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FEATURES

8 Mixing Work with Family POND CONSTRUCTION

Christopher Bell has always dreamed of working with his father and his son to build beautiful ponds. It was just a dream — until the stars aligned. With his dad moving close by and his son out of school during the pandemic, the "Bell Bunch" seized the opportunity of a lifetime.

14 Up-Close & Personal

Have you ever stuck your face up to the surface of a body of water and taken a really deep breath, taking in the sights, sounds and smells of the feature? It might sound strange at first, but **Jamie Beyer** is here to discuss all the benefits of aquatic proximity.

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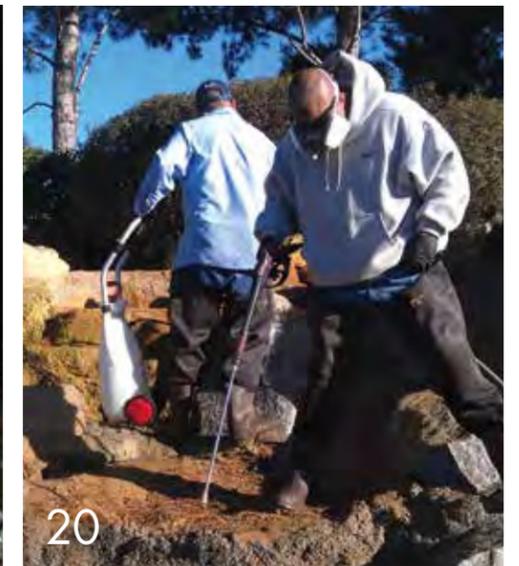
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2021

January 12 - 14

Landscape Ontario (Virtual)

Toronto Congress Centre
Toronto, Canada
www.locongress.com

May 11 - 13

National Hardware Show

Las Vegas Convention Center
Las Vegas, Nevada
www.nationalhardwareshow.com

August 25 - 28

Pondemonium

Q Center
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www.aquascapeinc.com/professionals/pondemonium

October 20 - 22

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Publisher's Perspective

Bye Bye, 2020!

As the old saying goes, "Don't let the door hit your a** on the way out!" I think most of us feel this way about 2020. I must say I'm looking forward to 2021 (hopefully) being a much improved year all-around. Out with the old, and in with the new!



It's been quite the strange year, with everybody staying home and a lot of people out of work. Thankfully, this industry has been an exception. I know that many of you have been really, really busy this year! When you think about it, it makes a lot of sense. More people staying at home means more people hanging out in their yards. One thing leads to another, and the next thing you know, the demand for ponds and water gardens goes through the roof!

I know those of you in areas with stricter shutdown orders have had to struggle to stay busy, and I'm continually impressed by the stories of your resiliency and perseverance. For example, Mike Garcia of Enviroscape L.A. was able to keep his crew hard at work earlier this year by taking on a pond rebuild and aquaponics system installation at a Los Angeles-area middle school (p. 55 "Saved by the Bell"). When it is safe enough for the students to return to the classroom, they'll have a brand new ecosystem on campus to learn from. How cool is that?

Speaking of learning, this issue is packed with knowledge and exciting content that will hopefully keep you thinking through the beginning of the 2021 pond season. Demi Fortuna lends us his expertise on calculating the ideal size for plumbing and pump systems (p. 49, "A Pump and Plumbing Primer"), while Zac DeGarmeaux paints a profile of some gorgeous, lesser-known waterlilies, iris and lotus (p. 34 "Pond Prima Donnas"). Also, if you've ever considered offering sand-bottom ponds to your customers, you'll want to read about Larry Carnes' quest to build his very own tropical oasis (p. 24, "Life's a Beach").

As we say goodbye (and good riddance) to 2020, I would like to wish you, your business and your family a safe, happy, healthy new year from all of us here at POND Trade magazine.

Happy PONDering!

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Mixing Work With Family

Three generations band together
for koi pond build

by **Christopher Bell,**
Bell Ponds, Plants & Patios

A little over a year ago, I was in Englewood, Florida, a beautiful town right around the corner from Venice Beach and world-famous Siesta Key. It was my second trip in just a few months, as I helped my parents move up to Mathews, Virginia, where I make my home and operate my business.

We had planned the move for some time. The initial trip was to help my dad make some upgrades to the house. (Dad is a one-man construction crew — there are few things he can't build!) This second trip was to take on the chore of packing and making the long haul back. To say it was daunting is an understatement. We spent the better part of two days packing up a huge U-Haul with everything from a Harley Davidson to petrified logs. It's not the most fun thing to do, but when you've waited as long as I had for a family member to move closer to you, all the typical frustrations of such a big move just don't get to you as much.

As usual, it was a very hot day in Florida, and the heat was getting the better part of us. In and out of the house, up and down the truck,

box after box, we were finally just about ready to close the door and begin the drive up. As I was coming out of the house and through the



Building bridges (and more) spanning over three generations: Riley, Anthony and Christopher Bell.

screened-in porch, I saw my dad inside the truck, moving backwards to navigate his way down and out. He missed his footing, and I watched my father fall and hit his head very hard. He went limp, and I feared the absolute worst.

Time just stopped. It all happened so fast, but it was like I was watching it in slow motion. That

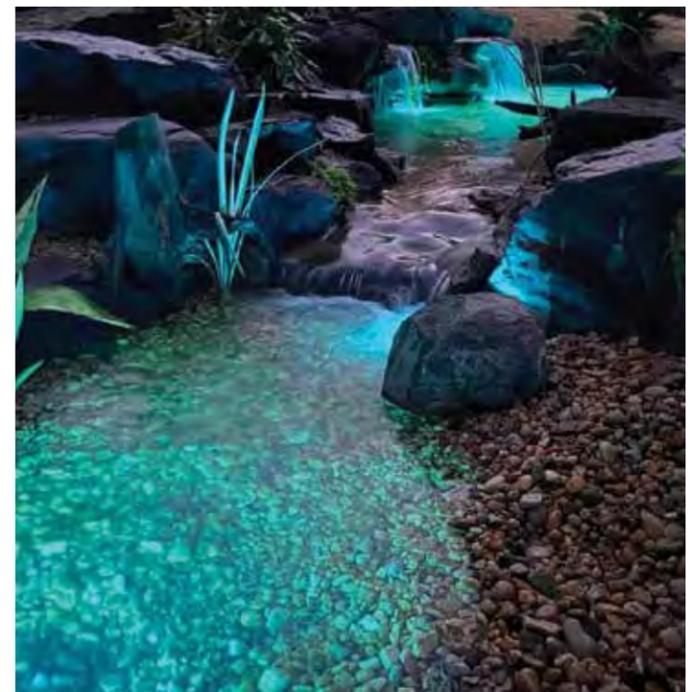
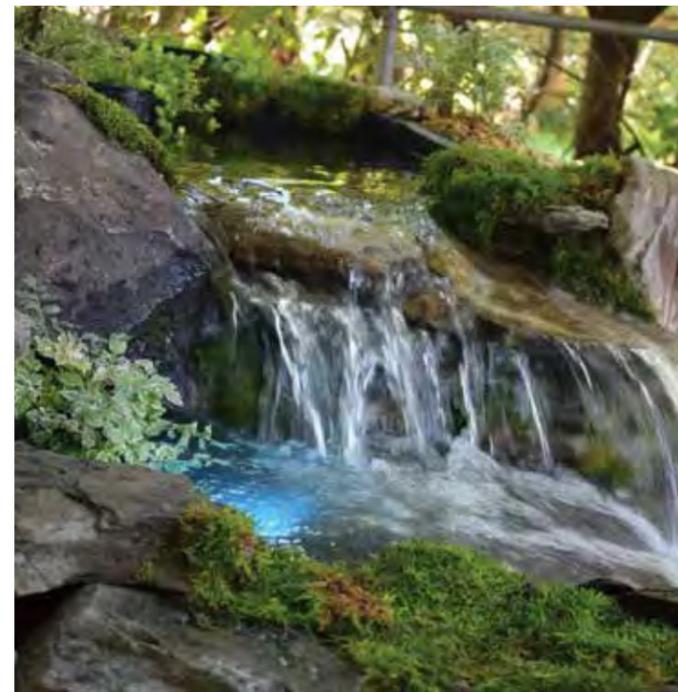


The Bell Bunch

Anthony (grandfather), Christopher (dad), Riley (son) and daughters Baylee and Lily Bell — a multi-generational pond family!



From mimicking nature to duplicating complex designs by my great friend and mentor, Jerry Romano, there is nothing left out when it comes to attention to detail.



The Bell family sets out to push the limits of their products and creative abilities, paying particular attention to both nature and the work of their industry colleagues.

was easily one of the scariest moments of my life.

A Wake-up Call

One of the items on my huge bucket list from when I started my company three years back was to work side-by-side with both my dad and my son Riley as a three-generation pond-building team. Riley had already begun getting his feet wet at the age of 15, spending his summers helping with everything from cleanouts to a few small builds. With my dad's extensive background in construction and project management, I knew that this would not be some ragtag team of undesirables. We were a three-generation family of quality pond builders — certainly not the first team to span multiple generations, but definitely a little outside the norm, especially in the United States.

But the moment I saw my dad fall, my bucket list was the last thing on my mind. I just wanted him to be OK. I still wanted to share my love and knowledge of the pond world with my dad and have the opportunity to work with him on projects, but at that moment, none of that mattered.

Thankfully, in the weeks that followed, although my father had some difficulty

recovering, he took it like a champ. He would lose some mobility in his hand and to this day lives with pain in his shoulder, but otherwise he's OK.

After years of dreaming and planning, the Bells were breaking ground on our first project together — a beautiful new koi pond off an existing deck with natural stone bridges, floating steppingstones, waterfalls and an all-new wetland concept I'd recently dreamed up.

After the move, the winter months arrived, but soon spring came, sending our country into a bit of chaos. Fortunately for us, business did not slow down. Riley was out of school, so he was available to step in and help out early in the year.

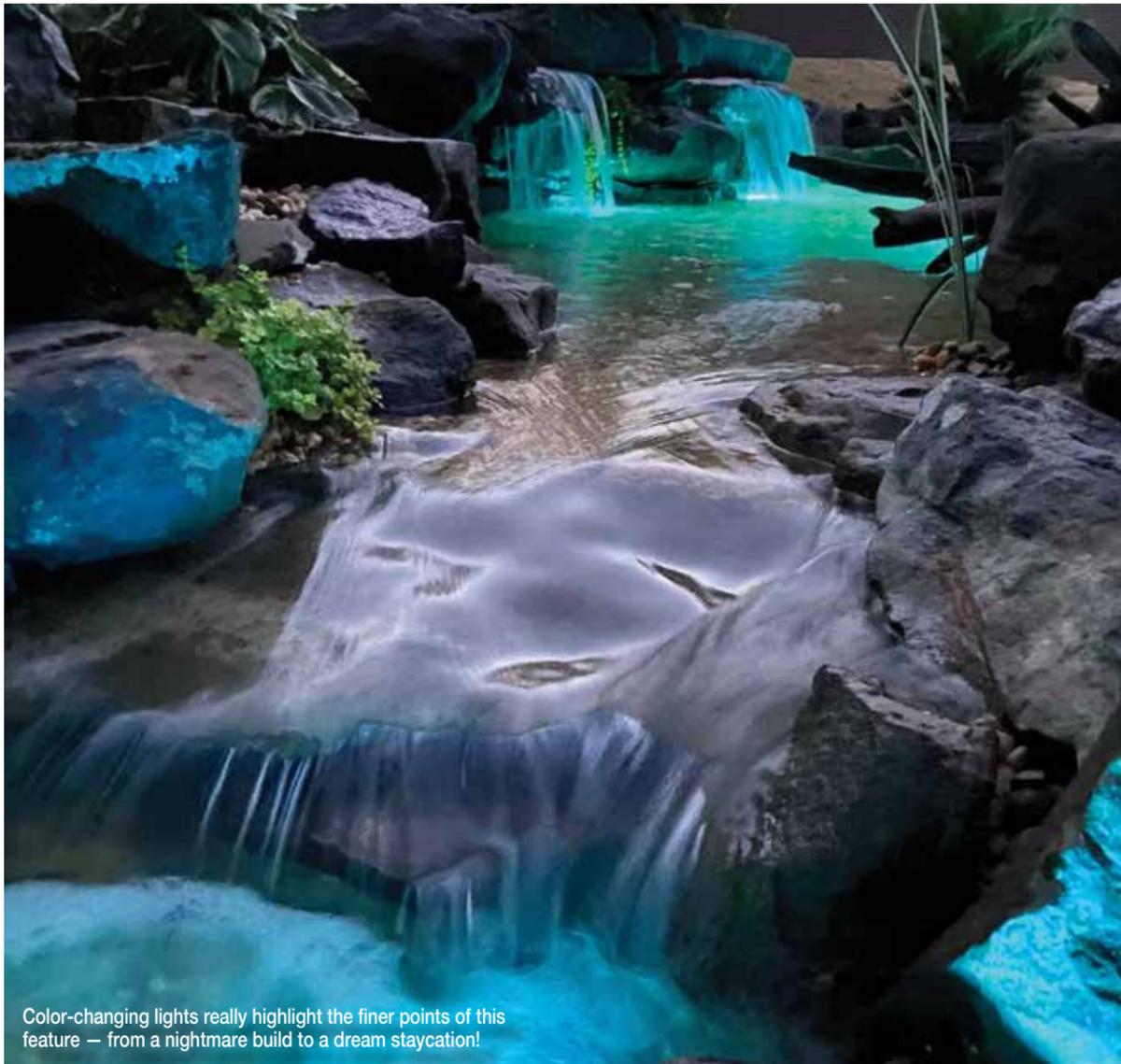
Building with the Bells

Finally! After years of dreaming and planning, the Bells were breaking ground on our first project together — a beautiful new koi pond off an existing deck with natural stone bridges, floating steppingstones, waterfalls and an all-new wetland concept I'd recently dreamed up. A multiple-level wetland filtration system with multiple-tiered falls created an incredibly natural look.

