



# MN DNR State Land Rutting Guidelines and Decision Tree

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# MN DNR State Land Rutting Guidelines

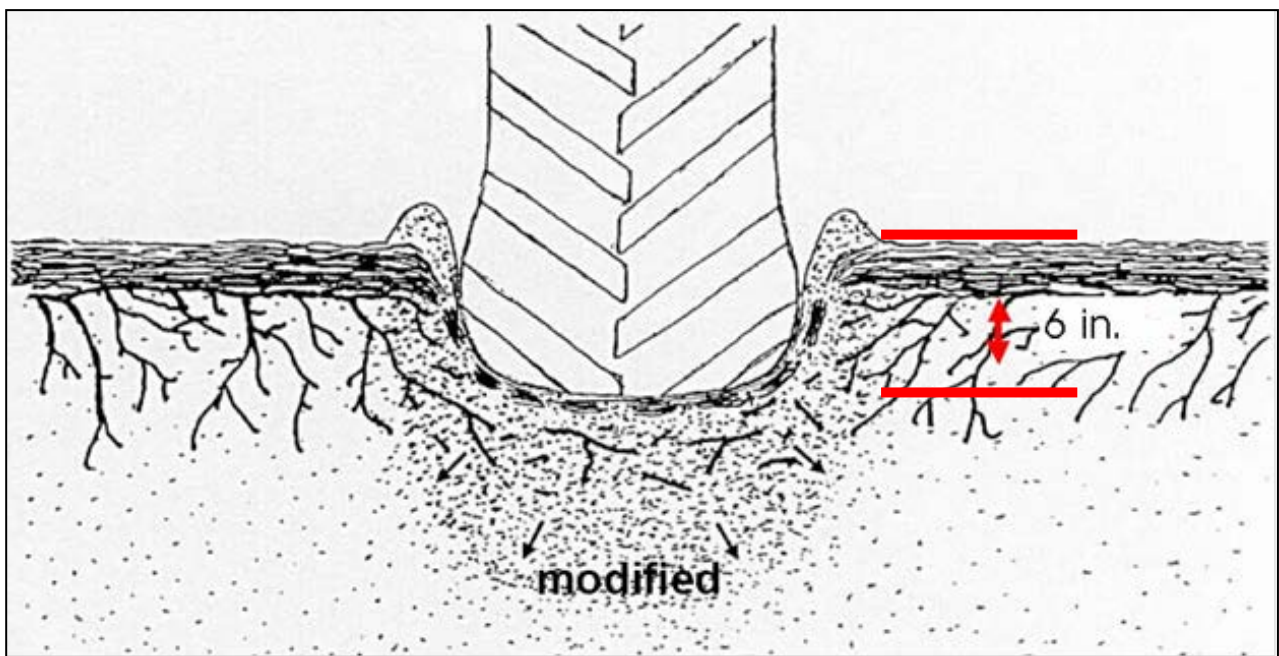
## Purpose

Minnesota's Site-Level Forest Management Guidelines recommend minimizing rutting of forest management sites to protect site productivity, hydrologic function and water quality, reduce erosion, and minimize impacts to flora and fauna. In most instances, the guidelines do not define rutting in measurable terms, instead using terminology such as "minimize rutting" and avoid "repeated rutting" or "excessive rutting".

The following rutting standards have been developed to provide staff foresters, timber sales administrators, and natural resource professionals with measurable metrics for applying the rutting guidelines to forest management activities on DNR administered state land.

## Definition of Rutting

Rutting is the creation of linear depressions made by tires or tracks of machinery - such as fellers, skidders, dozers or trucks - when soil strength is not sufficient to support the applied loads. Mixing, smearing and/or displacement of mineral soil or peat often occur on the sidewalls of ruts during operations. For the purposes of this document, ruts are defined as being 6 inches or greater in depth.



*Adopted from Brad Sutherland-Senior Researcher, Forest Research Institute of Canada (FERIC), 2004. Practical Guidelines to Prevent Soil Compaction in the Boreal Forest.*

## **Rutting Standards**

Any observable rutting 6 inches deep indicates that site conditions may be susceptible to further and deeper rutting. The Timber Sale Administrator (TSA) should take actions to limit or suspend management activities until conditions improve including corrective action (i.e., charging liquidated damages or site rehabilitation). See Page 6 below. Document all actions using the Permit Supervision Record, Timber Sales Module (TSM) and Forestry Incident Report System (FIRS).

### **Wetland Roads (or wetland crossings on upland roads)**<sup>1</sup>

- Rutting greater than or equal to 6 inches deep shall not exceed a contiguous length of 300 feet in a wetland.

