FALL 2019

AquaticsinBrief

Volume 13, Issue 3

Inside:

SOLITUDE LAKE MANAGEMENT®
A Rentokil Steritech Company

A Full Service Lake, Pond, Wetland and Fisheries Management Company

6 Things to Consider For a More Efficient Stormwater Management Facility

By **Greg Blackham, Aquatic Specialist**

As the growing season comes to an end, this is the perfect time to think about having your stormwater pond or management facility inspected, and also to schedule for any necessary maintenance or repairs. Sediment removal, pipe repair and other remediation efforts can all be done in the off season to help you prepare the facility for the coming year. Fall is also the ideal time to budget for any work that is needed throughout the next year.

Here are the top six things SOLitude's aquatic management professionals consider when it comes to maximizing the efficiency of your stormwater management facility.

1. The strength and integrity of the outlet structure. It's important to identify cracked concrete and other visible signs of damage as soon as possible. All grates should be cleaned and checked for debris and sediment blockage. If the facility has a low flow orifice, it needs to be free and open. The low flow orifice lets the water drain slowly after rain so that the suspended particles have time to settle. If the outlet structure has a concrete box, nothing should be present that may impede the flow of water. Signs of

Outlet structure

erosion should be examined above where the structure meets the pipe. This is often an indicator of a gap in the seal and the beginning of a sinkhole.

Continued on page 2

6 Things to Consider... *Continued from front cover*

2. Functionality of emergency spillways. In the event of heavy rainfall over a short period, debris can quickly block the outlet structure before anyone has a chance to clear it. An emergency spillway is a channel below the top of the embankment that can provide some relief to the system and direct discharge away from critical structures to protect the embankment. The spillway should either be filled with light beneficial vegetation or stone.

3. Inlet build-up and flow. Monitoring build-up and flow is especially important at the end of pipes because a blockage or low flow there could cause water to back up on a nearby street which could expose buildings to a risk of flooding. Swale and riprap channel inlets should be clear of trees. All channels that carry water to the facility should be kept clear of debris, sediment and excess leaves.

4. Forebay functionality and debris removal. Some stormwater ponds have forebays, which are collection points just beyond an inlet made of stones or earth. These forebays act as filters to capture most of the incoming debris and sediment in one location, making routine maintenance easier and extending the longevity of the main pond or basin. Some vegetation is encouraged as an added filter, but larger woody growth and trees are discouraged.


Emergency spillway


Inlet


Safety bench


Forebay


Pond embankment

5. Establishing a healthy safety bench. Many stormwater ponds have one or more safety benches to help prevent people from falling into deep water and drowning. These safety benches usually form a ring around the entire facility and should be filled with vegetation such as grass and/or wetland and aquatic plants. In dry areas, the vegetation helps to keep the soil in place and prevent erosion. Safety benches in wet locations should be vegetated for similar reasons and can also help prevent algae growth in these warm shallow areas where algae is produced much quicker than in deeper regions of a wet pond.

6. Installing a proper vegetative buffer along the lake or pond embankment. A buffer zone can help stop trash and debris from entering the main section of the waterbody. It can also block the soil from rain splash erosion. Keeping an un-mowed embankment protects the soil from the continual weight of commercial lawn mowers as well as grass being blown into the pond. It is okay to allow some small shrub species to exist in the buffer, but larger trees are problematic because their roots can lead to additional erosion around the waterbody.

Timing is important. As vegetation starts to go dormant in the fall, it is much easier to visually identify the key elements of the stormwater management facility and take appropriate action. This is also the time of year when the majority of debris accumulation occurs, especially leaf litter. Structural problems and upstream flooding can be very expensive and time consuming when a failure occurs. Having an annual management plan in place will allow professionals to see developing issues early, and take proactive steps to prepare the stormwater facility before a massive rain event happens. With routine inspection and repair, the stormwater facility should continue to perform well for many years, even decades! ■

What Exactly Is Electrofishing and Will It Harm My Fish?

