



Idaho Logging Utilization, 2008/2011

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Introduction

The Bureau of Business and Economic Research at The University of Montana conducted a statewide study of logging utilization in Idaho during 2008 and 2011. This study provides information to help resource managers and the general public estimate and better understand impacts of logging on timber inventory in Idaho.

What is logging utilization?

Logging utilization studies determine the volumes and proportions of growing stock (live trees ≥ 5 inches diameter breast height [dbh]; measured from a 1-foot stump height to a 4 inch diameter top outside bark [dob]) and non-growing stock portions (e.g., tops and limbs) of trees removed from the forest inventory (figure 2). Removals factors quantify the amount of growing stock volume that is cut and either delivered to the mill or left in the forest as logging residue.

Methods

Selection of logging operations:

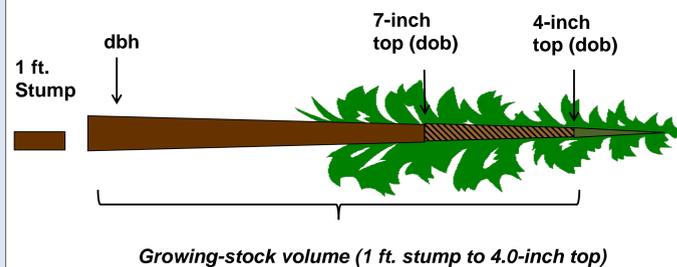
Site selection for Idaho was guided by two primary criteria: harvest volume by county within two resource areas and harvest volume by land ownership class. The distribution of sampled logging sites is represented in figure 1.

Tree measurements:

Diameter and section lengths were taken along the bole as follows (figure 2):

- At the cut stump
- At the 1-foot above ground
- At dbh (diameter at breast height)
- At appropriate log lengths (not to exceed 16 feet) to the 7-inch dob top. (end of sawlog portion of tree)
- At the 4-inch dob top. (end of growing-stock portion of tree)
- At the end of utilization of each tree
- To the tip of the tree

Figure 2 - Growing stock portions of softwood trees ≥ 5.0 dbh



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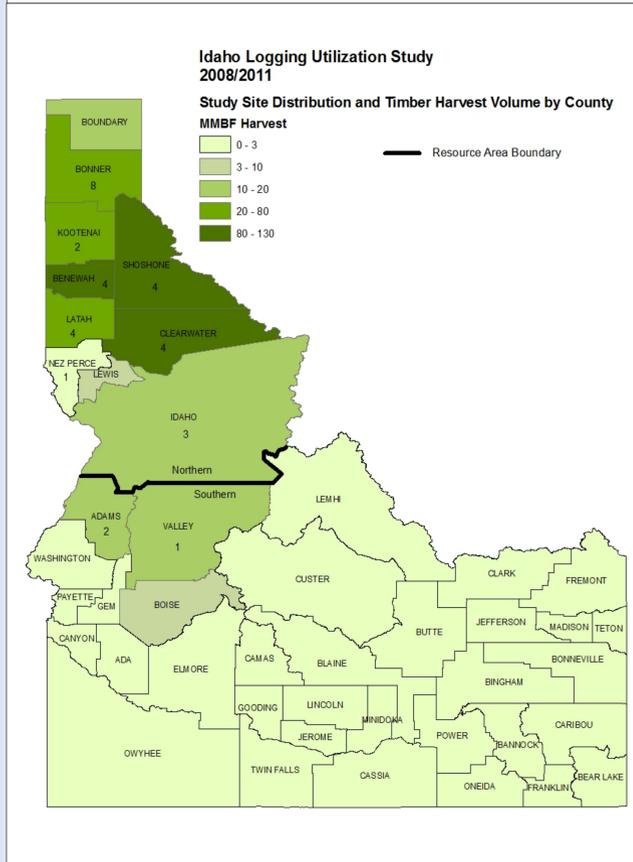
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Figure 1 - Logging sites and average annual timber harvest by county 2006-2010.



