Photo by Catherine Peterson

understanding the hobby of keeping fish

tales from the FIELD

We had a customer who was a real koi fanatic. I mean, he had some real expensive fish and he babied 'em. They were his kids for all practical purposes. He always did his own spring clean out, because he wanted to be the one to handle his fish. He just didn't trust anyone else to do the job right.

Then one spring he was too busy to do the clean out, so he called us to take care of it for him. We scheduled a day to get it done, and as we got close to emptying the pond, the guy showed up to "see how we were doing."

We Were Doing Just Fine

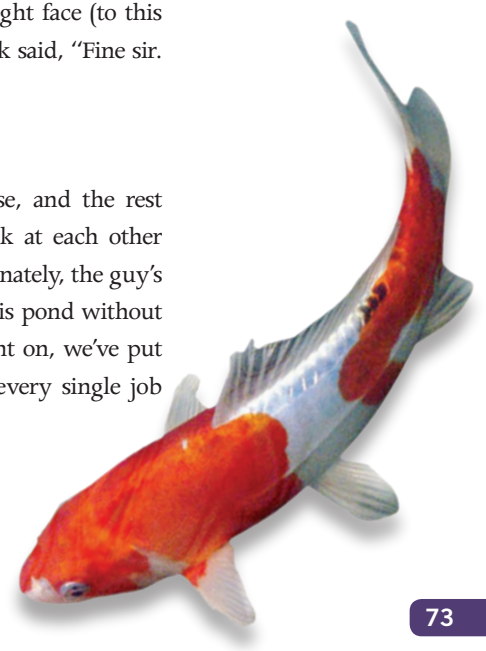
Up to that point we were doing just fine, but it so happened that we had failed to put netting over the buckets we were using to temporarily house his fish. As I was standing there talking, and telling the customer how good things were going, I noticed this prize koi (it may have been a $1000 fish) launch himself out of the bucket located about 20 feet behind the customer. I motioned with my eyes to my helper Zack, who promptly sprinted over to rescue the flopping fish. In the process, Zack stepped on him, dropped him, and had one heck of a time just getting a hold of him. Zack finally got his hands on the fish, and tossed him back in the bucket.

The fish had no sooner splashed into the bucket, when the customer turned and asked Zack how he was doing. With an absolutely straight face (to this day I don't know how he did it) Zack said, "Fine sir. We're doing just fine."

Don't Forget the Netting!

The guy went back in his house, and the rest of the day Zack and I couldn't look at each other without busting out laughing. Fortunately, the guy's fish were all just fine. We cleaned his pond without further incident, and from that point on, we've put netting over every fish bucket on every single job we've done!

Ed Beaulieu
Vice President
of Field Research



Jeep makes a popular "koi model" in Japan.

The Hobby of Fish-Keeping

Keeping fish for enjoyment has been a human obsession for hundreds of years. In the last century, the hobby of fish-keeping has become a major industry. This is partly due to the fact that keeping fish is relatively simple. Now combine that with the peacefulness and tranquility that fish-watching brings, and you'll understand its appeal.

Getting Over Fish Fear

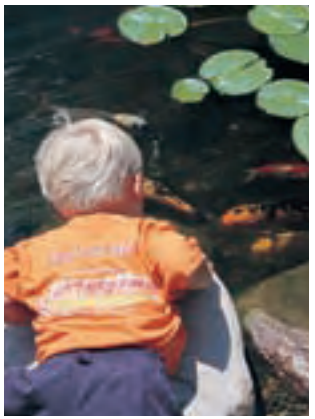
Koi-keeping is often misunderstood and misconstrued as a high-maintenance, headache-inducing hobby that turns out to be more work than anyone ever imagined. Having to maintain proper water temperatures, water volumes, and chemical levels are some common misconceptions attributed to keeping fish. Our experience in the field has proven the exact opposite.

A little known fact is that koi are related to piranha!

Koi-keeping is virtually maintenance free. Not only are fish extremely easy to care for, but they bring excitement to any water feature, and play an essential role in the ecosystem as well. We've found that customers who have the most "fish fear" are the ones who end up loving their fish the most. Observing the different personalities of your fish as they interact among each other is a common pleasure among koi-keepers. This, along with the vast array of colors that your fish display, often leads customers to naming their pets.

