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TAKE ADVANTAGE OF OUR WHOLESALE PRICING AND WATER GARDEN EXPERTISE!
26 COVER — POND Stars
In 1982, a young boy discovered his passion when he built a small personal pond in his backyard. Little did he know that 32 years later, that same passion would bring him a starring role on his own reality show. With less than a month to wait for the debut of "Pond Stars," Aquascape founder Greg Wittstock recounts his company’s long journey from his parents’ garage to TV screens nationwide.

34 Beyond Koi Pellets
Have you ever seen a koi eat a big, juicy wedge of orange? If not, then you clearly haven’t spent time with Toni Jacobs Lopez, who delights in feeding his fish all sorts of tasty treats. From honey to whole wheat and from pineapple to pasta, the diet Toni suggests for koi is diverse, healthy and a load of fun to feed!

38 The Impressive Power of Periphyton
If you’ve ever stepped on a hard surface in your pond and found yourself suddenly slipping, you’ve probably experienced periphyton. But this slimy green buildup is more than just an annoyance. According to Meyer Jordan, periphyton is the most important grouping of organisms in any aquatic ecosystem!

42 Right Plant, Right Pond, Nothing Left Out!
A well-designed water garden looks natural and organic, as though Mother Nature had lovingly placed each plant. But when you’re building your water garden from scratch, the selection and placement of plants falls to you! John Mark Courtney outlines the characteristics to consider when choosing which plants to use in your naturalistic (and healthy) backyard oasis.

49 Filtration, Circulation, Aeration and Cleaning
Maintaining a high-quality environment for your koi can be a complex endeavor. But according to Kent Wallace, success in your pond can be boiled down to four vital elements. In the first of a multi-part series, the owner of Living Water Solutions begins to outline his helpful blueprint for a clean, clear and healthy habitat.

55 Price Your Pond Construction Jobs Correctly
Offering a low price is a reliable way to gain customers. But some pond professionals are so eager to land jobs that they lower their prices beyond what is needed to sustain business. You can’t have cash flow without cash, and taking on more jobs for less money is a sure recipe for bankruptcy. Michael Stone, author of "Markup & Profit: A Contractor’s Guide Revisited," offers a strong argument for why you should stop undercutting yourself.
Upcoming Events

October 2
Blue Thumb Pond & Fountain Expo
Saginaw, Michigan
mppond.com/expo

October 8 - 10
WaterSmart Innovations Conference and Exhibition
Las Vegas, Nevada
www.watersmartinnovations.com

October 23 - 24
GIE+EXPO 2014
Kentucky Exposition Center
Louisville, Kentucky
800/558-8767
info@gie-expo.com
www.gie-expo.com

October 23 - 24
Hardscape North America 2014
Kentucky Exposition Center
Louisville, Kentucky
888/580-9960
www.hardscapenews.com

November 5 - 7
Int’l Pool | Spa | Patio Expo
Orlando County Convention Center
Orlando, Florida
972/536-6330
www.PoolSpaPatio.com

November 17 - 21
2014 Irrigation Show
Phoenix Convention Center
Phoenix, Arizona
703/536-7080
info@irrigationshow.org

November 18 - 19
INFO TANZA
Phoenix Convention Center
Phoenix, Arizona
770/592-9790
www.ippcas.com

January 6 - 8, 2015
Landscape Ontario
Toronto Congress Centre,
Toronto, Ontario
www.locongress.com

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What if Michelangelo only ever sculpted? Would the ceiling of the Sistine Chapel be white?

Luckily for us, Michelangelo was a "Renaissance man," always seeking to broaden his knowledge and creative skills. Not only was he a master of sculpting, but he was also an artist world-renowned for his painting, architecture, engineering and poetry.

Leonardo da Vinci was a like-minded Renaissance man who was a master in painting, sculpture, music, botany, invention, mathematics, geology and more, with a never-ending desire to learn and expand his expertise.

Today, Michelangelo and Leonardo are known as "Renaissance men" for their mastery and expertise in a variety of fields, having created masterpieces in all areas of art that continue to astonish us centuries later.

This bountiful production of mastery in multiple fields by one individual is nearly unheard of in today's society. Today, we see ambitious people specialize in one focused field, eliminating opportunity for knowledge to spill over for innovative ideas. From construction to medicine and from architecture to art, there seem to be fewer crossovers in applications, resulting in less learning and personal development.

Renaissance Man of Ponds

To paint a picture that ties into pond construction, let's compare homes that are built today to homes that were built a hundred years ago. Today, the framework of the home is done specifically by framers, the window installers install the windows, the door hangers install the doors and the finish carpenters give the home its final polish. In a home built a hundred years ago, the carpenter would have done the framing — as well as hanging doors, installing windows and performing finish work. His skills in all areas allowed him to apply
knowledge and techniques that the specialists today are lacking. My personal career goal is to emulate Michelangelo and Leonardo to become a Renaissance Man of Ponds, with mastery of many (if not all) techniques in pond building and knowledge of the aquatic life that thrives best in each environment.

Whether it is a koi pond or goldfish pond, a

To be a true pond specialist — a Renaissance Pond Man, if you will — I believe you should have a vast understanding of our trade ... that is, the trade of pond construction, design and maintenance.

game fish pond or simply a water garden with lilies and lotus, I am committed to a never-ending quest of growth and learning to understand all possible aspects of pond construction.

Styles of Ponds

Given the wide variety of ponds that exist today, acquiring this vast and diverse knowledge is no small task. There are dedicated koi ponds, formal ponds, ecosystem ponds, earthen ponds, frog ponds, water gardens, natural swim ponds, commercial ponds, residential ponds, game fish ponds, lily ponds, lotus ponds, butterfly ponds, reflection ponds and so many more!

With so many pond possibilities, it is safe to say that there is not a sole construction philosophy that can encompass all of these wonderful scopes of work. To be a true pond specialist — a Renaissance Pond Man, if you will — I believe you should have a vast understanding of our trade ... that is, the trade of pond construction, design and maintenance.

A Breadth of Knowledge

Do you expect a koi could live to be 100 years old in a two-foot-deep rock and gravel pond? How would you build a pond for a herd of $60,000 koi? Would you install a bottom drain on a pond with a sand floor?

Did you know that when the sunfish spawns, the male goes to great lengths to build a nest in a bed of sand to establish his territory and attract a female? Knowing this, would you build a sunfish...
A decade ago, I estimated a large game fish pond project for $450,000. The pond was 120 by 80 feet and 15 feet deep. My estimate was way over budget! At this time in my career I was only versed in one pond construction philosophy.

Luckily, I had the amazing opportunity to rebid the same project a couple years later when I was more experienced in my trade. My numbers came in at $150,000 for the same size pond, but with different construction philosophies and techniques. Why? In my quest for knowledge of my trade, I learned new pond construction techniques that enabled me to change my scope of work for the project. Thus, I was awarded the project and was extremely profitable on the installation.

### Smarter Consumers

The pond industry is growing rapidly, and so is the information about ponds on the Internet. Typical consumers, often already bitten in a bad way by a home improvement contractor, are shy about jumping into a project without doing some research to cover their assets. This can lead to lots of confusing information and misinformation.

By educating yourself in all the different types of pond construction techniques and philosophies, you can open the door for you and your clients to have a more successful long-term relationship. When you meet clients for the first time, frequently the information they are armed with is just enough to make them dangerous, but not really enough to ensure they know what pond construction philosophy will help them meet their goals and expectations for the pond project. They look to you, as an expert in your trade, to help them sort through buckets of info on the how, when and why of the project — as well as where the pond should be!

If you can tell your clients succinctly and correctly why they need (or don’t need) certain types of construction philosophies, they will be thrilled and you will have an advantage over the typical competitor. In order to properly serve your prospective client (and protect yourself), I would encourage you to become an expert in the trade of building ponds.

