

AquaticsⁱⁿBrief

SUMMER 2016



Volume 10, Issue 3

Inside:

Page 2

**Habitat Restoration:
Eradicating Invasive and
Non-Native Species**

Page 3

**What You Should
Know About Zika**

Page 4

**Be Part of The SOLution
with SOLitude**

Page 5

New SOLs

Page 6

**What are Beneficial
Bacteria?**

**Volunteer of the
Quarter**

Page 7

**Before and After
Showcase**

**2016 SOLitude Growth
and Expansion**

Check Us Out...

Page 8

Ponder These Thoughts

Transforming a Fishery Using Proactive Management Strategies

By **Dave Beasley, Fisheries Biologist and Director of Fisheries**

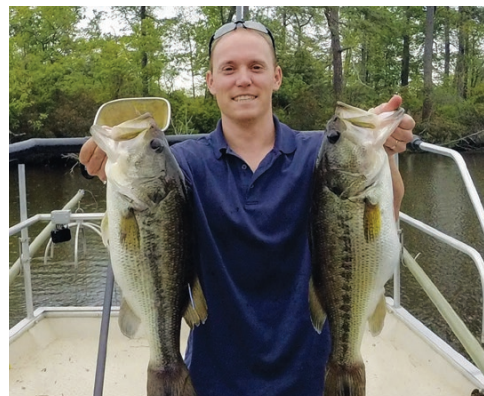
Establishing and maintaining a high quality fishery is a challenging task requiring a firm understanding of fisheries management. By using a variety of proactive strategies, fish populations can be manipulated over a few years to produce a desired outcome.

One specific fishery, an 85 acre mill pond located in the heart of Virginia, recently improved its largemouth bass population with the help of SOLitude. Rich in history, the pond was built over 300 years ago, in 1678, to run a mill for grinding wheat and corn. A couple hundred years later, in 1900, the pond was purchased and the Cohoke Fishing Club was formed.

Like the pond, the Cohoke Fishing Club has a long history, and in its prime would yield around 60 fish annually weighing between 5 and 10 pounds, while during off years as few as three of these quality fish were caught. Inconsistent numbers of quality fish over the years is natural when dealing with Mother Nature, but some members of the club started wondering if their laid back management strategies were truly allowing for a quality fishery.

In 2009, the club experienced several negative variables simultaneously. The waterbody was being taken over by hydrilla, their bass seemed underweight and the number of big bass being caught was lower than desired. As a result, the club decided to seek professional advice to gain better control over their fate.

Although the fishery was falling on hard



times, the club had one thing in particular in its favor. Over the past several decades the club kept good records of what they caught, which provided insight into the fishery's past that would not have been obtained otherwise. By using the extensive data set collected by the club, performing an electrofishing study and analyzing water quality testing from the spring of 2010, several limiting factors were identified. The data showed that the fishery was predator heavy, with a large number of fish measuring between 12 and 15 inches in length. It also showed that 80 percent of the bass in the pond were less than 15 inches long. When reviewing the club's historical fishing records, it illustrated that the number of big fish caught over the years was inconsistent. This inconstant trend indicated that past management strategies needed to be modified to produce a consistent result.

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SOLITUDE
LAKE MANAGEMENT

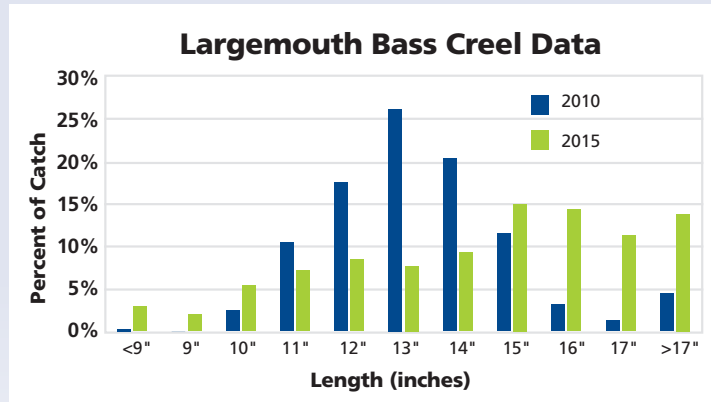
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Management Company*

Transforming a Fishery *Continued from front cover*

Using the data, a proactive management strategy was developed and implemented by SOLitude. The club shifted from a catch-and-release fishery to one that actively harvested intermediate size bass. Other actions included eradicating the hydrilla using herbicides and triploid grass carp, improving fish cover by adding cedar trees, supporting plankton blooms through fertilizing, installing two fish feeders, removing the nuisance wildlife through trapping, stocking adult bluegill to boost their numbers, implementing a catch-and-release policy for all bluegill, and implementing active angler harvest for all non-target predators such as chain pickerel, white perch and black crappie.

