

PONDTRADE™

Serving Professionals in the Pond and Water Feature Industry

Snakes in the Grass

How to avoid them and treat
their bites p.36



www.pondtrademag.com



SAVIO
EXCELLENCE

SAVIO UVINEX®

EASILY REMOVE ALGAE FROM YOUR POND!

- Simple plug & play installation
- Easy to maintain
- Increases the effectiveness of your filtration
- 1 Year ballast warranty

UVinex
System



HIGHOutput



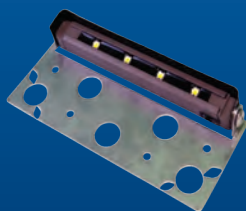
UPGRADE TO HIGH OUTPUT:
35% MORE EFFECTIVE!



IGNITE LANDSCAPE LIGHTING

Ignite Landscape and pond lights offer a fully customizable line of outdoor lighting supplies. Simply choose your lighting fixture supplies and transform your outdoor space into an elegant and gleaming wonderland.

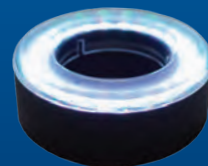
WALL LIGHTS



STRING LIGHTS



RING LIGHTS



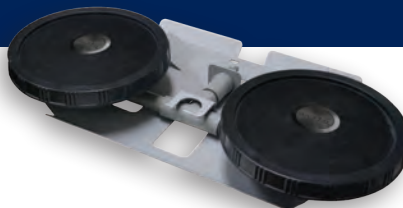
Protect Your Koi Fish - Help prevent fish kills from pond turnover



Improve Water Quality - Reduce green water & add oxygen to your pond



Built For Year-Round Use - Maintains a hole in icy water during winter





GRAND KOI

**THE FINEST IMPORTED JAPANESE KOI
FROM THE BEST BREEDERS IN THE WORLD**

CALL : 1-844-GRANDKOI (472-6356), 1-201-245-9352.

WE ARE ONE OF THE LARGEST JAPANESE KOI INVENTORY
HOLDERS IN THE UNITED STATES. TO SUPPORT HOBBYISTS
IN USA, WE HAVE COLLABORATED WITH LEADING MANU-
FACTURERS OF AUTOMATED FEEDERS, CERAMIC MEDIA,
AND OTHER KOI ACCESSORIES "MADE IN JAPAN".

INFO@GRANDKOI.COM

USA | JAPAN

WWW.GRANDKOI.COM

3751 GA-166, DOUGLASVILLE, GA 30135, UNITED STATES



FEATURES

8 Streaming from Canada POND CONSTRUCTION

Geert Meganck gives a guided tour of one of his prized pond builds just north of the border. This natural-looking stream and outdoor living space amid rough surrounding terrain is adored by its owners and is scheduled to be featured on the 2024 Ottawa Pond Tour.

14 The Making of a Masterpiece

Regardless of the pond equipment and products you use, it's the careful selection of aquatic plants that can make or break a water garden, according to **Kelly Billing & Larry Carnes**. Learn why "planning your plantings" is so important for any waterscape.

21 Body Language LANGUAGE OF KOI

Can your fish actually talk to you? **Paul Curtis** says yes, but you have to be aware of what you're listening for. From manifestations of physical symptoms to erratic behaviors, learn what your swimmers are trying to tell you when they might feel under the weather.

28 Bottoms Up

Aeration and maintaining healthy levels of dissolved oxygen are universal concerns across most bodies of water. Airmax's **Harrison Hugo** provides an expert's look at bottom diffused aeration and explains how bubbles from the pond floor work their magic.

36 Snakes in the Grass

As Indiana Jones might have reacted to our cover photo, "Why did it have to be SNAKES?" Regardless of where you live, snakes can pose dangers if you're working outdoors. Physician and snake expert **Spencer Greene** has advice on what you should and shouldn't do when you happen upon one in the wild.



46 Outsmarting the Drought

Extreme weather conditions brought on by climate change — especially lack of available water — are becoming more and more prevalent. **Jonathan Marston** explains how water gardens can serve as the ultimate prescription for sustainability across all hardiness zones.

53 Nature's Lifeguard

Jerry Romano follows up on a pond build we featured in our May/June 2013 issue, with multiple considerations of how to maintain water quality and safety in recreational ponds. If your work includes wading or swim ponds, you won't want to miss this highly informative article.

59 What a Show!

Pondliner's Water Garden Expo is an annual staple networking event held in Shawnee, Oklahoma. Our very own **Lora Lee Gelles** attends every year to run the POND Trade booth and present the winners of our annual Water Artisans of the Year contest. Check out her photo diary of the 2023 event!

DEPARTMENTS

- 6 Upcoming Events
- 62 Trade News
- 64 Marketplace
- 65 Advertisers' Index

COLUMNS

- 7 Publisher's Perspective



Upcoming Events

2023

May 27 - 29

Greater Louisville Koi & Goldfish Society
25th Anniversary Show
Louisville, Kentucky
www.louisvillekoiclub.com

June 24 - 25

Pond-O-Rama Tour
St. Louis Water Garden Society
Various locations, Missouri
www.slwgs.org

July - August (5 Saturdays)

Lotus Entertain You Garden Tour
Kansas City Water Garden Society
Various locations
www.kcwatergarden.com

August 23 - 27

2023 IWGS Symposium
Vancouver, B.C., Canada
www.iwgs.org

October 18 - 20

Hardscape North America
Kentucky Exposition Center
Louisville, Kentucky
www.hardscapena.com

November 13 - 15

International POOL | SPA | PATIO Expo
Las Vegas Convention Center
Las Vegas, Nevada

Are you attending an event that you think others should know about? Are you hosting an event and want more people to come? Send event information to llgelles@pondtrademag.com.



Moving? Let Us Know

If you are moving, please update your address with us so we can update our records.

Use the forms from the post office, or drop us an email at llgelles@pondtrademag.com with your old and new contact information.

POND Trade Magazine, ISSN 1949-0585 is a trade publication of LG Publishing, Inc. Material is selected for its interest to the koi, water feature and pond industries, and the publishers accept no responsibility for the accuracy of content. Reproduction rights by written permission only.

POND Trade Magazine is published bi-monthly, starting in January, for \$41.70 per year by LG Publishing, Inc., POND Trade Magazine, PO BOX 2721, Orland Park, IL 60462. Qualified applicants may subscribe at no cost at www.pondtrademag.com. Postage is paid at Orland Park, IL and additional offices. For new subscriptions, additional copies and address changes, please call 708/873-1921 or email llgelles@pondtrademag.com.

POSTMASTER: Send address changes to POND Trade Magazine, PO BOX 2721, Orland Park, IL 60462
© Lora Lee Gelles, 2023

Advertising Policies: LG Publishing, Inc. reserves the right to refuse to publish any ad. Submission of an ad to LG Publishing does not constitute a commitment by LG Publishing, Inc. to publish it. Publication of an ad does not constitute an agreement for continued publication. LG Publishing, Inc. will not be liable for failure to publish an ad as requested or for more than one incorrect insertion of an ad. In the event of an error or omission in printing or publication of an ad, LG Publishing, Inc.'s liability shall be limited to an adjustment for the cost of the space occupied by the error, with maximum liability being cancellation of the cost of the first incorrect advertisement or republication of the correct advertisement. Under no circumstances shall LG Publishing be liable for consequential damages of any kind.

PONDTRADE™

STAFF

Publisher

Lora Lee Gelles 708/873-1921
llgelles@pondtrademag.com

Editor

Jordan Morris
jmorris@pondtrademag.com

Advertising Sales

Lora Lee Gelles 708/873-1921
llgelles@pondtrademag.com

Graphic Design

Gelles Graphics
llgelles@comcast.net

Accounts Receivable

Lois Spano
lspano@pondtrademag.com

Web Editor

Joanne Costin
jcostin@contentforbiz.com

Printer

Sutherland Printing
Montezuma, Iowa

For your
Free Subscription
see our

website www.pondtrademag.com

or call **708/873-1921**

Contact Info

POND Trade Magazine
P.O. Box 2721
Orland Park, IL 60462
708/873-1921

www.pondtrademag.com

Publisher's Perspective

My Nemesissss...

Snakes on a Plane? No — snakes on the cover of POND Trade magazine! Full disclosure: I am deathly afraid of "my nemesis" (yes, snakes), but seeing that you can find them in yards on every continent except for Antarctica, it's a really important topic to get across to our readers. Let me tell you how this all came about.



I attended the Atlantic Professional Conference last fall, and I found myself chatting with Chad Smith from Water in Motion. He told me that his daughter was bitten by a venomous snake while at a friend's house. They raced to the emergency room, where things did not go well. The first hospital did not handle snakebites well, and her condition quickly went from bad to worse. They finally went to the Texas Children's

Hospital, where they had the good fortune to get treatment from Dr. Spencer Greene, an authority on snakebites. As his daughter's condition improved, Chad was so impressed with the care that Dr. Greene provided. I mentioned to Chad that I was looking to run an article about snakes, and he shared Dr. Greene's contact info. I reached out, and Dr. Greene delivered. We are overjoyed to present to you a fabulous article about these slithering creatures.

Once you get past the "snake shock," be sure to check out our other wonderful features this issue. For our pond construction segment, we travel north of the border to the Ontario-Quebec line and a beautiful, natural-looking pond built amid a rough terrain ("Streaming from Canada," pg. 8). We're also thrilled to welcome back two of our regular contributors, Kelly Billing and Larry Carnes, for a collaborative article about choosing the best aquatic plants for your pond's environment ("The Making of a Masterpiece," pg. 14). Finally, don't miss Water Artisan of the Year winner Jonathan Marston's informative article on sustainable water-gardening systems to curb the nasty effects of drought ("Outsmarting the Drought," pg. 46).

Happy PONDerIng!

CasCade 5000 1hp Floating Pond Fountain Aerator

100 ft Power Cord • Light • Timer • EZ Installation!

10-15'
high!

www.fishpondaerator.com
Fish people since 1955

\$869.95

- Pre-Assembled, Installs in Minutes!
- 1 Year Warranty
- 220/230 Volt commercial model also available.
- **\$SAVE HUNDREDS!!**

Call 7 days/week • Fast UPS Shipping! • 608-254-2735

From Start to Finish, Planning is Everything.

Kelly Billing, Aquatic Plant Specialist, Consultant
and Grower intent on:



changing the way
Water Becomes a Garden
-kelly



443-504-2345
nelumbo22@gmail.com
www.waterbecomesagarden.com

"Streaming" from Canada

This natural-looking pond build is a diamond in the rough

by Geert Meganck,

Geert's Land & Waterscapes

When we were approached about this pond project in Aylmer, Quebec, Canada, the client had already done lots of research. He found us through a Google search, and the job site was only 1 ½ miles from our home base. He was planning on attempting to do it himself, but he realized that it would have been too intense and time consuming.

Building Outside the Box

He provided me with a colored computer-generated design of the idea he wanted. After I saw the design layout of this rather small backyard, I knew this would be another "outside-the-box" and unusual

project, but with a very beautiful end result.

The design was very formal with a square-pond layout. The clients had Alamode Concrete, a family member's operation, install all the stamped concrete pathways, including two pads for a round and square cedar gazebo. We helped the stamped-concrete contractor design the two bridge cutouts for the curved bridge placement and the above-ground concrete planter boxes, specifically the U-shaped wall area.

This is where we would place the biofilter box. We needed to make sure the large biofilter fitted properly because of the space constraints around the new concrete planter boxes. The biofilter box berm and the start of the stream also needed to look as natural as possible around the 90-degree turn of the pathway and avoid the "volcano look."



I added some descriptions to the design (above) the client sent me. The view (right) from the top of the biofilter box reveals the 12-by-12-foot gazebo area.



For extra filtration, we decided to make a mini bog-filter area on the right side of the biofilter box and at the start of the stream, slowing down the water coming in and out of this area. Near the end, we added a small tree stump and planted some seasonal water lettuce, a pitcher plant and a 'Little Giant' papyrus that did very well there in just three months.

Follow the Leda

The native backyard soil was hard and heavy Leda clay, something the Ottawa area is known for. So, the hand-shovel carving of the pond shelves proved a bit time consuming. We wanted to make the pond and stream look as natural looking as possible, which the client approved.

The pond is approximately 14 by 17 feet, with the deepest shelf 30 inches. We added a fish cave at the bottom, as the nearby Ottawa River is known for its presence of blue herons. We also

designed one side of the pond right up to the gazebo so guests can dangle their feet into about 20 inches of water while sitting on the gazebo floor.

The stream is approximately 27 feet long and posed the biggest challenge. We had to figure out how to best attach and disguise the EPDM liner. Because the stamped concrete walkways were only 4 to 5 inches thick, we didn't have much stream depth to work with. We then carved out the center of the streambed a bit to get a better-looking stream.

The 2-inch diameter PVC flex pipe connecting the skimmer pump to the biofilter box also posed a bit of a challenge, as it had to be installed between two concrete paths. We installed a PVC pipe inside the streambed area beside the path edge in a sand bed and covered it with the underlayment and liner.

We used the Atlantic PS 4600 skimmer and their BF 2600 Filter Falls biofilter box. For the pump, we used

the OASE Waterfall Pump 5150 GPH synchronous magnetic pump with a grounding plate. The skimmer box has a 2-inch PVC flex overflow pipe to a drainage pit, as rainwater runoff will be an issue here thanks to the gazebo roof and non-permeable pathways. We added an Atlantic faux-rock fiberglass lid to camouflage the black PVC skimmer lid.

Canadian Cragg

When we were sourcing the roundish granite pond and stream boulders, we had a bit of a tough time finding the 8-to-12-to-18-inch diameter size in my area of Aylmer, Quebec, north of Ottawa (the Nation's Capital) and the Ottawa River. We deal mostly with local sand pits in my 20-to-25-mile-area radius, because of their price point and huge variation of color and character.

But now, as a result of the huge demand during the recent pandemic, several of these pit owners have told us that they are depleted of anything



The stamped-concrete pathways (top, left) are under construction before my pond work begins. The pond liner-stream attachment (bottom, left) is detailed relative to the stamped concrete. The 30-inch-deep pond dugout (right) is shown with the sand-bed layer and fish cave PVC pipe.



larger than 12-inch diameter. We all, as great pond builders, know that larger rock looks way more natural in ponds and streams. We managed to find just enough properly sized boulders on this build to make it look as natural as possible.

