

Forest Roads

OVERVIEW

A

FOREST ROAD SYSTEM is made up of permanent and temporary roads that connect the forest land to existing public roads. They provide forest access for such activities as land management, fire protection, recreation and timber harvesting. Forest roads that are improperly located, poorly constructed and / or not maintained are the largest contributor of nonpoint source pollution from forest activities. Roads on steep slopes, erodible soils or stream crossings hold the greatest potential for degrading water quality. In wetlands, forest roads must comply with 15 mandatory **BMPs**. See page 36.

PERMANENT ROADS

BMPs for Location & Planning

- Use of tools such as soil surveys, topographic maps, and aerial photographs can help achieve the most practical road construction results.
- Design a permanent road system to meet long-range objectives rather than simply to access individual sites. Numerous separate road projects have more environmental impact than one well-designed road system.
- Stabilize or reconstruct existing roads where significant erosion problems exist. Abandon and retire roads where repair is impractical.
- Safety should always be considered with road design and location of intersections, and access points to public roads.
- Minimize the number of stream crossings.
- Cross streams on straight segments and as close to a right angle as possible (see illustration on page 7).
- Locate roads on the best available sites, avoiding excessive slope.
- All suitable excavated material should be used for the construction of the road, when possible. This may include soil removed from ditches during construction or maintenance.

Note: Additional planning assistance may be obtained from the United States Department of Agriculture, Natural Resources Conservation Service (NRCS).

AVOID

- Using streamside management zone (SMZ) for road locations or traffic areas.
- Locating roads adjacent to SMZs.
- Locating roads where water tends to collect.



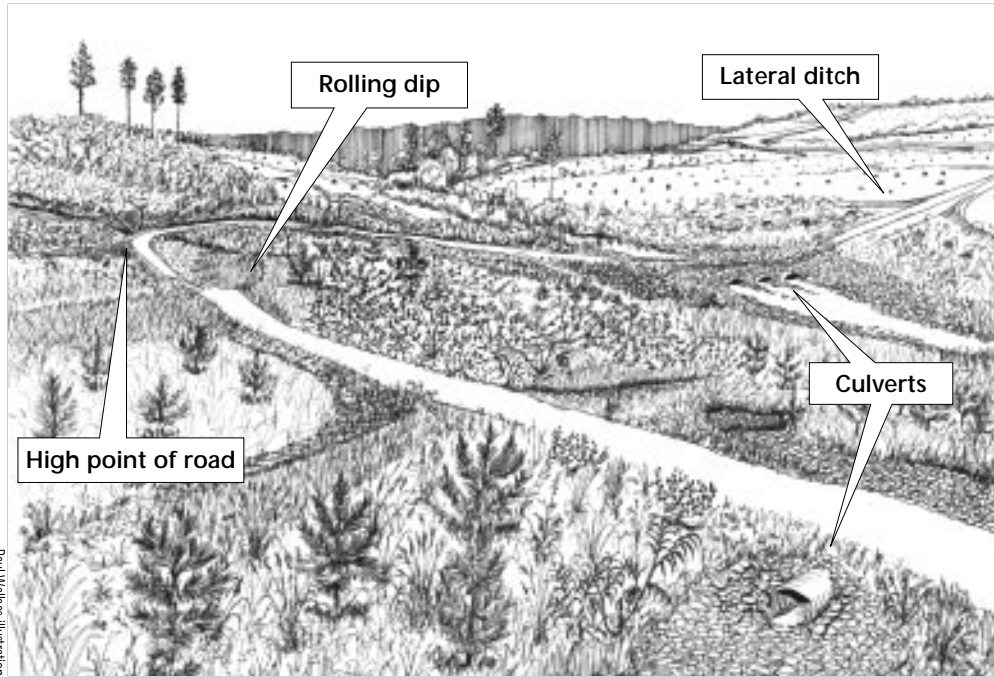
BMPs for Construction

- Salvage merchantable timber prior to clearing the right-of-way.
- Stumps, logs, slash and other organic debris should not be covered with fill material and incorporated into road beds unless the corduroy road construction technique is used.
- Minimize the amount of soil on the road banks or roadsides that is exposed to soil erosion. To minimize problems, revegetate or otherwise stabilize these areas as they are created.
- Functional water diversion structures should be installed at the same time roads are constructed. Drainage water should be dispersed onto the undisturbed forest floor when possible. Soil from parallel and lateral ditches may be incorporated as material for the road bed and drainage structure.
- Road bank slopes should be a 2:1 ratio. Seeding, mulching, or other stabilizing means should be used to reduce the potential for erosion.
- Plan for periods of heavy rain during road construction by including temporary waterbars, turnouts, or other structures to slow water runoff.