Managing the fishery over the past six years has required the club to put forth a large amount of effort and patience. For the first year or two, their hard work did not show significant evidence that the management approach was working. But, as the club continued with the strategy, the fishery's response became noticeable and club members were motivated to become even more involved.

After six years of hard work by members, along with cooperation from Mother Nature, the waterbody has successfully transformed into a higher quality fishery. In 2010, only one out of five bass caught exceeded 15 inches. Now, over 50 percent of the bass being caught by club members are greater than 15 inches. Addi-



tionally, the number of bass greater than 5 pounds has improved dramatically, measuring from only 16 fish caught in 2010 up to 48 fish caught in 2015.

The fishery's success is the direct result of hard work and its club members' willingness to change. Although the fishery has experienced a few good years, it is still vulnerable if the members do not stay proactive. The club now has an opportunity to control the fishery's future, allowing members to play an active role in adding to the waterbody's rich history. ■

Habitat Restoration: Eradicating Invasive and Non-Native Species

By **Bob Schindler, Aquatic Biologist and Territory Leader**

Invasive species management continues to be a focus of habitat restoration to improve or reestablish natural balanced communities of native ecologically valuable plant species. Achieving the management goal of eradicating invasive species in a wetland or upland habitat environment involves many of the same considerations as executing a lake or pond management program, with the exception that the progress and results are immediately visible and more accurately quantifiable. Habitat improvement projects can range in scale from small residential infestations to restoration programs that encompass thousands of acres. All habitat restoration sites include the same preliminary research prior to initiating any management activity.

The first objective is to assess the need for a management program by accurately identifying any potential invasive plant species, as well as cataloging other species within the restoration area. Once a comprehensive site assessment is conducted and invasive plants are identified, it is important to determine whether the land classification of the potential treatment area is a wetland or upland habitat. These two key components will generally guide the creation and implementation of the desired management program. Individual states have variations in permitting, and some require a permitting



component when performing any herbicide application within a wetland habitat. Determining whether a wetland habitat

exists may be as simple as referencing state affiliated website mapping software, or may require performance of a wetland delineation survey to identify and outline the boundaries of any wetlands within or near the management area. While upland habitats generally do not require a permit, a pesticide applicator who is licensed in the appropriate category will be necessary.

Plant species and wetland habitat identification are also critical in the preparation of an effective and efficient management program. Many plant species require management at select times of the year to be most effective and help prevent future plant propagation. Herbicide selection also influences, and can allow for, variations in the timing of the product application. Certain herbicide formulations can be applied at times of the year when desirable native plants are dormant, providing selective plant control. Others target multiple species to limit the number of applications and

Continued on page 3

What You Should Know About Zika

From the Team at SOLitude Lake Management

Worldwide, mosquito-borne illnesses are a serious public health concern and affect nearly 700 million people each year. Zika virus (ZIKV), a relatively unknown and unstudied virus, has been a hot topic in the news over the past several months – and rightfully so. ZIKV has spread quickly through Latin America and the Caribbean, and over 800 travel-related cases have been reported in the United States as of June 2016. There are major concerns surrounding Zika virus disease, particularly for pregnant women; therefore, it is important to understand ZIKV, how it's spread and how it can be prevented.

Zika virus was first discovered in 1947 in the Zika Forest of Uganda. Prior to 2007, it had only been detected in central Africa and throughout Southeast Asia. However, in 2007, it was associated with a disease outbreak on Yap Island in the South Pacific, representing the first time it had spread outside of Asia. From there, it spread to South America with human cases first reported in 2014.

ZIKV is transmitted by *Aedes* mosquitoes. In the Americas, it has only been linked to transmission by *Aedes aegypti*, the yellow fever mosquito. Recently in Africa, the virus was detected in *Aedes albopictus*, the Asian tiger mosquito; hence, it is possible that *Ae. albopictus* could vector the virus in the Americas. Both species of mosquito are considered container breeding, and larval habitats are often found around homes as well as areas with large amounts of discarded waste. In addition to transmission by mosquito bites, ZIKV can also be transmitted by a pregnant woman to her fetus and can be spread by a man to his sexual partners.

