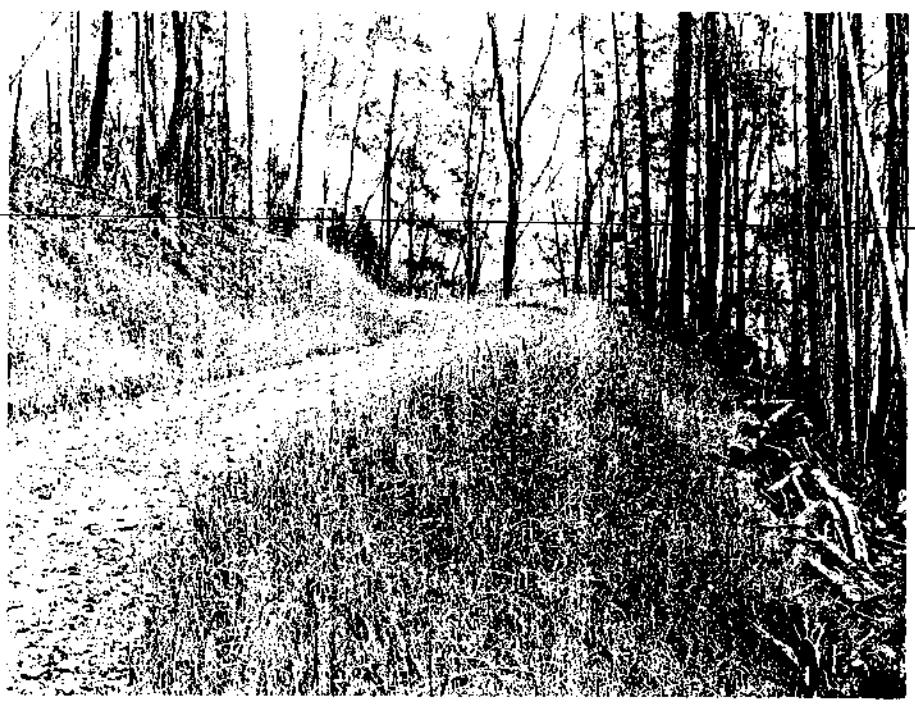
Access Roads

Establishing access in the southern mountains has always been a problem, and many abandoned roads scar the slopes and valley bottoms. Sometimes a new road will follow the path of an old one, repeating the errors of the past rather than taking advantage of new technology and experience. Currently, road construction is at an unprecedented high level in the Mountains. Old roads are reopened by landowners to provide access to woodlots and intermittently used farmlands. Both old and new roads are constructed each year for logging on private and government lands. But the largest road construction effort is for access to second homes and real estate developments. In all of these situations, the common need is for a low-cost, non-polluting, and essentially self-maintaining road design. The trend is away from the old approach of building, using, and then abandoning a road, to a new approach of building, using, and retaining most roads in a low or intermittent service category.

The USDA, Forest Service has supported research and demonstrations focused on forest access road design for more than 50 years at the Coweeta Hydrologic Laboratory in the Nantahala Mountains of Macon County, North Carolina. Early work demonstrated methods of roadbank stabilization using brush and native grasses or weeds. Through a series of logging demonstrations, a minimum standard, intermittent-use access road design was developed and tested. Features of this design are:

- All exposed soil is revegetated as construction progresses.
- Bare soil exposure is minimized by making vertical cuts and by reducing roadbed width through elimination of the inside ditchline.
- Soils and geology are mapped and construction practices modified where unstable sites are found. For example, soils on metamorphosed sedimentary rocks are physically and chemically poorer road construction materials than soils from acid crystalline formations.
- Siltation of permanent and intermittent streams is reduced by keeping a filter strip of undisturbed soil between the road and stream channel and by crossing channels at right angles, always using bridges or open pipe.
- Forest vegetation and brush, cut from the right-of-way, is piled below the roadway before construction begins. This brush barrier intercepts sediment-laden storm water or slows its progress downslope.
- A covering is laid on loose soil in fills to reduce erosion at critical points such as stream crossings and dip outlets. Excelsior and burlap sheets or scattered branches, brush, cut weeds, or grass help protect the soil until new grass becomes established.
- Surface water is removed from the roadbed by outsloping and broadbased dips. Inside ditchlines are used only when necessary to intercept subsurface flow out of the cutbank. Ditchlines that carry storm water tend to undermine the cutbank, become gullies, and require maintenance.
- Dips are spaced about 200 feet apart and placed to divert water away from stream crossings or steep grades. Broadbased dips are short sections of reverse grade which will intercept storm water and turn it off the roadbed.
- Maximum grade is held to 8% whenever possible.
- When roadbeds are not graveled, grass is planted on the entire roadway. Traffic may kill part of the grass, but the rest of the roadbed remains protected from erosion. Gravel is used on steeper grades, problem soils, or high-traffic sections. Larger washed rock (3" nominal diameter) provides an effective erosion prevention



Well designed and maintained access roads will remain useful additions to the area.

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pavement for light-traffic roads. Gravel bonds best to the roadbed if it is placed immediately after construction when the soil is loose. Maintenance requirements for access roads are increased by winter and early spring traffic when soils are wet and soft. Where traffic can be controlled, experience indicates that annual mowing of grass and brush, supplemented by periodic cleaning of dip outlets, is all the maintenance that is required. Greater traffic may require smoothing of the roadbed every 5 to 10 years and replacing grass and gravel. Heavy, year-round traffic requires that a road be upgraded and receive scheduled maintenance.

Not every user follows all these practices. Nevertheless, the road design developed and tested at Coweeta Lab has influenced Federal, State, and forest industry guidelines and thus has contributed to reducing erosion from access roads and minimizing sediment impacts upon downslope landowners and mountain streams. The USDA, Forest Service incorporates features of the design in timber sale contracts and road construction specifications. Elements of the design also appear in North Carolina's Best Management Practice guidelines for reducing non-point source pollution. Attachments to the example timber sale contract provided by the State of North Carolina Forest Service for private landowners and consulting foresters include many of these access road guidelines. Forest industries early recognized and adopted the concept that a low-cost, intermittent-use road is a permanent and sound economic investment, and they moved away from the cycle of building and rebuilding temporary roads. In 1985 the Soil Conservation Service, with TVA funding, published a booklet designed to help homebuilders and developers produce usable access roads with minimal environmental impact and cost.

In: Smith, Andrew R., ed. "Nothing could be finer": A story of soil and water conservation in North Carolina. Produced by the North Carolina Chapter of the Soil Conservation Society of America for the International Meeting of the Soil Conservation Society of America, Winston-Salem, North Carolina, August 3-6, 1986.