Act Now to Prevent Summer Farm Pond Fish Kills

By Jon West, Fisheries Biologist

Fish kills are often associated with raising water temperatures during the dog days of summer, but landowners can take steps to avoid these die offs throughout the year.

Fish kills are often the result of decreased oxygen levels that can be traced back to excessive nutrients in the system. How do excess nutrients lead to a fish kill? Phytoplankton – microscopic, free-floating algae – use nutrients and sunlight for photosynthesis and expel oxygen as a byproduct. While phytoplankton produce oxygen during sunlight periods, they cannot during the night and even consume oxygen during this time. Because of this, oxygen levels may be sufficient throughout the day but can reach lethal levels by sunrise. If this happens, fish begin gulping air at the surface. Several overcast days in a row can lead to reduced photosynthesis and cause a fish kill.

Ponds with 10 feet of water are deep enough to have a stratified layer in the summer where deeper, cooler water is depleted of oxygen and shallower, warmer water is oxygenated. In smaller ponds, a turnover – the sudden mixing of these two layers – can result in enough oxygen depletion to kill fish. Turnovers occur in the fall when the water temperatures are dropping, reaching a tipping point where the densities shift and the surface water is more dense than the deeper water. Rapid turnovers in ponds are usually associated with cold fronts and storms.

Adding some form of aeration to your pond can help with oxygen depletion issues. This can take the form of fountains, underwater diffusers, or agitators. Aeration not only provides an immediate supply of oxygen for fish, but also reduces stagnation, facilitates aerobic breakdown of organic materials on the pond bottom, and prevents wintertime freezing.

Controlling nutrients coming into the pond is another critical factor in fish kill prevention. Most of a ponds nutrient load comes off of the landscape through the watershed. Allowing buffer zone strips of grass to grow in the pond's drainage area can slow erosion, allowing sediment to drop out and trap nutrients before they reach the pond. Fencing livestock out of the watershed also helps reduce the nutrient load coming into a pond.

Controlling aquatic vegetation is another important part of pond management but it can be easy to go overboard. When applying herbicide for vegetation control, break the work into sections. It is recommended to treat only one-quarter of the pond per application allowing a week of rest in between applications. This will help avoid adding too much decaying matter into the pond at once and keep your oxygen in the water for the fish.

Maintaining buffer strips of grass around ponds can reduce nutrient runoff and prevent summer fish kills. (William McCoy/USFWS)