It’s important to know what systems your potential clients need for their “dream” ponds. Perhaps they want to travel to Japan for a $60,000 koi that will be touring the country to compete in koi shows. This koi cannot be housed in an 18- to 24-inch-deep water garden or ecosystem pond with little to no life support system. By the same token, you certainly do not need to build a six-foot-deep pond with redundant life support systems, bottom pond with anything other than a sand floor!
drains, settlement tanks, a UV clarifier and bead filters for a customer who wants water lilies and goldfish.

Learn, Learn, Learn

Educate yourself and stay open-minded on all the different pond construction techniques and philosophies. There are many types, but here are a few for you to start with.

Water garden ecosystems use a simple pond skimmer and a waterfall filter with filter pads and a little lava rock. There are more advanced systems that use fish-friendly pond skimmers combined with an air-assisted cleaning cycle waterfall filter. You can add under-gravel grids and/or bog filters to help with water clarity and algae control. These are all fairly low-maintenance systems, requiring minimal service. These systems use Mother Nature to help keep the pond clean and clear, but there is a very technological aspect for those customers who like to “fiddle” with their ponds.

These very advanced systems use technology to manage water quality, requiring weekly back-flushes from settlement tanks and bead filters as well as UV clarifiers to keep free-floating algae levels under control. Meanwhile, larger pond installations—say, a quarter-acre and bigger—may not require skimmers and solely rely on depth, aeration, aquatic plants and water treatment regimens.

The Journey to Renaissance Pond Status

If you aspire to be a Renaissance Pond Man, you will need to have the expertise and knowledge to help each and every customer build the pond of his or her dreams. Complete and total mastery of your trade will give you the confidence to answer any question completely and honestly to help your clients make the right decisions for their dreams and lifestyles.

Join me in my journey of constant and never-ending improvement in the trade of building ponds, and may we be considered Renaissance Pond Men when we are dead and buried.

About the Author

Eric Triplett owns and operates The Pond Digger, Inc. Waterscape Design and Construction Company, based in Yucaipa, California. With a focus on Information, Education and Inspiration, it’s easy to see why he has over 6 million views on YouTube. The Pond Digger specializes in ecologically friendly, low-maintenance waterscapes for fish and aquatic plants...but more importantly, for people.

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The dangers of an overstocked aquatic habitat

by Carolyn Weise,
Ecological Laboratories

An overstocked pond is an invitation to disaster... a ticking time bomb. Parasites proliferate and spread like wildfire in an overcrowded pond. Water quality is somewhere between difficult and impossible to maintain, making the pond less attractive to viewers. Looking closely at the fish, one can see sores, missing scales and torn fins, and viewers can spot uneaten food on the bottom. There may be an odor connected with this pond, and surely algae growth is unabated. Eventually, an overstocked pond leads to a call to a pond professional for help.

Most overstocked ponds do not happen overnight. In many cases, a few nice fish are added to the new pond, but the pond still has room for plenty more fish. Then they will grow. And then they will spawn if you give them good water quality and proper nutrition. There is no miracle sterilizing food or medication to add to the water to prevent the annual spawned for koi (or continual spawn for goldfish) once they reach the age of maturity.

Almost every pond owner wants to “watch them grow up” in the pond, to spawn. Figuring the standardized (but not written in stone) 10 gallons per inch of fish, up to now the pond has been happily stocked and perfectly balanced. Each koi has grown to between 12 and 18 inches, negatively impacted, the most common cause is overfeeding. Owners see more open mouths, so they will naturally feed more. However, to underfeed an overstocked pond is inhumane. These are

... a ticking time bomb.

The Joys of Fish-Raising

Practically every new pond owner wants to experience fish-raising for himself. He wants to see the excitement of a spawn and spends hours watching for the emergence of fry. He wants to see what his fish will produce. It is almost like that first childbirth: “Will he have my mouth, your nose, blond hair like the mother or brown eyes like the father?” Unfortunately, it’s too easy to get caught up with the development of the fish and lose sight of the overall stocking. If each fish grows 1/16”, and there are 20 to 50 fry growing up in the pond, the biomass will quickly add up! If the pond is not thinned regularly, this small growth has the potential to throw the pond off balance from one season to the next.

Exponential Growth

Imagine a 1,000-gallon pond with three recently matured koi that are ready

Then, the inevitable happened: The fish matured and spawned, and fry survived in the pond.

The following season there were 33 fish in the pond, and the average size of the progeny is 4 inches. Although as they age their growth will slow down, the parent fish grew another 1 to 2 inches. Before spawning the collective length of the fish was 45 inches, so they had ample room in the 1,000-gallon pond. After the first spawn, however, the total length of the 30 fry is 120 inches! All by themselves, the fry now have exceeded the maximum stocking for the 1,000-gallon pond by 20 gallons. And the parents are still in there. Going by the minimum requirement, 10 gallons per inch of fish, the present population will need 1,690 gallons or more to maintain a healthy environment. Of course, that is dependent upon good filtration and circulation in the pond. By the end of this season, these fish will have spawned again and the fry will likely double their size. To compound the problem, many of the fry have reverted to their wild ancestry (magoi) in coloration, and thus will be very difficult to find, catch and remove from the pond. This is how ponds easily become overloaded.

Feeding and Filtration

With proper flow rate and bioconversion, a pond will sustain a very large fish load. When water quality is large growing fish that can potentially reach lengths of 36 inches. A properly designed pond includes bacterial and phyto-filtration. To blame overfeeding or overstocking, you can also say a pond does not sustain a high enough level of bioconversion. At what point is an imbalance recognizable? What are the typical symptoms of imbalance? Is it sick fish, fish losses, declining water clarity or increased algae issues? There usually will be a predictable downhill slide when people continually add fish (either through purchase or spawn), increase

If each fish grows 1/16”, and there are 20 to 50 fry growing up in the pond, the biomass will quickly add up!
important to mention that manufacturers do not really help the situation. They may claim a certain model biofilter will meet the needs of a 1,000-gallon pond, for instance, but is this a pond with fish and, if so, what is the maximum limit of fish in pounds/kilograms? Manufacturers’ filter ratings are, at best, vague and often misleading. The only true determination of fish load is in total weight of the fish population.

Often a manufacturer seems to quote capacities of filter/pump without fish, or with fish other than koi, which produce more organic waste than goldfish or sunnies. Once koi enter the equation the figures don’t always work out the way they were planned. Other factors affecting the pond include the climate. Northern ponds do not run year-round, and biofiltration needs to restart each spring. Does the biofilter die off in winter? Do southern ponds continue without interruption and thereby support more livestock?

We know that surface area is important to oxygen levels in the pond. A fairly shallow pond with large surface area will support more fish than a very deep pond with limited surface area, even if they are the same total volume. With koi, the reasons for a deep pond are:

- Predator protection
- Development of female conformation (body shape, muscles)
- More stable pond temperature

With a male-only pond, depth is not as important. We still need predator protection and can use pond design instead of merely depth to thwart predators. Temperature can also be managed. With a shallower pond, it is easier to catch and remove excess fish! Pond management can become easier, and easier chores are more likely to be done. After all, a koi pond is a form of aquaculture. It needs to be managed or maintained in order to remain healthy for the future.

If fish are to be added to an optimally stocked pond, then fish need to be removed to maintain status quo. The optimal result for everyone — fish and human — is a safe, low-stress and workable stocking density that all may enjoy.

**About the Author**

Carolyn Weise handles consumer relations for Ecological Laboratories Inc. as liaison to koi and water garden clubs across the USA and Canada. She has attended numerous Koi Health Seminars at UGA, and spent time at the Holland Koi Show. She is an active member of the NRA, the Cape Coral Friends of Wildlife (CCFW) and the National Association of Pond Professionals (NAPP). She is the editor of the Microbe-Lift Watergardener and a frequent contributing author and editor for MAKC Magazine. She studied horticulture at SUNY Farmingdale and recently became involved in hydroponics. Her new home in Florida is landscaped and has a formal, 4,000-gallon koi pond with all the bells and whistles. Carolyn is koi kichi and wants the best water for her fish.
by Rick Smith
EasyPro Pond Products

Whether designing a new water feature, planning out a renovation or looking for ways to aid filtration to an existing pond, one of my personal favorite design techniques is the incorporation of an “Upper Pond.”

