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## The Value of Natural Shorelines

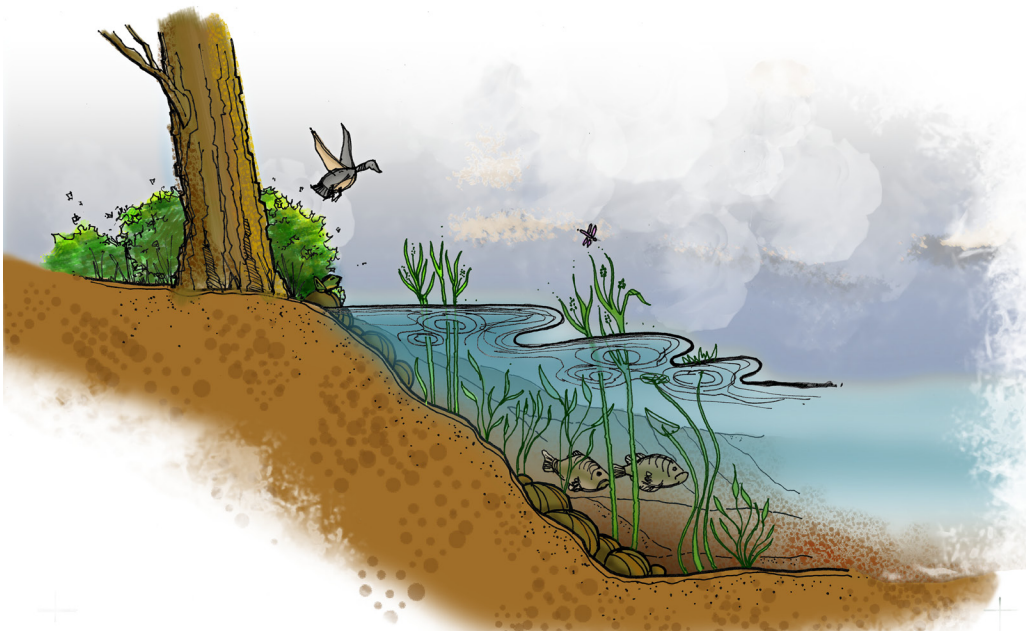
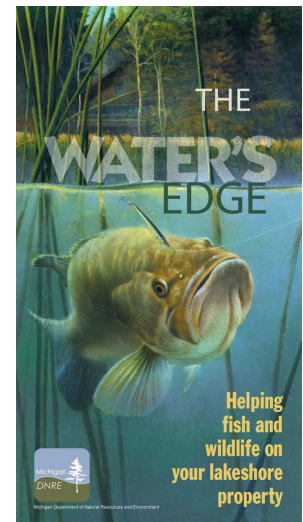
by Water Resources Group  
Progressive AE

April / 2019

### The Importance of Natural Shoreline

Riparian land owners are not the only ones who love lakeshore living. Natural shorelines provide critical habitat for fish and wildlife. Twenty-four species of amphibians, 25 species of reptiles, 87 species of birds and 19 species of mammals are commonly associated with Michigan's inland lakes.<sup>1</sup> Furthermore, near-shore areas provide critical habitat for at least 65 species of fish native to Michigan, 18 of which are identified as Species of Greatest Conservation Need in the Michigan Wildlife Action Plan.<sup>2</sup> A number of recent studies have found that natural shorelines help to sustain near-shore habitat essential to healthy fisheries in lakes<sup>3,4,5</sup>.

In addition to critical habitat, shorelines provide numerous water quality benefits. By filtering stormwater, natural shorelines can help trap a variety of pollutants including fertilizers, pesticides, animal waste, and petroleum products. Further, the extensive root systems found in a natural shoreline greatly reduce shoreline erosion.



In a report entitled *Conservation Guidelines for Michigan Lakes and Associated Natural Resources*, O'Neal and Soulliere (2006) noted:

