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AquaticsinBrief

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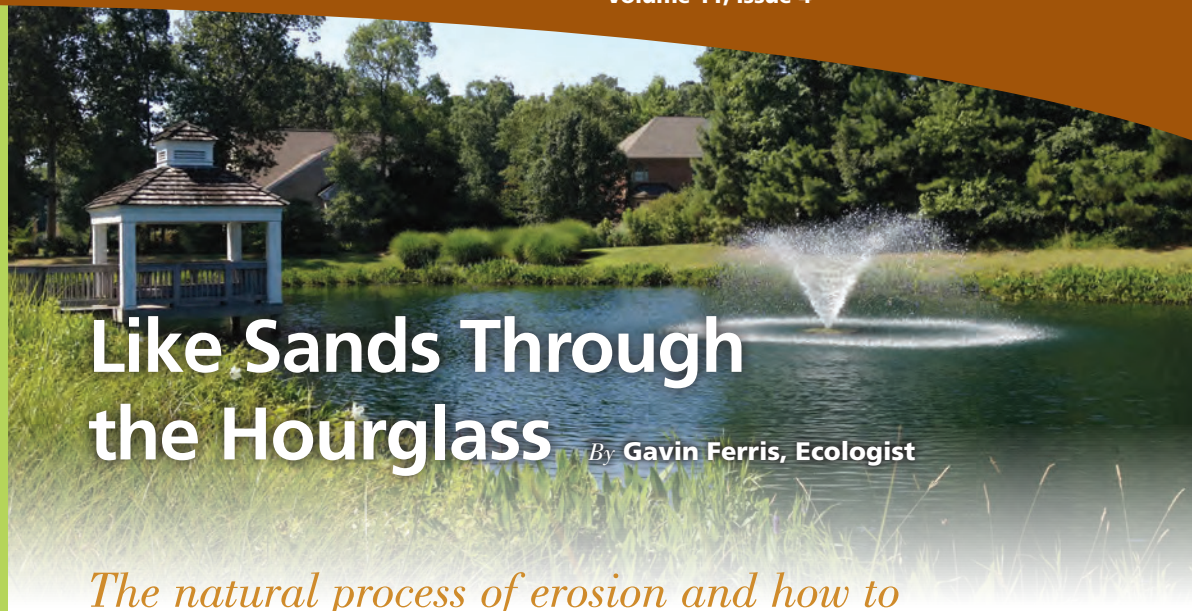

Like Sands Through the Hourglass

By **Gavin Ferris, Ecologist**

The natural process of erosion and how to control it utilizing vegetative buffers

It is often remarked upon how adept beavers are at creating their own habitat, but in my observation muskrats are nearly their equal in this regard. While beavers endeavor to turn every stream into a pond and every pond into a lake, muskrats seem intent on turning every pond into a marsh. Every muskrat burrow dug into the side of the bank collapses and erodes, washing sediment into the waterbody. The rodents continue stealing land from the shoreline as they dig new burrows into what was previously terra firma and the lake or pond continues to fill with what used to be its own banks.

This is but one example of shoreline erosion, which is (or at least should be) a concern of anyone with a lake, pond or stream on their property. Erosion is a natural process, and to a certain extent it is inevitable—if not entirely benign. But, it is also a force that needs to be monitored and managed lest it result in severe damage and, in some situations, a safety hazard.

A great many factors influence the risk of erosion on any given shoreline. Steep slopes are more prone to erosion due to the effect of

gravity. Stream banks are typically at greater risk than the banks of lakes and ponds due to the force of moving water. Loose, sandy soils also erode more rapidly than clay or loam because of the ease with which their particles can be displaced. Perhaps the most important factor to consider, however, is the type of vegetation present along the shoreline.

