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Ohio Roundwood Utilization by the Timber Industry in 2006

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Abstract

To identify changes in the structure, size, and wood raw material inputs of the primary wood processing industry in Ohio, the Ohio Division of Forestry and the U.S. Forest Service conduct a periodic survey of this sector. The current assessment of the state of the primary wood products industry in Ohio is based on information collected for the period 2003 through 2006. Average annual roundwood removals from Ohio forest lands are estimated to have been 91.2 million cubic feet during the period, virtually the same as the harvest level found by the previous survey in 1989. This volume includes 5.2 million cubic feet of saw logs and veneer logs exported to other countries, 62.5 million cubic feet of logs for domestic use, and 23.5 million cubic feet of pulpwood. Of the log volume harvested from Ohio forests that was consumed domestically, 96.5 percent was processed by the State's 197 sawmills while veneer mills processed only 0.7 percent. Of the pulpwood volume, 74 percent was consumed by the pulp and paper industry and the remaining 26 percent was consumed by the engineered wood products industry, predominantly by panel (oriented strand board) manufacturers. Considering saw log transfers among states (excluding international shipments), the ratio of imports to exports for Ohio is 5.6 to 1, indicating that Ohio remains a net importer of saw logs.

Cover photos

Buckeye tree, Richard Webb, forestryimages.com #1480026; buckeye log, Jan Wiedenbeck, US Forest Service; buckeye leaves, Chris Evans, forestryimages.com #2153027.

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INTRODUCTION

In 2004, efforts were begun to update the information contained in the 1992 publication *Ohio Timber Products Output—1989* (Widmann and Long 1992). This was a joint effort between the U.S. Forest Service (USFS) Northern Research Station (the Northeastern Research Station at the time) and the Ohio Department of Natural Resources (ODNR) Division of Forestry. We intended to follow the standard practice for timber product output (TPO) studies in which roundwood consumption data by a given state's primary wood products industry are collected during and for a single year. However, due to personnel changes and other pressing priorities, the data in this report were collected over a period of 4 years. For this report, these data were combined, processed, and will be reported for a single year, 2006. Details of the steps involved in data collection and evaluation are provided in Appendix 1.

ROUNDWOOD UTILIZATION VOLUME

Roundwood utilization has several components that, when summed, provide an estimate of the volume of roundwood (logs, pulpwood, etc.) utilized by the primary wood processors in the State as well as an estimate of the volume of roundwood removed from Ohio's private and public forest lands. These components include:

- 1) the volume of roundwood processed by each of Ohio's primary wood products producers in a given year,
- 2) the proportion of the roundwood volume processed that originated from in-state versus out-of-state forests, and
- 3) the volume of roundwood used by primary wood processors in other states or countries that was harvested from Ohio forests.

Roundwood removals ("removals" is defined as harvest for the purpose of utilization) from Ohio forest lands for 2006 is estimated to have been 91.2 million cubic feet. This volume includes 5.2 million cubic feet (29.2 mmbf Doyle or 36.6 mmbf Int. ¼-inch) of saw logs and veneer logs exported to other countries, 62.5 million cubic feet of logs for domestic use (350.9 mmbf Doyle or 419.2 mmbf Int. ¼-inch), and 23.5 million cubic feet of pulpwood (844.4 million tons or approximately 276,900 cords).

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Table 1.—Log-volume-based size class distribution of Ohio sawmills and corresponding response rates, 2006

Size class (mbf Doyle/year)	No. of sawmills in class	No. of responding mills	No. of estimated mills	Percentage of mills in class that responded
<100	51	22	29	43
100-999	49	34	15	69
1,000-4,999	74	67	7	91
5,000-9,999	15	15	0	100
≥10,000	8	8	0	100
Total	197	146	51	74

Table 2.—Change in roundwood amounts harvested from Ohio forests by product

Product	1966	1973	1978	1983	1989	2006	Percent Change '89-'06
	-----Thousand cubic feet-----						
Saw logs	59,960	53,858	43,702	46,735	56,098	60,272	+7
Pulpwood	28,619	18,937	21,403	29,826	30,727	23,538	-23
Veneer logs	1,032	786	1,133	1,376	1,282	478	-63
Cooperage logs	1,697	933	1,033	454	401	695	+73
Misc. products	6,956	5,487	3,202	3,907	636	1,026	+61
Int. log exports	na	na	na	na	2,400 ^a	5,196	+118
Total – w/o '89 exports	98,264	80,001	70,473	82,298	89,144	91,204	+2
Total – w/ '89 exports ^a	na	na	na	na	91,544	91,204	0

^a1989 log exports from Ohio were estimated by calculating the percentage growth for hardwood log exports from the entire U.S. for 1989 to 2006, and applying this as a depreciation factor to the published export levels for Ohio for 2006 (U.S. Bureau of Census data published by the Global Trade Information Service at: www.gtis.com/gta/usda, 2008).

Of the known primary processors in Ohio, 76 percent provided roundwood utilization data (74 percent of sawmills—Table 1). Roundwood volumes were estimated for the non-responding firms as discussed previously.

Of the log volume harvested from Ohio forests that was consumed domestically, 96.5 percent was processed by the State's 197 sawmills while only 0.7 percent was processed by veneer mills (Table 2). The remaining log volume was consumed by a variety of types of operations including manufacturers of cooperage (e.g., barrels), tool handles, pallet parts, commercial firewood, log homes, and posts/poles. Of the pulpwood volume, 74 percent was consumed by the pulp and paper industry and the remaining 26 percent was consumed by the engineered wood products industry, predominantly by panel (oriented strand board) manufacturers. The overall distribution of the types of roundwood harvested from Ohio's forests and consumed by U.S. manufacturers is shown in Figure 1 with the pulpwood volume further broken down into a secondary pie chart.

The 91.2 million cubic feet of industrial roundwood harvested from Ohio forests in 2006 is only slightly higher than the harvest level in 1989 (89.1 million cubic feet; Table 2; Widmann and Long 1992). The 1989 assessment did not include an estimate of international log exports, but the 2006 study does include export data obtained from the Global Trade Information Services, Inc. (2008). These state export data were collected by the U.S. Bureau of Census. Similar data are not available for 1989.

