DCNR Bureau of Forestry
Rutting Guidelines

Guideline Usage: These guidelines are provided as a tool to assist the Bureau of Forestry Management staff when conducting forest management operations on State Forests.

Background: Soil compaction and rutting can reduce the productivity of a site, disrupt surface drainage and infiltration, and contribute to sediment movement from erosion. During timber harvesting, soil compaction results from an increase in soil bulk density, primarily due to the ground pressure of harvesting and construction equipment. Compaction may occur over broad areas where it would not necessarily result in the visible depressions associated with rutting. Rutting occurs when soil strength is not sufficient to support the applied load from vehicle or equipment traffic on unpaved forest roads and trails (access system). A rut is a depression made into the soil surface by the passage of a vehicle or equipment.

A well planned and laid out access system, utilizing appropriate best management practices (BMPs), concentrates site disturbance, soil compaction, and rutting to these limited corridors while protecting water quality and overall site productivity of the general harvest area. These forest roads and main skid trails will probably become a permanent feature on the landscape and should be considered essentially removed from the production of timber. Similarly, permanent access systems have added benefits of increasing passive public recreational opportunities after the operation is complete and assuring access for future administrative use.

Timber Sales: Management expectation is that all steps and precautions, including implementation of BMP's, will be taken to avoid or minimize soil disturbances. Rutting in the general harvest area should be avoided to prevent significant impact to overall site productivity, root damage, disrupt surface drainage and infiltration, and contribute to sediment movement into stream buffers, wetlands, or water bodies as determined by the state forest manager or designees.

If a timber sale has soil disturbances that are below the excessive threshold, then the expectation is that the contractor will evaluate the disturbance and determine what actions, if any, are needed to repair or mitigate the effects of the soil disturbance.

If a timber sale has soil disturbances that exceed the excessive threshold, the expectation is that the contractor will contact the timber sale administrator (or vice versa) and together they will evaluate the disturbance and determine what action, if any are needed to repair or mitigate the effects of the soil disturbance. The timber sale administrator should meet on-site with the timber sale contractor and equipment operators. The administrator and contractor should consider management goals and objectives, weather, site conditions, availability of equipment and other factors when evaluating repair and mitigation options.

Prior to closing a sale, the timber sale administrator should ensure that any soil disturbances that may have occurred are properly addressed.

Excessive Soil Disturbance Determinations: A soil disturbance is "excessive" if it has

exceeded the threshold (see Table 1). An area with an excessive soil disturbance requires special attention from a timber sale administrator. Excessive soil disturbances require special attention to evaluate the effect of the soil disturbance and to develop repair or mitigation recommendations. Classifying a soil disturbance as "excessive" does not mandate closing of a timber sale or a forest road; however, actions should be taken immediately and as appropriate, to minimize further soil disturbances and should be documented on the Timber Sale Inspection Report.

Table 1. Thresholds for soil disturbances

State Forest Infrastructure	Soil disturbance are excessive if:
Roads, Landings, Skid Trails and General Harvest Areas	• A gully or rut is 6 inches deep or more and is resulting in channelized flow to a wetland, stream or lake.
Roads, Landings, and Primary Skid Trails	• In a riparian management zone (stream buffer) or wetland, a gully or rut is 6 inches deep or more and 100 feet long or more. • In Multiple Resource Management Zone, a gully or rut is 10 inches deep or more and 66 feet long or more.
Secondary Skid Trails and General Harvest Areas	• Gully or rut is 6 inches deep or more and 100 feet long or more

Note: *The depth is to be measured from the original soil surface to the bottom of the depression. If individual lug depressions are visible, the depth would be measured to the lesser of the two depths (the "top" of the lug). See Figure 1. The length is measured from the start of the "too deep" section to the end of the "too deep" section. Measurements are not cumulative.*

Definitions and terms:

A *gully* is an erosion channel cut into the soil along a line of water flow.

A *rut* is an elongated depression caused by dragging logs or by wheels or tracks of harvesting machinery, equipment or other vehicles. Ruts are often exacerbated by erosion from uncontrolled storm water runoff.

A *primary skid trail* is used for five or more passes.

A *secondary skid trail* is used for four or less passes.

Figure 1

Rut Cross-Section