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Like Sands Through the Hourglass

Continued from front cover

Oversimplified, any vegetation is better than no vegetation at all. Bare ground experiences erosion just from the impact of raindrops, let alone the force of flowing water over time. Some types of vegetation are better than others, however, and some plants should actually be avoided. Trees and other woody plants, for example, while quite beneficial along streams and rivers, can be disastrous on a lake, pond or stormwater BMP. While it is true that a tree's roots create a soil-holding net, they also penetrate the ground and then grow and expand. This has the effect of shifting earth, moving rocks and even cracking concrete in some cases. On an earthen dam this action can cause catastrophic failure, and if you want to see the results of an earthen dam failing, the city of Johnstown, Pennsylvania has entire museums dedicated to the subject.

More appropriate plants for pond shorelines are perennial herbaceous species, as these plants establish strong roots to hold the soil without causing the same types of disturbance. Recommended perennial herbaceous plants include cardinal flower, woolgrass, swamp milkweed, Joe-pye weed and hibiscus. Taller vegetation is better than short cropped grass, as it is more effective at dissipating the energy of falling rain and slowing sheet flow across the surface during heavy storms and floods.

Perhaps the most overlooked form of vegetation for erosion control is emergent vegetation within the pond itself. Plants like pickerelweed, arrowhead and lizard tail help to break up waves and currents before they reach the shoreline, dissipating their energy and protecting the banks.

Vegetation can be selected and managed for a variety of additional benefits, ranging from wildlife habitat, aesthetic appeal, goose deterrence and even edibility. Overall, however, the more beneficial, native vegetation you allow along the shoreline of your waterbody, the better it will serve you. ■

Spreading HOLiday Cheer

By **Ann Marie Dori, Marketing and Outreach Coordinator**

Since the inception of our community outreach and volunteering program, The SOLution, SOLitude has helped more than 21,500 under-resourced families enjoy their holidays! Once again this year, in addition to providing Thanksgiving turkeys or grocery store gift cards to elementary and middle schools to distribute to children with families that are struggling to make ends meet, we are seeking nominations for deserving families in the regions we serve to "adopt" for Christmas.

It is SOLitude's hope that each year through our HOLiday Cheer Program, we are able to bring some much needed joy to families and children who are facing serious financial, health and/or emotional problems. Families will be selected based on the severity of their situation. A wish list of necessities, as well as fun items, will be collected and distributed to our dedicated staff. Team SOLitude members then generously purchase items on the families' wish lists, which include winter coats, hats, gloves, shoes, pajamas, sports gear, toys, games and Target gift cards to purchase needed household items. We also will continue to support local children's hospitals by donating a variety of games and toys to the brave young children who will be spending their holidays in the oncology unit through our annual HOLiday Cheer social media campaign.

Thank you so much for all the gifts and gift cards! This is such a blessing to us and our family really needed this.

– Family helped in Western Virginia

We can't do this without help from our loyal clients, dedicated staff and partners! If you have a relative, friend, neighbor or co-worker that could use assistance in order to provide their family with the holiday everyone deserves or you would like to make a donation to support these families, please contact Ann Marie Dori, Marketing & Outreach Coordinator at info@solitudelake.com. Please be sure to include as much information as possible with your nomination: the ages and genders of the children under 18, the family's location, along with a brief summary of the challenges being faced by the family and why you think they are in need of HOLiday Cheer. Nominations will be accepted through Friday, November 3rd and all details and family names will be kept confidential.

Join the SOLitude family in being part of The SOLution through our HOLiday Cheer program and other community outreach and volunteering efforts throughout the year. ■

Visit: www.solitudelakemanagement.com/thesolution

New England Recreational Pond Restoration

Combating invasive fanwort while protecting native species downstream

By **Amanda Mahaney, Aquatic Biologist**

This aquatic plant management program is particularly significant because Agawam Mill Pond is located upstream from four rare and endangered aquatic vegetative species.