For our future builds, especially the larger ones, we're going to start using blasted angular Canadian Shield granite rock that often comes from major highway projects in the hilly areas of the Outaouais, Quebec region.

Final Touches

To attach the EPDM liner to the 12-by-12 foot gazebo floor

and along the stream edges, we used 1/8-by-1-inch-wide aluminum flat bars. We installed the bars with 1.25-inch tapcon screws every 8 inches or so. We also used Geocel 4500 roof bonding sealant behind the liner before attaching the aluminum flat bars to the concrete. This way, the water runoff from the concrete pathways entering behind the liner would be avoided.

The client had a 3-by-4-foot curved cedar bridge built to go over the stream. We decided to bring all the pond and stream lighting quick-connect cables and splitters under the bridge. The main feed cable from the lights transformer arrives here.



The biofilter box (top, left & right) was placed inside the concrete U-shaped wall. A fall view (right) of the stream from the curved cedar bridge captures the essence of the feature. The gazebo view (left) shows the pond and main garden entrance gate.





Hunter, the owner's chocolate Lab (left) enjoys the stream. An evening view (right) looks toward the double-gate entrance.



It was the most convenient and logical spot to disguise them. It will also be easy to troubleshoot in the future by quickly lifting the bridge.

For LED lighting, we used two 4-watt lights inside the pond, and two 2-watt stream lights near the biofilter waterfall area. For the under-bridge lights, we

used two 1.5-watt Brilliance Mini Beam brass lights and mounted them so that they are completely hidden. We find these mini bridge lights to provide a very nice effect in the evening. After the pond completion, we installed a small brown flagstone patio for guests to sit on — and perhaps feed the goldfish!

Enjoyment for All

This one-story home on a street-corner lot has a walk-out basement onto an older, covered dining patio. Above it is a three-season sun room for the full viewing pleasure of this new backyard water garden.

Your one stop solution for clear, healthy water and Great Profits



Our line of upper end filtration products is designed to give your customers clear, healthy water while using a minimal amount of electricity.

You'll love the profits that can be generated with our line of products.



Grand Champion Technologies

GC Tek

302 S. Sandy Lane

Chandler, Okla. 74834

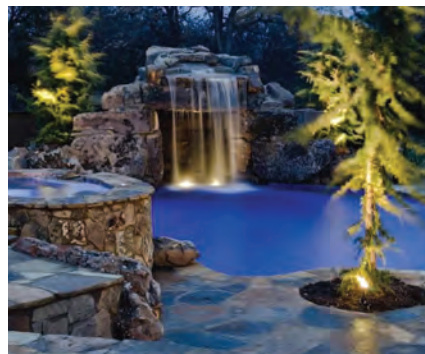
866-712-7007 405-258-5551 Fax 866-728-0678

www.gctek.com info@gctek.com

The clients are truly enjoying their retirement paradise. Many sitting and viewing areas were created, as they plan on entertaining quite a bit.

Another big fan of this project was Hunter, the 14-year-old chocolate Labrador family dog. This very aged dog had quite a bit of mobility problems, but quite often he could be found in the pond or sitting at the stream edge, just dangling his paws in it. When he managed to get completely in the pond, he always had to be pulled out by his owners, as he was not able to get out by himself. Sadly, Hunter passed away at the end of the summer. I was pleased to know that we gave him quite a bit of happiness in his final year.

We plan on featuring this pond on the 2024 Ottawa Pond Tour organized by the Greater Ottawa Water Garden Horticulture Society (GOWGHS) which I'm involved with. Come experience it for yourself! ☺



LINDLEY STONE

We are a wholesale stone supply company with 27 years experience specializing in moss boulders. We offer nationwide delivery.

918 429-3191
Shaun Lindley McAlester, OK

www.lindleystone.net



About the Author



Geert Meganck grew up in Flanders, Belgium, and has been passionate about horticulture since the young age of 15. He attended a specialized landscape and horticulture high school in the late '70s. At the age of 17, he emigrated to Quebec, Canada, where his passion for gardening grew. In 1986, he pursued a two-year horticulture and landscape college diploma in Ottawa. Fresh out of college in 1988, he started his own specialized residential landscape business serving the Greater Ottawa-Gatineau capital region, with a focus on water features.

In his spare time, he is actively involved with the Greater Ottawa Water Garden Horticultural Society and its wide range of community water-garden projects.

koismart.com
(561)408-2739

LARGE INVENTORY
FULL WAREHOUSE
We Stock Thousands of Items Ready-to-Ship

koi
SMART
YOUR POND • OUR PASSION

POND DESIGN
TECHNICAL QUESTIONS
COMPETITIVE PRICING

Our Experienced Staff Members are Here to Help You

SAME DAY SHIPPING
2pm EST Shipping Cut-Off
Nationwide

f **p** **G+** **YouTube**

West Palm Beach, FL

The Making of a *Masterpiece*

Aquatic plants are key to
the success of a water garden

by Kelly Billing,

Water Becomes a Garden

& Larry Carnes,

Reflections Water Gardens

Nature has long served as inspiration to the pond builder. Wind and rain-weathered rock formations, juttied outcroppings and eroded stone from centuries of varying seasonal water flows are all naturally occurring structures that are often studied and near replicated to bring water to life in the landscape. There is no question how the addition of moving water creates a space that soothes the stress of the day and contributes to a greater sense of wellbeing.

A long walk along the edge of a body of water reveals broad swaths of fern, moss, golden club, swamp hibiscus, cattail, arrowhead, arrow arum, pickerel rush, sedges, grasses and even lotus, to name a few. The foliage softens the harsh lines of boulders and seamlessly blends

water with landscape. Aquatic vegetation has a proclivity for finding itself tucked between cracks and crevices or establishing itself in massive stands along the banks and in the water.

“Bring a Garden to Life”

Nothing enhances this saying like the successful addition of plants. Even the smallest containers that hold water will invite insects, amphibians and microbial guests to bathe, breed, gather pollen and take up residence. This continuance of aquatic life is reliant on places that foster survival and mimic natural, biologically diverse ecosystems. For instance, the simplicity of burying a large container (36-60 inches in diameter and 12-15 inches deep) and naturalizing lotus or waterlilies will draw abundant wildlife. Bees, butterflies, beetles, water skates, tadpoles, frogs and birds are all reliant on water for survival. Even a single plant will provide shade, cover, oxygen and





The boardwalk was carefully framed and set on piers inside the wetland filter. During the summer, the lotus bed erupts in a sea of color.

Your fish called...

THEY WANT BETTER FILTRATION!!!

AMERICAN MADE PUMPS, FILTERS,
UV STERILIZERS, AND MORE!

www.WLIMPRODUCTS.com



nutrient management, creating an inviting habitat that will advance a simple ecosystem.

Replicating nature is as important with plants as it is with stone. The friendship between Larry Carnes and Kelly Billing was kindled by a mutual admiration of water feature artisans, just like Anthony Archer-Wills and David Duensing, who did exactly that — they not only dreamed big and executed beautiful replicas of natural aquatic environments, but they also took great care to consider the interaction between plants and stone while planning. Conceptually, not all pond builders have the vision to include plants as part of the big picture, but these masters always went the extra mile to plan (and plant) for the greater good of the ecosystem and the long-term enjoyment of their clients.

Aquatic plants have been cleansing water bodies for millions of years. Undisturbed wetlands are capable of filtering water on its way to massive water bodies. Bays, lakes and rivers would quickly degrade without them. Their ability to detoxify, filter and manage nutrients is well documented. Ornamental plants may have less nutrient uptake data than their aggressive counterparts like cattail and phragmites, but they should not be dismissed for their powerful ability to filter water as well. By harnessing and enhancing that qualification, plants can be competent for the



remediation of industrial runoff from airports, mining and petroleum operations, and all the way down to individual residences in remote locations around the world where access to infrastructure like stormwater management and water-treatment facilities is absent. In a simplified purification system, lotus and waterlilies are grown in containers that capture roof runoff to provide suitable water for cooking and drinking.

Built to Suit

Balance, scaling and planning are essential to replicating the benefits of what occurs naturally for the benefits of improved water quality and ecosystem development. Plants in small pots don't create a web of growth that provides safe harbor for all the living things that are drawn to water, nor do they have the ability to support the smallest life forms.

"Chronically, I see plants in undersized containers or being forced into habitats that aren't conducive to survival or adequate for plants to naturalize," says Kelly Billing. "This cannot be easily corrected without major interventions. Simply put, planning is important."

The networks that are the

most effective rely on a bottom-up approach for sustenance to be able to fully thrive. That means providing plenty of area for even the smallest of inhabitants to prosper. Building a healthy environment will reduce or eliminate the need for remediation.

Like a commercial office space, ponds should be built to suit. Planning is everything. Plants have personalities, strengths and weaknesses. Much like allocating space in an office building, a good understanding of the proper cultivar selection and the most accommodating parameters will ensure success and maximize impact. The payoff will be worth the extra effort.

"The edge of a pond should not be defined as a ring of rocks with water in the center," says Larry Carnes. "Large features with masses of plants should be carefully planned to coordinate plantings for time of day, season, color, shape and movement."

The edge of the water feature is then softened by a combination of carefully selected and placed aquatic plantings, natural stone and terrestrial landscape beds.

Loads of Lotus

While the project featured in this article does not contain



The concrete piers (top, left) were strategically placed to create a serpentine route through the wetland. After the retaining and separation walls (top, right) were constructed, spoils from the excavation were added to the lotus bed. Lotus were grown from tubers (middle) in large planting pots and placed inside a few pop-up swimming pools. They were removed from their pots (bottom) and transplanted after reaching maturity.



Several different varieties of lotus were planted, each with different heights, colors and shapes. As summer approaches, a few early lotus blossoms begin to emerge.

a stream in the traditional sense, it functions more like the Florida Everglades. Half of the 1,500-square-foot plant filter is dedicated to lotus.

"The concept behind the lotus bed was to recreate the growing conditions that the lotus plants would find in a natural environment," Carnes says. "Essentially, the lily and lotus beds are completely contained; they are like one big planting pot that allows the plants' rhizomes to spread as they would in nature. The water skims slowly over the top of the planting beds, which is what lilies and lotus typically prefer."

The slow flow across the entire area enhances nutrient uptake by continually bringing a fresh supply of fertilizer generated by pollen, leaves and other decaying matter.

Separation walls were created underwater to contain the otherwise rambling plants. The individual sections of the wetland filter are partitioned by boulders and liner, creating four physically distinct aquatic planting zones, each with its own unique physical characteristics, flow methodologies and aquatic plant selections.

Setting these physical planting boundaries keeps the ecosystem in check while still allowing substantial growth for dramatic effect. The area was excavated to 2 feet below water level. Underlayment was placed in the lotus planting zone and covered by EPDM liner, with a second layer of geotextile added to protect the base layer of the wetland filter. Spoils from the excavation were placed in the lotus bed to fill 12 of the 24 inches. The soil stays in place, much like in a natural stream, once everything has settled in.

The boardwalk was added as a way of providing spontaneous interaction with the wetland environment. Carnes dotes on this element of the project.

"You can lean over a lotus flower and admire its smell and the intricacy of its petals," he says. "You can watch the insects buzz across the surface of the water while bees harvest pollen and observe frogs and tadpoles that have made their homes among the rocks. You can experience nature in your own backyard."

Right Plant, Right Place

The other half of the wetland filter's real estate is dedicated to abundant waterlilies and various shallow-water plants, collectively keeping the shallow-water areas shaded and filtered. No single plant is usually capable of providing long-term water quality benefits, because each has specific and sometimes changing nutrient needs. It is also important to incorporate plants whose



The marginal planting zone and water lily bed are shown from across the wetland filter.

peak growing varies throughout the year. Cool-season plants have nutrient demands early in the growing season, and warm-season plants make the best use of excess nutrients during the heat of summer.

It is meaningful to get to know plants. Grow them and experiment with how they respond in contrasting environments in your region.

"You can fail a client by choosing the wrong plants or the wrong quantities," Billing advises. "Choose a handful of plants and learn them well. Right plant, right place."

What works in one area of the country may not work in another. For example,

lotus is a sun worshipper in most places. But in dry, windy climates, they are best protected on the east side of a building to reduce evaporative moisture due to wind and extreme afternoon temperatures that could damage the leaves.

Be certain to use plants in the best situation for success. Just as selecting and placing rocks gets easier over time as you get to know them, the same applies to planting and growing. The more experience you have, the more confidently you'll proceed! This project exemplifies a visually stunning masterpiece that is founded on all the elements and principles that capitalize on natural processes to ensure success. *CS*

About the Authors

Kelly Billing owns Water Becomes a Garden. She provides planning & design services for appropriate, site-specific plant selection. She gives special attention to seasonal interest, nutrient uptake and ecological balance to meet the project goals. Kelly is a grower specializing in new cultivars and plant procurement. She is thankful for her supportive network of quality growers across the country that helps her find the best plants required to suit each specific project destination and design.

Larry Carnes began his career as a student of art and developed an interest in landscaping. He worked for several companies, gaining knowledge in tree care, patio design and installation, and landscape architecture. He renders concepts for his clients, which are pieces of art as much as they are working designs. After assisting a pond builder in creating a unique in-ground pond for his family, Larry's landscaping interest turned to water features. Reflections Water Gardens focuses on high-end residential and commercial natural-pool construction projects with naturalistic water shaping.

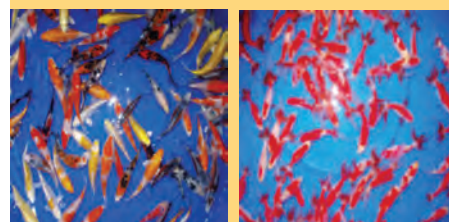


Bassinger Fisheries Koi & Goldfish Farm



Healthiest Koi and Goldfish in the USA!

- 100% Ulcer Free Farm
 - 100% Virus Free Farm
 - No New Fish Introduced in 17 years
- 100% Satisfaction Guarantee**



Rated Best All Around American Koi by International Koi Judge

- Brilliant Colors
- Stunning Patterns
- Great Selection of Different Koi and Butterfly Koi



One of two locations

Visit our new website at:

www.BassingerKoiFarm.com

817-366-1746

325-728-4237 Fax

thekoiman@sbcglobal.net

New Customer Special!