### **Timber Harvest – Skid and Forwarding Trails**<sup>2</sup>

- **Upland and Wetland:** Rutting greater than or equal to 6 inches deep shall not exceed 50 feet of any 200 foot section of skid trail; or rutting greater than or equal to 6 inches deep shall not exceed 10 percent of all skid trails per cutting block (*total of all lengths of skid trail with rutting greater than or equal to 6" deep divided by the total length of all skid trails*).
- **Wetland Crossings:**<sup>3</sup> Rutting greater than or equal to 6 inches deep shall not exceed a contiguous length of 300 feet; or more than 50 percent of the width of the wetland crossing whichever is less.

### **Decorative Tree Harvest in Deep Peat Wetlands – Forwarding Trails**

- Rutting shall not exceed 6 inches deep for a cumulative total length of 300 feet for each mile of forwarder trail.

### **General Activity Area (GAA)**

- The GAA is defined as the area within the boundary of a natural resource project. Projects may include a timber sale, silvicultural treatment, invasive species eradication project, or other resource management activity. In the GAA, the length of rut made by the wheels or track on each side of a machine is to be measured separately and added to determine total length of rutting.

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<sup>1</sup> **Wetland road:** an equipment access and hauling road constructed on frozen ground soil using snow, ice, and native vegetation.

<sup>2</sup> **Skid or Forwarding Trail:** A temporary pathway over forest soil to haul felled trees or logs to a landing for further processing, loading and transport to a mill. Skid or forwarding trails result from multiple trips of equipment over the same pathway. Single passes with skidding or forwarding equipment is not considered a skid trail, but falls into the general harvest area (MFRC, 2014).

<sup>3</sup> **Wetland crossing:** an equipment lane or section of skid/forwarder where equipment crosses. Wetland crossings can occur between two areas of upland ground or on small, embedded wetlands found within the GAA. Avoid crossings whenever feasible.

- **Upland and Wetland:** Rutting greater than or equal to 6 inches deep shall not exceed an average of 200 feet per acre for the GAA, with no more than 400 feet of rutting on any one acre of the GAA.

### **Assumptions related to Roads, Landings, and Skid Trails**

- Road, landing, and skid trail surfaces are shaped and stabilized (e.g., graded, ruts filled) as appropriate during construction and operations, and at closure to maintain their operability. Avoid expanding the footprint of roads, landings, and skid trails to maneuver around wet or muddy areas.
- Appropriate water diversion and erosion control structures are to be used during construction and active operations, as well as at closure to reduce erosion and minimize sediment transport.



# Rutting Metric Decision Tree

## Application

If the site has rutting that is less than 6 inches deep, it has not exceeded the metric. **Stop here.**  
If the site in question has rutting that is 6 inches or deeper, proceed with the questions below.

A **YES** answer to any of following questions indicates the site has exceeded the rutting metric.

A **NO** answer to all of the following questions (signifying the rutting is less than the designated length or surface areas parameters) indicates the site has NOT exceeded the rutting metric.

***Caution:** Any observable rutting 6 inches deep indicates that site conditions may be susceptible to further and deeper rutting. The Timber Sale Administrator (TSA) should take actions to limit or suspend management activities until conditions improve. Additional monitoring or corrective action (i.e., charging liquidated damages or site rehabilitation) may be warranted. Document all actions using the Permit Supervision Record, Timber Sales Module (TSM), and Forestry Incident Reporting System (FIRS).*

## Upland Roads:

The rutting guidelines were originally designed to protect wetlands and soil productivity. Therefore, specific metrics for upland roads were not developed. Where upland roads cross wetlands, use the wetland roads metrics below.

## Wetland Roads (or wetland crossings on upland roads):

- Does rutting greater than or equal to 6 inches deep exceed 300 feet in contiguous length? **Y / N**
- Does rutting greater than or equal to 6 inches deep exceed more than 50 percent of the width of a wetland crossing? **Y / N**

## Timber Harvest – Upland and Wetland skid trails:

- Does rutting greater than or equal to 6 inches deep exceed 50 feet of any 200 foot section of skid trail? **Y / N**
- Does rutting greater than or equal to 6 inches deep occur on 10 percent or more (lineal feet) of all skid trails on the site? **Y / N**

## Decorative Tree Harvest on Peatland – Forwarding Trails:

- Does rutting greater than or equal to 6 inches deep exceed 300 feet in any one mile segment of trail? **Y / N**
- Does rutting greater than or equal to 6 inches deep exceed 50 percent of the cross-section width of any one wetland? **Y / N**