Most people who contract the Zika virus show no symptoms. When symptoms do occur, they typically begin with a mild headache and fever, and may also include diarrhea, constipation, abdominal pain, dizziness and body aches. Within a day or two, a rash may appear and can cover many parts of the body. Currently, there is no vaccine or cure for ZIKV and treatment is symptomatic and supportive.



One of the main fears of Zika virus infection, as many are aware, involves concern with pregnancy and perinatal infections. If a pregnant woman is infected with ZIKV, it may result in microcephaly, a birth defect causing underdevelopment of the head and brain in newborn children. The Centers for Disease Control and Prevention has officially linked Zika virus to microcephaly; however, the organization is waiting for additional studies to confirm if cases of Guillain-Barré syndrome can also be linked to the virus. The World Health Organization has announced their belief that the virus can contribute to both diseases.

In the United States, the majority of Zika infection cases have been imported from travelers who contracted the virus in other countries and returned to the U.S. while infected. Competent vector mosquitoes, however, are found in the United States and a portion of the country, particularly the south, is at a higher risk because of climate and the presence of both *Ae. Aegypti* and *Ae. Albopictus* species.

The professionals at SOLitude are experienced to perform a detailed site assessment of your property, and to offer a number of natural and sustainable mosquito control methods that will help to reduce mosquito populations in and around your lake or pond. When it comes to controlling or preventing a serious mosquito-borne illness such as Zika virus, though, a more comprehensive, wide-area mosquito management program should be employed. Although your lake or pond could be providing suitable habitat for mosquito breeding, the reality is that most areas in your community that are conducive to mosquito breeding will be found elsewhere. If you feel you are in need of large-scale mosquito control solutions for your town, community, estate, golf course, ranch, industrial site or other large scale business, or you have an emergency response situation, we will work with our trusted partner, Vector Disease Control International (VDCI), to provide you with an integrated mosquito monitoring and management program that is tailored to your site and specific needs. ■

For more information on mosquito prevention and control, contact your SOLitude representative.

Continued from page 2
volume of herbicide required. Collateral damage to non-target plants, while sometimes unavoidable, can be limited or prevented by implementing the most appropriate management strategy.

As part of an Integrated Pest Management Program (IPM), alternatives to herbicides should be considered. Cutting, hand-pulling and ground disturbance are potential alternatives that may be effective, depending on the invasive plant species present. Each method, however, will require native plant

reestablishment in order to restrict the invasive species from continuing to dominate the project area.

The most effective method of invasive plant control is to prevent the introduction of any invasive species. Certain invasive plants provide an attractive landscape feature, and for this reason many species are commonly sold commercially. Invasive plants are capable of reproduction by spreading of seeds, rhizome development and stem fragmentation. It is also important to note that invasive plants should be disposed of in a manner that will

not permit their unintended introduction into additional habitat areas.

It is important to seek out professionals who understand the challenges and considerations in managing wetland and upland habitats for invasive plant species. The staff at SOLitude Lake Management has an extensive background with the technical expertise, appropriate equipment, and a thorough understanding of all state regulatory requirements and various management techniques to provide invasive species management for any habitat. ■

Be Part of The SOLution with SOLitude

The SOLitude team strives to create a better world through volunteerism, community outreach, sustainability and environmental consciousness. In honor of Earth Day and Arbor Day this spring, team members showed their support and commitment by participating in environmental cleanup events and plantings throughout the country. Employees, family and friends volunteered a total of 120 hours of their time and collected over 6,000 pounds of trash in their local communities:



1. SOLitude's Virginia Beach staff organized a staff cleanup on Earth Day and picked up trash along the road and woods near their office. In just one hour, the team filled the back of a pickup truck with 12 bags of trash, boxes and a tire.



5. In Tennessee, Environmental Scientist Brent Weber and his girlfriend Cassie joined a local yoga group on Earth Day to clean up "Love Circle," a popular public park in Nashville that overlooks the city and offers an excellent sunset view.



2. Environmental Scientist Kevin Shank and his son Marshall volunteered at the **Musconetcong Watershed Association's 24th Annual River Clean Up** in Hackettstown, New Jersey. Several SOLitude team members joined nearly 400 other volunteers for the event.



6. The Charlottesville, Virginia team volunteered with the **Rivanna Conservation Alliance** and loaded a pickup truck with debris removed from Quarry Park. The environmental clean-up was teamed with a buffer planting of over 300 seedlings in the park.