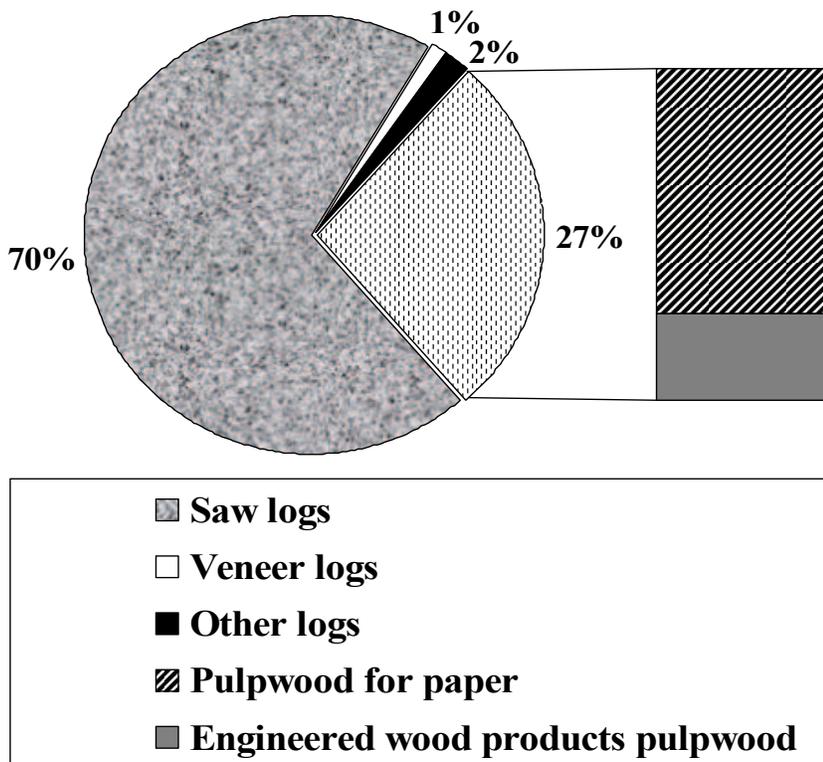


Figure 1.—Distribution of types of roundwood harvested from Ohio forests, by product, exclusive of international log exports, 2006. The right-hand bar chart shows the proportional utilization, by major market sector, of the pulpwood fraction (27 percent) of roundwood harvests.

U.S. Bureau of Census trade data on hardwood log exports from the United States (i.e., not specific to Ohio) do provide export data going back to 1989 (USDA, Foreign Agricultural Service 2008). The trend in hardwood log exports to international markets from the U.S. as a whole shows consistent growth over the period 1989 through 2007. During the period 1989 through 1991, hardwood log export volume from the U.S. averaged 35.3 million cubic feet (217 mmbf Doyle, 257 mmbf Int. ¼-inch¹) per year. For 2004 through 2007, the average annual hardwood log export volume was 118 percent higher than in the 1989 to 1991 index period. If we assume that the trend in the growth of log exports from Ohio was similar to that of the U.S. as a whole, the volume of roundwood saw logs and veneer logs exported from Ohio in 1989 that was not captured in that year's TPO numbers should have been approximately 2.4 million cubic feet.

Adding this estimate of the volume of international log exports harvested from Ohio forests in 1989 to the roundwood volume ascertained by Widmann and Long (1992) for that year, it appears that annual industrial roundwood harvests from Ohio's forests were essentially unchanged between 1989 and 2006 (91.2 vs. 91.5 million cubic feet; Table 2). This difference is remarkably small considering the significant loss of value-added manufacturing capacity in the eastern U.S. wood products industry that has occurred over the last decade.

¹Note that the factors used to convert cubic feet to bf Doyle and bf Int. ¼-inch are different for logs exported internationally than for domestically consumed logs. This is based on the assumption that logs exported to international markets are generally larger diameter logs.

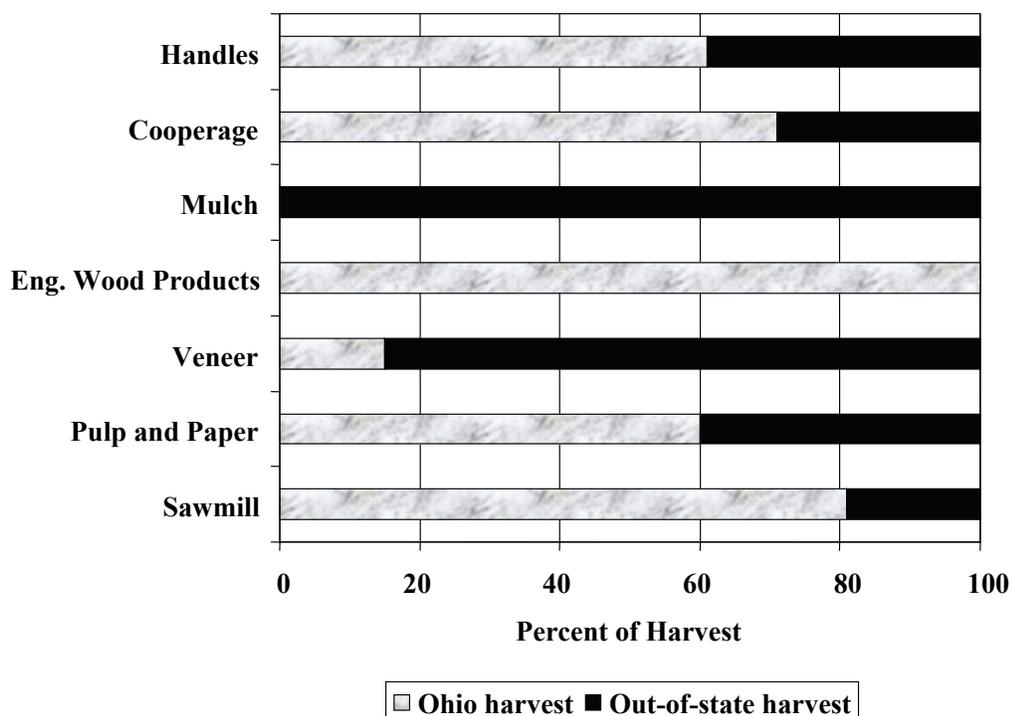


Figure 2.—Percentage of roundwood utilized by the larger primary industry sectors in Ohio harvested off Ohio timberlands.

MADE IN OHIO—ROUNDWOOD UTILIZATION BY OHIO’S PRIMARY INDUSTRY SECTORS

The total roundwood volume used by Ohio’s primary wood products industry, including wood procured from Ohio forests and wood procured from out-of-state forests, was 108.3 million cubic feet in 2006. Seventy-two percent of this roundwood volume was harvested from Ohio forests. The remaining volume was imported to Ohio from surrounding states, predominantly West Virginia and Kentucky, with smaller amounts from Indiana, Pennsylvania, and Michigan.

