POND HABITAT DEVELOPMENT

To develop a successful fishery, farm ponds must provide habitat that will promote adequate reproduction and good growth of fish populations. From this standpoint, several factors could be included under the term habitat.

Depth Considerations

In general, a deeper pond provides more habitat for fish production. However, as ponds get deeper, there is a greater likelihood of stratification. Deeper ponds can become stratified, with a warm upper level, a transition zone where the temperature drops quickly, called the thermocline, and a cooler, deeper zone. Problems in deeper ponds develop because oxygen levels in the isolated bottom zone drop throughout the summer and may reach 0. If this happens, available habitat is reduced because fish will avoid this part of the pond. (see Figure 8)

If the pond turns over quickly from a severe windstorm or a heavy, cold rainfall during late summer or fall, a fish kill can occur. The best solution in deeper ponds (large areas over 10 feet in depth) is to install a floating windmill aerator or similar device to keep the water column well mixed. This will ensure adequate dissolved oxygen levels in the hypolimnion and will increase the potential for fish production. (see Figure 9)

Figure 8. Stratification

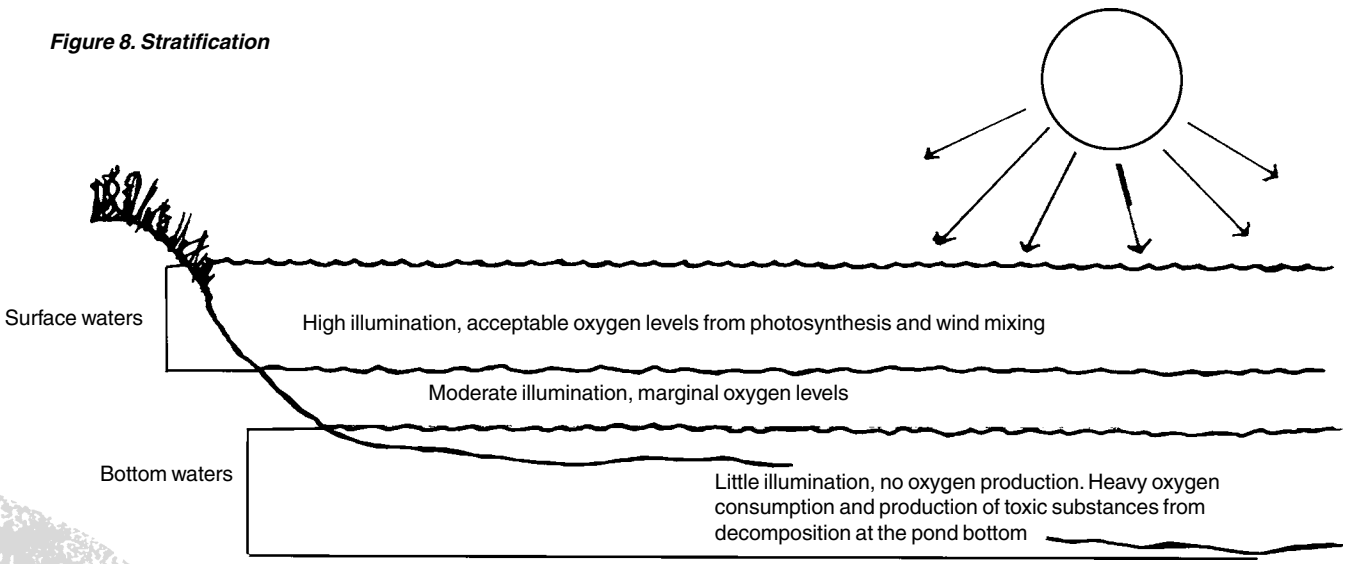
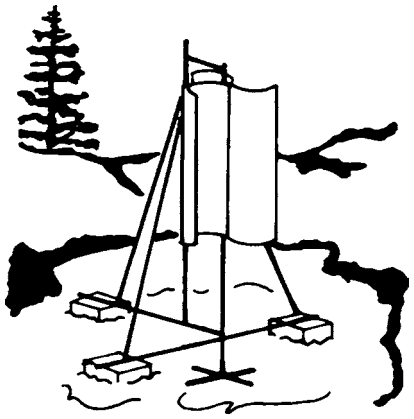


Figure 9. Windmill Mixer



Habitat Complexity

Apart from water quality and overall pond depth, two other aspects of pond habitat are crucial for developing productive fishing: habitat complexity and spawning areas. One aspect of habitat complexity is variability in depth and shape of a pond. A useful concept that has been developed to describe pond shape is the shoreline development index. This index compares the length of the shoreline of a pond to the circumference of a circle with the same surface area. A higher shoreline development index provides much better habitat for fishes that are suited for farm ponds in Louisiana such as largemouth bass, bluegill sunfish, redear sunfish and channel catfish. (see Figure 10)

A second aspect of habitat complexity is depth variability. A well-constructed pond should have near-vertical sides to a depth of 3 feet to discourage growth of rooted plants. Moving away from the vertical walls at the edge of the pond, deeper holes, underwater mounds and submerged points all provide habitat variability and cover for sportfishes, particularly largemouth bass. In this regard, ponds formed from dams constructed at the mouth of small hollows often provide better habitat diversity than excavated round or rectangular ponds. A third aspect of habitat complexity is submerged structure. Structure can be formed by anything in the water. It provides hiding places for fish, as well as a place to concentrate fish and increase fishing success. However, the type of structure present can have a tremendous effect on fish production and angling success. In general, the least beneficial structure in a pond is rooted vegetation. The problem with beds of vegetation is that they can become so dense that predatory fishes like largemouth bass are unable to forage effectively; this results in high densities of small sunfishes, which become stunted, attaining maximum sizes of 3-5 inches, and reduces bass reproduction. By maintaining a 3-foot depth at the margin of the pond and following a good fertilization schedule, you can usually eliminate rooted vegetation.

