



MI-6946-S  
1998

UNIVERSITY OF MINNESOTA  
**Extension**  
SERVICE

# Managing Your Shoreland Woodlot

SHORELAND BEST MANAGEMENT PRACTICES

NUMBER **10** 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.

## Forests and Water Quality

Clean water is one of Minnesota's greatest natural resources. Many of our water resources, such as lakes, rivers, and streams, originate in forested areas. Woodlands assist nature in maintaining water quality by keeping soil in place, storing nutrients, and balancing water flows. They also help moderate stream water temperatures to support healthy fish populations.

## Managing Woodlots Can Affect Water Quality

Whether your woodlot is five acres or 100 acres, managing it can require road building, timber harvesting, and mechanical site preparation. Any of these activities can adversely affect the quality of adjacent waters if not properly planned or conducted.

The biggest concern for managing woodlots adjacent to lakes, streams, or wetlands is the erosion and deposition of soil. The amount of soil erosion and sedimentation will depend on soil type, steepness of slopes, rainfall, and the amount of soil that has been disturbed or exposed by management activities.

*The goal of these BMPs is to minimize soil disturbance.*

This fact sheet is directed at the shoreland owner with five or more acres of forest land adjacent to a lake or stream. For more information refer to *Protecting Water Quality and Wetlands in Forest Management – Best Management Practices in Minnesota* (listed on back page). For information on caring for trees and shrubs on less than five acres, see fact sheet #11.

## Filter Strips Are Necessary

A filter strip is a zone of vegetation adjacent to a water body where management activities are kept to a minimum so that less than 5% soil is exposed. A filter strip should be established in the area between the shoreline (the ordinary high water level) and the area to be managed (Figure 1). Management is permitted in the filter strip if it does not result in soil disturbance. Minimizing the exposure of soil and maintaining the residual vegetation will help trap sediment and provide a zone of infiltration before runoff reaches surface water bodies.

The width of the filter strip will vary depending on steepness (percent slope), length of the slope, and soil type. Recommendations for filter strip widths for woodlot management are given in Table 1. (Percent slope is defined in Figure 2.)

In general, the steeper the slope, the wider the filter strip should be. For more erodible soil, the filter strip should be wider.

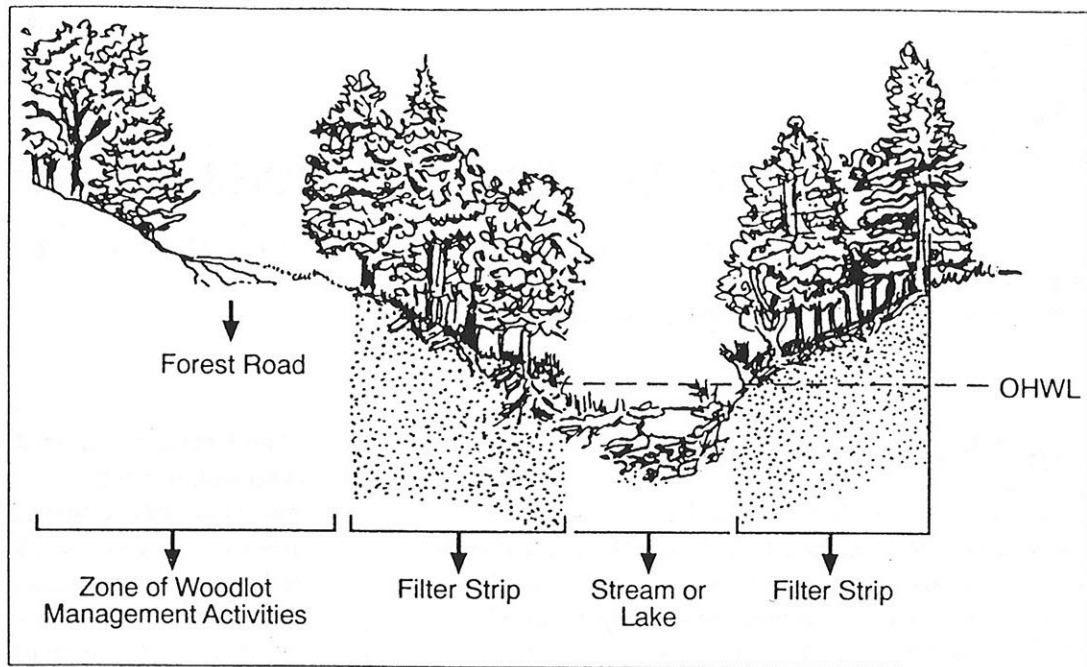


Figure 1: Areas where filter strips are needed.