Agawam Mill Pond, located in Wareham, Massachusetts, is a 150-acre waterbody owned by the Commonwealth of Massachusetts and is managed by the MA Division of Fish and Wildlife (MA DFG). It is used heavily for recreational activities, such as boating, fishing and swimming, and supports moderate residential development. The pond has an average depth of six to eight feet with a maximum depth of twelve feet; therefore, emergent and submerged vegetation has the capability to flourish, rapidly expanding into dense colonies. Currently, the invasive, non-indigenous submersed vegetation (fanwort and variable watermilfoil) has inundated the pond causing a decline in water quality and has severely limited recreational activities for residents and guests.

A multi-year, three-phase, aquatic plant management program was initiated in 2016. The first phase of the program involved the successful treatment of a 20-acre area located at the northeastern end of the waterbody. Recently, we completed Phase II of the Agawam Mill Pond restoration project. Phase II involved treating a 37-acre segment of the densest thicket of invasive plant growth, which is the largest treatment area of the three phases. This aquatic plant management program is particularly significant because Agawam Mill Pond is located upstream from four rare and endangered aquatic vegetative species. The species of concern include one grass (salt reed grass), and three herbaceous plants.

It was uncertain whether the herbicide used in this management program could potentially cause harm to the four state-listed, protected plant species. Because of this uncertainty, lengthy permitting processes were carried through by both state and private participants. Accordingly, the herbicide treatment plan was structured specifically to lessen impacts to the non-target plants while accomplishing desired control of fanwort.

An extensive monitoring plan and herbicide residue regime, followed by a post-treatment vegetation survey, was agreed upon by those involved to further alleviate concern of all possible ill effects of the herbicide on the protected plants. Monitoring of Agawam Mill Pond began on the day of treatment and continued through the next few weeks where specified observations were recorded from six pre-marked sampling stations.

Initial results of Phase II of the management program were extremely positive. Fanwort, as the primary species specifically targeted, fell from the water column within forty-eight hours post-treatment. Although not directly targeted, variable watermilfoil was also heavily damaged within the treatment area. But, as predicted, it began to display signs of regrowth two weeks after treatment. It was immediately apparent that residents and visitors were finally able to enjoy the pond again.

Observations and testing results concluded Phase II as an overall success, opening swimming areas, fishing accesses and boating lanes, all the while conserving the rare and endangered species. As this phased management program concludes, ongoing annual management will likely be refocused on reducing regrowth and overall density of non-indigenous vegetation in Agawam Mill Pond. ■

Nuisance Aquatic Plant Highlight:
Fanwort

By **Brea Arvidson, Aquatic Biologist**

What's purple and green, with a little white flower? Fanwort: it's a competitive aquatic plant that grows in dense mat-forming patches. Its submersed leaves are its name-sake — dissected into a thin, flat fan-shaped display. The submersed leaves grow approximately 5 cm across and appear in opposite pairings on the stem. Small, diamond-shaped floating leaves are sometimes present at maturity, growing up to 3 cm long, but only 4 mm wide. The 3-petaled flower is inconspicuous and typically blossoms right at the water's surface.

To date, fanwort occurs in 28 U.S. states, of which 12 consider the plant a non-native. Vermont remains the only New England state free of fanwort. While native to the southern United States and Latin America, fanwort is commonly managed for nuisance growth. Other plant species present within the waterbody are often 'choked out' or inhibited from growing due to fanwort's aggressive nature. As with all unbalanced growth, it negatively alters species habitat and relationships, and established infestations can be extremely challenging to eradicate.

Like invasive milfoils, fanwort can vegetatively reproduce by fragmentation, in addition to an innate ability to self-pollinate. Seeds are formed and released after the plant flowers, enabling fanwort to overwinter consistently within its northern range. Both fragments and seeds can be transported by water flow, wildlife, recreational supplies and equipment, and undue negligence.

Fanwort can grow in oligotrophic to eutrophic environments, and withstand wide ranges of pH and temperature. Stems have been documented most commonly at depths up to 3 meters, but reported to occur at depths up to 10 meters. While hardy, flow often deters growth and limits fanwort to quiet streams, lakes and ponds.