This chapter primarily focuses on koi, however, the same principles will apply to all fish who inhabit an outdoor pond. So, before we dive into to the koi subculture, let's glance at some other possible choices of fish for the water garden.

Other Fish to Consider



Aside from koi, goldfish are by far the most popular. There are many different kinds of goldfish, including shubunkin, comet, calico, and oranda. These are among the most common, along with the golden orfe. Many people ask about introducing game fish to their ponds. This is totally acceptable, however, people will often find that they do not enjoy them as much because of the inability to see camouflaged game fish such as bass, perch, bluegill, or walleye.

For those who live in warmer climates, or for those who would like to add a little spunk to their pond in the North, many different and beautiful tropical fish do very well in a pond during warm weather. Some of these tropical fish include swordtail, tilapia, and plecostomus. These fish will need to be taken out of the pond when the cold weather hits. Keeping fish of all kinds can be enjoyable, colorful, and entertaining. It's OK to give fish other than koi a shot at your ponds. It may work out well.

Koi, the Kings of the Pond

Koi-keeping can often develop into an obsession for the common pond and fish owner. However, despite some controversy in koi keeping, a clear perspective of proper koi care is vital in the attempt to create a natural, comfortable environment for koi. With this controversy in mind, we would like to touch on what we think are key factors in understanding just what makes koi healthy and happy.

History

Contrary to common "Japanese descendant" belief, koi are actually indigenous to Eastern Asia and China, where the earliest written records of koi were found. Records of this hardy fish date back 2,500 years, although their industrial cultivation is much more recent. Color mutations in this "fancy carp" only appeared a few hundred years ago, and it wasn't until the 20th century that the koi hobbyist emerged. With rampant development and industrialization, news of the koi's beauty began to spread into the UK and North America. Although Japan is the "koi-producing capital of the world," some of the nicest koi are found in the backyard water gardens of homeowners right here in North America.

Where They Come From

The process known as culling is a method which enables companies like Blue Ridge Fish Hatchery to produce the highest quality koi year after year. Blue Ridge's Vice President, Randy LeFever explains the culling process. "Our breeding koi are kept in dirt ponds until around March. Then we take them out, separate the males from the females, inject the females with a special hormone that renders them fertile, strip the eggs from the female, the sperm from the males, and put them all into an indoor hatching facility." Within four to seven weeks, they produce baby koi, which are known as "fry."

This fellow gives a new definition to the phrase "big fish in a small pond"

How Koi Are Judged

Although there are some misconceptions concerning their price, most koi found in your typical backyard water feature range from $5 to $50. There are, however, koi that can be purchased for hundreds or even thousands of dollars. But don't be fooled into thinking koi-keeping has to be an expensive hobby. Unless you're a certified koi judge, the average homeowner will get just as much enjoyment out a $5 koi as he/she would out of a $100,000 koi.

Below is a list of characteristics (in order) that are taken into account by professionals when they're judging and placing value on koi:

Body Conformation:
The face, head, body, and fins should not have any deformities. The body-line should be straight, and the pectoral fins should be round, large, and balanced with the body size.

Color Quality:
The white color of the body should be snow white in order to bring out the surrounding colors which should be solid and thick. These colors should have very defined edges.

Pattern:
The pattern of a mature koi should be large and powerful, and should be in proportion with the rest of the fish's body.

Character and Personality:
A large koi should show imposingness, power, and dignity, while a smaller koi should be more reserved and simple.

Quality and Elegance:
The bloodline and growth of the koi should produce shiny skin and sharp pattern edges. koi with defined facial structures, proportional body conformation, and well-balanced fins are considered to be elegant.

The Culling Process

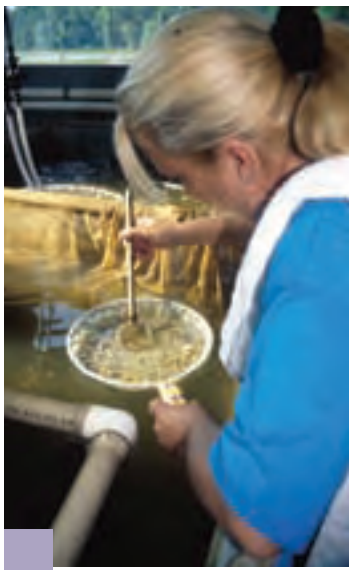
After seven days, the fry are placed into a "grow out" pond where they are encouraged in various ways to grow for another six to eight weeks. "At that point we harvest the koi, and the culling (sorting) process begins," says LeFever. During the first cull, they keep 25-50% of the entire batch, depending on the quality of the fish. The remainder of the batch is sold to other hatcheries at a reduced cost.