## Have a Management Plan

A landowner should develop a management plan before beginning any forest management activities. This plan should make clean water a priority while meeting the landowner's objectives. An important part of the management plan is a map of the area (Figure 3) that shows all lakes, streams (including all seasonal streams), springs, wetlands, and other sensitive areas. The map should also include existing roads and trails, forest types, soil types, and slopes. Eventually the map will be used to delineate new roads, harvest areas, filter strips, and other protected areas.

A landowner may obtain advice and assistance in preparing a management plan from the regional Department of Natural Resources (DNR) Division of Forestry, local Soil and Water Conservation Districts (SWCD), or local forest industries. Individuals can also contract with a private consulting forester. Cost-sharing programs may be available to assist woodlot owners with some management activities. Resources that are useful in preparing a management plan include soil surveys, soil maps, topographic maps, and aerial photos, as well as a thorough on-site examination of the area.

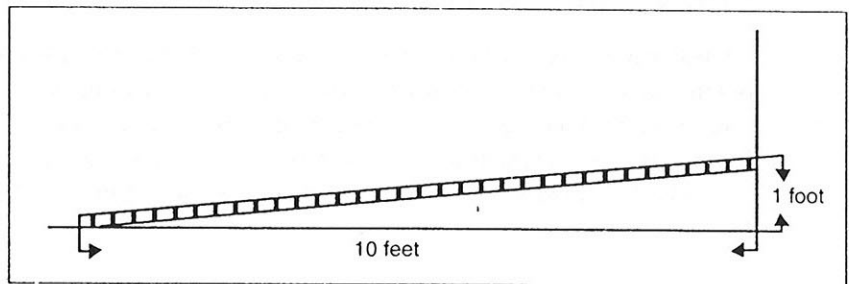


Figure 2: A 10% slope is represented by leaning a board against the wall with the top at 1 foot and the base set 10 feet away from the wall.

Table 1: Filter strip width guide for woodlot management.

Slope of land between management activity and water body (percent)	Recommended width of filter strip (slope distance in feet)*
0 - 10	50
11 - 20	51 - 70
21 - 40	71 - 110
41 - 70	111 - 150

\*Distance is measured to the edge of soil disturbance, or in the case of fills, from the bottom of the fill slope.

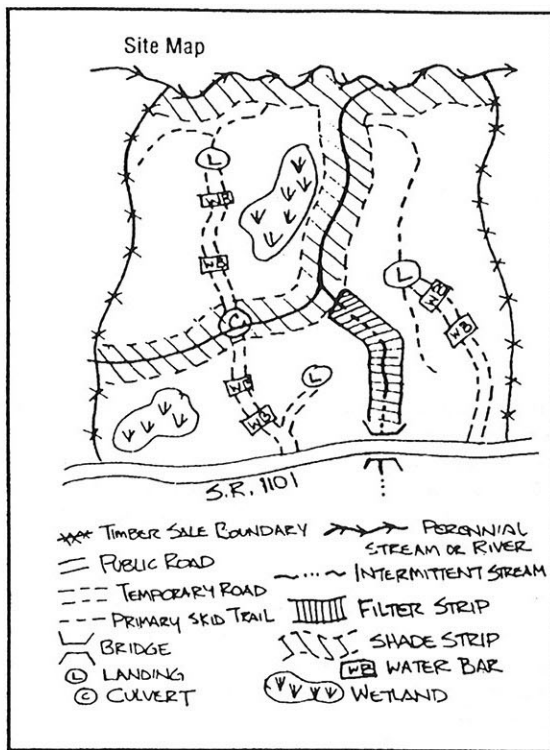


Figure 3: Map of management area showing roads, harvest areas, filter strips, landings, water bodies, and no-harvest areas.

## BMPs for Forest Roads

Erosion that occurs during forest road construction has the greatest potential to degrade lakes, streams, and wetlands. An important first step is to determine how the roads will be used now and in the future. To minimize road construction, roads should be built to the maximum standards needed to meet expected uses:

- Design roads in locations with lowest slope.
- Use barriers, such as silt fencing and hay bales, where siltation and erosion may occur (see fact sheet #8). Mulch and seed exposed soils.
- Where the road must cross a stream, contact the DNR Division of Waters to determine if a protected water permit is needed.
- Minimize the number of times a road crosses open water or wetlands.
- Low water crossings (driving through open water) are not recommended.
- Water crossings using a culvert or bridge should cross a stream at a 90° angle to the stream bed in areas where the stream edge is stable.
- Use properly sized culverts or bridges where necessary. Remove any temporary culverts or bridges after the road is abandoned.
- Design roads for maximum cross drainage using water diversion structures (e.g., water bars) to minimize downroad flow. Refer to *Protecting Water Quality and Wetlands in Forest Management – Best Management Practices in Minnesota* for additional information.
- Close all temporary roads after use to prevent unwanted use by off-road vehicles that could be detrimental to the site.

