

ROAD MAINTENANCE

Forest roads are essential to forest management and contribute to providing jobs, products, tax base and other social and economic benefits. Good road location, design and construction minimizes soil erosion, landslides and flow of sediment into streams. Timely maintenance during and after active operations prevents road-related sediment from entering streams and water ways.

In addition to being a prudent activity, maintenance of forest roads is required by the Oregon Forest Practices Act under OAR 629-625-600 Road Maintenance:

Operators shall maintain active and inactive roads in a manner sufficient both to provide a stable running surface and keep the drainage system operating as necessary to protect water quality.

When an operation is active, operators are required to complete road maintenance activities. After an operation is completed, the landowner responsibility for road maintenance activities is an on-going process.

Planning Ahead and Monitoring Road Conditions

The best way to keep road maintenance costs and sediment hazard low is through carefully planned road location and design BEFORE construction or reconstruction.

Knowledge of your road system and maintenance needs is an important first step. Identify those features that require special attention, such as culverts, wet areas, steep grades, slide- or slump-prone areas, ditches which tend to fill with dirt or rocks, and newly constructed roads with exposed soil.

Assessment and mapping of problem road locations is especially helpful to prevent sediment impacts.

Reducing road use seasonally or indefinitely may be an appropriate road maintenance tactic.

Roads near or crossing Type F (fishing bearing) and Type D (domestic use) streams, or significant wetlands should be a high priority for road maintenance activities. The *Oregon Plan for Salmon and Watersheds* includes additional voluntary measures for road assessment and remediation.

A periodic road inspection schedule should be established to make sure that problem areas are inspected more often than other portions of the road system. Patrolling roads before the rainy season, and during large storm or snow melt events, can find ditch overflows, fresh slumps, plugged culverts and other problems which can be remedied

right away. Timely response to repair road damage, before more serious drainage problems occur, is an important responsibility of operators and landowners.

Culvert Maintenance

Prompt removal of any material that restricts water flow is the most important type of maintenance for culverts. Culvert inlets, outlets and catch basins should be cleaned prior to the fall-winter rainy season, and during heavy runoff periods especially in recently logged or problem areas. Catch basins should be cleared of floatable debris for at least 20 to 30 feet above the inlet.

The areas at each end of culverts may need some maintenance to prevent erosion. Rock riprap can be used in the inlet catch basin to prevent scouring of soil or plugging of the culvert. Riprap used below the culvert outlet can prevent stream sedimentation. Vegetation, slash, rocks or culvert half-rounds (well anchored to culvert) also can act as energy dissipaters below the culvert outlet, and prevent "cannon culverts" which can undermine the road bed.

As older "legacy" culverts wear out, are damaged or otherwise need to be replaced, they must be replaced with culverts large enough to pass a 50-year storm event. And on Type F streams, culverts must be installed to pass both adult and juvenile fish. The *Oregon Plan for Salmon and Watersheds* includes voluntary measures for assessing and replacing inadequate existing culverts which are undersized and/or cannot pass fish on Type F streams.

Ditch Maintenance

Roadside ditches are usually adequate to carry runoff immediately after construction. Eventually, cut banks and ditch walls ravel down into the ditch. Logging debris or vegetation also may decrease ditch capacity.

An open ditch is important for draining the road surface and cut banks. Ditches should be inspected each fall before the raining season and periodically during the winter. Road-surface erosion from ditch overflow indicates a need for unplugging culverts or pulling the ditch with a grader. Ditch erosion shows that more, or larger cross-drain culverts, rolling dips, or some other type of ditch stabilization are needed. Frequency of drainage structures is covered in figure 1.

Graders are a good choice for grading roads and cleaning ditches, and slightly moist soil conditions are desirable for grading and for ditch cleaning. Graders can angle the blade to allow the corner to cut a V-shaped ditch, with one set of wheels running to the ditch to compact it and to keep the equipment oriented. Ditches should only be cleaned where necessary. Keep stabilized sod-layers intact and avoid undercutting the backslope. Material removed from ditches should be incorporated into the road surface, or placed in stable locations where it will not enter streams.

Figure 1

RELIEF CULVERT, CROSS DRAIN, ROLLING DIP OR WATER BAR SPACING GUIDE			
Road grade %	SOIL TYPE		
	Granitic or Sandy	Shale or Gravel	Clay
2	900	1,000	1,000
4	600	1,000	800
6	500	1,000	600
8	400	900	500
10	300	800	400
12	200	700	400
15	150	500	300
20	150	300	200
25+	100	200	150

Running Surface and Drainage Maintenance

Damage to the road surface starts when excess water gets trapped in the ditch or on the road surface. A crown or side slope for surface drainage is usually constructed in roads, however these features can be compromised by traffic and freezing or thawing conditions. Grading (shaping) can reinstall these drainage features, eliminate potholes or ruts, mix surface rock and fines, and remove berms. Grading should be done once a year, or periodically as conditions warrant. Excess grading spoils should be placed in stable locations where they will not enter streams.

