



Shoreline Buffers

In Wisconsin, open space often includes shorelines along rivers, wetlands, streams or lakes. Shorelines are the meeting place between land and water. Great damage can be done to either of these environments if proper precautions are not taken to provide and protect a buffer zone along this meeting line.

Water currents and natural or man-made waves erode shorelines while upland runoff puts pollutants such as silt, salt, fertilizer and pesticides into the water. A thick, soil-bonding vegetation cover along shorelines can prevent these undesirable effects, while providing wildlife habitat and aesthetically pleasing views.

“The water’s edge is a complicated and busy place.”

*Margin of Error: Human Influence on Wisconsin’s Shores
—UW-Extension Publication*

Because we all want clean water in our lakes and streams we should encourage good stewardship of shorelines. The following guidelines will help owners of shoreline open space accomplish this goal.

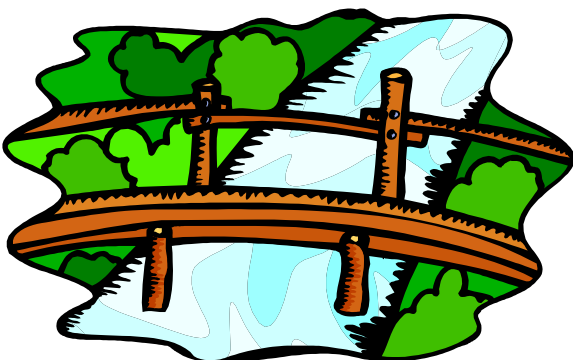
Suitable Sites

Nearly every shoreline has suitable sites for buffer strips. Natural vegetation may already be there and require no further attention. Other shorelines may suffer erosion or runoff contamination problems that need to be addressed.

A buffer area should extend along the shore at least 35 feet wide landward from the ordinary high water mark*. Do a ‘thunderstorm tour’ during a downpour to determine where water flows off the land, where it comes from, where it puddles and soaks in, and where it erodes. You may have to widen your buffer to protect low lying areas that may only hold water (flood) during wet weather periods.

Establishing a Shoreline Buffer

Lay out the buffer strip with stakes or ribbons. Gentle curves on the up-hill side will be more aesthetically pleasing than sharp straight edges. Small breaks in the buffer can be made to provide access to and from the waterway. Scattered boulders, stones or logs may be added to give a more natural look to the shoreline and buffer zone.



Prepare the site for native plants by eliminating competitive vegetation such as grass sod and undesirable weeds or brush. Cutting stems and treating with an appropriate herbicide will control woody plants. Spraying grass sod and other herbaceous plants with a herbicide is a way to get rid of the competition. Just make sure the product you choose is safe for use near water.

* The high water mark is the highest point on the bank or shore which shows evidence of the presence and action of water. It may show current or wave erosion, a change in vegetation from aquatic to terrestrial or by high water stains on rocks or trees.

Stabilizing Your Shorelines Rock vs Living Materials (Bioengineering)

Rip-rap

Placing rocks along shorelines has been a traditional solution to erosion problems. Common materials include rounded field stones or chunks of mined limestone. Stones are placed along the shoreline where wave action causes erosion. Field stone is more natural looking and more pleasing to the eye for some people compared to the stark white color and sharp edges of freshly cut crushed limestone. Do not forget that installing rip-rap along a shoreline requires permits from the DNR and your local municipality.

The advantages of using rock rip-rap are that it forms a strong barrier against wave action and is easy to maintain. The disadvantages are that it is expensive, unsightly to some people, provides no visual barrier, is difficult to walk on and provides very limited wildlife value. In particular, rip-rap inhibits the movement of frogs, salamanders and turtles to and from the water. Such movements are essential to these animals for reproduction. Frogs and salamanders must move to water to lay eggs and young must be able to reach land when mature. Turtles must move to land to lay eggs and young must be able to reach water when mature.