50%^{off}

(on first \$500 order)



**Build
healthy
ponds.**

**Grow a
healthy
business.**

Gain access to exclusive, top-of-the-line water management products and expert support that help set your work apart. Join our network of Elite Dealers and let us help you take your business to the next level.

**Become an
AquaElite Dealer.**

Get started online at aquaeliteproducts.com





Scoliosis in trout is often caused by nutritional deficiency from old or poor-quality feed.

Body Language

How fish communicate to us when they're unwell

by Paul Curtis,
AquaSolver/AquaFinn

Even though they can't talk, once you are around fish for a while, you begin to see how they communicate with you. When I was managing fish hatcheries, I was amazed how quickly you could look at a tank of fish and immediately get an idea how that population was doing. Our pond and aquarium fish are our pets. We get to know individuals very well and learn how different each fish can be so that we can recognize normal behaviors and appearances.

Once we have learned what normal is, we'll be able to recognize when a problem comes along. After a long conversation with our fish, we can build a list of clinical signs, such as behavioral any physical changes, that will point

us in the right direction toward solving the problem. These visual conversations with our fish are critical to catching something quickly and saving our fish's life.

Abnormal Behaviors

When fish are not well, they will often slow down. Lethargy is usually one of the first behaviors we notice, and it is common with many different problems. For example, fish become sluggish when they cannot get enough oxygen from the water, either because there isn't enough oxygen going into the water, temperatures are outside the fish's tolerance zone, or the fish are having problems with their gills. Infections from parasites and bacteria can also impact fish gills, along with the rest of the body, causing them to slow down. When your fish show lethargy, it is good to take a closer look to



DOLPHIN PUMPS

DISCOVER A NEW LEVEL OF QUALITY.



The premier manufacturer of external water pumps and products since 1978. A trusted brand known for reliability & efficiency.

WWW.DOLPHINPUMPS.COM

see what may be going on.

Heavy breathing is often the next phase of fish having difficulty getting oxygen from the water. You will see rapid mouth movements and exaggerated movement of the gill covers. Gradually dropping oxygen levels will cause heavy breathing and really warrants a closer look at the fish and the aeration system. Pathogens can

Unhappy fish will often move with their fins closed. Like lethargic behavior, clamped fins are often an early sign of an issue. It can also be one of the first signs of a parasitic infection.

cause gill inflammation, and as this progresses, breathing will also become heavier. High levels of nitrite cause brown blood disease, which prevents the hemoglobin in the blood from carrying oxygen.

When there is a lack of oxygen in the water, as seen with aerator failures, gasping at the surface will come on quickly and can kill quickly, often in minutes to hours depending on density. If the gill damage is restricting the fish from extracting oxygen from the water, surface gasping will usually come on more slowly, often over days.

Unhappy fish will often move with their fins closed. Like lethargic behavior, clamped fins are often an early sign of an issue. It can also be one of the first signs of a parasitic infection.

Fish not feeling well will often seek out specific locations where they feel better. Fish with oxygen issues may position themselves near waterfalls or water jets where the water will have the most oxygen. Fish that are lethargic will often seek out areas with little current so they don't get pushed around and have to swim. You may also see fish hiding more than normal, which may be because of a disease or from constant harassment from a predatory bird, animal or another fish.

IWGS SYMPOSIUM

VANCOUVER, B.C., CANADA

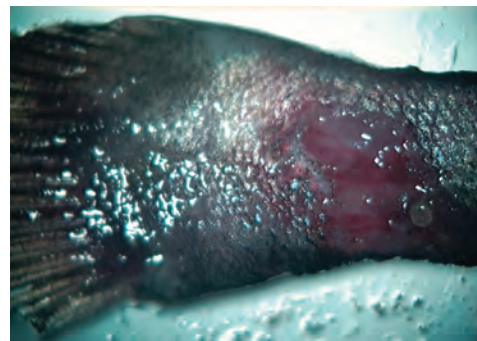


SAVE
THE DATE

23-27
AUGUST
2023

FOR MORE INFORMATION VISIT
IWGS.ORG





Ulcerative lesions in koi (left) are often due to the bacteria *Aeromonas hydrophila*. Oral lesions on the mouth (middle) and tail (right) of white sea bass can be caused by *Cytophaga* bacteria.

Lying on the bottom is often the next stage from searching out a quiet spot. If there are lots of structure where fish can hide, it can be difficult to find them at this stage. That's why it is really important to recognize changes in fish behavior while you can still find them. When on the bottom, it is also very difficult to inspect the fish for physical problems, such as ulcers.

Fish that have an irritation on the skin will often scratch on structures in the pond. Not all scratching

is abnormal. Healthy fish will scratch now and then. You should recognize what normal scratching looks like and become more attentive when you see increases in frequency. Increased scratching most often indicates a parasitic infection, but it is also seen with increased ammonia levels or chemicals that irritate the skin. With heavy scratching, fish may create lesions and risk secondary bacterial infections that can become bleeding ulcers.

If fish are rolling, spiral-swim-

ming or otherwise swimming erratically, there are usually major issues. Swimming like this is often associated with neurological issues. These can come from viruses and bacteria but also from a prolonged exposure to low oxygen levels or a toxic chemical that got in the water. The most common chemicals are chlorine and chloramine from tap water that wasn't properly treated. Overzealous fish may also jump out of the water and smack their heads, causing erratic swimming. Depending

Kloubec Koi Farm

YOUR TRUSTED SOURCE FOR USA BRED KOI

Beautiful wholesale koi and goldfish that sell fast!

Koi Health is our top priority

Year-round availability

Over 300,000 gallons indoors

80 acres of outdoor ponds

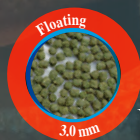
kloubECKOI.com
319.846.2077



SCIENTIFICALLY
FORMULATED
BY
AQUACULTURE
NUTRITIONISTS



Also available in 5 lb. and 33 lb. bags



Koi Grower
Complete High Performance Diet
for Koi & Goldfish



Pond Fancier
Complete Cool Weather Diet
for Koi & Goldfish
with Wheat Germ



Koi Fancier
Complete Color-Enhancing Diet
for Koi & Goldfish



For more information about Zeigler products,
please visit our website zeiglerfeed.com or call 800-841-6800.

Zeigler Bros., Inc.
400 Gardners Station Road
Gardners, PA 17324 USA

www.zeiglerfeed.com
info@zeiglerfeed.com

717-677-6181
717-677-6826 fax

Global
Aquaculture
Alliance

GLOBAL G.A.P.
For Global Standards to Safe and Sustainable Aquaculture

Product of
USA

on the severity the symptoms, it may subside on their own.

Sensitivity to Stimuli

If you have an aquarium and tap the glass, you will notice how the fish react. Different species react differently, but they usually will react. The same can be observed in your pond fish. If something drops in the water, the fish will often jump or skitter off. Fish that are not well will respond differently to stimuli. Lethargic fish may barely respond, while fish that are irritated by something may be extra jumpy. Pesky predators can make the fish much jumpier.

A change in feeding behavior can be an excellent early indicator of a problem, and warrants a closer look to see what may be going on. Frequent predator visits can put fish off feed and cause an increase in jumpiness along with oncoming infections. Poor-quality feed may also promote reduced feeding.

When fish have a skin irritant, they will often produce more mucus than normal. When this is released in the water, foam will be created at waterfalls or by bubbles from air stones. If



Totoaba broodstock swim at the Autonomous University of Ensenada hatchery in Mexico.



Healthy koi!

you see above-normal foam production, look for a parasitic infection or some other irritant like a chemical.

Physical Condition

Fish not feeling well will often go dark in color. Stressed fish may also look darker in color, indicating something is wrong. The stress can be from a disease, but it can also be from other sources, like predators and chemicals.

Fish may appear lighter in color from temporary stress, such as from handling, but their color will return when the stress is removed. A lighter or grey color that persists without other stress is most often associated with a thickening of the skin. This is most often from protozoa parasites, but it can also be from an irritant in the water. Both parasites and irritants cause an excess production of mucus which adds to the lighter color.

When fish are grayish or lighter in color, they also may look duller than normal. Healthy fish look shiny when the sun shines on them. With the inflammation of the skin and the extra mucus, that nice shiny look can go away.

You may see cloudy eyes

when the fish are looking lighter or gray in color. The inflammation of the skin can make the eyes look whitish. Other physical causes include sunburn and scratching on abrasive surfaces like concrete.

Visible Lesions and Sores

Popeye disease, or exophthalmia, is pretty rare in the pond. It is caused mainly by bacterial infections or nitrogen supersaturation in the water. By the time you see this symptom, the problem has usually progressed and may be hard to reverse. Koi Herpes Virus (KHV) can have the opposite effect, where the eyes become sunken into the head.

Changes in gills are much more difficult to see. You would have to handle the fish and open the gill cover to see what is going on. If the fish are struggling, it may be worth handling one fish to take a peek. If gills are abnormal, swollen, red or eroded, the issue is most likely bacterial and parasitic in origin. Brown-looking gills, however, are from high nitrite levels. The dreaded KHV will produce white patches on the gills.

Scale loss can occur for

Toledo Goldfish
GOLDFISH, KOI & MORE

Use discount code **PONDTRADE** for 15% off all orders over \$100

FROM OUR FAMILY FARM TO YOUR DOORSTEP

TOLEDOGOLDFISH.COM

The St. Louis Water Garden Society
proudly presents the
23rd Annual POND-RAMA
POND & WATER GARDEN TOUR

TICKETS ON SALE IN MAY
Individual - \$20 each
Groups 10+ - \$10 each

Please visit SLWGS.org or scan the code to purchase tickets.

POND MICROBE-LIFT®

FRESH NEW LOOK!



MADE IN
THE USA



MICROBE-LIFT POND IS EXCITED TO INTRODUCE OUR BRAND NEW LEGACY KOI & GOLDFISH FOOD & SPRING/SUMMER CLEANER PACKAGING!

Our latest eco-friendly redesign helps to reduce plastic waste.

— THE MICROBE-LIFT DIFFERENCE —
**SUPERIOR TECHNOLOGY.
RELIABILITY.
UNMATCHED PERFORMANCE.**

STILL
#1



**Ecological
Laboratories INC.**
Providing Aquatic Solutions Since 1976



MicrobeLift.com

If we are listening to our fish, we can often nip a problem in the bud and prevent a serious issue. Clinical signs associated with parasitic infections are easy to understand. If we catch it early, treatment can usually resolve the infection relatively quickly.

various reasons. A new ulcer will have scale loss prior to eruption and may also have some bleeding associated with it. Predators can cause scale loss, usually on the head or back. Scales can also be lost from aggressive scratching on abrasive surfaces like concrete.

A distended abdomen is usually associated with organs shutting down and fluid accumulating in the abdomen. This is accompanied by “pine coning,” or protruding scales. The most common cause is fish tuberculosis bacteria, which is unfortunately untreatable. However, distended abdomen can also be from a viral infection. This is most often seen in one or just a few individuals. Individuals with distended abdomens should be removed from the population.

Lesions on a fish’s body come in many shapes, sizes, and appearance. Where they occur on the body is also important. Large, bloody lesions are often caused by a bacterial infection such as *Aeromonas*. White spots like salt on the fish are caused by Ich. Wounds on the back and head are often from predators. Take note of what lesions are normal for your fish.

Fin erosion and fraying can occur from aggressive scratching on abrasive surfaces. Bacterial infection can erode fins edges often with white tufts. Fin


nipping can occur from other animals such as turtles or aggressive fish. Don’t forget about predators possibly affecting the fish.

Other Questions to Ask

How many fish are affected? One or many? Is there any mortality, and if so, is it occurring rapidly or slowly?

If we are listening to our fish, we can often nip a problem in the bud and prevent a serious issue. Clinical signs associated with parasitic infections are easy to understand. If we catch it early, treatment can usually resolve the infection relatively quickly.

Sometimes it is not so simple, and we need a longer conversation with our fish to figure out what is going on. In these cases, we may be dealing with external factors such as toxicity from overspray of a pesticide, or nitrogen supersaturation caused by an air leak from a loose or cracked fitting on the intake side of the pump. These problems are harder to diagnose and require more in-depth conversations with the fish and their habitat.

As you can see, these conversations yield valuable clues to help you or a fish health professional solve the problem. Never stop having conversations with your fish. It can save lives and anguish. 



Ascites, dropsy and pine coning in koi (top and middle) are often caused by viruses and bacteria. We examine fish egg samples (bottom) for spawning readiness.

About the Author



Paul Curtis is the principal of AquaSolver and AquaFinn, the parent company of the MinnFinn line of products. Paul has worked in the aquaculture field for more than 25 years and has been involved in many facets of the industry, including fish health, reproduction and early rearing. He attended the University of Guelph in Ontario, Canada, where he achieved a bachelor’s degree in marine biology and a master’s degree in fish reproductive physiology and aquaculture.



Adding bottom diffused aeration will keep a pond clean, clear and balanced all season long.

Bottoms Up!

How to choose & install bottom diffused aeration

by **Harrison Hugo,**

Airmax

Installing bottom diffused aeration is one of the best steps you can take when caring for a pond. However, improperly sized aeration can lead to additional problems. Multiple factors must be considered when determining the best aeration system for a pond. What works well for one pond may not be the best fit for another.

While an aeration system's specs might make it appear that it could work for a certain pond, the depth, size and shape all must be considered when determining the best aeration system. Once the aeration system has been selected and installed, there are additional factors that will play a role in the overall ongoing success of the aeration system and the beneficial effects it will have on the pond.

How to Determine Pond Size

Taking accurate measurements, including depth, on site is the best method to determine a pond's size. Traveling to a pond to take measurements, however, is not always a viable solution when determining the size of the pond and what aeration system is best.

Using aerial mapping programs can offer a nice overhead view of the pond. Accurate measurements can then be taken, allowing you to account for seasonal and yearly variations in the overall size of the pond. While there are many products and websites available that offer an array of overhead views, some may not always offer an accurate representation of the current pond. Many states and counties offer access to online maps that may provide newer images not readily available on other services.

If all else fails, or if the pond is newer and not shown on a mapping service, asking the customer

to draw out the pond as accurately as possible can often provide enough information to properly size an aeration system.