Grading is a good time to install rolling dips (figure 2) in roads without other drainage structures such as culverts. Rolling dips are best installed during the construction phase, however they should be installed before the rainy season. They are designed to carry runoff from the road surface before it gains the velocity and volume, causing erosion and stream sedimentation. Rolling dips should not channel runoff directly into streams, skid trails, or bare ground. Any road runoff should be filtered through grass, brush, or slash prior to entering streams.

Road Surfacing to Reduce Maintenance and Sediment

Installing road surfacing is a common, although initially expensive, application for heavily used roads. It reduces maintenance costs, improves road uses and prevents unacceptable amounts of sediment from entering streams. Examples of surfacing are pit run rock, crushed rock, asphalt, chemical binders, filter cloth underlayment and subgrade compaction. Spot applications of surfacing to problem areas, or at stream crossings, also can reduce maintenance costs.

Road surface chemical applications should be planned to prevent these materials from entering streams. Flagging streams and crossings helps the applicator avoid direct application to streams. The label on the chemical container must be followed.

Slope and Fill Stabilization

Pull-back of unstable fills may be needed to prevent larger and more costly slope failures or debris torrents during wet years. Riprapping or seeding with a soil-holing species are appropriate ways to stabilize slopes and fills. Planting must be done when soil moisture is high enough to support germination and growth. Consult the Natural Resource Conservation Service or a forest practices forester for local seeding mixtures.

Roadside Vegetation Control

Roadside vegetation is often controlled for good visibility and safe travel. Mechanical slashing or herbicide application can accomplish this. Flagging streams and crossings is recommended to avoid herbicide contamination of streams. Application of chemicals for control of roadside vegetation requires notification of the State Forester. For more information on the forest practices chemical rules, refer to OAR 629-620-000 to -800.

Stabilizing Unused Roads

All unused roads must be maintained to provide adequate drainage and soil stability. Maintenance includes installing rolling dips, waterbars, seeding, removing stream-crossing structures, out-sloping the surface and possibly, pulling culverts. Landowners are discouraged from closing roads that prevent access for fire suppression. Gates or other movable barriers allow for periodic access for road maintenance and other infrequent activities.

Mitigating Sediment Problems

Sediment filtering may be needed. Examples include using anchored straw bales, mulches and erosion mats, wood chip-filled mesh bags, hydro-mulching with straw and seed, erosion fencing with geotechnical fabrics, and frequent cross drains leading to forest floor filtering areas. Road maintenance options include watering for dust abatement (to keep fines on road), chemical dust abatement, cross drainage to channel runoff away from streams, road/ditch grade design to minimize ditch length draining into streams, additional surface cross-drainage after snow plowing. Avoiding road use during wet conditions is recommended.

Fish Passage at Crossing Structures on Type F Streams

Operators and landowners are required to maintain crossing structures on Type F streams that allow juvenile and adult fish passage. This standard is required for roads constructed or reconstructed after September 1, 1994. It is encouraged for all other roads with crossing structures Type F stream.

Structures should be cleared of debris that impairs fish passage. Other fish passage requirements administered by other state agencies may be applicable to crossing structures, including those constructed before September 1, 1994. For more information, refer to ODF's *Fish Passage Guidance at Road Crossings*.

ODF Field Offices Directory

Northwest Oregon Area

Astoria District
Route 1, Box 950
Astoria, OR 97103
503-325-5451

Tillamook District
4907 E. 3rd St.
Tillamook, OR 97141
503-842-2545

Forest Grove District
801 Gales Creek Road
Forest Grove, OR 97116
503-357-2191

Clackamas-Marion District
14995 S. Hwy 211
Molalla, OR 97038
503-829-2216

West Oregon District
25433 Alsea Hwy
Philomath, OR 97370
541-929-3266

Southern Oregon Area

Douglas District
1758 N.E. Airport Road
Roseburg, OR 97470
541-440-3412

Western Lane District
P.O. Box 157
Veneta, OR 97847
541-35-2283

Western Lane District
P.O. Box 157
Veneta, OR 97847
541-35-2283

Linn District
4690 Hwy 20
Sweet Home, OR 97386
541-367-6108

Southwest Oregon District
5286 Table Rock Road
Central Point, OR 97502
541-664-3328

Coos District
300 5th St., Bay Park
Coos Bay, OR 97420
541-267-4136

Eastern Oregon Area

Central Oregon District
Route 2, Box 357
Prineville, OR 97754
541-447-5658

Klamath-Lake District
3400 Greensprings Drive
Klamath Falls, OR 97601
541-883-5681

Northeast Oregon District
611 20th St.
La Grande, OR 97850
541-963-3168

Salem Headquarters

2600 State Street
Salem, OR 97310
503-945-7470

ODF on the Internet

For current Oregon forest practice rule information, connect to the Oregon Department of Forestry's Forest Practices Program world wide web page at:

<http://www.odf.state.or.us/forprac.htm/>



"STEWARDSHIP IN FORESTRY"

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