## General Activity Area (GAA):

- Does rutting greater than or equal to 6 inches deep exceed an average of 200 feet per acre? **Y / N**
- Does rutting greater than or equal to 6 inches deep exceed 400 feet in any one acre? **Y / N**
- Does rutting greater than or equal to 6 inches deep exceed 50 percent of the cross-section width of any wetland? **Y / N**

## **Timber Sale Administrator actions when rutting is first observed.**

### **Uplands:**

- Let the permittee know early on in the operation that rutting has occurred and may have exceeded the standard.
- Use corduroy or slash mats to stabilize the trail, and keep equipment on the original trail.
- Relocate a portion of the skid trail to more stable ground.
- Halt operations in the General Activity Area (GAA) and move equipment to a drier or frozen ground area.
- Temporarily suspend operations to allow time for soil to dry or freeze.

### **Wetlands:**

- Let the permittee know early on in the operation that rutting has occurred and may have exceeded the standard.
- Check spacing and activity between felling and skidding operations to ensure that operators are minimizing any impacts.
- Have operator build an access road(s) further into sale area to spread out skidding and shorten the skid lengths.
- Have skidder operator take fewer trees during skidding (“lighten the loads”).
- Halt operations in the General Activity Area (GAA) and move equipment to a drier or frozen area.
- Temporarily suspend operations to allow time for soil to freeze.



