

NATURAL RESOURCES CONSERVATION SERVICE
 CONSERVATION PRACTICE SPECIFICATION

FOREST HARVEST TRAILS AND LANDINGS

(ACRE)

CODE 655

GENERAL SPECIFICATION

Procedures, technical details and other information listed below provide additional guidance for carrying out selected components of the named practice. This material supplements the requirements and considerations listed in the conservation standard. Colorado Forest Stewardship Guidelines to Protect Water Quality, Best Management Practices (BMPs) for Colorado (Colorado State Forest Service) should be used for planning considerations and technical recommendations.

HARVEST TRAILS

Harvest trails (skid trails) are a necessary part of a harvest operation. Skidding by ground based equipment can cause severe and unacceptable damage if left unchecked. If a system is not planned, up to 40 percent of the area may be covered with skid trails during a single entry. Multiple entries can raise the percent of area damaged another 10-15 percent.

Limiting the area covered by skid trails during a harvest operation can reduce soil compaction and disturbance problems. Compaction from equipment can lead to less productivity in the forest. Severe compaction has been shown that individual tree diameter growth can be reduced up to 40 percent.

A goal of less than 15 percent of the harvest area in skid trails, including landings but excluding haul roads, is considered reasonable.

When requiring skid trails to be used, advance planning and clearly flagging trails is required. When laying out skid trails leave a strip of undisturbed vegetation parallel to all waterways, or other sensitive areas to reduce delivery of sediment. See filter strips under Erosion Control section.

Skid trails should be regarded as a permanent part of forest landscape. They will be used for later entries into the forest, thereby reducing additional impact to the site.

Limit tractor skidding to slopes less than 30 percent.

Limit skid trail width to 12 feet or less.

LOCATING HARVEST TRAILS

Generally, harvest (skid) trails are spaced from 75 to 150 feet apart. The closer distance will be on more sloping terrain and the farther spacing on flatter terrain.

<u>Spacing</u>	<u>% Area in Skid Trail</u>
75 ft	14%
100 ft	11%
150 ft	7%

On steeper, broken, or highly dissected terrain expect a higher percentage of skid trails to occur.

Skid trails have two common pattern systems, branching and parallel. Branching is more commonly used on flatter terrain. It has one or

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

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more main trails with side trails branching off it. Parallel skid trail systems are used on steeper slopes and run parallel to the slope as much as possible.

Skid trails on less than 20 percent side slopes do not require trail excavation. Side slopes beyond 20 percent may require excavating one to two feet of soil, at the trail center, to establish the skid trail. This is necessary because a loaded vehicle tends to slide down hill. Erosion control measures should be planned and applied under these situations.

When planning skid trail layout consider the following for trail alignment:

1. Make trails as straight as possible for as long a distance as possible.
2. Remove all trees from the skid trail and cut all stumps down to ground level.
3. Make intersections at 45° angles or less with respect to travel toward the landing.
4. Parallel the contour of the terrain and make up slope skid trails follow the ridge crest.
5. To reach long corners of a unit use short trail branches.
6. Do not place branching side trails directly opposite each other on the main trail.
7. Avoid sharp curves at the bottom of steep downhill segments.

SKID TRAIL GRADE

The grade (slope) of a skid trail affects the productivity of the operation. Skidding down hill is preferred in all ground-base systems. For main trails an adverse (generally uphill) grade needs to be no greater than 10 percent and favorable (down hill) grades not greater than 20 percent. Short steep uphill grades, up to 20 percent and 100-200 feet long, are feasible if the trail is straight and ground is firm enough for good traction.

On steeper side slopes where skid trails run up and down slope the vehicle runs perpendicular to the slope and maintains greater stability. With this operation increased protection from soil erosion will be required on the skid trails.

TREE FELLING FOR SKID TRAILS

Felling trees that make them accessible from designated skid trail is the key to a successful harvest operation.

Trees must be felled toward the skid trail or alternately away in the opposite direction. This is called "felling to lead". This allows for the winch line to be pulled directly to the tree.

When a tree is felled in the wrong direction, winched trees might be damaged or trees felled on top may be damaged. Review of the skidding plan should be done with those who are felling the trees to head off any problems.

When harvesting small trees either the tops or butts are suitable for winching. Winching large diameter trees, with the butt of the tree facing the skid trail, may lead to extra soil disturbance due to it digging into the soil.

Felling trees at approximately a 45° angle to the skid trail, and towards the main road leads to easier removal.

Wedges, hydraulic rams and jacks, and lines from skidders can be used to assist in directional felling.

Felling trees may obliterate skid trail markings. Felling the trees first, where the trails will be, can help in directing the felling of the remaining trees.

EROSION CONTROL

Erosion control measures on skid trails and landings will be part of the skid trail system design. Skid trails can have slash distributed on them, seeded with grass, water bars installed or any combination to minimize erosion and sediment reaching streams.

Slash material, tops and limbs, may be lopped and scattered on skid trails and landings to filter sediment, slow water velocity and divert concentrated flows to stable areas. Do not place slash materials in drainage ways with perennial water or in watercourses unless being used as vegetative riprap for bank stabilization and installed according to NRCS specifications.

Deflector logs (small logs) can be placed across the slope and anchored to trap sediment, reduce water velocity, and divert concentrated flows to more stable areas.

Filter strips are needed to filter out sediment before water reaches a watercourse. The width of filter strips should be a minimum of 50 feet.

Water bars can be installed on all skid trails and roads where infrequent traffic is expected.

Space water bars frequently enough to prevent erosion and to remove water from disturbed or unstable soil areas. Spacing will depend upon soil type, slope, and onsite conditions. Suggested guidelines are included in Colorado Forest Stewardship Guidelines to Protect Water Quality, Best Management Practices (BMPs) for Colorado – Recommended Waterbar Spacing Distance for Roads and Skid Trails

Place a waterbar about 15 feet up from where roads or skid trails cross drainage ways to prevent sedimentation of the drainage.

Insure that water flowing from a water bar does not flow directly into streams or onto lower parallel roads or skid trails. Place water bars about 15 feet up from where the centerline grade steepens to prevent accumulate water from flowing down steeper portions of roads or skid trails.

Place water bars above intersections of roads, skid trails and landings.

Avoid placing water bars in low areas where water has no escape.

Inspect and maintain water bars annually prior to and during the rainy season. Rebuild berms, clean ditches and outlets as needed. Build additional water bars, as needed.

LANDINGS

Avoid locating landings on flood plains, slide areas, steep slopes, erosive soils or wet meadows.

Landings should be located first when laying out the skid trail system. Landing locations should involve the least amount of excavation or filling, but be efficient for skidding and loading operations. Landings should be large enough to handle the loader, trucks and log decks.

Landings can be spaced up to 1200-1500 feet apart, but shorter distances are more efficient. Distances of 800 feet or less are more efficient and cost effective. If additional environmentally safe landings can be located and used, the efficiency of the operation can be improved.