

The Inland Koi Connection

THE OFFICIAL NEWSLETTER OF IKS • ISSUE 288 • OCTOBER 2022



Sunday, October 23 Potluck Meeting Hosted by John & Cricket Mouw ~ 2-5pm 16187 Porter Ave., Riverside 92504 ~ 951.398.9139

We will visit John & Cricket Mouw this month. They have recently completed a number of projects around their home — all delayed by the last few years of COVID restrictions — and are looking forward soon to building a new pond, above ground and larger than their present pond.

We will also welcome a guest speaker, *Paul Palacios*, who will discuss “Pond Automation.” *Paul & Angel Palacios* joined IKS in February this year; their pond, now over a year old, is a 6500-gallon concrete construction. Paul would admit in February that he was still on the learning curve to being comfortable and confident with what he has; now he’s ready to offer us some new technology for ponds. He works in pool construction and does a lot with artificial intelligence. If I understand correctly, he’s been working on ways to program or manage your pond remotely. Should be a most intriguing discussion.... (to pg.3)



Directions to the Mouw’s:

- **FROM THE NORTH OR SOUTH, ON I-215**, exit at Van Buren [March Air Base is on east side of the 215] and head West.
 - * Go 5.2 miles, turn right on Porter Ave. [at Louie’s Nursery].
 - * It’s one block on the left [past Sandy Terrace on the right]; the Mouw’s is the SW corner house, on the left at Sage Ave.Park on either side of Porter or Sage.
- **FROM POINTS WEST ON THE CA-91**, use exit 58 to Van Buren: turn left on to Indiana and then right onto Van Buren south.
 - * Go 5.9 miles, turn left on Porter Ave. [at Louie’s Nursery].
 - * One block on left, as above; park on the street.

NOTES FROM IKS BOARD MEETINGS

- **The IKS Board** met this month at the Milfelds' for dinner and planning. In the Kushners' absence, Rob Fales and Brenda Aker shared leading the meeting.
- **Meetings:** Brenda reported that we have hosts for October and November, and as usual we will not meet in December. She still needs hosts for the new year; in January we might follow our somewhat tradition of meeting in the Leveretts' garage in case of inclement weather. Contact Brenda Aker to offer your pond for a visit.
- **Treasury:** The board is studying options for purchasing a shipping container for storing club equipment instead of paying monthly for a storage unit — we have a place to house it if one is found — or for another storage site.
- **Rescue:** There have been no recent rescues, but Ed still has about 20 QT koi available for purchase, \$50-\$200 depending on size and quality...less than retail! Contact Ed Kushner—he's home again.
- **Koi Auction:** We will revisit this in January to decide if and when we can hold what may be our last Auction at the Riverside location.
- **Elections:** After three years with no changes in the makeup of the Board, an election is important: we need/want to get some new people involved in the planning of club activities. And we have some who need/want to retire — have tried to retire — but no one will replace them.
- **Website:** The IKS website needs a local webmaster. Is there anyone who has experience maintaining a site? Needs monthly postings....

10/2	IKS BOARD MTG ~ 5:30pm / Host <i>Nick & Peggy Milfeld,</i>
10/23	Potluck Mtg ~ 2-5pm ~ Hosts <i>John & Cricket Mouw,</i> 16187 Porter Ave., Riverside 92504 ~ 951.776.8323 ~ Speaker: <i>Paul Palacios,</i> Pond Automation
11/6	IKS BOARD MTG ~ 5:30pm / Host <i>Scott Zehm,</i> 6726 Dove Lane, Riverside 92506 ~ 951.237.2508 <i>Interested members are welcome: call ahead to confirm.</i>
11/20	Potluck Mtg ~ 2-5pm ~ Hosts <i>Jerry & Pat Mall,</i> 43024 Via Las Rocas, Temecula 92590 ~ 951.506.4814 ~ IKS Annual Thanksgiving Feast.
12/4	IKS Board Mtg ~ 5:30pm ~ Hosted by Theo Zoetemelk, 1407 Second St., Norco 92860 ~ 951.735.9896 <i>Interested members are welcome: call ahead to confirm.</i>
1/22 2023	<i>HAPPY NEW YEAR!</i> Potluck Mtg ~ 2-5pm ~ Traditionally hosted by Larry & Debby Leverett in Riverside. We'll see.