## Rutting Examples:

1. Rutting greater than 6 inches deep.

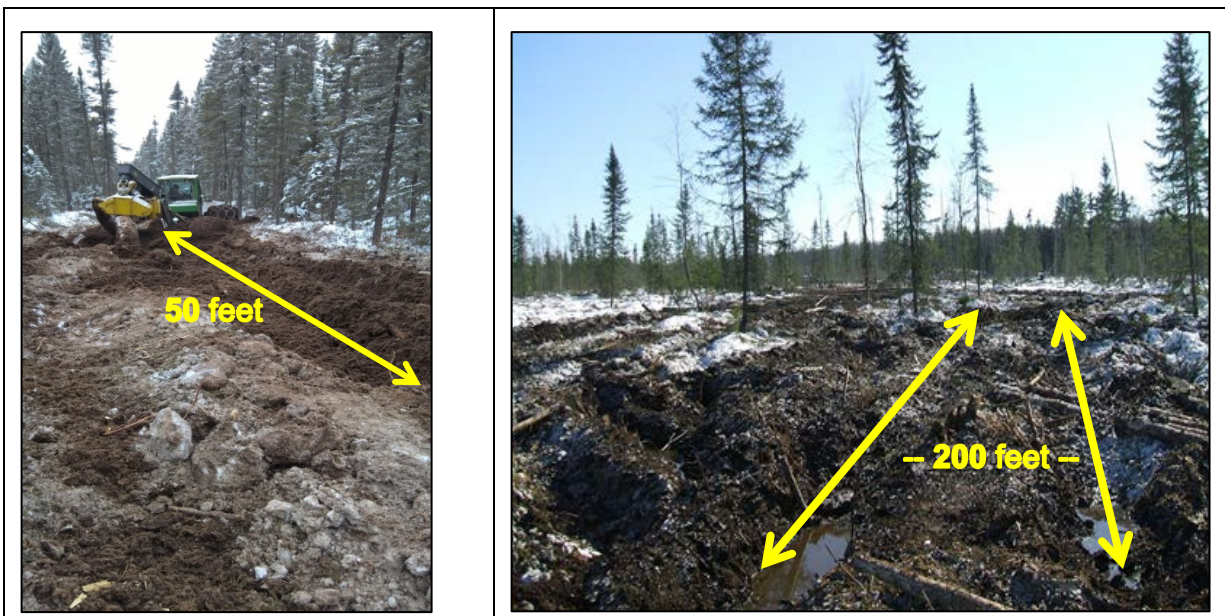




2. Upland skid trail- Rutting greater than or equal to 6 inches exceeds 50 feet on a 200 foot section of skid trail.

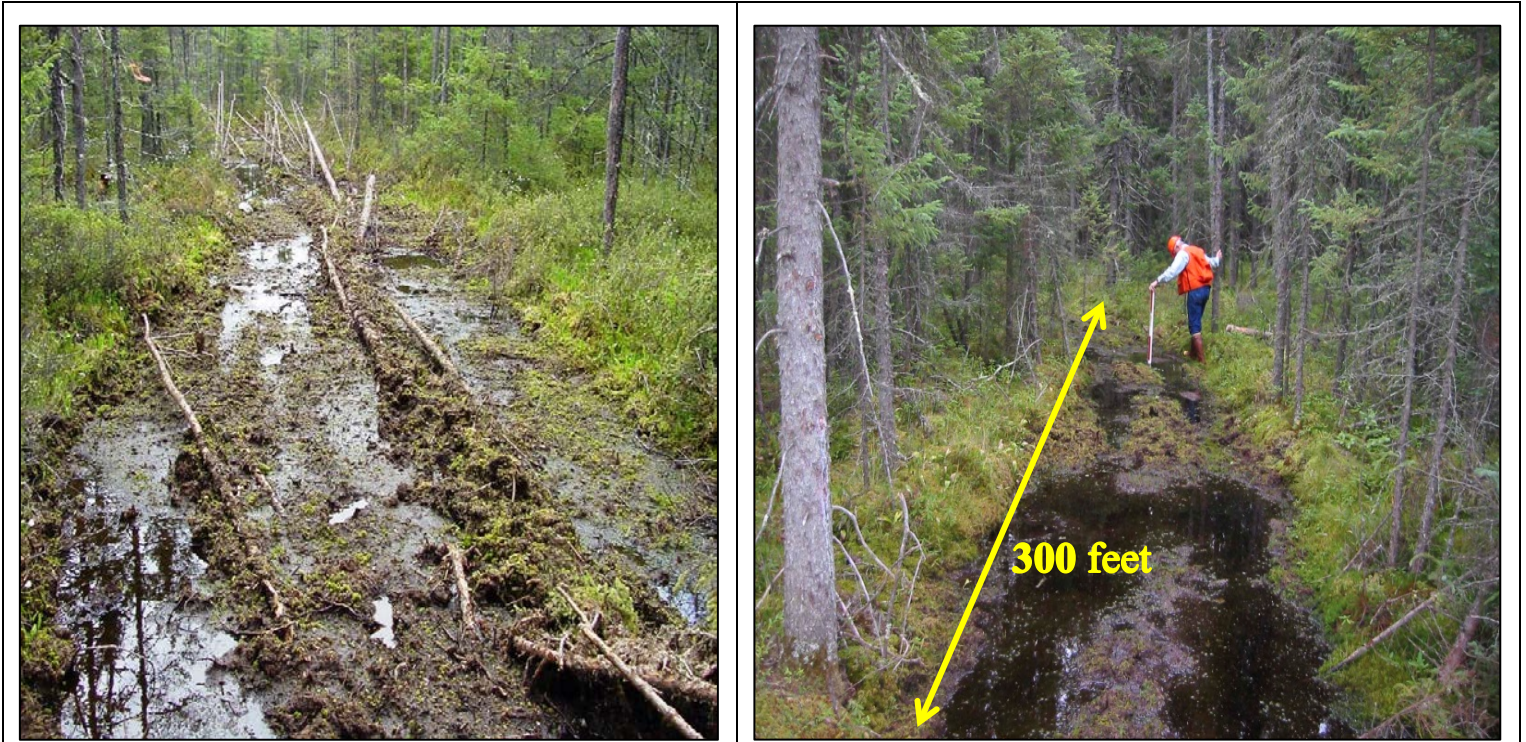


3. Wetland skid trail and General Activity Area – rutting greater than or equal to 6 inches exceeds 50 feet on a 200 foot section of skid trail. In addition, more than 200 lineal feet of rutting greater than or equal to 6 inches of the wetland per acre with no more than 400 lineal feet on any one acre of the GAA. (right).





Decorative tree forwarder trail in peatland - Rutting exceeds 6 inches deep for a cumulative total length of 300 feet for each mile of forwarder trail.



## **References**

1. Minnesota Forest Resource Council, Forest Management Guidelines [Quick Reference Field Guide](#).
2. FP Innovations (Forest Engineering Research Institute of Canada), [Prevent Soil Damage During Harvesting Operations](#).
3. Forest Management Guidelines for the Protection of the Physical Environment, [Version 1.0, 1997, Manitoba Natural Resources](#).
4. Timber Harvesting and Forest Management Guidelines on Public and Private Forest Land in Various Watersheds in Minnesota: [2014 and 2015 Monitoring Implementation Results](#).
5. Timber Harvesting and Forest Management Guidelines on Public and Private Forest Land in Minnesota: [2011 Monitoring](#).
6. Timber Harvesting and Forest Management Guidelines on Public and Private Forest Land in Minnesota: [2009 Monitoring](#).