

## 9. RUTTING

Rutting occurs when soil strength is not sufficient to support the applied load from vehicle traffic (see Figure 18). Rutting affects aesthetics, biology, hydrology, site productivity and vehicle safety. In general, rutting can cause soil compaction and loss of forest productivity. Where channelized flow to an open water body occurs, rutting can result in contributing sediment into an open water body. While not always a water quality issue, excessive rutting is certainly a sign that ongoing forest operations need to be modified to prevent further damage to soil and forest resources.



**Figure 18. Forest Road Rutting Damage**

Table 5 (below) provides guidelines as to excessive rutting in different areas of a harvest operation, immediate actions to be taken and restoration requirements. The rutting guidelines should be applied in relation to the specific area being harvested. Consideration should be given to soils, hydrology, forest type, slope, and other site factors. For example, on certain sites, it may be necessary to change or halt operations before the guidelines are exceeded. Conversely, deep ruts may not be a problem in a landing which will be smoothed and revegetated after a harvest.

Anytime rutting causes sedimentation in a stream, lake or open water wetland, the activity causing the rutting must stop and immediate actions taken to prevent further sediment deposition. Rutting in roads or landings that does not cause sedimentation should be monitored. If ruts begin to exceed the guidelines, measures should be taken to prevent further rutting. If further rutting cannot be prevented, the operations should cease until conditions change or until the rutting can be repaired. Off road rutting in the woods may occur on skid trails. Heavily used trails, also called main skid trails, may have more rutting than “one time only” trails or secondary trails. Consideration should be given to the overall impact of the skid trails across the landscape.

It would be difficult to define guidelines related to the total length and depth of skid trails across a forested stand, but in general the amount of skid trails should be minimized. Major skid trails will have more rutting than secondary skid trails. If secondary skid trails begin to resemble major skid trails, then rutting may be too severe, even though the rutting guidelines have been followed. Excessive rutting may occur even though any individual length of skid trail is within the guidelines. Professional judgment should be used to identify excessive rutting across a forested stand.

Surface water runoff from rain events can also lead to ruts in a logging road. The ruts collect runoff and increase the potential for ruts to deepen and further road erosion. Roads having slopes greater than 5% are especially vulnerable to the creation and deepening of ruts from rain events. Installing the proper water diversion devices, such as diversion ditches or broad-based dips at the appropriate intervals will periodically interrupt and divert stormwater runoff and decrease the volume and velocity of storm water runoff as it moves down slope. This reduces

the potential for rutting. Proper grading, crowning of roads and shaping of roads per soil and slope conditions (see figure 4) can also reduce the potential for rutting. Heavily sloped roads (those with slopes greater than 10%) can become rutted very easily, so the driver/operator must use extra care when driving these roads with heavy loads or under wet conditions.

**Table 5. Rutting Guidelines**

Location	Soil disturbance is excessive if:	Immediate Action	Restoration
Anywhere	A gully or rut of any depth channelizing flow to an open water body, (i.e. stream, lake or open water wetland).	<ul style="list-style-type: none"> <li>• Stop operations. Assess the situation. <b>Prevent further movement of sediment</b> by:               <ul style="list-style-type: none"> <li>○ installing rock check dams (use rock ranging from 3 -12 inches in diameter) or water bars at appropriate intervals or</li> <li>○ using other methods that will prevent the movement of sediment into a water body.</li> </ul> </li> </ul>	Repair gullies and ruts. Disc and plow, where necessary. Seed and mulch per recommended procedures (see Appendix E) . Check dams and water bars should be left in place until grassy vegetation is firmly established.
Roads	<ul style="list-style-type: none"> <li>• In a riparian management zone (RMZ) or wetland, a gully or rut is 6 inches deep and 25 feet long.</li> <li>• In an upland area (outside of RMZ), a gully or rut is 12 inches deep and 50 feet long.</li> </ul>	<p>Stop operations where rutting is occurring. Assess the situation . Only operate equipment in those areas not vulnerable to rutting. Consider installing water bars made from old conveyor belts or other rubberized material.</p> <p>In RMZ's, fill in rutted areas, apply geotextile fabric over rutted and susceptible areas, then apply gravel or crushed rock over the fabric at a depth no less than 3 inches (6 inches is optimal).</p>	<p>Where water quality will not be affected, remediation may not be necessary. Review site conditions and determine if site remediation would cause more damage to soil resources and site productivity than leaving ruts as they are.</p> <p>If a rutted road must be used to move forest products: 1) fill in ruts as conditions allow, 2) apply geotextile fabric over the length of the rutted portions and 3) apply gravel or crushed rock at a depth no less than 3 inches (6 inches is optimal).</p> <p>Consider vehicle safety as an issue from ruts in a forest road. This may require frequent grading.</p> <p>Smooth, seed and mulch as appropriate after timber harvest is completed (Refer to Appendix E for instructions).</p>
Landings (Should not be located in an RMZ.)	Soil moves from the landing area.	Install silt fence at edges of landing to prevent movement of sediment off site.	<p>When landing is no longer needed, smooth, seed and mulch as appropriate (Refer to Appendix E for instructions)</p> <p>Silt fence should be left in place until grassy vegetation is firmly established.</p>
Skid trails and harvest areas	Gully or rut is 12 inches deep and 50 feet long.	<p>Assess the situation.</p> <ul style="list-style-type: none"> <li>• Move operations to another area of the stand.</li> <li>• Stop operations until conditions improve.</li> </ul> <p>Use slash, tire mats, or PVC pipe linked together with chain or cable and lay over areas susceptible to rutting or use other suitable methods to prevent further rutting.</p> <p>Use slash or logs to prevent movement of sediment off site.</p>	No restoration is recommended if such action causes more damage to site (e.g. disking and plowing may result in unacceptable damage to the root systems of the trees affected by the rutting).