

## Stocking Dismay

**The appropriate amount of space needed for goldfish may come as a rude shock.**

*By Stephen M. Meyer*

Q. I bought my first copy of AFI (October 1993) and proceeded to read your series of articles on goldfish. Your recommendations are certainly not what I have been hearing from other sources.

I have a backyard pond that is 20 inches deep and holds about 180 gallons. I had planned to buy a 55-gallon tank to store my pond goldfish in during the winter. But in your article it says that I should plan on 20 to 30 gallons of water per fish regardless of fish size. If that were the case, a 55-gallon tank would hold only two goldfish. You also say that an outside garden pond of several hundred gallons or more is needed for raising only four quality goldfish.

If this is true then I am not going to buy a tank or equipment for fish. In the spring I might as well fill in my pond and knock down my 3.5-foot waterfall. I would only be able to have eight fish in it. This just doesn't seem right to me. Lilypons says 1 inch of fish for every 3 to 5 gallons of water. Trickers says 1 inch of fish for every gallon of water. You seem to be saying that they are lying. I only wish I would have read your article before I spent all the time and money on a pond and waterfall.

A. I can certainly understand your dismay, but your letter only strengthens my conviction that aquarists and pondkeepers must rid themselves of the "stamp collector" mentality. This is the view that holds that the value of the hobby is directly related to the number of fish owned rather than the quality of the aquatic environment provided. Why tear out your pond because it can "only" hold several goldfish? How many dogs or cats do you have to own before you consider them worthwhile pets?

The unfortunate fact is that the traditional rules of thumb for stocking a tank or pond are the single greatest reason for fishkeeping disasters. They inevitably lead to gross overstocking and massive die-offs of fish. Some pondkeepers casually mention that their fish last about a year or so. The reasonable life span for goldfish in an ornamental pond is well over 10 years. What would we think of someone who had to buy a new cat every nine months to replace the one that just died?

The guideline of 1 inch of fish per gallon or two simply cannot be taken seriously. Think about it. This rule essentially says that you can put six 1-inch goldfish in 6 gallons of water or one 6-inch goldfish in the same tank. But this entirely ignores one crucial factor.

Six 1-inch fish laid end to end only match the length of a 6-inch fish. What about the width and depth of these fish? When you consider the relative volumes involved, a 6-inch goldfish is biologically equivalent to about 100 1-inch goldfish in terms of mass, ability to pollute the tank, metabolic requirements and so on (see accompanying graph). I do not know of anyone who has kept a 6-inch goldfish in 6, 10 or even 20 gallons of water for more than a year. So clearly this rule can, at best, apply only to 1-inch animals.

But even here it is flawed. This is about 1000 times the fish load of natural ponds. And, given the fact that our pond filters cannot provide water quality even approaching that of a natural pond, there is no basis for believing we can do better.

No one, and I mean no one, can keep 55 1-inch goldfish alive in a 55-gallon tank for very long — or even 10 goldfish for that matter. Hobbyists who insist they are successful in maintaining extraordinary fish densities rarely talk about the number of fish deaths they experience, the rate at which they must buy new replacement fish and the frequency with which they have to use antibiotics and parasiticides in their tanks because of fish disease problems.

Aquarium and pet stores move their fish through these high densities fairly quickly, so the stress of crowding is limited in duration. Similarly, the very high loads maintained in fish farms are possible only because the fish are raised for eating and remain in the system only long enough to grow to salable size.

Why do fish and pond dealers continue to use these inaccurate rules of thumb? It is difficult to speculate, but habit and custom probably play a major role. Dealers probably get few complaints because the fish die in a year or so, and most people think that one or two years is the natural life span of these animals. It's all very sad.

So, returning to your pond of 180 gallons, let's say you follow a more conservative 1 inch of fish per 5 gallons rule and you

put 36 1-inch goldfish in the pond. Most — perhaps even all — will live until the fall, but I will warn you that by this time next year you will have less than half this number. And the choice of which die and which live will not be yours to make.

By this time two years from now you will have less than 10 goldfish. And of those perhaps one may have fairly good characteristics, but probably not because the most sensitive fish to crowding and poor water quality are almost always the most attractive animals. Moreover, you will have spent a small fortune on fish drugs.

If you follow my rule and put four goldfish in the pond, in two years — all else being equal — you will still have the same four goldfish and all will be healthy, well-formed and will be with you for years to come.

Your pond is fine the way it is. You may come to appreciate the joys of owning just a few healthy, good-size pond fish that you can recognize individually and that come to eat from your hand.