This was no easy project — probably not exactly ideal for what would be a first-time build for my dad, but I'm not one to run from a challenge. Thankfully,

we were not alone. I flew in my friend Jacob Ryan Deshone from Colorado, who was in the middle of his Atlantic Water Gardens certification testing. He needed some on-site training, and I was happy to provide the opportunity. Along with Jacob was my right-hand girl, Jamie McBride. I've never seen anyone learn anything as quickly as she can. She is a natural when it comes to our profession — I often just find myself in her way when it comes to stacking stone.

With a solid team, we were ready to execute this amazing (yet very difficult) design. Aside from very limited machine access and rain that caused nearly nine days of delays, we also had to contend with the



Color-changing lights really highlight the finer points of this feature — from a nightmare build to a dream staycation!

fact that the client's 30 prized koi — most over 20 years old — were quarantining in an above-ground swimming pool.

Time was a factor. Rain was a factor. Limited access and overall project difficulty combined to make a recipe for disaster. This was not your romanticized pond build with all great moments and perfect execution. We hit snags and setbacks daily. The wetland was a new concept and took longer than originally estimated. I made a rookie mistake in misjudging my overlap and ended up below water level. All eyes were on me, and it was not at an easy fix.

Overcoming Adversity

This was not the dream job I had hoped for. This was every pond builder's

We're doing some amazing work together! Three generations of my family already have two incredible builds under our belts as a team. If I said I haven't shed a tear or two, I'd be lying.

worst nightmares all on one project. Some say it builds character, and I have to agree.

In the end, the mistakes were corrected, and the client was ecstatic about the end product. If I didn't have my son and dad with me, it would have been so much worse. The team I built came together and overcame all the issues, creating a truly

beautiful new home for our clients' koi.

This experience prepared us for the next install, which would end up being the most challenging project I've ever attempted. Why not, right? I had a great supporting cast around me and the talent I needed to take on any build. Long story short, we found new ways to make mistakes, but in the end, we created a beautiful outdoor oasis for some long-time clients and friends. In fact, they have already booked Team Bell next spring for some additions.

We're doing some amazing work together! Three generations of my family already have two incredible builds under our belts as a team. If I said I haven't shed a tear or two, I'd be lying.

For me, building ponds has never been about money — it's about a lifestyle. (Money is just a consequence of operating a good business.) Having the ability to look over and see my father and my son laughing and working together on plumbing connections while I'm navigating through boulder placement is a dream come true.

My father is retired and does this out of pure joy in the oppor-

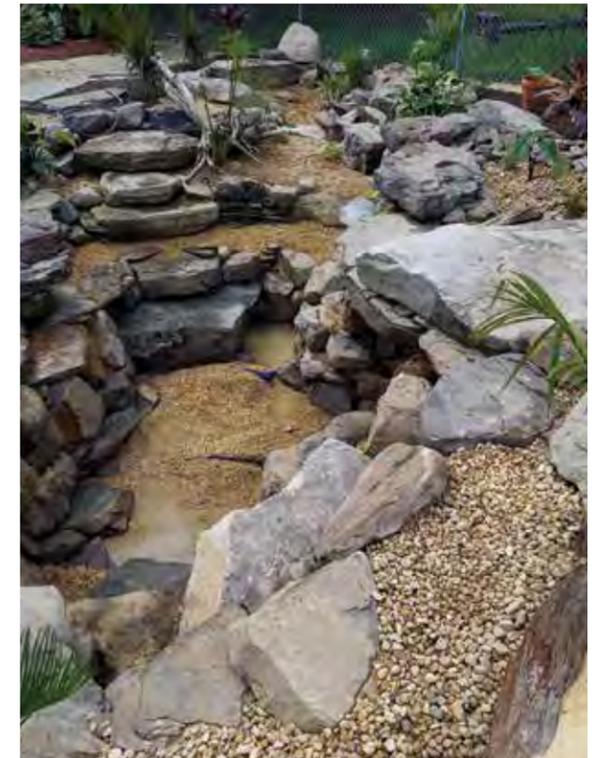
tunity. My son has plans for better things (using his brain and not his back). For now, though, at least for a moment in time, I get to make memories doing what I love with those whom I love the most.

But not to worry — I also have two daughters, and one just may take over the family business one day... until then, the Bell family will keep enjoying the moment and living our best pond life. ☺



About the Author

Christopher Bell is an award-winning water feature and natural stone wall artisan. He is the owner and operator of Bell Ponds, Plants and Patios, with more than 25 years in the field. He loves that after so many years, there is still always so much to learn. His philosophy is that with unity comes strength, and through that belief, he consistently seeks the wisdom of the best in the field. "Our passion fuels us, as artisans in our field, to not only showcase our talents, but also to leave a positive mark on this world, providing a greater return on our clients' most valued investment — their time."



Having worked in masonry for 20 years, Christopher has now been building ponds for about four years. Clearly, his passion lies in crafting intricate, multifaceted stonework.

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Up-Close and Personal

An intimate examination of a water feature

by **Jamie Beyer,**
Midwest
Waterscapes

Water gardening and the entire experience of having one can become a passion, if not an obsession. It can consume a person's thinking to the point that some non-water gardeners might question the person's sanity. (To be clear, we who have this passion would never question it!) So, what makes the hobby so pleasurable? For some, it might be the sight and sound of the water. For others, it could be the excitement of watching and interacting with the fish. Then there is the lush beauty of the aquatic plants that is so inviting. Although for most it is a combination of all these factors, there is yet another component of the hobby that a lot of people may not think of. I call it the "up-close-and-personal" aspect of the experience. Let me explain.

Site Selection

Let's say you have a water garden that is a fair distance from your home, where you can barely



Bullfrogs will eat any critter that they can fit in their mouths. If you pay close attention, you will find them eating birds that came a little too close.

see it, let alone hear it. To enjoy it, you must specifically make a special trip to see it. Even though it is technically designed as a garden destination, just how often would you do this? Every day?

Maybe so, right after installation, an upgrade or the addition of some new fish. But I can guarantee that in the long run, this trip will not happen as often. If you are going to invest time and money in something like a water garden, you might as well enable yourself to enjoy it every day.

So, positioning a water garden or feature is so critical during the design phase. Ideally, they all would be what I call up-close and personal — located in or right next to an outdoor living area like a deck or a patio, areas that you probably occupy on a daily basis anyway.

One could make the argument that if you placed a water feature in an area away from where you normally frequented, it might draw you to that location more often. Yes, maybe initially, but as time goes by, distant things tend to get less attention. Sure, you can always create an outdoor living area out in the back 40, like



What an experience for our kids to be able to watch fish from such a close distance! Remember that it can be dangerous for children to do so unsupervised.



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I like to get right down to the water surface with my face and turn a stone over to observe what might be hiding under it.

a sitting bench in a gazebo. But again, if you must make the journey to get there, it will not happen as often as time goes on.

The smaller the water feature, the closer it should be to where you always walk or enjoy the outdoors. This seems like a relatively simple concept, but it gets ignored way too often, in my view. For example, a tub water garden is best placed next to an entry door or next to a lounge chair on a deck.

Aquatic Ecosystem

As a lot of you may know from my previous writings, I like writing about critters and what goes on in the water on a scale that a lot of people may not think is interesting. I like to get right down to the water surface with my face and turn a stone over to observe what might be hiding under it. Some critters are easy to catch, and others are not so easy unless you are prepared with a net or jar. Of course, some critters attach to the rock itself, and those are the easiest to capture and observe. This is the experience water gardeners can totally miss, even with years of keeping a water garden.

And if this is fun for us adults, how about the kids who might witness a newly hatched baby fish? How about observing a blood worm in its casting and lightly scratching it off to see the actual bright-red worm? If a fish is close by, they will immediately eat it if given a chance.

This is the web of life on a small scale. How fun is that?

Go Micro!

The idea is to experience water gardening on a microscopic scale. Buy, beg for or borrow a dissecting scope or a microscope. You will open a whole new world of critter life that is absolutely amazing to discover and observe.

What kinds of critters might you see? The majority of them will be invertebrates, or animals without backbones — worms, insects in immature stages and protozoa of all kinds, for example. Remember the amoebas, euglenas and planaria you were taught about in high school biology class? If a healthy ecosystem exists, you should be able to find them in



Training koi to be handfed (top) is truly a fun experience. It does take time to train them, but when you succeed, it's hard to get much more personal than that. Getting this close to a bullfrog (middle) sometimes can be hard without them jumping off and scampering away, but patience and a good camera lens will allow you to get a good photo. These tiny baby toads (bottom) that have just metamorphosed from tadpoles are looking for very small prey to eat, like small flies and aphids.

unbelievable numbers.

If you do find invertebrates in your water garden, that usually indicates that you have a healthy ecosystem. Of course, the water garden must be up and running for at least a year before you will find very many of them. If you don't see them, keep looking. If none at all turn up, you may have a problem. If you really get into it, you can search for certain invertebrates that are more sensitive to pollution. Finding any of them would indicate very pure-quality water.

With your face still at the water surface, observe the color of the water. Water that has a whitish cast to it can mean very low oxygen levels. This whiteness comes from microscopic dead critters that have



Observing baby calico shubunkin goldfish that have just hatched from the green spawning mop is truly an amazing sight. You do have to have the right lighting and background (and the ability to get close to the water) to see this. You may remember the first time you saw even just one baby goldfish in a pond.

died from low levels of O₂. These guys tend to die before the fish do, so act quickly to provide more circulation.

Water that has a darker color to it could mean several

things. The most likely cause would be tannins from decomposing leaves. Some leaves have more tannins than others. A small quantity of tannins is OK and natural for

the ecosystem. A lot of tannins means the water has higher levels of dissolved organic matter in it. A lot of foam on the surface also indicates a high dissolved organic load. Dissolved organic matter can rob your ecosystem of oxygen if given the right conditions. When the organic load gets this high, it needs to be reduced by water changes or what they call a "foam fractionator." Plant filters will remove tannins and organics as well.

Stop & Smell the Water

Finally, while you are that close to the water — smell it. It should smell of the earth, as I like to say, or similar to what you might experience

during a rainstorm or after the ground is tilled. However, if it smells like rotten eggs, that is normally hydrogen sulfide gas, which comes from anaerobic microbial action (without oxygen). This gas is toxic to life. When this smell is discovered, provide more aeration immediately to supply the oxygen necessary to eliminate anaerobic conditions.

In summary, by locating a water garden close to outdoor living areas, you bring it up-close and personal, allowing you to experience the sights and sounds of water more easily on daily basis. You can even get closer and more personal by observing nature on a small scale, something that you might have never even thought about until now.

During these days of social distancing, you can still be up-close and personal — to a water garden! This is a healthy habit for you and your water garden, since your immersive investigative work may reveal potential problems with the feature. Above all, it is a real joy, and that is what water gardening is all about. ☺

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About the Author

Jamie Beyer

Water gardening has been a passion of Jamie's for more than 50 years, and he has worked on more than 1,000 ponds. He personally has several



very large ponds, which contain many kinds of water plants and fish. Jamie has a master's degree in Fish and Wildlife Biology, is a Lifetime Master Gardener and is founder and past president of the Central Iowa Water Garden Association. He has a broad background in fisheries, the dynamics of water, horticulture and wildlife ecology.

He owns a consulting and installation business, Midwest Waterscapes, where he works as a water garden, fountain and pond consultant and installer.



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Knights of the Pond Table

Controlling pond bacteria with chelated copper

Chelated Copper

by Patrick Simmsgeiger,
Diversified Waterscapes Inc.

Arthur Pendragon, the mythical Breton King, meets the Lady in the Lake, who imparts to him the legendary sword Excalibur. It is with this authority that the chaos of the isles is eventually subdued. Arthur is taken to Avalon to either die of his wounds or be healed to return as the first and true King of England. In addition to fighting against vast forces, Arthurian knights also quested for the Holy Grail, which was finally realized by Galahad.

So, what does any of this have to do with your water?

Even before the Bronze Age gave way to iron, Celts threw many bronzed items into their lakes and rivers. (Bronze is mostly copper with some tin.) Just like throwing salt over your shoulder for good luck, these ancient traditions had good results in combatting germs and algae. Druids like Merlin may or may not have suspected the presence of microorganisms, but the folk believed copper pleased the gods, so they continued to sacrifice these precious items over the centuries.

Technology marched forward, from stone to bronze, and then from iron to steel. Progress was our Lady, handing us new tools and choices that challenge tradi-

tion. Chelated copper is a prime example of this.

Choose Wisely

The Holy Grail represents any idyllic goal you know is worth pursuing, despite the struggle of an already-full schedule. In order to achieve it, you have to make sure you use a controllable and efficient weapon on your quest. Nowadays, we know that copper products can be used to control a body of water's eternal opposition — algae and cyanobacteria. To kill 100% is impossible, so we infuse the water with trace elements of copper until they retreat like Mordred's soldiers.

Many aquatic environments are rich in limestone, chalk or gypsum, and copper molecules attract these minerals like a magnet. The resulting compound is a heavy copper-carbonate (Cu_2CO_3), which precipitates out of the water column and collects at the bottom. This chemical bonding quickly diminishes the amount of copper in the water column. Historically, applicators answered this copper exhaustion by putting more into the water until the intended level of control was reached. This is like throwing more knights at a quest until one finally succeeds. It is nice to win — but at what



This lake is an example of where ancient bronze items may be found. The copper in these items may have helped resist harmful algal blooms that often result from excess nutrient loading. While the plant overgrowth and clogging of the waterway might have been viewed as acceptable 2,200 years ago, today we have downward-viewing radar and improved chemistry to examine and address potential issues in all bodies of water.

ultimate cost to the kingdom?

Copper Bonding

Chelated copper products present an advantage in this ability to control, compared to solid copper-sulfates. A further step exists in a double-chelated copper molecule, which is our modern-day Excalibur.

