



Aquatics **in** Brief

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Anchors Away?

"A Bug's Life"

By **Matthew Phillips, Aquatic Biologist/Environmental Scientist**



Damselfly

When referring to insects associated with bodies of water, people often think of pesky mosquitoes or the painful bites of black flies and horse flies. There are, however, several other types of insects that begin their lives in bodies of water. Two of these critters are dragon and damselfly nymphs. These creatures are both found in the Order Odonata, with dragon flies being in the suborder Anisoptera and damselfly nymphs found in the suborder Zygoptera. Telling them apart is quite easy. When they land, dragon flies tend to keep their wings out and apart or perpendicular to their body while the damselfly nymphs will fold their wings back, lining them up with their body. Most people associate these two insects with bodies of water, often buzzing and darting quickly around or hovering still in one place. Few, however, might realize how valuable of a predator these bugs really are.



Dragon Fly

Dragon and damselfly nymphs, like many other insects, begin their life in a body of water. Eggs are laid, typically in or on a piece of emerged vegetation or on the water surface itself. They go through several instars or molts before reaching adulthood. While they are a larvae or nymph, they live their entire life in the water where they are voracious predators. They feed primarily on

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Copper Sulfate vs. Chelated Copper

By **David Ellison, Aquatic Biologist**

Algae blooms have traditionally been treated with copper-based algaecides, particularly copper sulfate. Complex copper compounds are commonly used to treat algae and so are a few other non copper-based algaecides. These products were formulated due to the toxicity concerns of copper sulfate. Many of these products will provide just as



A good alternative to copper sulfate, chelated copper algaecides, do not have the negative impacts of copper sulfate.

effective control of algae as copper sulfate without the toxicity concerns.

Copper sulfate is typically the first product mentioned by a client when talking about algaecides. Copper sulfate does provide some initially quick results in treating algae, but has shown to create more algae issues in the future. Copper sulfate will accumulate in the sediment layer as a copper compound and destroy organisms and plant life within that bottom layer. The clearing of the bottom is what causes the release of excess nutrients and the cyclic nature of reusing the product for subsequent algal blooms.

Toxicity concerns for fish and humans with the use of copper sulfate are quite significant. It often irritates the skin and prolonged exposure can cause liver and kidney damage. The effects on fish vary from species to species, but studies show many different species are susceptible to toxicity from copper sulfate.

A good alternative to copper sulfate, chelated copper algaecides, do not have the negative impacts of copper sulfate. Chelated copper is more effective than copper sulfate even though it has less elemental copper. The chelated copper works better because of its chemical structure. The chemical structure allows the product to stay in the water longer than copper sulfate, have less copper than copper sulfate, and lower toxicity rates than copper sulfate. Chelated copper products are also less toxic to applicators and prevent a much lower inhalation concern typically found in copper sulfate applications.

Chelated copper algaecides, oxidizers, biologicals, and aeration are some products that are most often used to treat algae blooms. Algae issues in your pond will not be cured by an algaecide and will not ultimately be fixed until you address the problems your pond may have. ■

"A Bug's Life" *Continued from cover*

other insect larvae with a pair of vicious mandibles that in a quick flash, can be extended almost the length of their body. Some of the larger Odonata nymphs have even been known to feed on tadpoles and fish larvae. However, most feed on their favorite cuisine of mosquito larvae. Once they become winged adults, they continue this insatiable appetite for mosquitoes, whizzing around a pond, catching as many mosquitoes as their belly can hold with the same wicked pair of mandibles. The adults typically live 3-5 months before they die.

The adults are a very unique insect also. They have large, highly developed compound eyes and like all insects they have two pairs of wings. What makes them different is that they can move these pairs independently of one another. This allows the dragon or damsel fly to be able to hover, change direction quickly, and be the only insect that can fly backwards. They are also one of the fastest insects capable of flying 25-35 mph. Their aerial acrobatics could make even the most seasoned pilot green with envy.

Some people might find dragon and damsel flies to be a

nuisance. I am sure everybody has been bothered by a pesky dragon fly while they are lounging by a body of water or out on a fishing expedition. Also, at the end of the abdomen is a structure called a cerci. Many people mistakenly observe this structure to be a pair of large stingers. They are in fact, used by males to attach to a female during copulation while they fly tandem through the air. On the female, the cerci is used to make small incisions on emerged vegetation to deposit her eggs. So don't worry. Dragon and damsel flies do not bite or sting humans, they are perfectly harmless to us, just occasionally curious.