Within Ohio, primary wood products manufacturers in the sawmill, pulpwood, and veneer sectors process the largest volumes of roundwood annually. Combined, manufacturers in these three sectors process 95 percent of the roundwood utilized by in-state operations. Sixty-six percent of the roundwood used by primary manufacturers in the State is in the form of saw logs for the sawmill industry (402 mmbf Doyle or 502 mmbf Int. ¼- inch). Eighty-one percent of the saw logs were harvested in Ohio (Fig. 2).

GROWN IN OHIO, UTILIZED ELSEWHERE

In addition to the 5.2 million cubic feet of roundwood harvested in Ohio and exported to international markets, data from TPO studies conducted in neighboring states were compiled to form an estimate of the volume of roundwood harvested from Ohio forests that is utilized by out-of-state wood products manufacturers. Based on the best available data, West Virginia stands out as the state that uses the largest volume of Ohio grown roundwood—5.2 million cubic feet (Hansen et al. 2006). Thus, approximately the same volume of Ohio roundwood is shipped to West Virginia as is shipped to international markets. There is a notable difference between these roundwood volumes, however—the volume shipped from Ohio to West

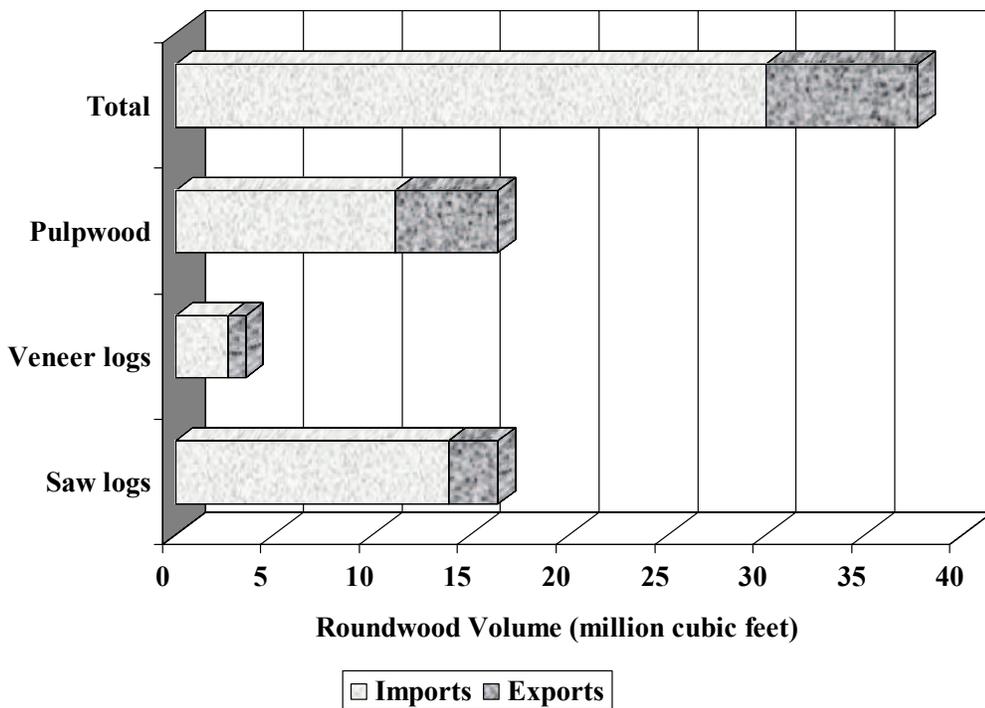


Figure 3.—Ohio roundwood imports and exports, excluding international log shipments, 2006.

Virginia consists of only a small percentage of saw logs/veneer logs (12 percent) and a very large percentage of pulpwood while the roundwood volume shipped to international markets is 100 percent saw logs and veneer logs. The only other state that receives more than 1 million cubic feet of roundwood from Ohio is Pennsylvania (1.9 mmcf or 10.7 mmbf Doyle or 13.3 mmbf Int. ¼-inch) (Murphy 2006). Almost all of the Ohio roundwood shipped to Pennsylvania consists of saw logs and veneer logs.

Of the 7.7 million cubic feet of roundwood that is harvested in Ohio and used in other states, only 32 percent is saw logs or veneer logs. The remaining volume (68 percent of total) is pulpwood.

OHIO ROUNDWOOD IMPORTS COMPARED TO EXPORTS

Whereas 12.8 million cubic feet of roundwood were exported from Ohio to other states and to international markets in 2006, 30.0 million cubic feet of roundwood were imported from other states for use by Ohio's primary wood products industry sectors. Eighty-one percent of the logs utilized by Ohio sawmills, the largest primary wood products sector, were harvested in Ohio (Fig. 2). Considering saw log transfers among states (excluding international shipments), the ratio of imports to exports for Ohio is 5.6 to 1 (Fig. 3). Put differently, for every 5.6 truck loads of saw logs that enter Ohio from West Virginia, Pennsylvania, Kentucky, Indiana, and other states, only one load is headed in the opposite direction. When cross-border shipments are considered for all types of roundwood, the ratio of imports to exports for Ohio is 2.3 to 1. If we consider saw log and veneer log shipments into and out of Ohio including shipments to international markets, this ratio drops to 1.8 to 1. All of these ratios point to the fact that Ohio is a net importer of roundwood, including saw logs. Ohio was a net importer of saw logs in 1989 as well, when the ratio of imports to exports was much higher—52 to 1 (Widmann and Long 1992).