Welcome to our Newest Members ~ look for unfamiliar faces and greet them!

- Eric, Wyatt Rice ~ Charlene Peters (4/22)**
- Paul & Angel Palacios (2/22)**
- Howard & Kimberly Newton (12/21)**
- Richard & Janna Grushen (10/21)**
- Raymond Aguilar (9/21)**
- David & Belinda San Jose (9/21)**
- Jason & Kristine Zara (9/21)**
- Look for these members & welcome them back:***
- John & Cricket Mouw ~ Riverside**
- Chuck & Ping Hille ~ Riverside**

Missing a badge? The last order of original style badges was received 4 March 2020. The following badges are at the registration table:

- Armand & Eve Blais***
- Ben Israel***
- Jerry & Pat Mall***
- Kelly McHan***
- Frank Painter***

2021 OFFICERS & DIRECTORS

Officers

- Ed Kushner, President** 951.520.0092
Koi Re-Homing ~ Web Liaison
- Brenda Aker, V.P.** 951.316.0263
Meeting Sites & Speakers
- Monica Dirac, Secretary** 909.887.7497
- Nick Milfeld, Treasurer** 951.780.7395
Membership
- Peggy Milfeld, Editor** 951.780.7395

Directors

- Rob & Deanna Fales** 951.279.0181
Raffles ~ Koi Re-Homing
- Larry Leverett** 951.781.3887
Properties Manager
- Linda Kushner** 951.520.0092
- Alvin Watson** 951.764.6387
- Scott Zehm** 951.237.2508
- Theo Zoetemelk** 951.735.9896
Buffet & Banquet Supplies

It was July 2019 that we first visited *John & Cricket Mouw's* home. It was fun checking out everything on their mini ranch. They had horse corrals, and a donkey and pig, a kiddie pool of ducks, and...it was like a visit to a petting zoo. They also had a lovely little pond, a fun story.

As mentioned on the first page, in the years since — and dragging on, delay after delay, through the Covid years — they have been doing a lot of renovation projects around the house. Those finished, they are finally ready to build a new and bigger pond: constructed of concrete and mostly above ground, four feet deep and 20 feet wide.

To that end, they have collected some of the necessary equipment. Needing more filtration in their little pond, they picked up a huge waterfall filter — they want to use an 8-ft high back wall with a waterfall as a privacy wall — and left it freestanding by the small pond. It serves its purpose there, even if it doesn't look right temporarily.

Cricket hand-dug her first pond for a 50-gallon horse trough, added a *Home Depot* box filter and pump and filled it with “boogly-eyed potbelly goldfish, which were soon plate size, white and orange flowing fins shimmering in the water.” Soon they disappeared, carried off by a heron.

John dug the next pond, a 6' x 11' hole, 4' deep. They used a rubber liner, and again from *Home Depot*, a Tetra canister bio filter, and a submersible pump, and surrounded it with rocks. Their new fish grew so large that they needed a bigger, better filter and pump. From *Mystic Koi* they purchased a Laguna submersible MaxFlow 2,000 and a new Laguna bio filter and air pump, which have worked well until recently when they added the bigger temporary filter.

The moral of their story, as shared by Cricket, is to make sure that your hole is deep enough, you have a cover over your pond, and you have proper filtration.

Have fun with the hobby, but join a koi club and learn all the things *not* to do. In other words, learn the old mantra of IKS, “*Build your last pond first!*”

Cricket has shared that there are a few little piglets at their *ranch* now that need homes. She had gone to the animal shelter and found a number of “livestock” animals rescued from someone. Problem is, the shelter “doesn't get involved with” livestock, so a mama pig and five piglets, and dad, desperately needed a home. Without care the sow was in a naturally self-imposed starvation/-dehydration. Cricket brought them home; she fed the sow three bottles of Aunt Jemima syrup to bring her back. Then she had the piglets and the male spayed and neutered: they have to be fixed before they reach 30 pounds, and at eight weeks a pig can be inseminated! She wanted to fix the sow too, but found that she was already pregnant again. Amazing creatures!



If anyone is interested in having a pig, Cricket will let them go for the price of their surgery, \$120 for the males (2) or \$150 for the female, certificate included.

We look forward to seeing more of you this month and having a good time at the Mouws'. Remember yur chairs, something for the buffet table, and make sure you sign up for the Thanksgiving Feast in November.

