

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

**FOREST TRAILS AND LANDINGS
(Acre)
Code 655**

GENERAL CRITERIA

All practices will comply with applicable laws, regulations, and the guidelines described in the "Texas Best Management Practices for Silviculture" handbook.

Design and locate trails on land that is to be established or re-established to woodland prior to planting to facilitate future management activities.

1. SITE AND SOIL CONDITIONS

During the planning process, soil related concerns will be discussed with the landowner. Either the dominant soils or those at important control points, such as the entry site, will be rated.

Factors to be considered will include:

• **Site and soil properties that affect general accessibility and trafficability.**

Concern	During Wet Conditions	During Dry Conditions
Moderate	Surface Texture: Loamy Surface Depth: >8" Subsoil Texture: Loamy Subsoil Color: Not mottled or gray	Surface Texture: Loamy or loamy sand Surface Depth: <40" Subsoil Texture: Loamy Subsoil Color: Mottled or gray
Severe	Surface Texture: Loamy or clayey Surface Depth: <8" Subsoil Texture: Loamy or clayey Subsoil Color: Mottled or gray	Surface Texture: Sandy Surface Depth: >40" Subsoil Texture: Sandy Subsoil Color: Not mottled or gray

• **Site and soil properties that affect erosion, rutting, and trail & landing construction.**

Concern	Erosion	Rutting	Trail & Landing Construction
Moderate	Surface Texture: Loamy or coarser & slopes = 5 - 15% Surface Texture: Loamy or finer & Slopes= 3 - 8%	Surface Texture: Sandy	Surface Texture: Silty or clayey Slope: 6-12% Ponding/Flooding Duration: Occasionally : 3 - 5 months Frequently: 1 - 2 months Water Table for 2 or more months: 12" -24"
Severe	Surface Texture: Loamy or coarser & slopes = 5 - 15% Surface Texture: Loamy or finer & Slopes= 3 - 8%	Surface Texture: Silty or clayey Year- round Water Table: <12"	Surface Texture: Sandy or organic Slope: >12% Ponding/Flooding Duration: Occasionally : 6 - 12 months Frequently: 3 - 12 months Water Table for 2 or more months: <12"

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

If accessibility and trafficability are a moderate concern, consideration should be given to restricting access during times of adverse weather conditions. If they are a severe concern, restrictions will be needed during wet or dry conditions, as appropriate.

Soils with "Moderate Concerns" from the second table above may require special practices as listed below. These may include consideration of soils, controlling trail grade, installation of water control devices, and revegetation. Those soils with "Severe Concerns" will require special measures.

2. TRAIL AND LANDING DESIGN AND LOCATION

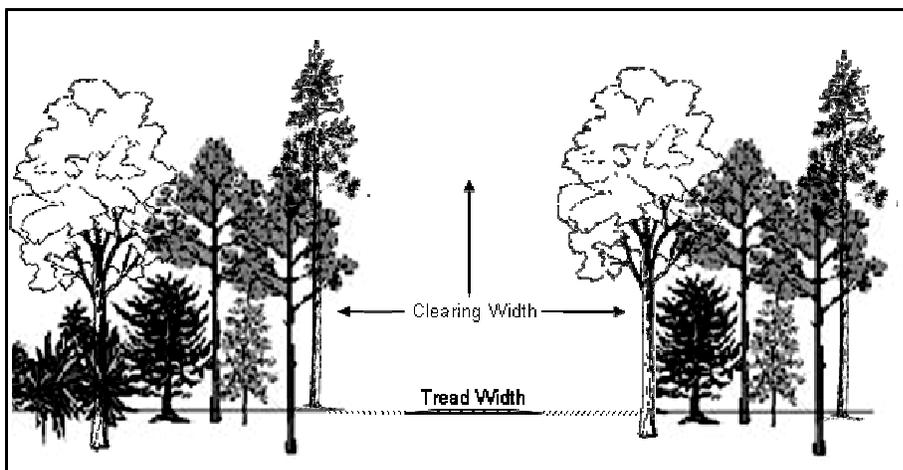
Trails and landings will be planned and installed to meet the intended purpose and traffic while minimizing onsite and off-site impacts.