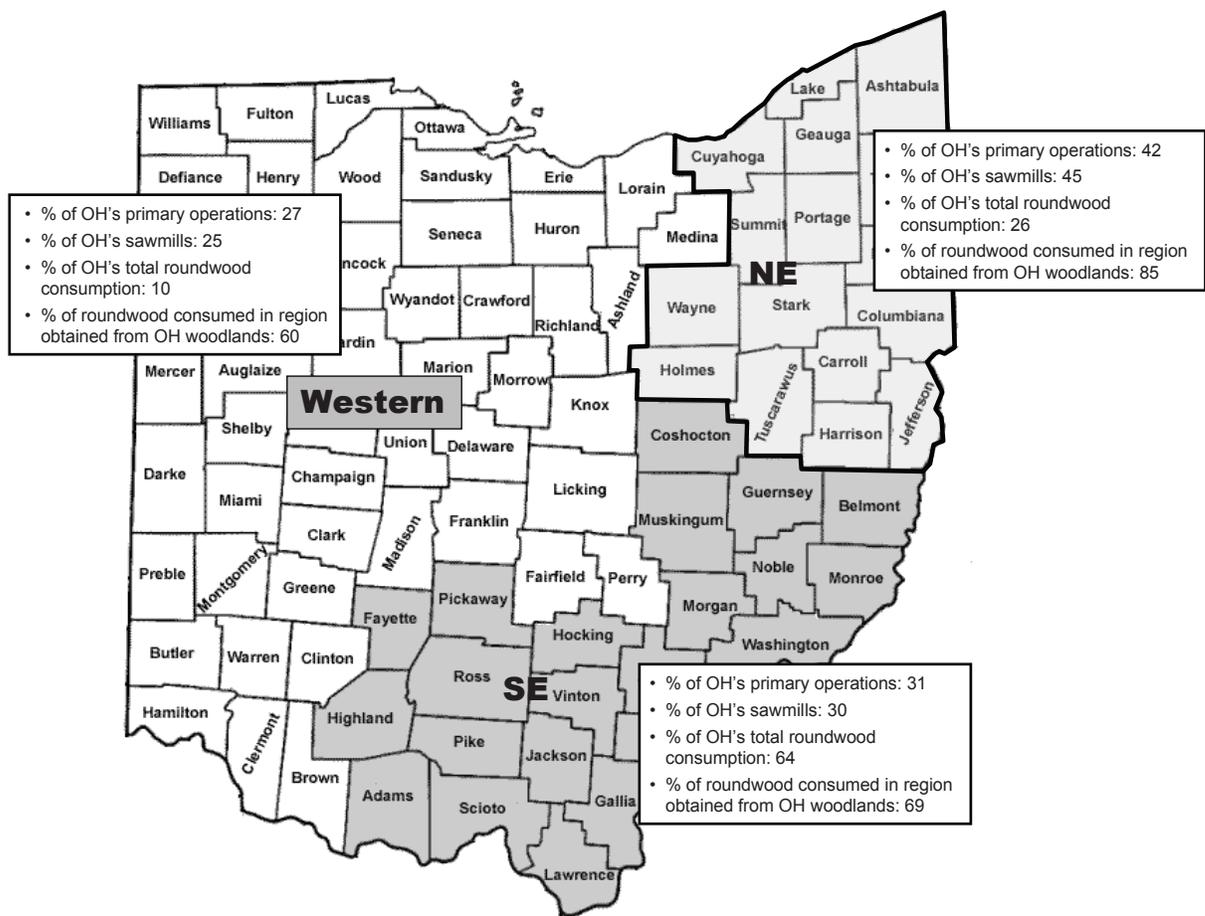


Figure 4.—Regional distribution of Ohio's primary wood processing industry and proportional distribution of roundwood receipts, based on Ohio's Timber Market Report regions, 2006.

Compared to 1989, a higher percentage of the saw logs processed by Ohio's sawmills in 2006 was obtained from Ohio forests (72 percent vs. 81 percent) (Widmann and Long 1992). The opposite trend was seen for veneer logs consumed by Ohio's veneer manufacturers. In 1989, an estimated 33 percent of the veneer logs used by Ohio's veneer manufacturers originated in-state (Widmann and Long) compared to only 15 percent in 2006.

REGIONAL INDUSTRY DISTRIBUTION, ROUNDWOOD CONSUMPTION, AND ROUNDWOOD ORIGIN

The distribution of primary processors in Ohio is summarized by region in Figure 4. These regions are based on the delineations used in Ohio's Timber Price Report (TPR) system. The western region of the state has the fewest primary wood processing operations, the lowest total roundwood consumption, and the lowest average consumption per operation (Fig. 4). There are more operations in the northeastern region of the State than in the other two TPR regions, but roundwood consumption is highest in the southeastern region (64 percent of total consumption). This is indicative of the fact that larger operations that consume greater amounts of roundwood are found in southeastern Ohio.

AVERAGE PROCUREMENT RADIUS BY SECTOR, MILL SIZE, AND REGION

Timber product output surveys conducted in previous decades, both in Ohio and in other states, have sought to obtain information on the county-based origin of roundwood received by primary processors. But few respondents have accurate information on the source of their logs to this level of detail, and they frequently skipped this question or provided only a best-guess estimate. Also, today's roundwood supply chain includes many more log wholesalers who procure logs and then resell them to the processor, making this an even more difficult question to answer than in prior survey periods. For these reasons, we used a different approach to estimate the regional sources of the roundwood used by Ohio's primary wood products industry.

Three survey questions addressed roundwood origin: (1) What percent of roundwood did you get from the county where your operation is located? (*Question 7a*); (2) What percent of roundwood did you get from the state where your operation is located? (*Question 7b*); and (3) What is your normal one-way procurement radius? (*Question 8*). Fifty percent of survey respondents provided information on the proportion of roundwood procured in their home county while 90 percent supplied in-state versus out-of-state procurement data. Roundwood procurement radii responses were obtained from 55 percent of the survey respondents. These response rates for individual survey questions are based on the 165 primary processors in Ohio that responded to the written survey.

Ninety-one of Ohio's primary wood products manufacturers reported their company's procurement radius. The average radius for all respondents across all industry sectors was 93 miles. The average procurement radius for the responding sawmills (n=80) and veneer plants (n=5) was 78 miles and 235 miles, respectively. Response rates were insufficient in the other sectors to merit reporting.

Primary processors located in the western region of Ohio process a higher percentage of roundwood originating in other states than do processors located in the other regions (Fig. 4). The principal reason for this is that three of the five veneer mills in the state are in the western region, and veneer mills typically have procurement zones that stretch across the northeastern U.S. and into Canada. The average procurement radius for the three western Ohio veneer mills was 300 miles.

With procurement data provided by 80 sawmill operations, it is feasible to look for a relationship between mill size and procurement radius within this sector. Shorter saw log procurement distances are reported by sawmills that consume smaller amounts of roundwood and longer distances are associated with larger consumers (Fig. 5; ANOVA result: $p=.003$). The average saw log procurement radius reported by the largest sawmills in Ohio ($\geq 10,000$ mbf Doyle per year; n=8) was 122 miles. For sawmills in the mid-size class (5,000-9,999 mbf Doyle; n=11), the normal procurement radius was 95 miles. For mills in the next smaller size class (1,000-4,999 mbf Doyle; n=32), the average radius was only 88 miles. For the two smallest sawmill size classes (100-999 mbf and <100 mbf Doyle), the procurement distances cited were 66 and 23 miles, respectively. These results are as expected. Owners of larger capacity