ELECTIONS 2022 ~ IS IT YOUR TURN??

Elections should take place at the November meeting to fill the **2023 term**. Consider carefully what you want out of IKS and whether you can give a few extra hours a month to help keep us moving forward with success.

Taking an office means adding a two-hour Board Meeting on a Sunday night to your schedule.

Don't be afraid of the idea of becoming President: we've got that one covered! Otherwise it's a one-year term (*a second is ok*) keeping the Board Meetings running smoothly, emceeding Regular Meetings (*polishing your public speaking persona*), and working with all the other crazies on the board.

Secretary (*takes minutes at the meetings*).

Treasurer pays the bills, reports to the board.

Editor gets to practice creative writing...must enjoy the computer, but does NOT have to keep the format.

Directors (*help make decisions for the club*) are elected for two-year terms. A couple can do it together and make it a monthly night out with good koi friends!

Questions? Call *Ed*, *Larry* or *Scott* and ask away! It's a small commitment to a great club.



Having issues with your koi? Check your water quality. If your parameters are not within range, it's time for a water change. Always use a liquid-based test kit purchased within the last year. If parameters are within

Parameter	Range
Ammonia	<= 0.1 mg/L
Nitrite	0 mg/L
Nitrate	<80 mg/L
pH	6.5 - 9.0
kH	>100 mg/L
gH	>100 mg/L
Temperature	Seasonal

range, how many fish are affected? Just one or more than one? If only one is affected, move it to your quarantine system. You should keep a QT set up and ready for use.

Sign up for Our Thanksgiving Feast

Sunday, 20 November ~ 2 - 5 PM

It has become a tradition to celebrate the end of the year together with a Thanksgiving Feast with all the trimmings. IKS provides the turkey, the Malls provide a beautiful place to gather, and we potluck the rest of the menu, sharing old family favorites or trying out new recipes before we serve them to our families. And we take reservations so we'll know how much meat to buy and how many tables to set.

There will be a sign-up list on the registration table at this month's meeting, or you can call the Milfelds at 951.780.7395 to leave a message of name, number of mouths, and your menu choice; Or text to PeggyMilfeld@inlandkoiociety.org.

**DEADLINE TO CALL
MONDAY EVENING, NOV. 14**

The options and sign-ups so far are listed here:

- *Stuffing or Potatoes ~ mashed, yams, cheesy....*
Leverett-Mashed Potatoes;
- *Vegetable Dishes ~ all the family favorites....*
B Henry-Butternut Soup; Wolf-Corn Casserole
- *Salads, any kind ~ green, fruit, molded....*
Milfeld-Applesauce;
- *Muffins, Rolls, Breads....*
???-
- *Desserts, any kind and all the favorites!*
???-Pecan Pie; Mouw-Cookies; Aker-???
- *Other Items, including Appetizers....*
Mall~Turkey & Gravy; ??~-

Members signed up last meeting: (22)

Aker	1	B Henry	1	Kushner	2
Leverett	2	Milfeld	2	Mouw	3
Poyle	2	Wolf	4	Zoetemelk	5

If you signed up for a menu item but didn't put your name with it, please add your name to the list at this month's meeting. The list will be updated and printed in the November Newsletter. ~Thanks!

Attendance at our September meeting was unexpectedly low. Perhaps it was the heat, although the hills of Yucaipa were noticeably cooler than most of our homes that week, and the *Nyiradys'* yard, overshadowed by great trees as it is, was decidedly so. Even with only 23 of us, including two neighbors who have a two-year-old pond and the Nyiradys' dog, Shelby the Sheltie (an unapologetic beggar), there was sufficient food on the table (always a fear of our gang). We were thrilled to see Patricia Hurley, who only gets to meetings held close to her home, which is just down the road from Steve & Laura.

I had a rare opportunity to explore before the meeting to get pictures with no people in them. My first stop was at the ponds; there are three separate systems, but it's not obvious in any way. From the east side of the house the 45-foot stream, unfiltered, recirculates as it flows under two bridges toward the koi ponds, making a great place for water lilies to thrive.

The ponds appear as one, but are not, a good design if you wanted to segregate the koi to prevent any spawning. That's not the case: they spawned for the first time ever in Spring 2021. Varying counters spotted five to nine 8" to 10" koi, and they're beautiful. **Ed & Linda Kushner** were with us this month. Ed looked good but thinner; he still has more out-patient treatments in Duarte to look forward to.

