

A Homeowner's Primer on Lakes and Ponds

BY JESSICA BACAL, ESQ.

This article is the first in a series of three, discussing how a body of water is composed, how it functions, and how it can be restored.

PART I HOW LAKES AND PONDS WORK

A standard literary device adapted to the cinema is to use lakes and ponds (sites known to environmentalists as "groundwater") as a backdrop for classic romantic scenes. The scenario of a couple seated on the shores of a lake, with gently lapping waves, needs no dialogue to convey a romantic setting.

For couples purchasing their dream house, the desire to sustain or re-establish the mood of their prenuptial relationship may drive their determination to purchase waterfront property. But such sentimental motivation aside, water views are widely acknowledged to be soothing, and the sound of waves softly cresting upon a sandy beach tends to relieve tensions as effectively as prescription medications.

In addition, groundwater provides myriad recreational opportunities for individuals and families, with fishing, swimming and boating in warm weather and ice-skating, ice-fishing and other related winter sports during the cold season. Boredom is rarely an option for those fortunate enough to live in lake communities.

Ah, but with every benefit comes burden. And what many prospective homeowners do not immediately grasp is that every surface water body requires dedicated care and maintenance. That's because

most people have no reason to know that surface water bodies consist of a community of complex interdependent organisms known as an ecosystem, which changes from season to season as well as from year to year. Lakes and ponds are constantly forming and disappearing, reflecting a natural process by which they evolve over thousands of years. But, lakes and ponds balance on a delicate ecology, sensitive to environmental nuances. That gradual process can be triggered into warp speed by certain disturbances in the watershed, which is the surrounding land area that drains into the water body. Thus, alterations in the oxygen level of the water, chemical imbalances, and contaminants can cause catastrophic biological and physical changes to a ecosystem called a lake or pond.

Most surface water bodies in Northern Westchester were gouged from the land by retreating glaciers eons ago. Biologists divide these lakes and ponds into zones and layers. The littoral community is where aquatic plants, such as water lilies and duckweed, predominate, and this is the zone, extending from the shoreline, where plants produce oxygen and provide food and shelter for insects, crustaceans, frogs, turtles and fish. The limnetic community is the open water area, which is the habitat for algae, fish, and zooplankton, which are microscopic animals. This is where oxygen is produced and is the basis of the lake's food chain. Beneath the limnetic zone is the profundal community, where oxygen consumption dominates in the dark waters where light does not penetrate and organisms decompose.

The epilimnion zone is the upper layer of the water, consisting of warm, light-filled water; the hypolimnion zone lies underneath, where cooler water predominates.

The transition zone between the two is called the thermocline.

In each of the zones, the key ingredient is oxygen, which supports the presence of living organisms, but other substances, such as phosphorus, carbon, and nitrogen, support plant growth. A relatively modest variation in any of these elements can wreak havoc with the health of a lake. If, for example, phosphorus levels rise as a result of runoff or septic failure, a lake's trophic status, or ecological health, will be impaired.

A eutrophic lake is shallow, with limited oxygen in the hypolimnion, and is so rich in nutrients that it boasts a lime green color. In contrast, oligotrophic waters are clear and deep, with high levels of oxygen in the hypolimnion. Between the two extremes is the mesotrophic lake.

My next column will focus on the need for diligent monitoring and conscious decisions about human habits if the health of a surface water body is to be maintained. ■

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