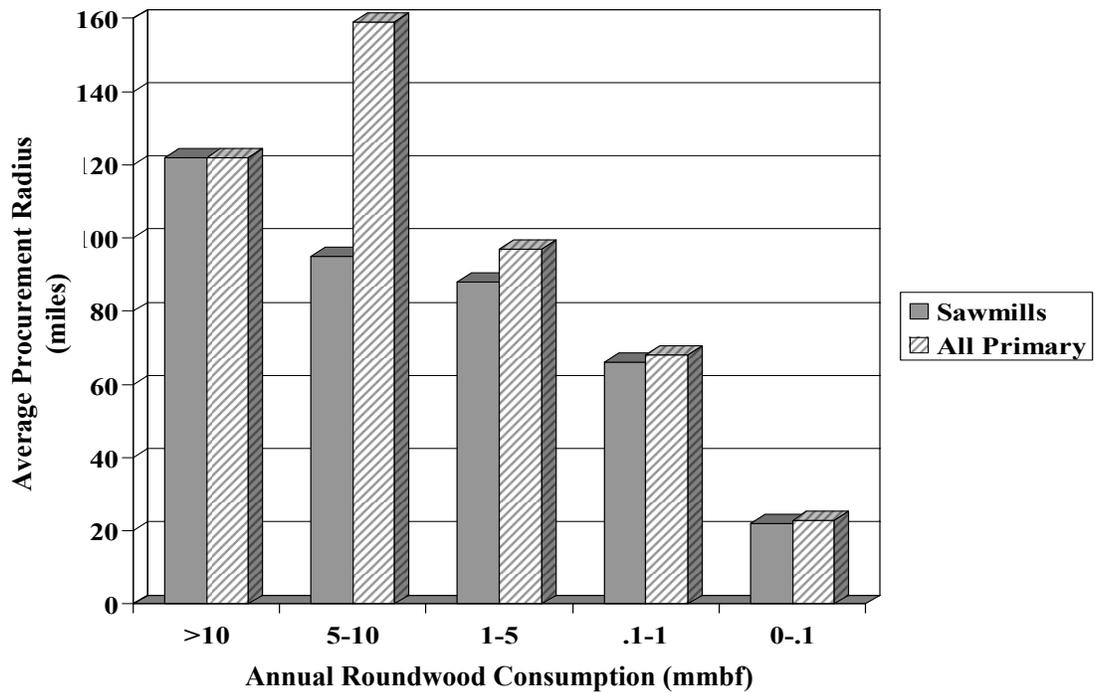


Figure 5.—Average procurement radius for sawmills and all primary processors, by size of operation (based on roundwood consumption), Ohio, 2006.

sawmills typically have more capital resources tied up in the mill making it financially feasible to acquire logs from further distances, thus keeping the mill operating closer to capacity and maximizing return on capital.

Considering the procurement distances of all primary processors (Fig. 5), longer log hauling distances are noted in the mid-size categories (annual consumption from 1 to 5 and 5 to 10 mmbf Doyle) as compared to the average distance of sawmills only. This difference is largely explained by the longer procurement radii reported by the five veneer mills that responded to this question.

Differences in average procurement distances among Ohio regions appear to be explained by differences in the distribution of different industry sectors (i.e., if veneer mills are present in the region) and by differences in the size distribution of the mills in the region.

SPECIES OF ROUNDWOOD CONSUMED

Species of roundwood harvested from Ohio's forests for use by the primary wood products industry in 2006 are shown in Figure 6. Overall, 9.7 percent of the industrial roundwood volume harvested in Ohio was made up of softwood species and 90.3 percent was made up of hardwood species. In 1989, only 3 percent of industrial roundwood removals from Ohio forests were softwood species (Widmann and Long 1992). In the current survey, oaks made up 34.4 percent of all roundwood harvests (red oaks—17.6 percent, white oaks—16.8 percent). Yellow-poplar, soft maple, and hard maple rounded out the list of the top five species of roundwood (14.2, 7.3, and 7.1 percent, respectively).

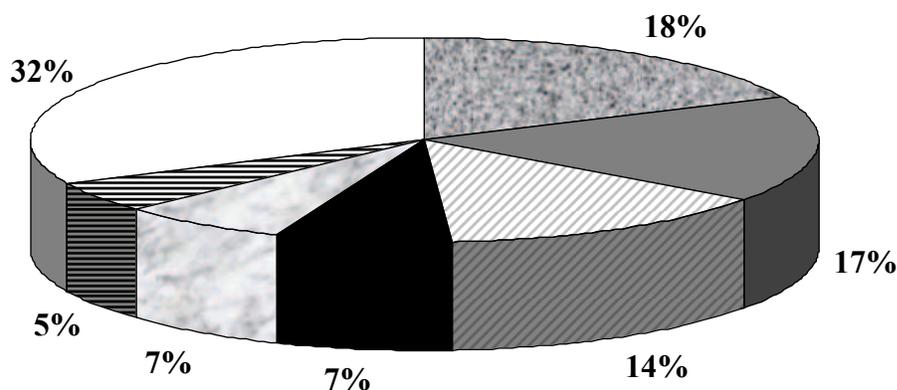


Figure 6.—Species of roundwood removed from Ohio forests for use by the primary processing industry, 2006.

Table 3 lists the top five species of saw logs, veneer logs, and pulpwood harvested in 2006. While red and white oak species made up 40.7 percent of the saw log harvests during this survey period, in 1989 they made up 55 percent of harvests (Widmann and Long 1992). Because the percentage of oaks making up saw log harvests dropped between surveys, other species became relatively more important. It appears that several species increased in relative importance to fill this gap—the hard maple proportion rose by 2.4 percentage points, soft maple rose by 1.8 percentage points, black cherry gained 3.7 percentage points, and the share of the saw log market held by several other species rose to a lesser extent. In 1989, the top five species made up 82 percent of all roundwood harvests (red oaks, white oaks, yellow-poplar, ash, and hard maple). In the current survey period, this concentration ratio was only 69 percent (Table 3). In short, saw log species proportions have shifted over the last 15 years with a greater diversity of species being utilized and the importance of red and white oak lessening.

