



Minimizing Runoff from Shoreland Property

SHORELAND BEST MANAGEMENT PRACTICES

NUMBER 8 IN THE SERIES

What Are Shoreland BMPs?

Best Management Practices (BMPs) are actions you can take to reduce your impact on the environment. BMPs have been described for agriculture, forest management, and construction. This fact sheet describes BMPs you can adopt on your shoreland property to help protect and preserve water quality. In many cases, the best management for shorelands may be retaining the natural characteristics of your property.

Why Is Runoff a Problem?

When an area is developed or altered, the way water flows is also changed. As land surfaces are covered with roads, driveways, or impervious surfaces (rooftops, decks, sidewalks, and parking lots), less water can seep into the soil, so runoff increases. This increased runoff is usually channeled into ditches, drainageways, storm sewers, or road gutters and often ends up in nearby lakes and streams.

High flows of water can cause flooding or erosion, as well as increasing sediment in streams and lakes. Fine sediment can also transport nutrients such as nitrate or phosphorus, and pollutants such as sands or salts from icy roads. All of these processes have an adverse effect on water quality.

Preventing Runoff

Planning ahead is the first and most important step in preventing or minimizing erosion due to runoff. An easy way to do this is to pretend that you are a raindrop. In looking at the landscape or any impervious surfaces, which route would you travel? Obviously, you would want to take the easiest path downhill. Keeping that in mind, note any areas that runoff would choose to travel.

Evaluate your property before you begin your landscape design. Consider slope, soil type, and existing vegetation as you plan your development. Fact sheet #6 offers additional tips for landscape planning.

Identifying Problems Caused by Runoff

PROBLEM

- Is the water near shore cloudy?
- Is there an oily rainbow film on the water?
- Are there algal blooms, green scum, or abundant plant growth in the water?
- Are washouts, trenches, small piles of sediment, leaves, or debris found at the bottom of slopes?

POSSIBLE CAUSE

- excess sediment reaching the water
- possible petroleum contamination
- excess nutrients such as nitrate or phosphorus reaching the water
- excessive runoff across the property

Long-term BMPs

Follow these long-term BMPs to minimize runoff and prevent erosion:

- Limit paved and covered areas that prevent water from seeping into the ground.
- Invest in permanent stabilization practices for long-term protection of your shoreland property by planting new vegetation, installing erosion control structures, and diverting drainage.
- Retain trees and shrubs; trees provide a natural umbrella by shedding water and can reduce runoff by as much as 50%; fact sheets #6, 9, and 11 offer landscaping tips.
- Plan and complete an annual maintenance schedule to make sure that your runoff and erosion control plan is working to protect your property.
- Limit clearing and grading on slopes and minimize cutting and filling for roads, sidewalks, and footpaths to reduce erosion and still provide access.
- Avoid damaging adjacent property with temporary erosion control methods, because water does not stop flowing at your property line.

Drainageways

- Use existing natural drainage systems such as valleys or low areas instead of digging new ditches.
- Design culverts and drainage structures to handle excessive amounts of runoff; assistance is available from your county Soil and Water Conservation District (SWCD) or the Natural Resources Conservation Service (NRCS).
- Protect storm sewers from sedimentation so they are able to carry storm water as intended.

Roads, Driveways, and Sidewalks

- Minimize pavements and impervious surfaces.
- Use gravel driveways instead of pavement.
- Where paved areas are necessary, locate them as close to the main road as possible to minimize the length of paved driveway.
- Do not pave wasted space such as corners near buildings that are not large enough for parking or driving.
- Locate driveways, sidewalks, stairways, and footpaths away from slopes because steeper slopes have greater erosion potential; if you must cross a hillside, follow the contour of the slope.
- Use steps when a walkway must go directly up and down a slope, particularly near the waterfront.
- Minimize road crossings over waterways and cross at a right angle to the stream if possible.
- Sweep driveways or sidewalks instead of washing them down with a hose, to prevent sediment, salt, and petroleum products from washing into storm sewers; cover stockpiles of salt and sand with a tarp or store them in a building.
- Use shallow grassed areas by roadsides instead of curb and gutter runoff and storage for snow.
- Install water bars on sloping roadways to slow and divert runoff.
- Use paving stones instead of solid concrete for walkways; this allows water to seep around the stones instead of running off.
- Avoid shortcutting down slopes because shortcutting causes erosion; compacted soil on footpaths also promotes excessive runoff.

