CENTRAL HARDWOOD NOTES

Forest Access Roads

In order to manage and use forest land, some type of access is needed. Today forest access means roads capable of providing access for tri-axle log trucks and skidroads for wheeled skidders (fig. 1). The bare soil exposed by road building is the major source of stream sediment from logging operations. Roads normally expose soil on about 10 percent of logged areas.

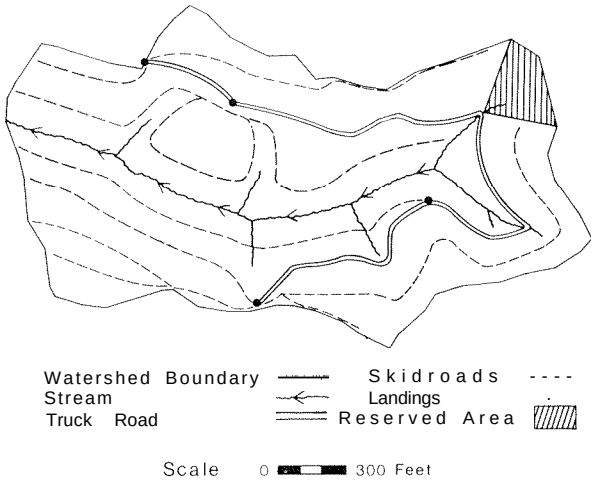

Figure 1.-An example of a forest road system meeting West Virginia Best Management Practice standards. It was used to remove approximately 1/2 million board feet of timber from a 96-acre Appalachian watershed.

The residual value of roads is often overlooked. Roads are the most lasting disturbance on logged areas and should be considered a permanent investment on forest land. Good roads not only provide access to a woodlot for posts, firewood, and future harvests, but may be used as access for hunters and other recreational uses. The importance of careful planning and layout cannot be overemphasized One steep section or soft spot can limit use of the road beyond for vehicles other than wheeled skidders. A good road system will meet users' needs without harming other resources (see Note 11.02 *Management Practices and Water Quality*).

Steps to a good forest access system:

1. Examine the area that can logically be served with the proposed road system until you are familiar enough to outline it on aerial photographs and topographic maps.

2. Determine the starting and ending points of the truck road.
3. Find out the elevation difference between the starting (e.g., county road) and ending locations (e.g. saddle on a ridge) to see if a road between the two points is feasible on an acceptable grade where maximums do not exceed about 10 percent.

$$\text{Road Grade percent} = \frac{\text{Elevation Difference X 100}}{\text{Horizontal Distance}}$$

4. If possible, lay out roads when the leaves are off. There is no substitute for walking over the area to be roaded It requires a lot of time to plan and layout a mile of truck road. Remember there is always a best road location. It is the responsibility of the road locator to put forth the effort to find it.
5. Locate control points. Control points are critical in determining road location. There can be obstacles you must avoid such as property corners, wet areas, underground gas lines or cables, and rock outcrops; or places the road should pass through, such as landing locations, and sites to cross streams. Keep roads and landings at least 100 feet from streams, the further the better.
6. After a proposed route is determined, flag a rough grade line (e.g., +5 percent or less) on this proposed location to see if it is feasible. Consider skidroad locations at this time too, so the entire road system can be tied together. Keeping forest access roads within acceptable grade limits is normally a problem in Appalachia, so major changes in the proposed road locations are sometimes necessary. Always remember: (a) road grades can be reduced if roads are lengthened, and (b) it is much more difficult to control water on steep roads. Keep rerunning the road grade line, always removing the old ribbon until you are satisfied that the road is in the best location. Locating a road properly the first time can avoid years of poor access and the difficulty and high cost of relocating.
7. Make sure the final road location is: (a) well flagged, (b) will provide access to the entire tract, (c) is environmentally sound, and (d) that a system of landings and skidroads can be tied into it.
8. Decide on the number and size of culverts. Use tables listed in the various erosion control references to determine culvert sizes. Culverts should be used on all live and intermittent streams and major seeps. Use at least 25 to 30 feet of culvert for truck roads. Deeper fills require longer culverts.
9. Space broad-based “dips” about 150 feet apart to control surface water (fig. 2). Where feasible vary the road grade to provide natural grade “breaks“ (where the grade suddenly changes) and reduce the number of constructed dips.
10. Lay out skidroads after the truck road. Use the same procedure striving for a maximum 15 percent grade and a minimum 150-foot spacing.

Figure 2.-A minimum-standard road showing a broad-based dip in the foreground.

11. Build truck roads and skidroads in dry weather if practical. Avoid skidding and hauling logs during rainy periods (when roads and trails may be damaged by excess water) and when surfaces are freezing and thawing.
12. Don't use broad-based dips on skidroads. The road surface is constantly being disturbed by dragging logs. Instead, use major grade breaks or grade changes to control surface water. Wheeled skidders can negotiate these sharper, deeper dips. Used gas-line pipe makes excellent culverts for seeps and streams on skidroads because it is highly resistant to crushing. Install 'water bars" to control water on skidroads as soon as logging is completed on them.

13. Seed roads and landings after logging to provide additional protection against erosion. Seeding also improves the appearance of logged areas and provides food for wildlife (see Note 9.08 Logging *Roads and Log Decks for Wildlife Habitat*).

A "minimum-standard" road that provides good access for several forest uses and is environmentally sound is described below (see References). The average cost per mile for this type of road (excluding gravel) is about $8,000. While gravel is costly it not only improves road utility but dramatically reduces soil losses from road surfaces.

References

Haussman, Richard F.; Pruett, Emerson W. 1978. Permanent logging roads for better woodlot management. NA-FR-18. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Area State & Private Forestry. 45 p.

Helvey, J.D.; Kochenderfer, J.N. 1988. Culvert sizes needed for small drainage areas in the Central Appalachians. Northern Journal of Applied Forestry. 5(2): 123-l 27.

Kochenderfer, J.N.; Wendel, G.W.; Smith, H. Clay. 1984. Cost of and soil loss on "minimum-standard" forest truck roads constructed in the central Appalachians. Res. Pap. NE-544. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 8 p.

Tew, Howard C.; Price, Lane C.; Swift, Lloyd W., Jr. 1985. The layman's guide to private access road construction in the Southern Appalachian Mountains. U.S. Department of Agriculture, Soil Conservation Service; U.S. Department of Agriculture, Forest Service, Tennessee Valley Authority. 29 p

Walbridge, T . A ; Bentley, A.R., Jr. 1980. Road locator's handbook instruction and field notes. Calhoun, TN: Hiwassee Land Co. 45 p.

James N. Kochenderfer and
J.D. Helvey
Northeastern Forest Experiment Station
USDA Forest Service
Parsons, West Virginia