Invasive and nuisance plant growth directly harms our economy (tourism, real estate values, etc.) and the ecosystem. Spread of fanwort can be prevented through the removal of pond material from recreation equipment before leaving and entering a waterbody. Control is most effectively achieved through herbicide application; however, drawdown practices and hand-removal have been utilized to success in smaller infestations. As with any invasive, preventative management is key. ■

SOLitude Announces Cole Kabella as Volunteer of The Quarter

Through our corporate volunteering program, The SOLution, Cole Kabella, Wildlife and Fisheries Biologist, was named Volunteer of the Quarter for the second quarter of 2017.

Cole spent many weekends volunteering with the Aggieland Humane Society in Bryan, TX. There, he helped walk dogs, clean kennels and clear the surrounding fence line of overgrown trees. Cole also identified vegetative and water quality problems with the shelter's quarter-acre pond and worked with SOLitude's aquatic scientist Travis McCarver to restore the waterbody using products donated by SOLitude.

Outside of his work at the shelter, Cole participated in several neighborhood cleanups and joined his wife by supporting and competing in two SPCA benefit races. Cole, thank you for being a part of "The SOLution" in your local Texas community! ■

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.

Buford Lessley

Aquatic Biologist
Tyler, TX

Buford Lessley is an aquatic biologist based out of SOLitude's Tyler, TX office. Buford helps clients determine the best management approach for their aquatic resources, and has extensive experience in electrofishing, vegetation management and water quality testing. He has a bachelor's degree in Wildlife, Fisheries and Aquaculture from Mississippi State University and a master's degree in Biology from the University of Texas Rio Grande Valley.

Elijah Pridgen

Aquatic Specialist
Virginia Beach, VA

Elijah Pridgen is an aquatic specialist serving clients in Virginia and North Carolina. He delivers sustainable algae and aquatic weed management solutions, and provides comprehensive aeration and fountain installation and maintenance services. Elijah is pursuing a degree in Marine Biology from Brunswick Community College in Bolivia, NC and continues to build on his expertise through continuing education seminars with industry leaders.

Michael Meritet

Aquatic Specialist
Fairfax, VA

Michael Meritet is an aquatic specialist who is focused on helping clients, throughout Virginia and Maryland, achieve their lake and pond goals through best management practices and ecologically sustainable strategies. Michael has extensive experience working to solve lake and fisheries challenges in a variety of situations. He earned his bachelor's degree in Fisheries and Aquaculture from SUNY Cobleskill. Before joining SOLitude, he worked as a bayman and a team member on an aquaponics farm.

Erique Cote

Mechanical Specialist I
Shrewsbury, MA

Erique Cote is a mechanical specialist in SOLitude's mechanical division. He is experienced with the operation, tow and repair of mechanical harvesters and hydrorakes. Erique studied Automotive Technologies at Harvard Ellis Tech where he focused on troubleshooting, maintenance and repair of gas diesel engines. He has also completed four ASE certifications, as well as the Honda CDX program.

Carolyn Stabley

Regional Administrator
Nashville, TN

Carolyn Stabley is a regional administrator and client relations professional who serves as one of the first points of contact for clients and vendor partners throughout the Mid-South and Texas. She helps ensure customer and team member communications flow as smoothly as possible and uses her wealth of business knowledge to support SOLitude's field staff, operations team and regional directors.

Allison Tabisz

Services and Contracts Administrator
Virginia Beach, VA

Allison Tabisz is a services and contracts administrator based out of the Virginia Beach office, and is focused on processing service agreements and supporting SOLitude's operations and administrative teams. Allison has more than a decade of business and management experience, and has utilized her administrative expertise in a variety of fields ranging from catering and events to healthcare. She holds a degree in Business Administration with a focus in Technical Management from DeVry University.

Largemouth Bass Genetics: Should I be concerned with genetics when stocking fish?