Unchelated copper crystals (2+) can be toxic to many types of aquatic life at higher doses. This blunt weapon also

combines with free hydrogen to form sulfuric acid (H_2SO_4), which is highly corrosive and smells like rotten eggs. Also, the application of a solid into water requires the crystal to dissolve, which may not occur before reaching the bottom. But tradition is difficult to overcome, as Arthur discovered too late in his dealings with Mordred. Many applicators will never move beyond the feel of solid copper hitting water.

Chelated copper solutions do not

combine as easily with the aqueous minerals, because a portion of their ions (1+) are already bonded. These liquid algacides deliver more control by remaining suspended within the water column longer. A lower weight of copper is needed for the same outcome, compared to over-dosing with the crystal form. The fortunate side effect is less precipitate at the bottom that will need to be removed when toxicity is too high. Limnology science is discovering



To an expert's eye, this lake (left) has been manicured to reduce pressure on the ecosystem, with no evidence of one microorganism dominating. To the yeoman's eye, this scene has an ambience commonly described as "natural," but even nature has to work hard to balance many factors to maintain an idyllic scene. Two modern knights (right) clean a man-made waterfall with enzymes and pressure wands. Merlin would be very curious of this process!



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that lake bottoms may account for the majority of their own annual nutrient-loading and toxicity issues. Anybody can swing a sword, but only a knight can fight for weeks before getting exhausted — that is, if they're attacking the right target.



Favoring a "Lab Coat of Arms," this modern water lord preps his steed for battle.

Modern-Day Excalibur

Double-chelated copper (0+) bonds most of the remaining ions. One might ask, "How is the algae affected if the ions are already bonded?" Algae do not swim away from threats; i.e., they are not mobile. The presence of diffusing copper interrupts the growth of microorganisms. There is a lower rate of copper exhaustion while realizing the same level of control with a double-chelated product — representing the best in our Grail Quest for solutions.

Applying double-chelated copper requires less labor and is safer to handle. The best copper products maintain potency in high-alkalinity waters and colder temperatures. When treating your water (or your Avalon), the choice is between a place devoid of growth and a place of rebirth.

The availability of a double-chelated copper product allows maximum power with the lowest toxicity. The algae will be kept to a healthy minimum, and sediment cleaning can be extended long into the future.

Overall, lower toxic concentra-

tions are better over the long term ecologically. Less copper in the water is less toxic for fish, which is especially important for trout. Arthur's England had no trout, but they certainly had herring and hedges! This finer focus of copper allows for precision control toward the potable water limit of 1.0 ppm, according to the Environmental Protection Agency, Lead and Copper Rule, 1991.

Quest for the Grail

If Arthur represents the reach for civilization and modernity, then his many-named wife Guinevere represents nature. With strong Christian themes of Adam and Eve, these two figures lean on and pull against each other. Arthur embodies the burden of control, while his mercurial partner is passionate and sometimes described as a traitor or villain. We still love and fear the power of nature, trying to control her while lamenting her worst outbreaks of power and passion. This is our collective Quest for the Grail.

Remember that while Lancelot may have been the strongest warrior in the land, it was his son Galahad who was the ideal Knight of the Grail. His success ultimately unified the Bretons and the Welsh. This is another lesson we should all take to heart. ☞

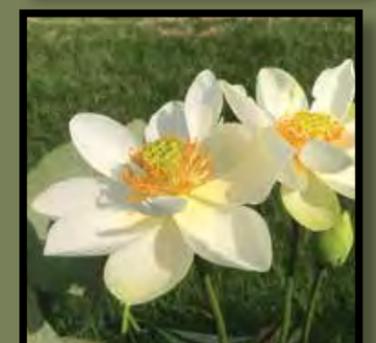
About the Author

Patrick Simmsgeiger is the president of Diversified Waterscapes Inc. (DWI), a certified lake management company and manufacturer of aquatic products for 35 years and counting. A vital supplier for the industry, DWI is maintaining service to its clients during the COVID-19 pandemic with modified work practices and procedures.



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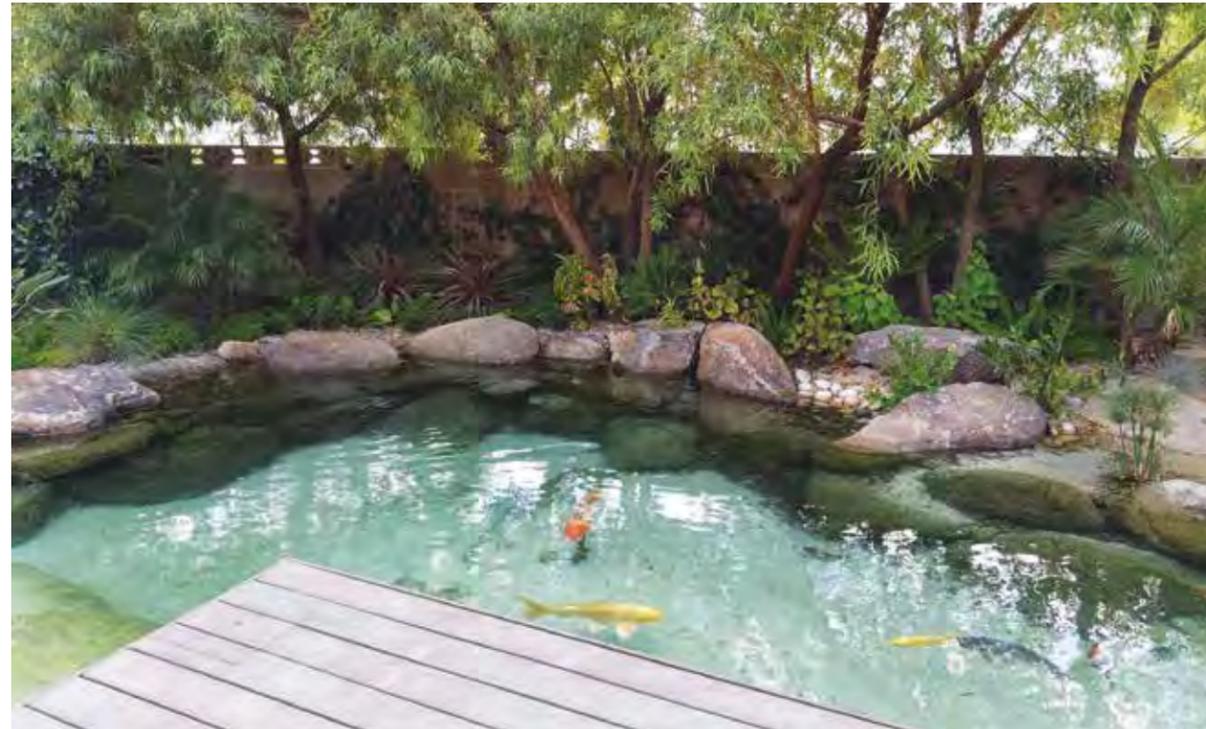
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Life's a **Beach**

Building a sustainable, tropical sand-bottom oasis



Several months after our first sand-bottom pond was completed (top), the native landscaping filled in, and the water was looking great. Larry Carnes and Hector Mardueño (bottom left) examine one of their boulder specimens and discuss the best spot for it in the pond. Clients have fallen in love with the concept of having a private oasis in their own backyard (bottom right).

by Larry Carnes,
Reflections Water Gardens

I was taught early on as a pond professional not to put sand on the bottom of a pond, and I've always just accepted it as best practice in the pond-construction industry.

After all, I have heard quite a few objections over the years. "Sand can't be brushed or vacuumed effectively, so it will be nearly impossible to keep it clean. That won't make your clients happy!" "Installing sand on the bottom of a pond or natural pool might create an environment where harmful microbes could dwell, and that may put your clients and their expensive koi fish at risk of contracting a waterborne illness!" "Any disturbance in the sand, whether it be a fish foraging for food, a strong current of water or a human footprint, would toss so much sand and debris into the water column that the pond would become cloudy. It would be very difficult, if not impossible to keep the water clear!" I could go on and on.

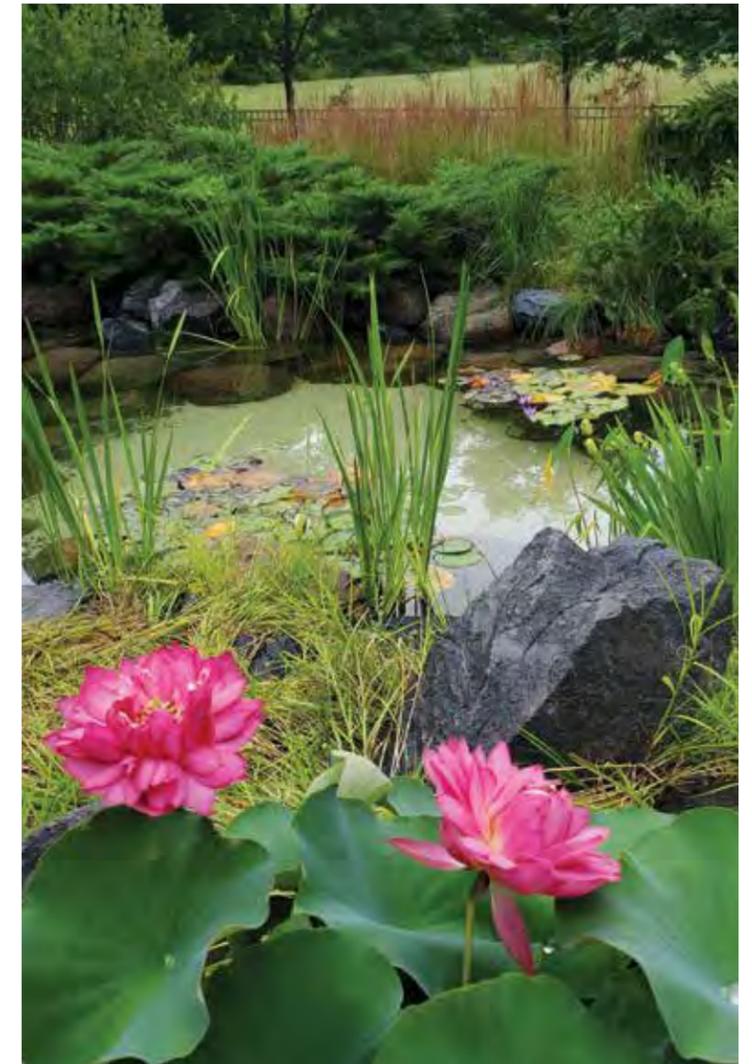
So, whenever I heard a client say, "I want my pond to look like a tropical oasis — a soft, sandy beach that we can wade and lounge in," I often found myself repeating all these objections and attempting to compromise. After all, as a professional designer and builder, I have a responsibility to find middle ground between my client's design goals and best practices for construction, right?

Seeking out a Tropical Oasis

For my company, Reflections Water Gardens, the client's creativity is an essential piece of the design process, so we never want to give them an outright "no." Our culture is to work closely with our clients so that we understand and embrace all their design goals, translating those concepts into their own perfect oasis of tranquility.

Figuring out how to realize the client's vision is part of the fun of being a designer, and it's that maxim that fuels my creativity as an artist. With this motivation always at the back of my mind, I told myself that the next time a client asked me about creating a pond with a sandy, tropical look, I would not see that as a problem, but as an opportunity to try something new and different, something bold that others had told me not to do, and something beautiful that my clients could proudly claim as their own perfect oasis.

Before long, sand-bottom ponds became the shiny thing in my peripheral vision that prevented me from thinking about anything else. I was far too excited to wait around for a client to ask me to build one, so while hunkering down at our home in Illinois during another cold Midwestern winter, I decided to be proactive and set out in search of others who were designing and building these tropical-



White sand (top) creates a beautiful backdrop for flowering aquatic plants. The sand was installed on the bottom of the pond and between the rocks (bottom). We washed it multiple times until the water ran clear and was free of fines.

looking water features. After many hours of internet research and browsing through Facebook groups and Instagram stories, I came across a Brazilian company called Genesis Ecosystems that offered ornamental ponds and lagoon-style, natural swimming pools with remarkably clean sandy bottoms, lush tropical landscaping and crystal-clear water. I kept this in mind for any future clients who might ask me to create an oasis in their backyard.

I contacted my friend and fellow pond builder Hector Mardueño at Stonewall Creek in Las Vegas and, with an enthusiastic tone in my voice, told him about the sand-bottom ponds I had seen by Genesis Ecosystems. Hector had also recently seen photos of sand-bottom ponds popping up on the internet, and it was clear that we were both very intrigued by the concept. We kept in touch throughout the winter and talked about how we thought they could be built. Was there some nuance in the way these sand-bottom ponds were being constructed in Brazil that simply

had not yet made its way to the United States? We were compelled to learn more.

Chance Reconnaissance

I started following the principal of Genesis Ecosystems, Ricardo Caporossi Júnior, on social media and became further inspired by his photos of sand-bottom ponds and natural-pool installations. One day in late summer 2019, he posted an Instagram story from a Bass Pro Shop in Chicago, so I reached out to him and invited him to my home in West Dundee, Illinois, to see the natural pool I had built nearly 10 years prior. We enjoyed a meal together while talking about different methods for pond construction and the challenges we've faced in the creation of natural-looking water features.

Ricardo revealed to me that the success of his company's sand-bottom ponds was based on a combination of biology, material selection and modern technology. It was at that point that I knew these techniques were transferrable to the United States. There was

no "secret sauce" — just a carefully crafted recipe that yielded the kind of high-quality results I had been searching for.

I'm no stranger to enhancing freshwater ecosystems with modern technology in order to replicate the conditions found in natural bodies of water. But the tropical look was one that still eluded me. Inspired by my conversation with Ricardo, I decided it was time to do a little experimenting of my own.

To the Desert!

