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Michigan's Inland Lakes

Condensed from an article by Tony Groves

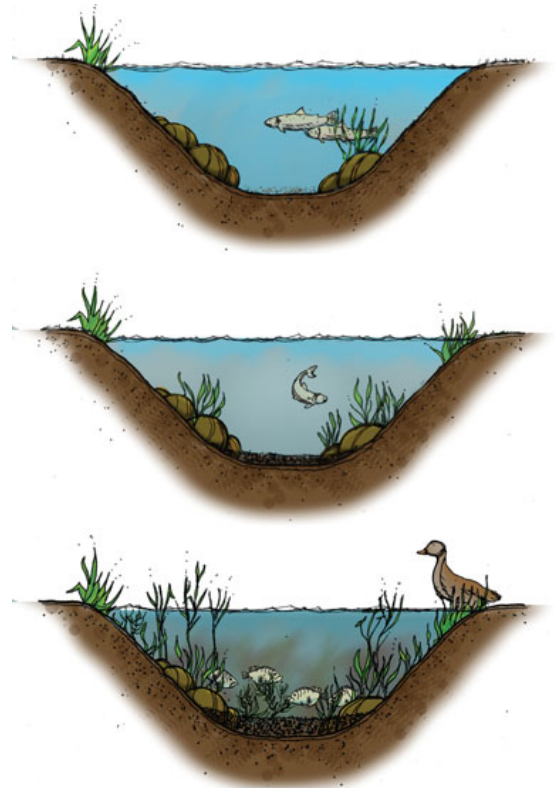
A common question is: "What is the quality of my lake?" The answer often depends on whom you ask. A water skier would likely prefer a lake with little or no vegetation, while a bass fisherman knows the vegetation "holds" the fish. The bass fisherman and the water skiing enthusiast may provide two completely divergent answers if asked about the quality of a particular lake.

Scientists classify lakes based on their ability to support plant and animal life. Oligotrophic lakes are generally deep and clear with little aquatic plant growth. These lakes maintain sufficient dissolved oxygen in the cool, deep bottom waters during late summer to support cold water fish such as trout and whitefish. By contrast, eutrophic lakes have poor clarity and support abundant aquatic plant growth. In deep eutrophic lakes, the cool bottom waters usually contain little or no dissolved oxygen. Therefore, these lakes can only support warm-water fish such as bass and pike. Lakes that fall between these two extremes are called mesotrophic lakes. Under natural conditions, most lakes will ultimately evolve to a eutrophic state, as they gradually fill with sediment and organic matter transported to the lake from the surrounding watershed. As the lake becomes shallower, the process accelerates. When aquatic plants become abundant, the lake slowly begins to fill in; sediment and decaying plant matter accumulate on the lake bottom. Eventually, terrestrial plants become established and the lake is transformed to a marshland.

The natural lake aging process can be greatly accelerated when excessive amounts of sediment and nutrients that stimulate aquatic plant growth enter the lake from the surrounding watershed. Because these added inputs are usually associated with human activity, this accelerated lake aging process is often referred to as cultural eutrophication. Phosphorus is the nutrient that most often accelerates the eutrophication process. In general, as phosphorus levels in a lake increase, plant growth increases and water transparency decreases. Primary sources of phosphorus include fertilizer runoff and septic systems.

Infestations of exotic plant species are a significant threat on many Michigan lakes, and lake management projects often focus on plant control. Exotics exhibit aggressive growth tendencies and, if left unchecked, can outcompete native plant species and dominate the lake. If embarking on a plant control program, it should be noted that excessive removal of aquatic plants can have negative consequences. Aquatic plants perform many important ecological functions. Maintaining a diversity of beneficial plants is as important as controlling nuisance and exotic species.

In a recent nationwide assessment conducted by the US Environmental Protection Agency, loss of shoreland habitat was found to be the greatest stressor of the nation's lakes. Lakes with poor shoreland habitat



were three times more likely to be in poor biological condition. It has long been realized that logs, sticks, and other woody structure in river systems provide habitat for a variety of aquatic insects. These insects form the foundation of the food chain and are essential to sustaining a healthy fishery. Recent research indicates the same holds true for lakes. These findings underscore the need to promote restoration and preservation of natural shoreline areas.

Michigan has no statewide development standards for lake shorelands unlike several other states. Management practices, such as maintaining shoreland vegetation, are voluntary and creative ways must be found to promote and incentivize good land stewardship.

Ongoing education of lake property owners is vital to effective lake management.

The complete article can be found at:

http://macdc.us/PDF_links/PIPELINE/Pipeline2010_4Qtr.pdf beginning on page 15.

Additional resources:

Michigan Lake Info has articles on lake water quality, aquatic plants, and much more.

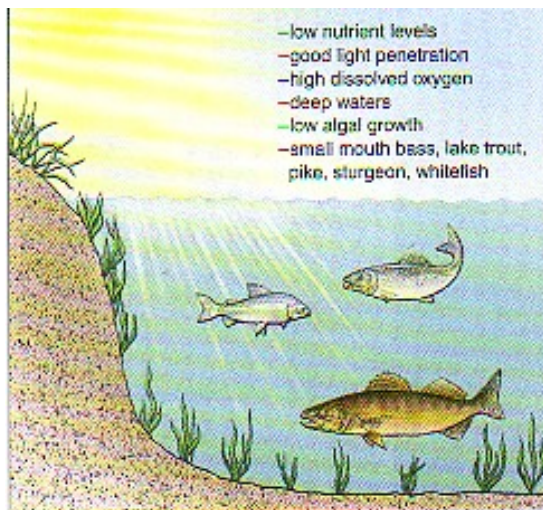
<http://michiganlakeinfo.com/>

Michigan Department of Environmental Quality

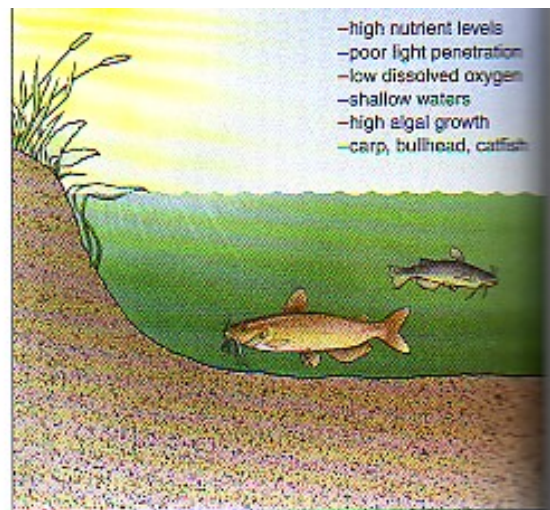
http://www.michigan.gov/deq/0,1607,7-135-3313_3681---,00.html

Michigan DNR – Lake Maps

http://www.michigan.gov/dnr/0,1607,7-153-30301_31431_32340---,00.html



(a) Oligotrophic lake



(b) Eutrophic lake