Depth & Shape Considerations

Depth is vital when determining which aeration system will work best in any pond. Bottom diffused aeration relies on rising air bubbles to lift water from



Aeration circulates the water and eliminates thermocline, which is a stratified layer of water between the warmer surface zone and the colder deep-water zone.

the bottom of the pond to the surface. The amount of water lifted to the surface and the overall turnover rate created by the aeration system are directly affected by the depth of the diffusers.

Diffusers placed deeper in the pond will affect a larger area. Given two ponds with similar surface

maintaining
OPTIMUM WATER QUALITY
has never been easier

Take the guesswork and manual labor out of adding regular water treatments to water features!

Aquascape, Inc. offers two electronic, automatic dosing systems that accurately and consistently add your choice of water treatment to any pond, waterfall, or fountain.

Dosing System SL – NEW!

- Designed for water features up to 2,000 gallons
- Mounted control panel under hood hides and protects components
- Available July 2023

Smart Pond Dosing System XT

- Perfect for larger water features (30,000 gallons for over a month)
- Low treatment alert system
- Connect to the Aquascape Smart Control App to monitor and control with your smartphone or tablet

Smart Pond
Dosing System XT

NEW
Dosing
System SL



aquascapeinc.com

Water Treatments Sold Separately

Both dosing systems use the Simple Solution line of water treatments, also available in pump-top bottles.



While surface area and depth will help you determine the minimum-size aeration system that may be necessary, the shape of the pond will influence the overall movement of the water, which may create the necessity for additional diffuser plates.

areas, the deeper pond will oftentimes require fewer diffuser plates, because each diffuser will have a larger zone of influence. Variations in depth must also be accounted for when sizing an aeration system. A diffuser placed at or near the maximum pond depth will affect a much larger area of the pond than a diffuser placed at a shallower depth or one placed closer to the shoreline.

Pond shape is also vital when selecting the proper aeration system for a pond. While surface area and depth will help you determine the minimum-size aeration system that may be necessary, the shape of the pond will influence the overall movement of the water, which may create the necessity for additional

diffuser plates.

Islands, coves, peninsulas and inlets will all limit the overall zone of influence of each individual diffuser plate. Additional diffuser plates may be needed to properly move the water in these areas. Failure to account for the shape of the pond can result in areas with little to no water movement, leading to areas with stagnant water, an accumulation of nutrients and accelerated algae growth. Long, narrow ponds will also require additional diffuser plates over similarly sized round ponds. The shape of these ponds limits the influence of each individual diffuser plate, so additional plates will be necessary in long, narrow ponds to ensure the entire waterbody is being circulated properly.



Airmax aeration systems utilize a shore-mounted air pump that delivers air to specialized diffuser plates on the pond bottom.




Wholesale Pond & Aquarium Plants

A Huge Selection of Water Lilies, Marginal & Submerged Plants, Floaters & more


Weekly shipments of 1st quality, handpicked plants delivered to you! Low (\$100) minimum

Call 800-226-7758 • email ed@eddiessaqua.com
www.jermack.com


JERMACK
WHOLESALE CULTIVATED PLANTS
FAMILY OWNED FOR OVER 40 YEARS



PerformancePro PUMPS



MADE IN USA



PERFORMANCEPROPUMPS.COM
503.356.5888



For more information &
informative videos.



Grown in our state of the art nursery in
southern New Jersey.

We have an extensive selection of plants
ready to plant or market.

- Marginals
- Water Lilies
- Lotus
- Floaters & Oxygenators
- Combination Planters



Whether you have a retail store or do installations exclusively, we have solutions for both. From pre-planned assortments to customizable solutions, we can help take the guess work out of assembling a healthy balanced mix. Contact us for a catalog or to schedule a salesman visit.

1.800.788.8547 • www.netherlandbulb.com • contactus@netherlandbulb.com



Netherland Bulb Company
Plant Happiness



Aeration is key in the summer months (above) to keep dissolved oxygen available for your fish with warm temperatures. In the winter, aeration keeps oxygen levels up so harmful gases do not get trapped below the ice. Bottom diffused aeration (below left) relies on rising air bubbles to lift water from the bottom of the pond to the surface area.

Once an aeration system is installed, it should not be allowed to run nonstop at first. Always recommend a slow start-up, with the system only running 30 minutes the first day. Run time should then be doubled each day, increasing the run time until it is running 24 hours a day by the end of the first week.

During & After Installation

There are many additional steps that can be taken both during and after installation to enhance the success of the aeration system and add to the lifespan of the components of the system. During installation, it is recommended to cut down on excess airline after the diffuser plates have been installed in their proper positions. Excess airline will increase the operating pressure of the system, which can lead to premature wear on the compressor.

Once an aeration system is installed, it should not be allowed to run nonstop at first. Always recommend a slow start-up, with the system only running 30 minutes the first day. Run time should then be doubled each day, increasing the run time until it is running 24 hours a day by the end of the first week. A slow

start-up prevents a sudden turnover event. A sudden turnover event will drop the dissolved oxygen level of the pond and can lead to a fish kill. Taking the time to do a gradual start-up of the aeration system will drastically decrease the chances of a fish kill occurring.

After the aeration system is up and running, air filters should be checked monthly. Clogged air filters will restrict air flow and can lead to overheating and premature wear on the compressor. Air filters should be changed regularly for optimal performance. Additionally, maintenance should be completed on the compressor every 12 to 18 months, depending on the type of compressor and the operating pressure. Internal parts will wear down over time due to heat and friction. Changing out these internal parts will prevent damage to the compressor. Failure to do so can lead to catastrophic failure and require a replacement compressor to be installed.

A properly sized aeration system is a great step toward achieving a healthy

pond. Accounting for the pond size, depth and shape will ensure that the best aeration system is selected for each pond, yielding the best results. Proper installation, start-up and maintenance will ensure that the system continues running properly, keeping the pond healthy and enjoyable for years to come. ❧

About the Author

Harrison Hugo is the technical support manager at Airmax. Before moving into this role, he gained experience working in sales and as a certified pond treatment applicator. In his current role, Harrison is troubleshooting products and training new technicians on everything pond related, from water garden setups to laying out and installing pond and lake aeration systems.





Innovation,

New!



**DEFEND
your pond
all season long!**



**AQUA
DEFEND**

Breaks down waste
and sludge buildup

Helps prevent buildup on
rocks, waterfalls and streams

Controls phosphates

Contact us for
special introductory
discounts!

Aeration....

Reliable aeration solutions for

FOR KOI PONDS & WATER GARDENS

Ponds up to 3500 Gallons

CHS Compact Aeration Series



- Quiet, energy efficient aeration for aquariums, koi ponds and water gardens
- Three kit sizes available for ponds up to 3500 gallons and 4' deep
- Kits include compressor with adjustable air flow, tubing, air diffuser(s) and check valve(s)



Ponds up to 30,000 Gallons

STRATUS KLC SERIES Pond Aeration Kits

- Ultra quiet operation & low energy usage

- UL and cUL listed for outdoor use

- Four kit sizes for ponds from 1000-30,000 gallons

- Kits include compressor with 6' power cord, rubber membrane diffuser(s), connectors and 3/8" Quick Sink Tubing.



EasyPro Water Treatments work great in combination with aeration to provide the natural, ecological balance needed for clean, clear water.



Solutions for nearly every water issue • Simple dosages and applications



All natural Eco-Friendly labeled products are safe for use around pets, fish, plants and wildlife.



Made in the USA Proudly manufactured in the USA.

Retail ready Full color packaging unites our products as a family brand. Solid margins are built in to our products with the value of a lower "cost-per-treatment" on the entire EasyPro® Water Treatment lineup.

800-448-3873

Quality, Experience

800-448-3873
www.easypro.com
info@easypro.com



H2O'h Yeah!

ponds of every size, shape and location!

FOR LARGER PONDS & LAKES

 **Sentinel** The Lake and Pond Guardian
AERATION SYSTEMS



As one of the country's largest manufacturers of diffused aeration systems, EasyPro has the products and the experience to help you with nearly any aeration project. Check out our extensive line of aeration systems and accessories.



Try out our online aeration system request form to help you select the proper system.
www.easypro.com/aeration-system-request



EasyPro proudly manufactures Sentinel Deluxe Aeration systems in Grant, Michigan with components primarily made in the United States.

FOR THE BACK NINE OR THE BACK FORTY



 **BECKER**
WINDMILLS
A Division of EasyPro Pond Products



Let Mother Nature aerate your pond

- Modern engineering with a classic look
- Aerate up to a 2 acre pond with no electricity nearby. Windmills can sit up to 1000' away from the pond's edge.
- Complete 12', 16' and 20' windmill kits available
- Saves \$30-\$50/month in electric costs vs. electrical aeration systems, paying for themselves in a few short years.
- Five year limited warranty

Request Your 2023 Catalogs Today!

Visit our website to find a distributor near you & to request our catalogs.
800-448-3873 easypro.com



Let our decades of experience help you sell your next project!



EASYPRO.COM

Water Moccasin



Snakes

in the Grass

How to avoid them and treat their bites

by **Spencer Greene,**

MD, MS, FACEP, FACMT, FAACT, FAAEM

As outside temperatures move from the sublime to the ridiculous, more people will be spending time in and around their pools and ponds. Hazards such as drowning are frequently addressed in the media. However, there is another potential danger to people working and playing outside: bites from venomous snakes.

Texas is home to many venomous snake species, and approximately 1,000 Texans seek evaluation in the emergency department (ED) annually after sustaining a bite. Some knowledge of where snakes live and how they act can hopefully prevent an undesirable encounter.

This article is not intended to demonize snakes. They are beautiful, fascinating creatures that occupy an important role in the ecosystem. They provide a variety of benefits to humans, including vermin control. Furthermore, some snake venoms are used in the production of human medications. For example, angiotensin-converting enzyme (ACE) inhibitors are derived from venom found in the jararaca, a snake native to South America.

There are many misconceptions about snakes, and even more about snakebites. Sources that one would expect to be reliable, such as the Mayo Clinic and the Centers for Disease Control and Prevention (CDC), continue to provide incorrect or outdated information. The more this misinformation is disseminated, the more difficult it is to educate the public about safely co-existing with these beautiful creatures. The recommendations that follow are evidence-based and

come from the most reliable snakebite literature.

Common Species

Texas is home to 14 types of venomous snakes: 10 rattlesnake species, one cottonmouth species, two copperhead species and the Texas coral snake. Collectively, rattlesnakes, cottonmouths and copperheads are classified as pit vipers, or crotalids. They



Texas coral snake (courtesy of Nathan Wells)

account for 98% of native snake envenomations nationally. In Texas, approximately 95% of venomous snakebites are attributed to pit vipers, and 5% are caused by the Texas coral snake.

Pit vipers are characterized by large, triangular heads, relatively small eyes, large, retractable and mobile fangs and a thermoreceptor “pit” located halfway between the eye and the nostril. Rattlesnakes will have one or more keratin segments that compose



The timber rattlesnake (top) is responsible for the most snakebite deaths in the United States. Notice the large, round pupil on the Eastern copperhead (second), which can occur in low-light situations. This scout (third) is holding a Texas coral snake. He picked it up after he was misinformed about its identity, because somebody misremembered “the rhyme.” The Eastern copperhead (bottom) bites the most people on an annual basis in the United States.

the “rattle” at the distal end. Though some references recommend using the pupil or head shape as a way of distinguishing a pit viper from non-crotalids, it should be noted that both venomous and nonvenomous snakes may have round or elliptical pupils — and pupil shape can change depending on the amount of ambient light. Additionally, many non-venomous snakes can flatten their heads into a triangle shape when they feel threatened. Experts recommend that people learn to recognize the venomous species in their vicinity using multiple characteristics, rather than rely on single features, rhymes or mnemonics.

The Texas coral snake is not a viper. It is a member of the elapid family of snakes that, worldwide, also includes cobras, kraits, mambas and taipans. As a result, people often exaggerate the danger posed by coral snakes.

Let me pre-emptively mention this: There has never been a documented human fatality attributed to a Texas coral snake envenomation. In fact, of the three coral snake species native to the U.S., only the eastern coral snake — which is not found in Texas — has ever caused a human death, and there has only been one fatality in the past 50 years.

Coral snakes are slender with narrow round, black heads. They have round pupils and fixed front fangs. Typically, coral snakes have alternating bands of red, yellow and black. The distinctive coloration has led to several mnemonics that are often used to distinguish coral snakes from non-venomous mimics. “Red on yellow, kill a fellow. Red on black, venom lack” is often true of native coral snakes, but there are multiple aberrant patterns that make reliance solely on the rhyme dangerous. Additionally, some people recite

the rhyme incorrectly, placing themselves or others at risk.

There are also non-venomous mimics that have red bands touching yellow bands, such as shovel-nosed snakes. Finally, non-native coral snakes have a variety of patterns and colors that render the mnemonic inaccurate. For everyone’s safety, use of “the rhyme” is discouraged.

Dispel the Myths

Contrary to popular belief, most snakebites occur when the victim is unaware of the snake’s presence. A large study using data from the American College of Medical Toxicology’s North American Snakebite Registry (NASBR) found that only 19% of native snakebites resulted from intentional interaction with the snake. The overwhelming majority occurred when somebody stepped on or near the snake or stuck their hand near the snake. Most bites (55%) affected the lower extremity, particularly in women.

Another common myth is that many snakebite victims are drunk or under the influence of other psychoactive substances. Nothing could be farther from the truth. A study from Dallas found that fewer than 1% of bites involved drug or alcohol use.

Arguably the most common envenomation myth is that baby snakes are unable to control how much venom they deliver per bite, and therefore their bites tend to be more serious than those from adults. This is completely untrue. First, juveniles do have the ability to regulate how much venom they release. Secondly, even if juveniles did not have that control, their total venom volume is much less than that of an adult snake. It is true that in some species the ratio of venom components changes as a snake ages, and some toxins may be more potent in juveniles than



A copperhead bite (left) to a patient's middle finger fully recovered within several weeks with conservative treatment. These blisters, although scary looking, do not require surgical intervention. It's important to elevate a limb (top, right) the proper way. A patient bitten by a Western diamondback rattlesnake (bottom, middle) recovered fully after treatment with antivenom. He also did not require surgical intervention. A child who was bitten on two fingers (bottom, right) by a copperhead was treated with antivenom and recovered fully.

adults. However, the total volume of venom delivered is a much more important factor in determining the severity of a bite. That is why, on average, a bite from an adult snake is worse than a bite from a juvenile snake.