This first group is cultivated for another two months until they grow to between four and six inches long. The second cull is then conducted, and another 10-40% are selected, and again encouraged to grow for another two months. At this point, the koi have reached a length of six to eight inches, when the third and final cull is conducted.

This final select group will be cultivated for another season until they reach lengths of between 12 and 18", at which point they're sold. "Each time we harvest koi from our mud ponds, we keep the best ones, allowing them to grow further, and sell the remainder. Consequently, you will find that the larger fish are always of higher quality than the smaller ones," explains Randy.

"It's a long, expensive, and time consuming process," says LeFever. "But this process is what separates the serious koi breeders from the recreational koi breeders in the market. If you want really great koi, it's like everything else, you get what you pay for!" For more information, visit www.blueridgekoi.com.

How would you like this guy's job? Caviar anyone?



Only a few fish make it past the executioner. The rest are, how do you say this? Euthanized.

From the privacy of a murky, mud and gravel pond, to a center stage in a gin clear water garden!

You must ace the patience test to perform this job.

This man's hand was lost in a tragic accident when he mistakenly thought the piranha tank was a feeder goldfish tub.

Caring for koi

Overfeeding is the most common mistake when keeping koi. Kind of like humans, koi will always accept more food than they can comfortably eat, which is not only harmful to them, but it's harmful to the ecosystem as well. Overfeeding leads to an increase in waste volume excreted by the koi which, in turn creates water that's high in ammonia and nitrites absolutely perfect for algae growth.

It's recommended to avoid feeding koi when temperatures drop below 50 F. In the presence of these relatively low temperatures, the koi's metabolism slows to a minimum, reducing the fish's ability to sufficiently digest or process what they consume. koi will, however, consume as much food as you throw at them, so it is up to you to monitor their intake during these lower temperatures.

Too Much of a Good Thing

Feeding your koi less food is much smarter. Only feed your koi what they can eat in a matter of minutes, once or twice a day at most. Overfeeding your fish can lead to algae buildup, since the excess food contributes to the nutritional load and so algae growth, which in turn leads to more fish waste. A koi owner can actually completely abandon feeding, and still have very healthy fish. Start with small fish, especially in a new pond that will not have algae and invertebrates necessary for fish growth. As a vital part of the ecosystem, koi will feed on algae and other nutrients already present in your pond just like they do in nature. So, keeping fish actually creates less, not more, pond maintenance. Thus, "fish fear" is almost always unwarranted.

Koi Types

Classifications of koi can become quite confusing with the abundance of Japanese terms that describe each one. Here are some common classifications of koi:

Kohaku
White with red markings.

Sanke
White base with red and black markings.

Showa
Red and white markings with a black base.

Tancho
Kohaku, Sanke, and Showa with a red marking on the head and no hi (color) on the body.

Hikarimujil:
Singular uniform color.

Utsurimono
Black with white, red, or yellow markings.

Fish Diseases

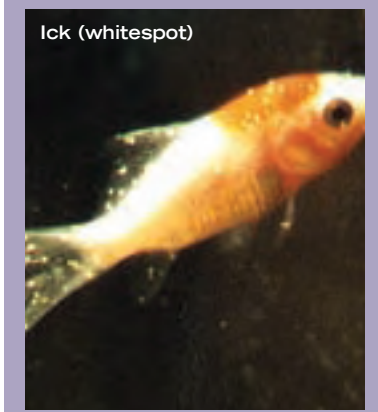
At Aquascape, we have no fish doctors. However, it doesn't take a koi vet to tell if your fish are suffering from a disease or infection of some sort. If your fish are suddenly dying or behaving strangely in the absence of water quality issues, it's safe to suspect that your fish are suffering from a parasite or bacterial infection. Listed below are just a few common diseases fish may suffer from, along with a few recommended treatments.