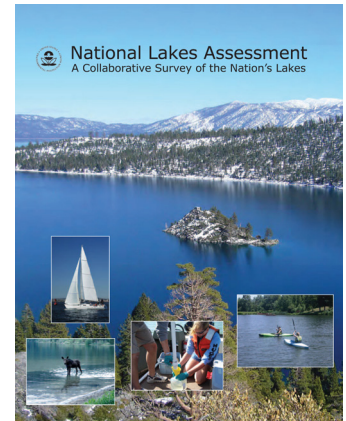
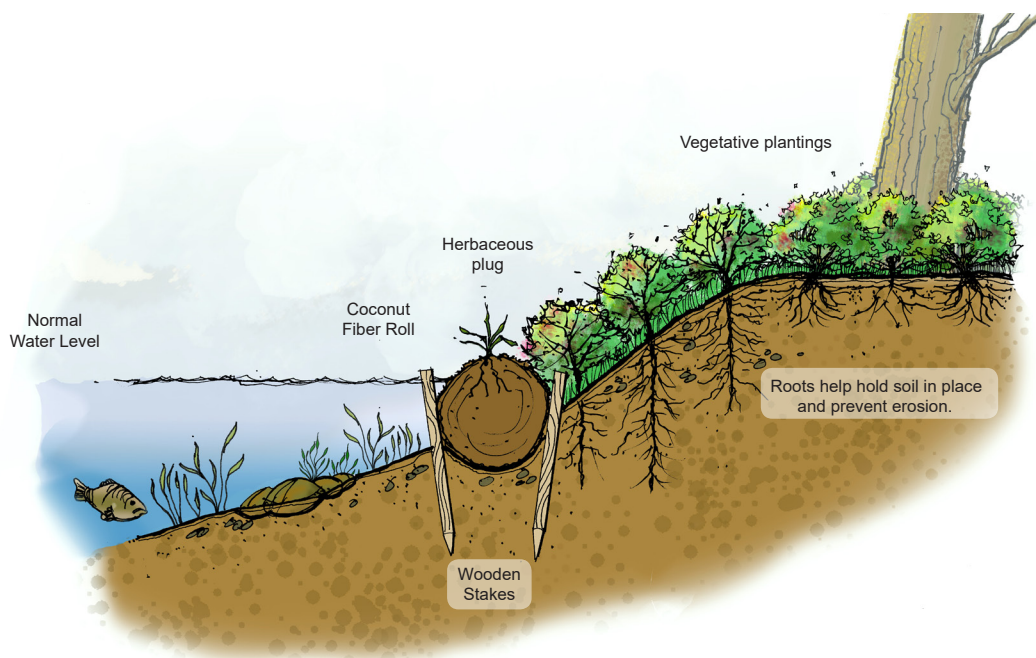
Construction of buildings, seawalls and lawns along lakeshores removes natural vegetation that mammals, birds, amphibians, reptiles, and fish require. Septic tanks and lawn fertilizers leach nutrients into the lake, having the same effects on water quality as agricultural fertilizers. Wetlands are often cleared and drained for buildings. Many Michigan lakes presently have little, if any, naturally sloped or vegetated shoreline remaining.

In the first-ever nationwide assessment of lakes, the U.S. Environmental Protection Agency evaluated several stressors of lakes. Of the factors evaluated, lack of shoreline vegetation was the biggest problem facing the nation's lakes. In fact, lakes with poor shoreline habitat were three times more likely to have diminished plankton populations.<sup>6</sup>

### Creating a Natural Shoreline

Shorelines that have been altered by the removal of natural vegetation, the placement of fill material or "hardened" structures such as sea walls are sometimes referred to as "disturbed shorelines." Hardened structures are typically added by homeowners as a response to excessive erosion. Often, the need for these structures can be reduced by reverting the disturbed shorelines back to a natural condition.

Natural shorelines can be restored through bioengineering or natural shoreline landscaping. These practices involve the use of live plants and natural structure. When selecting plant materials, it is important to use native, locally-grown plants to ensure successful establishment without the introduction of invasive species.



*Bioengineering is a method of stabilizing shorelines with shrubs, herbaceous plantings, and natural materials to prevent erosion and provide fish and wildlife habitat.*



Given the importance of natural shoreline, maintaining and protecting undisturbed natural shoreline should be a priority for every waterfront property owner. However, in areas where the shoreline has already been altered, how does one create natural shoreline? What resources are required? What methods work best? What are the costs? Are permits involved?

To help address these questions and to assist landowners who would like to re-establish natural shorelines, the Michigan Natural Shoreline Partnership was established in 2008. The Partnership is supporting a number of initiatives that promote natural shorelines. The Partnership administers a Natural Shorelines Training and Certification Program, maintains a listing of natural shoreline professionals, and a listing of suggested native plants for use at the water's edge. To find out more about the Michigan Natural Shoreline Partnership visit: [www.mishorelinepartnership.org](http://www.mishorelinepartnership.org).



[www.mishorelinepartnership.org](http://www.mishorelinepartnership.org)

### Minor Permit Project Category for Bioengineering Practices

Most shoreline alteration work requires a permit from the Department of Environmental Quality (DEQ). DEQ has an expedited permitting process when natural landscaping or bioengineering practices are used. These criteria can be found online at [www.michigan.gov/documents/deq/Minor\\_Project\\_Categories\\_360884\\_7.pdf](http://www.michigan.gov/documents/deq/Minor_Project_Categories_360884_7.pdf).