After lunch, Steve explained the changes in the years since we've visited here... •The addition of solar: 60% of electricity is used by the ponds; the balance by the two houses. If you over-generate, Edison gives you credit; in the first two years they had a \$1200 credit banked, but when they asked to cash it in, they got \$50! •Automatic feeders: they got tired of asking each other if the koi had been fed so they invested in two *FishMate** feeders, one for each pond, at \$100 each. Both were knocked into the water, destroying the food inside. Twice! Steve finally rigged a pulley system and suspended the feeders in green camouflaged buckets; he only fills them with a weeks worth of food because of the weight. •Fine-tuning the filtration — a 6-year experiment/study to get it just right.



Our speaker was **Don Fredricks**, one of Monica Dirac's neighbors. Don has worked a lot with 3rd world countries such as Romania, Ukraine, Lebanon, Philippines, Uganda through *Communities of Hope*, where he teaches locals to farm veggies and fish for the sustenance of families and whole villages. Tilapia is the base fish — a protein source — but he has also adapted such systems to koi. Aquaponics is a sustaining and income-producing project which can be run by a couple

Hydroponics and **Aquaponics** are often confused. The former grows food in water in a sterile environment; it requires adding a nutrient/fertilizer solution to the water. The latter grows food in water naturally fertilized by fish which area usually being raised for food. Another term has joined our language: *fertigation*, which is recycling pond waste water to irrigate yards, vegetable gardens and other crops.



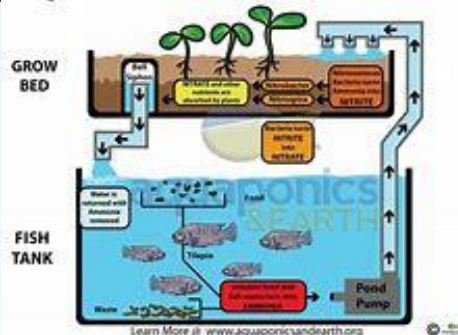
The advantages of this system, illustrated below, are many: •It uses a fraction (10-20%) of water used by soil gardening. •Two foods can be raised together, fish and veggies. •There are no soil-borne diseases. •No pesticides or herbicides. •High fish stocking. •No waste. •Food security. •Works in poor soil conditions....



There are disadvantages, too: •Initial start-up costs. •Need knowledge of fish and plant production for success. •Need to plan based on environment. •Needs daily management. •Electrical energy demands. •Cannot provide a complete diet.

Interested? Look for the definitive book on aquaponics by Nelson & Poole. 🐟

AQUAPONICS BASIC DIAGRAM



* *Fish Mate* feeder, 30-cup, battery operated programmable for 1-3x a day, amount controlled. Currently on sale at Chewy.com

Last month's article on *Anoxic Filtration* certainly roused interest by promising so many benefits; however, there were no explanations of what it is or how it works, much less how to achieve the touted results. I hope this will help.... ~Ed.

"I'm a DIY'er. I have a 14,000-gallon koi pond with three 100-gallon anoxic filtration tanks..."

That's where the original article started. But what are those tanks? The DIY instructions: "Take a planting basket and fill it with cat litter; scoop out a depression from the center and fill that depression with an aquarium plant fertilizer called *laterite*. Put a plant in the basket if you wish, but it isn't necessary...."

That is the inexpensive way to make a **biocenosis basket**, but most koi keepers are not using the **anoxic filtration system** it represents. It's rare to find a koi keeper who really understands what anoxic filtration actually is, what it does, and how it works, perhaps because even discussing it introduces — or requires — a new and intimidating vocabulary. *Laterite*? *Biocenosis basket*? Doesn't **anoxic** have something to do with anaerobic sludge full of harmful bacteria?

- **Laterite** is a clay-based material rich in iron; used in tropical fish tanks as a plant fertilizer, it can be brought at a tropical fish store.

- **Biocenosis** is a scientific term for a place where different biological processes take place, each process being of mutual benefit to the other processes.

- **Anoxic** is not the same as **anaerobic**, which is a complete **absence of oxygen**. In an anoxic situation, there is oxygen present but it is at a very low level. In a biocenosis basket there is always a **low level of oxygen**, typically between **0.5 mg/L and 2 mg/L**. This low O₂ level is the key factor that will influence a situation where anoxic filtration can occur: an extremely low level of oxygen is crucial to the system.