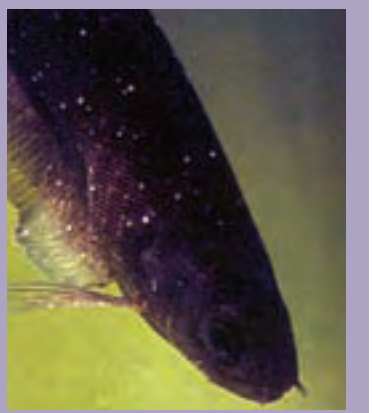
Ick (whitespot):

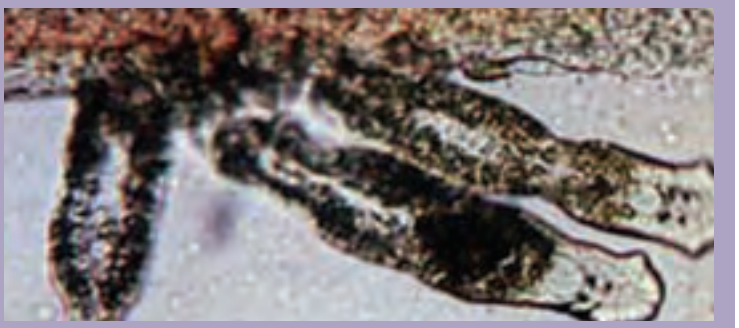
This is one of the most common of all fish diseases, and it's characterized by tiny white spots on the fish's skin. Symptoms of Ick may appear before the spots surface, and can include flashing (rubbing their sides against rocks), lethargy, and loss of appetite. Recommended treatment for these symptoms is a Salt Bath: 10 lbs of salt daily for three days–30 lbs total. Wait 2 weeks and do a water change to remove some of the salt.

esp Ick (puntos blancos)

Está es una de las enfermedades más comunes de los peces, y se caracteriza por puntitos blancos en la piel del pez. Las síntomás de Ick se pueden aprarecer antes de que salgan los puntos por la piel, y pueden incluir flashing (razcando sus lados en contra de las piedras), letargo, y falta de hambre. El tratamiento recomendado para éstas síntomás es un baño de Sal: Ponga 25 libras de non-iodized sal por cada 1,000 galones de agua sobre un tiempo de 48 horas.







Flukes:

Flukes are the most common parasite found on koi and goldfish. High numbers of flukes can cause serious damage. Symptoms of flukes include flashing, gasping at the surface, frayed fins, and sometimes death. Recommended treatment for flukes is called a salt dip: Add 10 tablespoons of salt per gallon of non-iodized salt to a basin of water. Dip the infected fish in this solution for three to five minutes, or until the fish starts to roll over. Repeat twice more at 12 hour intervals.

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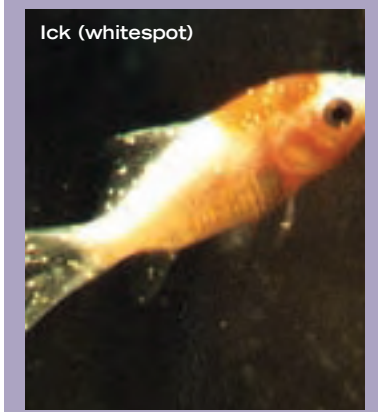

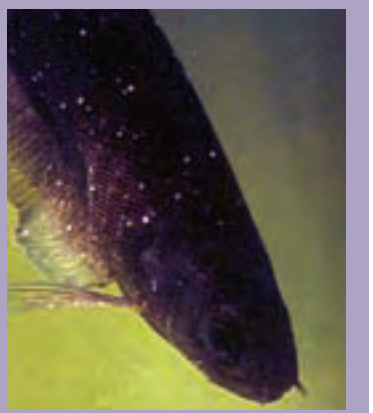

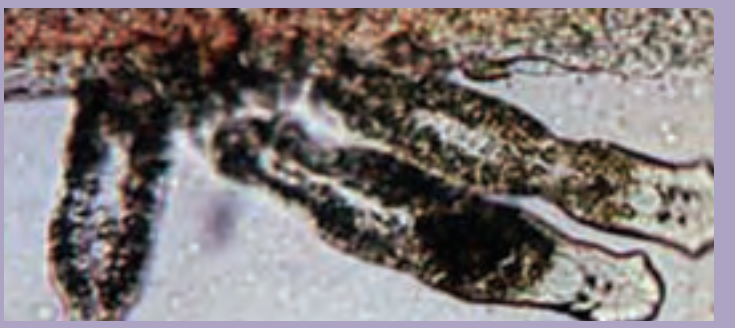

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Bacterial Infections:

