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Woodland Notes

Careful Logging Practices – Part I Logging Damage Criteria

When logging your woodlot, one of the key steps in meeting your silvicultural objectives and maximizing future financial returns is to use logging methods that will minimize damage to the remaining trees.

The commercial value of timber is directly related to the diameter and quality of the log (e.g. clear, unblemished and straight). Its value will be significantly reduced by the presence of defects such as stains, rot and crooks. Under partial cutting systems (selection and shelterwood), logging activities can increase the opportunity for defects to be introduced into the residual stand.

Logging studies have shown that poor felling and skidding techniques can result in excessive damage to tree crowns, bark abrasion injuries, stem breakage and detaching of stems from their root systems. Crown damage and the associated development of decay will vary by species. Fortunately, the losses from crown damage normally have a minor impact on the commercial value of the tree. The quality and volume of the upper stem log generally represents a small proportion of the sawlog volume. The larger impact associated with the loss of crown is reduced overall growth of the tree.

The same cannot be said for losses from skidding damage. Bark abrasion and displacement from the root system are the two major types of damage, and in most cases, the damage can be significant. Any major wound located in the lower section of the tree has the potential (at least a fifty-fifty chance) to greatly reduce the quantity and quality of the future wood product by causing stain or decay in the high-value butt log.

The amount of damage to the residual stand and the site is directly related to the intensity of the harvest and skidding activities. Success in minimizing this damage will only be as effective as the amount of effort made to implement preventative measures.

It must be recognized that controlling logging damage is critical when the selection and shelterwood cutting systems are utilized. These systems rely on carrying trees, both in terms of a balanced diameter distribution and tree quality, over a number of cutting cycles. The objectives of your woodlot can be compromised should the damage to the residual stand or site become too severe, and the quantity and quality of future harvests will be adversely affected.

There are a number of different methods and standards that woodlot owners can use to assess logging damage. The information contained in Table #1 describes one standard that is currently

in use in a number of woodlots in central Ontario. The standard describes what is considered a major wound and recommends an acceptable level of damage that should be sustained after harvesting operations have been completed.

The woodlot owner or the operator can easily perform these measurements and assess their logging operations for damage as harvesting operations progress.

TABLE: 1 – LOGGING DAMAGE CRITERIA	
Type of Injury	A wound or injury is Considered Major When...
Bark Scraped Off	<ul style="list-style-type: none"> ▪ Any tree measuring 10 to 31 centimetres in diameter at breast height (dbh) with a wound greater than the square of its diameter is considered major. If the wound is in contact with the ground, the allowance is reduced to 60% of the square of its diameter. <p>For example, a wound on a 28-cm tree measuring greater than 784 cm² would be considered major. If the same wound was in contact with the ground the tolerable allowance is 60% of 784 cm² or the wound could not exceed 470 cm².</p>
	<ul style="list-style-type: none"> ▪ Any tree measuring 32 cm or larger measured at breast height cannot have a wound measuring greater than 1000 cm². <p>For example, a wound on a 40-cm tree measuring greater than 1000 cm² would be considered major. If the same wound was in contact with the ground the tolerable allowance is 60% of 1000 cm² or the wound could not exceed 600 cm².</p>
Broken Branches	<ul style="list-style-type: none"> ▪ More than 33% of the crown is destroyed.
Root Damage	<ul style="list-style-type: none"> ▪ More than 25% of the root area exposed or severed.
Bole of Tree Broken Off	<ul style="list-style-type: none"> ▪ Any tree.
Bent Over	<ul style="list-style-type: none"> ▪ Any tree tipped noticeably.
<p>After harvesting operations are complete, a minimum of 85 percent of the residual trees measuring 10 centimetres and larger at breast height must be free of any major damage. And, at least 90 percent of the residual stems of the “acceptable growing stock¹” must be free of major damage.</p>	

To learn more about logging damage and its impact on your woodlot, you may want to read – *Logging Damage: The Problems and Practical Solutions (Forest Research Report No. 117 - 69 pages)*. A copy of this report is available from the Ontario Forest Research Institute (Ontario Ministry of Natural Resources) by calling (705) 946-2981.

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¹ Acceptable growing stock: Trees suitable for retention in the stand for at least one cutting cycle (15 to 20 years). They are trees of commercial species and of such form and quality as to be salable for sawlog products at some future date.