It would be beneficial to have these Odonata's calling your pond home since their favorite diet is both the larval and adult form of mosquitoes. Dragon and damsel fly larvae are also very tolerant of most water conditions, capable of surviving the various extremes a pond might go through during a season. Also, try not to remove all emerged or submerged vegetation from your shoreline. Small stands of bull rushes or similar aquatic plants are ideal habitat areas for the larvae. ■

NPDES is Coming Your Way

By **Shannon Junior, Aquatic Ecologist**

I know it's easy to "zone out" when the acronyms start flying, but if you're reading this newsletter, then it is very likely that new EPA regulations will directly affect you and your pond. NPDES stands for National Pollutant Discharge Elimination System, and it is the primary federal legislation that regulates point source pollution to the waters of the U.S. Starting on April 10, 2011, there is a new NPDES permit that will be in effect for aquatic pesticide applications. Although the EPA had previously ruled that pesticide discharges were exempt from NPDES permitting, a new judicial decision mandates that the residues resulting from these applications should be regulated within the same framework as other water pollutants. So basically, if you own or manage a property with a pond, then you will be responsible for making sure that all pesticide applications related to the pond meet the requirements of the new court mandate. Some of the activities that will be regulated under this permit include algae and weed treatments in the water, shoreline vegetation control, and mosquito control. And the most important part of this new law is that as a decision maker or financier for the applications, you are just as liable for permit compliance as the applicator.

To further complicate matters, most states will have a different version of the permit than the federal version, so there is no "cookie cutter" template for every state. And even though the deadline for compliance is April 10, most states have not yet finalized their permits. At SōLitude Lake Management, we are licensed to apply pesticides in eight states, so we are extremely familiar with the federal regulations and we are well-versed in all of these jurisdictions to ensure that we are in compliance no matter where we are working. In general, the permit requirements are geared to minimize the overall amount of pesticides applied to the water, to reduce the number of adverse incidents related to pesticide applications, and to ensure that violators are held accountable for their actions.

Although the actual implementation of the permits will vary based on the specific regulations in each state, there are some general requirements that will be inherent in all of them. The "operator" (a.k.a., decision maker, financier, and/or applicator) will need to demonstrate that Integrated Pest Management (IPM) strategies have been considered prior to the decision to apply pesticides. This may include non-chemical control methods



such as aeration, beneficial bacteria, and triploid grass carp. Post-application monitoring for adverse effects will also become a mandatory process subsequent to pesticide treatments. All of this information will need to be maintained for each site, in addition to detailed documentation of each application. For operators exceeding certain applications thresholds (limits vary by state), a Pesticide Discharge Management Plan (PDMP) will need to be prepared and continually updated, which will outline the specific procedures utilized by that operator to control and minimize the amount of pollutants

discharged into state waters. Some states will also require that all applicators exceeding the thresholds will submit a Notice of Intent (NOI) prior to any treatments, with a permit fee to be paid at the time of submittal.

So exactly what does this mean for you, the pond owner or manager? It means that you will need to stay informed and be sure that all aquatic pesticide applications to your pond or lake are completed by knowledgeable and experienced operators that are aware of and compliant with the new regulations. SōLitude Lake Management has participated on the Technical Advisory Committees for both the Virginia and Delaware permits, and we are actively following the permit developments in all of the states where we provide services. We already utilize a specialized lake management software program to manage our application data, and are working with our industry partners to ensure that all of our operations will be compliant with the permit requirements prior to the time that the permits go into effect.

On March 3, 2011, the EPA requested a 6 month stay on the implementation of the NPDES permitting requirements to allow the individual states to have more time to develop their individual permits, so there is a remote chance that the deadline for compliance may be extended. There has also been a bill introduced in the House of Representatives (H.R. 872 – Reducing Regulatory Burdens Act of 2011) with the goal of completely overturning the new court order. H.R. 872 would clarify the legal primacy of the existing Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as the governing legislation for aquatic pesticides, which would eliminate the need for any further permit development. So although the deadline for implementation of NPDES is looming in the immediate future, there is still some doubt as to when and if it will actually go into effect. Stay tuned! ■

Green Practice is Good Practice

By **David Beasley, Fisheries Biologist**

Going Green; a growing trend and an important one! Managing our freshwater resources is a concern for many people. Knowing we have an issue is much easier than determining how to realistically resolve this issue. It may not occur to most people, but part of the process to improve the world's water quality is related to the efficiencies of Storm Water Management.