I called Hector in Las Vegas and told him that I wanted to attempt to build a sand-bottom pond. Hector had been toying with the idea of putting in a pond at his house, and since the Nevada desert seemed like a perfect testing site for our new tropical-oasis concept, he volunteered his backyard as our laboratory.

We were both excited by the opportunity. We agreed that I would provide the labor to build the pond and the aesthetic design for the surrounding landscape, and

he would provide all the equipment and materials that we needed for construction. In February 2020, I flew down to Las Vegas along with two of my best crew to join forces with Hector and start building the pond. When we arrived, the excavation had already begun. As soon as I saw the footprint of the pond, I knew that we were going to need to bring in some large boulders to make it look as natural and as tropical as possible. After fine-tuning the edges and shaping the shelves where the rocks would be placed, we went hunting for the perfect boulders, landscape plants and other elements that would adorn our oasis.

I knew from my talks with Ricardo that the quality of sand was a very important piece of the puzzle. Regular beach sand simply wouldn't allow the system to work properly. We had to use a special kind of silica sand, and it would have to be very clean and dense enough to fall out of suspension quickly — not so fine that it would prevent water from flowing through it, but not so coarse that it would harbor sediment and detritus.

We went to multiple stone yards and landscape suppliers in the surrounding area trying to find just the right stuff, testing a small sample of each type of sand in a bottle of water to make sure it had the properties we were looking for. We found a type that came really close to matching Ricardo's description, and after doing our calculations, we ordered enough of it to cover the bottom of the pond and the shelves.

Filtration

With the fabric underlayment and liner already installed, it was time to truck in more than 33 tons of boulders to create our rocky, tropical oasis. Access to the site was good, and we were able to crane our boulders right off the back of the truck. After getting them all lined up so we could see what we had to work with, I put on my artist's cap and got to work placing boulders. Hector put on his engineer's cap and figured out a way to distribute water evenly throughout the sand.

Another important lesson I learned from Ricardo is that sand-bottom ponds

should flow water upward through the sand in order to help keep it clean and prevent dead spots where bacteria could thrive. The concept of an under-gravel filter was nothing new to us, but to do it with sand seemed counterintuitive and presented a new challenge. Hector

be growing on the pond bottom, and the sweeping motion of their tails would help toss debris into suspension and ultimately into the skimmers. Along with the continuous flow of water upward through the sand, this combination of biology and technology would effectively keep the



Boulders were hauled into the pond by crane and placed right off the back of the truck. More than 33 tons of stone were needed to complete the oasis.

developed a solution that incorporated multiple discharge points under the sand to flow water evenly throughout the entire pond bottom. We also learned that fish would play an important role in this new, sand-bottom pond ecosystem. If we got fish that were large enough, they would constantly graze on any algae that might

sand looking clean and free of obstructions.

I advised Hector on the sizing of the plumbing and filtration systems. His crew finished the installation of the skimmers, pumps, plumbing, ozone system and filter while we finished the boulder placement and covered the bottom of the

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pond with sand. Although the sand came from the yard labeled as “washed,” we knew that it would need to be flushed multiple times to eliminate any lingering fine particles. We filled the pond slowly with water, stirred up the sand, pumped it down, filled it up again and repeated that process several times until the water ran clear.

Once the sand was thoroughly washed, we filled up the pond one last time, and all the underwater stonework was revealed. I was fascinated by the way the sand had found its way into the smallest of gaps between boulders, creating a spectacular visual contrast between the dark-colored walls and the light-colored bottom of the pond. It reminded me of a pool at the bottom of a tropical waterfall. As an artist and designer, it was truly a delight to see how perfectly all the project elements were blending together.

The entire process from excavation to landscaping took us roughly two weeks to complete.



Larry Carnes (center) with Ricardo Caporossi Júnior of Genesis Ecosystems and his wife, Daniela.

Interest Ignites!

After designing and installing the native landscaping behind the pond, it was time to say goodbye to Hector and leave him to do the initial startup of the pond. We checked in with each other from time to time over the next few months, and Hector reported that everything was running well, and the pond was looking great. He told me that he had recently completed another

sand-bottom display pond at his retail shop using similar techniques, and the concept was receiving a lot of praise and attention. It wasn't long before Hector told me that he had multiple sand-bottom ponds on the drawing board for new clients.

Later that summer I returned to Las Vegas to see our oasis and take some photos, and I was impressed by how well it was performing. The fish were healthy and happy. The water was clear and free of algae. Even the sand was clean except for a few leaves that had recently fallen from a tree overhanging the edge of the pond. Hector did note that there were some growing pains and lessons learned in the first few months of operation. (At one point when the ozone system went down, the water went a bit green.) But overall, the installation was a success and a beautiful showcase of our first tropical oasis pond with a sandy bottom.

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our oasis was, I was inspired to retrofit my own natural pool with a sand-bottom pond. My pool has evolved many times over the years as I've learned new techniques for filtering water, setting stones and constructing wetland areas. Some of these methods I've developed on my own as a result of making mistakes or recognizing ways to build things more efficiently, but it was my collaboration with Hector on our first oasis that gave me the confidence, know-how and motivation to attempt one on my own.

It couldn't have been easier. My local crew and I completed it in less than a day. I found a local source for sand that passed my "shake-it-up-in-a-water-bottle test" with flying colors. We repurposed an old 2-inch return line to feed water to the shallow lounging area of the pool, which was to become a new sandy beach.

This shallow lounging area has become a favorite spot for my German Shepherds. They love to sun themselves on the rocks, splash about in the water, chase dragonflies through the aquatic planting beds and, frankly, make a mess of everything. I knew one of the challenges I'd face after installing a sand-bottom in the dogs' favorite play area would be figuring out how to prevent the sand from migrating from

the shallow lounging area down to the gravel-covered suction grid at the deep end of the pool. I didn't want the sand to erode down the slope of the pool or clog up my under-gravel filter, so we took extra care to use a graduated selection of boulders, cobbles and pebbles to seal up any voids. This also created a natural transition from the boulders to the sand.

It turned out great, and I couldn't be happier with the way it has performed. The water in the pool is as clear as it's ever been. I have an evenly distributed flow of water through the beach with no visible channeling, and the sand has stayed sparkling clean and white throughout the entire season.

I'm thankful for the inspiration and insight provided by Ricardo at Genesis Ecosystems and the lessons learned through collaborating with Hector through the design and construction of our first sand-bottom pond. My company now proudly offers oasis-inspired, sand-bottom ponds and natural pools to our clients across the country.

In the wake of the pandemic, when protecting the health and safety of our families and communities has become so vitally important, when congregating at beaches and other outdoor public spaces has become increasingly difficult, when travel

options to exotic destinations have become so narrowly limited, and when more people than ever are staying home, taking a tropical vacation in your own backyard just got a little bit more attainable. ☞

About the Author

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.





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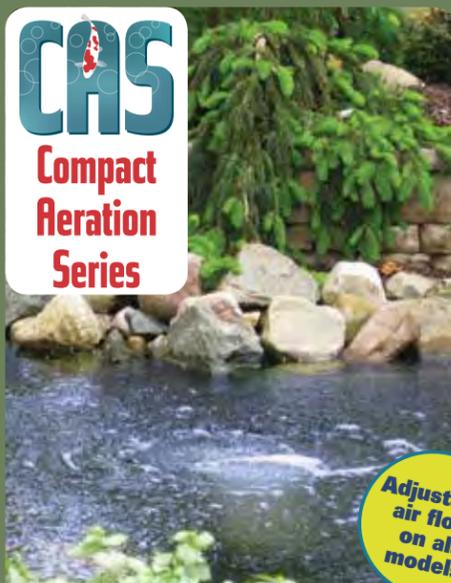
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Louisiana Iris 'Mystery Blue' is an enchanting late-spring / early-summer flower with blooms much larger than the native blue flag iris.



The beautiful pink Sino-American Lotus (left) is more than showstopping, with flowers often larger than a person's head. Another Louisiana Iris you must see to believe is called 'Handmaiden' (right), with large, pink flowers each as large as an adult's hands.

by **Zac DeGarmeaux,**
Pond Megastore

So, you've just created and built an amazing showcase pond, complete with the best waterfalls and master stonework. Why would you just throw in some random green plants when you could integrate some standout plants and flowers that other installers often overlook?

Your water garden will have everyone talking! I find it amazing that some installers can go decades without seeking information about new and better varieties of plants that can bring the pond to life every day!

Lotus

The lotus is not generally known to bloom daily, but there are improved varieties out there that can bloom from mid-June into September!

Sino-American Excellence Lotus is stunning and statuesque, growing up to 4 feet tall with huge, beautiful pink flowers that can grow 8 – 12 inches across. These large, graceful blooms have first-day flowers with shades of rich pink. The flower progresses each day to a lighter pink and then to almost white, with just a whisper of pink in the petal. This lotus does extremely well when grown in a wide container but grows majestically and to its full potential when grown directly in the soil of a natural-bottom pond. Beautiful, dark-green foliage complements this elegant lotus variety. It can make a beautiful backdrop or a spectacular focal point in your water feature.

The Sino-American Excellence Lotus symbolizes the collaborative works and benevolence among lotus lovers in China and America, a gift from Dr. Daike Tian. Dr. Tian has been known to introduce cultivars with improved blooming qualities.

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Lady Bug Lotus is a very small lotus that may be grown as an Excellence of Bowl Lotus or a Micro-Mini Lotus. Lady Bug Lotus is a remarkable bloomer that blooms all season long, often with multiple flowers from our friend and hybridizer Laura Bancroft of Ten Mile Creek Nursery. It is classified as a red lotus, but the single-petal flowers are drenched in intense pink. The blooms are numerous and nonstop once established! Sunny-yellow receptacles and anthers add a splash of sunshine to this sweet, petite lotus variety. The emerald-green foliage adds a nice contrast to the pretty pink blooms. This dainty little lotus is as easy to grow as a tall lotus and adds a whimsical delight to any sunny corner of your garden!

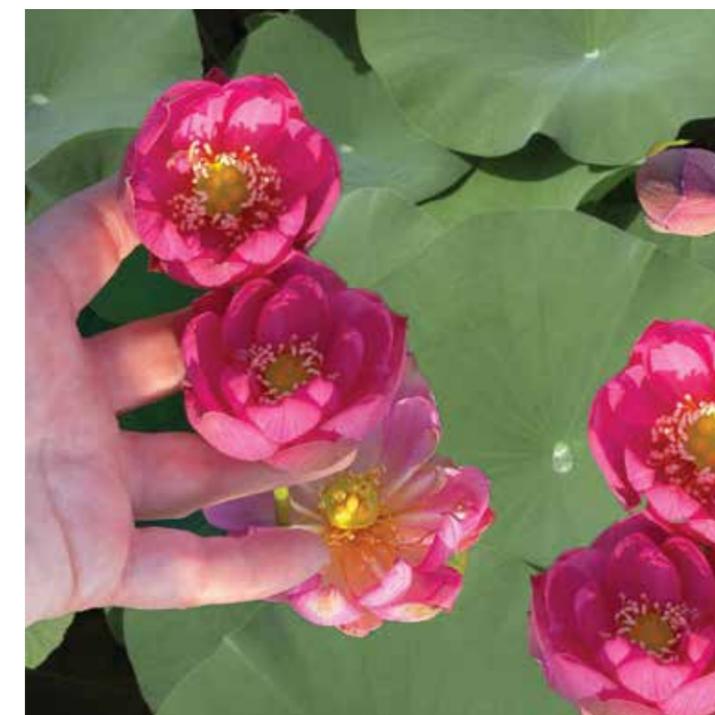
Iris

The following iris are not the common, small, insignificant blue-flag varieties you tend to see in every pond. These amazing iris will add a new dimension to your springtime or early-summer garden.

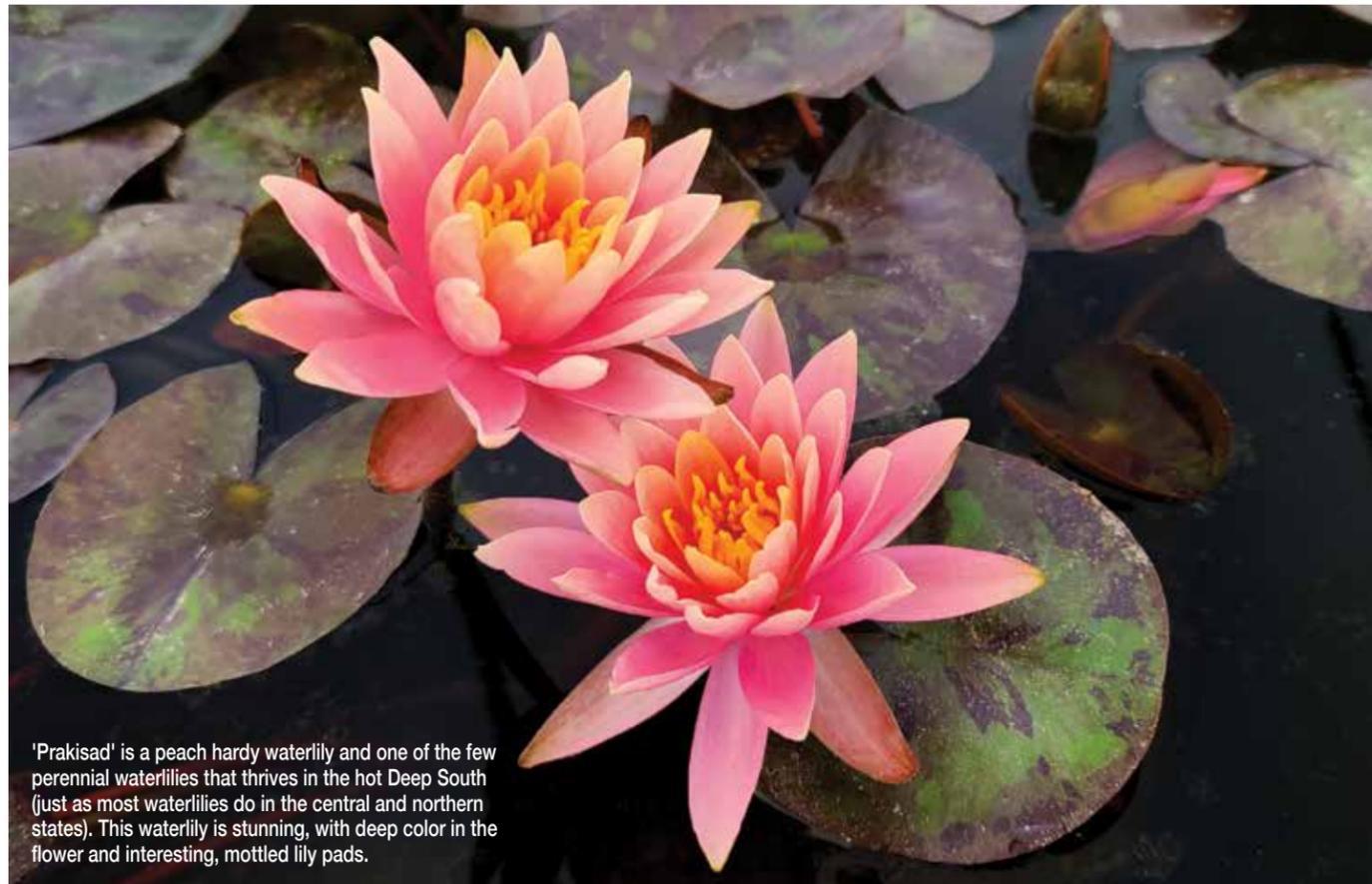
The irresistible Louisiana Iris always adds an elegant element to a water garden, bog or terrestrial garden. They thrive in zones 6 to 11 and are just what you need to perk up your spring water garden or terrestrial garden.