OHIO INDUSTRY DEMOGRAPHICS WITH A FOCUS ON SAWMILLS

The estimated number of sawmills in existence in Ohio in 2006 was 197 (Table 1); this is 22 fewer than were tallied in 1989—a 10-percent reduction (Table 4). However, the volume of logs processed by these 197 sawmills was only 5 percent lower than the volume processed in 1989 (402 mmbf Doyle versus 425 mmbf Doyle in 1989), which indicates an overall increase

Table 3.—Species of roundwood harvested from Ohio forests by product, 2006

Ranking based on volume consumed	Saw logs (n=108)		Veneer logs (n=4)		Pulpwood (n=5)	
	Species	%	Species	%	Species	%
1	Red oak	20.9	Hard maple	32.8	Yellow-poplar	17.1
2	White oak	19.8	Black cherry	28.7	White pine	11.3
3	Yellow-poplar	13.2	White oak	17.1	Soft maple	10.5
4	Hard maple	7.9	Red oak	8.4	Red oak	9.0
5	Black cherry	7.1	Black walnut	8.4	White oak	9.0
	All hardwood species	97.0		100.0		72.6
	All softwood species	3.0		0.0		27.4

Table 4.—Change in number of operating sawmills by saw log size class for the current and prior survey periods

Year	Production class (million board feet Int. ¼-inch) ^a				Total - all size classes
	>5	1-5	.1-1	<.1	
1973	-----86----- ^b		122	102	310
1978	-----120----- ^b		108	98	326
1983	-----93----- ^b		106	119	318
1989	31	75	70	43	219
2006	29	70	48	50	197

^aNote that in Tables 1 and 5, sawmill log volumes are cited in terms of the Doyle log scale. In this table, volumes are cited in the Int. ¼ - inch log scale so that this between-year comparison could be made.

^bThese sawmill numbers from earlier surveys were provided by Widmann and Long (1992); in their citation, the two largest sawmill production classes were aggregated together into a single class, "More than 1 million board feet."

in sawmill size, or production concentration. The mean sawmill log input volume for 2006 was 2.0 mmbf Doyle (2.6 mmbf Int. ¼ -inch). This is indeed larger than the mean volume determined in 1989, which was 1.9 mmbf Doyle (2.4 mmbf Int. ¼-inch) (Widmann and Long 1992). Although these average figures are relatively similar, the production concentration had increased dramatically between the two previous survey periods—1983 to 1989. The 318 sawmills in Ohio in 1983 (Table 4) used a log volume of only 301.7 mmbf Doyle (376.5 mmbf Int. ¼-inch), which equates to a mean annual saw log consumption of only 0.9 mmbf Doyle (1.184 mmbf Int. ¼-inch) per sawmill, more than a million board feet per mill less than that reported for 1989 (Widmann and Long).

The overall mean number of employees for the 59 Ohio primary wood processing companies that responded to survey question 11 (Appendix 2) during the 2006 survey was 25. The number of employees reported was quite variable: the median response was 10 (i.e., half the companies had 10 or more employees and half had 10 or fewer) and the mode for this set of responses was 2 (i.e., "2 employees" was the most common response given). Most of the responses on number of employees were provided by sawmill companies (54 out of 59 responses); however, the non-sawmill respondents employed large numbers of people. For this reason, the mean number of employees in Ohio's sawmills was lower than the industry-wide mean—16 compared to 25.

Regional differences in employee numbers within Ohio's sawmill industry are apparent. The mean number of employees per sawmill in the northeastern, southeastern, and western regions of Ohio (Fig. 4) were 23, 14, and 11, respectively. These employee numbers for the different regions do not seem to be consistent with the fact that the southeastern region has the fewest sawmills but consumes the greatest amount of roundwood. The biggest reason for this inconsistency is that employee numbers were not obtained from, nor were they estimated for, the many smaller sawmills located in the northeastern region. Also, a couple of sawmills in the northeastern region employed a relatively large workforce that skewed the mean employment number for the region. The median numbers of sawmill employees by region were 10 in the northeastern region, 15 in the southeastern region, and 7 in the western region.

A more detailed look at the size and geographic distribution of Ohio's sawmill industry is provided by the summary results presented in Table 5. Note the indirect relationship between mean annual log consumption (second column) and the percentage of saw log inputs harvested

Table 5.—Size and geographic distribution of Ohio’s sawmill industry, 2006

Size class (mbf Doyle)	Mean annual log consumption (mbf Doyle)	Mean percentage of logs harvested in Ohio	Mean number of sawmill employees	Number of sawmills in western region	Number of sawmills in southeastern region	Number of sawmills in northeastern region
<100	24	96	1	21	8	22
100-999	442	92	6	17	13	19
1,000-4,999	2,438	86	16	9	20	45
5,000-9,999	6,798	76	22	2	12	1
≥10,000	12,112	74	78	0	6	2

from Ohio forests (third column) in Table 5. The direct relationship between mean annual log consumption and number of sawmill employees (fourth column) also is apparent.

The sawmill size-class distribution for the three Ohio regions (columns 5 through 7 of Table 5), provides further evidence that the sawmills in the western region of the state are, on average, smaller than in the other two regions (only 2 out of 22 mills consuming more than 5 mmbf Doyle per year are in the region). The larger size of the sawmills in the southeastern region also shows up clearly in this comparison (Table 5). The five counties with the greatest concentration of sawmills are Holmes (31 sawmills), Wayne (20), Vinton (10), Tuscarawas (9), and Pike (7). The five Ohio counties with the most sawmills that process more than 5 mmbf Doyle per year are Vinton (4), Pike (2), Washington (2), Scioto (2), and Hocking (2).

Fifty-eight companies responded to survey question 12, “At what percent of capacity did your mill operate in 2005?” (Appendix 2). The mean capacity response was 79 percent. This underutilization of productive capacity is a sign of the general downturn in the industry that has come about as a result of global competition. The 79-percent capacity utilization estimated for Ohio compares favorably with nationwide industrial production and capacity utilization for all manufacturing, durable goods manufacturing, and all wood products manufacturing industries in 2006, which were 79, 77, and 76 percent, respectively (Federal Reserve 2008).

RESIDUE UTILIZATION AND MARKETS

Residues generated by primary processors are classified into one of three categories: bark, coarse residue, or fine residue. Coarse residue includes slabs, edgings, trim ends, and other materials that are sent to the chipper where they are reduced to piece sizes that can be used for pulp manufacture or boiler fuel. Fine residues include sawdust and planer shavings. The residue information collected on the survey (Appendix 2) consists of a matrix of types of residue generated and residue markets. Hardwood residue results are based on responses from 98 of the 212 companies that processed hardwoods. The disposition of softwood residue was based on responses from only 16 of the 18 companies that processed softwoods. The markets/uses for the different types of residue were calculated by weighting the roundwood consumption volumes of responding firms. For example, with 16 firms providing softwood residue utilization information, the summary percentages (Table 6) were derived by weighting each respondent’s individual percentages by their proportional softwood roundwood consumption among the 16 responding firms.