## BMPs for Upland Timber Harvesting

Timber harvesting is an integral part of woodlot management that involves cutting trees and removing them from the site. Harvesting temporarily disturbs the environment in the immediate area and should therefore follow a plan that incorporates water quality protection in all operations:

- Time the harvest to be compatible with soils, topography, and weather conditions. Soil disturbance is generally greatest under wet conditions and least under frozen conditions.
- Locate landings (areas where harvested trees are brought for processing) away from low, poorly drained areas and outside of filter strips.
- Never deposit harvesting slash (tree tops, branches) or debris into wetland areas.
- Follow road construction BMPs when designing and laying out skid trails.
- Prevent erosion and sedimentation along roads by filling in ruts, seeding disturbed areas, and installing water diversion structures and erosion barriers.

## BMPs for Mechanical Site Preparation

The purpose of mechanical site preparation is to enhance conditions for the establishment, survival, and growth of desired tree species. Mechanical site preparation involves clearing the site for planting, seeding or natural regeneration, and providing partial control of other vegetation competing with crop trees. Site preparation is usually done by a contractor with specialized equipment.

- Avoid operation during periods of saturated soil conditions when such operations may cause rutting or accelerate soil erosion.
- Avoid disposing of residues from shearing and raking operations in wetland areas. Deposit residues in stable upland locations.

- Be sure that slash piles do not interfere with natural drainage patterns.
- Consider shearing and raking under frozen conditions to minimize incorporation of soil into slash piles.
- Follow land contours to promote soil stability.
- Use patch or row scarification (clearing) where terrain or soil type calls for minimum soil disturbance.

## Regulations that Apply

Permits are required for work in protected waters and wetlands. To determine whether a permit is required for a particular water body, contact the DNR Division of Waters area office. In some instances, further review is required by the U.S. Army Corps of Engineers or local authorities. Also, the Minnesota Wetland Conservation Act of 1991 prohibits the draining and filling of certain wetlands. Contact your local SWCD office for more information on management activities allowed in wetlands.

## For More Information...

### call

#### county offices:

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

#### regional offices of MN State agencies:

- MN Department of Natural Resources (DNR), Divisions of Forestry and Waters
- MN Board of Water and Soil Resources (BWSR)

#### other:

- local forest industries, private forest management assistance programs

### read

**Protecting Water Quality and Wetlands in Forest Management – Best Management Practices in Minnesota.** MN Department of Natural Resources, Forestry Division and the MN Pollution Control Agency. 140 p.

**Water Resources and Timber Harvesting in the Lake States.** Lake States Forestry Alliance, E-1311 First National Bank Bldg., St. Paul, MN 55101.

## 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:

University of Minnesota Extension Service of the Arrowhead counties  
College of Natural Resources, University of Minnesota  
Water Plan Coordinators of the Arrowhead counties  
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  
Minnesota Sea Grant Extension Program  
Mississippi Headwaters Board  
St. Louis County Health Department, Environmental Services Division  
Soil and Water Conservation Districts of the Arrowhead counties  
Natural Resources Conservation Service  
Environmental Protection Agency  
Western Lake Superior Sanitary District

## USE OF PUBLICATION...

Copyright © 1998 Regents of the University of Minnesota. All rights reserved.

These publications may be photocopied for local distribution. The addition of commercial names, products, or identifiers is not permitted. Please do not add or delete any text material without contacting:

University of Minnesota Extension Service, Distribution Center  
20 Coffey Hall • 1420 Eckles Ave  
St Paul, MN 55108-6069 • 612-625-8173

You may add information about contact persons or regulations specific to your county, region, or lake association.

Find more University of Minnesota Extension Service educational information on the World Wide Web at <http://www.extension.umn.edu/>

♻️ Printed on recycled paper with a minimum 10% postconsumer waste. Produced by the Educational Development System, University of Minnesota Extension Service.

In accordance with the Americans with Disabilities Act, this material is available in alternative formats upon request.  
Please contact your Minnesota county extension office or, outside of Minnesota, contact the Distribution Center at (612) 625-8173.