Beginning a Planted Aquarium

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by

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Many people are intimidated at the thought of starting a planted aquarium because they're afraid it will involve too much work and they will only fail anyway. While it's true that the startup may require some extra effort in the first few months, the initial investment will pay off in the long term. My well-established home tanks only require work once every two weeks.

It takes a while for the tank to attain a healthy equilibrium, especially to reach a balance with the algae. You'll have to persistently remove algae—everyday if necessary—tinker with light level and duration, as well as plant fertilizer dosage, until the system starts to work. Keep up with water changes—25% water changes every other week. And you'll need to keep the tank away from direct sunlight. Rest assured, however, that this initial investment will pay off in the long term.

It's best to start out light on fish and heavy on plants. Initially, try to pack the aquarium with lots of fast-growing plants so they out-compete the algae for nutrients. Then gradually start adding plant nutrients. If necessary, purchase fast-growing tropical plants such as water sprite and hygro from an aquarium store. As the tank becomes more established, you can gradually replace the exotic plants with native plants.

Regarding light, be sure to use good bulbs. I like fluorescents, such as Triton and Powerglo. The usual rule of thumb is 2-3 watts per gallon, although I've heard that some people do well with much less. My tanks usually receive light for 12 to 14 hours a day. For convenience, I use a timer.

It's easiest to grow plants that like your tap water. Amazon swords, for example, prefer soft, acid water, whereas *Cabomba* will thrive in moderately hard, alkaline water. Of course, hard water can be softened with reverse osmosis, and you can raise the pH and hardness of soft water with African rift lake salts or gravel made from crushed coral.

If you're using well water, check the following parameters: phosphates, silicates, CO_2 level, general hardness, carbonate hardness, and nitrates. This *is* important. It was a major source of problems in a nature center project I worked on. Groundwater, particularly in an agricultural area, could have runoff from fertilizer, which would lead to excessive algae growth. You may want to consider using a tapwater purifier if you have well water. I've heard that CO_2 levels tend to be higher in well water, and therefore the water may have to be aerated before use.

When introducing new plants to your tank—either wild or store bought—you'll need to disinfect them first. I've tried soaking them for a couple of minutes in a 19:1 bleach solution, then rinsing in water treated with dechlorinator. However, this method may damage delicate leaves. Potassium permanganate solution is another way to disinfect. You can purchase this at aquarium stores as Clear Water, manufactured by Jungle. A half-teaspoon per gallon of Alum, available at many pharmacies, is another commonly used plant disinfectant.

Substrate, too is a factor in healthy plant growth. Clean gravel doesn't have enough nutrients to support plants. Many aquarists add laterite, a reddish clay, to their gravel. About 10 grams per gallon should be enough. Any more will create dense pockets where anaerobic bacteria can thrive, fouling your water. The laterite will also give your water a temporary reddish tint, which will return when you uproot any of your plants.
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The mulm that accumulates in the gravel of any well-established tank will also prove hospitable to aquatic plants.

If most of your plants are rooted, you may want to try adding fertilizer tablets to the substrate. If you do this, don't vacuum the substrate too deeply during water changes because it could introduce too many nutrients into the water column and promote algae growth. I'm not saying that liquid fertilizers are bad—I use them at home. You'll just need to try a little at a time, until you find the optimal amount. If you notice an explosion of algae after adding liquid fertilizer, you may need to do a large-scale water change of 50% or better to remove the excess nutrients.

Some Native Plants I've Had Experience With

• Spineless hornwort (*Ceratophyllum echina*) can do well at fairly low light levels. Easy to grow. I like to anchor it to the gravel with a rock or sunken drift wood. Letting this rootless plant float, as it does in nature, will block off light to substrate plants.

• Widgeon grass likes hard water. May work well in brackish water.

• Low watermilfoil (*Myriophyllum humile*) is very hard to grow. A little coating of algae on the very fine leaves will suffocate the plant. It needs strong light.

• Watershield species (not identified yet) seem to be quite hardy under a variety of light and water conditions.

• *Najas guadalupenses* grows like a weed! Will need frequent trimming.

• *Cabomba* spp. I have mixed feelings about these plants. Some people are successful with them, but I've not been so lucky. Bob Bock reports that some have done well for him in hard, alkaline water.

• Frog-bit is a nice little floating plant. It may die off periodically but always bounces back.

• Duckweed is one I'd try to avoid if I were you. It multiplies rapidly and blocks light to bottom plants. It's good to have on hand, however, for plant-eating species like goldfish and rift lake cichlids.

Web References

If you'd like to pursue this topic in a little more detail, the following Web references may be helpful:

• That Darn Plant Tank, by Erik Olson, 1997; http://www.cco.caltech.edu/~aquaria/Krib/Plants/People/Darn/darn.html

• http://www.cco.caltech.edu/~aquaria/Krib/Plants/ has a nice collection of articles, in particular an E-mail archive of native plant chatter at http://www.cco.caltech.edu/~aquaria/Krib/Plants/Plants/native-usa.html

• Center for Aquatic Plants, University of Florida; http://aquat1.ifas.ufl.edu/welcome.html

• PLANTS project (USDA database, useful for searches); http://www.itis.usda.gov/

The North American Native Fish Keeper's Bookshelf

A Recently Published Title

Imagine being on a guided tour of a lake or river led by two seasoned, colorful and unabashedly opinionated naturalists who know every critter and ecological niche like the back of their hands. That's what it's like to read **Yellowstone Fishes: Ecology, History and Angling in the Park** by John D. Varley and Paul Schullery (1998, Stackpole Books, 154 p., $19.95 softcover). Nearly every page of this book—an expansion and update of the authors' 1983 *Freshwater Wilderness*—has something to surprise, delight or teach. In addition to descriptions of Yellowstone's 12 native and six introduced fish species, we learn how the region's recent glacial history has kept the fish diversity so small; about the evils of introduced species, or "bucket biology," and how the introduction of lake trout can ultimately starve bears and otters; why the babbling brooks seen in beer commercials are nearly devoid of life; how forest fires help fish; how to be an ecology-minded angler; how the management philosophy of Yellowstone has evolved since it became the country's first national park in 1872; and sundry other topics, all wonderfully presented and engagingly written.* The authors' main theme, and the Park's philosophy, is that "wildness" is Yellowstone's resource, not trout, trees or bears. As long as we take care of the ecosystem that supports this wildness, the trout will take care of themselves. *Christopher Scharpf*

* One passage is so wonderful, I must include it here: "Parasites, especially ones as widely loathed as leeches and tapeworms, don't have many friends among enlightened naturalists. But look at it this way: Parasites are native fauna, just like cutthroat trout, swallowtail butterflies, and moose. Yellowstone Park is being preserved for the protection of all native species, not just those that look nice on wildlife calendars. The legal rights of the parasites should be as strong as those of the hosts. When you can accept tapeworms, roundworms, and leeches, then you can call yourself a real conservationist" (p. 17).