However, if rooted vegetation is not present, what types of cover are available, and what types are best? One of the best types of cover is a submerged tree. Consider a 40-foot tree that has been cut down, trimmed of all branches under 1 inch in diameter and placed in a pond perpendicular to the shoreline with the trunk at the pond's edge. It provides physical structure in the pond, but not dense structure. Small and large fishes can easily swim among the branches, thus allowing predatory bass to crop the young sunfishes.

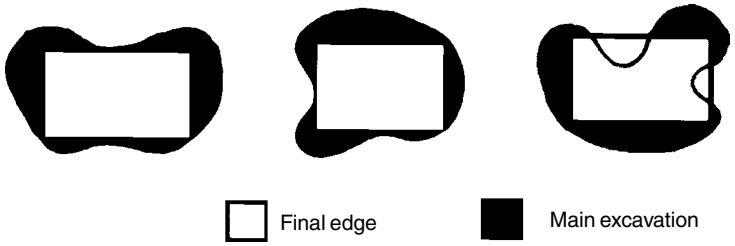
The tree covers the entire range of depths from the surface at the edge to the bottom toward the middle, increasing habitat complexity. It provides good surface area for development of attached algae communities and the insects that serve as forage for young fishes. It provides protected areas where nestbuilding fishes like bass and sunfish can spawn. Finally, it concentrates larger sunfish and bass to increase the catch rate of pond anglers. In general, the more cover/depth combinations that can be developed, the better the habitat.

Other types of submerged structures provide excellent cover for pond fishes, and they all share at least some of the above characteristics. Brush piles that are lashed together and weighted provide excellent cover. Several brush piles can be placed at different depths and locations in a pond to increase habitat complexity. Tire reefs can be made inexpensively. Tire reefs provide low-density cover for a long period of time and are fairly easy to build and anchor. Construction and placement are easiest before the pond is filled or if the pond can be drawn down and then refilled after the reefs have been constructed. Piles of concrete blocks or other materials can also provide cover. In fact, the only real limitations to providing submerged structures are finding heavy materials and getting them into the water. (see Figures 11, 12 and 13)

Spawning Areas

The other important aspect of pond habitat is spawning substrate (what the bottom is made up of). Largemouth bass and bluegill are nestbuilders, and they prefer a substrate that is fairly firm and coarse. Fairly new ponds with clay bottoms will usually provide adequate spawning substrate for pond fishes. Older ponds, however, tend to become silty, and in time the buildup of this fine mud can reduce nesting success. Check to see that there is some firm substrate in 3-6 feet of water along the windward shoreline (so that the most of wave action will be at the other end of the pond). If these conditions are not present, the substrate can be improved by spreading pea gravel (1/8 inch to 1/4 inch in diameter) along 50-100 feet of shoreline (5- to 10-foot band, 1/4-1/2 inch deep) or along patches of shoreline around the pond.

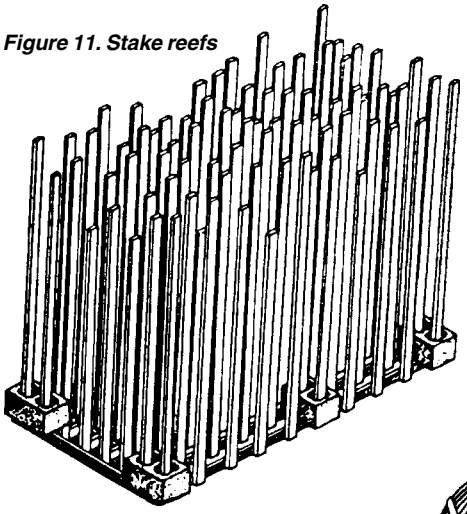
Figure 10. Shoreline Development



Figures 11, 12 and 13.

Figure 12. Brush piles

Figure 11. Stake reefs



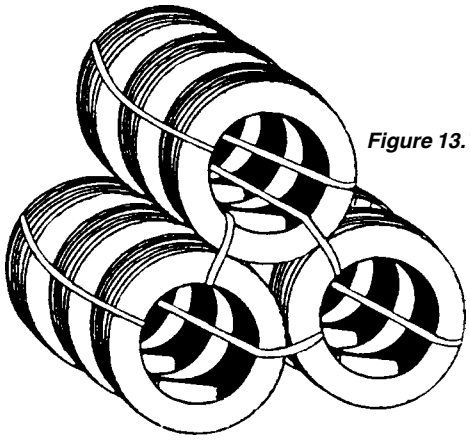


Figure 13. Tire reefs