around the pond, which can also make your pond aesthetically pleasing at the same time. The benefits that come along with rip rap are significant and deserve consideration.

Erosion prevention can occur before the first scoop of dirt is removed when digging a new pond. Making plans to avoid steep slopes and considering the beneficial vegetation that will help stabilize the banks of your pond will prove to be advantageous in the life of your pond. In existing ponds, rip rap may be just what you need to stop sediments from entering your pond, thus improving the health of this asset. Vegetation will also play a key role and can turn your pond into a thing of beauty. Erosion can be a serious issue for ponds and requires attention when present.

IS THAT STUFF SAFE?

Terry Owens, Environmental Scientist

This question is frequently asked of our technicians while they are performing pond maintenance. Most commonly we encounter this question when we are treating a pond for algae or aquatic weeds. The question is focused on the products we are applying to the pond. The products you see us spraying, either by backpack, vehicle mounted sprayer, or boat, are commonly algaecides or herbicides, depending on what aquatic problem we are treating. Most importantly, to answer the question, YES these products are safe.

The algaecides and herbicides we apply have gone through a rigorous testing process by the Environmental Protection Agency along with State and Local governments to document any negative effect on the environment. The products that pass these tests are given both EPA and state registration numbers certifying that they are safe and able to be used as labeled, and then allowed for use in the public sector. This means that the products we apply have been deemed non harmful to the environment when applied properly and in accordance with the label. To insure that the herbicides and algaecides are applied properly, all of the Virginia Lake Management field staff are certified pesticide applicators and have completed all of the training, field work, and passed all the tests required to legally apply all pesticides in the states in which we work. This training includes regular continuing education and field testing on the latest products that come to market. Our staff is also industry and manufacturer trained and certified in many of the specific products we use for the safe and ecologically balanced management of our customers' ponds.

"Will that stuff hurt the fish?" The other most common question we come across while treating a lake. Here the answer to this question is NO. The herbicides and algaecides we employ have been tested as mentioned above to see the negative effects on animals both living in and surrounding the pond and have been proven to be nonharmful to these organisms. The algaecides and herbi-

IS THAT STUFF SAFE?

cides are designed to target specific organisms. This means that the products can effectively kill algae or specific aquatic weeds without damaging other plants or wildlife in the same areas. In conjunction with using species specific products, Virginia Lake Management staff, as part of our commitment to environmental stewardship, only use just enough product to treat the specific problem area, further limiting the impact on surrounding plants and animals.

Overall Virginia Lake Management is committed to limiting its impact on the environment by following the standards and practices set forth by both federal and state governments and regulatory agencies. Our company wants to ensure you that the products we apply and the application methods utilized are both safe and in compliance with all regulations. If you have any questions on the products we apply please consult our website at www.virginialakemanagement.com. Most importantly, do not use any of these products yourself without consulting the label, and do not hire anyone to apply them for you who is not a licensed pesticide business and whose applicators are not individually licensed aquatic pesticide applicators. Never hesitate to ask for proof of licensure...a professional and reputable applicator would be honored to show his or her credentials.

GETTING TO THE BOTTOM OF THE PROBLEM

David Ellison, Aquatic Biologist

any times when we treat a pond a homeowner indicates their desire to "have my pond looking nice again". Sometimes a one time herbicide treatment is only rectifying the current problem and not providing a preventative solution to issues concerning their lake or pond.

Often times a pond that is heavily loaded with weeds will be treated and the treated material dies off resulting in the release of nutrients that cause algae blooms. Decaying plant material settles to the bottom creating an organic layer that becomes a source of nutrients that new plants can use to grow. This cycle can continue and eventually the bottom of the pond becomes heavily loaded with sediment or sludge.

In addition to providing a source of nutrients for future algae and weed growth, this thick layer of organic matter will also reduce the amount of dissolved oxygen in your pond. Adequate levels of dissolved oxygen are required for your pond and the organisms in it to remain healthy. Aerating your pond would be the most beneficial approach to fixing a dissolved oxygen problem. This added oxygen also accelerates the bacterial decomposition of the sludge.

Bioaugmentation is another option for pond owners. This adds beneficial microbes that enhance the existing biological processes occurring in the pond. Regular treatment will increase the consumption of nutrients by bacteria, decrease the supply of nutrients available for algae growth, and decrease the amount of sludge in the pond. Biological treatment combined with aeration provides a multi-faceted approach that will greatly improve the health of your pond.

Treating the symptoms will cure the problem in the short term, but not provide ecological balance to your pond. As responsible pond managers we are looking to not only treat any current issues your pond may have now, but also prevent any future problems that may arise. Having your pond checked regularly by an aquatic specialist is important to keeping it looking the way you desire.