By **Ben German, Fisheries Biologist**

Collecting data on fish populations, which are inherently difficult to directly observe, has always presented a unique challenge to fisheries biologists. To combat this issue, a subset of the fish population is sampled (collected) and used to draw conclusions about the larger population in the water body. Fish collection techniques

have evolved over time with several ancient technologies like nets, weirs, traps, and lines still in use today. More recently, in the mid-20th century, biologists began exploring electricity as a viable means to capture fish.

When performed by a trained professional, electrofishing is a safe and efficient survey method that allows biologists to obtain a more complete picture of the fishery and accurately calculate important metrics. This data, evaluated in conjunction with water quality assessments, fish habitat, and stakeholder goals, provides fisheries biologists with the information needed to develop customized fisheries management plans.

Simply put, electrofishing is the use of an electrical current to capture fish. In most lake or pond applications, an electrofishing vessel producing pulsed direct current (DC) is the best option. The vessel has an on-board generator that produces a current which is directed via a control box to terminals called the anode (positive) and cathode (negative). The anode droppers hang from booms at the bow of the boat and the cathode can either be a single insulated dropper or the boat's hull. Together, they deliver voltage and current to the water forming a three-dimensional field affecting a 6-8-foot radius around the anodes. In fresh water, fish generally have

a higher conductivity than the surrounding water and become the path of least resistance for the current. When performed carefully and correctly by a trained professional, this process temporarily stuns the

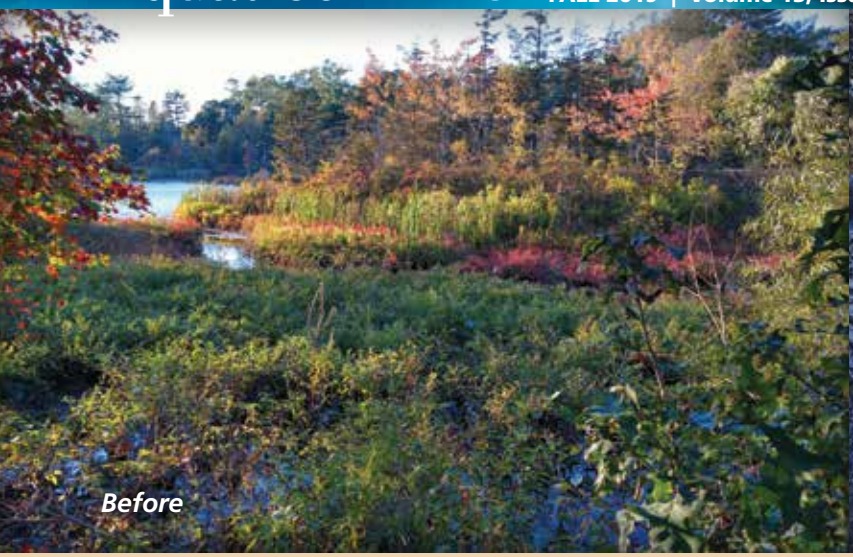
fish and allows fisheries biologists to safely collect them.

After the fish are netted, they are placed in an insulated livewell which removes them from the electrical field until the survey is complete. Once the appropriate amount of fish are collected, data such as weight, length, species and sex can be gathered, in addition to scale or tissue samples. The fish may also be tagged with a unique identifier to provide growth data upon future capture. After the necessary management data have been gathered, the fish are promptly returned to the lake unharmed.

The data and information provided by an electrofishing survey is the foundation of a successful fisheries management plan. It gives biologists insight into the way a population is responding to the current management regime and establishes knowledge of the system required to make well informed decisions. This new information, paired with knowledge of the habitat, water quality and stakeholder goals, allows biologists to craft a tailored suite of management techniques to meet the goals for your system. A customized, adaptable management plan crafted in this way ensures the best course of action is taken to help you achieve sustainable fisheries success. ■

DISCLAIMER: When electrofishing is employed, for the safety of the fish and the crew it is imperative that a skilled professional operator is in command of the vessel and the electrical systems. Electrofishing can be dangerous for people and fish alike when carried out by untrained personnel. Since every lake and pond is unique, the precise settings and appropriate outputs will vary and must be accounted for by the operator. While no sampling method is without stress for fish, when properly conducted by trained biologists, electrofishing is one of the most effective and efficient ways to collect fish and will result in minimal stress for the fish.

