AERATION

Natural ponds get much of their oxygen from the atmosphere. However, as often is the case with artificial ponds, this process, called atmospheric diffusion, is insufficient to achieve optimally desirable levels of oxygen. This often results in stagnation associated with algal blooms, unpleasant odors, low water quality and possible fish kills. By artificially introducing diffuse air into a pond or lake, a number of benefits can be achieved. These include:

- Improved water quality and clarity
- Reduced weeds and algae
- Prevention of fish kills
- Improved health of fish
- Elimination of foul tastes and odors
- Reduction of organic sediment
- Improved aesthetics

Diffused Air Aeration System

One of the most common and arguably the most effective way to artificially introduce oxygen into a waterbody is through a diffused-air aeration system. In a system of this type, a compressor stationed on shore pumps air through hoses connected to diffusers placed near the bottom of the lake or pond. These diffusers are manufactured with permeable membranes which emit fine bubbles intended to maximize oxygen transfer. The rising air bubbles not only increase the diffusion of oxygen into the water but also increase the rates of circulation, aerating large amount of water. By evenly spacing the diffusers throughout the system, the entire lake or pond will become aerated within a short time period.

Benefits of Diffused Air

The most common result of aeration is an improvement in dissolved oxygen levels and the resulting benefits to fish and water quality. Under oxygenated conditions, nutrients otherwise available to fuel weed and algae growth are greatly reduced. As these nutrients become tied up in the sediments, nuisance plant growth slows and the general appearance and quality of the water increases.

Stagnant conditions often result in high levels of organic sediments ("muck") associated with foul odors. These odors, similar to the smell of rotten eggs, are a result of the breakdown of organic matter by anaerobic bacteria. Aeration is able to not only eliminate these odors, but also increase the rate of *aerobic* decomposition of organic matter. Diffused aeration systems have been shown to significantly reduce the levels of organic material and prevent further muck accumulation.

Fish die-offs or are often a sure sign of low oxygen in a waterbody. By properly aerating a lake or pond, conditions leading to die-offs can be eliminated. In addition, the general health of the fishery can be improved by allowing the not only desirable fish species to thrive but also the numerous organisms upon which fish feed. As often is the case in systems without aeration, low levels of oxygen greatly limit the areas of the waterbody in which fish can survive. Aeration can improve fish habitat by allowing fish to live throughout the lake or pond year-round.