Landscaping and Construction

- When landscaping, stage construction so one area is stabilized before another area is disturbed.
- Avoid construction in areas with:
 - little vegetative cover; preserve existing cover
 - erodible soils (sands, or soils that appear fluffy when dry)
 - mainly bedrock with a thin covering of soil
 - steep slopes of greater than 10%; to picture a 10% slope, imagine putting the bottom end of a board 10 feet out from the wall and the top end at 1 foot up the wall; this is a 10% slope (see Figure 1)

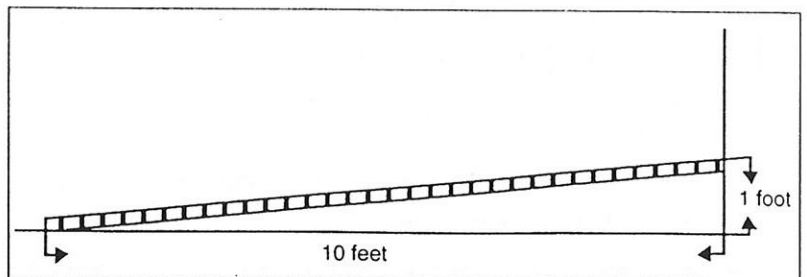


Figure 1: A 10% slope is represented by leaning a board against the wall with the top at 1 foot and the base set 10 feet away from the wall.

- Control erosion during construction by using temporary methods such as **diversions** to carry water away from the construction site to where it can be safely dispersed or **silt fences** or **hay bales** to trap sediments before they enter the water; a combination of methods may be the best solution (see Figures 2 and 3).

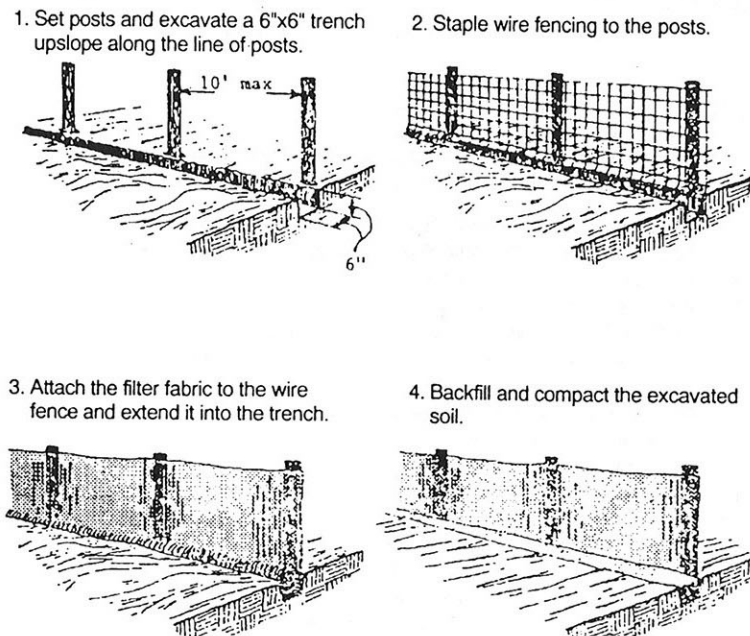


Figure 2: Constructing a silt fence to slow runoff and prevent erosion.

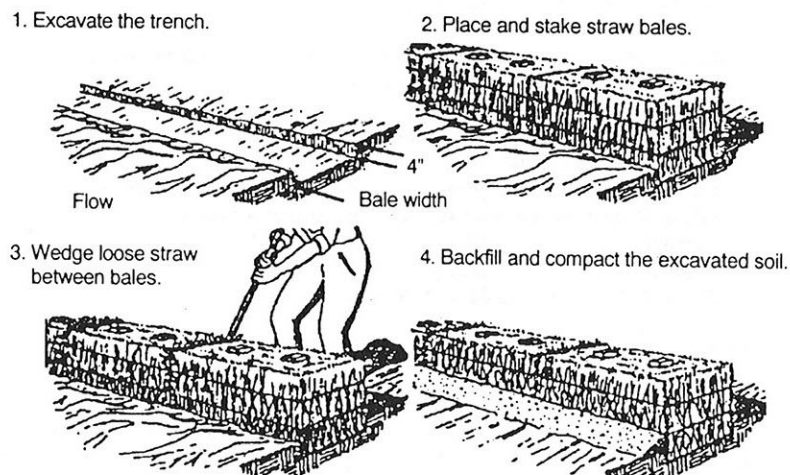


Figure 3: Constructing a straw bale barrier to slow runoff and prevent erosion.