AquaticsinBrief FALL 2019 | Volume 13, Issue 3



Hydro-raking Restores Ecological Balance and Recreational Access in a Community Pond

By **Lauren Sullivan, Environmental Scientist and Project Coordinator**

A 4.2-acre pond located within the western section of a 1,400-acre lake in Webster, MA, is a valuable resource for the surrounding community. The pond has historically served as a direct inlet into the lake, with a culvert connecting the pond to the watershed. It is used by surrounding residents for kayaking, wildlife viewing and fishing.

Over time, the water connectivity between the two waterbodies was halted due to an accumulation of nuisance emergent vegetation and organic matter buildup along the pond side of the culvert. Several factors led to these issues, including shoreline erosion and excessive nutrient loading as a result of stormwater runoff and human impact.

The community opted to utilize hydro-raking for the restoration of water flow and depth. This solution was chosen because of the machine's limited environmental impact and dynamic maintenance capabilities. A hydro-rake is essentially a floating barge on which is mounted a backhoe with several rake attachments of different sizes and functions. The hydro-rake can operate in water as shallow as 1.0-1.5 feet and can remove nuisance vegetation and bottom debris from water depths ranging from 18 inches to 10 feet. Hydro-raking was also favored as a budget-friendly alternative to costly dredging, which eventually becomes required to maintain all waterbodies if other sediment management strategies are not proactively utilized.

The overall objective of the restoration program was to remove several feet of accumulated organic matter in a 0.5-acre section of the pond, as well as emergent vegetation such as rushes, buttonbush and cattails to maintain open water habitat, water flow and desirable water quality. Other benefits of the hydro-raking restoration program include reduced odors, improved boating and fishing lanes, and shoreline preservation.

In the fall, a hydro-rake was deployed to the designated area of the pond culvert. The hydro-rake removed the organic matter, emergent vegetation and associated rhizomes. The materials were then offloaded into the bucket of a front-end loader and placed in dump trucks to be transported to a local composting facility. Due to the proximity of the offloading location, the SOLitude team was able to efficiently remove a large amount of material in a relatively short timeframe.

The project was extremely successful and the management efforts took a total of six days. 600-yards of material were removed, restoring three feet of depth within the pond, as well as the flow to the lake. Removing three feet of organic matter from the bottom of the waterbody also helped to restore available habitat and reduce eutrophication, or aging, of the pond.

The community was so pleased with the results that they made additional plans to hydro-rake another side of the culvert, which was severely hindered by organic matter build-up and dense vegetation. ■

Utilizing Lake Mapping and Bathymetry to Help Determine the Perfect Submersed Aeration System

By **Kyle Finerfrock, Environmental Scientist**

One of the great tools in a lake manager's tool box is the use of submersed aeration. Submersed lake and pond aeration adds oxygen directly into the water column and involves involves the mixing of water to increase exposure to atmospheric oxygen, thus, decreasing harmful gases like hydrogen sulfide with in the waterbody. This proactive management solution significantly helps promote positive changes in lakes and ponds; however, aeration systems must be properly sized and placed in order for aquatic ecosystems to fully reap the benefits. Surface mapping used in conjunction with depth-sensing technology, such as bathymetry, can help determine the correct size and location of aeration systems to ensure the entire waterbody is receiving adequate oxygenation.

Submersed aeration uses diffused air to push water from the bottom of the pond to the surface, where it can be exposed to the atmosphere. The water on the surface then gets displaced and driven down to the bottom of the pond, creating circulation and mixing from top to bottom. This mixing creates a more uniform and oxygenated body of water.