Results

Removals Factors — Removals factors, quantifying harvesting impacts on forest inventory, revealed that 1,011 cf (cubic ft.) of growing-stock volume was cut or killed per 1 mcf (1,000 cubic ft.) delivered to the mill, with just 24 cf of growing stock left in the forest as logging residue. In addition, 13 cf of non-growing stock from over-utilized stumps and tops went to the mill (table 1). These factors compare to 1,076 cf removed from growing stock with residues of 85 cf per 1 mcf of mill-delivered volume in the 1990 logging utilization study (McLain 1996). Of the "merchantable bole" of harvested trees (i.e., from the cut stump to the end of utilization), 1.3 percent is mill-delivered volume from non-growing stock sources (mostly stumps cut below 1 foot), 96.4 percent is mill-delivered growing stock, and 2.3 percent is growing-stock logging residue (figure 4).

Characteristics of trees — For this study 815 felled trees were measured, ranging from 5.0 inches to 29.3 inches dbh. Fifty percent of the harvested trees were ≤ 12 inches dbh, accounted for 18 percent of the mill delivered (utilized) volume, and 20 percent of the total logging residue. Trees > 12 inches dbh accounted for 82 percent of the mill delivered volume, and 80 percent of the total logging residue. In general, smaller trees produced proportionally less volume and more residue for every cf delivered to the mill (figure 5). Results suggest that the amount of residue in relation to mill-delivered volume varies by species (figures 6).

Logging methods & equipment — Logging operations included hand and mechanical felling methods, ground skidding and cable yarding systems, and hand and mechanical merchandising. Mechanical felling included the use of equipment with accumulating heads such as a feller-buncher, as well as cut-to-length (CTL) harvesting heads. Ground-based skidding included the use of rubber-tired skidders or dozers as well as systems where material was stacked on a bunk forwarder that was unloaded at a landing or transferred directly onto a logging truck. Mechanical merchandising methods included the use of stroke (slide-boom) delimiters and dangle-head processors. Mechanical felling was used two-to-one over hand felling in Idaho during 2008 and 2011. Each of the following methods was employed at least four-to-one over the alternative: ground based yarding, tree length skidding, merchandising at the landing, and merchandising with mechanical processors.

Comparisons

This study shows that since 1990 timber harvesting in Idaho has shifted from federal to private and state lands (figure 3).

Since 1965, for every 1 mcf delivered to the mills 10 percent less growing stock has been removed from inventory and 80 percent less residue has been produced. Also, since 1990, there has been a very slight reduction in the percentage of growing stock delivered to mills (as a proportion of total delivered volume) and a 44 percent increase in the utilization of non-growing stock components (i.e. stumps cut below 1 foot, and tops used beyond 4 inches dob)(table 1).

Figure 3 - Percent of sample sites by ownership: 1990 vs 2011

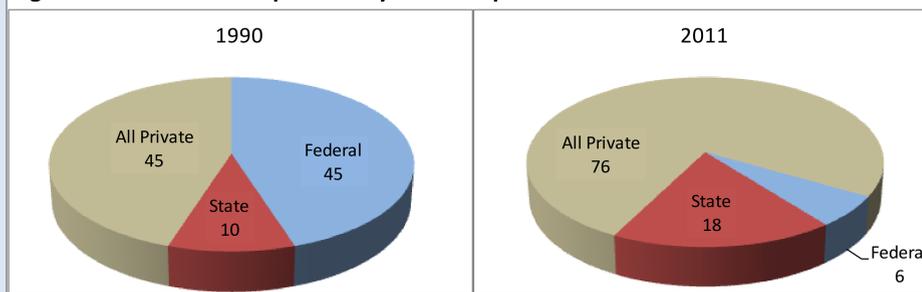


Table 1 - Removals and residues over time

	1965	1990	2011	Change	Percent Change
----- Cubic ft (cf) per 1000 cf of mill delivered -----					
Non growing stock product delivered to mills	N/A	9*	13	4	44
Growing-stock product delivered to mills	N/A	991*	987	-4	0
Growing stock logging residue	123*	85	24	-99	-80
Removals from growing stock	1,123*	1,076	1,011	-112	-10