Consequences

The most important thing to remember is that every bite is unique, and a bite from any pit viper of any age has the potential to be mild, moderate, or severe.

More than 85% of pit viper bites will result in envenomation. A “dry” bite, in which no venom is delivered and no symptoms develop, is the exception, not the rule. The most consistent finding in crotalid envenomation is local tissue injury, which is present in more than 95% of cases. Swelling and bruising are usually observed after envenomation and are typically present by the time victims seek medical attention. However, it may take several hours for local findings to appear, and it is imperative to not

diagnose a dry bite prematurely.

Blood-filled blisters are common following bites to the finger but may be seen elsewhere on upper extremities and on lower extremity bites.

Systemic toxicity can present in several ways. Nausea, vomiting, fast heart rate (tachycardia) and a sensation of impending doom are nonspecific findings and may represent nothing more than anxiety from being bitten. However, recurrent vomiting may suggest a significant envenomation, and tachycardia may result from fluids leaking out of blood vessels and into tissues. Low blood pressure (hypotension) may also result from fluid shifts or be one manifestation of a severe envenomation.

Abnormal blood-clotting test results are sometimes reported in crotalid envenomation. Fortunately, only a small percentage of patients develop actual bleeding as a result.

Skeletal and respiratory muscle weakness is not typical of crotalid envenomations but may manifest in

bites from some rattlesnakes, such as the Mojave rattlesnake.

It is estimated that 30% - 50% of coral snake bites are “dry”, which is likely due to a combination of coral snakes’ relative shyness and their fangs being smaller and less mobile than crotalid fangs.

Pain is often present immediately after a coral snake envenomation, but some clinical features may not manifest for up to 12 hours or more. Unlike in crotalid envenomations, local findings are insignificant following a coral snake envenomation. There may be slight redness, but bruising is absent. Swelling is mild and confined to the bite site; there is no progressive swelling of the affected extremity. Tingling sensations are common and often extremely painful.

How to Avoid Them

Prevention is the best medicine, and there are several easy ways to minimize



A PUMP THAT PUTS YOUR POND AT A HIGHER LEVEL



While there are multiple elements that make up a pond, one of the most foundational is the pump. After all, it's essential for the health of your fish and overall pond performance. Nitto Kohki LA Series blowers provide unparalleled performance for koi pond and water garden applications. This is why they're the professional choice:

They last longer, especially in hot, humid climates.

Nitto Kohki aerators have one moving part per piston. Properly installed and maintained, they have an expected service life of 6+ years.

They run quieter, supporting the natural design of ponds.

Listened to a diaphragm pump lately? In contrast, linear-piston LA aerators have about as much ambient noise as a light ballast.

Their cost-of-ownership is lower.

LA Series blowers consume far less energy— have only 50-60% of the line current requirements of diaphragm pumps.

Nitto Kohki aerators better leverage filtration capability, increase the fish handling capability of existing ponds, and minimize the risk to valuable koi collections. They're the ideal selection when building a new pond – as well as when you're looking to add quality and reliability to your existing pond.

Call **800 843 6336**, e-mail **info@NittoKohki.com**, or visit **NittoKohki.com** for more on LA Series blowers.





the likelihood of getting snakebitten. In Texas, most bites occur between May and September, although I just treated five bites in the first week of March 2023. Avoid walking barefoot outside during snakebite season, especially at night. Never stick your hand or foot into an area you can't see. Many hand bites occur when someone reaches under a heavy object, e.g., a large stone. You can also make your home less hospitable to snakes. Keep lawns short and well manicured. Do not allow debris to pile up, because snakes may choose these places to hide.

Some experts recommend using cedar chips to discourage snakes, but the evidence for this is lacking. Do not place mothballs around your yard. These do not work and are toxic to many animal species. They are also illegal in some jurisdictions. Finally, do not waste any time or money on commercial snake repellants. They have proven to be absolutely worthless.

What to Do Post-Bite

If you do sustain a bite, the most important thing to do is remain calm. With proper treatment, most patients fare well and recover fully. Death is,

fortunately, especially rare. I authored one of the definitive studies looking at snakebite fatalities. My co-authors and I found that there are an average of 3.4 deaths from snakebite annually in the U.S., and many victims did not seek medical attention. In 2022, a completely preventable death (one of three in the U.S. last year) occurred when someone was bitten while handling a snake at a rattlesnake roundup in Freer, Texas.

If you are bitten, move away from the snake. You do not want yourself or anyone else to incur another snakebite. Do not attempt to catch the snake; doctors do not have to see the snake in order to treat you correctly. A pit viper envenomation is easily distinguished from a coral snake envenomation and from a nonvenomous snakebite clinically. Bringing a snake to the hospital poses risks; even dead and decapitated snakes can envenomate. A gentleman in South Dakota recently died after being bitten by a decapitated prairie rattlesnake.

It is helpful if you can photograph of the snake, but only do this if it can be accomplished quickly and safely. Definitive snake identification is not essential. It certainly should not delay

treatment or transport. Unless you are certain that the snake that bit you is nonvenomous, call 911 or arrange for someone to transport you to the ED. In general, it is better to have emergency medical services transport you, unless you are very close to the hospital and someone can get you there quickly. Never drive yourself to the ED.

Remove constrictive clothing and jewelry. Tissue swelling and injury occurs in more than 95% of our native snake envenomations, and anything tight on the affected limb will make the local injury worse. This is why applying tourniquets or constriction bands to the bitten extremity is discouraged.

Position the affected extremity appropriately. Although it was once taught to place the affected limb below heart level, we now understand this is harmful. As previously mentioned, tissue swelling will occur in nearly all crotalid envenomations. Furthermore, for most snakebite victims, local injury will be the only manifestation. Bleeding and systemic toxicity (e.g., difficulty breathing, low blood pressure and refractory vomiting) are much less common. We can minimize tissue injury by elevating the affected limb to



YOU BUILD TRANQUILITY

WE PROVIDE YOU THE
SUPPLIES TO CREATE IT



WHOLESALE PRICING AND SERVICE

We support your business with very competitive pricing and a large variety of equipment from multiple brands. Most orders ship the same or next business day.

EDUCATION

Our customer service representatives are always happy to help with any technical assistance and are able to provide professional advice on products, design & construction.

We also offer pond training & certification classes.

HUGE INVENTORY

We house over \$1,000,000 of inventory from over forty top manufacturers in our warehouse.

We handle most warranty issues for you, no need to contact the manufacturer.

WE SHIP EVERYTHING BUT THE WATER

WWW.PONDLINERWHOLESALE.COM

(866) 219-3561

45 – 60 degrees and keeping the elbow or knee straight, not bent. This allows the fluids that have accumulated from the envenomation to drain and reduces the hydrostatic pressures that can contribute to tissue damage.

Coral snake envenomations do not cause tissue damage or significant swelling, so elevation is not essential. I recommend placing the affected limb in whatever position is most comfortable for the patient.

What Not to Do

Knowing what not to do for a snakebite is as important as knowing what to do. Many of the "treatments" that were previously recommended for snakebite have proven to be useless at best and dangerous at worst.

Do not cut and suck. All this does is make a larger wound and potentially introduces bacteria into the skin.

Do not apply a tourniquet. There is no benefit in cutting off an extremity's arterial blood supply unless the patient

is bleeding to death.

Do not apply any sort of constriction band or pressure immobilization for pit vipers. It will exacerbate local injury. Furthermore, a study demonstrated that only 5% of people can do this correctly. Multiple toxicology societies issued a position statement discouraging pressure immobilization for our native crotalid bites.

Do not use electrical shock treatment. It does not "neutralize the venom," or whatever nonsense its advocates claim. It causes local injury and could potentially electrocute the victim.

Do not apply heat. It can damage the affected tissue.

Do not apply prolonged ice packs. A few minutes at a time is okay (say, 5 minutes on, 10 minutes off) but prolonged cryotherapy is also bad for the tissue.

Do not use one of those commercially available suction devices. Multiple studies have demonstrated that they do not remove venom and can cause harm.

Finally, despite many viral social media posts, diphenhydramine (Benadryl) provides absolutely no benefit following snake envenomation.

Get Stabilized

Snakebites are much less common than many other emergencies, and most physicians get little training on the subject. Get to an appropriate hospital. If you are having life-threatening signs and symptoms (e.g., difficulty breathing, low blood pressure) get to the closest hospital for stabilization. You can get transferred to an expert later. Otherwise, proceed directly to a hospital with a snakebite expert. If you interact with snakes a lot or are outside in snake-endemic areas, you should investigate your regional hospitals to locate one or more specialists.

Space limitations preclude a comprehensive description of what should and should not happen you arrive at the hospital. Just remember a few key points, like elevating the affected limb

The advertisement features a black and white ShinMaywa NORUS pump on the left side. The pump has a black top with a handle and a white body with 'ShinMaywa' and 'NORUS' printed on it. A blue discharge pipe is attached to the bottom. The background is a vibrant blue with a dynamic splash of water on the right side. The text 'ShinMaywa' is prominently displayed in a large, bold, blue font, with the tagline 'Brighten Your Future' in a smaller, italicized blue font below it. Three bullet points with orange checkmarks are listed: 'Widest Operating Range', 'Highest Overall Efficiency', and 'Lowest Lifetime Cost'. Below these, a line of text states: 'ShinMaywa pumps deliver best in class performance for your water garden project. Visit www.Shinmaywasales.com and see how.' In the bottom right corner, there is a logo for 'Distributed Exclusively By FieldingPump' and the website address 'www.ShinMaywaSales.com' in orange text.

ShinMaywa
Brighten Your Future

- ✓ Widest Operating Range
- ✓ Highest Overall Efficiency
- ✓ Lowest Lifetime Cost

ShinMaywa pumps deliver best in class performance for your water garden project. Visit www.Shinmaywasales.com and see how.

Distributed Exclusively By
FieldingPump

www.ShinMaywaSales.com

ULTRA BALANCE

PREMIUM KOI FOOD

- ✓ Available in Growth & Maintenance Formulas
- ✓ Helps koi achieve their ideal health, growth, and energy levels
- ✓ Nutritionally balanced with amino acids, vitamins & minerals, and natural color enhancers



For More Information:

✉ info@koifood.com

| [f /ultrabalancekoifood](https://www.facebook.com/ultrabalancekoifood)

| [@ultrabalancekoifood](https://www.instagram.com/ultrabalancekoifood)

| koifood.com

Manufactured by
Star Milling Co.
Made In USA



in crotalid envenomations. This helps with the swelling and the pain, and it does not endanger the patient.

Prophylactic antibiotics should be avoided. The incidence of infection following snakebite in the U.S. is less than 1%. Unnecessary antibiotics increase costs, cause side effects and can contribute to antibiotic resistance.

Acute surgical intervention is inappropriate. Snakebites are medical, not traumatic emergencies. Antivenom is safe and effective, and its use should be considered for

all more-than-minimal pit viper envenomations. Even mild bites recover faster when treated with antivenom, and antivenom use decreases the need for pain medication. Because there are two antivenoms approved for all North American pit viper envenomation, it is not necessary to know the exact snake species.

Texas coral snake envenomations frequently cause pain, but objective weakness is rare. Paralysis and respiratory failure do not occur. Coral snake antivenom should only be

used when there is any objective weakness on examination.

Remember, snakes are beautiful creatures. They should be respected but not feared. It is easy to safely co-exist with them. Hopefully you will never end up on the wrong side of a snake fang, but if you do, at least now you know what steps to take and what to avoid. *CS*



Aberrant Texas coral snake (Courtesy of Matthew Morris)

About the Author

Spencer Greene, MD, MS, FACEP, FACMT, FAACT, FAAEM

is a board-certified emergency physician, medical toxicologist and addiction medicine specialist. He is a Clinical Professor at the University of Houston College of Medicine and serves as the Director of Toxicology at HCA Houston Healthcare-Kingwood, where he oversees one of the busiest snakebite services in the United States. He has authored more than



50 book chapters and scholarly articles and is the recipient of multiple teaching and clinical awards. Dr. Greene has directed the Houston Venom Conference since 2013. He serves as the Co-Chair of the newly established American College of Medical Toxicology (ACMT) Toxinology section and directed the ACMT Natural Toxins Academy.

- ✓ Directly check salinity, pH and /or temperature
- ✓ Rugged and water resistant
- ✓ Easy to use
- ✓ Auto-lock readings with temperature compensation
- ✓ Simple maintenance with push button calibrations

Scan to learn more

+65 6742 0367

sales@transinstruments.com

TTBH PTE LTD 5 Jalan Kilang Barat, Petro Centre #04-04, S159349

30th Anniversary

WATER GARDEN TOUR

TOUR DATES

July 8	Clay & Platte Counties MO
July 15	Kansas North
July 29	Central Jackson County, MO
Aug. 5	Lawrence, KS
Aug. 19	Missouri South
Aug. 26	Kansas South

A \$10 ticket is good for all 6 tours

For more info visit
www.kcwatergardens.com/tour or scan this QR code

2023 Tour
Eventbrite Ticket



Ferns grow directly out of this lush stream, which cascades more than 60 feet down the hillside into a 2,000-gallon reservoir. Multiple downspouts from the house feed into the feature and allow it to capture over 20,000 gallons of rainfall each year.



Outsmarting the Drought

Water features are the **ultimate sustainable landscape**

by Jonathan Marston,
FallingWater Scapes

When most people think of droughts, they don't picture the green deciduous forests of the Northeast. Growing up in Massachusetts, I certainly didn't. It wasn't until I visited relatives in New Mexico as a kid that I got to experience the issue up close.

At the time, my family there lived in an off-grid house known as an Earthship, which deals with the dry environment in an unconventional way. Utilizing captured rainwater from the roof, all their faucets, showers and toilets ran on grey water, which would then be recycled for multiple uses. To optimize this system in a high-desert climate, one had to be very water-wise. Rules I'd never heard of before, like "if it's yellow, let it mellow; if it's brown, flush it down," became like scripture for me during those trips.

