

Winter Fish Kills – by Edwin Lentz – Hancock County Extension

Many of us have asked how the cold and excess snow may have affected the survival of plants and wildlife. However, Ohio State University Extension's pond specialist, Eugene Braig, has noted that this year's severe winter may have an effect on fish populations in ponds.

He has reported that winter fish kills are uncommon in Ohio. However, the prolonged cold and abnormally large amount of accumulating snow may have created environments for fish kills this winter.

To survive these winters, fish need oxygen. Oxygen primarily enters the water of ponds from diffusion with the atmosphere and as a photosynthetic byproduct from aquatic plants. Fish and other aquatic animals use this oxygen during respiration.

Cold water is actually better capable of holding oxygen than warm water. The use of oxygen will decrease in cold water, but it is still needed by fish to survive during the winter months. The larger the fish the more oxygen will be needed to function.

Problems arise when a pond's surface is completely sealed by ice, preventing atmospheric oxygen from entering the water. If ice is opaque or if snow accumulates on its surface, sunlight cannot reach plants and algae in the water. Sunlight is needed for photosynthesis to occur in these plants, which releases oxygen during the process.

The consumption of oxygen by fish will continue even though ice and snow have prevented new oxygen from entering the water from the atmosphere or photosynthesis. If this situation continues too long, fish may deplete the oxygen supply of the water leading to death and if large numbers are affected, a fish kill.

Many game fish (bass, bluegills, crappie) become stressed when oxygen levels fall below five parts per million. Very few fish can survive at levels below two parts per million. The vast majority of fish kills in Ohio ponds occur from too much depletion of oxygen in the water.

Ponds with a greater volume of water potentially hold a greater amount of oxygen and tend to be less susceptible to winter kill. It is recommended in northern Ohio that 25% of the pond should be at least 10 to 12 feet deep.

Maintaining an appropriate coverage of vegetation within a pond that has an appropriate expanse of deep water will have a natural resistance to winter kill; a shallow pond that is choked with excessive vegetation will be much more susceptible to winter kill.

Around 20% of the surface area of the pond should be allowed for plant growth for adequate oxygen levels, depending upon your management goals and fishing activities. Algae, especially planktonic algae, are difficult to manage since this type of algae can suddenly die in season -- quickly depriving a pond of oxygen production.

Filamentous algae simply tend to be a nuisance within ponds. A reasonable coverage of submerged plants both provides ponds with a more consistent source of oxygen and helps suppress nuisance blooms of filamentous algae and duckweeds through competition for nutrients.

It is not practical at this time to determine whether you may have had a fish kill from the winter. As your pond thaws with the approaching spring, watch for signs of a winter fish kill. If you are unfortunate to experience one, know that you have some susceptibility and take actions to mitigate when bad winters are predicted in the future.

Proper management of aquatic plants during the warmer months will assist in preventing future fish kills.

Treating large areas of vegetation with herbicides or an excessive natural die off of aquatic plants in the summer before increases the amount of decomposing organic matter, which will deplete oxygen and make a pond more susceptible to winter kill.

Aerating from spring, throughout the summer, and into autumn—in particular with a bottom-bubbler/diffuser or air lift—can help to sustain healthy oxygen levels throughout the warm season and improve resistance to winter kill.

If maintaining an area of open water with aeration is not an option, you can reduce the risk of fish kill by simply removing snow from the ice's surface, allowing the penetration of sunlight to stimulate some photosynthesis and oxygen production.

Plan to keep 30% of the pond's ice free of snow; however do not forget safety concerns when working on and around pond ice.

Additional information on fish kills may be found in OSU Extension Fact Sheet, Winter and Summer Fish Kills in Ponds, <http://ohioline.osu.edu/a-fact/0008.html>.