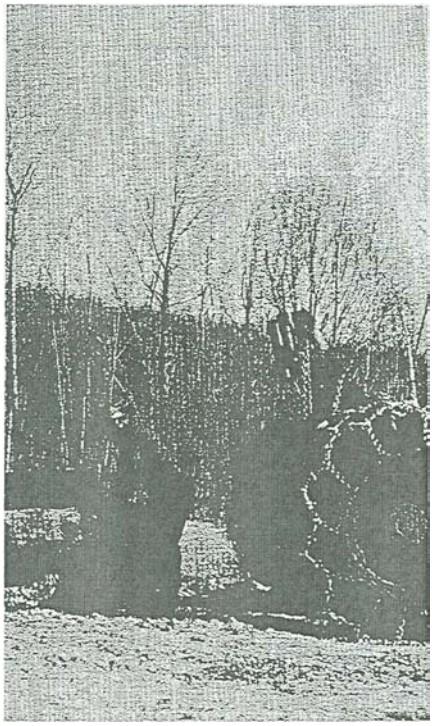

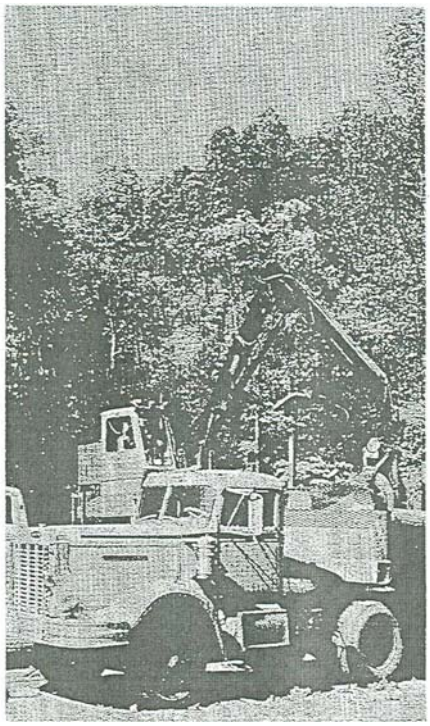

Skidders, Trucking, and Fellers limiting Factors in WV Logging Industry

by William G. Luppold, Curt C. Hassler and Shawn Grushecky*

Introduction

Like many states in the Central Appalachian region West Virginia has experienced a continual expansion in primary hardwood processing capacity during the 1990s. In the early part of the decade, hardwood sawmill capacity increased by nearly 40 percent to more than 700 million board feet per year. In the mid and late 1990s, several other primary processing facilities were built in or near West Virginia, including two oriented-strandboard mills, two parallelstrand and laminated veneer product mills, and two rotary-cut hardwood plywood mills.

All these industries rely on loggers, yet there is little readily-available information on West Virginia's logging industry. More specifically, what type of logging operations exist in West Virginia and what are the technical factors that limit increased timber production? This information could allow industry and state agencies in West Virginia and other states in the Central Appalachian to take steps that would facilitate increased timber production. This article presents such information.

*The authors are, respectively, Project Leader, USDA Forest Service, Northeastern Res. Stn., 241 Mercer Springs Road, Princeton, WV24740; Associate Professor and Research Assistant, University of West Virginia, Division of Forestry, Morgantown, WV 26506. This research was sponsored by the Appalachian Hardwood Center of West Virginia University, the hardwood industry, and the USDA Forest Service.

Collection and Data Groupings

A list of licensed loggers in West Virginia was obtained from the West Virginia Division of Forestry by the Appalachian Hardwood Center at West Virginia University. A questionnaire was developed and mailed to 1,230 logging firms. Of the 305 returned, only 218 reported harvest volume. Since scale of production may affect responses, we decided to examine only this subset of returned surveys.

An initial review of the usable questionnaires revealed logging operations ranging from 5,000 board feet (Mbf)~approximately 20 tons, to more than 97,000 tons per year (Table 1). About half the operations handled only logs for sawmills, peeler mills, and veneer mills (usually measured in Mbf Doyle scale). These operations are termed log producers (LP) in this article. The other half tended to cut both these logs and other materials destined for pulp mills, OSB mills, scragg pallet-part mills, and post/rail fencing operations (usually measured in tons). These operations are termed log and roundwood producers (LRP).

Thirteen logging operations cut only "other material" with most producing fewer than 250 tons of pulpwood annually. Since operational differences in size and different product mixes may affect the variables examined, we divided logging operations into four groups representing two size categories within two product subcategories (Table 1). The groups were determined by examining the data and finding natural breaks in the scale of operation.

TABLE 1- Categories of logging operations in West Virginia classified by size and product.

Scale of operation	Sawlog, veneer log, and peeler log (LP)	Sawlog, veneer log, peeler log and other material (LRP)
	Mbf	tons[a]
Small	5 to 3125	20 to 5,630
Large	400 to 4,035	6,200 to 97,400

[a]Sawlogs, veneer logs, and peeler logs converted to tons assuming 4 tons per Mbf.

