

If necessary, deepen the shoreline to 3 feet deep while water levels are reduced. This reduces the likelihood of weeds returning. After reflooding, if weeds persist and begin to sprout, apply an appropriate herbicide. The combination of a winter drawdown, shoreline deepening, and effective early spring herbicide application usually eliminates or greatly reduces aquatic weed infestations.

Drawdown for Fish Management

Winter drawdown is also a good fish population management technique in largemouth bass/bluegill ponds. By reducing the water level and pond area, you drive forage fish, such as bluegill, out of shallow water refuges and concentrate them in open water, making them more available for bass to eat. This is a good technique to use in ponds having “crowded bluegill” but still containing viable bass populations.

The increased feeding by largemouth bass on bluegill reduces bluegill numbers and provides more food for the bass. Routine annual drawdowns can help maintain a balanced bass/bluegill fishery.

Drawdowns can make bass crowded situations worse. If you have a bass-crowded pond, follow the recommendations in the Managing section, and do not use winter drawdowns until pond balance is restored.

Winter drawdown also provides a good opportunity to do repairs on piers, docks, and boat ramps, as well as minor dam repairs and shoreline renovation. Fish attractors, such as brush tops and gravel beds, can be more easily put in place while the water is down, and this is a good time to deepen edges to the recommended minimum depth of 3 feet. You can use dirt from the shoreline-deepening operation to build earthen piers at various locations around the pond. These piers increase the shoreline area of the pond and provide increased access for fishermen.

In most farm ponds, lowering the water level 2 to 4 feet usually exposes the proper percentage of the pond bottom. You must consider the topography of the pond, amount of shallow water, and pond shape and design. Reach the maximum depth of drawdown by late November, and let the water remain down through February. In south Mississippi, the stand pipe can be raised a little earlier, perhaps mid-February, to let the pond refill and not hamper bass spawning activities that begin earlier in that part of the state.

Winter drawdown can be a useful tool if you do it properly. It poses no threat to the fish population and costs nothing if the pond is equipped with a

water control structure. Drawdowns should be done only in the winter, however, never in summer! The extreme temperatures in Mississippi summers, coupled with the increased activity level of fish and reduced oxygen levels in warm water, will likely result in fish kills in a summer drawdown.

UNEXPECTED FISH KILLS

Occasionally, a fish kill occurs in farm ponds because of water quality problems, infectious disease, swarming fire ants (in the spring), or misused agricultural chemicals (pesticides). In some cases, the losses may be enough to affect the balance of the fish population. **Get professional help to evaluate the fish population balance after a fish kill. In many cases, a phone call will provide enough information.**

Oxygen Depletions and Pond Turnovers

By far the most frequent cause of fish kills in farm ponds is low oxygen. Low oxygen can be the result of two separate phenomena in ponds. The first is simple oxygen depletion, which usually occurs July through September in the time of highest water temperature. Dieoffs caused by low dissolved oxygen levels result from natural biological processes, and preventive measures are rarely efficient except for running an expensive aerator every night.

Following are factors that can contribute to low oxygen levels:

- Dense plankton blooms or dense stands of pond weeds.
- Several days of cloudy weather that reduce plant oxygen production.
- High temperatures, which decrease the solubility of oxygen in water and increase oxygen consumption by plants and animals.
- Sudden die-off of plants or algae, especially associated with herbicide use.
- Unusual weather patterns, such as storm fronts and heavy, cold rain.
- Overstocking fish, excessive fertilization, or high feeding rates.
- Input of organic matter, such as hay, straw, or cottonseed meal for turbidity or algae control, and materials such as animal manure or sewage.

Another condition, often called “pond turnover,” can occur after heavy cold rains in late spring to early

fall when temperatures drop suddenly. During calm, hot days, the pond develops temperature layers called “stratification.” The layer of water at the surface is exposed to the sun and warms quickly. This warm layer weighs less than the cool water below, so these layers do not mix (Figure 11).

