

## **New Pond Syndrome**

Is it wabbit season? Is it duck season? No, Elmer, it's Ponding Season.

Your contractor has vanished over the horizon at just under lightspeed to deposit that check. Alternatively (and much more likely), the backyard project that you started this spring – as soon as the ground thawed out enough to allow a shovel to penetrate the permafrost – is lined, decorated, plumbed, pumped, skimmed and maybe even bottom-drained. It's hooked up to a spiffy new filter. The water's in, the pumps are on and it's time for fish! Lotsa fish! Got 5000 gallons of fresh water just sitting there!

Not. So. Fast.

Ponding is seriously addictive. It is hard for beginners to recognize that they are starting up a complex, artificial and often delicate ecosystem that is going to take Ma Nature's own sweet time to mature. The temptation to add fish is nearly overwhelming. Especially koi – several contractors we've dealt with over the years actually offer new pond owners several sacrificial koi as they vanish. The First Law of Ponding is the first to take hold. Yeah, there is always a better fish. The trick is to keep them alive long enough to enjoy them.

Any backyard pond relies on a number of interlocking conditions to maintain optimum water quality and fish health.

- Reliable water sources, preferably free of chlorine and other additives (either chemically treated, well water or prefiltered)
- Enough dissolved carbonates (KH) to stabilize pH. Every molecule of ammonia that is converted to nitrate generates five molecules of acid. The carbonate salts soak up the acid and prevent the pH from dropping low enough to kill bacteria and, yes, fish. It's called a "pH crash". The carbonates are dissolved in the water as it comes from whatever source you are using. Water from the Great Lakes has a comfortable 120 parts per million from the limestone the water flows through. Depending on your source, your levels will be different. A good range is 80 to 120 ppm.
- Good oxygenation with turbulent waterfalls
- Competent pumps and filters
- Stable temperatures from depth and shade
- Good water movement without dead spots
- A clean and easily-maintained bottom
- And, most importantly, a way of getting rid of the waste products that those fish are generating.

This is biofiltration, also called nitrification, and it relies on the activity of several species of naturally-occurring bacteria. They need media with a large enough surface area to allow them to establish a biofilm in which to interact with the water and convert the ammonia the fish are producing to relatively nontoxic nitrates.

New ponds do not have any of these populations present at startup. It takes weeks to get them introduced and functioning. The different bacteria do not all develop simultaneously. The bacteria that convert ammonia (toxic at moderate levels, worse with higher water temperatures and higher pH) to

nitrite (toxic under any conditions) develop first, usually over a one to two-week period after startup. The bacteria that take nitrite to far-less-toxic nitrates take several more weeks to develop, regardless of the excellence of the new high-tech filters. Almost all the bottled “Insta-Startup” bacterial additives available commercially are not terribly effective, with one probable exception.\* {A better solution would be to get a generous sample of active filter media or mat from a mature pond and put it into your filter (if possible) or even just into the pond.}

The result is called “New Pond Syndrome.” You’ll know you’ve got it when all those new fish you put in on day 1 are dead by day 15. The first wave died from the ammonia and the survivors succumbed to nitrite poisoning (similar to carbon monoxide poisoning in mammals). Water testing will reveal a rapid uptick in ammonia as the fish go in, followed by a gradual decrease. As ammonia drops, nitrite climbs and, over a week or so, begins to drop off. You are done with the first stage of this when both of these levels have returned to zero.

The preventative solution to this initial problem is either to pretreat the pond with household (NOT sudsy!) ammonia and wait for the levels to drop before adding any fish (not recommended) or adding only one or two fish at first and feed very lightly, again, until the levels drop to zero. More fish can be added *gradually*, to the capacity of the filter and pond.

We call it a syndrome because it doesn’t go away. It generally takes a backyard pond five to six years to achieve a robust enough population of filter bacteria to survive stresses. The most common stressor is winter shutdown. For many ponders, this means shutting down the pumps and filters and blowing out the plumbing to prevent freezing related catastrophes. This deprives the bacteria in the filters of oxygen; the cultures left on the pond walls go dormant. Come spring, these populations will revive, but with the same timetable the owners saw at startup. This does improve as the pond matures, but it is still a major water quality issue every spring, especially as the fish wake up and demand to be fed.

The simplest solution to this is to protect the pond with a weather cover or poly house. Add strategies to keep the water temperatures at or around 40 degrees F., maintaining flow through the filters all winter. The filter bacteria do go dormant, but bounce back very quickly in the spring.

An even simpler solution to this problem (although logistically challenging) is to move the family establishment somewhere without winter and dig your pond there.

A popular alternative to “high-tech” biofiltration is the installation of a bog filter. This is basically a separate container of water, preferably about 20% of your pond’s volume, heavily planted with aquatic vegetation. Water arrives from your pumps and flows around the roots of the plants which remove the ammonia and also provide some mechanical filtration. From there, the water descends to your pond. Fish do not belong in the bog. A new startup with a bog actually takes much longer than a high-tech system, since it requires the plantings to settle in and mature. While these tend to be hardy perennials, they do die back in the winter and have to re-establish themselves in the spring. Obviously not a problem if you do not have winter.

The most common error that can perpetuate New Pond Syndrome indefinitely is the mistaken assumption that a backyard pond needs to be spiffy-clean everywhere: drained, pressure-washed and stripped of all that nasty algae, refilled and dosed with ineffective supplements. It happens more often with gravel-bottomed liner ponds, since the gravel traps sludge and there’s no other way of getting it

out. Pressure washers classically hook up to the garden tap delivering cholera-proof chlorinated water to the device and onward to the entire pond system, killing the bacteria and restarting perpetual NPS.

So, some advice:

- New pond? Start slow, only a few fish and feed lightly
- Water test daily until ammonia and nitrites are zero.
- Beware of Spring. Feed sparingly as the pond wakes up.
- Avoid winter if at all possible
- Protect the pond in the winter. Keep the pumps and filters running if at all possible.
- Do not put gravel on the bottom of the pond. The guys who want you to do this need an excuse to come back every six months to pressure wash your pond and destroy your filters. Again. For \$1000 a pop.
- Do not pressure wash your pond. Ever.
- Never add chlorinated water to your pond or wash any part of your filter with chlorinated water.
- Bacteria boosters mostly do not work.\*

\* A company called Fritz-Zyme provides start-up cultures for large aquarium installations (like the Shedd in Chicago) that have to be used within 24-48 hours after initial prep. This is shipped refrigerated and costs \$\$\$\$\$\$\$\$\$\$. They make a hobbyist version, also shipped cold, that works well. It's called TurboStart 700 and works over a 5-day period.)

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