Handmaiden Louisiana Iris are simply divine, with blooms in breathtaking shades of lavender-pink. They are adorned with delicate veining and sunny-yellow signals. The flowers on the Handmaiden Iris are as large as a man's hand! This amazing iris has star power with its large-sized blooms and fabulous color, which are complemented by handsome, green, sword-like foliage. The Handmaiden Iris grows up to 30 inches tall and makes a splendid addition to your water garden or an area with moist soil in your terrestrial garden. In three years, you should have a 3-foot-wide clump of iris that is ready to divide.

Splitter Splatter Iris is the perfect name for this whimsical, moisture-loving iris, which has delightful, pale-yellow blooms with random purple and



Louisiana Iris 'Splitter Splatter' (top) is so unique! The color combination will have your friends asking you all about this amazing flower. Plantsman Matt Vande Vegte (above, left) shows us a wonderful collection of his exquisite bowl lotus blooming en masse when properly planted. Heavy-blooming lotus varieties like 'Lady Bug', 'Chu Chu' and 'Sparks' (above, right) will bloom from late June through the end of summer.



'Prakisd' is a peach hardy waterlily and one of the few perennial waterlilies that thrives in the hot Deep South (just as most waterlilies do in the central and northern states). This waterlily is stunning, with deep color in the flower and interesting, mottled lily pads.



Wood's Blue Goddess is an overachieving blue waterlily — not a new variety, but an underutilized, large-flowering showstopper.

yellow blotching along with bleeding, beet-root purple color spilling over the petals. Falls are adorned in shades of light yellow, and Splitter Splatter Iris is complemented with attractive, medium-green, sword-like foliage all summer long. Splitter Splatter Iris grows up to 30 inches tall in moist soil or shallow water.

Blue flag iris are inexpensive and commonly used in water gardens, but they are no match for the large, lovely, blue blooms of the Mystery Blue Iris! Mystery Blue Louisiana Iris are drenched in vivid Wedgewood blue and adorned with yellow-gold signals. We are unaware of the origin of this spectacular iris — hence its name. Mystery Blue Iris grows to just over 2 feet tall and is complemented by lovely green, sword-like foliage.

Waterlilies

We saved the best for last (in our opinion). Waterlilies are the regal jewels of the pond! Two of our favorite annual waterlilies are Teri Dunn and Woods Blue Goddess.

Teri Dunn Waterlily is one of the most dependable bloomers we sell. It is a divine variety with blooms growing to between 4 and 6 inches in dazzling shades of heavenly blue-purple. The green pads form a 4-to-6-foot spread on the water. As long as it is fertilized, the very fragrant Teri Dunn Waterlily will do well in a pond of any size.

In the case of large show ponds, a small waterlily just will not do! Choose Woods Blue Goddess, a magnificent waterlily with lavender-blue blooms that sit high above the water.

This lovely, fragrant waterlily needs lots of room in a large pond and must be planted in a large container. Dark stamens accent this waterlily flower beautifully. Flowers grow larger as the plant grows larger — pads and flowers can grow up to 11 inches across when



'Cuddlin Caroline' is a new red lotus from Ten Mile Creek Nursery that produces many large flowers through the summer with broad scarlet petals and amazing, bright-yellow centers.

properly fertilized! This waterlily is fragrant and adds an electric element to your pond.

Moving on to heavier bloomers, the Prakisd Waterlily is a new waterlily that does well in northern and southern climates — a rare trait among hardy waterlilies! Fans of Colorado Hardy Waterlily should become acquainted with this new variety, as its peach color is more intense, with delicious shades of peach, orange and coral

throughout the stellate blooms. These mouth-watering blooms are complemented by exotic, richly mottled pads that add an alluring element to your pond. The Prakisd Waterlily is medium in size but big on blooming; it blooms consistently throughout the summer months, adding beauty and grace, day after day.

Perry's Baby Red Waterlily has been around for quite a while but is simply delightful, with splendid red colors on the rosy-red blooms. This is a small waterlily with a spread over the water ranging between 20 – 30 inches. The emerald-green pads complement this gem nicely. Perry's Baby Red Waterlily is perfect for small ponds or container gardens. When grown in a container, this little red jewel will add a delightful dash of color to any sunny area on your porch or patio.

Just envision a pond on a warm summer day with lavender-blue Woods Blue Goddess Waterlilies and bright-peach Prakisd Waterlilies blooming amid mottled pads on the sparkling waters; tall lotus with very large pink blooms and beautiful green foliage; Perry's Baby Red Waterlilies in shallow water at the edge of the pond; and the handsome, green, sword-like foliage of the Louisiana Iris gently swaying in the breeze. Because when you've built a stellar pond, the surrounding water garden deserves no less than absolutely the best plants. ☘

About the Author

Zac deGarmeaux built his first water garden at the age of nine. Each summer, he would design water gardens for friends and neighbors and advise them on what waterlilies and plants to purchase. He has been growing water garden plants for more than 25 years. He is always on the lookout for new developments in the waterlily field, having spent the last few years traveling the world to learn more about them and meet with hybridizers and some of the world's foremost authorities on waterlilies and lotus. He is the owner of Pondmegastore.com and Wholesalewaterlilies.com and works as a wholesale and retail distributor of aquatic plants. He enjoys traveling with friends, photography, growing new varieties of waterlilies and helping to introduce new waterlilies, lotus and pond plants each year.



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Know Your Lingo!

How to professionally describe basic koi traits

by **Casey LeFever,**
Blue Ridge Koi & Goldfish

Nothing stands out in a pond quite like koi. Their bright colors and unique patterns are part of the reason why they are such a popular fish. Today, there are numerous breeds of koi, with each categorized by color, pattern and scales. Knowing the traits of koi varieties, along with the terms commonly used to describe their different characteristics, can be useful when helping clients and customers choose the best additions to their pond.

When examining the color of koi, the hue should be bold and even from head to tail. The edges where one color meets another should be sharp, distinct and free from overlap. It's generally preferable that the color pattern is free from "window," which occurs when a base color breaks through a larger area of secondary color.

It's also important to note that color will likely change or develop as the fish gets older. Any black areas tend to grow in size, depth and clarity over time. Reds don't typically get larger, but often the

Knowing the traits of koi varieties, along with the terms commonly used to describe their different characteristics, can be useful when helping clients and customers choose the best additions to their pond.

Color

Learning common terms for koi colors can help you better understand differences between varieties. Koi breeds display a variety of hues, ranging from a single, solid color to complex combinations of red, orange, yellow, black, silver and more. The names of most koi varieties come from the Japanese word used to describe their colors and features. For instance, *asagi* means light-blue or indigo, which refers to the blue-gray color seen in this variety of koi. Likewise, *ochiba shigure* translates to "autumn leaves on the water," which aptly describes the fall-like copper and gray colors found in this variety.

color will become richer or bolder. White coloring also sees improvement as koi grow and their skin matures, so a spot that initially looks yellow or cream will likely eventually transition to a cleaner, crisper white.

Scalation

The term *Wagoi* is used to describe a normal, full-scaled koi. However, this term is usually left out when describing koi breeds, because it is considered the default trait. Unless another type of scale is noted, it's typical to assume that the scalation is *Wagoi*.

Doitsu refers to koi that are scaleless or mostly scaleless. There are three main types of *Doitsu*



Asagi should have a clean, blemish-free head and uniform net pattern.



Doitsu koi (shown above and below) have smooth skin and very few to no scales.



Tancho marks should be centered on the head and as circular as possible.



Matsuba come in red, orange & yellow varieties.



Gin Rin koi have glittering, shiny scales that reflect light.

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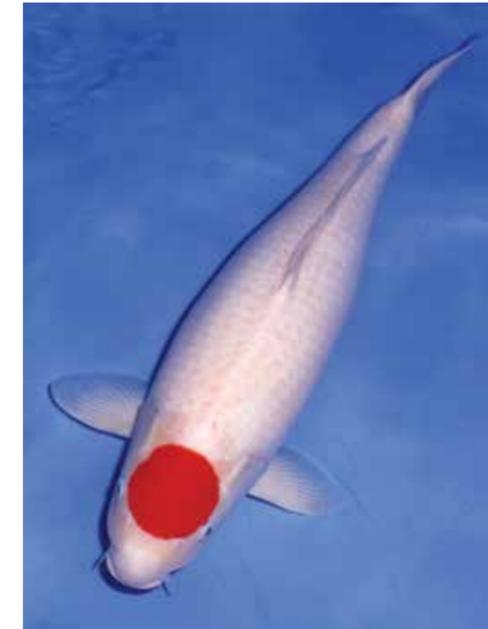
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Shiro Utsuri have a black base with bands of white wrapped around the body.



Tancho Kohaku have a red circle on the head and no other red anywhere else on the body.

Common Scale Types and Patterns Variations by Breed*

Breed	Wagoi	Doitsu	Gin Rin	Maruten	Tancho
Kohaku	✓	✓	✓	✓	✓
Sanke	✓	✓	✓	✓	✓
Showa	✓	✓	✓	✓	✓
Shiro Utsur	✓	✓	✓		
Hi Utsuri	✓	✓	✓		
Ki Utsuri	✓	✓			
Asagi	✓		✓		
Shusui		✓	✓		
Matsuba	✓	✓			
Platinum Ogon	✓	✓	✓		
Yamabuki Ogon	✓	✓	✓		
Kujaku	✓	✓	✓	✓	✓
Hariwake	✓	✓	✓		✓
Kikusui		✓			✓
Kumonryu		✓			
Beni Kumonryu		✓			
Chagoi	✓	✓	✓		
Soragoi	✓	✓	✓		
Ochiba Shigure	✓	✓	✓		
Goromo	✓			✓	✓
Goshiki	✓	✓	✓		✓
Kikokuryu		✓			
Kin Kikokuryu		✓			

*adapted from the Koi Variety Guide at www.blueridgekoi.com

patterns. Kawi Goi, also known as a leather pattern, refers to koi that are completely scaleless or have a single row of scales that runs down the back on both sides of the dorsal fins. Kagami Goi, also known as a mirror or striped pattern, is when koi have scales both on the dorsal and lateral line. Finally, Yoroï Goi means it is armor-scaled. This pattern is made up of varying-sized scales that are randomly distributed all over the body.

Both scaled and scaleless koi can be further distinguished by the type of scales present or absent. For instance, the term Gin Rin refers to a pattern of sparkly scales, and any koi that has at least three complete rows of these scales is considered Gin Rin. Note that Gin Rin koi are different from the Hikarimuji and Hikarimono classes, which encompass all metallic varieties. While Gin Rin refers to sparkly scales, Hikari koi are characterized by their metallic skin. It is possible, however, for koi in the Hikarimuji and Hikarimono classes to also be Gin Rin. Another example is Matsuba koi, which are part of the Hikarimui class and are characterized by black markings at the center of the scales, giving this variety a pattern that resembles a pine cone.

The edges of scales on Wagoi koi

Common Koi Coloration Terms

Term	Meaning
Aka	Red base
Beni	Dark red/orange-red
Hi	Red
Ki	Yellow
Gin	Metallic silver
Kin	Metallic gold
Orenji	Orange
Ogon	Solid metallic
Shiro	White
Sumi	Black markings
Muji	Solid, uniform

should be hardly noticeable. The scales should appear in uniform lines and not be uneven or distorted in shape. The metallic quality of Gin Rin scales should be bright and reflective.

In Doitsu koi, skin quality is extremely important. Skin should be bright, clean and blemish-free. Scale patterns in Kawi Goi should have no spacing or spacing that is even and symmetrical on both sides of the dorsal fin. The highest-quality Kagami Goi will have a uniform and unbroken scale pattern running from head to tail.

Patterning

Koi color patterns can be either continuous or in a step configuration. A pattern that has no breaks or separations from head to tail is considered continuous. If the pattern has one

or more separations that form several color patches, it is called a step pattern. If there are two patches, it's a two-step pattern. If there are three patches, it's a three-step pattern, and so on.