17 years ago, when I built my second pond in the backyard — of course a lot bigger than the first — an upper pond was incorporated in the design strictly for the added visual impact. The design made the water feature longer, providing more depth of view; it added subtle sloping grade changes; and it lent itself to three waterfalls instead of one.

Although not part of the original design rationale, after years of enjoyment I have come to truly appreciate the long list of other added benefits that upper ponds can provide (and the technical reasons behind these benefits).

If only I was so smart back then.

Since this old dog is always open to sharing with and learning from others, I can say that I learned even more from reading Jamie Beyer’s article, “Pond Design Information for a Two-Pond Filtration System,” published in the 2009 July/August issue of POND Trade Magazine. This is a great article and one more example of how sharing design options provides value within the industry. Jamie’s article on design and flow rates is certainly worth digging through the archives for another read. Great job, Jamie.

Here are just a few of the many benefits of a two-pond system or an upper-pond design:

- Additional Points of Interest and Water Action
  Creating a desired pond atmosphere is all about incorporating the action and sound of water within a strong landscape presentation and utilizing seasonal color, differing plant heights and a variety of textures. Water features with an upper pond double the opportunity for waterfalls and landscape plantings, thereby expanding the ability to create more points of interest while expanding the visual depth of the feature. When done to scale, you really don’t need a lot of space to make this happen, either.

- Protecting Plants from Fish
  As we all know, koi and water garden plants don’t always mix well. The koi destroy the plants, and if you maintain the recommended plant cover, you can’t see well enough to enjoy the koi. At minimum, it is a struggle to protect the plants from the fish.

  Well, for we “hybrid water gardeners” who love both koi and water gardens with plants, the upper pond solves a lot of issues. All those valued and beneficial plants that contribute to the beauty and balance of the system are now protected from the natural habits and cravings of koi. And since the plants are in the upper pond, it allows for more open water in the main pond to actually see your fish. It’s a beautiful thing.

- Aids Filtration and Reduces Sediments in the Main Pond
  In order to maximize the upper pond’s ability to provide additional filtration effectively, there are a couple of options.

**Option One — Using a Single-Pump Setup**

With this setup, we can feed the main water flow...
through the normal channels to the filter/waterfall and then the stream, diverting some of the water at a much slower rate through the upper pond, where the sediments are allowed to settle out. In his article, Jamie Beyer provides some great examples of flow rates. The slower rate allows for the sediments to settle out, and if you incorporate plants — especially Water Lettuce and Water Hyacinth with their natural long roots — they do a great job of assisting in the process.

**Option Two – Using a Two-Pump Setup**

We can utilize a two-pump system with each pump feeding its own filter. The first pump would feed the main stream and waterfall from the skimmer, while the second pump would draw off the bottom drain and feed the upper pond’s filtration prior to falling into the upper pond. The advantage here is that since the upper pond already has a filter, we can allow a little more aggressive flow rate for the waterfalls while still benefiting from protecting the plants from the fish and the additional filtration.

- **Aids in Keeping Water Cooler and Oxygen Levels Healthy**
  
  With an Upper Pond setup, water garden plants are now able to thrive since they are protected from the destructive nature of fish. Thus, they are able to become healthier, thicker plants. Oxygenators produce more and floating plants become a thick shield from the heat of the sun, thereby allowing the water to stay cooler and hold more oxygen. And, we are able to incorporate plants we never thought we could protect.

- **Big-time Nighttime Enjoyment with Lighting**
  
  Since upper ponds provide more points of interest, including additional waterfalls, there is more opportunity to be creative with lighting. The impact and enjoyment at night is dramatic. And don’t forget that lighting provides enjoyment all year round. Yes, it even brightens up the darkest winter days and nights, turning the blowing and drifting snow into a thing of beauty.

- **Attracts More Wildlife**
  
  Upper ponds do have a tendency to attract more songbirds and frogs. Songbirds are attracted because the water is usually slower and shallower, which is

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Upper ponds create more points of interest. Mentally divide this photo into thirds. How many points of interest can you count in each section?

Conducive to bathing. Frogs are attracted because the water is calmer and all those plants mean more insects for dinner. Add night lighting and it’s a feast!

So, if the desire is to attract more songbirds, as some pond owners do, make sure to landscape with plants that provide shelter. Also use plants that provide a food source, like berries. Provide a safe landing area close to the water and a shallower beach area, no deeper than 2.5 inches, for bathing.

(Note: Some people may not want to attract more birds than necessary, since they can contribute to an increase in troublesome parasites for the fish. If this is the case, scratch the shallow beach area.)

- Easy Seasonal Cleanout
  Since upper ponds are naturally higher in elevation, incorporating a bottom drain with a valve makes seasonal cleanouts easy. Simply open the valve, let the pond drain off down grade and flush the system clean. In the spring, do a quick flush, close the valve and fill. It’s just that easy.

- Great Pond Renovation Project — Solving Filtration Issues
  If you’re working on options for a pond renovation project, an upper pond might just be a great feature to incorporate to add depth of view and more points of interest, beef up the filtration and separate the plants from the fish.

One of the most frequent renovation project requests comes from the need to correct an insufficient filtration situation. Sadly, some of these are caused by improper installation, and others exist because the pond’s demand has outgrown the original design, resulting in the pond’s inability to stay in balance.

In many of these cases, it is impractical to take out the existing filter … or we really don’t want to alter the current look of the waterfall. However, there may be room off to the side to install an upper pond, which could provide just enough additional filtration to tip the scale back into balance. Another option that has been utilized when there is an existing stream is to install an upper pond midstream.

When planning an upper pond setup, don’t be afraid to be creative. There are always a number of options and they’re all good ones as long as eco-balance is achieved.

About the Author

Rick Smith serves as Director of Sales with EasyPro Pond Products and has over 30 years of organizational leadership and sales and marketing experience in the lawn & garden, nursery and water features industries. Water gardening has long been one of Rick’s passions. While enjoying his own ponds and fish, Rick has had a focus on contributing to the enjoyment of other pond owners, as well as the success of business owners, by developing customized business plans and sales support.

Ponds become amazing after dark (top) with lighting. Don’t miss out on the added time of enjoyment. You don’t need huge waterfalls (above) to create points of interest. These waterfalls (bottom) are 10 and 18 inches wide.
If I could go back in time and give myself one piece of advice, here’s what I’d say: “It will all work out in the end.” I’m a firm believer that everything happens for a reason. With over 35 years as a water feature hobbyist, 23 of them as the owner of Aquascape, I’ve experienced a lot — if not the birth of water features in the U.S., then certainly its infancy. I was there during the booming years of 1997 to 2007, when a business I started out of my parents’ garage was recognized four times as one of the top 500 fastest-growing privately held companies. And I was there for the bust years corresponding with the economic crash beginning in 2008.

Through all the highs and all the lows, I can honestly look back and say that every experience was meant to happen and there were lessons in all of them. Not always was that apparent at the time, but without fail I eventually found the lesson in each and every trial. I wonder how much pain and worry I could have avoided if I knew everything would work out in the end? Then again, if I knew then what I know now, I might not have experienced the lessons I needed to! Which, I guess, is why I believe everything happens for a reason.

So it is with much excitement — along with a healthy dose of trepidation — that I look forward to the premiere of our reality TV series, “Pond Stars.” On Sept. 5 Nat Geo Wild will effectively trump all my previous efforts to get the word out about the benefits of the water feature lifestyle when they debut “Pond Stars,” a show chronicling our exploits as water feature contractors. When this show hits the airwaves, it will be over two decades in the making. Nothing would personify Aquascape’s efforts over that time frame more than my almost-maniacal obsession to get the word out there about the joys of decorative water features and the meaningful profession it is for all who choose to pursue it. That drumbeat is about to get louder and more audible than ever before!