Why is it important to increase oxygen levels in your pond? The amount of oxygen in a waterbody can drive the type of organisms that live within an aquatic environment. Organisms that use oxygen promote a healthy ecosystem. Organisms that thrive in low or no oxygen (anoxic) conditions promote poor water quality and can damage the lake or pond's health. A pond that lacks a properly sized and located aeration system will likely have anoxic conditions at depths greater than eight

feet deep in the summer months. In this zone, anaerobic bacteria can produce ammonia and hydrogen sulfide which can be toxic to other organisms and give off foul odors. Anoxic conditions can also change a pond's chemistry, leading to the release of nutrients like nitrogen and phosphorus, which can promote nuisance algae growth and other water quality issues.

When determining the perfect aeration solution for your waterbody, an aquatic management professional will take into account the shape, various depths and overall volume of a lake or pond. Surface mapping utilizes GPS software and satellite imagery, which enables a specialist to determine a waterbody's exact surface area. In turn, bathymetric mapping involves the use of integrated GPS and depth sensing technology to create a three-dimensional model of your waterbody. As a result, this model has detailed bottom contours and highly accurate volume calculations. Combined, these tools provide the necessary data to choose and install a submersed aeration system that is customized, and optimized, for your unique property.

With a proper submersed aeration system in place, you're on your way to restoring ecological balance and preventing future water quality problems. It's important to note, though, that aeration is only one piece of the puzzle. A comprehensive lake and pond management plan should also include regular water quality testing,

nutrient remediation and beneficial vegetative buffer management to help ensure the ongoing health and longevity of your lake or pond. ■

The Benefits of Professional, In-House Water Quality Testing Labs

By **Sam Sardes, Laboratory Manager and Weed Science Director**

If you were sick, would you perform an at-home blood test or would you count on an experienced medical professional? Most of us would choose the expertise of a doctor or nurse. Water quality testing should be viewed in the same vein.

Picturesque lakes and ponds don't occur by accident. In most cases, they are the result of rigorous, comprehensive management plans, with water quality testing as the backbone. Like a blood sample, water samples can reveal a plethora of information about a waterbody.

To a "do-it-yourselfer," conducting an amateur water quality test might seem like a way to cut costs, but sampling is complex and can be impacted by many factors, including time of day and the type of bottle used. And when you send those samples to an independent lab, they will return a sophisticated data report, but probably won't interface with you or explain (in layman's terms) how the results impact your waterbody.

What does working with an aquatic management company mean for you? It means knowing that all testing is completed properly by a scientific team in an in-house laboratory, that the data is interpreted in a way you understand, and all factors are considered to develop a customized, premium management program for your waterbody.

Water quality management is a complex and dynamic scientific field, very much like medicine. If you truly care about the health and longevity of your aquatic ecosystem—as well as using your budget efficiently—you will invest in a professional management company that puts an emphasis on cultivating the relationships beyond the water sample.

Volunteers of the Quarter Collaborate on Lake Restoration Efforts

Through our volunteering and community outreach program, The SOLution, we're pleased to name Assistant Regional Manager Errol Walsh and Aquatic Specialist Scott Dye as co-Volunteers of the Quarter for the second quarter of 2019. Based in Central Florida, the two have been active through recurring volunteer initiatives benefiting their local community of Seminole County.

During the second quarter, Errol and Scott have volunteered extensively during weekends and in their personal time with the Seminole Education, Restoration, and Volunteer (SERV) Program, an organization that partners with local biologists, lake residents, and students to complete invasive species pulls, shoreline stabilization projects and other environmental restoration efforts. Collectively, Errol and Scott participated in seven events and finished the second quarter with a total of 30.5 volunteer hours!

Their hard work and dedication makes them an inspiration to us all! Congratulations, Errol and Scott!

Before and After Showcase

Filamentous Algae Treatment
Noel Browning, Aquatic Biologist, CO

Planktonic Algae Treatment and Fountain Install
Dave Riedl, Regional Manager & Environmental Scientist, VA

Watershield and Filamentous Algae Treatment
Peyton Woods, Aquatic Scientist, GA

NEW SOLs

It is our pleasure to introduce and welcome some of our newest colleagues.