Despite that memorable introduction, my awareness for water conservation would quickly fade upon returning home to the land of flushing toilets (a.k.a. Boston). Even 20 years later, I still notice that tendency to associate real water problems with distant

places in the West. That was until 2022, when those problems came home to roost.

"Extreme" Severe Drought

In summer 2022, Boston experienced its fourth-driest stretch of weather in more than 100 years. By the end of August, 94% of Massachusetts had the designation of "severe drought," with our primary service area categorized as "extreme." Full-on water bans went into effect for many parts of the state, while lawns turned brown and crispy.

As things continued to dry up, I wondered how our water features were faring. For years, we've promoted the water-saving benefits of ponds and pondless features to our clients, but mostly in comparison to water usage required for lawns —and never during a full-fledged drought. As I waited for calls from concerned clients to pour in, the phone stayed surprisingly quiet. Only a handful of people reached out to ask whether it was okay to top off their features given the restrictions. I kept thinking to myself, why aren't more people calling?

At the start of fall maintenance season in October, I got my first answer to that question when I stopped by a client's



Twelve large Aquascape AquaBlox (left) make up Elaine's 400-gallon reservoir, which is designed to run throughout freezing New England winters. Wide pooling areas slow down the water (right) between the rushing falls and provide ideal drinking spots for some of the birds that Elaine loves.

house in Dover.

An Enduring Oasis

Elaine, an elderly woman who loves birds, had become our client back in 2021 when we built her a 17-foot-long pondless stream with several wide pooling areas. For her build, we had incorporated an oversized 400-gallon reservoir to allow the feature to run in freezing conditions (as we often do for many of our features). The idea, in her case, was to provide a dependable water source for the birds to drink from during winter when open water becomes scarce.

Given her age, an enlarged reservoir also made sense to reduce maintenance tasks like regularly pulling out a hose out to fill up the basin. While these details would help the feature conserve more water, it was by no means designed to be self-sustaining. However, to my surprise, Elaine said she hadn't filled up the feature up once —not since we had first built it a year earlier.

Shocked, I decided to do some math to understand how this was possible. Using a standard evaporation equation, I multiplied 0.5% (0.005) by the hourly flow rate of her pump. At a rate of 2,500 gallons per hour, her feature would lose about 12 ½ gallons per day. Factoring in 400 gallons of storage capacity, this meant Elaine's feature could last 30 days or so without needing to be refilled in the event it didn't rain. That's a pretty healthy buffer, considering we still

received some minimal precipitation as well during even the driest stretches.

Additionally, the previous equation doesn't factor in variables like Massachusetts' humidity, the lack of sunlight in Elaine's shaded backyard and the minimal amount of splashing from the feature. Realistically, she lost even less water than the equation suggests, which explains why her feature did so well.

Water Wise

Throughout the fall, I heard more success stories like Elaine's. At each service visit, my clients emphasized that their features used surprisingly little water.

While a portion did require occasional top-offs — like ponds without underground storage reservoirs — the amount needed was far less than what both they and I had expected. When they did fill up, however, it's important to note that they acted in accordance with their municipality's rules, which continued to allow intermittent hand-watering for gardens. Generally speaking, the bans applied to automatic irrigation systems, sprinklers, washing cars and filling pools.

Some who aren't familiar with ecosystem ponds might flinch when they hear that last part, but a pool and a pond are two completely different animals.



What was once a grass hillside temporarily becomes dirt as we prep the site for a water feature.

One is a sterilized system where no life grows, while the other sustains it, becoming a vital resource for beneficial insects, reptiles, amphibians and other biota during the drought.

Others might try to refute that interpretation, but the facts on the ground don't support their argument. From the data points I gathered last year from our clients, their features used very little water to begin with, required only modest supplementation and had a net-positive impact on the surrounding stressed-out ecology. Does it get any better than that?

Believe it or not, it does! Down the road from Elaine, we designed a rainwater harvesting water feature for a client that's even more sustainable than our standard projects. This particular feature starts off with two gentle 10-foot tributaries that converge into an 8-by-14-foot koi pond. From there, the water flows beneath a stone-slab bridge and cascades an additional 35 feet down the hillside where it terminates into a large reservoir. The reservoir is capable of storing 2,000 gallons of water and ties into multiple downspouts on the house. During rainstorms, the system captures roughly 850 square feet of precipitation, 450 of which comes from the footprint of the feature itself, and the remaining 400 comes from the roof.

To put those numbers into perspective, 1 inch of rainfall equates to more than 500 gallons of water captured and stored. On average, the Boston area receives more than 40 inches of rain annually, which amounts to 20,000 gallons of total water captured (or 1,600 gallons per month). Factoring in the feature's evaporation rate of losing 30 gallons per day (or 900 gallons per month), we average a 700-gallon surplus each month — more than enough for this system to run self-sufficiently during a prolonged drought like in 2022.

Convenient Sustainability

Thanks to Mother Nature's tough test last year, I now feel reassured

Get a **FREE** Listing with a
ONS Network Services or
50% Off Setup Fees by
Using Code **PondTradeMag**

Get Listed on the
1st Page of Google,
Instantly with a
New Website



Join **FREE**
Contractor Directory

www.outdoor-network.services



Covered by rock stone today, we had excavated a large hole (left) to accommodate the 60-plus Aqua-Blox needed to create our 2,000-gallon reservoir. To maximize water storage, we also sunk those modules deeper into the hole (right) to allow for additional room over top of the blocks.

and inspired. Our water gardens are proving to be phenomenal elements of sustainable landscaping that are capable of conserving water, providing local ecology some relief and so much more.

In a time when people are making sacrifices in their yards, water features present a compelling alternative. They show that's it possible to have a beautiful landscape that's also environmentally friendly and resilient. Simply put, they make it convenient for people to be

sustainable — often antithetical to many changes the Green movement posits.

From where I'm standing, I see these features as part of a much broader solution to problems rising on the horizon. However, some municipalities don't view them that way and have labeled water features as the enemy.

Shot Heard Round the World

Earlier this year, some disconcerting news surfaced within the Certified

Aquascape Contractor (CAC) community. A fellow CAC from Colorado posted about a recent water-conservation measure in Aurora, Colorado with the potential to affect all of us.

In a well-intentioned move to save water, Aurora moved to restrict what people can and cannot do when it comes to landscaping. In a newly added section of the City Code, (section 138-191) now specifically limits "the use of turf and ornamental water features ... to help

High Quality Koi @ Wholesale Prices

Hand picked from Japanese Breeders

Koda, Suda, Hiroi, Marusaka, Jirosuke, Kase,
Maruhiro, Miyatora, Ozumi, Yagenji, Yamazaki

lagunakoi.com/wholesale



**LAGUNA
KOI
PONDS**



THOUSANDS OF BABY KOI!

Call for price
949 494 5107

2 Locations:
Newport Beach, CA
Laguna Beach, CA

Quarantined & KHV Free



Aurora meet future water needs in the interest of health, safety, and general welfare of the residents."

In no uncertain terms, the code states that "the use of water in all public and private exterior ornamental water features and ponds is prohibited" and defines ornamental water features as "any exterior decorative fountains, waterfalls, basins, ponds, lakes, waterways or similar aesthetic structures."

Simply put, it has become illegal to build water features in this Colorado town. While the news is shocking and disappointing, it's tempting to ignore it when you're located 2,000 miles away in Boston or any other region that doesn't have the same historical water constraints.

However, a local event that happened in Massachusetts nearly 250 years ago makes me think twice before sweeping this story under the carpet. Back on April 19, 1775, hundreds of British troops marched into Lexington, Massachusetts, and confronted a small group of minutemen. Shortly thereafter, someone fired a musket and what ensued was a battle that started the Revolutionary War. We now refer to that skirmish as the "shot heard round the world," and I'm afraid Aurora may have just fired the equivalent bullet on the water feature industry.

Ripple Effects

While Aurora is just one town, rumblings throughout Colorado indicate that more towns may follow suit with the state itself potentially stepping in to adopt these new restrictions. If this trend

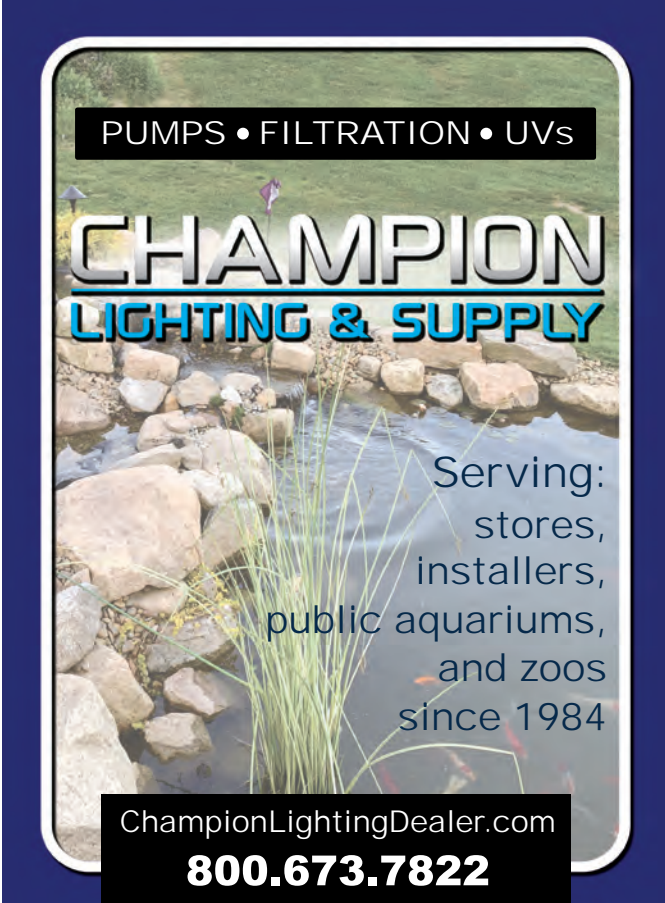
continues and Colorado becomes the first place to ban outdoor water features — as it did with rainwater harvesting systems that store more than 110 gallons — what could the consequences mean for the rest of the country? If things play out like the Revolutionary War, a ban on water features could spread far beyond just a few towns.

At face value, restrictions might seem like a good thing, but they're really an act of friendly fire. Water features, as everyone in our industry knows, are often amazing conservation tools for water and wildlife (just like they were for my clients last year). To lump them in with turf grasses as Aurora did shows a major lack of forethought and looks to be self-sabotaging. With a little bit of research, they'd discover that many types of water features are part of the solution — not the Boogeyman they think.

Moreover, if they actually looked under the bed, they'd find that the people comprising the water feature industry share many of their same sustainability values. So how did we find ourselves mistakenly placed on the other side of the line in this case?

It seems to be a matter of perception versus reality. Water features inherently convey an image that on the surface makes them look wasteful. While this assumption couldn't be farther from the truth, the optics speak for themselves before the data.

This problem isn't unique to our industry. Earthships, the eco-houses I described earlier, faced similar hurdles at their inception. Most notably, building departments refused



PUMPS • FILTRATION • UVs

CHAMPION

LIGHTING & SUPPLY

Serving:
stores,
installers,
public aquariums,
and zoos
since 1984

ChampionLightingDealer.com
800.673.7822



HARDSCAPE
North America | Louisville, KY
OCTOBER 18-20, 2023

YOU'VE GOTTA BE THERE!

HANDS-ON | **LEARN** | **CONNECT** with the
Experience | from Experts | Hardscape Community

REGISTER TODAY!



HardscapeNA.com

AIRMAX

The Professional's Choice

Unrivaled Fountains and Aeration


- Largest Most Defined Spray Patterns
- Innovative Low Maintenance Design
- Best In Class Energy Efficiency
- Made in the USA



Contact Airmax
(866) 424-7629
Become a Dealer or
Find Your Local Distributor

to approve the structures because they used old truck tires with packed dirt for their walls. Michael Reynolds, the founder of the concept, knew these walls were strong (much stronger than traditional 2-by-4 framing, in fact) and decided to arrange a test to prove it.

In a calculated move, he drove a large truck over a section of rammed-earth tires in front of the inspectors to demonstrate their strength. Needless to say, it worked, and they approved all of his walls from that day forward.

While this example comes from the Wild West of New Mexico in the '80s, the message applies to us here and now. It's up to us to educate and guide those who are making significant policy changes surrounding water features. 

About the Author

Jonathan Marston built his first water feature at the age of 18 for his grandparents in Massachusetts. After high school, he moved to British Columbia for a unique undergraduate opportunity that allowed him to study water features in one of the most scenic parts of North America. Highlights of that degree included interning with Streamworks Designs in Vancouver and petitioning the university to have him build a koi pond on campus, which was completed in 2016 and doubled as his thesis project. Upon graduating, he moved back to Boston and officially opened FallingWater Scapes in 2017, which has since become a Master Certified Aquascape Contractor and an award-winning water-feature company.

Today, some of his favorite projects are the ones that allow him to practice Frank Lloyd Wright's principle of organic architecture: bringing nature as close to his clients' homes as possible.





Aerial view of the “No Passport Required” plunge pond.

|Water **Quality**|

Nature's Lifeguard

Managing water quality in recreational ponds

by Jerry Romano,
Liquid Designz

Let me begin by stating what this article is not going to cover — a biology lesson and municipal codes.

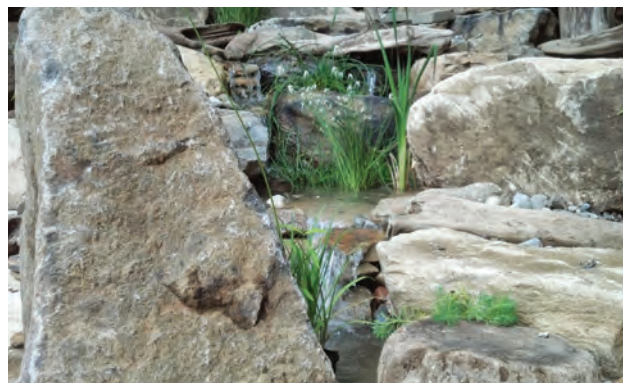
Following major back surgery in 2008, I was fortunate and healthy enough to pursue my latest passion in my life. For the next couple of years, my company, Liquid Designz, was back to constructing water features, and we couldn't be happier.