Conceiving a Show

In December of 2011, we were contacted by a television production company based in Hollywood. An executive producer there had seen some of the videos that we posted on our YouTube profile, “Aquascape4.” With each video she saw, she became more and more convinced that we could carry our own reality show for a major network. As flattering as her enthusiasm was, I tempered it with the reality that there wasn’t much likelihood that it would actually come to fruition. This wasn’t the first time we had been approached by a “Hollywood” type of firm interested in producing a show to showcase our purported talents. In fact, it was a scenario that occurred multiple times a year. The nature of the business, combined with our own marketing and promotional efforts, exposes us to those whose sole job is to fill the talent pool for networks to choose from.

Before we knew how the game worked — something we are still learning today — our hopes would rise with each opportunity we had to get our message out there to the masses. We even went so far as to produce an entire episode for a show pitched as “The Pond Squad” to various “How-To” networks. It’s been said one
out of 2,500 shows that get pitched makes it to series. And then only 17 percent of those that do get made are successful enough to earn a season two. The journey from concept to reality for our reality show mirrors those numbers. After signing an exclusive representation deal, we heard little to nothing from the production company that was busy pitching our show to various networks. By the time fall rolled around I was frustrated, seeing that our window for shooting projects was closing. Every time I checked in, I was assured by the production company that they understood our concern and told us that things were “hearing up.”

Finally a Bite
In November, I was informed that Animal Planet loved our show concept, which they had seen on a promotional reel the production company had compiled from our footage. Then nothing. On Jan. 4, 2013, I received notice that Animal Planet had picked up our show and had hired a different production company to produce aizzle reel of what an actual episode could look like! In fact, they wanted to send a team to Chicago in a month to shoot our crew in action. I quickly did the math. They wanted to shoot us building a water feature in February… in Chicago! Exactly what I was worried about — exactly what I was afraid would happen — was happening! They were ready to film us doing our thing at a time of year that we aren’t doing our thing!

But a problem is just an opportunity in disguise, which is just the sort of thing we’ve been figuring out since Aquascape’s inception. Snow and a frozen ground might prevent us from building ponds in Chicago in February, but there were parts of the country that weren’t frozen over. The key was to find not just one of those areas, but also someone with an interesting story and the budget to fund it.

CAC Network to the Rescue
Fortunately, we have a North America-wide network of Certified Aquascape Contractors (CACs), including plenty of them located in the South. We tapped into Jason Duffney, who is a landscape architect with a 14-year-old nephew who had built his own pond and whose parents agreed to fund a surprise makeover by the Pond Stars. The concept was agreed upon, and we booked our tickets to travel to Florida the first week of February 2013.

Joining me were my two longest-tenured team members, Ed Beaulieu and Brian Helfrich. Ed, a degreed zoologist and Aquascape’s Chief Sustainability Officer, has been with me since 1993. Brian, Aquascape’s Head of Chicagoland Construction, started working with a production company to land a show. The sun, the stars and the moon...
A Programming Change

Animal Planet passed on our show during the final round of selections. An executive at Animal Planet was quoted as saying, “People dream about pools, not ponds!” They then went out and signed a very talented and eccentric pond designer, Anthony Archer-Wills, and created a show called “Pool Master” that debuted to rave reviews this past June. Anthony’s creations, which we would say qualify more as “recreation ponds” than swimming pools, will undoubtedly further the European trend of naturally designed and filtered bodies of water. As for Pond Stars, we found a new home on Nat Geo Wild. Everything happens for a reason, right? We are extremely honored to be on a network owned by the National Geographic Society. Nat Geo Wild is their fastest-growing channel. For our little niche of an industry to even be mentioned in the same breath as National Geographic is something I couldn’t have imagined in my wildest (pun intended) dreams.

The Long and Winding Road

Not only was the project to land our show long and hard, but filming each episode has been more of the same. If it standardized the construction process, we would never have been able to shoot this series. In total we installed a dozen water features in four states, with the Aquascape home team not seeing the majority of the properties until we showed up. But since every water feature we install is built with the same sequential process, we were confident we could pull it off.

As for how good they looked — well, we will leave that up to the viewers to decide. If they like our work and our show, we will soon need every Certified Aquascape Contractor possible! Not only will we need them as a network for future episodes, but also to handle the increased consumer demand for water features.

35 years from now I will be 79 years old — and God willing, still living the water feature dream. I truly love this industry, which I believe is poised for the next uptick led by the latest wave of reality shows chronicling our unique world. “Pool Master” and “Pond Stars” might be the first of their kind, but I’m believing and hoping more are to follow. This industry, and the work that all of us Pond Guys and Galz do, needs and deserves all the attention it can get. I’m proud of the organization Aquascape has become and excited to see how we will evolve with this continuing, evolving hobby and lifestyle. One thing’s for certain: through it all, it won’t be boring; … and it most certainly will all be worth it!”

About the Author

Also known as The Pond Guy, Greg Wittstock is Founder and CEO of Aquascape Inc., the premier manufacturer in the water features market. Since its inception in 1991, Aquascape Inc. has experienced incredible growth, appearing on Inc. Magazine’s list of 500 Fastest Growing, Privately Held Companies in North America for four years in a row (1999-2002).

The pond that started it all! My first pond I installed in 1982 is still alive and well today. I visit it every year and have a far greater connection to it than the home I grew up in. Not only was it my classroom, but it became my inspiration for my career and those of tens of thousands of others. Millions now enjoy the beauty of water features because of the inspiration that backyard pond provided. No other water feature can come close to making those claims, so by far that’s my favorite water feature of all time!
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Installing aeration is the single most cost-effective way to improve water quality and enhance your water garden experience. The introduction of oxygenated water from the bubbler aerator provides a big boost of benefits to your body of water.

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- Increases oxygen levels to help with decomposing organic material, reducing odors and ferrous minerals
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Aeration and Diffusers
- EasyPro offers several styles of diffusers and airheads. Installing an EasyPro aeration system with a standard air diffuser, air diffuser whirlpool and AirStrat diffuser, means your EasyPro system can handle the most challenging conditions. A wide range of custom sizes are available for custom applications from 2.5 to 200 gallons.

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- Diffused Aeration System Options
- From individual aerators to custom Deluxe aeration systems, we have a wide range of options. Diffused aeration systems are an excellent way to reduce algae, keep water clear, and maintain healthy fish and plants.

Customized Kits for Unique Applications
- Choose an EasyPro aeration kit that meets your needs. Based on your preferences and water body size, an EasyPro kit can be used to support and enhance your water garden. Just choose your size and attach it to your aeration system to maximize oxygenation.

Seasonal Boost: Cold Weather Bacteria
- Cold weather bacteria reduces buildup of decaying leaves and reduces waste in water temperatures as low as 32°F
- Brinefish formula with Brinefish
- A unique way to keep a pond clear and clean. Seasonal boost bacteria is eco-friendly and safe for fish, plants and wildlife. Available exclusively in powder or tablet, and ice in a bag with dry bacteria

Which products will you depend on this fall?
EasyPro has the solutions...
- Pumping some heat, single stage can keep your customers' pond in good shape throughout the winter months. EasyPro has the products to support your customers' water features in any climate.
- Cleansing the Pond. Fall is the best time to clean the pond. Using a product like EasyPro's Seasonal Boost Brinefish will help keep your leaves out of the pond. Great for early and late season feedings.
- Feeding. Fall is the time many customers' ponds will be fed. EasyPro's bulk feeding comes in 25-lb. bags or smaller bags. EasyPro Bulk feeding comes in 25-lb. bags or smaller. Some feed that is easily digested at lower dissolved oxygen levels.

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Feeding koi is probably one of the most enjoyable things to do in our hobby. It’s always an amazing sight to see your swimming jewels rushing to greet you at the edge of the pond with their mouths wide open, begging for a handful of food. But what are we providing our precious pets?

As you may have already noticed, koi will eat almost anything that you offer them. But feeding them poor-quality food will not fulfill their nutritional requirements, so it is important to invest in a good-quality basic pellet food for optimal development, long-term health and good water quality.