Living Material (Bioengineering)

Using a mix of plant and rocks or other non-living materials is an alternative method for erosion control along shorelines. This technique is called 'Bioengineering' and it uses organic materials such as fiber logs and mats which soak up water and anchor native plant seeds and seedlings. As the plants grow over the eroding shoreline they form a carpet of living and dead roots, stems and leaves that hold the soil together. Bundles of thin willow stems are another technique to stabilize eroded areas while shoreline plants get established. The result is a lush growth of native plants which attract birds, butterflies and other wildlife.

Disadvantages of bioengineering are: the site preparation requires moving soil thereby exposing it to potential erosion; it takes more time to install and to do follow-up maintenance; and it may not handle erosion on extremely steep slopes. Advantages are: less expensive, more natural looking and aesthetically pleasing; more wildlife friendly. As with rip-rap project, permits from the DNR (and perhaps your local municipality) will be needed for any bioengineering project that involves adding fill below the ordinary high water mark.

Establishing a Shoreline Buffer Continued . .

Non-chemical techniques include repeated cultivation or smothering with old rugs, large sheets of black plastic or woven perforated black landscape fabric. Erosion control devices should be installed prior to any disturbance of soil and allowed to remain in place for several years until a vegetative cover is completely established.

Although many types of plants can be used in buffers, native species have adapted over thousands of years to Wisconsin's climate, soils and pests. For this reason they often grow better than non-native cultivars and do not require as much care, eg, fertilization and pest control. As a bonus, native wildlife is attracted to native plants which adds balance to the larger shoreline environment.

Keep in mind that the depth to ground water may limit the establishment of certain plants. Wetland vegetation requires water near or at the surface of the ground, so plants like cattails, bulrushes and duck potato need to be placed in wet areas. Slightly drier areas would support wild irises, sedges, swamp milkweed, red osier dogwood, willows, red and silver maple and green ash. Wet prairie plants may also be used in low areas (see Prairie section of this manual). Planting taller vegetation in clumps alternating with lower vegetation will provide a framing for views of the water. Careful selection of plants can enhance wildlife, especially birds (see Bird Sanctuaries section). Lists of appropriate plants and sources for buffers areas are presented in two publications referenced on the back page: *Shoreland Plants and Landscaping* and *Wisconsin's Native Plant Sources and Restoration Consultants*.

Seeds can be planted on tilled ground in the spring or on undisturbed ground in the fall if most of the litter has been removed. Straw or old litter can be spread back over the seeds to prevent drying and slow runoff. Seedlings can be planted directly through dead vegetation. This will reduce weed growth, hold moisture and add organic matter to the soil.

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Keep plants watered and control weeds, especially purple loosestrife. Even though the flowers are pretty, purple loosestrife can choke out native vegetation (see *Invasive Plants* chapter).

Maintenance

The goal of buffer strips is to provide long term protection of the shoreline from excessive runoff and erosion. Maintaining a tight, well covered site is essentially all the long term effort needed. Avoid using fertilizers or pesticides. Remove or cut undesirable weeds, but avoid the temptation to clean-up dead leaves, sticks or logs. They help break up the impact of rain drops, which spatter soil particles into the air making them easily swept away by flowing water, and act as check dams to runoff. Organic matter soaks up water, holds it on the site and enriches the soil by slow releasing nutrients as it decomposes.

Wildlife

One of the more enjoyable aspects of buffer strips is the wildlife they attract. The more 'wild' your shoreline is, the more animals you will have. Overhanging vegetation provides food, shade and cover for fish moving along the shorelines. Berry and nut-producing trees and shrubs will bring more birds. Rocks, logs and leaf litter will provide hiding places for frogs, toads, salamanders, worms, and ground insects. Nesting boxes for swallows and bats may encourage these mosquito-eating predators. Animals may also use the buffer strip as a corridor for safe travel along the water's edge. All of these animals add to the naturalness of the shoreline and enrich the experiences of children and adults in the neighborhood.



