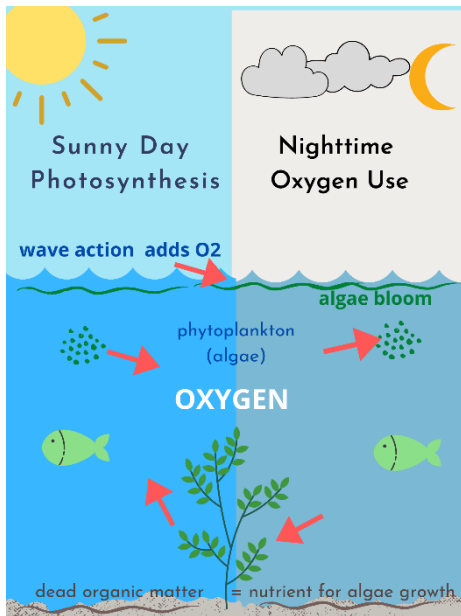


FISH KILLS, OXYGEN PROBLEMS, and AERATION

- **ILLNESS:** Fish are exposed to infections and parasites, but these harmful organisms usually occur at low levels in ponds and seldom reach the entire fish population. The fish suffering from disease or parasites usually die slowly, a few at a time and may affect a certain size or species.
- **STRESS:** Stressed post-spawning fish may be more susceptible to these issues as water temperatures warm in the spring and summer. Large fish past their prime may perish during the hot summer months or from winter starvation.



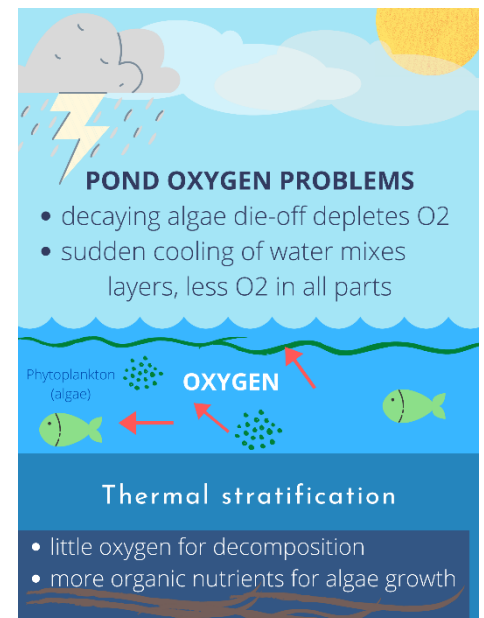
Oxygen is dissolved into pond water through the photosynthesis of aquatic plants on sunny days and water movement through wind/wave action. During daylight, plants normally produce more oxygen than they use, providing oxygen to fish and other water organisms. At night or cloudy days, the aquatic plants including algae, remove oxygen for respiration.

Oxygen depletions are the most common cause of fish kills in ponds. Oxygen levels are usually highest at midday and lowest just before sunrise. Fish kills from nighttime oxygen depletion occurs in the summer, usually in the very early morning hours in nutrient rich waters. Fish kills usually occur when more oxygen is consumed during the night hours than is produced during the daylight hours.

SUMMER KILLS:

Four events, on their own or in combination, can lead to a decrease of dissolved oxygen and result in summer kills of fish:

1. cloudy, hot still days- reduced photosynthesis worsened by calm windless weather
2. large scale die-off of microscopic plants results in the decaying process using more oxygen and less photosynthesis creating less oxygen
3. sudden thermal turnover (inversion) of pond layers caused by dramatic weather like severe thunderstorm/heavy cool rainfall, where oxygen poor bottom water mixes throughout the pond
4. chemical treatment of algae or pond weeds resulting in excessive decay of plants, placing a greater demand for oxygen



WINTER KILLS:

When heavy snow and thick ice cover a pond for an extended period, sunlight penetration is decreased and photosynthesis is affected. Oxygen production is lowered and compounded by the decomposition of decaying plants. Dissolved oxygen can be depleted during the course of a harsh winter depending on its severity. A thick layer of ice creates a seal between the water and air, preventing oxygen from dissolving into the water.

Fish kills seldom result in the death of the entire fish population. Low dissolved oxygen problems may affect the largest fish first. Smaller or more resilient fish species may survive.



Aeration may be an option to install in your pond to aid with oxygen issues. Fish Haven Farm offers many choices including those powered by electric, wind and solar. Check out the AERATION page of our website to see the decorative & aerating fountains, surface aerators, and diffused systems that can be tailored for your needs and pond conditions.