Let's consider our ponds: The **minimum acceptable oxygen level** in a koi pond is **6 mg/L**, although **7 mg/L** is **more often recommended** as a safer minimum. You see the difference. Let's see if I can contrast how these two systems work — conventional filtration vs. anoxic — by testing my understanding of how biological filters actually work.

CONVENTIONAL BIOLOGICAL FILTRATION

Koi continuously excrete ammonia which is toxic to them; it has to be removed from the pond water before it can cause them harm. A well-designed conventional biological filter system will take this ammonia and convert it, first into **nitrite** and then into **nitrate**, by a process called the **nitrogen cycle**. Having made this conversion of ammonia into nitrate, our conventional biological filter's work is done. No other biological action is made to remove the nitrate, so the level of nitrate in the water slowly rises. This is a disadvantage of conventional biofilter systems.

Nitrate is not as toxic to koi as either ammonia or nitrite, but that doesn't mean it doesn't affect them. Anecdotal evidence shows that koi kept in low-nitrate ponds show better growth and color development than those kept in a pond where the nitrate level has been allowed to rise.

Besides affecting fish, nitrate affects all types of algae. Nitrate is a plant fertilizer, and rising levels will encourage growth. Water changes will help, but not much: even after a 10% water change, the nitrate level will still be 90% of the original value and, as more ammonia is converted, the nitrate level will soon begin rising again. That is a problem....

A second problem with some conventional biological systems is that the biological media can become anaerobic (no oxygen at all). This will not occur with moving media, but where the media is static, water flowing through it carries suspended particulate matter as it passes through. This will settle within the media and, over time, can cause it to block.

Water flowing through media carries oxygen to the bacteria living in it. As the flow through a particular area is reduced, the bacteria will find less and less O₂ in their environment. The ammonia-oxidizing bacteria will have been using a great deal of oxygen to convert the ammonia NH₃ to nitrite NO₂ and then to nitrate NO₃. As the media becomes clogged, they will find that they no longer have the oxygen available to carry on this process.

Bacteria need oxygen and normally take what they need directly from the water surrounding them in the biological filter. But if there is no oxygen in that water — if the media has become clogged — some bacteria have another way to get it: they take it from nitrate.

Some bacteria can live in anaerobic areas of the biological filter, and they will rapidly colonize those clogged areas, robbing oxygen from the nitrate their cousins are producing, and effectively reversing the nitrogen cycle. This results in nitrate being converted back to ammonia again before it leaves the filter to return to the pond.

This is what happens in many filter systems that are not maintained, where the biological media is not regularly cleaned. “Bad” bacteria, thriving on O₂-deprivation, can undo the good done by bacteria in oxygen-rich areas.

ANOXIC FILTRATION

The anoxic system was designed and has been developed over many years by Dr. Kevin Novak, PhD; it addresses both problems described in conventional filtration.

Anoxic systems don’t rely on converting ammonia to nitrite and then into nitrate. With the anoxic system, ammonia is either converted directly to nitrogen gas (more correctly called di-nitrogen) by bacterial action in the unplanted baskets, or it is taken up by plant roots in baskets that also contain plants.

Remember where we started, with *anoxic filtration tanks* or *biocenosis baskets*...?

It is well known that plants “like” nitrate as one of their nutrients. What is less well known is that plants actually “prefer” ammonia as a nutrient instead, and will take it directly from pond water if it can be presented to their roots in the correct way. Without getting too scientific, let’s just accept that ammonia molecules are attracted into those *baskets* by the negative electrical charges that exist within it.

...less well known is that plants actually “prefer” ammonia as a nutrient....

Another important feature to understand is that only the ammonia molecules are drawn into *biocenosis baskets*. Obviously, water floods into them when they are immersed, but after that, water doesn’t actually need to flow through them in order to filter out ammonia. The electrical charges in the center of the basket only draws in ammonia molecules; it doesn’t draw in water

molecules. This directly addresses the second problem that can happen with some static types of conventional filter media – that suspended particulates can clog the media and make it become anaerobic.

Critics who haven’t bothered to understand how the anoxic system works, often wrongly describe it as a “bog filter, full of nasty anaerobic bacteria”. They warn that the baskets are a breeding ground for parasitic bugs that can then spread to your fish.