Non-Point Pollution

Randy Bolin

A lithough the state of Virginia has spent over \$600 million in recent years to upgrade Point Pollution such as sewage plants and industrial systems that directly pipe their waste into state waters; they have spent less than 10 percent in the same period to improve the effects of **Non-Point Pollution**. Examples of **Non-Point Pollution** which account for 67 per cent of the nitrogen and 36 percent of phosphorus flowing into the Virginia portion of the Bay are runoff from city streets, storm water drains, lawns, farmlands, gardens and development sites. Nitrogen and phosphorus are the primary nutrients that are choking the Bay. In excessive amounts, nutrients spark algae blooms, which in turn rob oxygen from waterways and can kill fish and shell fish.

Mud sediments from farm fields can cloud surface waters, as well as smother underwater grasses that breathe life in to the Bay and provide habitat for baby crabs and fish.

With the majority of the high nutrient levels coming from **Non-Point Pollution**, the state of Virginia needs to focus on helping the farmer and landowners by funding projects that will work toward decreasing the phosphorus and nitrogen levels that flow into the Bay.

NON-POINT POLLUTION

It is similar with lake and pond management; we deal with the same problems in treating the ponds and lakes within the state; high nutrient levels from runoff affect the nearby storm water ponds the same as it does the Bay. Quality pond management helps to reduce nutrient levels through the use of Beneficial Aerobic Bacteria, and Aeration.

Beneficial Aerobic Bacteria are made for the purpose of metabolizing excess nutrients in the water and digesting organic matter and

bottom sludge, thus removing primary cause of algae and preventing future algae growth.

Aeration breaks the cycle of stratification to lower nutrients and restore dissolved oxygen to levels safe for fish and other desirable organisms.

Before we can have the great impact that most environmentalists want for the Chesapeake Bay, we must first concentrate on reducing the larger problem of Non- Point Pollution.



MANAGEMENT

June 1, 2008 Virginia Beach, Virginia

VLM & EQR ANNOUNCE STRATEGIC PARTNERSHIP

Virginia Lake Management Company and Environmental Quality Resources (EQR) have formed a strategic partnership to help provide both firms with the ability to better serve their customers. Virginia Lake Management Company brings its many years and considerable knowledge and experience in lake and pond management services into this partnership, allowing EQR to expand and improve its service offerings and help its existing customers better manage their lakes, ponds and other water resources. EQR is an industry leader in environmental, wetland, and pond construction; dredging, erosion repair and prevention, stream restorations, and more. This partnership will allow Virginia Lake Management Company to improve its capabilities and offer all of its customers the help needed for lake and pond structural repair issues and similar construction related projects. "Both of these firms are the best in the industry at what they do, and together, there really is no lake or pond related project that they can't tackle. Our customers are better for it...the customer is the real winner here"

> You can visit their websites at www.virginialakemanagement.com • www.eqri.com

RETENTION VS. DETENTION

Dustin Kennedy, Aquatic Biologist

hat is a storm water BMP? It is the best management practice implemented to manage and control the storm water runoff from a given area. These structures or devices are put into place to filter and collect nonpoint pollution. They are usually known as retention ponds or detention ponds, but there is a difference between them.

A retention pond, also known as a wet pond, is an area used to filter pollutants and control storm water runoff to prevent flooding and downstream erosion. These areas will hold water at all times, allowing the sediments and pollutants in the water to settle to the bottom in between rain events so as not to have "dirty" fast moving water flow down stream. They are usually not installed specifically to become aquatic habitats for wildlife, but often times they do evolve into just that. From a design and functional standpoint they are strictly used for the management of storm water runoff.

A detention pond, also known as a *dry pond*, is a structures built to hold water temporarily during storms and times of flooding. They allow time for the water to percolate through the bottom soils and/or runoff at a controlled rate. In either case they are removing pollutants from the waters before they enter larger bodies of water. They are designed to be dry at times of no rain. Ideally, they are heavily covered in beneficial vegetation which will further help to filter the inflowing water as it passes through the system.

All of these ponds are used to improve water quality in nearby streams, rivers, bays, and other down stream waterways. They are extremely important to the overall water quality in our area, and as such, should be managed properly.