Going Green in Pond Management is an overall approach that starts with preventing many of the harmful nutrients from entering ponds. To reduce nutrient loading starts with environmental impact awareness. Resolving these issues once they enter the water comes down to the pond owners' dedication to improve their property and their local watershed. Many storm water ponds have nutrient levels that are simply too high to



Take away or limit one of these and algae and vegetation will diminish greatly.

Those who consistently have plant or algae infestations should take a better look at what they can do to break this cycle. As a symptom of the problem, plants and algae should be used as indicators to monitor the efficiency of your management approach. There are many tools available to improve the quality of water from the time it enters your pond to the time it leaves. As environmental stewards, it's important to recognize when a management approach is more reactionary, and to make that shift to a proactive approach. This shift is almost always a progression, but in time the result is a pond with occasional algae and vegetation issues, not a daily occurrence.

Several preventive maintenance tools that greatly improve water

As environmental stewards, it's important to recognize when a management approach is more reactionary, and to make that shift to a proactive approach. This shift is almost always a progression, but in time the result is a pond with occasional algae and vegetation issues, not a daily occurrence.

sustain a healthy ecosystem. As a result, these ponds annually struggle with algae and vegetation issues. Regardless of how "green" the remediation processes for removing the algae and plants from the pond, this process is not the true Green Pond Management approach. Green Management is a holistic approach, not just a classification for a product. Although hard to believe at times, algae and vegetation are actually the symptom of a problem. The three main variables that lead to plant and algae growth are proper temperature, sunlight and available nutrients.

quality and pond health are buffer management, beneficial aquatic vegetation management, sufficient aeration, pond dye, Grass Carp and beneficial bacteria. Quality Green Management can be achieved if these tools are utilized to their fullest based on the pond's unique needs. If your pond seems to always have algae, it may be time to take another look at the different options to reduce nutrients. Options like beneficial aquatic vegetation and buffer management are inexpensive and can truly contribute to improving your local watershed. ■

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Pollution Prevention Around Your Local Ponds

By **Kyle Finerfrock, Environmental Scientist**

It is getting to be springtime and “Neighbor Joe” notices that this coming Saturday is going to be a warm and sunny day. Joe spends all week coming up with a plan of attack to start working on his yard and garage for this weekend. When the weekend finally arrives, he is prepared. He is going to tune up his lawn mower, spread some Weed and Feed in his yard and he is finally going to tackle that garden shed full of old paints and mystery cans of products that have been tucked away for a decade.

Saturday morning Joe gets an early start on the shed. He decides to “clean house” and get rid of everything he hasn’t touched in years, including old paints, oil and fertilizers. Joe notices (from the labels) that he just can’t throw all of these partially filled containers in the trash bin. He’s got a full day of tasks to do and he doesn’t have time to figure out where to take the chemicals to dispose of them properly. So, Joe decides he really only has a couple ounces of each product and feels like it won’t hurt anything to just to dump them down the storm drain.

Next, Joe tackles the lawnmower that has been sitting all winter. He starts working and immediately wants to change the oil and put fresh gas in the tank. He looks around for a place to drain the oil, but he does not have a proper container. Instead, he just takes the lawn mower to the back of his yard and dumps all the old oil and gas out onto the ground, thinking it will just filter through the soil.

With the shed and the lawnmower complete, Joe moves on to the task of fertilizing the lawn. He breaks out the spreader and the fertilizer he just purchased and gets started. Joe wants to have the greenest lawn in the neighborhood this year and decides to put twice as much product on his yard as recommended by the directions.

Joe is feeling pretty productive after accomplishing so many things today, so he decides it is time to wash the car in the driveway. He squeezes a hefty portion of soap into a bucket and starts washing the car. Lots of soap and suds run into the street and the storm drain. Joe is feeling so proud that he washes his car three times!

Ending Joe’s “perfect” and productive day, he has overlooked one thing: the big rain storm coming in the middle of the night. Unknown to Joe, the rainstorm washes away most of the fertilizer he put down, it washes the gas and oil in the back of the yard into the storm drain and the stormwater pond in the back of his property. All of the little bits of chemicals from all of the containers in Joe’s shed have now found their way into the neighborhood stormwater system as well – along with a load of phosphates from the soap used in the three washes he put on his car.