On the contrary, *biocenosis baskets* cannot clog because, if no water flows through them, there is no way debris can get inside. On the other hand, if water flowing through conventional media doesn’t have every bit of debris filtered out of it, there will always be the risk that sludge will settle inside and block the media. Far from a *biocenosis basket* being a “bog filter”, it’s more likely that the label could be applied to a conventional system that hasn’t been kept sufficiently clean.

THE ANOXIC FILTRATION SYSTEM

Figure 1 shows a typical anoxic filtration pond without the plants. It’s a simple shallow pond, around 24" deep, with water being pumped into one end and overflowing by gravity back into the main pond at the other end. This anoxic pond contains 22 *biocenosis baskets*. Small pebbles on top of the baskets prevent the cat litter inside from being disturbed by the water flowing past them, which would cause it to float away.



Figure 1: Typical anoxic pond without plants

~continued on page 8→

Figure 2 shows how the entire anoxic filtration system can be “hidden in plain sight.” The anoxic pond looks like a water garden, not a filter, and yet everything except the pump in the main pond can be clearly seen. For those who don’t like pump-fed systems, the anoxic pond can be gravity-fed from a bottom drain. Build it at the same level as a conventional gravity-fed system and use a submersible pump or external dry-mounted pump to move water from the anoxic pond back into the main pond. Your ingenuity is the only limit to how the system is built or adapted.



Figure 2: Entire filter system hidden in plain sight. The top pond is actually the anoxic

filter.

There are few hard and fast rules as to how to make biocenosis baskets:

- The *baskets* need open lattice-type sides to allow ammonia to be drawn in through them. Apart from that, any basket about 30cmx30cm x20cm (12x12x8") deep will do.

- Use *cat litter* that is granular, unscented and “non-clumping” type, which should retain its granular structure when wet.

- Laterite* can be found at tropical fish outlets or online in 1.6 kg packets.

Biocenosis baskets require very little maintenance because the life of the cat litter is indefinite and the laterite is only very slowly depleted by plants

Photosynthesis is the plant process that makes energy from sunlight; a green pigment called chlorophyll is essential for this process. Plants need iron to make

chlorophyll, so if there is a plant in the biocenosis basket, the iron in the laterite will become exhausted after about ten years and you’ll have to add more laterite or remake the basket. Ahh...Maintenance schedule — every ten years!

Let’s return to the original author’s description of his

“I’m a DIY’er. I have a 14,000-gallon koi pond with three 100-gallon ANOXIC FILTRATION tanks, two former shower filters that have been converted to ANOXIC and four 50-gallon Kaldness moving beds that will be converted to ANOXIC by the end of this month. So soon I will have 100% ANOXIC for all my biological filtration.”

pond system:

As I tried to picture this set-up in my mind, I realized had options. On one hand, I pictured our pond (12,000-gallon) surrounded by nine “baskets” all flowing into the pond from different locations. To be honest, it sounded rather unsightly.

On the other hand, I could see our pond, dedicated to koi only (and the requisite mosquito fish!) bordered by boulders, waterfalls, and multiple planter beds full of groundcover, flowers and bushes—none of them water plants. There was a time when we had beautiful water lilies spread across the water surface, but then there was a spawning, several years in a row, and the lilies were ravaged repeatedly and finally sacrificed. So I imagined those planters being converted to “biocenosis baskets” planted with wonderful arrays of water plants that we cannot now have, and flowing into the pond from various levels.... That seemed a lovely landscape aesthetic, and if it also produced all those benefits claimed by the original article’s author, perhaps it would be a doable upgrade. Who knows; but I doubt it will be done by our hands.

If this has helped clarify the Anoxic Filtration system in your mind, I’m pleased. If there’s feedback showing an interest in “Part 2”, I will tackle that next month. It would describe how to build the anoxic filtration system, and how ammonia can be drawn into a basket and destroyed without leaving nitrate to build up in the pond. Let me know....



Koi Organisation International
Current Accurate Useful

October 2022

Get a Scholarship to Become a Certified Koi Keeper (CKK)

Don't miss this chance to learn. Your koi will thank you!

