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An Examination of Regional Hardwood Roundwood Markets in West Virginia

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Abstract

West Virginia's hardwood resource is large and diverse ranging from oak-hickory forests in the southern and western portions of the state to northern hardwood stands in the northeastern region. West Virginia also has a diverse group of primary hardwood- processing industries, including hardwood grade mills, industrial hardwood sawmills, engineered wood-product manufacturing facilities, rustic-fence plants, face-veneer operations, a hardwood plywood mill, and several pulpwood concentration yards that supply mills in Ohio, Maryland, and Virginia. Each of these primary hardwood-processing industries has specific roundwood requirements with respect to species and quality, resulting in diverse roundwood markets. We examine the diversity of West Virginia's roundwood markets based on a survey of 30 logging and associated roundwood merchandising operations. The harvesting operations surveyed merchandised roundwood to an average of four markets each. However, the production of sawlogs or peeler logs appeared to be the primary driver of these harvesting operations. Other roundwood markets appear to be secondary and material is merchandised for these markets as profit opportunities emerge. Of the species harvested in West Virginia, yellow-poplar is the most versatile as it is used for sawlogs, peeler logs, and rustic fencing. Yellow-poplar also is the primary species used in the production of oriented strand board.

Keywords: hardwood markets, roundwood, yellow-poplar

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Introduction

West Virginia's hardwood resource is large and diverse ranging from oak-hickory forests with extensive quantities of yellow-poplar to northern hardwood stands with significant amounts of hard maple and black cherry (DiGiovanni 1990). West Virginia also has a diverse group of primary hardwood-processing, industries including hardwood grade mills, industrial hardwood sawmills, engineered wood product manufacturing facilities, rustic-fence plants, a face veneer plant, a hardwood plywood veneer mill, and several round- and pulpwood concentration yards that serve mills in Ohio, Maryland, and Virginia. Each of these industries has specific roundwood requirements with respect to species and quality. [21] This large number of markets also creates opportunities to better use hardwood roundwood. However, the form and degree of roundwood product segmentation in West Virginia or other hardwood-producing regions have not been well documented.

In this paper we examine the number of roundwood markets in West Virginia and the distance that roundwood is hauled to end users. Data were developed from a survey of 30 active logging jobs during 2001. The survey provided information on the number and type of hardwood roundwood products merchandised at each site and the distance to market(s). The survey also provided information on the factor that influenced merchandising decisions. We first examine the composition of West Virginia's forest and primary forest-products industry and briefly describe data-collection procedures.

West Virginia's Sawtimber Resource

West Virginia comprises three survey units or regions (Fig. 1) as designated by the USDA Forest Service's Forest Survey and Analysis (FIA) program (DiGiovanni 1990). The Northeastern region contains 40 percent of the state's sawtimber inventory followed by the Southern and Northwestern regions that has 34 and 26 percent, respectively (Table 1). Although yellow-poplar is the most common species in all three regions, the Northeastern region has a higher proportion of currently high-value species: northern red oak, hard maple, and black cherry. While twenty-two percent of the sawtimber volume in the Southern region is yellow-poplar, this region also has large proportions of oak species. The Northwestern region has the higher proportions of select white oaks and other red oaks (e.g. primarily black, pin, and scarlet).

An alternative way to examine the forest resource is to categorize sawtimber by hard and soft hardwood species (Table 1). Hard hardwood species include the oaks, sugar maple, ashes, hickories, and elms. Soft hardwood species include yellow-poplar, soft maple, birch, beech, basswood, the gums, and aspen. Pulp and paper manufacturers in the states that border West Virginia prefer hard hardwood species, while soft hardwood species are preferred by the manufacturers of engineered wood products (EWP) and hardwood plywood. In fact, the high volume of yellow-poplar led to the construction of three EWP facilities and one hardwood plywood peeling operation in West Virginia.

[21] Luppold, W.G.; Bumgardner, M.S. Regional changes in the timber resources and sawmilling industry in Pennsylvania. In press.

Figure 1. – West Virginia's Forest Inventory and Analysis survey regions.