BMPs for Drainage

- Ditches, culverts, dips, and wing (lateral) ditches should be installed at the time of construction of the roadway. Ditches should be adequately sized and sloped to prevent silting-up and to allow for maintenance equipment access.
- Roads should be designed to drain at all times by using crowning, ditching, culverts, and water bars.
- Ensure that culverts, water turnouts, and broad-based dips empty road runoff onto the undisturbed forest floor.
- All culverts, permanent or temporary, should be of adequate size to carry the water flow anticipated during heavy rains. (See CULVERT SIZE CHART, Page 61).





Paul Valdes illustration

Several types of drainage structures are used in this forest access road.



Alabama Forestry Commission photo

A permanent culvert of adequate size has been installed on this forest access road.

BMPs for Water Crossings

- Stream crossings should be constructed to minimize the disturbance to stream banks and existing stream channels.
- Use of equipment in the stream bed should be kept to an absolute minimum.
- Crossing streams at fords should take place when stream flow is down and threat of sedimentation is low.
- Fills and earth embankments used as bridge approaches should be stabilized to minimize potential erosion by using headwalls, wing walls, rip-rap, and other suitable material.
- Excess material and woody debris from road construction should be cleared from streams and drainage ways.
- Bridges and culverts should not constrict clearly defined stream channels.

Note: Some of the most common mistakes in road construction and maintenance are shown below.

AVOID

- Improperly sized culverts (too small).
- Poor location (wet spot, loose soil).
- Insufficient number of wing ditches.
- Steep hills (more than 10 percent grade).
- Use of fill material taken from smz to cover culvert.
- Improperly maintained road crown.
- Plugged culverts.
- Leaving erodible soils unstabilized.
- Leaving ditches clogged with logging debris.
- Inadequate soil compaction or "set-up" time before heavy use.

Note: Proper maintenance of permanent access roads is of vital importance to logging and land management activities. Road systems should be kept in serviceable condition to minimize erosion by rainfall runoff and vehicle use.

BMPs for Road Maintenance

- The road surface should be crowned or outsloped to dissipate surface runoff and minimize erosion of the roadbed.
- Ditches, wing ditches, and culverts should be kept free of logging debris or other obstructions to allow unrestricted passage of water. Siltation should be removed from ditches and wing ditches through periodic maintenance.
- Exposed soil subject to excessive erosion should be revegetated or otherwise stabilized if natural revegetation will not suffice.
- Trees adjacent to permanent roads should be trimmed or cut back to allow maximum sunlight on the road surface.
- Closed roads should be periodically inspected to ensure their integrity.
- Anticipate weak spots in road bed and repair with support materials. Do not excavate the road surface and create a channel.

Exemption for Roads in Wetlands

Road construction for silvicultural purposes in jurisdictional wetlands does not require a permit because of this silvicultural exemption. However, to qualify for silvicultural exemption, the road construction must comply with 15 mandatory BMPs for forested wetlands, (from Clean Water Act, Section 404 Program Definition and Permit Exemption, Part 232.3). See FOREST WETLANDS, Page 30.

Forest Roads

TEMPORARY ROADS

Temporary roads often incorporate the same principles as permanent installations, but not the same degree of refinement and permanence. For example, the need exists to disperse water from temporary roads when conditions are wet, just as with permanent roads.

BMPs for Construction

- Roads should be built on the contour and at a sufficient distance to minimize disturbances to streams. Existing ridge lines should be used where possible.
- Crossings should be designed to prevent restrictions of high water flows during harvest operation.
- Temporary roads may include the use of mats, portable bridges, culverts, lateral ditches, etc.
- Temporary roads may require installation of underlayment to operate trucks across soft or unstable areas.
- Cross streams as close to right angles as is practical.
- Temporary roads should be closed and the soil stabilized after use. Stabilize stream banks, ditches, and roads as needed. Remove temporary crossings.
- Maintaining or closing temporary roads as the operation progresses prevents erosion and minimizes downtime.

AVOID

- Roads located directly up or down steep slopes.
- Turning water onto erodible soils unless additional protection from erosion is used.
- Creating channels by cutting deeper and deeper in an attempt to remove soft spots.



Alabama Forestry Commission photo

Installation of one of the types of temporary bridges that can be used.



Alabama Forestry Commission photo

Another type of temporary logging bridge, completed and ready to use.

TEMPORARY ROADS



WESTVACO photo

Temporary roads should be closed and stabilized after use.