Pond Management 101

BY **JEFF STELZER**

When looking to address pond problems, there are three words you need to keep in mind: restoration, management, and protection. Restoration is defined as using ecologically sound principles to attempt to return a water body as close to its original condition as possible. Management is improving the lake or reservoir to enhance stated uses, such as water supply, swimming, fishing, or wildlife habitat. Finally, protection is what you do to prevent adverse impacts. All three of these can be readily interchanged and intertwined within pond management. For example, a pond once restored will often require continued management and possible protection to stay in that condition.

Before we go any further it is imperative to determine one extremely important piece of the puzzle: What is the function of the pond? Is it serving as an aesthetic centerpiece of a property? Maybe the main goal is to attract wildlife or provide trophy-fishing opportunities. These will ultimately determine the restoration, management, and/or protection measures you need to apply to get the most out of the water feature.

Restoration

Depth will ultimately dictate the types and amount of rooted aquatic growth. Ponds should be constructed with a minimum depth of around 10-12 feet. Steep slopes should also be considered as they help to prevent excessive growth by limiting sunlight penetration.

There are many potential problems for a shallow pond. As the summer months progress, the sun can heat up a pond. Generally, warmer water holds less oxygen than colder water. The resulting oxygen depleted water can slow down beneficial microbial activity, stress and potentially kill fish, and increase potential for algae growth. For shallow ponds, restoration such as dredging may be the only way to improve current conditions (see photo).

Proper management does wonders for this subdivision pond.

Management

Unlike years ago, there are now many different management strategies available for pond managers, each with different benefits, side effects, and limitations. None are suitable for every pond or for all problems. Below are some of the tools including aeration, aquatic plantings, beneficial microbes, fish stocking, light-limiting dyes, and plant elimination/removal.

A properly aerated pond will reduce algae production by binding phosphorus with naturally occurring metals. It will help to maintain a firm, organic free bottom by providing the oxygen necessary to allow natural microbes to break down decomposing plant matter. Aeration will also increase the habitat that fish have available to them in the summer months.

Another important aspect is choosing the correct plants not only for the shoreline area but also for in the pond itself. Shoreline plants such as bulrush, arrowhead, pickerelweed, and iris can provide aesthetics while also stabilizing shoreline sediments. For in the pond, I recommend chara (plant-like, but actually an advanced form of algae). Think of chara as turf. When maintained properly, it helps to crowd out less desirable plants while providing outstanding fish habitat. And because of the algae characteristics, it filters its nutrients from the water column resulting in clearer water and less floating algae.

Beneficial microbes are a fairly new management technology. These microbes come in many different formulations and are usually added once or twice a month during the growing season. Some aim at reducing the amount of phosphorus in the water column while others reduce the organic matter (muck). The different brands all have one goal: to reduce algae or organic matter while providing a healthy, naturally sustaining pond.

Stocking fish also works a little like the bacteria. Phosphorus, the main source of food for plants and algae, is a component in all fish. It goes like this: algae uses phosphorus, which is eaten by tiny zooplankton, which are eaten by minnows and

panfish, who are eaten by game fish that can then be removed through fishing thereby removing all accumulated phosphorus. Care has to be taken in stocking the best species for the pond. Largemouth bass, hybrid bluegill, and fathead minnows are usually a great combination.

Light-limiting dye reduces plants and algae by inhibiting light penetration that in turn stops plant photosynthesis. Typically blue, these dyes produce a pronounced and aesthetically pleasing color in the water column. They are only effective at shading out growth in over 4 feet of depth. Dyes can also mask otherwise unpleasant algal blooms and are very efficient at eliminating planktonic algae. Plant elimination and removal can be achieved either mechanically or through the use of herbicides and algaecides. Mechanical removal is beneficial because nutrients within the extricated plant material are no longer in the pond. This method is very labor intensive and time consuming. Herbicides and algaecides on the other hand are usually fast acting. This can be a great management tool, but it's a Band-Aid and not a solution. These treatments, no matter how effective, leave decaying plant material in the pond where it recycles the nutrients for more growth. It is imperative to have some type of management plan in place to reduce treatments in subsequent years.

Protection

Okay, so you've planned some restoration and/or management techniques for the pond. But have you taken the steps to reduce the previous problems? Some of the common protection methods include reducing the watershed size (if possible), assessing the water source, reducing phosphorus fertilizers, and maintaining a pond buffer.

Limiting the watershed of the pond can be an extremely effective technique to limit potential contaminants from entering. A watershed is a drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation. It is essential to understand that a pond is not an isolated body of water, but part of a larger picture that includes all land uses within its watershed. It is possible to reduce the watershed of a pond to almost nothing by putting a berm around the pond. This ensures that the runoff from surrounding land does not flow directly to the pond, thereby reducing the chance for sedimentation and nutrient loading.

Assessing the water source for the pond can also have multiple benefits. Unless the pond was created for some type of wildlife purpose, surface water should not be used. Why? Well just as discussed above, every water body has some type of watershed. That watershed, depending on the slope of the surrounding land, may be hundreds of square miles. If this surface water source with a large watershed is used, it may bring with it large amounts of contaminants. Pond water levels should also be maintained during periods of drought. If not, water levels drop meaning more sunlight penetration, higher concentrations of nutrients, warmer water temperatures and obviously, more plant growth.

Think about it this way. Let's say that you have X amount of the nutrient phosphorus in your pond and you lose half of the pond volume to evaporation. Remember that evaporating water does not take nutrients or anything else with it. So even though you still have the same amount of phosphorus in your pond, now you have effectively doubled the concentration!

So here we are back to phosphorus again. One-way phosphorus moves into the pond is through poorly timed, aimed, and/or excessive fertilizer application. Look at using phosphorus-free fertilizer or at least a fertilizer where the phosphorus is minimal.

The second way phosphorus can move is through erosion or runoff. We've already talked about some beneficial shoreline plants, but it's also important to limit runoff into the pond. This can be accomplished by growing a buffer, which is an unmowed area around pond. Ideally, one should aim to have a buffer that is anywhere from 1-30 feet out from the edge of the pond. **ST**

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