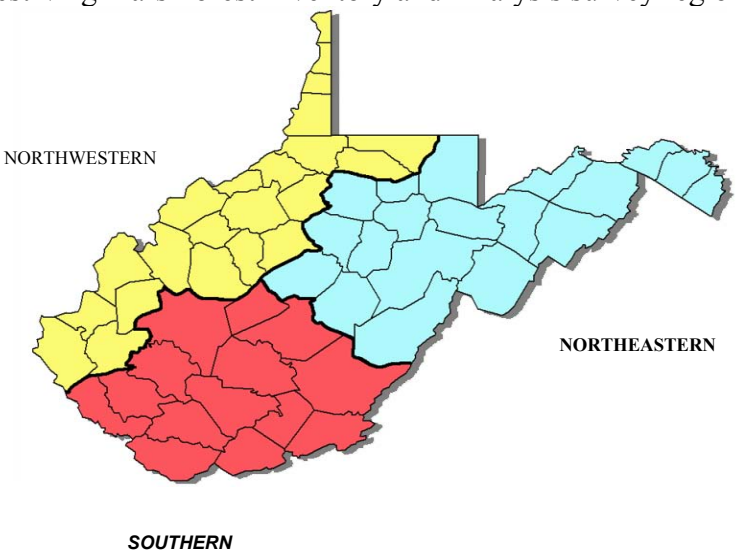

Table 1. – Board-foot and proportional volumes of sawtimber for the Northwestern, Southern, and Northeastern survey regions of West Virginia 2000[a].

Species	Northeastern		Southern		Northwester	
	Volume	Proportion	Volume	Proportion	Volume	Proportion
	(mmbf)	(percent)	(mmbf)	(percent)	(mmbf)	(percent)
Yellow-poplar	4,113	14.3	5,395	22.5	3,480	18.5
Select red oak	3,418	11.9	2,453	10.3	1,541	8.2
Other red oaks	1,392	4.9	2,168	9.1	2,012	10.7
Select white oak	2,051	7.2	2,025	8.5	2,862	15.2
Other white oaks	2,136	7.4	2,165	9.0	1,383	7.4
Hard maple	2,103	7.4	1,008	4.2	786	4.2
Soft maple	2732	9.5	1,335	5.6	842	4.5
Hickory	1,236	4.3	1,425	6.0	1,318	7.0
Black cherry	1,827	6.4	310	1.3	559	3.0
Soft hardwood pulpwood species [b]	9,690	33.8	9,783	39.6	6,223	30.2
Hard hardwood pulpwood species [c]	13,007	45.4	11,735	49.0	10,743	57.2
Softwoods	2,333	8.1	994	4.2	751	4.0
All species	28,660		23,930		18,782	

[a] Source: USDA Forest Service (2004).
[b] Includes yellow-poplar, soft maple, birch, beech, basswood, gums, and aspen.
[c] All oaks, hard maple, ash, hickories, and elms.

Forest Industry in West Virginia

In West Virginia, hardwood sawmills are the most important operations that consume hardwood roundwood (Table 2). In 1999, the state had more than 160 sawmills, with nearly half in the Northeastern region. Mills in the Northeastern region are more numerous but the Southern mills are on average larger. The Northwestern region has about the same number of mills as the Southern region but production is only about one-third of that in the South. Hardwood mills also can be divided into larger mills that primarily produce graded lumber (National Hardwood Lumber Association Rules) and other mills (Table 2).

Table 2. -- Capacity of hardwood sawmills and number of hardwood sawmills and other major consumers of hardwood roundwood, by region[a].

Mill type	Northeastern	Southern	Northwestern
Number of sawmills	95	41	44
Capacity of sawmills (million board feet)	352	306	96
Number of OSB mills	1	1	0
Capacity of OSB mills (million cords)	450	255	0
Number of peeler mills (LVL[b], veneer, and plywood)	1	2	0
Capacity of peeler mills (million board feet)	40	50	0
Number of pulpwood yards	4	2	4
Number of rustic-fence plants	15	1	2

[a] Source: West Virginia Division of Forestry (2001).
[b] Laminated veneer lumber.

Grade sawmills consume high-quality logs, however the highest quality logs are consumed by the sliced face-veneer industry. In 1999, there was one slicing operation in the Southern region and a second was being constructed in the Northwestern region. However, the logs consumed by this industry usually are sorted in log yards rather than at harvest sites (Wagner et al., in press).