By **Dr. Vic DiCenzo, Fisheries Biologist**

Stocking fish is one of the most common management practices employed by fisheries managers to help enhance recreational fishing. There are a variety of reasons why managers stock fish:

- Establish populations in new or reclaimed lakes and ponds
- Supplement a population that experiences poor reproductive success
- Create a "put-and-take" fishery (such as trout or channel catfish)
- Introduce an alternative species
- Introduce genetic diversity
- Control predator populations
- Enhance the forage base
- Control undesirable species with a biological solution

Given the myriad of reasons why managers stock fish, a number of decisions must be made prior to stocking. When it comes to stocking Largemouth Bass, undoubtedly the single most discussed topic is genetics.

Florida Bass (FLMB) are native to peninsular Florida, and because of their ability to grow faster and reach larger sizes, they have been stocked widely outside their native range. Largemouth Bass (often referred to as Northern Largemouth Bass, NLMB) are native to the St. Lawrence River and Great Lakes, Mississippi River basins, and Atlantic Slope drainages from North Carolina to Florida, and Gulf Slope drainages from southern Florida into northern Mexico. Due to widespread stocking, much of the original NLMB distribution is now comprised of fish with both Florida and Northern genetics (called intergrades).

Hatchery managers can cross pure FLMB and NLMB to produce individuals called F1 hybrids. These first-generation hybrids are believed to be aggressive like the NLMB and fast growing like the FLMB, making them popular with private lake and pond owners.

Despite the potential growth and size advantages of FLMB, the genetics of stocking Largemouth Bass is still debated by fisheries professionals. Three factors are often discussed: growth, survival and catchability. Although a number of studies have examined Largemouth Bass performance related to genetics, definitive results that could inform better management decisions are lacking. Therefore, fisheries managers must make the best possible decision on a case-by-case basis to achieve objectives.

Fisheries managers should consider the advantages and disadvantages of NLMB, FLMB and F1 Largemouth Bass when determining which strain to stock. Although FLMB generally grow faster and to a larger ultimate size, survival decreases in more northern locations. Consequently, fisheries managers may not achieve their desired objectives by stocking FLMB in New England waters. Similarly, NLMB may not grow as fast as FLMB in southern climates. Therefore, if survival is poor, then fewer fish will live to realize this growth advantage. Thus, stocking success requires an understanding of how growth and survival interact to determine how your stocking will perform and, ultimately, what the fishing experience will be like. F1 hybrids tend to exhibit the best traits of the NLMB and the FLMB— above average growth, higher survival rates in cooler water, and better catch rates. Scientists refer to these advantages in traits as "hybrid vigor."

If F1 hybrids demonstrate the best performance traits of NLMB and FLMB, then why is there so much debate over Largemouth Bass genetics when it comes to stocking? F1 Largemouth Bass will spawn in several years and their offspring will no longer be first generation hybrids. These second-generation (Fx) hybrids may not exhibit the hybrid vigor of their parents. Subsequent generations are even further removed from the advantages of the F1 Bass, so populations consist of Fx hybrids. Consequently, the advantages of F1 Largemouth Bass could be short lived. However, because of stocking, most Largemouth Bass populations consist of Fx fish. So, it is quite natural to have a fishery consisting of various generations of Largemouth Bass intergrades.

Lake and pond managers must remember that while stocking is a common fisheries management strategy, it alone does not guarantee success. Careful consideration to regional/geographic location, habitat, productivity, harvest, water quality and prey management must be given to any fisheries management plan to help achieve the desired objectives. ■

Before and After Showcase

Excellence in Water Quality Treatments

Location: Portsmouth, VA

Surface Area: .5 acre community stormwater pond

Primary Target: Filamentous algae

Restored By: Cody Griffey, Environmental Biologist

Location: Rehoboth Beach, DE

Surface Area: .3 acre private community pond

Primary Target: Filamentous algae

Restored By: Greg Blackham, Aquatic Specialist

Location: Tyler, TX

Surface Area: 8 acre public lake

Primary Target: Woody vegetation on north face of dam

Restored By: Cory Smith, Territory Leader

Featured Mechanical Harvesting Project

Location: Boiling Spring Lakes, NC

Surface Area: 4.3 acre management area

Primary Target: Maidencane

Restored By: SOLitude Mechanical Team

The SOLitude Knowledge Bank

Helping You Make Informed Decisions

When you partner with SOLitude Lake Management, we provide you with a wealth of lake and pond management resources. Our expert aquatic scientists and specialists will educate you on the services that are being provided. We will also give you what you need to help disseminate valuable information to your community members, adjacent land owners, or other stakeholders and interested parties on a variety of engaging lake, pond, wetland and fisheries management topics.