With that basic premise established, I would like to introduce you to a wide variety of other foods that we can provide our koi in addition to the regular pellet foods. As the majority of you already know, koi are omnivores, meaning they eat both plant and animal foods. So when the water temperature in our ponds approaches 18 degrees Celsius (or 65 degrees Fahrenheit) we can start providing our koi some of these natural foods ourselves. A few of the natural insects, crustaceans and aquatic creatures that we can give our koi include:

- Mealworms
- Silkworms
- Shrimp
- Earthworms
- Gammarus
- Daphnia
- Tubifex worms
- Bloodworms
- Black mosquito larvae
- Tadpoles
- Clams
- Wax moth larvae

All of these foods are very high in natural protein, oils, minerals and vitamins, which help to build a koi’s natural defense against disease and improve their digestion. They are usually available alive, dried and frozen.

It’s important to note that maggots are not suitable to provide as koi food! Waste created by rotting meat inside the maggots can bring disease-causing bacteria into the koi, along with all its negative consequences.
Don’t Catch It Yourself!

Another very important thing to note is that you should never catch live food in streams or lakes! Some aquatic animals can be harmful because they carry bacteria and viruses. If you want to provide your koi with live food, the safest method is to breed these animals yourself or buy them in a store.

Whole Wheat Bread and Oatmeal Flakes

Oatmeal flakes and whole wheat bread are real delicacies for our koi. They love bread so much that they would gladly eat the entire loaf if you gave it to them! When large koi are present in the pond, their feeding can create quite a spectacle — especially when you put honey on the bread. Some koi can bring almost their entire bodies above the water to get a piece of bread with honey. Why give your koi whole wheat bread? Simple: because it is more healthy than white bread! In whole wheat bread, the whole grain is used, so it still contains most of the vitamins, minerals and dietary fiber. White bread, in contrast, has little of that nutrition, and it has the tendency to expand more in the stomachs of the koi than whole wheat bread does.

Honey

As I mentioned earlier, mixing honey with pasta or spreading it onto a slice of bread is a great technique. This is because honey is a tasty and incredibly healthy product — both for humans and for animals! It contains a high amount of enzymes, antioxidants, minerals, trace elements and vitamins. Raw, unprocessed, locally made honey is unpasteurized and has antimicrobial, anti-inflammatory, anti-fungal and anti-ptic properties. Keep in mind that we are not talking about the clear, amber-colored honey from the grocery store, but rather the milky or cloudy honey from a health food store or local source. If you haven’t tried it, I encourage you to do so. Both you and your koi will love it!

Fruits and Vegetables

Fruits and vegetables are a rich food source full of different fibers, vitamins, trace elements and antioxidants. These substances are very important for your koi’s diet and help keep your koi healthy, vital and happy. Koi love fresh fruits and vegetables such as lettuce and oranges. They enjoy pulling the floating leaves off a head of lettuce and chasing orange pieces around the surface of the water! In fact, feeding your koi oranges can be just as much fun for you as it is for them! Just cut the oranges into quarters and put them in the pond with the skin still attached. The koi will jump for joy, enthusiastically pulling pieces of flesh off the peel. As a bonus, both lettuce and oranges are valuable sources of vitamin C, which is essential for growth, repair of tissues and reproduction.

Other fruits and vegetables that you can provide your koi include beans, peas, carrots, cabbage, radish, garlic, leeks, broccoli, cauliflower, endive, peppers, onions, pineapple, melons, grapefruit, cantaloupe, grapes, apples, pears, mandarins, berries, kiwi, strawberries, bananas and others. Beans, peas and corn are less suitable for the koi because they are very hard to digest. If you want to feed your koi these vegetables anyway, it’s advisable to cook them first.

Complements, Not Replacements

Remember that all the foods we have discussed above are not regular basic koi food — they should be seen as tasty additions to, rather than replacements for, the koi’s normal diet. When feeding your koi these unique foods, alternate the variety and provide it in small amounts rather than every day. Good and healthy koi-keeping starts with a balanced, varied, nutritious diet and the right feeding habits. And healthy koi make for happy owners. So buy some fresh new foods, start expanding your koi’s diet and have fun!

About the Author

Toni Jacobs Lopez is the owner/founder of Yoshino Koi Food and Yoshino Koi Products International located in the Netherlands. He has over 19 years of experience in the koi industry and Japanese garden design. His company specializes in koi foods, water management, high-quality koi, Japanese garden designs and the import/export of koi-related products.

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info@yoshinokoiproducts.com
Periphyton Explained

The Impressive Power of Periphyton

by Meyer Jordan,
Ripples Aquatic Habitats

It is usually green. It is almost always slimy. It is seldom attractive. It is universally cursed and derided by many pond keepers. It is, however, the most important group of organisms in any aquatic ecosystem. It is generally called periphyton.

Although the dictionary defines periphyton as “aquatic organisms, such as certain algae, that live attached to rocks or other surfaces,” there are a bevy of terms that refer to organisms, such as certain algae, that live attached to rocks or clings to stems and leaves of rooted plants or other surfaces, “there are a bevy of terms that refer to organisms, such as certain algae, that live attached to rocks or other surfaces,” there are a bevy of terms that refer to organisms, such as certain algae, that live attached to rocks or clings to stems and leaves of rooted plants or other objects projecting above the bottom without penetrating the surface. Unlike periphyton, it includes not only algae like Chlorophyta, but also diatoms, nematodes, protozoans, bacteria, fungi and myriad other tiny creatures such as tardigrades.

It is only through the examination of these two groups of organisms, both in internal structure and function and the interrelations within and among the two groups, that we can truly understand the importance of these groups to overall water quality. In this article, we will dive (metaphorically speaking) into the first: biofilm.

Part 1: Biofilm

Biofilm is the foundational structure of these combined communities and may vary in thickness from only a few micrometers to several hundred micrometers — from the thickness of a single cell to multiple layers and community groupings.

Perhaps the best definition of biofilm can be found in The American Heritage Science Dictionary:

Biofilm: A complex structure adhering to surfaces that are regularly in contact with water, consisting of colonies of bacteria and usually other microorganisms such as yeasts, fungi, and protozoa that secrete a mucilaginous protective coating in which they are encased. Biofilms can form on solid or liquid surfaces as well as on soft tissue in living organisms, and are typically resistant to conventional methods of disinfection. Dental plaque, the slimy coating that forms on human teeth, is an example of a biofilm.

Microbial communities, predominantly bacteria, encased in a layer of extracellular polymeric substances (EPS).

Biofilms: Pronounced O’F-vooks, this word is German for “growth upon.” Biofilms is the fuzzy, sort of furry-looking, slimy green coating that attaches or clings to stems and leaves of rooted plants or other microorganisms that make up biofilms form the basis for food webs that nourish larger organisms such as insect larvae, which are consumed by fish. Even plants benefit from naturally occurring biofilms.

The instant that the first water contacts any surface of your pond — whether it be liner, rock, filter media, plants, et cetera — biofilm begins to form. Initially, the first surface deposits are transparent exopolymer particles, or TEPs: planktonic organic microgels that are ubiquitous in aqueous environments, which neutralize the electrical charge of the surface that would otherwise repel bacteria and other microorganisms.

This initial layer of organs also serves as a nutrient source. Bacteria then begin to colonize the surface by secreting strands of sticky polymers (extracellular polymeric substances, or EPS), which holds the biofilm together in a structural matrix and secures it to the surface. These polymers also serve to trap nutrients and act as a very strong protective barrier against toxins. As nutrients accumulate, the original bacteria multiply. These offspring bacteria produce their own sticky polymer. Soon a colony of bacteria is established.

According to Susan Borenstein in her 1994 book, “Microbiologically Influenced Corrosion Handbook,” these “other bacteria and fungi become associated with the surface following colonization by the pioneering species over a matter of days.”

Martin Wahl discussed the settling pattern of biofilm in four phases:

1. Surface conditioning or adsorption of dissolved organic compounds where macro-molecules attach to submerged surfaces following a spontaneous physical-chemical process;
2. Primary colonization or bacterial settling following surface conditioning, and, after their colonization, bacteria start to produce EPS; 3. Secondary colonization to bacterial layer and EPS pool by eukaryotic unicellular microorganisms — mainly protozoa, microalgae and cyanobacteria; 4. Settlement of eukaryotic multicellular organisms as a function of nutrient sharing, grazing and predation.