A single Hi (red) marking on the head is referred to as a Tancho, which is seen in Kohaku, Sanke and Showa varieties of koi. Another name for a Hi marking on the head is a Maruten. The difference between the two is that Maruten is accompanied by additional Hi markings on the body, while a Tancho is the only Hi marking on the entire fish. A Hi marking that appears around the mouth like lipstick is called Kuchibeni, meaning "red lips." A zigzag Hi pattern, like that seen in Kohaku, is referred to as Inazuma, which translates to "lightning strike."

The term Kiwa is used to

describe the line where two colors in a pattern meet. The two types of Kiwa patterns are Kamisori, or razor, and Maruzome, or scalloped. In some cases, both Kiwa patterns may be present on the same koi, which is then called a Konzai Kiwa.

The leading edge of pattern areas on a koi is called Sashi. Sashi is a colored scale that is overlaid by a white scale that is unfinished, which gives it a pink or grey blurring effect. The white scale will get thicker as the koi ages, and the color underneath will be obscured.

When it comes to color patterns on koi, the most important aspect is balance. Patterns that are evenly distributed are favored over patterns that are heavier on one area of the body. Kiwa should be crisp, with little to no overlap in color.

For Tancho koi, and especially show koi, the shape and placement of the Tancho is very important. Ideally, the spot should be between the eyes of the

koi and not reach farther than the shoulders or run down the nose. The rounder the mark, the better. Because a Tancho marking is not a breedable trait, it's fairly rare and extremely desirable among hobbyists.

The Sashi should ideally be no more than two scales. In young koi, the Sashi can give an indication of how strong and vibrant the color will be when the koi matures. However, it's important that the color found on the leading edge of the Sashi is as uniform as possible. An uneven color could mean that the edge will not be sharp if and when it develops.

Know Your Customer

Every koi keeper has different standards for what constitutes a quality koi, and certain traits might be more or less important to some enthusiasts than they are to others. If your customer or client plans on showing their koi, they may be pickier than someone who is just looking for a back-



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yard pet. Exact standards of quality can vary depending on the variety of koi and its distinct features.

For those customers stocking their first pond, they may be more drawn to traditional koi breeds, such as Kohaku or Sanke. These breeds, along with

Knowing the basics of coloration, scalation, and patterning will allow you to be better informed and ready to assist your customers and clients with selecting their next koi.

Showa, Utsuri, Asagi and Shusui, also tend to be popular choices for those customers wanting to show their koi. More adventurous koi hobbyists may be drawn to flashier koi, such as Doistu or Gin Rin variations.

It's not easy to keep up with the ins and outs of each class and variety of koi, especially with new ones continuing to pop up. But knowing the basics of coloration, scalation and patterning will allow you to be better informed and equip you to assist your customers as they mull over selecting their next koi. 

About the Author



Casey LeFever is co-owner of NextDayKoi.com and part of the third-generation future ownership of Blue Ridge Koi and Goldfish, the largest and longest-running koi farm in the United States. He was brought home from the hospital and weighed in a feeder goldfish bucket at just a few days old, and he has been around fish ever since.

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| **Plumbing** Primer |



Features like this fountain head require very specific water pressures and volumes to achieve the desired effect.

A Pump and Plumbing Primer

How to determine flow, friction and Total Dynamic Head

by **Demi Fortuna,**
Atlantic – OASE

When I was asked to revisit the subject of pump hydraulics, I was honored — and a little intimidated. I immediately wondered how I could make this article in some way more interesting than the mathematics involved.

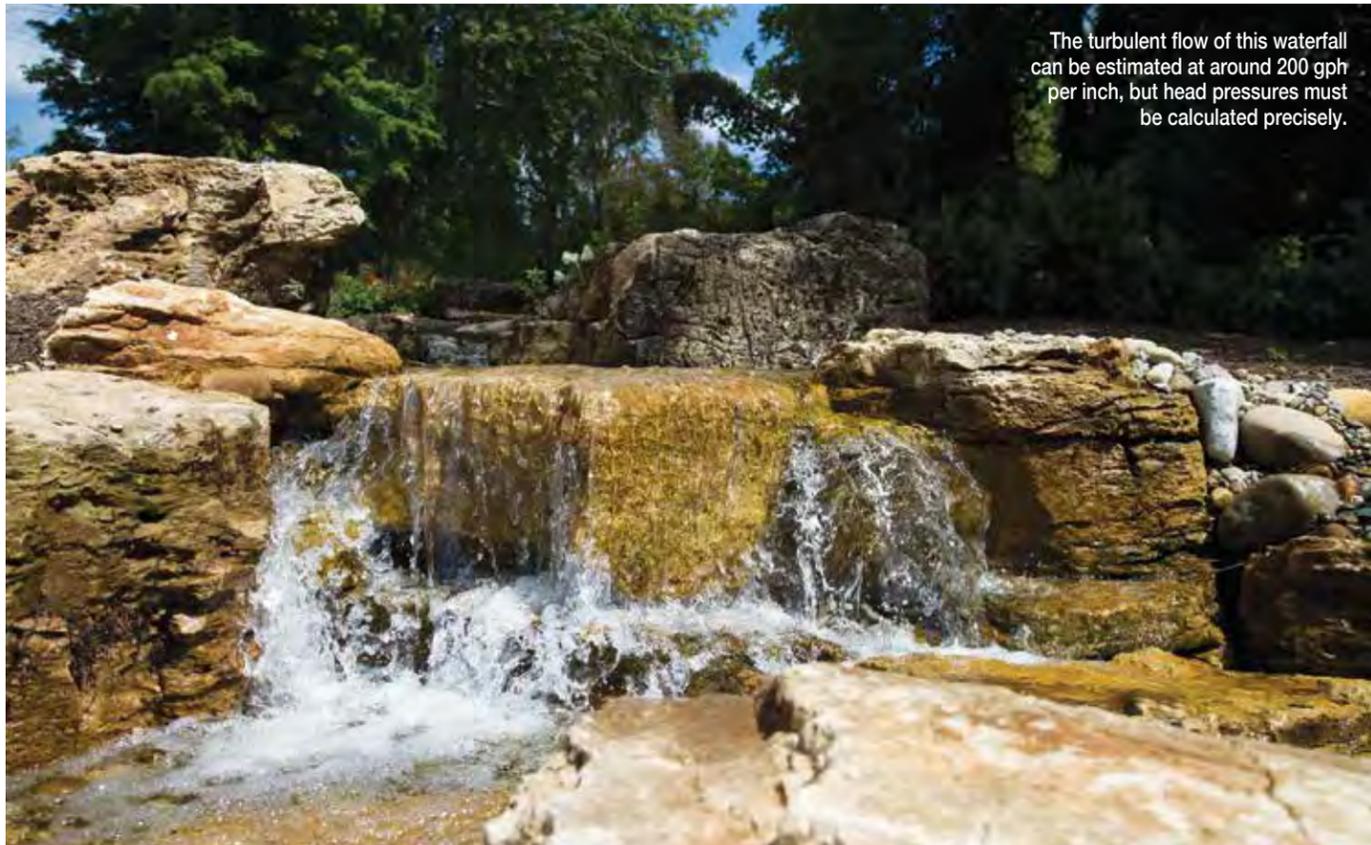
Let's face it — as important as knowing what Total Dynamic Head (TDH) is, how to calculate it and how much money it will save you, I still may be

the only person left who actually enjoys figuring it out. So, I wracked what brains yet remain after this challenging year to find a way to "Make Friction Fun Again."

I decided to start with a discussion of the different types of pumps to explain why head calculations are needed in the first place. Then I'd try to make the steps — determination of flow, plumbing diameter, friction loss and Total Dynamic Head — as digestible as possible through simple visualizations.

January/February 2021

POND Trade Magazine 49



The turbulent flow of this waterfall can be estimated at around 200 gph per inch, but head pressures must be calculated precisely.

Avoid Plumbing Pitfalls

The choice of pump and plumbing for any feature is often the most challenging decision a designer or contractor has to make. The wrong size or type of pump can turn a successful feature into a maintenance nightmare or an unaffordable money pit. The right plumbing is equally important. The wrong pipe diameter or poor fitting choices will destroy a powerful, well built, expensive pump in months, or even weeks. In order to determine the proper equipment, we first need to define the measure of the work to be done.

Pumps push water of varying volumes at varying rates upward against gravity and through pipe, battling friction every step of the way. We measure volume and rate in gallons per hour (gph). We equate the pressure a pump produces with the height it can push water upward in feet. One pound per square inch of pressure lifts water to 2.31 feet of "head" height. Using "feet of head" as the measure of pressure is convenient because we can add the height the pump raises water, or the Vertical Head, to the pressure required

to force water through plumbing, or the Friction Head. The two combined, Vertical Head plus Friction Head, are the Total Dynamic Head (TDH), the total work any pump has to do in any given application. Once we know the TDH of any project, we can choose the right size and type of pump for the job.

Direct-Drive Pumps

For every water feature, there is an optimal pump. Waterfalls that draw from the bottom of natural bodies of water or unscreened open reservoirs that aren't maintained are best supplied by powerful direct-drive pumps with heavy impellers in oversized volutes, or so-called "trash pumps," that can chop up debris and pass solids with ease. They have the power to drive water to great heights or distances, but they can be expensive to run.

They have long been the go-to for many contrac-

tors who are predictably more concerned with trouble-free operation than operating costs, but they have to be carefully sized and plumbed. A high-volume, high-pressure pump that doesn't have enough work to do will overspeed, cavitate and fail.

Clockwise from top: direct-drive, mag-drive, brushless DC & asynchronous pumps



For high volume at low pressure, such as very wide water walls and waterfalls less than 10 feet high, axial flow pumps offer great efficiency. This type of direct-drive pump changes the design of the impeller and the direction of water flow inside the pump to offer great efficiencies at low head heights. In high-head direct-drive pumps, water entering at the front of the pump hits the face of a spinning impeller and gets slung out at 90 degrees at high pressure.

The axial-flow pump works differently. Envision a propeller in a tube. Water coming in the bottom of the pump gets accelerated out the top by a propeller-style impeller along the same axis without changing direction, hence the term "axial flow."

The vertical style of both types can be a weakness. The top bearings, condensers and capacitors are located at the top of each pump and generate considerable heat. If the top of the pump isn't completely submerged, the volute at the bottom will still draw and pump water, but the electronics will overheat and eventually fail.

Magnetic Induction

For water features that don't have solids to chop up and have more modest volume or pressure requirements, like ponds with skimmers, magnetic induction

Tech Tip

What if you wanted to know the flow of an existing waterfall, perhaps because you want to recreate the same effect? You can measure the thickness of the water flowing over a spillway or fall rock. Turn a ruler or tape sideways or perpendicular to the flow to get as accurate a reading as possible. (Remember, the water will be in motion.) For an irregular surface, measure every 4 – 6 inches and take the average depth of the water spilling over the top of the waterfall rock or spillway. Just like before, multiply by the width of the waterfall to get the total flow.

¼" – 3/16" depth of water over spillway ≈ 50 gph/inch

½" – 5/8" depth of water over spillway ≈ 100 gph/inch

1" – 1¼" depth of water over spillway ≈ 200 gph/inch

For a more accurate reading on smaller falls, it's sometimes possible to measure the flow directly using a piece of scrap liner and some gravel. Turn off the pump and cover the falls with the liner, anchoring the upstream edge with gravel. Fold the rest of the liner into a 5-gallon pail and turn on the pump. Measure the number of seconds it takes to fill the pail. (You will get wet.) The flow in gph will be equal to the number of seconds in an hour, times 5 gallons, divided by the time it takes to fill the bucket in seconds:

$$\text{GPH} = 3,600 \text{ sec/hour} \times X \text{ gal} / Y \text{ sec}$$

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pumps offer a number of advantages. By design, all mag drives eliminate the direct connection between the impeller and motor that gives “direct drive” its name. Direct-drive motors spin a shaft attached directly to a heavy impeller, necessitating bearings and shaft seals that cause power-robbing friction. Magnetic induction works on the principle that a magnet (or “rotor”) suspended inside a coil will spin when the coil is energized. Since there is no direct connection between rotor and coil, the coil that makes up the motor can be sealed in epoxy, with no power-robbing seals required. Lighter impellers mean less friction and less power required. Water circulating around the horizontal rotor keeps the motor cool. These pumps can be shorter and thus easier to keep submerged, so they are less prone to overheating in shallow water.

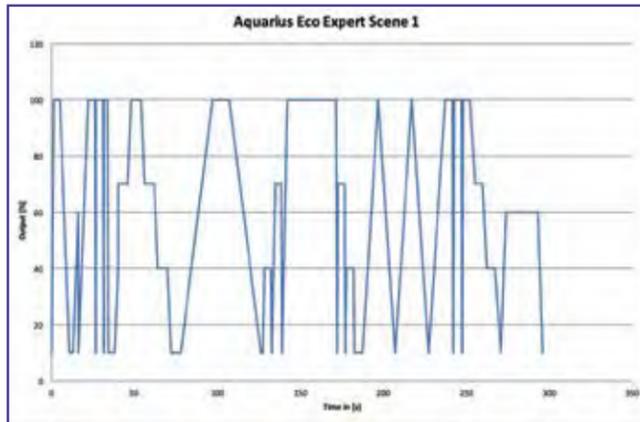
The cons? Magnetic induction pumps can't handle large solids.

They need relatively small intake screens or protection from a skimmer or pump vault to intercept debris (hence the nickname “clean-water pumps”). Also, the indirect connection between motor and rotor can't provide the same level of pressure generated by a direct drive. These pumps are more efficient at providing high volumes, but at much lower head heights.

Magnetic induction pumps come in a variety of flavors according to rotor type and

rotation. Simple magnetic rotors that spin in either direction are at the small end, producing low volume at low head. The larger stainless-steel-clad rotors of the asynchronous pumps drive very efficient impellers at a relatively low operating cost. With volumes of up to 10,000 gph at up to 10 feet of head and less than 1,000 watts, these have become the workhorses of the industry.

