



# Diagnosing Fish Kills: Important Questions for Landowners

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This document is intended for information gathering prior to recommendations. Answers to the following questions are critical for diagnosing fish kills and will help streamline the process of recommendations.

- What is the approximate surface area of the pond?
- What is the approximate maximum depth and average depth of the pond?
- What species of fish and approximately how many of each species have died?
  - Some species of fish are more tolerant of low dissolved oxygen and may respond differently to depletion events. It is important to know whether the fish kill disproportionately affected certain species, or if it affected all species similarly.
- What sizes of fish have died and what sizes of fish died first (smaller or larger)?
  - Oxygen depletion events generally affect larger fish first, while toxicity events generally affect smaller fish first. Knowing what sizes were affected first will help determine what type of event may have caused the fish kill.
- Are there live fish still present in the pond and do they appear normal?
  - Are the species that died and the species that lived different?
- Over what time-period did the fish kill happen?
  - It is important to know whether the fish kill event was chronic (occurred over the course of multiple days) or acute (occurred in one day or less).
- Have any chemical treatments recently been applied to the pond or the surrounding land? If so, can you identify the chemical and dosage?
  - Chemical treatments of aquatic vegetation or algae have the potential to lead to fish kills via toxicity or oxygen depletion. Chemical treatments of surrounding land have the potential to enter ponds through surface runoff and lead to similar issues.
- What is the water source for the pond and has anything recently changed about it?
  - Is the pond fed by a stream, spring, or surface runoff? Is any water being pumped into the pond from a well or other water source? Inflow streams and runoff are susceptible to human impacts, some of which may contribute to fish kills.
- What does the water look like?
  - Is the water clear or turbid?
  - Is a dense algal bloom present?
  - Is the water an abnormal color?

- What were the weather conditions for the week leading up to the fish kill?
  - Long periods of hot and dry weather followed by sudden heavy rains, winds, or thunderstorms can cause turnover events, which can lead to oxygen depletion and subsequent fish kills.
- Was anything about the pond visually different leading up to the fish kill, such as presence of algae, presence of aquatic vegetation, or color or clarity of the water?
  - Any changes in pond conditions leading up to a fish kill event are helpful for determining potential factors contributing to the event. The more information we have the better!
- Are fire ants abundant near or on the surface of the pond?
  - When fire ants swarm, particularly during warming periods following significant rainfall, they can be consumed by fish when they land on the water's surface. During digestion, toxins in the ants can be lethal to the fish that consumed them.
- Were fish being fed at the time of mortality? How much feed per day?
- Close-up photos of the pond as well as any dead fish that can be feasibly photographed are essential for helping determine the cause of a fish kill.