Be sure to subscribe to the SOLitude blog (www.solitudelakemanagement.com/blog), and view past issues of Aquatics In Brief, various published articles and our FREE downloadable educational guides. ■

Unlock the Knowledge Bank: solitudelakemanagement.com/education

Check Us Out

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

October 19
Western New York Chapter of Community Associations Institute Trade Show
Rochester, NY

October 20
North Carolina Lake Management Society (NCLMS) Fall Conference
Wilmington, NC

October 24
Chesapeake Chapter of Community Associations Institute Annual CA Day and Trade Show
Baltimore, MD

November 4
San Antonio Chapter of Community Associations Institute CA Day
Helotes, TX

November 6-9
North American Lake Management Society (NALMS) 37th International Symposium
Westminster, CO

November 13-15
Carolinas Golf Course Superintendents Conference and Trade Show
Myrtle Beach, SC

November 15
Pennsylvania and Delaware Valley Chapter of Community Associations Institute Mini Trade show/Educational Forum
Mt. Laurel, NJ

November 27-29
Texas Aquatic Plant Management Society (TAPMS) Conference
San Antonio, TX

November 29
Missouri Green Industry Conference
St. Charles, MO

December 1
Southwest Virginia Chapter of Community Associations Institute Business Summit
Roanoke, VA

December 5-7
Texas Turfgrass Association Conference & Show
Arlington, TX

December 5-7
Rocky Mountain Regional Turfgrass Association Show
Denver, CO

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- Water Quality Testing
- Bathymetric Studies
- Biological Augmentation
- Mechanical Harvesting
- Ultrasonic Algae Control

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Help us reduce our environmental footprint by opting to only receive a digital copy of this newsletter. Visit solitudelakemanagement.com/gogreen

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Ponder These Thoughts

SOLitude Lake Management wants you to be prepared for the Autumn season and all of the wonderful cool weather it brings. With this in mind, we recommend you consider the following tips as you enjoy the colorful fall months on your lake or pond:

- Fall is a good time to think about repairing and maintaining the areas around your lake or pond. Be sure to trim the buffer zone and make certain that it is free of woody vegetation. Repair any eroded areas around your waterbody before they become major issues. Erosion repair can easily be done in the fall months when you can plant and seed the areas to allow for soil stabilization.
- Schedule a bathymetric study as well as a structural inspection of your lake or pond. This will allow for proper budgeting for future dredging and repair of any physical problems with your waterbody and its related structures.
- Falling leaves and other yard debris may blow into your lake or pond. Try to keep leaves, clippings and other debris out of the waterbody and the ditches and storm drains that lead to it, as this adds nutrients which could lead to the growth of algae and other unwanted vegetation.
- If your lake or pond has a fountain, now is the perfect time to schedule an Oil and Seals service which should be performed every three years. For those who live in the colder climates, you may desire removal and winter storage for your fountain. If so, this should be completed by early December.
- For those considering hydro-raking as a solution for removal of aquatic vegetation and accumulated debris, fall and winter are the ideal time for this service (in areas that don't get a hard freeze).
- Liming is an important method of correcting many water quality issues, as well as helping to improve fish productivity in ponds. This process, if needed, should be done in the fall or winter.
- Fall is a great time to stock rainbow trout. Trout serve as a very entertaining fish to catch and will survive in ponds during the fall, winter and spring months. During this time, they transform your warm water fishery into a fun and entertaining cold water fishery that everyone can enjoy.