TABLE 2.- Characteristics of logging firms that returned complete or nearly complete questionnaires.

Scale of operation	Years in business	Percent full time	% with logging contract	Number of employees.	Number of responses
Small LP	11.6	50.8	19.2	S[b]	61
Small LRP	10.4	53.5	23.2	S	56
Large LP	15.5[c]	86.7[c]	55.0[c]	2.9	60
Large LRP	15.9[c]	88.1[c]	66.7[c]	5.9[d]	42

[a] May be underestimated because high worker compensation rates cause logging companies to hire individuals as individual contractors.

[b] Indicates suppressed because few firms reported this information.

[c] Coefficient significantly (at 95% confidence level) greater than coefficient associated with respective small operations.

[d] Number of employees of large LRP operations significantly greater than number of employees associated with large LP operations.

Analysis of Survey Results

The results of the West Virginia loggers' survey are presented in Tables 2 and 3. Information in Table 2 indicates that large firms that have been in business for a longer. time are full-time operations with logging contracts. However, there is little difference between LP and LRP operations in their respective size category. The only significant difference between the two types of operations is that large LRP operations reported twice the number of employees as large LP operations. However, there was insufficient information to determine whether the same was true for small LRP and LP operations.

It was difficult to determine the number of employees per logging operation because many respondents did not provide employee information. The reluctance of most smaller firms and even some of the larger operators to provide the number of employees may be the result of the high workers' compensation rate levied in West Virginia.

To avoid these high rates, some firms hire people as "independent contractors." Other firms hiring people on a part-time basis may be reluctant to provide information on the number of employees for fear that state agencies will use this information to seek additional tax revenue. In any case, we believe that the average number of employees in Table 2 are underestimated. However, since the firms we examined are classified by production volume, the results are not biased by incomplete data.

Because of the nature of the timber resource, type of manufacturers, and terrain, the typical West Virginia logging firm used manual felling and cable skidding during the survey period. If there was a market for the lower-grade material, tree length logs' usually were skidded and merchandised at the landing.

If there was no market forthe lower grade material, sawlogs usually were separated from lower grade material at or near the felling site. Since our survey there has been an increase in the use of mechanical feller bunchers by operations that produce primarily roundwood material. However, most sawlogs are still harvested using manual felling.

Technical Considerations

In discussions with loggers, six technical factors that limit logging capacity were identified: felling, skidding, bucking, loading, trucking, and forwarding. However, few West Virginia operations use forwarders, so forwarding was included with skidding for this study. The limiting factor for small LP operations was trucking, followed by skidding, while small LRP operations rated

TABLE 3- Factors that limit increased sawlog and roundwood production (in percentage of operations)[a]

Scale of operation	Felling	Skidding! forwarding	Bucking	Loading	Trucking	Number of responses
Small LP	20.8	37.5[b]	4.2	16.7	50.0[b]	48
Small LRP	11.4	45.5[b]	6.8	4.5	45.5[b]	44
Large LP	38.0[b]	50.0[b]	10.0	6.0	14.0	49
Large LRP	34.2[b]	50.0[b]	2.3	5.2	21.0	40

[a] Percentage exceeds 100 because multiple responses occurred in some instances.

[b] Significantly higher mean than three of the five categories (at 95% confidence level).

skidding and trucking evenly.

Large LP and LRP firms rated skidding as the factor most limiting production, followed by felling. This may be the result of the owner being the principal feller in small operations, while additional fellers are required by larger operations. Due to possible increase in demand for lower quality material, additional tree-length logs will be skidded to landings. This will result in larger volumes of low-grade material being shipped and might reduce sawlog volume 20 to 25 percent because of longer turn times and increased emphasis on wholetree utilization. Such circumstances could make skidding and trucking even more limiting.

Although large LRP firms indicated that felling was a limiting factor for increased production, the shift to mechanical harvesting for roundwood by these firms probably has reduced the importance of this factor by roundwood harvesters. Large LP operations still use manual felling for sawlog production, so felling is probably a limiting factor for these firms.

Summary and Conclusion

Our survey results indicate that small firms tend to be run by part-time operators with relatively few years in the logging business. As size of operation increased, so did the percentage of full-time operations and years in business. As firm size increased, so did the percentage of firms with logging contracts. Larger logging firms have considerable capital investment in equipment. For these firms, logging contracts reduce the risk of interruption of revenues needed to maintain a large capital base.

Smaller producers considered trucking and skidding as the most limiting factors in log production, while larger operations considered skidding and felling as the most limiting factors. The fact that skidding was listed as a limiting production factor, regardless of the type or scale of operation, is a strong signal to investigate whether skidding can be made more efficient.

Skidder capacity is a technical problem than can be solved by increasing the number or size of skidders or by increasing skidder efficiency. However, the nature of log production means that every time you increase the number of skidders you also must increase the number of fellers, truckers, and other personnel.

Perhaps the most cost-effective solution is to study the skidder process as it is being practiced in West Virginia and use the resulting information to develop procedures and/or add-on equipment that allows for maximum productive capacity for a given set of logging conditions.