According to Robert G. Wetzel, associated organization from secondary colonization onwards can be designated as “periphyton.” In that way, it could be defined as an advanced successional stage of biofilm. However, there could be a fifth phase:

5. The tertiary colonization, where bacterial plankton colonize on the surfaces of unicellular and filamentous secondary colonizers (e.g. diatom, Oedogonium, et cetera).

The diagram above is based on Steinmand (1992, from Oecologia vol. 91) after Gregory (1980, PhD Oregon State University) and is a good summary of the various growth forms on stones.

The diagram above is based on Steinmand (1992, from Oecologia vol. 91) after Gregory (1980, PhD Oregon State University) and is a good summary of the various growth forms on stones.
Once a certain bacterial population level is reached, a process called “quorum sensing” occurs. Quorum sensing is a cell-to-cell communication through the use of chemical autoinducers that allows populations of bacteria to simultaneously regulate gene expression in response to changes in cell density.

Biofilm is made up of microorganisms and a polymeric web. Interestingly, in a well-established biofilm, most of the volume (between 75 and 95 percent) is the sticky polymer matrix. This matrix holds quite a bit of water and makes the biofilm-covered surface slippery. This is why, especially in bare liner ponds, it is difficult to maintain traction while you are wading in your pond.

A fully developed biofilm is a complex, mutually beneficial community of various microorganisms living in a customized micro-niche. According to Andy Coghlan, author of “Slime City”: “Different species live cheek-by-jowl in slime cities, helping each other to exploit food supplies and to resist antibiotics through neighborly interactions. Toxic waste produced by one species might be hungrily devoured by its neighbor. And by pooling their biochemical resources to build a communal slime city, several species of bacteria, each armed with different enzymes, can break down food supplies that no single species could digest alone. The biofilms are permeated at all levels by a network of channels through which water, bacterial garbage, nutrients, metabolites, and oxygen travel to and fro. Gradients of chemicals and ions between microzones provide the power to shunt the substances around the biofilm.”

A mature biofilm may take anywhere from several hours to several weeks to develop. A fully developed biofilm is able to move water through the entire matrix, supplying nutrients and transporting wastes. Biofilms may be very thin to several inches thick. The biofilms that are usually encountered in an aquatic ecosystem are measured in microinches. A microinch is equal to one millionth of an inch. The congregation of multiple species into biofilm microcosms increases the range of organic and inorganic substances that can be biodegraded.

It’s Everywhere!

Biofilm covers every submerged and constantly wet surface associated with a pond. It is on the rock, liner, plants, skimmer, biofilter and media — it’s even inside of the pump and related piping. The biofilm in one location will be different in makeup than that in another location. Factors such as light, water movement, temperature and availability of nutrients will determine the member microorganisms of each community. The very same parameters that we test for to ensure healthy fish also influence the membership of the biofilm community.

It is within this biofilm that nitrification and denitrification take place along with other chemical and organic conversion processes. Biofilm is the primary source of production in an aquatic system. It is what sustains all higher levels of aquatic life.

In aquatic systems, the biofilm bacterial count per square centimeter of surface has been estimated to be approximately 1,000-fold higher than the corresponding planktonic count per cubic centimeter.

About the Author

Meyer Jordan is the owner of Ripples Aquatic Habitats, crafting life-sustaining water features for 17 years. He is also a lifelong gardener and a self-proclaimed research nerd in all fields related to fresh water ecology, with a focus on microbiology.
A water garden is not a water garden without plants. A pond is not a complete ecosystem without plants, either. Plants are a key element and play an essential role in maintaining good water quality and a healthy, balanced habitat. Choosing the right plant palette for a water garden or pond depends on the goals and primary use of the water body. Careful consideration of these goals should be exercised during plant selection so as to avoid any issues that may arise from an overly aggressive plant — issues that may result in the need for physical removal or, in some cases, the use of an aquatic-approved herbicide. A good planting plan takes into consideration the primary uses of a pond and balances it with the need for aquatic vegetation to achieve a functioning, healthy ecosystem.

Once the objectives and goals have been identified, the first step toward formulating a good planting plan is to observe the site. Inventory existing vegetation; note non-native plants and invasives that need to be addressed as well as desirable native plant populations that can be enhanced. Note the inlet and water source, as well as the outlet structure. Consider the entire watershed of the pond. Special attention should be paid to the primary and secondary sources of water. It is in these areas that plants can be used to slow water down through vegetated swales, trap sediments and aid in nutrient removal before the water reaches the main water body. Look close to notice seasonal high and low water levels based on existing plant growth. Observe the wind patterns of the site, especially on larger ponds and lakes. This will help to identify areas of organic deposition and wave action that may result in erosion issues if the area is not planted. Wind can also be used as a means of seed dispersal as plantings become mature.

**Plant Selection**

The rate of spread is an important characteristic to be familiar with when considering certain species. Speaking simply, aquatic plants can be broken down into two types regarding their rate of spread. The first is "clump-forming," and the other is "colony-forming." Clump-forming plants do as they sound. They will, upon maturity, form large, stationary clumps without running around via roots. Like all plants, however,
they will produce and disperse seed—some more aggressively than others. Colony-formers can be broken down further into two subgroups:

1) Stoloniferous plants — Stoloniferous plants spread by aboveground stems laying horizontal sending roots and new shoots at each internodal section.

2) Rhizomatous plants — Rhizomatous plants spread via modified underground roots called rhizomes that produce roots and shoots to form new plants.

Some colonizers can quickly get out of hand by also producing hundreds of seeds along with their stoloniferous or rhizomatous nature. A good example would be Cattails, or Typha spp.

In general, rhizomatous plants are the workhorses of the aquatic plant world; they cover a lot of ground in a few seasons, form dense mats of growth and help stabilize large areas of shoreline. Aesthetically, large sweeps of texture or blooms can be pleasing to the eye, and functionally, colonies of well-rooted emergent vegetation will provide habitat and cover and will also help to break up wave action and stabilize the pond bank. Clump-forming plants add diversity to large plantings and can be planted en masse to achieve the same results as a large colonizer but maintain a certain controlled planting.

Native Rhizomatous/Stoloniferous Plants for Large Ponds

Acorus americana
Carex aquatilis
Decodon verticillata
Dulichium arundinaceum
Eleocharis palustris
Menyanthes trifoliata
Polygonum amphibium
Pontederia cordata
Sagittaria latifolia
Saururus cernuus
Scirpus tabernontanii
Sparganium eurycarpum
Sparganium americanum

Polygonum hydrophyllotes meanders along a shoreline to soften the edge and provides cover for fish and amphibians. Therefore, if any seeds escape in a storm event, they will only contribute in a positive manner downstream. These plants will also be better-adapted regionally, help maintain diversity of the local gene pool and provide food and cover to the bird and insect population in the area.

At home in the small water garden, cultivars of native plants can be used in conjunction with the straight species to add a little ornamental flair. Some great selections of native aquatic cultivars include:

- Dulichium arundinaceum "Tigress"
- Hydrocotyle ranunculoides "Crystal Ball"
- Orontium aquaticum "Big Red"
- Sagittaria Australis "Bennii"

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Sparganium eurycarpum
Sparganium americanum

Excelent Native Clump-Forming Plants for Every Pond

Carex stricta
Hibiscus moscheutos
Iris fulva
Iris versicolor
Juncus effusus
Orontium aquaticum
Peltandra virginica

Go Native

As a general rule of thumb when considering plants for an earth-bottom pond, nursery-produced local native plants should be used. Therefore, if any seeds escape in a storm event, they will only contribute in a positive manner downstream. These plants will also be better-adapted regionally, help maintain diversity of the local gene pool and provide food and cover to the bird and insect population in the area.