- **Soils:** When possible, avoid soils with severe concerns.
- **Design / Location:** Design and locate trails to serve the intended purpose; the type of traffic expected; and future use. The following trail specifications apply to temporary logging roads, limited use access roads and skid trails needed for forest management. Sound engineering practices will be followed on all roads and trails, but for heavily used roads refer to the Standard for Access Roads (560).

Landings will not be located within 50 feet of a Streamside Management Zone (SMZ). Place landings to: take advantage of well drained soils and sites, limit skidding distance (normally to ¼ mile or less), and to cause skidding to generally be uphill. Skid trails on steep slopes will ascend either in a zigzag or slanting pattern.

Except for stream crossings, trails will not be located within SMZs. When possible, meander trails along ridge tops or place on the side of ridges. Maintenance and erosion control measures will be planned.

- **Size/ Width:** Landing sizes will be compatible with the harvesting, loading, and transporting equipment being used. Adjustments may be made for additional uses such as wildlife plantings, etc. Minimum trail width will include a treadwidth of 10+ feet plus additional width as needed to accommodate the planned traffic and vehicles. Additional width should be considered to allow sunlight to reach the road when vegetation is planned for road protection and erosion control. Widen to 30+ ft. at intervals for turnouts (if needed), turns, and curves.

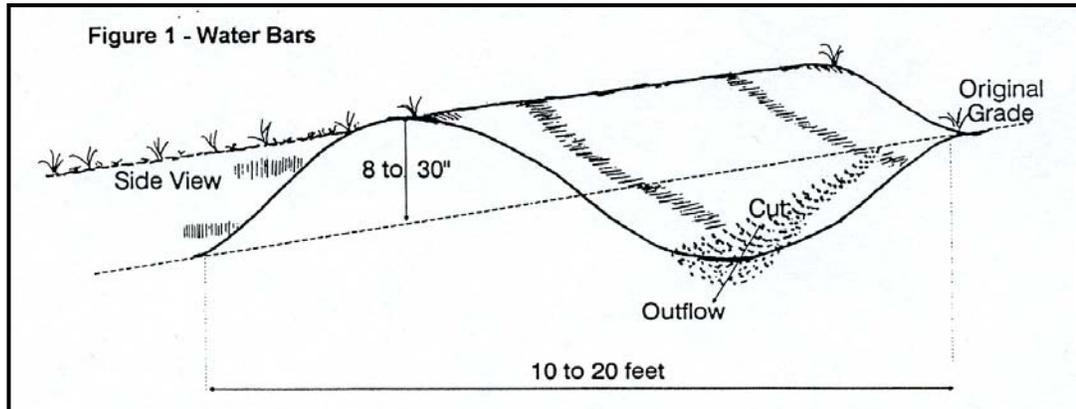


- **Slope:** When possible, landings will have a 2 to 5% slope to facilitate drainage. Sustained road and trail grades of between 2 to 10% are desirable, but may be steeper in some situations. On highly erodible soils, a maximum grade of 8% or less is desirable. Slope lengths on steeper grades will be kept as short as possible and water control devices will be installed. In addition, avoid as road and landing locations long flat areas that can pond water.