Pathogenic bacteria are always present in pond water and on your fish, however they are only a problem when the fish are weakened by poor water quality or parasite infestations. Therefore, it is important to correct any poor water quality conditions before attempting to treat such infections. Symptoms of bacterial infections include fin and tail erosion, redness of tail, pectoral or anal fins, and open red sores. The most effective remedy for these conditions is feeding your fish medicated fish food for approximately 10 to 14 days.

esp Infeciones Bacteriales

Bacteria patogénicas siempre están presentes en el agua del estanque y sus peces pero no solo presentan problemás cuando los peces están debilizados por baja calidad del agua o infestáciones de parásitos. Entonces, es importante coregir cual quieras condiciones malas del agua antes de atrever a tratar sus infecciones. Síntomás de infeciones bacteriales incluyen la erosión de aleta y cola, tener rojas a sus colas, aletas pectorales y anales, y llagas abiertas y rojas. El remedio más efectivo para estás condiciones es dando de comer a sus peces comida medicada por aproximadamente 10-14 días.

** For further information on koi diseases, symptoms, and their treatments, we recommend you search the Internet. There are literally hundreds of sites full of information concerning koi diseases and treatments, ranging from koi Societies to koi breeding facilities.*

This photo could be a painting! Happy fish in a gravel pond!

Spring algae blooms are common before the ecosystem kicks in. A spring cleaning, S.A.B.™ Extreme bacteria, and Bitty Bales™ are the answer…

Water Quality

Since koi are freshwater fish, we need to understand some water quality issues in order to best replicate a natural environment. Included in the broad water quality topics are: temperature, pH, hardness, oxygen, and ammonia levels.

Temperature:

Since koi are such hardy fish, they can withstand a very broad range of temperatures, from freezing conditions to hot summers in Arizona. This means the temperature of the water is the least of the koi-keeper's worries. *(See winterization in chapter 18 for more information.)*

A heater keeps a hole open in the ice for gas exchange, but alone does not oxygenate the water.

pH:

The pH measures the degree of acids and bases in a given body of water, and ranges from 1 (acidic) to 14 (basic). koi prefer a pH ranging between 7 and 8, however, since they are such hardy fish, they can handle pH levels from 6 to 11. Slight, and temporary fluctuations of pH in ponds are actually quite normal, and are not harmful to your koi. The pH value in a pond may fluctuate from 7 to 9.5 within a 24-hour period (and will be highest in the morning), not causing any harm to your hardy fish.

Hardness:

Hardness mainly depends on the concentration of calcium and magnesium salts in the body of water. koi can cope with a wide variation of hardness levels, although hardness does have important influences on aquatic life. Hard water reduces the workload of the osmoregulatory system (the ability to allow water to pass through gills). koi living in soft water require a more efficient osmoregulatory system to maintain their salt/water balance. Thus, adding salt to the pond may reduce the osmotic stress load of the fish. So it's not confusing: salt additions to your pond are not needed on a regular basis, in fact, we seldom recommend it. *(See pg. 78 in this chapter for more information about salt treatments.)*

Oxygen:

The amount of oxygen dissolving in water at any given time is directly dependent upon temperature. Higher temperatures mean less dissolved oxygen. Needless to say, the water should be continuously pumped 24 hours a day, 365 days a year, to maintain sufficient oxygen levels. Since warm water holds less oxygen than cold water, summer nights are the time when oxygen levels will be the lowest. During the day, aquatic plants consume CO_2 and convert this into oxygen using photosynthesis. At night, however, this process is reversed by the plants using available oxygen and producing CO_2. Therefore, these warm summer nights are most vulnerable to low dissolved oxygen