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Excellent Native Clump-Forming Plants for Every Pond

Carex stricta
Hibiscus moscheutos
Iris fulva
Iris versicolor
Juncus effusus
Orontium aquaticum
Peltandra virginica

Go Native

As a general rule of thumb when considering plants for an earth-bottom pond, nursery-produced local native plants should be used.
Getting to know native aquatic plants and their hydrological zonation is key to making the right choice for any pond, but always choose the plants after the primary objective and goals have been set and a complete site analysis has been performed.

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**CIG Update**

**Help Us Define Best Practices!**

An update on the Irrigation Association Water Features & Lake Management Common Interest Group

by Paul Amos
Chair, Irrigation Association Water Features & Lake Management CIG | Founder, Amos Sales Associates Ltd.

Since its launch in May of 2014, the Irrigation Association’s Water Feature & Lake Management Common Interest Group has held two meetings to define the group’s goals and objectives. The primary goal of this group is to provide a forum for stakeholders to develop peer-reviewed best practices for water features and lake management that promote overall industry growth and success.

The CIG has identified six focus areas:

- Lake management, including containment, water quality, human/animal and water-use interface, safety, suggested regulations and guidelines for municipalities, sizing guidelines and decorative water enhancements.
- Disappearing features, including their types, construction and maintenance.
- Water gardens, with a focus on landscape ponds with plants and fish, including design, construction, filtration, edge treatments, fish health and habitat, pump selection and lighting.
- Water features, including design, construction, water flow, treatment and lighting.
- Flora and fauna, including transportation, adaptation, transplanting and transferring, temporary housing and regulations.

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**About the Author**

John Mark Courtney is an award-winning designer, avid bogman and lover of all things wild and natural. For the last 15 years John has been the greenhouse manager for Aquascapes Unlimited Inc. in Pipersville, Pennsylvania. He has grown and nurtured from seed over 100 different genera of native herbaceous wetland perennials for habitat restoration. John has lectured on many topics involving ponds and bogs and has also been featured on Martha Stewart’s television show. John has a Bachelor of Science degree in Environmental Design from Delaware Valley College of Science and Agriculture (class of 1998) and completed an internship program at Bowman’s Hill Wildflower Preserve in 1997. www.aquascapesunlimited.com

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“I have never found anything that works even close to GreenClean. I am sold for life!”

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A nice addition of Menyanthes trifoliata and Peltandra virginica play well together along a planted shoreline.
Swimming ponds.

As the CIG works on defining best practices, members are focused on the following important objectives:

- Considering environmental components to ensure responsible and compliant design and construction.
- Communicating best practices to regulators and policymakers that promote responsible use of water and the benefits of balanced, well-maintained bodies of water.
- Educating irrigation practitioners about this growing field.
- Establishing regular channels of communication to engage interested parties.

Creating best practices is a long process, and the CIG invites all industry professionals to help with this effort. The group will host its first face-to-face meeting at the 2014 Irrigation Show & Education Conference in Phoenix, November 17 through 21. CIG meetings are free and open to all IA members, and no advance registration is required.

To get involved or learn more about this group, contact IA Water Features and Lake Management Chair Paul Amos (paul@amossales.com) or IA Business Development Director Scott Hersh (scotthersh@irrigation.org; 703-536-7080).

In addition to the CIG meeting, the Irrigation Show will include a pond and waterscape pavilion and the International Professional Pond Companies Association’s annual education conference, INFO TANZA. Visit www.irrigationshow.org to learn more and register.

Four main factors in building successful koi ponds are filtration, circulation, aeration and cleaning. In future articles we will discuss each of these in-depth, but initially we should look at how these relate from an overall perspective when designing a system. A koi pond is a decorative wastewater treatment plant that takes care of the needs of the fish by dealing with the fish’s waste in real time. Good filtration, circulation and aeration are what you design into the system for the fish. The ability to easily clean and maintain the system is what you design in for you or your customer.

What is this Pond For?
The first consideration in the design is the purpose of the pond. What is the customer’s intent for the feature? A koi pond has the highest turnover rate and filtration demand and usually needs a turn-over rate of at least once per hour. What is the intended fish load?

What is this Pond Made of?

After the size and volume of the pond you’re building have been established, you can calculate the total flow in pumped water volume necessary to move all the water through filtration in one hour or less. It is important to flow...
can circulate and oxygenate the system. There are other examples, but you must be careful about how much you count on these to do any bioconversion.

**Filtration**

Once you’ve established the total flow rate, you can determine how water will exit from the pond and then determine how it will return. Pre-filtration is the first part of the system. Its job is to remove the heaviest or largest solid wastes from the water column. Pre-filtration protects the pump and biofiltration from heavy solids that cause restrictions and clogging, lowering overall performance. Water can be removed from the pond through skimmers, bottom drains and, in some cases, mid-water drains. Each of these has varying flow rates depending on size and type. Skimmers can be gravity-fed to another pre-filter or direct suction to the pump and vary from 1,500 gallons per hour to 5,000 gph, with the higher flow rates being more hazardous to the fish. Skimmers vary in pre-filtration ability depending on their type. A skimmer’s primary job is to create surface tension, drawing water across the top of the pond to collect floating debris. Some have just a basket or net to trap the larger debris while others have additional ability with the inclusion of pads, matting or other media types that can trap particles. Skimmers with pads, matting or media will do some bioconversion, but I generally do not count them in my calculations because they get serviced more regularly than other components in the design. The cage around a submersible pump and the leaf trap on the intake of an external pump are also primitive forms of pre-filtration.

Bottom drains should never be plumbed as direction suction to a pump. This leaves only the leaf trap on the pump as pre-filtration and a leaf trap does not adequately have the capacity or the particle separation capability required to do the job. A leaf trap’s only job is to protect the pump’s impeller. There are several types of pre-filtration for bottom drain circuits, but the most common form of pre-filtration is gravity flow to a settlement tank with additional particle trapping or separation in the tank. Other types are rotary drum filters, vortexes and floating micro-screens. Some have just a basket or net to trap the larger debris while others have additional ability with the inclusion of pads, matting or other media types that can trap particles. Skimmers with pads, matting or media will do some bioconversion, but I generally do not count them in my calculations because they get serviced more regularly than other components in the design. The cage around a submersible pump and the leaf trap on the intake of an external pump are also primitive forms of pre-filtration.

**Biofiltration**

Biofiltration is where the work gets done. A biofiltration’s job is to provide a protected home for the bacterial colonies, allowing them to expand to a size equivalent to the volume of ammonia produced in real time by the fish. They fall into two basic categories: static-trapping and aerated. Static-trapping filters have two jobs — bioconversion and water polishing or clarity — and they must be sized accordingly. There are many types of trapping filters, but all have a speed limit. If water passes through them too quickly they will do the conversion but they won’t trap very well, leaving particles suspended in the pond, reducing clarity. For open up-flow filters, a good rule of thumb is a maximum flow rate of approximately 630 gph for each square foot of cross-sectional surface area. This, of course, varies based on filter media type and design, but it’s a good place to start.

Aerated biofilters are filters that add oxygen or use air to circulate water within the filter. They come in many styles, from aerated static media to moving beds and shower filters. Aerated biofilters do a huge job of bioconversion because the
bacterial colonies need oxygen, as do the fish, but they won’t do any trapping. While extremely productive in bioconversion, they should not be used by themselves. Aerated biofilters need good pre-filtration in terms of fines trapping because solids and fine particles just pass through them. They must be used in conjunction with a static-trapping filter for good water clarity. For instance, a moving bed can be used in series with an under-gravel system but cannot be used as a stand-alone biofilter for a system with a bottom drain and no pre-filtration. All biofilters should have bottom drains, and some should have upper rinse drains to adequately clean them.

**Aeration**

Most ponds suffer from a low dissolved oxygen content. This is one of the most common problems I see when rebuilding ponds. Bottom drains can be aerated with an external pump, aerated biofilters add oxygen, and some current jets can help oxygenate the system. Aeration tubing can be installed in under-gravel systems and free-standing air domes and air rings can be placed on the pond floor. In recent years I have built a number of ponds that run on air-lift pumping systems that both flow the water through filtration and oxygenate the water column with the same energy. Some have been split systems with part of the water flow created from air-lifts and the rest through conventional pond pumps to power a waterfall filter.