3. The Mid-Atlantic team volunteered with the **Brandywine Red Clay Alliance** in Downingtown, Pennsylvania to clean up the Brandywine River. The team paddled in canoes along four miles of river to remove over 500 pounds of trash.



7. In North Carolina, team members participated in the annual **Haw River Clean-Up-A-Thon** and, along with 22 other teams of volunteers, collected trash along Haw River near Pittsboro, North Carolina.



4. Mid-Atlantic team members also volunteered with the **Delaware Department of Natural Resources and Environment: Division of Fish and Wildlife** and planted over 200 saplings in the Augustine Wildlife Area of New Castle County, Delaware.



8. Amanda Mahaney, Aquatic Biologist, helps to remove the invasive plant Japanese Barberry from the Cascades Conservation Area during an environmental volunteer event held by the **US Department of Agriculture** in Worcester, Massachusetts.

Join the fun and help support your local community! We encourage our clients, vendor partners, family and friends to be part of The SOLution. If you would like to share a non-profit's goals or upcoming event, or join the SOLitude team at a future volunteer day in your area, visit www.solitudelakemanagement.com/community or email info@solitudelake.com. ■

The **SOLution**
creating a better world

New SOLs

In each issue, staff members from SOLitude are highlighted. It is our pleasure to introduce you to the incredibly talented members of our team and give you insight into the vast array of knowledge and experience they offer.

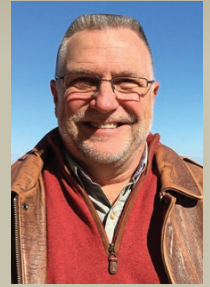
Mychal Manolatos *Vice President of Sales*

As a seasoned senior sales executive, Mychal is responsible for leading the overall sales strategy for SOLitude. These efforts include leading our sales organization, developing relationships with new clients nationwide and introducing the company's many service offerings and products. He also works to ensure that the needs of existing clients are exceeded by the entire SOLitude sales team.



Bo Burns *Market Development Manager*

Bo has worked in the lake and pond management industry for over 30 years and is responsible for business development in new and emerging markets, bringing his wealth of knowledge to new clients. Bo has a Master of Environmental Management degree in Resource and Wetland Ecology from Duke University.



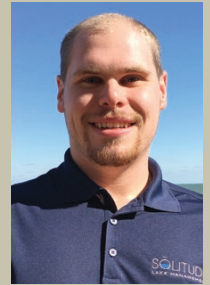
Emily Mayer *Aquatic Biologist*

As a member of the Biology team at SOLitude, Emily conducts water quality and biological assessments, providing clients with an array of solutions to help prevent water quality problems and maintain a healthy, balanced aquatic ecosystem. She graduated with a Bachelor's degree in Environmental Science in 2015.



Tim Schnauer *Aquatic Biologist*

Tim earned his Bachelor of Science degree in Conservation Biology at SUNY College of Environmental Science and Forestry in Syracuse, NY in 2014. With a focus on water quality, Tim provides clients in New York and surrounding states with a complete range of lake, pond and fisheries management solutions.



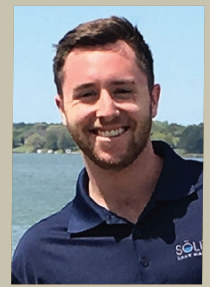
Jordan Meissner *Business Development Specialist*

Jordan comes to SOLitude with over five years of experience in the successful development of new business territories. He is responsible for helping the team build relationships with new partners as we continue to expand our footprint throughout Tennessee and surrounding states.



Joe Hogan *Business Development Specialist*

Joe is responsible for building relationships with clients, successfully acquiring new business and developing the Colorado territory. Joe comes to SOLitude with business-to-business sales experience and has been specifically tasked with tailoring new client solutions for growth.



Sallie Burns *Regional Administrator Client Relations*

Sallie is one of the first points of contact for clients in the southeast region and also performs an array of administrative duties to support leadership and staff. Her customer service and organizational skills, combined with her upbeat and friendly personality, make her a valued asset to the SOLitude team and its clients.



Matt Serino *Creative Marketing Specialist*

Matt joined SOLitude with nearly a decade of marketing and graphic design experience. He supports overall marketing strategy, advertising, branding and communications, and is also responsible for all graphic design needs of the company, bringing innovative ideas to continuously enhance the SOLitude brand.



What are Beneficial Bacteria?