TIP from TEAM AQUASCAPE

These are simply idealistic conditions for keeping koi. As we've stated time and time again, koi are extremely hardy fish, able to withstand a broad spectrum of conditions. This section should not complicate koi keeping, but make things a little clearer. By no means should you, or your customer, need to monitor, maintain, or even check water conditions/levels. Aquascape has over 1,000 ponds in the ground, and none of them are tested. Given ample time, your system will balance itself and create its own necessary conditions. No one monitors nature's ponds! If you notice drastic changes in the water quality (clarity, foul smells, fish death or disease, etc.), you will need to check the levels.

levels in a pond. In combination with this, an excess of accumulated organic debris will further reduce oxygen levels; so keeping up on bacteria dosages is crucial. Ideal oxygen level testing is best between 6 and 7 a.m., when the content will be lowest.

Ammonia:

The level of ammonia in your pond is a good indicator of the quality of your water. Ammonia is a highly toxic gas or liquid that is produced from the decomposition of organic matter and fish waste. Excess amounts of ammonia in your pond have the potential of producing gill irritation or even lethal conditions.

Predator Control

Predators rank among the pond-owner's list of top concerns for keeping koi, although this fear is often misinterpreted. The primary predator who deserves being feared is the heron. Any other predator will not pose a serious threat to your koi in a two-foot deep pond.

A Real Threat

Let's look at raccoons for example. Since raccoons are not swimmers, the only method they have for snatching fish is resting their bellies on the ground and swinging their tiny arm into the pond barely reaching the first shelf, while your fish are down at the bottom. Heron, on the other hand, will stand in your pond as still as can be until a fish is in perfect position for snatching.

So, instead of policing your pond during your free time, we recommend installing a Scarecrow if you have an overly aggressive Heron for a visitor. When anything walks in the path of the motion sensor, the sprinkler kicks on and sends a stream of water 30' long across its path. Unfortunately, this is the most effective method we've found for scaring heron away from your backyard paradise. Fake birds, statues, and things of that sort have proven to be helpful, but some intelligent bird can figure them out in one or two trips to the pond.

Fish Caves

Protection measures can be built right in during the pond's excavation. You can create holes or miniature caves within your rockwork. Or you can place drain tile pipe at the bottom of the pond "inside" one of the shelves. *(See Construction Guide-*

Common predator deterrents include Scarecrows that sprays water when motion is detected and alligator, heron, and koi decoys.

Acclimate Your Fish!

Minimal water temperature changes can stress out your fish more than you may think. So, whether you're doing a cleanout, or introducing new fish to your pond for the first time, acclimating them is very important to their health.

- Acclimate your fish by floating them in a bucket of water or plastic bag in the pond for 15 to 20 minutes.
- During that time you should periodically mix the two water sources (bag and pond) together.
- You can then begin to introduce your fish into the new pond or newly cleaned pond.
- The purpose is to equalize the water temperatures of the two sources.
- An extreme and sudden change in water temperature can cause a tremendous amount of stress to your fish, and possibly death.
- In new ponds we recommend introducing several small, inexpensive fish first before re-introducing your prized koi. This is meant to "test the water," making sure adequate conditions exist in your pond before an imbalance shocks the fish that are dear to you.

esp Cambios mínimos de la temperatura del agua pueden afectar a sus peces más que uno piensa. Así que, si Ud. esté limpiando el estanque o presentando peces nuevos por la primera vez al estanque, aclimatándolos es muy importante por su salud.

- Aclimate sus peces flotándolos dentro de un cubo de agua o bolsita de plástico por 15 a 20 minutos.
- Durante ese tiempo Ud. debería mezclar periódicamente los dos orígenes del agua (de la bolsita y del estanque).
- Despúes puede empezar a presentar sus peces al estanque nuevo o al estanque recién limpiado.
- El propósito es nivelar las temperaturas del agua de los dos orígenes.
- Un cambio extremo o de repente de la temperatura del agua puede causar una gran cantidad de estrés a sus peces, y posiblemente su muerte.
- En estanques nuevos nosotros recomendamos que primero se presente varias peces pequeñas y baratas antes de introducir el nuevo koi valioso. Esto es para "probar el agua" asegurando que existen condiciones adecuadas en su estanque antes que un desequilibrio asuste a los peces que Ud. quiere mucho.

lines in this chapter on page 85 for more information.) This allows the fish to find shelter and protection whenever the predator threat arises. So yes, there are lots of predators out there, but only one poses a serious threat, and there are a few simple precautions that can be taken to drastically reduce this threat.