10 Scholarships Available First come, First served

- Limited time to apply
- On-line Signup
- November 1 – 15
- K.O.I. giving 10 Scholarships



What you need to know

- Application available November 1 - 15
- Requires upfront fee of \$100
- Will be refunded upon CKK certification (Yes, you can do this!)
- Click [HERE](#) For more information



Elizabeth Eagleson
New CKK graduate Indiana

www.KoiOrganisationInternational.org

November Pondsides Koi Nutrition

Syd Mitchell via ZOOM

November 12, 2022, noon EST



TIP OF THE MONTH

Don't Go Down Aeromonas Alley

- Aeromonas bacteria not active below 4.4°C (40°F)
- Peak Aeromonas activity at 15.6°C (60°F)
- Koi not active when Aeromonas not active
- Transition from 60°F to 40°F as rapidly as practical
- Read this month's article to learn more about Aeromonas Alley

[The Science Behind Cold Water and Koi Ponds](#)

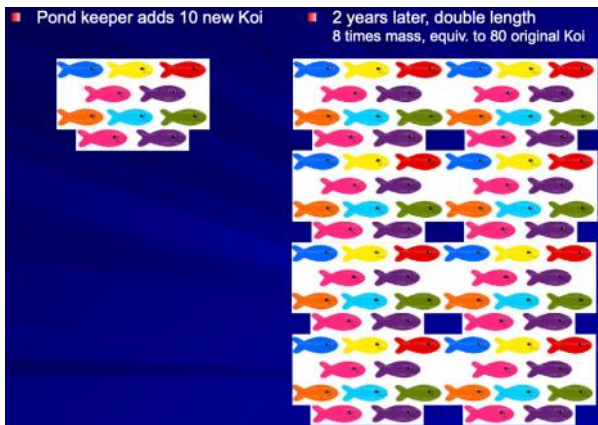


If you're new to koi keeping, it's easy to get excited about buying your first koi. Experienced koi keepers know how many fish their pond can handle based on their *goals, pond size* and *filtration set-up*. But if you are just starting out in the koi hobby, you need to know what an appropriate "fish load" for your size pond. And unless you are planning to show your fish in competitions, you can use a hobbyist rule of 250 US gallons per koi. This approach is derived from the S.A.F.E pond limits :

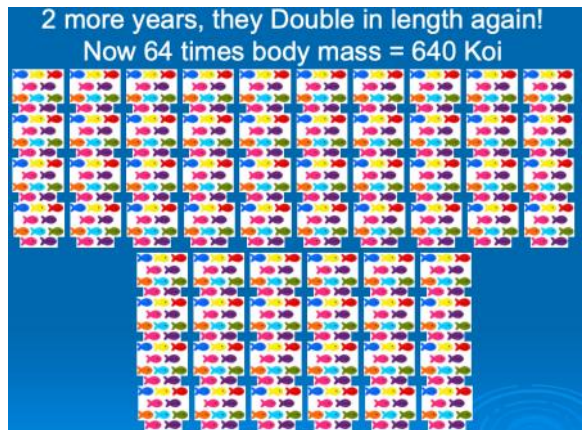
- Safe gallons of water for every linear inch of fish
- Aeration capability
- Flow rate
- Emergency capacity for life support.*

The first step is to know the volume of your pond, or how many gallons of water it holds. Let's say your pond holds 1,800 gallons. If you apply the rule of 250 US gallons per koi, it equates 7.2 fish.

That doesn't sound like a lot of fish and it's tempting to buy more than seven. But koi grow, and they can grow fast. To put it in perspective, if you buy 10 little 5" koi, two years later when they hit 10", it's like you put 80 of the original 5" koi in the pond. Yes, you read that right. Those original ten koi now use eighty times the oxygen and put out eight times the ammonia they did just two years ago. Picture it this way:



But it gets worse. If those original 10 fish make it to 20" in length, it's like you originally stocked with 640 fish! You'll find yourself fighting to keep the water quality up and the parasite load down. The next picture show the (frightening) impact:



Koi can easily grow to 25" and 250 US gallons per koi allows for the future growth shown above. Some fish may not reach that length, and some may grow bigger, so it provides a safe limit for the average koi keeper. Koi keepers who are raising koi for competitions will allocate more water, up to 500 or even 1,000 gallons per fish, and heavily increase their filtration equipment to provide better grow-out conditions for prize koi.