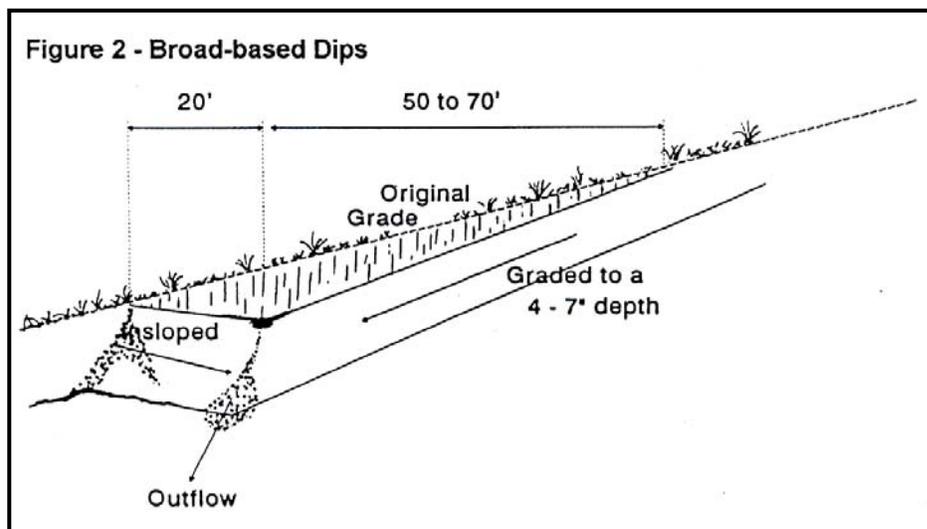
3. WATER CONTROL DEVICES

Water bars, rolling dips, broad based dips and other drainage measures for trails shall be of sufficient size, intervals and gradient for adequate drainage and erosion control.

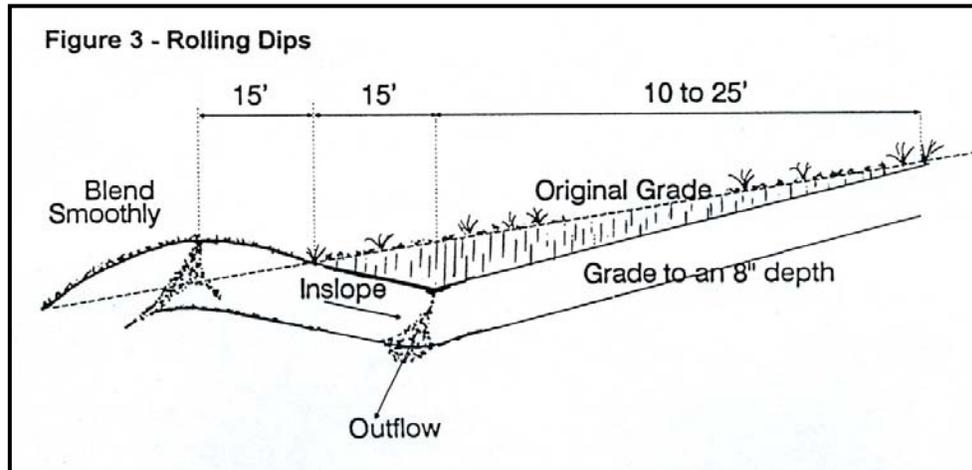
- **Water bars:** Install water bars after logging or on trails that will have limited use. Angle water bars across the trail at 30 to 45°, and release water only onto stable outlets. See table for spacing.



Broad-based dips: Install dip at a grade of 2 to 3% toward the outlet, and release onto a stable area. Outslope only the dip, not the road. Limit broad-based dips to slopes of less than 12%. Broad-based dips will not be used for cross drainage of springs, seeps or other live water. See table for spacing.



- **Rolling dips:** Install dip at a grade of 2 to 3% toward the outlet, and release onto a stable area. See table for spacing.



Maximum Spacing for Water Bars, Broad-based Dips, and Rolling Dips

Slope	Water Bars	Broad-based Dips	Rolling Dips
2%	250 feet	300 feet	200 feet
5%	135	180	150
10%	80	140	130
15%	60		110
20%	45		90
30%	35		

- **Drainage across the trail:** Trails will be designed to by-pass drainage ways as much as possible. However, if the trail will cross small drainage ways (excluding intermittent and perennial streams), depressions, etc., crossings will be compatible with the expected amount of use, traffic, and term of use.

Log and soil crossings, as well as temporary culverts, will be removed after logging and the drainage way returned as closely as possible to its original condition. Grade dips or culverts (pipe or open box) will be installed according to sound engineering principles for the drainage area and intended use. A 12-inch pipe or culvert is the smallest that should be used.

4. STREAM CROSSINGS (Intermittent and Perennial)

When possible, stream crossing will be kept to a minimum.

All stream crossings will be planned. Approaches will be at a right angle to the stream and stabilized.

Temporary crossings –

Log, slash and soil crossings will be avoided in perennial streams.

Design of temporary culverts and bridges will be consistent with sound engineering principles for the drainage area, intended use and traffic, and the expected term of use.