Current jets or returns are an important consideration when designing a pond. Areas of low circulation have poor water quality and create dead zones. Recently I rebuilt a pond and had no way of effectively running water returns to the corners. I built two small air-lifts and installed them into the pond corners. They pulled water from the bottom corner and sent it out over the surface for circulation and oxygen. I used the same 25-liter-per-minute air pump that was being used for the small air dome, so no energy increase was necessary and the pond gets oxygenated all the time.

I incoporating these concepts into the design up front helps ensure a successful project long-term.

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**The Round Table**

by Rick Smith

In part one of “The Five Golden Minutes in Sales,” we took a look at the fact that 7 percent of what we communicate. We learned that tonality accounts for 38 percent of our communications and body language accounts for 55 percent. Each of these three elements provides a library of options to draw upon. The real magic of communication comes from knowing when to use which words, what tonality to apply to them, what body language to add to them — and with whom — in order to truly connect and build trust.

The other half of the communication equation is possessing a working understanding of the four basic personality types. Each personality type addresses communications differently with regards to how they process information, the words they use, the level of emotion expressed, their rate of speech and what makes them reach a decision.

**The Driver Personality** — Focuses on facts and logic, is careful not to commit too quickly and acts only when the payoff is clear. It is important to set an upfront contract (agreed-upon meeting agenda) with an Analytical, or an hour later you might feel you have been going in circles with no concrete decision made.

**The Expressive Personality** — Focuses on sharing of ideas, dreams, feelings and motivation by excitement and enthusiasm. Expressive people are very creative and have the ability to provide a multitude of great ideas with great enthusiasm, although many times they require the assistance of someone who can pull their ideas into a game plan to complete the project.

**The Amiable Personality** — Focuses on being a good listener and communicating trust and confidence. The amiable personality is easygoing and likes things that are non-threatening and friendly. You should provide support to an Amiable by acknowledging that you understand what he or she is sharing and cooperate to achieve agreement.

**The Analytical Personality** — Focuses on facts and logic, is careful not to commit too quickly with details and hard numbers, so be quick and touch lightly on the numbers when you need to. They can also be a little wishy-washy, so plan for extra time, and if you are a good listener, you will become one of their favorites and the relationship will grow.

Keep in mind that like the Expressive personality, they prefer feelings over dealing with details and hard numbers, so be quick and touch lightly on the numbers when you need to. They can also be a little wishy-

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**The Five Golden Minutes in Sales**

Part 2

Interacting with the four communication types

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washy when making a decision, so a good approach at decision time is to take the leadership role by saying, “What if we did this? I am confident that it will provide you with …” and then restating the vision they shared earlier in the conversation.

Assess and Communicate

Now that you understand the different personality types, don’t hesitate to switch to the appropriate communication style when meeting with two or more at a time. Keep in mind that most of us have a blend of at least two communication personalities. For example, one might be amiable, analytical and a driver … but when it’s time to get down to business, “the predominant personality always shows up. Know how to communicate with any or all of them and you’ll find a whole new level of sales success!”

Rick Smith serves as Director of Sales with EasyPro Pond Products and has over 30 years of organizational leadership and sales and marketing experience in the lawn & garden, nursery and water features industries. Water gardening has been one of Rick’s passions. While enjoying his own ponds and fish, Rick has had a focus on contributing to the enjoyment of other pond owners, as well as the success of business owners, by developing customized business plans and sales support.

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by Michael Stone,
Markup & Profit

It’s a basic principle: Cash flows into your construction business when you sell a job. Cash flows out when you pay the costs of the job and your overhead expenses.

If you sell jobs for less than what it costs to build the job and pay your overhead expenses, you’ll get behind. You won’t have enough cash to flow. Pricing your jobs correctly is the first step to positive cash flow in a construction business. It’s easy to do if you know the math. Determine your markup — the markup you need based on your overhead expenses and your profit needs. Apply that markup to your estimated job costs, and use it every time. Now you can rest easy knowing that if you make the sales and if you build your jobs the way you have estimated them, you will always have enough to pay your bills and make a minimum profit on that job.

I’ve championed the cause of 8 percent net profit for many years. I know from long experience that construction companies who consistently price their work to obtain an 8 percent net profit are always able to pay their bills on time. They can pay their suppliers, their subcontractors, their employees, their taxes and themselves. When the bills are paid on time, they are free to focus their time and effort on building a profitable business instead of worrying how to make payroll next Friday. And when a problem happens on a job, they have a cushion to tap if needed.

During the last few years, we have seen more and more contractors cut their

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prices to obtain work. That is foolish mischief at its worst. Think about this: Where will the money come from to pay your bills after you cut the sales price of a given job?

Stop Undercutting Yourself

I recently read a post from a contractor who said he would cut his price up to 10 percent to get the job. OK, if he was pricing jobs to make an 8 percent net profit, he’s now given away all of his profit and 2 percent more that was needed to pay overhead expenses. He will be taking money out of his own pocket to build that job.

“Oh,” you say, “I will make it up on the next one.” Right. I have yet to meet the contractor who will cut his price to get a job and then increase the sales price on subsequent jobs to make up for the loss on the first job. It’s a great theory, but it doesn’t happen. Why do you think it will be easier to get a higher price on the next job to make up for the low price on this one?

Don’t do it. Recognize that when you cut your price, you are putting your company at risk. Spend time polishing your sales presentation instead of worrying about your sales price so you won’t have to cut your prices.

Calculate the markup your construction business needs to apply to all job estimates, and use it without fail. Positive cash flow can only happen if there’s enough cash to flow.

For more on how to calculate your markup, visit www.markupandprofit.com/book.

Michael Stone has used his experience to help thousands of general contractors, new home builders, remodelers and specialty contractors build stronger, more profitable businesses. Michael is the author of “Markup & Profit: A Contractor’s Guide Revisited” and “Profitable Sales, A Contractor’s Guide” and has taught business management, sales and/or estimating classes. Michael also provides coaching and consulting services.

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About the Author
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Eco-friendly Laboratories at City Hall
Michael Richter, Founder and CEO of Ecological Laboratories Inc., manufacturer of Microbe Life hydroponic products, recently gave a press conference at New York City Hall. The press conference was geared to represent businesses who export goods, with the hopes of persuading Congress to renew their contract with EXIM Bank. EXIM Bank supports American business success in the global market.
Trump National Golf Club in Washington, D.C., works with natural products to keep water features clean and attractive. The 36-hole property includes several acres of wetlands and ponds as well as a new 7½-foot tall waterfall. “The waters are maintained with all-natural Bioverse AquaSpheres.”

The property sits on 2½ miles of the Potomac River. Director of Grounds Brad Enie said, “The environment is a priority of ours. Our goal is to create an amazing golfing experience for our members, but we are especially concerned for the environment as we work on our courses and ponds.”

Enie said, “We need hydration to keep everything alive. A healthy pond makes a healthy habitat and healthier irrigation water, which makes for healthier turf.” “In most cases what’s good for the turf is bad for the water on the course,” Bioverse aquatic specialist Ron Slingerman said. AquaSphere microbes also consume nitrogen and phosphorus, denying algae the food sources it would otherwise thrive on.

Slingerman explained, “Instead of chemicals, Bioverse breaks down unwanted material naturally. Whereas chemicals are killers, biological matter digests or consumes what we don’t want in a healthy pond. Bioverse uses organisms in a way that doesn’t disrupt the natural ecosystem.” The property’s ecosystem attracts a great impact of their own on the water system. However, Bioverse products handle fish waste, leaves, duck and geese waste and other organics that might cause dirty or murky water.

Bioverse AquaSphere application is easy. Slingerman said, just toss a ball into the pond. The AquaSphere releases organics that might cause dirty or murky water. The AquaSphere has openings to release organics that might cause dirty or murky water. The sphere is designed to disintegrate naturally in 30 days. These microbes work at the bottom of the pond, reducing the sludge layer from 10 to 20 percent a year. The sphere is a biodegradable corn product weighted with sand, so everything entering the pond is natural.

For more information contact:
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