West Virginia has two oriented strandboard mills (OSB) in the Northeastern and Southern regions (Table 2) that primarily consume lower quality soft hardwood and softwood roundwood, including tops and limbs. The Northeastern region also has a laminated veneer lumber (LVL) mill and the Southern region has a rotary veneer mill. Both operations consume yellow-poplar "peeler" logs which are relatively clear upper logs that can be used to a small-end diameter of 8 inches. The Southern region also has a hardwood face-veneer facility that uses a rotary lathe to slice oak and basswood. Manufacturers of rustic-fences also uses hardwoods. In addition to locust, a hard hardwood, this

industry also uses smaller diameter yellow-poplar logs and other "soft" species in the manufacture of rails. One additional hardwood using industry that exists in West Virginia is rustic-fence manufacturing and most of these operations are in the Northwestern region. There are no pulpwood mills in West Virginia although 10 pulpwood yards provide material to mills in adjoining states. The Northern region has four yards apiece, while the Southern region has only two yards.

Data Collection Procedures

During 2001, 30 logging operations in West Virginia were interviewed and surveyed. Respondents were asked the type of products they merchandised and their destination, one-way haul distance to destination, method of handling products of secondary importance, delivered price, timber ownership, harvesting method, and about the relationship between logger and purchaser. Because West Virginia has three FIA survey regions, it was decided to stratify the sample on the sawtimber in these regions. Thus if 30 sites were selected 12 were indicated for the Northeastern region, 10 in the Southern region, and 8 in the Northeastern region. Loggers willing to cooperate in the survey were located by contacting primary processors and the West Virginia Division of Forestry. The final sample differed slightly from the original design with 13 observations in the Northeastern region, 9 in the Southern region, and 8 in the Northwestern region.

Roundwood Merchandising in West Virginia

Roundwood merchandising for the 30 operations surveyed is summarized in Table 3. In addition to the six markets listed, four minor markets were identified: alloy chips, softwood pulpwood, firewood, and logs for log homes. On average, the harvesting operations surveyed merchandised roundwood to about four markets (Table 3). All but two operations listed three or more roundwood markets and one operation listed six. One operation did not produce hardwood sawlogs as a primary product or at least one additional hardwood product. The lone operation that produced a single product was a softwood pulpwood harvest exclusively.

Peeler logs were the second most common roundwood product merchandised among the surveyed operations. Nearly half of the operations that merchandised these logs considered peelers as additional primary products. The proportion of operations merchandising peeler logs was high as a result of the relatively high price for this material ($350 to $400 per thousand board feet – Doyle scale). A higher percentage of operations in the Southern region merchandised peeler logs as two-thirds of these operations considered peeler logs as a primary product. The LVL plant in the Northeastern region purchases peeler logs to a 7-inch small-end diameter, while the hardwood plywood mill in the Southern region purchases logs to a 10-inch small-end diameter. The Northeastern region had a lower percentage of peeler log merchandising, possibly because rustic-fence manufacturers purchase yellow-poplar logs to a 6-inch small-end diameter.

Table 3. -- Number and percentage of surveyed logging operations mechanizing to major roundwood markets, by region.

Mill type	Northeastern		Southern		Northwestern	
	(Number)	(Percent)	(Number)	(Percent)	(Number)	(Percent)
Sawlogs	13	100	9	100	7	88
Peeler logs for LVL and plywood	9	69	8	89	6	75
Number of jobs reporting that peelers a primary product	2	15	6	66	3	38
OSB	8	62	7	78	7	88
Pulpwood	7	54	4	44	5	63
Low-grade sawlogs	7	54	2	22	4	50
Rustic-fence	5	39	1	11	1	13
Average number of markets[a]	4.2		4.1		3.8	
Range in the number of markets	2 to 5		3 to 5		1 to 6	

[a] Includes additional markets for metallurgical chips, log home logs, and firewood.

OSB is the third most common market for hardwood roundwood. This product requires a greater volume of roundwood material than peeler mills, but the relative value of OSB material is considerably less. OSB appeared to be more important in the Southern and Northwestern regions than in the Northeastern region.