Table 6.—Uses of hardwood and softwood residues in Ohio weighted using roundwood consumption volumes of responding firms, 2006

Type of residue	Boiler fuel, external	Boiler fuel, internal	Chemical products	Household fuel	Livestock bedding	Mulch	Composite panels	Pulp	Other	Not used
	-----Percentage-----									
Hardwood bark	1.8	3.3	2.3	16.7	9.4	57.3	1.1	4.3	0.6	3.2
Hardwood coarse	8.9	8.5	0.0	2.7	4.2	5.2	0.1	58.2	0.5	11.7
Hardwood fine	33.6	26.8	0.2	0.4	23.6	2.5	0.2	5.5	0.0	7.2
Softwood bark	0.0	0.0	2.8		0.0	20.8	0.0	0.1	0.0	10.7
Softwood coarse	0.0	0.0	0.0	0.0	0.1	95.6	0.0	0.0	0.0	4.3
Softwood fine	0.7	67.9	0.1	0.0	11.0	18.0	0.0	1.0	0.0	1.3

In 2006, a higher percentage of residues went unused than in 1989. Most notably, almost 12 percent of hardwood coarse residue was unused and only 58 percent was used as pulp chips. In 1989, 87 percent of coarse residues were used as pulp chips and less than one-half of one percent went unused (Widmann and Long 1992). During the earlier survey period, four pulp mills were operating in Ohio; during the current survey period, only two pulp mills were utilizing chipped residue. Fortunately, because the use of fine and coarse residues for fueling boilers for heat production appears to have become more common, this market has filled some of the void created by the loss of chip markets.

SUMMARY

Annual industrial roundwood harvests from Ohio's forests were essentially unchanged between 1989 and 2006—91.5 million cubic feet in 1989 and 91.2 million cubic feet in 2006. The total roundwood volume utilized by Ohio's primary wood products industry, including wood procured from Ohio forests and wood procured from out-of-state forests, was 108.3 million cubic feet per year in 2006. Seventy-two percent of this roundwood volume was harvested from Ohio forests.

The western region of the State has the fewest primary wood processing operations, the lowest total roundwood consumption, and the lowest average consumption per operation. There are more operations in northeastern Ohio than in the western and southeastern regions. However, roundwood consumption is highest in the southeastern region (64 percent of total consumption), because larger operations that consume greater amounts of roundwood are found there.

Overall, 9.7 percent of the industrial roundwood volume harvested in Ohio was made up of softwood species and 90.3 percent was made up of hardwood species. While red and white oak species made up 40.7 percent of the saw log harvests during this survey period, in 1989 they made up 55 percent of harvests (Widmann and Long 1992). Because the percentage of oaks making up saw log harvests dropped between surveys, other species became relatively more important. It appears that several species increased in relative importance to fill this gap—the black cherry proportion rose by 3.7 percentage points, hard maple rose by 2.4 percentage points, and soft maple rose by 1.8 percentage points, and the share of the saw log market held by several other species rose to a lesser extent.

The estimated number of sawmills in existence in Ohio in 2006 was 197—22 fewer than in 1989 or a 10-percent reduction. However, the volume of logs processed by these 197 sawmills was only 5 percent lower than the volume processed in 1989, which indicates an overall increase in production concentration in Ohio's sawmill industry.

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APPENDIX 1

Data collection was accomplished by a combination of mail, email, and telephone contacts. The goal was to account for every known primary wood products operation in the State. The Office of Management and Budget approved survey was mailed to all primary processors in Ohio based on information provided by the ODNR in its publication Primary Directory of Ohio Sawmill and Dry Kiln Companies, 2003 (Sabula and Heiligmann 2004) and updates to that publication available online (<http://www.oardc.ohio-state.edu/ohiowood/counties.htm>). For those cases in which company contact or type-of-operation information was missing, online phone book business listings, Web searches, and a table included in Lowery and Noble (2000) (compiled using the Ohio Amish Directory: Holmes County and Vicinity, Wengerd 1997) were used to obtain the required information.

The survey was originally mailed in the summer of 2004 to all identified primary wood processors in Ohio. This included not only sawmill operations, but also pulp and paper, veneer, engineered wood products, cooperage, post and pole, pallet, log home, handle, and firewood producers. A followup, more concise version of the survey was mailed to non-respondents approximately 2 months after the first mailing. An email version of the survey was mailed quickly thereafter to all processors with a known email address. When the effort was resumed in early 2006, the concise form of the survey was remailed to non-respondents. Approximately 2 months after this mailing, followup phone calls were made to non-respondents. Extensive efforts were made to contact non-responding mills listed in the Primary Directory of Ohio Sawmill and Dry Kiln Companies. At least two, and in many cases more than five, telephone calls were placed. For the handful of mid-size and larger mills that we failed to reach via the telephone, ODNR District Foresters, Ohio State University Extension Foresters, or managers/owners of neighboring sawmills were consulted to learn the status of the mill in question.

As a final validity check, the ODNR listing of wood products companies with emerald ash borer compliance agreements (as of January 2008) was referenced at: <http://www.ohioagriculture.gov/eab/plnt-eab-compliance.stm#Companies>. This was not the simple validity check that we had anticipated. Several dozen companies not listed in Ohio's Primary Directory were registered as having entered into compliance agreements governing the safe shipment of primary wood products such as logs, chips, firewood, and lumber. We telephoned those companies on the list that we had not previously contacted and for whom we could find a telephone number. We made at least two attempts to reach the company and administer the survey. We successfully contacted 35 percent of the companies on the compliance agreement registration list. For the remaining companies, decisions were made about including them in our tally based on the name of the company and the type of business listing under which they appeared in the local telephone book. Companies with names that included "lumber" or "sawmill" and business listings that appeared under "sawmill" were included. In the several cases where no phone book business listings were found, we assumed that the companies were very small sawmills engaged only in custom or local use sawing.

Roundwood utilization was estimated for companies that we determined were operational but could not be reached. These estimates were based on two factors: (1) insights provided by state forestry personnel or contacts with neighboring sawmills as to the general size class of

the sawmill in question (i.e., <100 mbf Doyle^{2,3}/year; 100-999 mbf Doyle/year; 1,000-4,999 mbf-Doyle/year) and (2) the average roundwood consumption estimates for mills in the same size class for which we had data. For example, there were 29 operational sawmills in the smallest size class (<100 mbf Doyle of logs per year) for which we needed to estimate roundwood consumption. Using information obtained from 22 sawmills in this class, a mean annual consumption of 24,158 bf Doyle (4,303 cubic feet; 30,391 bf International ¼-inch rule [Int. ¼-inch]) per mill was calculated. This log volume was then used as the estimated volume for each of the 29 sawmills for which we lacked data. This procedure was used for each of the size classes.

Not surprisingly, as sawmill size increased, so did our response rate. There are at least three explanations for this. First, larger mills are more likely to have someone answering the telephone throughout the day. Secondly, in many larger mills multiple office and/or management employees can answer basic production questions. Thirdly, larger mills typically have a comprehensive log inventory and tracking system whereas the smallest mills may not. In several cases the small mills reported “a very small volume” or “not much” but would not offer an estimate of the footage or number of logs processed. Table 1 shows the proportion of sawmills in each size class that provided log consumption data. Overall, of the known sawmills in Ohio, 74 percent provided log consumption data.