So instead of overstocking at the beginning, here's a better way to build your collection:

- Start with the "250 US gallons per fish" rule
- Establish your maximum number of koi
- Buy less than the maximum to start
- Consider buying fewer koi initially, for example 9-10" rather than 5-6" ones
- Think ahead to what variety of koi (colors and patterns) you like
 - Do you want a mix of varieties?
 - Or do you love just one or two types?
 - How do they look together?
- As you gain experience, add additional fish over the next year or so to reach your maximum.

Size: Large koi are truly "living jewels." You need less fish to make an impact. Rather than waiting two to three years to grow out fish, consider purchasing fewer fish in the 9-10" range to start. In a year they will be 15-16" fish and your pond will hum with their activities. show up best against my black liner.

Continued on page 11

Continued from page 10...

Varieties: Before I learned about the limits of my pond, I added varieties of koi that were less colorful. Over time I've learned that "bright, white and sparkling" show up best against my black liner.



Solid or patterned koi -- yellow *Kigo* and *Hariwakes* and red, white and black *Sankes* – provide wonderful swirls of color and light as they roam the pond. Several are *Gin Rins* with sparkling scales.

I love *Ochiba Shigure* and *Chagoi* koi. They are beautiful and super friendly, but their grey or brown coloration just doesn't show well against the black liner of my pond.

And beware of "free fish." One *free-with-purchase fish* that an online dealer sent was an ugly (to me) blunt-nosed fluorescent orange koi. Fortunately, my neighbor loved him, so now he lives next door.

Numbers: Fewer fish are easier to care for and to account for. When my pond held 13, I was always triple counting to see who was missing. With nine, it's easy to confirm all is well. The fish are much calmer. There's less competition for food and space. They are less stressed, and the smaller ones are now growing faster.

Now you notice I said I have nine. That's two more than I should have in my 1,800-gallon pond. I initially overstocked and had 13, but I was able to rehome four of them. It's breaking my heart that I need to rehome two more. And that's the best reason not to overstock in the first place.

*RE Emergency capacity for life support:
For more information, see "Koi Overcrowding" by Karen Pattist at <https://koiorganisationinternational.org/koi-articles/overcrowding-koi>

Article by Sue Kingston, Certified Koi Keeper
Washington Koi & Water Garden Society

Source: *Koi Organisation International ~ K.O.I.*

Feeding Koi Into Fall

Everyone knows water temperature plays a big role in how active koi are, but a koi's metabolism and ability to digest foods are also affected. It's critical that as temps drop with approaching winter -- or increase with the onset of summer -- that you feed your koi the right amounts and at the right time. To illustrate, consider...

~ Feeding Less

Giving your fish less food is a good idea, especially as water temperatures start to drop. This will cause them to produce less waste, which will help in maintaining good water quality, and slow down their digestive systems. Fish naturally do this on their own: they will eat less food as temperatures decrease because the cooler water will slow their metabolism.

~ Changing Food

Current thinking is that you *should not* change the koi food (to wheat germ or anything else) at all. Use one premium koi food with the correct protein content such that it address the nutritional needs of the koi, and then simply vary the amount of it that is fed according to water temperature.

Everything koi do is based on water temps, and in nature it's not so much that there is a totally different food source available over the seasons, just that the amount of food available changes.

It has also now become accepted to feed the koi a pellet or two whenever they ask for it over the Winter — even in CT where ponds are so cold they can freeze over! Koi will come close to the surface and look for food every once in a while, and they will take a pellet or two, even in very cold temps. Don't ignore them or quit visiting our pond just because it's cold outside.

~ Up the Veggies

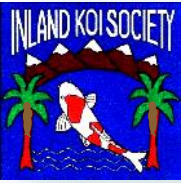
Even in the Fall, you can give your fish treats. Share some healthy vegetables, like carrots, pumpkin or peas. They'll provide important nutrients while being gentle on their system.

~ 50-Degree Mark

When water temps consistently read below 50°F on the pond thermometer, many koi keepers stop feeding for Winter; others only reduce the amount of food given. They won't starve; they feed on the algae if nothing else is offered. They will also live off fat reserves added over Summer. By Spring, they'll look fresher and healthier than ever.

~ Cooler Temps, Slowing Systems

Fish, including the koi in your pond, are *poikilothermic*, which is a fancy term for "cold-blooded." Their internal temperature varies with the ambient external temperature. So in Winter, when the pond water cools, the body temperatures of your fish cool, too. And with that dip in body temperature comes a reduced need for nutrients.



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