Raw material for rustic-fence manufacturers was important only in the Northeastern region (Table 3). That rustic-fence manufacturers can use a portion of logs that otherwise would be shipped to an OSB mill might account for the lower percentage of OSB roundwood merchandising in the Northeastern region.

Pulpwood was merchandised by more than half of the operations appeared to be more important in the Northern regions. The lack of pulp markets in the Southern region is partly due to rough terrain and a lack of major highways in the western portion of this region.

Impact of Market Haul Distance

Transportation economic theory stipulates that the greater the value of a commodity per unit weight, the greater the distance the commodity can travel to the end consumer (Bressler and King 1970). However, there are underlying aspects of the hardwood roundwood market that counters this assumption. Larger sawmills are primary users of higher value hardwood

roundwood.[22] These mills are disturbed widely in West Virginia and appear to be competitive in both input and output markets. Still, grade mills obtain sawlogs through a variety of channels, including ownership of standing timber, open-market stumpage purchases, log purchases from independent loggers, and logs purchased from concentration yards. Mid-and low-grade sawlogs usually are processed by numerous smaller sawmills or rustic-fence manufacturers. By contrast, peeler mills, OSB plants, and pulp mills are less numerous (Table 2) and consume greater quantities of roundwood. Therefore, even though these larger users may consume lower value roundwood, their requirements and locations imply that on average, roundwood must be hauled a greater distance from harvest site to the mill.

Average haul distances to various roundwood markets are presented in Table 4. Since all but one of the logging operations sampled was associated with the production of sawlogs, the haul distance to the mill or distribution yard for this primary product is a critical factor. In the three regions, the average distance to the primary sawlog delivery point ranged from 33 to 35 miles. This narrow range would be expected given the relatively even distribution of large and small sawmills located throughout West Virginia. However, there was considerable variation in the haul distances to other roundwood consumers.

Peeler logs were hauled 49 to 86 miles from the logging site to the mill. The haul distance in the Northeastern region may be shorter due to the LVL mill in which can purchase smaller logs, and also to the large number of rustic-fence manufacturers that purchase small-diameter yellow-poplar logs. Roundwood directed to OSB manufacturers was hauled an average of 95 miles from the Northwestern region, which has no OSB facility. The haul distance for pulpwood varied considerably from region to region, perhaps because of the combination of topography and access to highways. Of the three regions, the Northwestern region, relatively speaking, flat when compared to the western portion of the Southern region has some of the greatest average slopes in the eastern United States.

The greater distance that lower grade hardwood roundwood is shipped in West Virginia leads us to believe that these products are merchandised as profit opportunities emerge. Both OSB and pulp mills attempt to compensate loggers for the distance materials are hauled when market conditions merit these premiums. However, these large users also may reduce or eliminate suppliers from distant areas when demand for OSB or pulp declines.

Conclusion

Our examination of "how" roundwood is merchandised in West Virginia demonstrates the complexity of hardwood roundwood markets in this state. Ten markets were identified when harvesting operations were examined. However, sawlogs, peeler logs, OSB roundwood, hardwood pulpwood, low-grade sawlogs, and rustic-fence material were cited most frequently as end-use destinations. On average, there were about four roundwood markets for each logging operation surveyed through the number of markets ranged from one to six.

Other than the distance that sawlogs were hauled and the average number of roundwood markets per logging job, there was little consistency among the three regions as each is different in forest composition, topography, and industries that consume hardwood. Although 29 of the

[22] Face veneer logs are the highest value form of hardwood roundwood. However, these logs usually are transported to a sawmill or mill yard before they are remerchandised to a log buyer.

30 harvesting operations surveyed indicated that "higher grade" sawlogs were a primary product, most of the low-quality roundwood markets appeared to be opportunistic in nature.

One of our most interesting findings was the importance of yellow-poplar to a variety of industries in West Virginia. Total consumption of small diameter yellow-poplar logs by the LVL, hardwood plywood, and rustic-fence industries exceeds 80 million board feet annually. OSB manufacturers also use lower grade yellow-poplar roundwood while yellow-poplar butt logs are processed by sawmills. The multiple uses of yellow-poplar are unique because it is possible that segments of an individual tree could be merchandised for three to five discrete roundwood users.

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