A healthy shoreline provides habitat for fish and other creatures, adds privacy and requires minimal maintenance compared to a traditional lawn down to the water's edge, pictured below.



Benefits of Natural Shoreline Buffer Strips

- Many individual landowners, developers, agencies and government bodies are planting natural vegetation buffers along streams, rivers and lakes. Here's why.
- Protect water quality of surface waters by filtering runoff containing silt, salt, fertilizer and pesticides.
- Slows runoff allowing water to soak in the ground rather than flush to the lake or stream..
- Prevent erosion of shorelines from waves and runoff.
- Improve shallow water habitats for fish and other aquatic life by providing shade, shelter and food
- Provides habitat for terrestrial wildlife including mammals, birds, reptiles, amphibians, and insects.
- Provides visual screening (privacy) for landowners and a more natural looking shoreline for boaters on the water.
- Good looking shorelines enhance property values.



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Trails and Paths

People like to get down to the water. A smooth flowing natural looking trail or two can accommodate that need. The trails may end at a particular destination like a pier, a fishing or swimming spot or a beautiful view. Trails to the water should be integrated into other trails through the open space. Avoid puddles and erosion areas. A dirt foot path requires minimal maintenance; wood chip trails need more upkeep and mowed paths demand the most care. Build a trail that accommodates your needs for access, but also protects against runoff and erosion into the water.

Contacts:

County Land and Water Conservation Departments Provide information and programs that help rural landowners manage natural resources. Some offices have shoreline specialists on staff. Visit this web link to locate the office in your county: <http://www.wlwca.org/Pages/LCDWeb.html>

University of Wisconsin Extension (UWEX) Local offices usually have someone on staff who can answer questions about shoreline management practices and direct you to other experts in and outside of the University system. Visit this web link to find the location of the office in your county: <http://www.uwex.edu/ces/ct/>

Wisconsin Department of Natural Resources (DNR) The agency responsible for shoreline protection and permits for shoreline work. Local Service Centers usually staff lake biologists, fishery specialists and other shoreline habitat experts who can answer questions, provide permits and assist you with the management of your shoreline. Visit this web link to locate the office nearest you: www.dnr.state.wi.us/org/water/fhp/waterfront.htm

Publications and other sources of information:

A Fresh Look At Shoreland Restoration (From the Shoreland Stewardship Series) UW-Extension Publication GWQ027 <http://cecommerce.uwex.edu/>

Lake-scaping for Wildlife and Water Quality, Minnesota Bookstore, 117 University Ave., Saint Paul, MN 55155. 1-800-675-3757, 176pp

Life On The Edge...Owning Waterfront Property, Contact the Wisconsin Lakes Partnership, 715-346-2116 or contact your local UW-Extension offices, 100pp

Shoreline Plants and Landscaping, Dan Wilson & Gary Korb, UW-Extension Publication GWQ014, 16pp <http://cecommerce.uwex.edu/>

What is a Shoreland Buffer?, (From the Shoreland Stewardship Series) UW-Extension Publication GWQ028 <http://cecommerce.uwex.edu/>

Why Protect Shoreland Areas?, DNR Publication W2-009

The Wealth of Waterways: Managing Stream Corridors for Wildlife, (From the Wildlife and Your Land Series) DNR Publication WM-225

Wisconsin Native Plant Sources and Restoration Consultants, 2004, UW-Extension Publication GWQ041, 12pp <http://cecommerce.uwex.edu/>

Protecting and Restoring Shorelands, 2003, Carmen Wagner, Robert Korth, John Haack, UW-Extension Publication GWQ038, 8pp <http://cecommerce.uwex.edu/>



Options for Open Space

A resource guide for private and public land owners and managers.

Produced by the Southeast Wisconsin Fox River Partnership Team to protect, restore and enhance the natural resources of the Fox River basin.

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For more information please contact:

SE WI Fox River Partner Team
N25 W27534 Oak Street
Pewaukee, WI 53072
414-290-2431

<http://basineducation.uwex.edu/southeastfox/>