Michael Didier
(Shrewsbury, MA)
Aquatic Specialist

Jordan Hathaway
(Saint Louis, MO)
Aquatic Specialist

Jay Lucas
(Fort Myers, FL)
Aquatic Specialist

Daniel Williams
(Nashville, TN)
Environmental Scientist

Daniel Meeker
(Tyler, TX)
Environmental Scientist

Randall Ratliff
(Fort Myers, FL)
Fountain and Aeration Specialist

Chris Oliva
(New Jersey)
Business Development Consultant

Ethan McAlhaney
(Virginia Beach, VA)
Environmental Scientist

Tara Gamble
(Mesa, AZ)
Customer Experience Manager

Evan Brillhart
(Shrewsbury, MA)
Natural Resources Scientist

Jordan Beck
(Fort Pierce, FL)
Aquatic Specialist

Nolan Norris
(Fort Myers, FL)
Aeration and Fountain Specialist

Grant DeMello
(Nashville, TN)
Environmental Scientist

Check Us Out

SOLitude will be participating in the following events over the coming months. Come visit us!

October 8
Palm Beach Condo & HOA Expo
Palm Beach, FL

October 11
Nevada Chapter of Community Associations Institute's CA Day Tradeshow
Las Vegas, NV

October 14 – 17
Florida Aquatic Plant Management Society Meeting
St. Petersburg, FL

October 17
New Jersey Chapter of Community Associations Institute's Annual CA Day and Tradeshow
Freehold, NJ

October 22
Chesapeake Chapter of Community Associations Institute's Annual CA Day and Tradeshow
Baltimore, MD

October 24
Hudson Valley New York Chapter of Community Associations Institute's Annual Tradeshow
West Nyack, NY

October 24
St. Louis Apartment Association Fall Expo and Seminar
St. Charles, MO

November 4 – 7
Georgia Recreation and Park Association Conference
Dalton, GA

November 18 – 20
Carolinas Golf Course Superintendents Association Conference and Expo
Myrtle Beach, SC

December 5
Wine Industry Expo
Santa Rosa, CA

December 12
The Cooperator Expo South Florida
Ft. Lauderdale, FL

THANK YOU TO OUR VENDOR PARTNERS

Aqua Master Fountains and Aerators — Master the Power and Beauty of Water
Vertex Water Features — Lake Aeration Systems & Floating Fountains
SOX Erosion Solutions
the MappingNetwork
The Stewards of Water
Ranch King
Texas Hunter

SOLITUDE
LAKE MANAGEMENT
A Rentokil Steritech Company

TOLL FREE: 855.825.8679
www.solitudelakemanagement.com
2844 Crusader Circle, Suite 450, Virginia Beach, VA 23453
Email: inquiries@solitudelake.com • Fax: 888.358.0088

Want helpful lake, pond, wetland and fisheries management tips at any time?

PRESRT STD
U.S.Postage
PAID
Norfolk, VA
Permit No. 287

Services and Consultation Offered Nationwide

- Annual Lake & Pond Management
- Water Quality Restoration
- Fountain & Aeration Systems
- Algae & Aquatic Weed Control
- Fisheries Management
- Water Quality Testing
- Bathymetric Studies
- Biological Augmentation
- Mechanical Harvesting & Hydro-Raking
- Erosion Control & Bioengineered Shorelines

Say Goodbye to Snail Mail and Go Green! Help us reduce our environmental footprint by opting to only receive a digital copy of this newsletter. Visit solitudelakemanagement.com/gogreen

PPCECO
It's our nature to be green.

This paper contains 10% Post-Consumer Waste and is printed using soy-based ink.

BBB ACCREDITED BUSINESS
BBB RATING: A+

1 Follower = $1 Toward a Lifetime of Clean Water

Help us reach our annual giving campaign goal of providing **100 people** in need with access to clean water by liking our social media channels: **solitudelakemangement.com/social**

The SOLution
creating a better world

charity: water
SUPPORTER

For every new follower this year, we'll donate $1 to charity: water, where 100% of those donations go to bringing clean water to people in impoverished countries.