Recently, brushless DC pumps also have entered the field of water gardening. These



pumps utilize the same type of powerful motor as those found in hard drives, cordless drills, Dyson vacuums and Tesla cars, using transistors instead of graphite brushes to increase efficiency and power. Electronic control of the rotating windings also means they can offer built-in variable speed control; some even feature pre-programmed patterns of higher and lower revolutions that cause the water flow to “dance.” (See Scene 1 above.) Their use is still reserved for larger pumps, as

they are more expensive to produce, but the savings in operating costs often compensates for the higher initial price tags.

Calculating Flow

Regardless of pump type, which is determined by the requirements of the water feature's design, the specifier needs to know what flow will be needed and the total work the pump will have to do. We usually use visual cues to determine flow requirements.

The height or spread of the decorative spray of a fountain nozzle will vary with both volume and pressure, so charts specific to each nozzle are required. Open returns are easier to determine. Plug in the width of the flow and multiply by the required volume to produce the desired visual effect. Since the rate of flow (measured in gph per inch for water features) produces characteristic visual cues that we are all innately familiar with, a simple formula works for spillways and spouts, waterfalls and streams, bowls and boulders:

$$\text{width (inches)} \times \text{gph/inch} = \text{Total Flow}$$

For a clinging flow where water adheres to a smooth vertical surface, you need around 50 gph/inch. An overflowing bowl with a rim 16 inches in diameter has a circumference of $16 \times \pi$ (or 3.14) = 50 inches \times 50 gph = 2,500 gph.

For a laminar flow, a smooth sheet of water falling off a smooth edge, you need at least 100 gph/inch. A 36-inch spillway needs 3,600 gph to produce a smooth curtain of water.



About 50 gph per inch of edge is considered low flow (left). Medium flow (above, right) is up to 100 gph per inch of width.

Consider the pipe diameter for a 6,000-gph, 3-foot-tall, 30-inch-wide waterfall.

Using a larger-diameter pipe cuts pump costs.

3 inches = 8 feet TDH; requires \$600 asynchronous pump

$$6,000 \text{ gph @ } 520 \text{ watts} \times 0.10 \text{ kwh} = \$37/\text{month}$$

A smaller-diameter pipe increases costs.

2 inches = 21 feet TDH; requires \$900 direct-drive pump

$$6,000 \text{ gph @ } 1,200 \text{ watts} \times 0.10 \text{ kwh} = \$86/\text{month}$$

For turbulent flow, chaotic action and noise (usually characterized as whitewater), provide at least 200 gph/inch. A 30-inch-wide waterfall that needs to be seen and heard at a distance will need at least 6,000 gph.

Total Dynamic Head

Once we select the flow required visually, we can figure out the TDH using the two tables shown on the following page. If you'd like to download a TDH worksheet, you can find one at www.atlanticwatergardens.com.

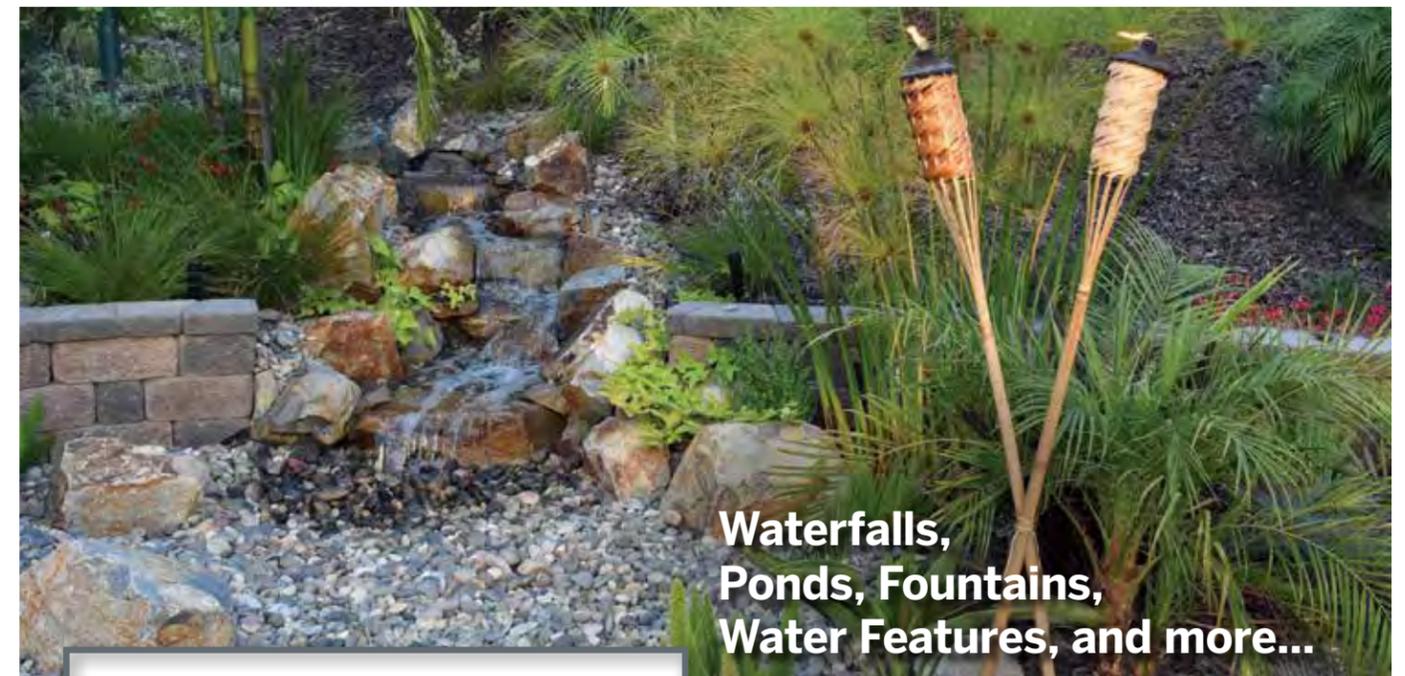
Let's use, for example, a turbulent waterfall and stream 3 feet tall and an average of 30 inches wide, with a 50-foot run of pipe, a 90-degree elbow, male adapter and check

valve. The flow required will be 30 inches \times 200 gph/inch = 6,000 gph. We need only look at the larger table, which shows the friction of every foot of pipe for varying pipe diameters. With a straight run of 50 feet of pipe, 6,000 gph through 2-inch pipe will add 0.22×50 feet = 11 feet of friction head. By using 3-inch pipe, we drop the friction loss to 0.03×50 feet = only 1 1/2 feet of additional head.

What about the fittings? Take a look at the smaller table on the next page, which converts the friction in fittings to an equivalent length of straight pipe. The 3-inch elbow, male adapter and check valve will add 11, 6 1/2 and 27 feet of equivalent length

to the 50-foot actual run respectively, so the corrected friction will actually add $(44 \frac{1}{2}$ feet + 50 feet) \times 0.03 = 2.8 feet of friction head to the given vertical head of 3 feet. Thus, the TDH is about 6 feet. Knowing the total work the pump has to do, we can look for a pump that will deliver 6,000 gph at 6 feet TDH, like the Atlantic TT7500 that draws 520 watts.

What would we be looking at if we went with the cheaper, easier-to-install 2-inch pipe? Well, the fittings would have added 8 1/2, 4 1/2 and 19 feet to the 50-foot run, creating an 82-foot equivalent length. The friction coefficient of a 2-inch pipe



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CHART A
FRICTION LOSS PER FOOT OF TUBING

FLOW (GPH)	TUBING SIZE						
	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"
100	0.10	0.01					
200	0.38	0.05	0.01				
300	0.83	0.10	0.02				
400	1.00	0.18	0.04	0.01			
500	2.25	0.27	0.06	0.02			
750		0.50	0.14	0.04	0.02		
1000		0.84	0.21	0.07	0.03		
1250		1.20	0.33	0.10	0.04	0.01	
1500			0.43	0.15	0.06	0.02	
2000			0.94	0.26	0.10	0.03	
3000			2.07	0.52	0.22	0.05	
4000				1.10	0.43	0.09	0.01
5000				1.60	0.67	0.15	0.02
6000					0.96	0.22	0.03
8000					1.77	0.38	0.05
10,000						0.59	0.07
12,000						0.84	0.10
15,000							0.15
18,000							0.25

Example: GPH: 3000 Friction Loss: 0.05 Tubing: 2"
** For flows over 10,000 GPH or lengths over 100 ft, please contact us.

CHART B
FRICTION IN EQUIVALENT FEET OF STRAIGHT PIPE

PVC FITTINGS	FITTING SIZE						
	1/2"	1"	1 1/4"	1 1/2"	2"	3"	
Std Elbow, 90 degree	4.5	5.5	7.0	7.5	8.5	11.0	
Std Elbow, 45 degree	1.0	1.5	2.0	2.5	3.0	4.0	
Male / Female Adapter	1.5	2.0	3.0	3.5	4.5	6.5	
Tee (Straight Thru)	2.5	3.0	5.0	6.0	8.0	12.0	
Tee (Thru Branch)	5.5	7.0	9.0	10.0	12.0	17.0	
Swing Check Valve	9.0	11.0	13.0	15.0	19.0	27.0	

Example: 8.5 (90°) + 4.5 (M/FA) + 19.0 (Check Valve) = 32 (Fitting Length in Feet)

at 6,000 gph is 0.22, multiplied by the equivalent length makes 18 plus 3 feet of vertical head. Thus, we would have been looking for a pump that could provide 6,000 gph at a whopping 21 feet of head. This “more economical” 2-inch pipe would require the much larger and more expensive A-31 model, drawing 1160 watts — more than double the operating cost. The 3-inch pipe is the far wiser investment, and it will pay off handsomely.

Using the right size plumbing, you’ll select the right size pump for the job. It will cost less to buy and far less to run, perform better and last longer. If you or someone you know are still following the old rule of thumb of adding 1 foot of head for every 10 feet of pipe and 1 foot for every fitting, you would have come up with a guesstimate of 5 + 8 + 3 = 16 feet of vertical head.

You would have had to choose the massive A-31 – and it would have cost you and your customer many hundreds of dollars unnecessarily.

Friends don’t let friends use rules of thumb. Calculate TDH. It’s money in the bank. ☞

About the Author

Whether building waterfalls in the Yucatan, working with his sons on Long Island, or serving as the Director of Product Information for industry leader Atlantic Water Gardens, **Demi Fortuna** still loves water gardening even after 30 years in the muck.



The pond water (left) is now crystal clear thanks to the new OASE pressure filter. The filter for this pond (right) was installed into a nearby vault.

Saved by the Bell

School gets new waterscape with aquaponics during pandemic

by **Mike Garcia**,
Enviroscape L.A.

The year 2019 was just amazing from a business viewpoint. The economy was a business owner’s dream. Jobs were coming in faster than we could keep up with, and everything was good. As 2019 ended and a new decade began, early 2020 showed no signs of letting up!

Then, the bad news began. In late January, the news began reporting on a new virus discovered in China called the Coronavirus. As February began, the Coronavirus began to take center stage on the world scene. In March, people were told to not go out in public unless it was absolutely necessary. We were told to wear masks to stop the spread of the virus. Masses of people began to hoard toilet paper when news broke of potential

supply issues.

Then came that fateful Friday when the Governor of California declared that all businesses shut down unless they were deemed “essential” — which most of us



This sign is posted at the school to explain to students how aquaponics works.

initially assumed only meant firefighters and law enforcement. Thankfully, the next day, the California Landscape

Contractors Association was instrumental in getting the landscape trade designated as an essential business.

Even though we knew we could work safely outdoors, many clients thought otherwise and postponed jobs. This meant I had to scramble to keep my crews working.

Back to School

Around the time this was happening, I received a call from the Environmental Charter Middle School in Inglewood. They wanted to upgrade certain elements of the aging infrastructure across their amazing campuses, which include a high school and two middle schools (with plans underway to build an additional high school).

We were happy to help out, especially because they had several existing ponds on campus. One was paid for through a

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The combination of the filter and aquaponics resulted in clear water and growing food, teaching the students a valuable lesson about nutrient cycling.

grant; however, the pond builder was a general contractor who had zero pond-building experience, and it showed — there was no pond filtration!

On our first day to the middle school, we decided to tackle the no-filter pond. It had tons of goldfish and a few koi. It was built out of concrete, and its “filter” consisted of frequent water changes. There was a small underground concrete vault with a drain where the pond water was drained. Since the vault was already there, we decided to place the filter inside this vault. The vault was small, but thankfully, today’s pressure filters have a very small footprint and do an amazing job of cleaning out pond debris.

Circulation & Filtration

We decided to install an OASE pressure filter (Filtoclear 4000) and an Aquamax 3,600-gph filter pump. We chose this combination for several reasons.

First, the pump. We wanted a pump that could go on the bottom of the pond, where all the fish waste tends to end up. Once the fish waste falls to the bottom of the pond, the Aquamax pump sucks it in and pushes it to the filter. The Aquamax has an extremely low electrical draw, saving the school thousands of dollars over the life of the pond. Adding to the electrical savings is the longevity of the pump itself. I still have ponds running with their

originally installed OASE pumps for more than 10 years. In case you didn’t know, a pump with more than a decade of constant service and low electrical draw is practically unheard of! The pump is square, making it easy to hide at the bottom of the pond, and has an attachment that can add a satellite drain to the other end of the pond bottom for additional filtration. A mini skimmer also can be added if there is a high organic load. We didn’t in this case, since there was no organic load nearby, but it was nice to know it was available in case it was needed.

The pressure filter (Filtoclear 4000) is a real gem. The Aquamax pump pushes pond water into the OASE filter. Once the pond water enters the filter chamber, there is a plethora of special debris collecting sponges that trap fish solids and release the clean water back to the pond. The filter also has a built-in UV light that eliminates algae populations, resulting in water quality as clear as gin.