Ohio companies that responded to the 2006 TPO survey included five veneer manufacturers, five pallet part manufacturers, two cooperage manufacturers, two handle plants, two log home manufacturers, one post/pole/piling manufacturer, one mulch manufacturer, one engineered wood product manufacturer, one commercial firewood manufacturer, and one pulp and paper mill in addition to the 145 responding sawmills (out of a total of 197). These are all firms *that purchase roundwood* in the process of manufacturing their product(s). There clearly are more pallet plants and log home manufacturers operating in Ohio. Many of these non-responding operations do not process roundwood, but rather purchase lumber, machined logs, pulp chips, and other forms of wood raw material. Some may purchase roundwood but were missed because of their small size. No attempt was made to formulate estimates on the missing component of these smaller wood industry segments beyond that of consulting with state Division of Forestry personnel to try and identify all known firms so that we could approach them with the survey.

Although the key piece of data that we sought from each primary producer was the volume of roundwood utilized in their operation annually, the survey (Appendix 2) included a range of other questions on species distribution, procurement radius, in-state vs. out-of-state roundwood proportions, residue markets, and number of employees. Respondents who completed the written survey typically provided responses to most or all of these questions. Primary producers whom we contacted over the telephone typically addressed only a subset of the survey questions. Differences in response rates among questions are highlighted in each section of this report.

²bf = board foot—a volume of wood the equivalent of 1 square foot in area and 1 inch in thickness; mbf= thousand board feet; mmbf= million board feet.

³Log volumes in Ohio are typically measured using the Doyle board footage scale. Traditionally, log volumes have been reported by the Forest Service using the Int. ¼-inch scale and cubic feet (cf). All three measures are used in this report to enhance comprehension for Ohio readers and others accustomed to the Doyle log scale.

APPENDIX 2



Form Approved
 OMB No. 0596-0010
 Expires 10/31/2006

Ohio Roundwood Received for Processing - 2006

Your contact information

Business Name	
Your Name and Title (e.g., owner, manager)	
Company Address (Street, Box)	
City, State and Zip Code	
Email	
Phone	

1. What best describes your operation

<input type="checkbox"/> Sawmill	<input type="checkbox"/> Veneer Mill	<input type="checkbox"/> Engineered Wood Products
<input type="checkbox"/> Log Concentration Yard	<input type="checkbox"/> Other - Specify _____	

2. In what state is your operation located?

3. In what county is your operation located?

4. Did you receive roundwood (sawlogs, pulpwood, etc.) in 2005?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

5. If yes to #4, how much roundwood did you receive in 2005? (If no, stop here – but please mail this form back to us!)

 (Do not include logs/ bolts sold or transferred to another primary processor)

6. What measure did you use for the roundwood received?

<input type="checkbox"/> Board Feet - Doyle	<input type="checkbox"/> Green Tons
<input type="checkbox"/> Board Feet - Scribner	<input type="checkbox"/> Cords (85 cubic feet)
<input type="checkbox"/> Board Feet – International 1/4	<input type="checkbox"/> Pieces
<input type="checkbox"/> Other – Please Specify _____	

7. What percent of roundwood do you get: from the county (7a), from the state (7b) where your operation is located?

7a. <input type="text"/> % from home county	7b. <input type="text"/> % from home state
---	--

8. What is your normal one-way procurement radius?

 Miles

9. Please estimate the percent of each species received (the total should equal 100%).

Eastern Hemlock		Yellow Birch		White Oak	
Red Pine		Other Birch		Yellow-Poplar	
White Pine		Black Cherry		Black Gum	
Eastern Red Cedar		Elm		Other Gum	
Other Softwood		Hickory/Pecan		Sycamore	
Ash		Hard Maple		Black Walnut	
Basswood		Soft Maple		Other Hardwood	
Beech		Red Oak			

10. Please indicate the ways that mill residues are used by writing the percent for each residue type. Total of all uses for each residue type should equal 100%.

RESIDUE USE	Hardwood BARK	Softwood BARK	Hardwood COARSE	Softwood COARSE	Hardwood FINE	Softwood FINE
Manufacture of fiber based product						
Manufacture of composite based product						
Charcoal or chemical wood						
Industrial fuel at this mill						
Industrial fuel at other mill						
Household fuel						
Livestock bedding						
Garden mulch						
Other, specify						
Not used						
TOTAL ALL USES	100%	100%	100%	100%	100%	100%

11. How many employees worked at this mill in 2005?

11.

12. At what percent of capacity did your mill operate in 2005?

12. %

If you have questions, please contact Jan Wiedenbeck at jwiedenbeck@fs.fed.us or call 304-431-2708.

This form is for reporting the quantities and kinds of logs and other roundwood processed by this mill in 2006. All replies will be held confidential and used only in statistical reports. This survey is authorized by PL 93-378 as amended by PL 94-588. Your cooperation is appreciated and needed to make the results of this survey comprehensive, accurate, and timely, although you are not required to respond.

Abstract

Wiedenbeck, Jan; Sabula, Andy. 2008. **Ohio Roundwood Utilization by the Timber Industry in 2006**. Resour. Bull. NRS-32. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 18 p.

To identify changes in the structure, size, and wood raw material inputs of the primary wood processing industry in Ohio, the Ohio Division of Forestry and the U.S. Forest Service conduct a periodic survey of this sector. The current assessment of the state of the primary wood products industry in Ohio is based on information collected for the period 2003 through 2006. Average annual roundwood removals from Ohio forest lands are estimated to have been 91.2 million cubic feet during the period, virtually the same as the harvest level found by the previous survey in 1989. This volume includes 5.2 million cubic feet of saw logs and veneer logs exported to other countries, 62.5 million cubic feet of logs for domestic use, 23.5 million cubic feet of pulpwood. Of the log volume harvested from Ohio forests that was consumed domestically, 96.5 percent was processed by the State's 197 sawmills while veneer mills processed only 0.7 percent. Of the pulpwood volume, 74 percent was consumed by the pulp and paper industry and the remaining 26 percent was consumed by the engineered wood products industry, predominantly by panel (oriented strand board) manufacturers. Considering saw log transfers among states (excluding international shipments), the ratio of imports to exports for Ohio is 5.6 to 1, indicating that Ohio remains a net importer of saw logs.

KEY WORDS: roundwood, utilization, Ohio, saw logs, sawmills, exports residue

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