- Use only clean fill (free from debris and dirt) such as rock, sand, or gravel near lakes and streams.
- Use only solid concrete forms such as interlocking blocks or slabs; do not use liquid concrete and avoid treated timbers or railroad ties.
- Make sure utility trenches are drained of water, backfilled, seeded, and mulched.
- Inspect construction projects immediately after initial installation of erosion control measures, during construction, following any severe rainstorm, before reseeding, and when nearing the completion of construction work; temporary erosion controls should be removed; ensure that stabilization is complete and drainageways are in proper working order.

As a general rule, the erosion hazard will become critical if slope lengths exceed these values:

0-6%	200 feet
6-12%	100 feet
13% and over	50 feet

Buildings and Runoff

- Install rain gutters along the edge of rooftops to help carry water off of the roof and away from the building to areas where soil won't be eroded; make sure there is erosion protection where the gutters outlet onto soil.
- Keep gutters free from debris and draining properly.
- Keep rooftops free of snow and ice buildup to help control the magnitude of runoff in the spring and protect your roof from damage.
- Pave patios with flagstones or decay-resistant wood blocks instead of solid material to permit some water to seep around the stones or blocks.

- Position rooftops so they are perpendicular to the slope, instead of parallel, to slow down runoff (Figure 4).

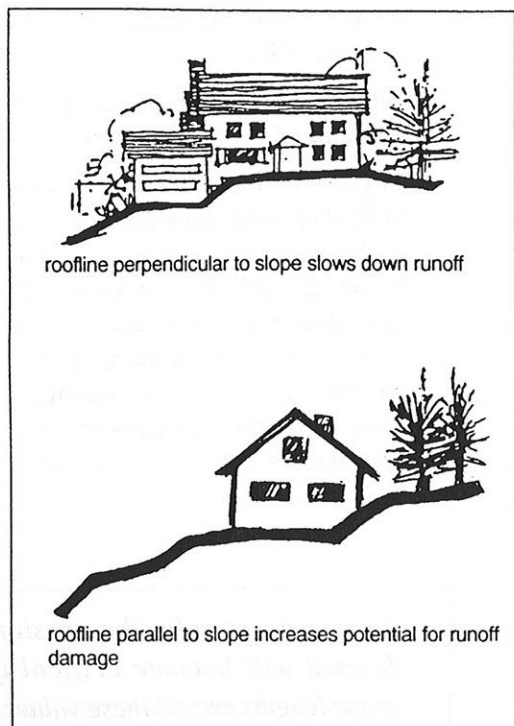


Figure 4: Build rooflines perpendicular to slopes

Regulations that Apply

Most zoning ordinances restrict the amount of impermeable surface allowed in the shoreland area; check with your local zoning officials for more information. Alteration or filling of wetlands is strictly regulated; check with your county Soil and Water Conservation District before beginning any projects that impact wetlands. For any development along waterways or lakeshores, contact the Department of Natural Resources, Division of Waters for any necessary permits.

Remember

It is a Minnesota law that you must "call before you dig." Contact Gopher State One Call 1-800-252-1166.

For More Information...

call

county offices:

- Soil and Water Conservation District (SWCD)
- University of Minnesota Extension Service
- Planning and Zoning Department

federal agencies:

- Natural Resources Conservation Service (NRCS)

PART OF A SERIES...

This fact sheet is one of a series designed to assist shoreland property owners in protecting and preserving water quality. The series includes:

- 1 Understanding Shoreland BMPs
- 2 Maintaining Your Shoreland Septic System
- 3 Installing a Shoreland Septic System
- 4 Ensuring a Safe Water Supply
- 5 Limiting Impact of Recreation on Water Quality
- 6 Developing Shoreland Landscapes and Construction Activities
- 7 Stabilizing Your Shoreline to Prevent Erosion
- 8 **Minimizing Runoff from Shoreland Property**
- 9 Caring for Shoreland Lawns and Gardens
- 10 Managing Your Shoreland Woodlot
- 11 Valuing Your Shoreland Trees
- 12 Preserving Wetlands
- 13 Managing Crops and Animals Near Shorelands
- 14 Reducing the Use of Hazardous Household Products
- 15 Preventing the Introduction of Exotic Species
- 16 Accessing Information to Protect Water Quality
- 17 Shoreland Stewardship Scorecard
- 18 Conserving Water

This series of fact sheets is a cooperative effort of the following agencies:

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 Minnesota Board of Water and Soil Resources
 Minnesota Department of Health
 Minnesota Department of Natural Resources, Division of Fish and Wildlife,
 Division of Waters, Division of Forestry
 Minnesota Pollution Control Agency
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