



Nonpoint Pointers

Understanding and managing nonpoint source pollution in your community

Pointer
No.

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Managing Nonpoint Source Pollution from Forestry

Nearly 500 million acres of forested lands are managed for the production of timber in the United States. Although only a very small percentage of this land is harvested each year, forestry activities can cause significant water quality problems if improperly managed. The latest *National Water Quality Inventory* reports that forestry contributes to approximately 9 percent of the water quality problems in surveyed rivers and streams.

Sources of NPS pollution associated with forestry include removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees. Road construction and road use are the primary sources of NPS pollution on forested lands, contributing up to 90 percent of the total sediment from forestry operations. Harvesting trees in the area beside a stream can elevate water temperature and destabilize streambanks. These changes can harm aquatic life by limiting sources of food, shade, and shelter.

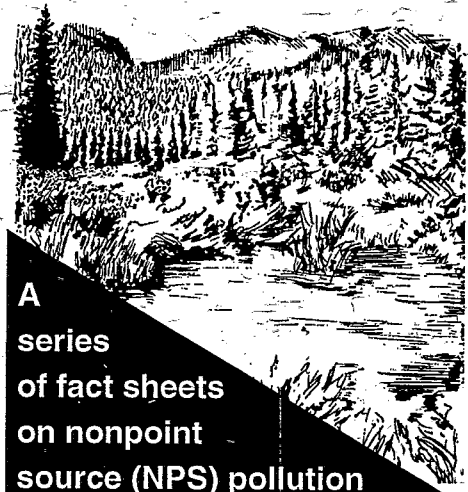
Following properly designed preharvest plans can result in logging activities that are both profitable and highly protective of water quality.

Preharvest Planning: Opportunities to Prevent NPS Pollution

To limit water quality impacts caused by forestry, public and private forest managers have developed site-specific forest management plans.

Following properly designed preharvest plans make logging both profitable and highly protective of water quality. Such plans address the full range of forestry activities that can cause NPS pollution. They clearly identify the area to be harvested; locate special areas of protection, such as wetlands and streamside vegetation; plan for the proper timing of forestry activities; describe management measures for road layout, design, construction, and maintenance, as well as for harvesting methods and forest regeneration.

Public meetings held under the authority of federal and state laws provide citizens with a good opportunity to comment on the development of forest management plans.



A series of fact sheets on nonpoint source (NPS) pollution

Did you know that streamside vegetation protects streams, lakes, and other waters from NPS pollution caused by forestry activities?

NPS pollution occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into ground water.

RELATED PUBLICATIONS

- Additional fact sheets in the Nonpoint Pointers series (EPA-841-F-96-004)
- Evaluating the Effectiveness of Forestry Best Management Practices in Meeting Water Quality Goals or Standards, USDA Forest Service, Miscellaneous Publication 1520, July 1994
- Forest Resources of the United States, 1992, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-234 (Revised)
- Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Chapter 3 (EPA-840-B-92-002)
- The Quality of Our Nation's Water: 1994 (EPA-841-S-95-004)
- Summary of Current State Nonpoint Source Control Practices for Forestry (EPA-841/S-93-001)
- Water Quality Effects and Nonpoint Source Control for Forestry: An Annotated Bibliography (EPA-841/B-93-005)

To order any of the above EPA documents call or fax the National Center for Environmental Publications and Information.

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FOR MORE INFORMATION

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Factors Considered in the Preharvest Plan

Surveying the Site. Preactivity surveys can help identify areas that might need special protection or management during forestry operations. Sensitive landscapes usually have steep slopes, a greater potential for landslides, sensitive rock formations, high precipitation levels, snowpack, or special ecological functions such as those provided by streamside vegetation. Forestry activities occurring in these areas have a high potential of affecting water quality.

Timing. Because most forestry activities disturb soil and contribute to erosion and runoff, timing operations carefully can significantly reduce their impact on water quality. Rainy seasons and fish migration and spawning seasons, for example, should be avoided.

Establishing Streamside Management Areas (SMAs). Plans often restrict forestry activities in vegetated areas near streams (also known as buffer strips or riparian zones), thereby establishing special SMAs. The vegetation in an SMA is highly beneficial to water quality and aquatic habitat. Vegetation in the SMA stabilizes streambanks, reduces runoff and nutrient levels in runoff, and traps sediment generated from upslope activities before it reaches surface waters. SMA vegetation moderates water temperature by shading surface water and provides habitat for aquatic life. Large trees provide shade while alive and provide aquatic habitat after they die and fall into streams as large woody debris.

Managing Road Construction, Layout, Use, and Maintenance. Good road location and design can greatly reduce the transport of sediment to water bodies. Whenever possible, road systems should be designed to minimize road length, road width, and the number of places where water bodies are crossed. Roads should also follow the natural contours of the land and be located away from steep gradients, landslide-prone areas, and areas with poor drainage. Proper road maintenance and closure of unneeded roads can help reduce NPS impacts from erosion over the long term.

Managing Timber Harvesting. Most detrimental effects of harvesting are related to the access and movement of vehicles and machinery, and the dragging and loading of trees or logs. These effects include soil disturbance, soil compaction, and direct disturbance of stream channels. Poor harvesting and transport techniques can raise sediment production 10 to 20 times and disturb as much as 40 percent of the soil surface. In contrast, careful logging disturbs as little as 8 percent of the soil surface.

Careful selection of equipment and methods for transporting logs can significantly reduce the amount of soil disturbed and delivered to water bodies. Stream channels should be protected from logging debris at all times during harvesting operations.

Managing Replanting. Forests can be regenerated from either seed or seedlings. Seeding usually requires that the soil surface be prepared before planting. Seedlings can be directly planted with machines after minimal soil preparation. In either case, the use of heavy machinery can result in significant soil disturbance if not performed carefully.