* Base year for change comparison

Figure 4 - Merchantable bole volume of trees from cut stump to the end of utilization

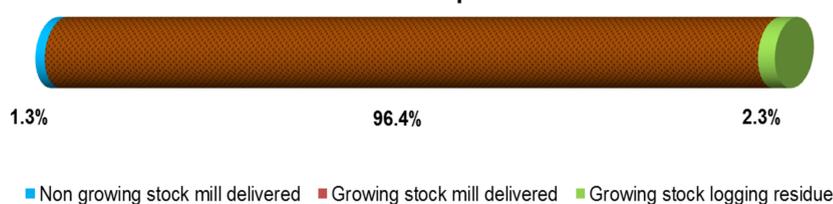


Figure 5 - Proportion of trees harvested and logging residue to utilized volume by dbh class

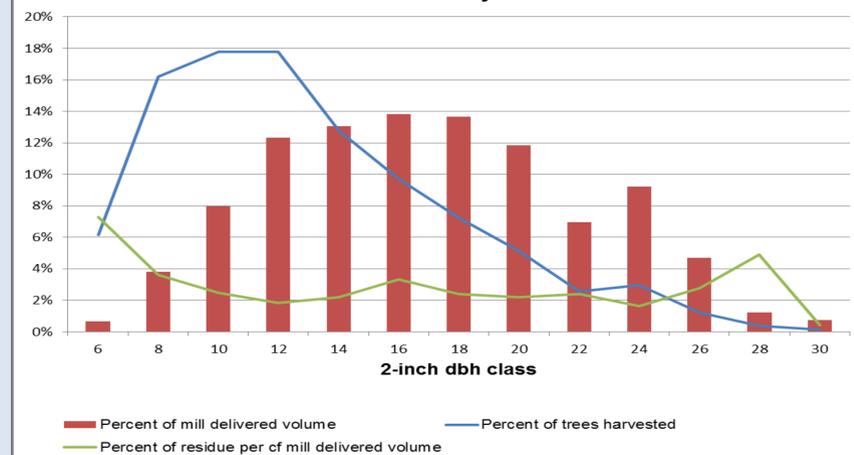
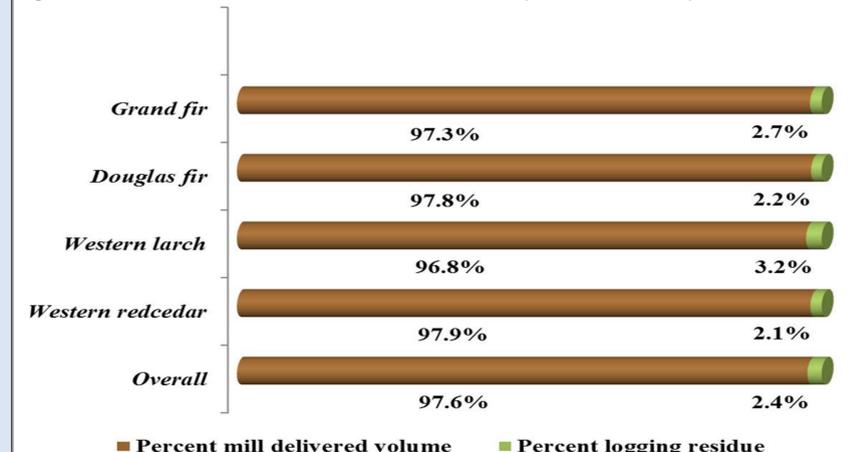


Figure 6 - Percent of residue to mill delivered volume: top four harvested species



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