

The Lake Environment

Each lake is a unique environment, influenced by numerous factors in the watershed.

Water quality degradation and lake problems arise when a lake cannot rebound from pollution. Each lake will react differently to watershed disturbances, however. Baseline studies on individual lakes help scientists predict and remedy problems.

Understanding a lake requires learning about:

- ✓ the lake's water sources
- ✓ how long the water stays in the lake
- ✓ the chemical, biological, and physical processes that occur in the water column and substrate

Habitat

Lakes provide essential habitat for aquatic and semi-aquatic species. Lake habitat includes the shoreline, the nearshore, the open water and the lake bottom. Healthy habitat provides food, shelter, protection from predators, travel corridors and nesting areas.

Hydrology and Lake Flushing

The water quality in a lake is influenced by precipitation and the flow of surface and groundwater from the surrounding watershed. It is also dependent on how quickly a lake's water volume is replaced, or **flushed**.

Slow flushing allows pollutants to build up, potentially leading to water quality problems. The lake's water quality may be strongly influenced by groundwater and internal cycling.



With **rapid flushing**, pollutants are flushed from the lake more quickly. The lake's water quality is largely dependent upon surface inflows.

Lake Characteristics

The size and shape of the lake basin influences the lake's water quality and habitat.

Shallow lakes tend to be well mixed and oxygenated throughout. The water in deeper lakes, however, may "stratify"- or layer- as a result of seasonal temperature changes. Whether or not a lake stratifies is an important characteristic when assessing water quality.

What can harm a lake?

- ✓ Excess nutrients from the watershed
- ✓ Sediments: from the shore, or from stirring up the lake bottom
- ✓ Destruction of the natural shoreline and nearshore habitat
- ✓ Fuel or other toxic substances
- ✓ Bacterial contamination from faulty septic systems, farms, dog lots or animal waste
- ✓ Shoreline erosion from boat wakes

Nutrients And Nutrient Cycling

Nutrients play an essential role in the lake ecosystem. Nutrients come from natural sources in the environment, and are used and recycled by living things in the lake. Nitrogen and phosphorus are two important nutrients for lake organisms- but the quantities are critical. **They become pollutants when they enter a lake from unnatural causes!**



Life in the lake depends on good water quality and healthy habitat.



Production of this panel was made possible by funding from the U.S. Fish & Wildlife Service and The U.S. Environmental Protection Agency.

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