Cleaning pond water is only half the job of a pond filter. The pond filter must be easy to clean, or else a pond owner might neglect to clean the filter often enough, resulting in a dirty pond. A dirty pond can be a bad reflection on a pond builder. Thankfully, the Filtoclear 4000 is easy to clean. All it takes is turning a knob and pulling on a handle to let the debris flow. Flushing the Filtoclear is so

easy, your hand doesn’t even get wet! I remember in the old days when people were asked to clean out pond filter mats and lava rock; doing so was very heavy and dirty work. Now, it takes a fraction of the time to clean your pond filter.

Just Add Aquaponics

While the crew installed the equipment, I toured the campus and saw a vertical aeroponic tower garden that had been donated to the school, but it was not in use. We decided to incorporate the vertical garden into the pond, providing the students with the ability to grow organic food with pond water. The pond will help teach students about nutrient cycling and plant succession.

Plus, fish make amazing wet pets. The bonus of marrying the vertical tower to the pond meant that students could learn about aquaponics, or growing food with recycled water. We drilled a drain into the bottom of the vertical system and installed a bulkhead fitting to attach a pipe return to the pond. This allows the roots of plants to get wet and absorb nutrients from the pond water. We added a small piece of pond filter mat to the top of the system to trap solids, and the water flows past this point to get to the plant roots.

Aquaponics touches on very big issues. In Southern California, the biggest environmental issue facing residents is a lack

of water. Aquaponics’ recycled-water strategy saves about 98% of the water normally used in a soil garden. One can grow organic food that doesn’t have to be sprayed with pesticides and herbicides. Plus, the space savings of growing vertically is invaluable for people who have very little room to grow. You can grow 28 heads of lettuce or swiss chard in as little as a 3-by-3-foot space!

We used an OASE 1,200-gph Aquamax to connect the pond to the vertical tower because the electrical demand is a mere 45 watts of power. We rerouted the discharge of the fish waste out of the drain, and now the fish waste (which is rich in nutrients) is discharged into the garden soil, taking full advantage of nature’s own fertilizer.

When the pandemic comes to an end and the students return, they will find a much cleaner pond and a brand-new aquaponic food system. Perhaps some will be inspired to create their own ponds at home — and even better yet, aspire to be professional pond builders! Only time will tell. *CS*

About the Author

Mike Garcia, founder of EnviroScape, began his career in the horticultural field more than 25 years ago. After earning his college degree in ornamental horticulture, he earned his C-27 Landscape Contractors License, as well as his D-49 arborist Tree Service Contractors License. Under his leadership, EnviroScape has won numerous landscape and water feature awards at the local, state, national and international levels.



| Pond Camp |

This One Time at Pond Camp

Garden State Koi hosts contractors in the Poconos

by Tom Smith,
Garden State Koi

Imagine 120 pond contractors in the mountains of Northeast Pennsylvania, facing cold, crisp autumn days and even chillier nights, with a goal of building three water features over two days.

This was the scene at the 2020 Garden State Koi Certified Aquascape Contractor (CAC) Pond Camp held at Camp Timber Tops in the Poconos from Oct. 4 – 6, 2020.



Happy Campers

Although the contractors came to build, they would all unknowingly take a trip back to the “summer-camp” experiences of their youth by sleeping in unheated bunkhouses, eating camp food making tie dye t-shirts, competing in egg-toss and ax-throwing contests, playing cornhole and partaking in the CAC fishing contest — all while working and networking with some of the best pond builders in North America!

The second-annual camp event also came with a number of COVID-19 protocols, such as individual bunk houses, indoor face masks, designated table assignments for family-style meals and social-distancing practices.

Campers were up early Monday morning for a hike to Shohola Falls to seek inspiration from Mother Nature’s waterfalls. With the combination of recent rains and the fall leaf colors, the 75 contractors who managed to get up early did not come back disappointed.

Time to Build

The construction of three water features began Sunday and resumed in earnest on Monday morning. Talented teams could be found at all three of the builds, which were held simultaneously:



Large Entrance Pondless Waterfall. Aquascape's Ed Beaulieu, the Pond Professor, Artist of the Year Jaak Harju of Atlantis Water Gardens and Alan Decker of Decker's Pondscapes led a group of 20 talented CACs to construct a 12-foot-high pondless waterfall using large native Pennsylvania boulders covered with moss and lichens. This waterfall will greet campers of Camp Timber Tops for years to come.

Ecosystem Pond. Tim Dille of Garden State Koi and Allan Schule of Sound Shore Pond, with the help of 25 contractors, worked on constructing an 8-by-12-foot ecosystem pond with a stream and waterfall in the Nature Center. This pond will be home to lots of different wildlife, including small fish, tadpoles, frogs, newts and the occasional turtle.

Bubbling Stone Pondless Feature. Set along a woodland trail in the arts and crafts section of the camp, Sean Frost of Naturescapes, Jay Duke of Rivercrest Water and Landscapes and Enrique Gomez of Garden State Koi led another talent-laden group of CACs on this unique, natural-stone, bubbling-rock feature. The finishing touches of moss, ferns and native plants made this feature look like it was always there.

With amazing precision, speed and attention to detail, all three water features were started Sunday afternoon and were 100% completed by lunch on Tuesday.

Extracurricular Activities

Of course, it wasn't all about building water features. The CAC fishing contest on Tuesday morning saw David Speece of Dreamscapes Water Gardens catch a nice, 30-inch pickerel to win the Largest Fish and Most Fish trophies. A camp highlight was having Bernie Kerkvliet of Skyline Ponds travel all the way from California to demonstrate how to split stone with feathers and wedges.

Pond Camp provided a unique opportunity for teaching, mentoring and learning pond and waterfall construction techniques in an open-air environment with all the instruction, leadership and guidance provided by some of the top pond builders in the Northeast. It also provided contractors the opportunity to network and have fun while reliving the fond emotions of their youthful camp experiences. Although Pond Camp was a lot of work for the staff of Garden State Koi, they loved building one-of-a-kind water features with their customers, contractors and friends in the mountains while surrounded by nature. ☘



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EasyPro Pond Products Releases Two 2021 Catalogs

EasyPro Pond Products offers two specialized catalogs. This year, the Pond & Water Feature catalog is bigger than ever and packed with professional and DIY pond products. EasyPro's signature line of Tranquil Décor water features has grown this year, with eight new stone fountains! Inside, you'll also find everything you need for pond aeration, pond lighting and water treatments. Check out their new Eco-Clear pond pumps and filters for an affordable yet effective pond filtration system. The Lake & Pond Management catalog is also available for those who maintain larger bodies of water. Check out their ever-expanding line of aeration products and water treatments. See how EasyPro's 50 years of experience can work for you! For more information or to request a full-color catalog, call 800/448-3873 or visit www.easypro.com

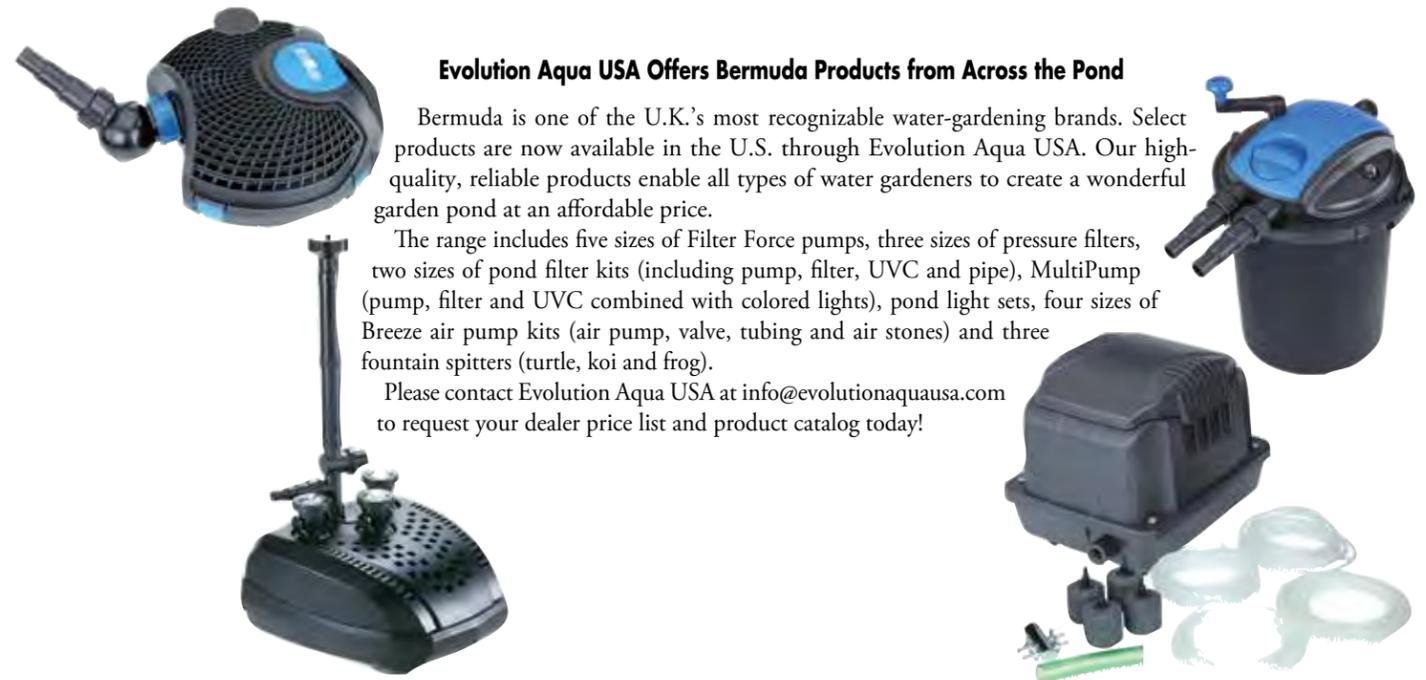


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Aquascape, Inc. Provides Essential Products for Winter Pond Season

Aquascape, Inc., is making this winter pond season worry-free with a pond de-icer, pond aeration kits and the Smart Pond Thermometer (coming in 2021).

The Aquascape 300-Watt Pond De-Icer is ideal for preserving a small hole in the ice during freezing winter months and ensuring proper gas exchange, which helps keep fish safe until spring. Operated by an internal thermostat, the de-icer warms only the water immediately around it to prevent ice from forming. The stainless-steel construction prevents corrosion and cracking, providing years of trouble-free operation.

Aquascape pond aeration kits are ideal for winter use. The included braided tubing in the Pro Air 20 and Pro Air 60 Aeration Kits are freeze resistant, guaranteeing functionality in even the harshest climates. Choose the kit sized for your pond to create the ideal environment for counteracting the depletion of oxygen caused by decaying debris.

The Aquascape Smart Pond Thermometer offers peace of mind for

pond owners who want to monitor their water feature's temperature from anywhere at any time using the Aquascape Smart Control App on a smartphone or tablet. Use real-time temperature data to adjust feeding schedules, change water treatments and more. This product is available to pre-order for delivery in early 2021.

For more information about Aquascape and our full line of water feature products, visit www.aquascapeinc.com or call 866/877-6637 (U.S.) or 866/766-3426 (Canada).



Back to Japan for Brian Fitzsimmons and Fitz's Fish Ponds!

Fitz Fish Ponds is a pond company that designs and builds ponds and landscapes, and has two retail locations. Through our connections in Japan, we have been buying koi for our own stores and customers for many years. We are happy to offer a full line of wholesale koi fish and pond products all over the United States.



I was actually in Japan this past February during the beginning of the COVID-19 pandemic. I remember watching the news in Japan and hearing about it reaching the United States for the first time. I never would have believed that it would become this devastating.

Our latest trip to Japan was very different from previous trips. The Japanese government is not taking COVID-19 lightly. They are one of the only countries allowing business travel during this pandemic. The airport that is typically very busy was a ghost town, like a scene out of a movie. Japan is very proactive in combating the virus and seems to take every precaution to ensure the safety of the country. As an international travelers, we were very cautious and respectful of all the guidelines that were put in place by the Japanese government.



Due to these restrictions, we had to quarantine for 14 days upon our arrival in Japan. After the quarantine, we were able to start visiting breeders. We were fortunately able to participate in a few harvests with Shintaro Koi Farm. We also visited Dainichi, Maruhiro, Marusei, Yamasan and many other famous, high-quality breeders while in Japan.

All the koi we bought will be shipped to the United States in January 2021. We have thousands of koi coming in many different sizes and varieties. If you are looking to pick out premium Japanese koi for your retail store, come to our farm in New Jersey to handpick your koi just like we did in Japan! If you are unable to make the trip, please let us know, and we would be happy to ship your new koi anywhere in the United States.

Contact us today with all your koi requests: brian@fitzfishponds.com.



Virtual Hardscape North America Features Top Industry Experts for January 2021 Education Event

Three top-name presenters who have combined their on-the-job experience with professional training and education to become leading industry experts are in the lineup at the Virtual Hardscape North America (HNA) Education Event. Frank Bourque, Gary Ross and Corey Halstead will each present multiple sessions throughout the two-day event, which will take place Jan. 26 – 27, 2021.

"I've picked up tips from all of them through the years and know from experience that their sessions are well worth the time and investment," said Frank Gandora of Creative Hardscape Company. "I'm looking forward to logging on in January to hear these three, as well as some of the other top-quality speakers that are on the schedule."

Produced by the Interlocking Concrete Pavement Institute (ICPI), the event will provide 42 interactive sessions across three tracks – Business, Installation and Marketing & Sales. Participants can earn up to 30 Continuing Education Credit hours needed for ICPI Concrete Paver Installer Certification.

Registration provides an all-access pass to participate in an unlimited number of courses. See the full session lineup and register at www.icpi.org/virtual-hna.



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FINAL THOUGHT



On the Rocks

Photo courtesy of Tim Wood, Aquatic Edge



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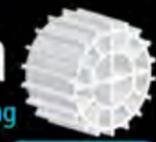


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