By **Shannon Junior, Aquatic Ecologist and Territory Leader**

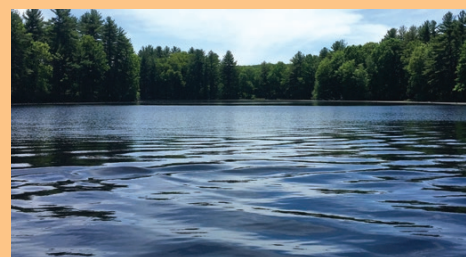
Beneficial bacteria occur naturally in lakes and ponds, and are the microbes responsible for processing dead organic material. There are many different types of bacteria, which work in different ways to break down organic compounds. Aerobic bacteria use oxygen and rapidly break down organic compounds. Anaerobic bacteria are able to work without oxygen, but work much more slowly. Both types of bacteria produce enzymes that allow them to break down organic compounds and take them into their cells as nutrients. Many bacteria also perform denitrification, transforming nitrate into nitrogen gas and removing it from the pond system. They can also convert soluble phosphorus from the water column into calcium phosphate and calcium iron phosphate, which are insoluble minerals that are not available to most types of algae.

Since the bacteria convert nutrients into unavailable forms, they can be beneficial in reducing nuisance algae blooms in lakes and ponds. In fresh water, phosphorus is generally the limiting nutrient for algal growth. The ratio of nitrogen to phosphorus determines the types of algae that will grow and thrive in a pond. In situations where there is excess phosphorus, nuisance species of filamentous and blue-green algae (cyanobacteria) will dominate the waterbody instead of the beneficial planktonic green algae that form the base of the food web. The bacteria themselves

can also contribute to the food web, becoming a food source for zooplankton and benthos, which then become food for fish and other organisms.

Biochemists have found ways to culture beneficial bacteria so that they can be added to lakes and ponds to accelerate the decomposition process and to remove nutrients from the aquatic system. This process is often referred to as biological water quality augmentation. Initially, a large inoculation dose is added to get the bacterial population established, and then maintenance doses are applied to ensure that the bacteria continue to thrive. As the bacteria grow and replicate, they tie up phosphorus and nitrogen in their cells so that it is not available to nuisance algae. The majority of the bacteria will go to the bottom and sides of the lake (the benthic and littoral zones) where they break down excess organic matter. Some of the bacteria remain in the water column, where they process dead phytoplankton and soluble nutrients.

There are many different types and formulations of beneficial bacteria. Most product formulations are based on aerobic bacteria and target compounds that are slow to degrade. SOLitude uses bacteria products in our Annual Maintenance programs for organic waste degradation and general water quality improvement. We can also supplement these products with a formulation of bacteria and enzymes



that is specifically geared towards digesting the organic matter that builds up on the pond bottom – this process is known as biological dredging. Some of the enzymes are even targeted to break down specific compounds, such as the cellulose found in leaves and sticks that accumulate in the pond. While this process does not address the build-up of inorganic soil particles, it can greatly increase pond depths while decreasing the amount of organic bottom sludge. However, the results can vary greatly between waterbodies and cannot be predicted with any accuracy. Biodredging programs can differ widely in scope, and the species composition and colony forming units (CFUs) of bacterial formulations are typically considered proprietary information. There is currently no industry standard to provide uniform guidelines, so it is important to develop a program that is tailored to the water quality conditions and budget limitations of each site.

It is significant to note that because most beneficial bacteria formulations include aerobic bacteria, they work much better when used in conjunction with aeration. Bacterial metabolism is optimized when dissolved oxygen levels are maximized, so a fountain or aerator will greatly improve the overall results of any water quality augmentation program. ■

Volunteer of the Quarter

Congratulations to Becky Snyder, Volunteer of the First Quarter!

Becky Snyder, Client Relations Regional Administrator, in our Shrewsbury, MA office spent 50 hours volunteering in her community in the first quarter of 2016. For an impressive 19 years, Becky has served as an adult advisor and mentor of the International Order of the Rainbow for Girls, teaching young women valuable leadership skills that will continue to open doors for each of them through college and their careers. As The SOLution volunteer team captain for SOLitude's New England region, Becky coordinated team volunteering events with the Worcester County Food Bank, started a supply drive for the Worcester Animal Rescue League, created an office fundraiser for the American Cancer Society and scheduled an Earth Day cleanup on the Blackstone River. Congratulations Becky and thank you for all that you do! ■



Before and After Showcase Excellence in Water Quality Treatments



Before



After

Location: Clarksburg, Massachusetts
Surface Area: 45 acre state park lake
Primary Target: Watershield, fanwort, coontail and bladderwort
Restored By: Rebecca Giguere, Environmental Scientist