### References

- <sup>1</sup>O'Neal, R.P. and G.J. Soulliere. 2006. Conservation Guidelines for Michigan Lakes and Associated Natural Resources. Michigan Department of Natural Resources – Fisheries Division, Special Report 38.
- <sup>2</sup>Eagle, A.C., E.M. Hay-Chmielewski, K.T. Cleveland, A.L. Derosier, M.E. Herbert, and R.A. Rustem, eds. 2005. Michigan's Wildlife Action Plan. Michigan Department of Natural Resources. Lansing, Mich. 1592 pp.
- <sup>3</sup>Schindler, D.E., S.I. Geib and M.R. Williams. 2000. Patterns of fish growth along a residential development gradient in north temperate lakes. *Ecosystems* 3:229-237.
- <sup>4</sup>Merrell, K., E.A. Howe, and S. Warren. 2009. Examining shorelines, littorally. *Lakeline*, 29(1): p. 8-13.
- <sup>5</sup>Francis, T.B. 2009. Urbanization vs. natural habitat. *Lakeline*. 29(1): p. 14-17.
- <sup>6</sup>U.S. Environmental Protection Agency. April 2010. National Lakes Assessment: A Collaborative Survey of the Nation's Lakes. EPA 841-R-09-001.

### About the Authors:

For over 30 years, Progressive AE's Water Resources Group has provided professional lake and watershed management services to communities across Michigan. The Water Resources Group created MichiganLakeInfo.com, a website for those interested in Michigan's inland lakes. On the site you can find this article and information on topics such as lake water quality, lake and watershed management, aquatic biology, emerging issues, invasive species and more.

The following activities are incorporated into this list of MP categories. The proposed activity must meet specific criteria of a category in addition to the General Criteria, Exclusions, and General Conditions. E category lists the statute(s) to which it applies.

#### 1. Bioengineering Practices for Stabilization of Inland Lake Shorelines

Category applies to: ☒ Part 301, Inland Lakes and Streams  
☒ Part 303, Wetlands Protection  
☒ Part 325, Great Lakes Submerged Lands

Bioengineering practices (also known as "soft" or "green" engineering) are used to stabilize inland lake shorelines as needed to prevent erosion and restore natural shorelines while protecting and enhancing fish and wildlife habitat and other natural features associated with inland lakes. Bioengineering uses combination of native plantings and natural or biodegradable materials to engineer shoreline protection that, to the extent possible, mimics and/or enhances the natural landscape.

The specific practices included in this MP category are not recommended as the sole means of correcting existing erosion problems where wind and wave energy are excessive or where eroded banks exceed 3 feet in height. However, these measures will typically be suitable for habitat enhancement, prevention of erosion problems, or to stabilize eroding banks at locations where:

- The longest unobstructed distance across the lake from the proposed project site is less than one mile.
- The proposed project site is not adjacent to a heavily used boating access point or marina.
- The proposed project site is not located on an unprotected point, headland, or island where erosive forces are high.
- Site-specific conditions warrant bioengineering.

This MP category is not applicable to Great Lakes shoreline areas, streams, and rivers. It is also not applicable to inland lakes where shorelines are stable, and where natural wetland habitat would be degraded by installation of these structures.

This MP category includes installation of bioengineering practices on inland lakes as necessary to prevent or control erosion, using the following bioengineering practices:

- Placement of biological erosion control structures, including but not limited to fiber rolls, fiber mats, live stakes, brush mattresses, brush bundles, and plantings of native vegetation.
- Limited placement of natural stone or rock riprap, covering no more than 25% of the length of project and allowing for the free growth of plants. If necessary, to stabilize biological material. Stone used for this purpose shall be a maximum 24-inch diameter rock and shall consist of natural field stone or rock (broken concrete is not allowed). Natural field stone or rock includes crushed quarry rock.
- Temporary placement of fiber rolls or similar materials to serve as wave breaks or barriers not more than 5 feet from the existing shoreline to facilitate establishment of biological control structures or plantings. Temporary wave breaks must be constructed of and anchored with materials that are 100% biodegradable.
- Maintenance of previously authorized bioengineering structures.

The installation of bioengineering practices must meet all of the following:

- This MP category shall be limited to less than 500 linear feet of shoreline per project.
- Bioengineered shore protection structures shall not be permitted under the MP category where the top of the bank is more than 3 feet above the ordinary high water mark of the lake.
- Vegetation, including plantings and other potentially viable material such as live stakes, brush bundles, or other gathered woody material, shall be comprised only of plant species that are