

## **Pond Management Components**

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*The* **Pond Doctor**

The basic problem for most farm and recreational ponds is they are artificially made without natural structure. You can provide that natural structure a little at a time and have a natural pond.

Ponds are not just a hole in the ground with water in them. Ponds are habitat for plants and animals. Without placing the right habitat in the pond, you will not have a balanced ecology. This is a process where the entire ecology has to be considered; and although very complex is composed of very understandable parts. I will briefly describe them.

### **Pond Plants**

Plants do many things for your pond. They are responsible, in-part, for the respiration of the pond. This keeps the animals alive in the pond. Plants consume fertilizers before they enter your pond; and thus weeds and algae won't grow in the pond. The plants also offer habitat for fish, wildlife and birds.

*The* **Pond Doctor** recommends three levels of planting. Our prescription is for water plants and bog flowers in the pond (Level I), grasses and rushes (marginal, Level II), and shrubs and trees (canopy, Level III). Most man-made ponds do not have these plants. Decades if not centuries are required to establish plant ecology. With just a little instruction, your pond can be planted in a few years.

Native perennials are the best to use for your pond because they thrive and once established will care for your pond continuously. Although most ponds have some of these plants already, they usually have only 5 or 6 species. The key to pond health is to create a diverse ecology. You may need as many as 50 species. The fall, winter and spring is the best time to establish these perennial plants. *The* **Pond Doctor** can help you select these plants and how to place them.

Ornamental perennials that are non-native can also be used. Like native plants, they also help the pond and offer a great variety of color.

As always, price is the major problem in stocking a pond with the proper plants. Because as many as 3,000 plants are necessary for a ¼ acre pond, I recommend native plants as they are inexpensive. Many of these plants are readily available on the pond's property or on nearby properties. I identify these plants and show pond owners how to transplant them or take cuttings. I also recommend field plant identification books so you can touch

your own environment. The natives are hardy and beautiful. However, to add color to the pond, I recommend the use of ornamentals. Some of the ornamentals are large leafy plants that consume a lot of fertilizer and are excellent to add to the pond.

I must warn you that many of the pond plants are invasive. You must select the correct plants to start the process. After a base planting is made, some of the invasive plants can be used. Examples of invaders are cattail, yellow water iris, and pond lily. As you can see a considered approach is necessary.

As I mentioned above, the tree canopy for a pond is extremely necessary. Weed growth is all about how much sunlight strikes the pond. And in addition, because trees have a lot of cellulose, they consume a lot of energy and thus a lot of fertilizer. So tree and shrub planting is very necessary. Look at natural waterways.

### **Nature's Landscaping**

At this point, I would like to direct your attention to the natural environment. By becoming aware of natural streams and lakes near your pond, you will see how they are structured. I challenge you to observe this and also to put Mother Nature's plan into practice. It only takes a moment to become aware of how She works. It would take more than ten lifetimes to understand it.

### **Pond Respiration**

Ponds without the proper structure have trouble respiring. Yes, a pond breathes. You must deal with the gasses in the pond. When organic materials and fertilizer decompose and animals breathe, they produce gasses. These gasses are heavier than water and must be removed from the pond. Two of the gasses, carbon dioxide and ammonia are great fertilizers and stimulate algae and weed growth. Plants will remove the gasses. But often these plants will be undesirable weeds. Mother Nature will supply the weeds free; OR you can take care of the gasses until you get the right plants planted in the pond. You can pump air to the bottom of the pond and lift the gas out and it will blow away on the wind. This is called artificial nutrient replacement. Many people think that fountains or artificial waterfalls do the same thing. They won't because the gasses accumulate at the deepest point in the pond where the fountains and waterfall only deal with the surface. There is a little more to this than I can cover here because bacteria and their habitat are necessary to complete the respiration cycle. Often these bacteria are added to the pond to start the process.

## **Bottom Ecology**

Often when ponds are built there is a clay silt bottom. Mother Nature provides rock piles. You can do this too by simply dumping in some river run rock. Don't use mined stone as it has many minerals that can poison the pond. River run rock has been washed for centuries and has lost most of its soluble mineral. The bottom should have a deep spot for cold water to accumulate. The bottom should not be smooth.

At this point let us discuss for a moment what a pond should look like. Virtually every artificial pond I have looked at has straight shorelines whereas natural ponds have highly irregular shores. To have a natural landscape you need to have a natural undulating shoreline with shallow areas for planting and shallow sloped banks. Natural slopes are gentle being no greater than 1:3. If you dig steep slopes, they will simply slough into the bottom of the pond.

## **Animal Ecology**

Immediately everyone thinks about fish. Fish are a portion of the animal ecology of ponds. They are absolutely required. Ponds here in the Northwest can sustain both warm water fisheries and cold water fisheries. I often recommend rainbow trout as they are relatively simple to culture. However, you can also have warm water fishes. The warm water fishery is a little more complex and requires management so as not to have them overpopulate a pond. Rainbow will not overpopulate because they cannot spawn unless spawning beds are provided. Many of the local fish culturists are here and can be consulted on obtaining fish.

A log must be put in the pond to supply substrate for invertebrates and cellulose consuming bacteria. Several thousand species of invertebrates will infect the log. Cellulose consuming bacteria form the base of the food chain in the pond for the invertebrates that supply natural fish food.

The carbon cycle in a micro-environment regulates how healthy a system is. A log is a large energy source and carbon source. The vital energy of a tree is stored in its wood. This can be released into a pond. The decomposed log leads to plant growth, habitat for several thousand species and substrate for the pond bacteria. This leads to fish food, bird food, and your food if you so desire to eat your own fish.

## **The Top Predator**

I will conclude by talking about the top predator. Ponds need top predators. Yes, there is more than one. In the bottom, you should have the common crayfish. The large fish are top predators and will eat the invertebrates and crayfish. If a log is supplied, the western pond turtle will inhabit the pond. She needs an egg laying area. You can not buy turtles, you offer habitat and they select you. She is the queen of the pond. This interrelated predation sets up tension where no one animal can overpopulate or gain control.

We are not finished. Birds are an integral portion of the pond. Great Blue Heron and Osprey often visit ponds and take fish. To control them, you need song birds and the queen of the Oregon sky, the barn owl. I show how to structure habitat for them.

You are the TOP top predator, because with all that I have told you today, you can be the master of your pond. You will be your pond keeper.

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You are probably thinking, “Wow, this is a lot of work.” It is and it isn’t. The whole process takes about three years. When I come out, I diagnose the problems using observation and some chemistry, give a two hour seminar on pond management, and then follow this with a report. At the end of the report, I show work projects and how to do this in a step-wise way so it is easily performed. I also lay-out the costs showing the most inexpensive method to achieve a natural self-managing pond. Restorations are relatively easy to perform; it just takes some effort. A few plants at a time are all that is necessary. In the end, you will have a beautiful pond that requires minimal maintenance and is yours to enjoy.

If you need some help, give *The* **Pond Doctor** a call and I will help you.

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