Before



After

Location: Morris/Sussex counties, New Jersey
Surface Area: 329 acre recreational lake
Primary Target: Water chestnut
Restored By: Glenn Sullivan, Certified Lake Manager



Before



After

Location: Purvis, Mississippi
Surface Area: 3 acre privately owned pond
Primary Target: Watershield and water lilies
Restored By: Brent Weber, Environmental Scientist

2016 SOLitude Growth and Expansion

SOLitude Lake Management continues to grow, offering superior aquatics related services to new markets throughout the United States, while adding new talent to exceed the expectations of our current clientele.

SOLitude recently expanded into Texas with the acquisition of Total Lake Management. Owner, Paul Dorsett and his wife Dawn, along with six other full-time employees, joined the SOLitude family, bringing with them a broad range of lake and pond management experience with a particular focus on fisheries management. The office in Bryan/College Station is centrally located positioning the SOLitude team for growth in the Texas market.



SOLitude also recently expanded in North Carolina with the acquisition of AquatiCO, Inc. located in Shallotte, just north of Myrtle Beach. Owner, Michael Norton, a professional engineer, along with Nic Butler, an aquatic specialist, joined the SOLitude team. They bring with them an extensive range of lake and pond management experience, with a particular focus on aquatic vegetation control and stormwater pond management. Michael is also the owner of Compass Pointe Engineering, a civil and environmental engineering firm. Through Michael's expertise and a strategic partnership with Compass Pointe, SOLitude's in-house engineering resources will be further strengthened and will allow the company to better serve clients with stormwater engineering needs.

Please help us welcome our new teams of talent! ■

Check Us Out...

SOLitude Lake Management will be participating in the following events over the coming months. We encourage you to come see us! If you need information on attending any of these events, please call our office at 888-480-LAKE.

July 24-27

The CAI Virginia Leadership Retreat
Hot Springs, Virginia

August 18

Austin Chapter of Community Associations Institute Conference and Expo
Austin, Texas

September 8

Greater Houston Chapter of Community Associations Institute Trade Show
Houston, Texas

September 9

Southwest Virginia Chapter of Community Associations Institute Communities Associations Day
Roanoke, Virginia

September 15

Dallas Fort Worth Communities Associations Institute Expo and Trade Show
Plano, Texas

September 19

Rocky Mountain Chapter of Community Associations Institute Mountain Conference & Tradeshow
Vail, Colorado

October 6-7

South Carolina Chapter of Community Associations Institute Annual Community Associations Day and Trade Show
Charleston, South Carolina

October 7

Tennessee Chapter of Community Associations Institute Annual Tradeshow
Nashville, TN

October 12-13

Deep South Turf Expo
Biloxi, Mississippi

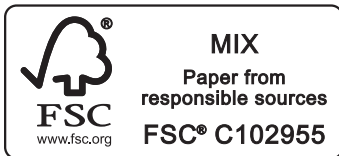


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- Fisheries Management
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- Bathymetric Studies
- Biological Augmentation
- Mechanical Harvesting
- Ultrasonic Algae Control



AquaticsinBrief

SUMMER 2016 | Volume 10, Issue 3

Ponder These Thoughts

SOLitude Lake Management wants your lakes and ponds to be prepared for warm weather. With this in mind, we recommend that you consider the following during the summer months:

- Warm summer weather seems to bring out the best and the worst in ponds. Although pond algae and aquatic weeds seem to be more abundant at this time of year, a year-round maintenance plan is the best way to ensure a healthy pond all year long.
- Summer is the perfect time to think about pond aeration. The warmer water temperatures can be detrimental to the overall health of your pond. Increase oxygen, reduce stagnation and stratification, and prevent algae, mosquito breeding, fish kills and many other water quality problems with a properly sized aeration system.
- Mosquitoes can ruin summer fun. Think about stocking your pond with juvenile bluegill, fathead minnows and other small fish that help to control mosquitos. This, along with beneficial buffer plants and proper aeration, can help eliminate a potentially big problem.
- Remember to respect the natural vegetative 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 months = Good fishing! Maintain your fish habitat with good water quality and cover. Consult our experts if you have questions about proper maintenance of your fishery.
- Plan a Labor Day fishing event in your community. Be sure your pond is stocked with easy-to-catch fish, like bluegill, largemouth bass and catfish, and have a fisheries biologist tag some fish to allow for special prizes.