Temporary crossings will be removed after use and the site restored.

Permanent Crossings –

Log, slash and soil crossings will be avoided

Permanent culvert and bridge design and installation will meet engineering specifications for these practices – See Stream Crossing Conservation Standard (578). Culverts will be designed to meet a 2 year- 24 hour storm runoff capacity.

Low water crossings will be planned for the expected traffic and will be designed to ensure stability of the stream and approaches. If rock or geotextile materials are used, install according to the Stream Crossing Conservation Standard (578).

5. RENOVATION OF EXISTING TRAILS

The condition of existing trails will be evaluated according to this standard. Consideration may be given to abandoning all or parts of existing trail systems. Practices needed for renovation will be consistent with this standard.

6. REVEGETATION

Trails and landing will be sufficiently revegetated to control erosion. Sites on steep or erodible soils or subject to excessive erosion will be revegetated within the first fifteen days of the next planting season after the disturbance, as weather permits.

- **Seedbed preparation:** The NRCS technician will determine the need for and if necessary, the method of seedbed preparation. Generally if the soil is loose, or even firm (but not compacted), smooth enough for planting, and has not been sealed by rainfall, little or no seedbed preparation may be needed.
- **Adapted plants:** Refer to the common seeding table and/or the Standard for Critical Area Planting for the selection of adapted plants and seeding rates other than those listed below.

COMMON REVEGETATION COVER							
Vegetation Type	Species	General Soil Adaptation			Season of Growth	Planting Dates	Minimum Planting Rates/Ac ⁶
		Sands	Loams	Clays			
Annuals ⁽¹⁾	Millet	X	X	X	Warm	4/15 – 8/1	20 lb.
	Ryegrass		X	X	Cool	9/1 – 11/30	24 lb.
	Oats / Wheat	X ⁽⁴⁾	X	X			64 lb.
	Elbon rye	X	X	X			56 lb.
Perennial Grass	Bahia ⁽³⁾		X	X	Warm	***** ⁽⁵⁾	15 lb.
	Common Bermudagrass ⁽³⁾		X	X	Warm	3/1 – 6/1	3 lb.
	Sprigged Bermudagrass	X	X	X	Warm	1/15 – 6/1	24 bu.
	Tall fescue ⁽³⁾		X	X	Cool	9/15 – 11/15	10 lb.
Legumes ⁽²⁾	Singletary peas		X	X	Cool	9/15-11/30	35 lb.
	Hairy vetch	X	X	X			15 lb.
	Arrowleaf clover		X	X			10 lb.
	Subterranean clover		X	X			16 lb.
	Crimson Clover	X	X				20 lb.
⁽¹⁾ Use as temporary cover, in mixes, or for wildlife plantings		⁽⁴⁾ Not adapted to very deep sands					
⁽²⁾ Inoculate seed before planting		⁽⁵⁾ Can be planted nearly year round if with an appropriate temporary cover plant					
⁽³⁾ Most shade tolerant of listed plants		⁽⁶⁾ Seed rates are Pure Live Seed					

- **Establishment methods:** Seed may be applied by hand, cyclone seeder or other acceptable method. Sprigs may be planted by hand or other acceptable method. Woodies will be established according to the Tree/Shrub Establishment Standard (612).
- **Fertilization:** If fertilization is determined to be needed, refer to the Nutrient Management Standard.
- **Mulching:** Mulching is the application of plant residues or other suitable materials to the soil surface for the purpose of reducing erosion and helping establish a plant cover. Logging slash may be used on disturbed sites where the NRCS technician determines that it will provide sufficient erosion control until the area can be planted or native vegetation can become established. Slash and other suitable mulching material, may be spread mechanically or by hand, but must have as much in contact with the soil as possible. Hay may be applied at a rate of approximately 100 pounds per 1,000 square feet, and should be anchored by light disking or other suitable method. Wood chips should be spread no deeper than 1" if revegetation is planned. Refer to the RUSLE Handbook for the percent of ground cover needed to keep soil loss within acceptable limits.

7. SLASH AND DEBRIS

Slash, debris and vegetative material left on the site after harvesting will not present an unacceptable fire or pest hazard or interfere with the intended purpose.