It is vital to realize the importance of the individual impact on the local watershed. The excess runoff of fertilizer and fossil fuels into ponds can be very problematic for your neighborhood pond and to the watershed. Fertilizers and car wash detergent contain



high levels of phosphate. Phosphates are a major contributor to excess algae and aquatic weed growth. Fossil fuels like the oil and gasoline that Joe dumped in his yard can be very harmful to a pond ecosystem. Fossil fuels can cause an oily film on the water’s surface blocking out sunlight and preventing oxygen from entering the pond. While these are problems in many ponds, they can be easily prevented. Many times lawns can be fertilized much less if the soil nutrient levels are tested before fertilizer is applied. If you need to wash your car, take it to a local car wash station.

A lot of car washes have to send their waste water through the local sewer system to be treated at a water treatment plant. If you wash your car at home, it is best to wash it in your yard so that the runoff doesn’t go directly into the storm drains. Household chemicals and fossil fuels can be disposed of easily and properly by contacting your local waste collection company. Remember that storm drains are for rainwater only. The health of your local pond and the entire watershed is dependent on the actions you take around your home. ■

Getting to Know Your Aquatic Weeds: Alligator Weed

By **Lee Abernathy, Environmental Scientist**

Have you ever looked around your pond and seen something growing along the edges and also up into the grass? Chances are it is alligator weed: *Alternanthera philoxeroides*. This invasive species can be a problem in your pond, and if found, should be addressed immediately. Native to South America, alligator weed forms dense, interwoven mats that are usually found along shorelines, but can break away and float around a body of water. The stems are long, branched and hollow and often turn pink. The leaves form opposite of each other and are slender with an elliptic shape. It also flowers in the warm summer months and has a small, white flower that grows on the stalks.

As the dense mats of alligator weed form, water flow and quality are decreased. If the mats are dense enough they will prevent light penetration and oxygenation in the water. This



invasive plant will also out-compete native plants. Alligator weed provides a favorable habitat for mosquitoes. Fish kills may also be caused by alligator weed as the large mats die off in the fall causing a drop in dissolved oxygen from decomposition. While it does provide habitat for fish and small invertebrates, alligator weed has no known food value for other wildlife.

There are different products on the market that will help control alligator weed, as the plant is difficult to eradicate entirely. Please do not hesitate to take action once this plant has been identified in your lake or pond. ■

Slippery Little Booger

By **Dustin Kennedy, Aquatic Biologist**

The American Eel (*Anguilla Rostrata*) is the only species of freshwater eel to inhabit the Chesapeake Bay and its tributary systems. It is found in abundance in all salinity ranges from saltwater to freshwater. It inhabits rivers, streams, lakes, and likely your nearby retention pond. The American eel body shape is long, slender, and snake-like, which allows it to get about anywhere.

Sexually mature eels undergo large migrations yearly for reproductive reasons. The eel is catadromous which means they leave freshwater to spawn in saltwater. This migration occurs in the autumn of each year, with the eels ending their journey in an area known as the Sargasso Sea, just north of the Bahamas. After reproduction, mature eels will die and the new offspring start the journey all over. The larvae will drift for 9-12 months and grow to approximately 2.5 inches. At that time, they enter the glass eel stage which will allow them to start to enter the estuarine systems. In this environment they become a little bit more pigmented and become known as elvers.



Within several months, the American eel will enter the final, yellow eel stage, before becoming sexually mature. This is the stage in which they will spend most of their lives. They will spend at least five to twenty years in freshwater or estuarine conditions before they are mature enough for reproduction.

It is in this yellow stage where they will cause problems to your fountains. The snake-like bodies enable them to get just about anywhere. They will squeeze themselves into fountain impellers and props while the power is off, tangling around the shaft, and then clogging the pump chamber once power is turned on. They are also known to get sucked up into nozzles. The American eel should not cause your fountain to break down, but they are a nuisance. They will at times cause spray patterns to become distorted, or worse yet, completely clogged, depleting your pond of the needed aeration being provided by the fountain aerator. Routine monthly fountain maintenance is important to help mitigate these and other problems and keep your fountains running trouble-free. ■

Anchors Away?