That being said, however, we weren't at the point where we were installing recreational and plunge ponds. In fact, I barely knew what the heck they were about, let alone did I understand the importance of water quality and its very distinct difference from water clarity. Sure, I had picked up a few pointers along the way from countless seminars (along with some Anthony Archer-

Wills reading material), but the majority of my knowledge and interest was in the construction department. And the questions I used to ask along the way? Just ask Ed and Brian at Aquascape, as I'm sure they remember all too well.

In 2012, our “No Passport Required” project came about and was featured in the May/June 2013 issue of POND Trade magazine. It was constructed at our showroom in Bergen County, New Jersey. It was a fun event, as I invited a few contractors as well as CAT, who donated two machines. I felt that this would be an ideal location to learn and experiment.

Due to the existing steep hillside and old railroad tie wall, I knew that containing and redirecting as much run-off as possible would be a crucial and constant challenge. We began by incorporating some of the basic necessities that most recreational ponds should have such as a wetland filter,



Testing equipment (left inset) should include total coliform count, E. coli tester and total dissolved solids meter. A main wetland filter (above) is constructed within the stream area.

aeration, multi level jets, etc. We also implemented some of our own methods with the initial construction. The design has since changed dramatically over the years, as my newfound passion — achieving the healthiest water quality possible — has arrived and remained at the forefront.

The Role of Sand

Since we were planning to install a beautiful beach adjacent to the design, I figured we would begin with a sandy bottom, which made perfect sense to my distorted mind. This decision had now taken me into uncharted territory. We had also implemented a nice fish load the first three to four years. Eventually we began to shift gears and designed a couple of new floors, but not before gaining invaluable knowledge about the

use of sand within a water feature.

This didn't occur just by distributing some sand at our showroom. In fact, it got very interesting as far back as 2009. Located very close to our showroom is a very affluent area with a natural swimming vessel known as Graydon Pool. It has a lovely, natural sandy bottom and spring-fed swimming pool area on 2 ½ acres that has been a staple in the community for what seems like forever.

Unfortunately, there was a drowning that year. The bigger problem was that the lifeguards on duty couldn't locate the young man for 30 minutes or so due to the cloudiness of the sandy water. Following the incident, the town council had multiple meetings and was seriously entertaining a design that Liquid Designz and Perrone Ponds had drawn up and presented. Unfortunately, they decided to keep things as they were.

However, there was some good that came out of this situation, as I became friendly with one of the higher-up staff who was responsible for all aspects of maintaining Graydon Pool. This included learning about the type of sand they had finally settled on (triple rinsed) and how they maintained it. He had informed me that an estimated 300 tandems of this fine white luxury are dredged out of a few specific areas along the New Jersey shore and trucked up the lovely New Jersey Turnpike every season.

Did you catch that? The old sand is dredged out each season, and new sand is brought in. This is a must when implementing sand within your water feature, regardless of what zone you're in. Any idea where we obtained our sand every season? You guessed it, and it was complimentary as well. We also learned how the pool, which bordered



Our tri-blend of ceramic, structural and lightweight aggregate (left) was implemented into our "sun shelf" wetland filter (above).

and drained somewhat into the wetland area, was approved to use a very low dosage of chlorine each day but was closely monitored by the U.S. Environmental Protection Agency (EPA). Due to the small draining weir that led into the large wetland area, an exorbitant amount wouldn't be acceptable.

Some Interesting Feedback

So when the article came out in 2013, it had a picture of my son enjoying the water of our newly designed "Plunge/Rec Pond." It was Liquid Designz's first real exposure. As I began to read some of the responses to the article, there were some comments and concerns from some readers that took me by surprise.

Remember, I was a rookie taking on a pretty unique design for the first time. Most of the comments, however, were very favorable, which was nice to see. I remember one in particular from Dave Kelly. The criticism, for lack of a better word was due to the question, "How did I know that the water quality would be safe for human interaction?" It certainly was a fair question, and one that every contractor should be concerned with when constructing recreational ponds.

A couple of readers pointed out their concern about a bacterial infection known as necrotizing fasciitis, which occurs when stagnant or unhealthy dirty water filled with bacteria comes in contact with an open wound. It sure sounded like I needed to educate myself once again, as my desire for this industry seems to have me committed for a while!

It was from that point on that our showroom transformed into our own Dr. Frankenstein lab, if you will. I love construction as much as the next guy, but there's only so many cool water features one can build, demo and then rebuild on their property. Since then, our main focus has always been on how Liquid Designz could achieve the healthiest water quality possible.

**Wholesale Distributors
of Water Gardening
Products**

SERVING OUR
CUSTOMERS FOR
**30
YEARS!**





- Fully Stocked Warehouse
- Most orders shipped within 24 hours
- Competitive Pricing
- Nationwide Shipping

Order Fulfillment Services Available

**WHOLESALE ONLY to trade-related retailers...
we do NOT sell directly to YOUR customers.**









**Floating
Planters**







**BEST
SELLER**



Matala®
"Make water alive"









DISCOUNT POND SUPPLIES

www.discountpond.com

800-979-0999 ~ sales@discountpondinc.com
P.O. Box 129 Lebanon VA 24266



In-progress construction photos are shown of the vanishing-edge filtration area (top left) and bubbling beach boulder (bottom left) bog area filter. The completed vanishing-edge area (above) turned out great. The red arrow indicates the return from the beach bog boulder.

It has been so rewarding over the years to see all the different styles of recreational and plunge ponds installed out there. There is such an abundance of talented contractors in our industry, and I'm just glad to be a part of that group. I have worked with many of them and have shared countless correspondence with some of them throughout the years. There is nothing I enjoy more than helping others while gaining knowledge from them as well.

Water Testing

For the first four years, all our testing was done through an established lab. Of those eight test results (twice a season back then), one test showed a positive coliform/E. coli count. I actually remember the week of the test. We had a few flocks of starlings enjoying our design every day. It wasn't a big deal, since we knew we had the correct filtration in place, and any trace should filter out sooner than later.

I still keep in touch with the lab rep who used to come out and grab the samples. I'll never forget what he said when we spoke after the very first test was administered. He told me that the lab technician didn't believe we didn't have a UV light installed, because the water was as close to potable

as you could get, especially for these types of natural designs. (That being said, I still feel that a UV light is a great addition under certain circumstances.)

One of my favorite tests is to see how quickly our design works through a heavy rain event, both for water quality and clarity. The location of our design is ideal for this. Our plunge-pond design was constructed in the middle of an existing patio and steep hillside. Though we did what we could to keep runoff to a minimum, it still occurs during heavy rains. However, in our case, it also would bring some of the beach into the water as well. It's difficult enough keeping the anaerobic buildup beneath the sand to a minimum without this occurring.

All these factors created an excellent opportunity for testing via different means and methods. We test directly after, as well as a couple of days later. This will typically depend on the size of your particular design. One of the things I do during and after a heavy rain event is slow down both of our pumps considerably. The other crucial test is to gauge the phosphorus/phosphate count. Though essential for our plants and other aquatic life, an excessive amount could lead to low levels of dissolved oxygen, which in turn affects water quality.

The Splash Pad

Right next to our main feature at the time was an rainwater-fed splash pad that had very little filtration. This was done purposefully. (There is always a method to my madness.) We did, however, have constant water movement along with some of our unique filter media that we placed in the first flush filter, filling up the inside of the 300-micron net. It was still a fun place to enjoy during the hot summer days, so we wanted water with acceptable quality running through it. Once in a while I would throw in an occasional small chlorine tablet just to be on the safer side.

The cool thing is, for the five years or so that we had the splash pad, it was tested every single time our main swim pond feature was. Can you guess the test results? If you guessed positive every time, you would be correct. So, here we had the same environment, location, wildlife, aeration and runoff as the adjacent feature, but with contrasting results. This wasn't a shock to us, as we understood that without implementing the standard methods of filtration along with our additional filtration methods and materials, these contrasting results were not surprising.

Fast forward to the 2022 winter/



Beautifully simple water gardening



To learn more, contact our Dealer Support Team at **800-353-3444**
or email us at newcustomers@rchagen.com



HAGEN
GROUP

© 2022 by Rolf C. Hagen Inc. Laguna is a registered trademark of Rolf C. Hagen Inc.

Always On Guard



EasyPro Sentinel Aeration Systems include:

- Lockable steel cabinet with cooling fan and electrical outlet installed
- Compressor
- Quick Sink, rubber membrane diffusers
- Airlines
- Plumbing
- Pressure gauge

Systems Available for Ponds and Lakes up to 20 Acres!

Aeration solutions also available for larger lakes

See all Sentinel systems and accessories here!



Use our online aeration system request form to help you select the proper system

www.easypro.com/aeration-system-request

As one of the country's largest manufacturers of diffused aeration systems, EasyPro has the products and the experience to help you with nearly any aeration project.



2023 Catalogs are Available!

Call or visit easypro.com to request your catalogs today!



800-448-3873

EASYPRO.COM

spring months when I decided to rip out that same very cool splash pad, which wasn't too popular a decision among my family and Ryan, the foreman. Once again, there were two specific reasons why I did this. One, I was bored with the splash pad. Two, I wanted to construct something truly unique to enjoy and to equip me with another body of water to work with — a sun shelf and reflection pool that would be naturally filtered by its own wetland filter, as well as many other methods. The design would not only be an awesome place to hang out and cool off, but more importantly, it would also serve as another vessel to test and hopefully confirm the same results that the main feature design had returned since 2014.

As I expected, our most recent design did bring back the same exciting water quality results that we had been accustomed to. I can confidently say that we are definitely on the right track and will continue to grow and educate ourselves. In the meantime, as much as we would like to install more recreational and plunge ponds, the reality is that we have assisted and bid on a number of them. To date, we feel quite fortunate to have a couple of beautiful and unique designs to continue our ongoing testing.

Keys to Filtration

The testing kits we use are both for drinking and well water using EPA-approved quality standards. Shoot for the stars is my philosophy. Every three weeks, unless there's a heavy rain event) we implement the following tests: coliform/E-coli, volatile organic compounds, dissolved oxygen levels, total dissolved solids, nitrates, phosphates, lead and copper.

One of the other important aspects of filtration is how often you turn over the volume of water from your design. This is very different from how quickly, or I should say, how slowly water should flow through your particular wetland filter. I haven't come up with a firm, consistent test number that has

altered the filtration either way.

Filtration or regeneration zones, according to many, work best when they comprise 50% of the total square footage of your bathing vessel. Our designs that I speak of here are approximately 40%. Obviously, it's much easier to pull off a significant filtration area on smaller designs.

We also have spent a fair amount of time over the years trying new floor styles and designs. As indicated earlier, we started with a sandy-bottom design with fish initially before I decided to deepen the design a bit, cutting out a large area of the floor liner to gain a little depth for our new bottom aeration setup. This is crucial to avoiding any stratification. The problem with sand is being able to implement bottom aeration throughout the majority of the floor area without the water clouding up each time you use the design. I was fine with the latter, but was I set on a brand-new floor idea where one could walk all over the bottom without disturbing any of the five aeration disks — not an easy feat if you have a design that is only 3 to 4 feet deep with constant foot traffic. However, we absolutely accomplished that.


Other Ideas

Some additional methods that we have implemented include moving water from the main vessel to other areas, or in our

case, a beautiful, bubbling, beach-grade slab surrounded by aquatic plants that not only is aesthetically cool but functions so nicely as our secondary filter. It took some serious juggling to pull this off. One valve controls how much water from the main pond goes sub-beach and connects via bulkhead to create the bubbler. The spillover is then captured by a 360-degree perimeter catch basin that is loaded with our unique filter media and aquatic plants.

The challenge, however, was positioning the receiving bulkhead from the pond area just above the exiting bulkhead from our bubbling beach slab, which, of course, takes that water via flex under our patio slabs and dumps into our vanishing edge area — the final but very effective filter area. This vanishing edge area is so cool. I've done quite a bit of testing with assorted materials over the years in this section, with never any clogging. We use a large, standard filter media cut-to-size pad, another different-density pad, a thick layer of LEED-certified aggregate and some natural smaller beach or standard gravel, which helps to keep the light-weight aggregate in place.

My hope is to see more contractors sharing some of their water-quality test results as well. It is my opinion that when you put a recreational pond title on your design, it takes on an entirely different

aspect of contractor responsibility than just gorgeous aesthetics. I feel collectively we can continue to contribute to our amazing industry while gaining a larger share of the swimming pool pie. Always remember that the more your clients enjoy their recreational pond, the healthier they will remain. 

About the Author

Jerry Romano founded Liquid Designz LLC in 2005. He has since grown the company into one of the most recognized water feature companies operating in the Northeastern United States.

The journey, as expected, is never an easy one. Following major back surgery in 2008 and most recently a complete rupture of the patella tendon in 2019, has made him appreciate his craft that much more. The water feature industry hasn't been the only passion in Jerry's life where he has excelled. In 2015 Jerry was inducted into the Minor League Football Hall of Fame as one of the nation's top punters — a blessing that he attributes to many other influences.



| WGE Recap |

What a Show!

Great new venue for Water Garden Expo

by **Lora Lee Gelles**,
POND Trade magazine

This year's annual Water Garden Expo sponsored by Pondliner was held in Shawnee, Oklahoma, from March 1-3, 2023. It was a bit different this year, for the expo was held in the

conference rooms at the Grand Casino Hotel & Resort, which is where our accommodations were.

There was a really good turnout this year, and people came from all over the United States and beyond.

The motto was "Learn, Network and Re-Energize," and it really did hit the mark. On Wednesday, there




was an all-day sales boot camp led by Paul Amos and Joe Holz. On Thursday and Friday, we had our choice of speakers and sessions, with topics such as recreational ponds, how to get new leads, EPDM training, filtration systems, large construction projects and much more.

On both days, exhibitors had booths to cruise around and peruse. It's a good way to learn about new products and have helpful discussions with representatives from across the industry. It's always a pleasure to see many of you stop at the POND Trade booth and chat!

My personal highlight was presenting the Water Artisans of the Year awards on Thursday morning. It was nice to have three out of six judges in attendance. Chad Smith, Larry Carnes and Tim Wood got up front with me and voiced their thoughts on the whole judging process as well as some good tips for next year's contestants.

A big part of Water Garden Expo is the networking. Many valuable conversations are shared about all things pond related.