Preparing for Winter

Again, koi are a very hardy fish. As the temperature drops, the koi will move into the deeper parts of the pond, and will become more and more reluctant to feed, especially in temperatures below 50° F. Do not feed your koi in temperatures lower than 50° F. During the winter season, your koi will go into a state of "hibernation," where they will huddle together in the bottom of the pond (the earth warms the bottom of the pond). They will remain awake and somewhat mobile however, their respiration and metabolism slows drastically to conserve body heat, which means that processing food is a very difficult and risky task.

Here in Chicago's Zone 5, we experience harsh winter temperatures and conditions. Despite what you may have heard, the two-foot deep ponds that we build have never had any problems with over-wintering hardy fish.

There are some precautions you will need to take to ensure successful over-wintering. First, you need to make absolutely certain that the water in your pond is constantly circulating, which will continuously provide oxygen for the fish. Secondly, you need to make sure that your pond surface does not freeze over. If it does freeze over, you will need to add a floating heater to your pond, creating a hole in the ice, which will allow for proper gas exchange. Follow the steps listed in the maintenance section for winterization.

In a well oxygenated pond, koi do just fine in winter. Plan on repeating this for the rest of your life.

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- An extreme and sudden change in water temperature can cause a tremendous amount of stress to your fish, and possibly death.
- In new ponds we recommend introducing several small, inexpensive fish first before re-introducing your prized koi. This is meant to "test the water," making sure adequate conditions exist in your pond before an imbalance shocks the fish that are dear to you.

esp Cambios mínimos de la temperatura del agua pueden afectar a sus peces más que uno piensa. Así que, si Ud. esté limpiando el estanque o presentando peces nuevos por la primera vez al estanque, aclimatándolos es muy importante por su salud.

- Aclimate sus peces flotándolos dentro de un cubo de agua o bolsita de plástico por 15 a 20 minutos.
- Durante ese tiempo Ud. debería mezclar periódicamente los dos orígenes del agua (de la bolsita y del estanque).
- Despúes puede empezar a presentar sus peces al estanque nuevo o al estanque recién limpiado.
- El propósito es nivelar las temperaturas del agua de los dos orígenes.
- Un cambio extremo o de repente de la temperatura del agua puede causar una gran cantidad de estrés a sus peces, y posiblemente su muerte.
- En estanques nuevos nosotros recomendamos que primero se presente varias peces pequeñas y baratas antes de introducir el nuevo koi valioso. Esto es para "probar el agua" asegurando que existen condiciones adecuadas en su estanque antes que un desequilibrio asuste a los peces que Ud. quiere mucho.

lines in this chapter on page 85 for more information.) This allows the fish to find shelter and protection whenever the predator threat arises. So yes, there are lots of predators out there, but only one poses a serious threat, and there are a few simple precautions that can be taken to drastically reduce this threat.

Preparing for Winter

Again, koi are a very hardy fish. As the temperature drops, the koi will move into the deeper parts of the pond, and will become more and more reluctant to feed, especially in temperatures below 50° F. Do not feed your koi in temperatures lower than 50° F. During the winter season, your koi will go into a state of "hibernation," where they will huddle together in the bottom of the pond (the earth warms the bottom of the pond). They will remain awake and somewhat mobile however, their respiration and metabolism slows drastically to conserve body heat, which means that processing food is a very difficult and risky task.

Here in Chicago's Zone 5, we experience harsh winter temperatures and conditions. Despite what you may have heard, the two-foot deep ponds that we build have never had any problems with over-wintering hardy fish.

There are some precautions you will need to take to ensure successful over-wintering. First, you need to make absolutely certain that the water in your pond is constantly circulating, which will continuously provide oxygen for the fish. Secondly, you need to make sure that your pond surface does not freeze over. If it does freeze over, you will need to add a floating heater to your pond, creating a hole in the ice, which will allow for proper gas exchange. Follow the steps listed in the maintenance section for winterization.

