

LAKESHORE DEVELOPMENT . . . IT ALL ADDS UP!

(fact sheet #12 of the Shoreland Management and Lake Classification Series)



Please Don't Feed the Lake!

Lake Aging

- ❖ All lakes age, or become eutrophic, with time. However, this natural process can be accelerated through an increase in hard surface area and an increase in other sources of sediments and nutrients. Eutrophication is a process resulting from excess nutrients, particularly phosphorus, entering the waterway and causing algal blooms and oxygen loss. In most cases, eutrophication results in degraded habitat for fish and other aquatic life and reduced community diversity, reduced water clarity and an increase in algal blooms.

Water Quality Impacts

- ❖ While the impacts from each individual lot that is developed may be minor, water and habitat quality will be adversely affected by the collective impact of shoreland development over time. Densely developed shorelines are more likely than undeveloped shorelines to result in substantial phosphorus inputs entering the adjacent waterway. This is the result of more hard surface area and a high degree of shoreline vegetation removal. Studies have shown that sediment and nutrient inputs increase as shoreland lots are developed and cleared.

Case study #1: A study on phosphorus loading to a Wisconsin lake showed that a 1940s style home with a narrow grass corridor did not result in an increase in phosphorus loading over an undeveloped shoreline. However, with a 1990s style development with the entire property converted to lawn, **phosphorus inputs increased 700% compared to an undeveloped shoreline** (Panuska 1994).

Case study #2: A study in Maine showed that a developed watershed with 40% forest cover and a subdivision of one acre lots resulted in an **increase of 720% in phosphorus delivery** over an undeveloped watershed (Dennis 1986).

***For additional studies demonstrating the impacts of development on water quality and habitat, see: Bernthal, T. 1997. Effectiveness of Shoreland Zoning Standards to Meet Statutory Objectives: A Literature Review with Policy Implications. Wisconsin Department of Natural Resources, Madison.**

Mother Nature Knows Best!

Impacts on Wildlife Habitat

- ❖ Standard shoreline development which permits a 30 foot clearcut view corridor results in the fragmentation of riparian wildlife habitat and reduces the ability of wildlife to forage, find cover and satisfy other habitat needs.

- ❖ Densely developed shorelines also impact life within and near lakes and streams by affecting the role of shorelines and near shore areas within the ecosystem. Denser development often results in more shoreline modification in the form of pier and riprap or shore stabilization and the removal of ground cover, shrubs and woody debris. All of these activities impact the highly productive littoral zone by removing key sources of woody and plant debris, essential as sources of food and cover to fish and aquatic life. This “simplification” of near shore habitat may result in reduced fish populations and a loss in diversity within the aquatic community.

Lake Friendly Alternatives:

Managing lot sizes and widths gives a community an opportunity to control shoreland density. Overall lot area and width and side yard dimensions will directly affect the extent and value of the buffer area. The size of the buffer area between and around dwellings will also affect water quality and quality of wildlife habitat. A study done in Oconto County, Wisconsin, suggested that larger lot sizes were associated with less overall vegetative cutting and shoreline alteration (Ganske 1990) (**see fact sheet #13 for managing shorelands with lot sizes**).

Conservancy developments permit an increase in overall building density in exchange for a greater proportion of undisturbed shoreline. A “clustered” subdivision design with small lots and a substantial amount of common open space is more effective in minimizing adverse water quality impacts than a traditional subdivision design (**see fact sheet #15 for managing shoreline density with clustered development**).

Vegetation protection areas go beyond the minimum standards, which allow 30 feet of every 100 feet of shoreline to be clear cut, to protect the vital shoreland “buffer zone.” By allowing only selective thinning for a view corridor and no removal of vegetation in the rest of the near shore area, a functional buffer is left to protect water quality and provide habitat (**see fact sheet #5 for suggestions on vegetation removal standards**).

Keyhole or pyramid development occurs when water access is provided through a single lot for large numbers of backlot owners. Performance zoning standards (minimum access lot size, limit on number of backlots with access) for access lots for new pyramid developments may reduce the adverse environmental impacts resulting from intensive use of the near shore and shoreland zones (**see fact sheet #14 for tips on controlling pyramid development**).

Watershed planning consists of taking an inventory of resources within a watershed, including aquatic resources, wildlife and plant communities, sensitive areas and rare habitat, and existing development, and planning for growth in light of the carrying capacity of the receiving water body. Specific measures can be adopted to apply to sensitive stretches of shoreline and zones within the watershed. Effective shoreland zoning is ultimately the result of effective land and watershed planning (**see fact sheet #16 for an introduction to the concept of watershed planning**).

References and Additional Sources of Assistance:

Panuska, J. 1994. Internal Memorandum on results of modeling study of phosphorus loading. Wisconsin Department of Natural Resources.

Ganske, L. 1990. Lakeshore development: a study of six Oconto Co., Wisconsin lakes. University of Wisconsin-Green Bay. M.S. Thesis.

Dennis, J. 1986. Nutrient loading impacts: phosphorus export from a low-density residential watershed and an adjacent forested watershed. Lake and Reservoir Management: Vol II.



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