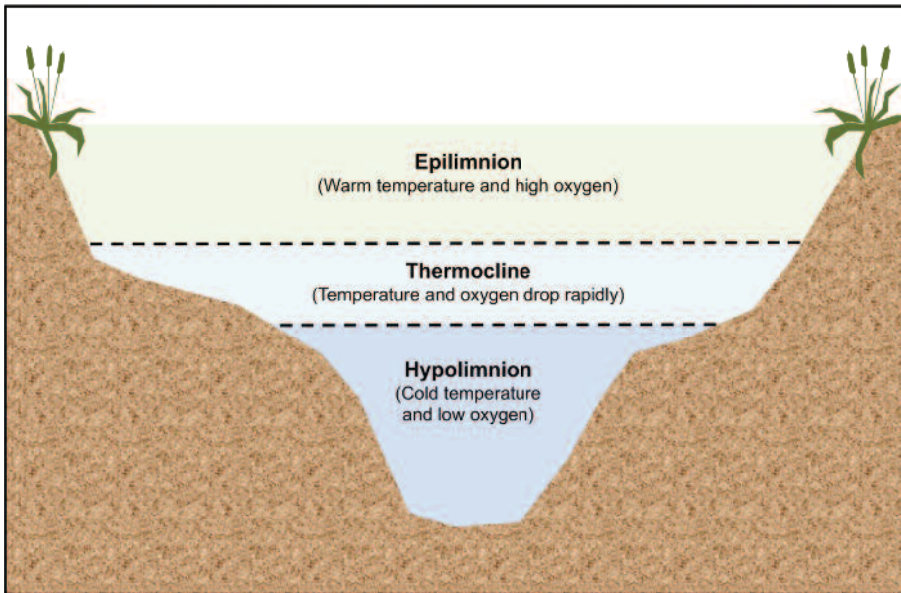


Figure 11. Stratification of water layers in pond during summer.

Surface layers contain high levels of oxygen produced by the phytoplankton. The cooler bottom layers are cut off from the surface layers and their sources of oxygen, so oxygen levels drop over time because of normal biological processes. In fact, these deep waters can actually develop an “oxygen demand,” which is like having negative oxygen levels. When a heavy, cold rain enters the pond, or when there are sustained high winds, it mixes the two layers of water. When this occurs, oxygen levels throughout the pond may drop too low for fish to survive.

A severe mixing event can kill nearly every fish larger than an inch or two in one night. It is not uncommon to find large dead fish on dry land in the watershed above the pond following a turnover. These fish swam up the incoming rain waters seeking oxygen. Adult fish die first, and intermediate-sized fish follow, if the low oxygen levels are too low or if low oxygen conditions continue for many days.

Usually, by the time you recognize there is an oxygen problem, it is too late to save your fish. But an early symptom of a low-dissolved oxygen level is fish at the surface of the pond at sunrise. Fish appear to be “gasping for air.” If you discover the low oxygen

event early enough, you may be able to save some fish by using emergency aeration. A powerhouse-type aerator works great, but most people don’t have access to aquaculture equipment. You can back a boat with an outboard motor halfway into the pond and tilt the motor at a 45-degree angle to the water surface. Run the motor at high speed to move a “rooster tail” of water into the air and across the pond. Any technique that mixes water and air can help provide an oxygen refuge for fish.

Following a severe fish kill, some fingerling fish usually survive, but overcrowding bream tends to follow. **After a severe fish kill, contact a fisheries biologist to assess the status of your fish population.**

pH and Mineral Problems

Poor water chemistry is the second leading cause of fish death in Mississippi ponds. Fish in acidic water with low alkalinity and hardness are more likely to get sick, especially during times of stress, such as spawning season or periods of rapid temperature change. A few fish, usually of different species (although catfish are especially sensitive), die every day, and many may have sores or lesions. If this is the case, have your pond water alkalinity measured to determine if agricultural limestone is needed. Liming increases the dissolved minerals in the water, which reduces stress on the fish. See the section on Liming Ponds for more information.

Infectious Diseases and Parasites

Bream and bass generally do not have significant problems with infectious diseases in well-balanced ponds, although you may see an occasional sore on individual fish during spawning season or after an injury. This is normal, and these external sores do not pose any health hazard to humans.

The one known exception is Largemouth Bass Virus (LMBV), which is not common in Mississippi ponds. This virus becomes evident during the hot summer, when largemouth bass are seen sick or dead on the surface and around the pond. A few bass die every day during warm weather, and larger fish seem to be more affected. When water temperatures cool in September/October, no more fish die from the virus, but the virus persists in the pond. The best way to avoid LMBV and other health problems is to