LITTERBUG ALERT By Shannon Junior, Environmental Scientist

ne of the least desirable activities that I perform on a monthly basis is the removal of trash from ponds and lakes that we service. You would not believe the stuff that we pull out of ponds! The usual suspects are plastic bottles, cans, children's toys, soggy newspapers, plastic grocery bags, paper cups, and hundreds of pieces of Styrofoam "popcorn". I have also had the pleasure of removing tires, appliances, bicycles, shopping carts, "For Sale" signs, miscellaneous auto parts, shoes and clothing, dirty diapers, and lots of other disgusting items that I won't mention. There is even a king-sized mattress lying on the bottom of one of our ponds – it will remain there indefinitely because it is not visible from the shore, and the client is not thrilled with the extra cost involved in removing a waterlogged mattress off the bottom of the pond.

All of these items ended up in the water because humans were careless, lazy, or downright spiteful in their handling of their garbage and their attitude towards the environment. Carelessness is almost excusable – we've all accidentally dropped a bottle cap that rolls into the storm drain or had a paper cup blow out the back window of our cars. But what about the bike that we dutifully pull out of the water and leave on the shore with the hopes that the child who lost it will reclaim it? Guess again – there it is in the pond again the next week! And the mattress? I just can't understand why it's easier to dump a mattress in a pond than to take it to the landfill. If only I could force the people who would do something like that to assist me in litter patrol for a month or two!

Recently, though, a new possibility has crept into my mind. At one of our properties, we consistently remove several carefully-tied bags of dog poop from the pond. Certainly, a responsible dog-owner who would go the extra mile to pick up after their dog would not just toss it in the storm drain afterwards, right? It has occurred to me that there is a distinct possibility that maybe there are people who don't know that storm sewers do not flow to the landfill or some mysterious "trash collection apparatus". Maybe they just don't realize that they discharge directly into our local ponds, streams and rivers. So perhaps education is the key. Maybe if we all share these common sense reminders with the members of our communities, it might help to keep some of the trash out of our ponds and waterways:

Be aware that the storm drains in our neighborhoods flow directly into a pond, stream, or river. Fish, turtles, and frogs do not appreciate our



trash in their homes. Placards like the one [bside] can be placed on the sewers in your neighborhood as a reminder.

- 2 It's helpful to bag all garbage when it's put out by the street for pick-up, even if it's in a can with a lid. It doesn't take a very strong gust of wind to topple a can and send the garbage blowing. Trust me – cans and lids are among the items we frequently remove from ponds.
- 3 If there are common areas in your neighborhood, it is a good idea to provide convenient trash receptacles nearby, and to have them emptied frequently. Many trash removal and landscaping companies provide these services for very affordable prices.
- Virginia is ranked among the top ten states in the nation for our litter control programs, with fines for offenders of up to \$1,000.00. So if you were to ever consider tossing your empty water bottle on the ground instead of taking the extra minute to put it in an appropriate recycling or disposal container, keep in mind that there may be a Police Officer (or a concerned Lake Manager) lurking nearby to set you straight!



A CAT'S TALE

Greg Blackham, Aquatic Specialist

When asked to think of the first plant you see when imagining a pond or lake, what do you see? Cattails (or Typha) would definitely command a lot of space in this visual. There are cattails almost everywhere you see water, and if there is not, there is a good chance they are being controlled, or another more invasive species has set up shop. Why is this? There are many different species of cattails across the world, and all seem to be doing quite well, in fact they have become a big problem. They are invading our waterways and lakes at an alarming rate. So why now? What has changed?

Your first guess, that it has something to do with humans, is of course always right. By manipulating, damming, and redirecting water flow, we have created a very favorable environment for cattails, due to the fact that they are one of few plants that thrive on instability and fluctuation. Our excess pollution and nutrient loading has fueled their feeding, and in congruence has stifled some of the competitors with less tolerance to these chemical intrusions.

If that was not enough, it seems that a cattail hybrid has emerged on the scene, with an even more invasive agenda. Typha X glauca is a combination of the more adaptable traits into a new breed of cattail.

Cattail plants create dense infrastructures through underground rhizomes that crowd out other native plants, and also use this system to help overwinter. The "cattails" themselves produce anywhere from 20,000 – 700,000 seeds that can germinate in a wide variety of substrates and environmental conditions, and can quickly start a large new colony of plants. This formula for reproduction and expansion could easily dominate a body of water, possibly reducing open water by half and crowding out all other plant life. Control of these plants is a high priority, ideally before they are established. Even after initial treatment and removal of the parent plants, you can expect to see their aftereffects for years following. The best time to treat them is late summer into fall, when they are starting the translocation process, which is when they are sending their nutrients downward towards the rhizomes for their sustenance through the winter. Spring is the best time to spot treat new growth as it emerges so that you control it before it has a chance to grow tall and spread.

We may have visualized our imaginary pond with clumps of cattails scattered artistically about, but did we advance the slide ahead, to the image of a cattail dominant wall of head high growth all the way around our pond with no water in sight?



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