In a well oxygenated pond, koi do just fine in winter. Plan on repeating this for the rest of your life.

What a beautiful sight. Wrinkled liner and imprisoned, bored koi.

Koi enjoying a pond the way nature intended it to be.

Pond Construction, and Koi

How to construct the proper living environment for your koi is, and has been, a topic under heavy debate. Through years of creating natural pond ecosystems (which house koi), we at Aquascape have found koi to be extremely hardy fish that are able to withstand pH fluctuations, climatic and temperature extremes, and lack of artificially produced food, just as they have done in nature for years and years. So, despite the many opinions or philosophies you may run into, our field experience has proven that koi are able to flourish in the natural environments that we create, just as in nature.

You may hear many different opinions regarding proper conditions for your koi. We've been very successful in housing koi in an environment that replicates their origin as closely as possible. Thus, all the ponds we build are lined with rocks and gravel, which mimics the roots of koi's natural habitat. The debate over whether rocks and gravel are necessary is quite possibly the largest controversy in the koi industry. Think about it … how could a koi be happy if it's not in its natural environment?

Rocks and Gravel

Rocks and gravel lining a pond act as a massive natural filter. The surface area that is provided by the rocks and gravel is the perfect spot to house bacteria, which consume nutrients from the water, and also break down organic matter in the bottom of the pond, thereby providing filtration. None of our ponds lack rocks and gravel, and 95% of our ponds are no more than two feet deep, which brings us to another debate in the koi-raising industry.

Depth

Koi worshippers will constantly tell you that koi require at least three feet of water to be stress-free. However, as stated earlier, the vast majority of our ponds are two feet deep, and all our ponds house happy, active, and healthy koi with high success rates.

You may get five different answers from five different people, but we can assure you that if you build your pond two feet deep with rocks and gravel, your koi will be happy and feel at home in their natural environment. We've got literally thousands of ponds to prove it.

Building a Place for Fish to Hide

Helping protect the pond's fish inhabitants can be done during the pond's excavation. You can simply create holes or miniature caves within your rockwork, or you can place a drain tile pipe towards the bottom of the pond "inside" one of the shelves. Simply dig out a portion of one of the shelves to house the drain tile pipe and place the tile accordingly. Remove the drain tile pipe and re-install once the liner is placed into the pond. You can then disguise the tile with your rockwork and gravel. This will allow your fish to find shelter and protection in this tube whenever the threat of predators arises.

esp Construyendo un Lugar Donde Se Escondan

Se puede ayudar a proteger los habitantes del estanque durante la excavación del estanque. Simplemente crea huecos o cuevas miniaturas con las piedras durante la construcción, o se puede poner un tubo de desagüe dentro de una de las estántes. Excaven una de las estántillas y alojen el azulejo apropiadamente. Ud. puede esconder el azulejo con la piedra y grava. Esto dejará que sus peces lo usen para protección cuando se presente el peligro de un depredador.

Carve an area in the soil large enough for your fish cave. Remove it, put the liner into place, put your tube in its trench and cover with stone.

Dealing With Fish Fear and Koi Myths

Myth:	Aquascape Says:
"Fish will just create more pond maintenance."	Actually, fish are a crucial part of the ecosystem. koi reduce algae by feeding on it, and they fertilize plants with their waste. So, fish actually create less pond maintenance.
"Koi cannot live in a pond with rocks and gravel."	Koi, or carp, are river fish, where rocks and gravel cover almost everything. We build rock and gravel lined ponds almost daily, which house perfectly healthy and happy koi.
"I don't want to lose all of my fish to predators."	If constructed properly, one can virtually eliminate the risk of predators with a few simple precautionary techniques.
"Koi need at least three feet of water to survive."	95% of the ponds that we build are two feet deep in the center, and the koi are happy and healthy as can be.
"I don't want to be troubled with bringing my fish inside for the winter."	Koi are an extremely hardy fish, whose ancestors over-wintered in freezing conditions, and still do. Just keep the water circulating and maintain a hole in the ice and they'll never know the difference.
"I don't want to spend thousands of dollars on my fish."	Actually, pet quality koi start at $5.00 each with show quality koi going for one hundred thousand dollars or more. Since fish food is also very inexpensive, how much you want to spend on fish is your decision.