By **Ethan Chappell, Aquatic Specialist**

The ice and snow may finally be giving way to the heat and light of summer. Those bitter cold days when we pray for just a touch of the blistering heat and humidity are behind us for the time being. Soon, our prayers will shift to cooler climes and snowmen, while we sweat away the days with a tall glass of iced tea at the ready. Now is the time to begin preparing for the coming summer and its challenges. This means first taking stock of what the winter has left us with or in the case of fountain anchors... what she has taken away.

Thick ice sheets covered many lakes and ponds in our region this winter. While we did not have the "snow-megedon" of last year, we did have several major storms and subsequent snow melts. These storms blanketed our waters with thick ice that stayed most of the winter. If your pond has a fountain in it and it became trapped in the ice you may have a problem. The anchor lines may be compromised.

Hungry varmints may be to blame. It is my experience that most water borne varmint varieties subscribe to a strict taste first policy when it comes to feeding. In the winter when food is scarce most things near the surface of a body of water get 'tasted'. In addition to critters, current or wave action from beneath the ice sheet working on frozen lines at the surface can cause weakness or even snap an anchor line after a period of time. It is also possible for a pond to rise with an ice sheet still intact covering its surface. If this happens to your fountain it may lift the anchors off the bottom of the pond. The ice sheet and the float, being much more buoyant than your fountain float alone; have a greater combined lifting capacity. The anchors that would hold up to most conditions simply dangle beneath the ice sheet until such time as the water level subsides and they are deposited in a less than optimal position.

If these things have occurred it is very important to correct the problem before turning on the fountain for the season. The anchors keep the fountain stationary. Like most inanimate objects, fountains are bent on their own self destruction. Without the subtle reminder provided by a firm tie down they will spin themselves to death upon the first opportunity. While the idea of a swirling whirly-gig churning up your pond and spurting water in all directions may sound entertaining, I assure you that the show will not last long and the bill to repair the damages will be anything less than a 'good time'.

Fortunately, the fix is relatively easy. All that needs to be done is a quick check of the lines and a pull of the anchors. The lines may be moored to shore or running down to some type of anchor. They should be inspected and replaced if they show signs of damage or extreme fatigue. In the case of submerged anchors, they should be repositioned to provide a firm footing to hold the fountain in place. If they have disappeared due to taste-testing by the local varmint gourmets, they will need to be replaced with a new anchor and a heavier line like a thin stainless steel aircraft cable. I have yet to meet a muskrat who could chew through that. In this way, 20 pounds of prevention can prevent tons of frustration. ■

Check Us Out...

SōLitude 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.

April 14

The Pennsylvania and Delaware Valley Chapter of Community Associations Institute Annual Conference and Expo, Citizens Bank Park, Philadelphia, PA

April 14

Central Virginia Chapter of CAI's Spring Social and Scavenger Hunt Winner Announcement, James River Winery, Glen Allen, VA

April 14 – 16

Pond Boss IV Conference & Expo, Big Cedar Lodge, Ridgedale, MO

April 26

Central Virginia Chapter of CAI's Professional Luncheon, "Reducing Your Community's Environmental Footprint" *Kevin Tucker, Speaker, Powhatan Secondary of Williamsburg*

May 4 – 7

Community Associations Institute National Conference – Boca Raton, FL

May 18 – May 19

Hampton Roads Industrial & Facility Maintenance Show, Virginia Beach Convention Center, Virginia Beach, VA

July 28 – July 31

Virginia Leadership Retreat, The Homestead, Hot Springs, VA

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"Pond"er These Thoughts

Sōlitude Lake Management® wants to be certain that your pond is prepared for 2011. With this in mind, we recommend that you consider the following during the spring months:

- As the weather warms, mosquitoes will invade! Ask us about stocking your lake with minnows to naturally and effectively control mosquitoes.
- Spring is a great time to "green up" your lawn. Just make sure this doesn't mean "greening up" your lake. Ensure correct fertilizer rates are observed and limit usage in areas directly adjacent to a lake or pond. Avoid pavement and concrete and use products that are low in Nitrogen and Phosphorus.
- During this growth season, limit mowing around your lake or pond to help establish a protective vegetative buffer. This will stabilize the bank and help act as a filter to reduce the amount of nutrient build-up in the water.
- Day Light Savings Time should trigger thoughts of your pond's Annual Infrastructure Inspection. This inspection, performed by a licensed engineer, will help site any issues that can easily be addressed in the warmer season. Having the inspection done in the Spring will also help put you ahead of the upcoming budget season. ■



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