Be sure to put the Water Garden Expo on your list of places to go next year. It's the place to be! 



Contest Winners!







Ecological Laboratories Introduces New Single-Pellet Koi Food

Microbe-Lift Variety Mix Koi food has always delivered an unmatched nutritional blend for your fish throughout the pond season. It has been the answer to those wanting to provide all the benefits of multiple fish foods but within one package. One distinct change you will notice: the food is now one consistent pellet as opposed to four distinct pellets and sticks. We made the investment to reformulate the Variety Mix to include all the nutritional benefits of the formulas in our Summer Staple, Fruits and Greens,

Immuno Food and Growth & Energy into one singular pellet. The greatest benefit is that it now ensures that every bite of food the fish ingest has the benefits of all four varieties. An additional improvement is that the food can be easily used with automatic fish feeders when needed. As always, the Variety Mix will not cloud the water and will



BEFORE



AFTER

be eagerly eaten by the fish. The Variety Mix contains the optimal levels of proteins, carbohydrates, fats and stabilized vitamin C.

You will also notice that we now package our small, medium and large sizes in a high-gloss bag. At Ecological Laboratories, we continue to look for ways to make less of a negative impact on our environment. The switch to these bags removes the large amount of plastics incorporated within our packages.



Aquascape Introduces Faux Basalt Column Fountains

These extremely realistic and durable fountains are molded from real basalts and handmade in the United States using fiberglass, resin and real stone.

Real basalt is extremely heavy and can be difficult to install. Due to the lightweight nature of the Faux Basalt Columns, installation is quick and easy. Each column provides a convenient base, making it easy to secure in place using decorative gravel. The included tubing and plumbing fitting install easily into the recessed area at the top of the fountain.

Faux basalt columns are available in 18", 24", 30", 36" and 42" heights. Three-piece and five-piece sets are also available, in addition to the Faux Basalt Column Set of Three Landscape Fountain Kit, which includes everything you need to create an impressive fountain display. To order, call 866/877.6637 (US) or 866/766.3426 (Canada) or visit www.aquascapeinc.com.



Tour Dates Announced for the Greater Kansas City Water Garden Society Pond Tours

The Greater Kansas City Water Garden Society celebrates its 30th annual self-directed driving tour on six Saturdays in July and August. Each tour will feature up to 12 water features located in proximity. Tickets are \$10 per person (age 14 and up) for access to all six tours in the greater Kansas City area. The tours run from 9 a.m. to 5 p.m., with one night party per tour sponsored by a local business.

Lotus Entertain You is the theme for the 30th Anniversary Water Garden Tour. Exotic water lilies and swaying lotus are sure to impress, while dragonflies and butterflies will put a smile on your face.

Tour dates and locations are:

- July 8, Missouri, north of the river,
- July 15, Kansas, Leavenworth, Wyandotte and Northern Johnson counties,
- July 29, Kansas City, Missouri, inside the I-435 Loop, Raytown and Independence,
- Aug. 5, Lawrence, Kansas, and surrounding areas,
- Aug. 19, South Missouri, Jackson, South of the Loop, Ray, and Cass counties, and
- Aug. 26, South Kansas, Southern Johnson County.

Proceeds from the annual tour are used to build and sustain ponds for schools and other nonprofits. With your \$10 ticket, you will receive a large tour book with maps and host-written pond descriptions. Tickets are available May 1 at www.eventbrite.com or our website, www.kcwatergardens.com. Follow the Greater Kansas City Water Garden Society on Facebook for updates, plein-air artist locations and information about the night parties.



EasyPro's New Low-profile Accent Fountain

EasyPro introduces another beautiful basalt fountain to their Tranquil Décor lineup. The Pedestal Fountain is a low-profile accent fountain that helps you bring the tranquil sound of water to smaller spaces. The complete kit includes the Pedestal Fountain (approx. 22"-26" in diameter by 12" tall), basin, pump, plumbing kit and light. To request your full color catalog or for more information about EasyPro products call 800/448-3873 or visit www.easyp.com.



Fitz's Fish Ponds Imports 50,000 Tosai from Japan!

In March 2023, the Fitz's Fish Ponds team imported 50,000 tosai from Japan! This is one of the largest shipments of koi ever to be imported into the US. More than 500 boxes of koi were unboxed and released into our stock tanks at the FFP Farm in Milford, New Jersey.

"All the koi came to us in great condition," said Brian Fitzsimmons, owner of FFP. "Now they are in their quarantine period as they acclimate to their new environment."

The FFP Team is very excited about this particular shipment because we now have the largest quantity of koi as well as the most variety. We can confidently supply a customer with just about any variety or size koi they are looking for. On the recent Japan trip, Brian and the team visited and bought koi from the top breeders in Japan including Marusei, Shintaro, Shinoda, Maruhiro, Iwashita, Marusada, Chogoro, Hiroi, Masaki Aoki, Marusho, Torazo and Hiroi Seji.

These 50,000 koi came to us in two separate shipments, one on March 15 and the other on March 22. None of this could be possible without the help of Masaru Saito, Kosuke Saito and those at Shintaro Koi Farm. We are especially grateful to Kosuke, who boarded the plane and made the trip to the FFP Farm from Japan after loading all the koi. He then helped our team unload, unbox and monitor the health of the fish at our facility.



Contact us at 908/301-4722 to schedule an appointment to visit the FFP Farm in New Jersey.

St. Louis 2023 Pond-O-Rama Tour

The St. Louis Water Garden Society (SLWGS) is celebrating 33 years as a society sharing information about fish, ponds and gardens. 2023 marks the Society's 23rd annual water garden and pond tour, the Pond-O-Rama, and will be held Saturday, June 24 and Sunday, June 25, 2023, from 9 a.m. to 5 p.m. each day. It will feature private gardens owned and maintained by society members. Tickets covering both days of the tour are \$20 each.

The gardens are located throughout the St. Louis metropolitan area. This self-guided tour is arranged each day by geographic location. This year, many of our gardens on tour are new, and some are even "over the top," with the owners very excited to share their new ponds and waterfalls.

This event is the only time many of our over 200 St. Louis Water Garden Society members open their gardens to the public as a group. In addition to having water features, most of our hosts are avid gardeners who maintain beautiful landscapes filled with perennials, annuals and shrubs. Our hosts will be available and delighted to share information and answer questions about their gardens, water features, fish and beautiful plants.

This event provides funds for the SLWGS to continue their civic project to plant and maintain the reflecting ponds at the Jewel Box in Forest Park. For 33 years, society members have worked each Saturday at the ponds from May to October to keep lily ponds looking beautiful.

For more information or to purchase tickets, visit one of the many retailers and garden centers in the St. Louis area, or visit our website, www.slwgs.org. Tickets will be available for purchase in May 2023.





Atlantic's Natural Basalt Column Kits Are Back!

They're back! Gorgeous, natural Basalt Column Kits are in stock and ready for delivery. Three column sizes — 18", 24" and 30" — enhance any space and accommodate every budget. Three kits, including two single-column kits in 24" and 30" sizes and a three-column kit in 18", 24" and 30" sizes, create fully self-contained water features in no time! Each comes with a strong, generous fountain basin that houses and protects the pump and plumbing, which are also included. Best of all, unlike cookie-cutter artificial columns, each piece is unique. Add fountain lights for a liquid torch effect after dark.

www.atlantic-oase.com/products/categories/fountain/basalt-column-kits

Atlantic-OASE
330/874-8317
www.atlantic-oase.com

Get Rid of That Debris!

Kloubec Koi Pond & Waterfall Scrubber works as your strongest line of defense to quickly and safely remove debris from rocks, waterfalls, streams or anywhere build-up has occurred. Our fish-safe dissolvable granules bring the natural cleaning power of oxygen to your pond. Kloubec Koi Pond & Waterfall Scrubber also restores a natural electrolyte balance to the pond with a slight buffering effect to prevent dangerous PH swings. Available in a 2-pound container, it is mild enough for routine maintenance, yet powerful enough for tough build-up, all while containing no harmful detergents, chemicals or other ingredients.

Use this all-natural, non-toxic product to safely remove debris from rocks, waterfalls and streams and restore a natural electrolyte balance.

www.kloubekoi.com/products/Kloubec-Koi-Pond-26-Waterfall-Scrubber.html



MARKETPLACE

Koi-Kit
For sparkling clear Koi pond water.
treats 100,000 gallons

FREE SHIPPING!

Aquacide.com/kit
800-328-9350

Our 68th year **AQUACIDE CO.** PO Box 10748 DEPT 120, White Bear Lake, MN 55110-0748

NEED MARKETING HELP?

pondtent
215.805.8257

WE TURN YOUR DATABASE INTO DOLLARS

Mt. Parnell Fisheries Co.
Goldfish & Koi since 1923
When Quality Matters

Born & Raised in the USA

1574 Fort Loudon Road ~ Mercersburg, PA 17236
800-438-4652 ~ info@mtparnell.com

**Don't miss out on this
Market Place advertising opportunity.
See our website:**

<http://www.pondtrademag.com/advertise-with-us/>



K LOUB EC
K OI F A R M

WE DELIVER MORE...

Family owned & operated,
3 generations of award winning
excellence in aquaculture

(319) 846.2077
www.kloubeckoi.com



IWGS SYMPOSIUM
VANCOUVER, B.C., CANADA

SAVE THE DATE
23-27
AUGUST
2023

FOR MORE INFORMATION VISIT
IWGS.ORG



HARDSCAPE®
North America

**THE LARGEST HANDS-ON
HARDSCAPE EVENT IN THE U.S.**

OCTOBER 18-20, 2023
LOUISVILLE, KY · HARDSCAPENA.COM



www.kodamakoifarm.com

KODAMA KOI FARM

Quality Wholesale Koi
and Pond Supplies

Contact us for a price list
1-808-354-7031 info@kodamakoifarm.com

Advertisers' Index

Airmax	52
Anjon Water Garden Products	2
Aquacide	64
Aquascape, Inc.	30
Atlantic / Oase	68
Bassinger Fisheries	19
Champion Lighting & Supply	51
Discount Pond Supplies	55
Dolphin Pumps	22
EasyPro Pond Products	34, 35
EasyPro Pond Products	58
Evolution Aqua USA, Inc.	67
Fishpondaerators	7
Fitz's Fish Ponds, LLC	67
GC Tek	12
Grand Koi	3
Greater KC Water Garden Society ...	45
Hardscapes North America	51
IWGS	22
Jermack Cultivated Plants	31
Kloubec Koi Farm	23, 65
Kodama Koi Farm	65
Koi Smart Pond Supply	13
Laguna Koi Ponds	50
Laguna Water Gardening	57
Lindley Stone	13
Microbe-Lift	26
Mount Parnell	64
Netherland Bulb	32
Nitto Kohki	40
Outdoor Network Services	49
Outdoor Water Solutions	20
Performance Pro Pumps	31
Pondliner.com	42
POND-O-RAMA	25
Pondtent	64
ShinMaywa	43
Toledo Goldfish & Koi	25
Trans Instruments	45
Ultra Balance	44
W. Lim Products	16
Water Becomes a Garden	7
Zeigler	16

**Extend your national visibility -
advertise in**

PONDTRADE™

**Call Lora Lee Gelles 708/873-1921
or llgelles@pondtrademag.com**

FINAL THOUGHT

Ruff day building ponds





Interested in a Koi Buying Trip to Japan?

We provide you with access to the highest quality breeders in Japan! Inquire today by visiting KoiTrips.com or contacting us!



WHOLESALE JAPANESE KOI

CALL TO BOOK AN APPOINTMENT

HAND PICK FROM TENS OF THOUSANDS OF IMPORTED KOI FROM THE FINEST BREEDERS IN JAPAN. ALL SIZES AND VARIETIES AVAILABLE.

CONTACT US TODAY: MARKETING@FITZFISHPONDS.COM - 908.301.4722 - FITZFISHPONDS.COM

FASTER FILTER MATURATION!



PURE+ FILTER START Gel

Live bacteria gel to start new pond filters

PURE+ Filter Start Gel is a live, concentrated bacteria culture for use in new pond filters. The gel based solution will stick to the filter media, allowing the nitrifying bacteria it contains to rapidly colonize your filter.

Filter Gel is Available in 2 sizes: 1 liter treats ponds up to 2,640 US gallons and 2.5 liters treats ponds up to 6,600 US gallons.



PURE POND BOMB

PURE Pond Bomb is a fast acting, concentrated combination of friendly bacteria and enzymes, which get to work as soon as the Bomb hits the water to clean up organic waste and break down the ammonia and nitrite, leaving your pond crystal clear and healthy.

One ball can be used on ponds up to 5,200 US gallons.

EVOLUTION AQUA
INNOVATION IN WATER

K+AdvancedFilter

Advanced Pressure Filters For Ponds Using K+Media



- Economical to run thanks to its unique design
- The filter has been engineered to maximise pump efficiency
- Pre-filled with advanced K+Media for improved filtration
- Easy to operate and clean
- One piece rotationally moulded filter body
- Built-in feet (no skirt) for additional durability
- Granite grey colour matches existing Evolution Aqua filters

Model	Maximum pond size	Optimum flow rate	Quantity of K+Media included	Diameter	Multi-Port Valve	Pipework size
K+AdvancedFilter 16	3,000 US gallons	1200 - 1500 gph	30 Liters / 1.06 cu.ft	16"	1 1/2"	1 1/2"
K+AdvancedFilter 20	4,800 US gallons	1600 - 2000 gph	50 Liters / 1.77 cu.ft	20"	1 1/2"	1 1/2"
K+AdvancedFilter 24	9,600 US gallons	3200 - 4000 gph	100 Liters / 3.53 cu.ft	24"	2"	2"
K+AdvancedFilter 30	14,500 US gallons	4800 - 6000 gph	150 Liters / 5.28 cu.ft	30"	2"	2"
K+AdvancedFilter 36	24,000 US gallons	6000 - 7000 gph	250 Liters / 8.83 cu.ft	36"	2"	2"

info@evolutionaquausa.com - evolutionaquausa.com - 888.417.5837

INCREASE YOUR PROFITS WITH ALL-IN-ONE KITS

We make it easy to install water features with our
All-In-One Hammered Brass Bowl Kits



 **Atlantic | Oase**

Visit our website to explore our line of premier water feature products
www.ATLANTIC-OASE.com

