

RIPARIAN ZONE IMPACTS ON SURFACE WATER QUALITY
Jeff Cooper
Aquatic Biologist
Great Lakes and Environmental Assessment Section
Surface Water Quality Division / Department of Environmental Quality
Nashville, Michigan

There is an urgent need to protect our limited supply of freshwater in a rapidly changing society. These protection efforts have often concentrated on protecting the stream channel itself while overlooking the subtle impacts of land use change adjacent to the a waterbody. Contemporary aquatic ecology now recognizes the role of natural riparian zones in protecting water quality.

Riparian zones or riparian buffers are interactive areas between the edge of an aquatic system and the adjacent land use. Highly variable in size, riparian buffers typically have distinct soil and vegetation characteristics that collectively function to protect the aquatic environment. The true value of a functioning riparian zone is often overlooked because these buffering capabilities are slow processes that are not immediately evident from a quick observation.

Riparian buffer vegetation slows and traps sediment that would otherwise migrate to the lake/stream itself. In addition, nutrients found in surface runoff can be quickly utilized by shallow rooted vegetation while nutrients in the shallow groundwater (< 20' deep) are adsorbed by medium and deep rooted trees and shrubs. These trees and shrubs subsequently provide structure and organic inputs to the lake or stream that help fuel the biological machinery that maintains good water quality. Under certain soil and groundwater conditions, riparian vegetation can also utilize nutrients directly from the river or stream thus reducing instream concentrations.

In addition to the elements listed above, riparian vegetation also provides thermal protection to water bodies by providing partial barriers to sunlight. This "canopy" effect can efficiently minimize temperature extremes during warm and cold weather months which tends to stabilize macroinvertebrate and fish communities.

Activities adjacent to lakes, rivers and streams must consider the riparian and aquatic ecosystem as a single, interactive unit to efficiently protect water resources. Where possible, restoration (or rehabilitation) efforts should attempt to restore the functions listed above before or concurrent to stream channel restoration.