

contributions of
the **TIMBER INDUSTRY**
to the **ECONOMY of**
the **MISSOURI OZARKS**

SB 828 JULY, 1965
AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF MISSOURI

CONTENTS

Highlights	4
Introduction	4
Method of Study and Assumptions	4
Prices	4
Local Projections	5
Eastern Ozark	5
Northwestern Ozark	8
Southwestern Ozark	9
Summary for Entire Missouri Ozarks	11
Appendix	13

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Missouri Agricultural Experiment Station and Economic Research
Service, U. S. Department of Agriculture, Cooperating

HIGHLIGHTS

The wood-using industries in the Ozark Region produced products valued at \$50.6 million and employed 14,000 workers with a total payroll of \$20.7 million in 1960. Most workers were employed part-time, often in two or more wood-using industries. The equivalent number of full-time employees was 6,300. The average annual earnings from forest industries was only \$1,500, but would have been \$3,300 for full-time employment. Operators of 760 wood-using firms derived income from processing timber products. Since many sawmills were operated part-time, an equivalent of 480 full-time firms existed.

More than 52 percent of the workers in wood-using industries were employed in harvesting and hauling timber to plants. Another 22 percent were employed in sawmills and the remainder in other processing plants.

Most of the harvesters, haulers, and sawmill workers were employed seasonally at a time when farming and trucking operations were slack. Workers in the other processing plants were employed full time. If all workers had been employed full time, 35 percent would have been employed in harvesting and hauling, 17 percent in sawmill activities, and 48 percent in other processing plants.

In recent years, the timber resource has made a remarkable recovery from its depleted state in the 1930's. Currently, three times as much lumber is being produced as in that period, and the volume of growing stock and saw-timber is increasing.

By 1975 the volume of harvestable trees is expected to be 20 percent greater than it was in 1960. At projected harvesting rates and current prices, the gross value of timber products manufactured will be \$60.8 million and the total payroll will be \$24.8 million. Total full-time equivalent employment will be about the same as in 1960, but wages and productivity per worker should be 20 percent higher.

The forests not only provide employment for those involved in the wood-using industry, but are the major factor in attracting tourists into the Ozark area. In 1960, tourists spent \$72 million in about this same area. Employment was provided for the operators of 2,500 firms and 5,300 part-time employees. Total wage payments were about one-third as great as those for wood-using industries and about one-half as many workers were employed. However, by 1975, it is expected that tourists will spend \$160 million in the area and the tourist industry will provide employment for as many workers as the wood-using industry.¹

¹ Bird, Ronald and Frank Miller "Contributions of Tourist Trade to Income of People in Missouri Ozarks," Univ. of Mo. Agr. Exp. Sta. Res. Bul. 799, March 1962, p. 4 and "Where Ozark Tourists Come From and Their Impact on the Local Economy," Univ. of Mo. Agr. Exp. Sta. Res. Bul. 798, March 1962, p. 27.

CONTRIBUTIONS OF THE TIMBER INDUSTRY TO THE ECONOMY OF THE MISSOURI OZARKS

Ronald Bird*

INTRODUCTION

Previous studies have shown that a major reason for low incomes in the Ozarks of Missouri is the limited physical resources in relation to the number of people. Agriculture and the recreational industry have been studied to determine present and projected levels of employment, production, and incomes.²

This study was made to determine the present level of employment in forest product processing industries with projections to 1975.

These studies are a part of a larger undertaking to determine the adjustments in the use of resources possible in the area that will result in higher incomes to local residents.

Method of Study and Assumptions

Recently, three studies of wood-using industries in Missouri were completed by the School of Forestry at the University of Missouri and the U. S. Forest Service. One included a complete inventory of the number and kinds of wood-using industries in 1960.³ Another contained estimates of the number of employees, payroll and value of products manufactured in the State for the years 1960 to 1963.⁴ A third study showed the amount of timber cut in Missouri in the year 1958.⁵ Based on data in these reports, estimates of employment, volume of production, and income in the wood industries were prepared for 1960 and 1975.

Prices

The U. S. Forest Service projected consumption and production of timber products in the United States to the year 2000. In making these projections, it was assumed that the relative price of lumber during the projection period would be within the range of prices prevailing during the 1950's.⁶ The estimate for hardwood consump-

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² Bird, Ronald and Frank Miller, "Resources and Levels of Income of Farm and Rural Nonfarm Households in Eastern Ozarks of Missouri," Univ. of Mo. Agr. Exp. Sta. Res. Bul. 661, March 1958, and "Profitable Adjustments on Farms in Eastern Ozarks of Missouri," Univ. of Mo. Agr. Exp. Sta. Bul. 745, July, 1960.

³ McCormick, L. E., Fred W. Taylor, and Smith, Richard C., "Sawmills and Other Wood Using Plants in Missouri," University of Missouri Agr. Ext. Cir. 834, June, 1965.

⁴ McGinnes, E. H. Jr., "The Wood Using Industries of Missouri," Missouri Business, Vol. 14, No. 2, Nov. 1963.

⁵ "Forest Survey Timber Cut Tables, Missouri 1958," Forest Service, United States Department of Agriculture, multilithed, undated.

⁶ "Timber Trends in the United States," Forest Resource Rept. No. 17, Forest Service, U. S. Dept. of Agr., Feb. 1965, p. 9.

tion in terms of roundwood volume was 11.6 percent greater for 1970 than the price in 1962 and 30.6 percent greater in 1980.⁷ Interpolating between the estimates for these two periods, an increase of about 20 percent is projected for 1975.

Since the Forest Service projected relatively stable prices, local price relationships prevailing from 1960 to 1962 were used in the Ozark area.

Local Projections

Hardwoods, the major species of trees in the Ozark area, are used mainly to produce lumber, cooperage, flooring, pallets, posts and charcoal. There are no pulpwood plants in the area, and little timber is shipped out to be used for this purpose. Some pulpwood plants may be located here in the future, but their influence probably will be small between now and 1975. Current harvesting patterns are likely to continue, with more lumber processed into high quality products such as flooring.

Assuming that prices for timber products will remain unchanged, two of the important factors determining the amount of timber that will be harvested and processed in the Ozarks are the natural growth occurring in the area and the costs of harvesting and processing it. The studies of forestry resources and growth rates in 1947 and 1959 indicated that with current conservation practices, 20 percent more hardwood will be available for harvest in 1975 than in 1960. Harvesting and processing costs probably will not increase substantially for several reasons:

1. Current employment in the area shows about twice as many workers employed in a part-time capacity as would be needed if they worked full-time;

2. Hourly wage rates in the forest industry in Missouri increased 1.9 percent a year from 1958 to 1964. Total employment during the period decreased about the same amount,⁸ but the annual amount of timber cut since 1958 has remained fairly constant;

3. As the quantity and quality of sawtimber improves, labor costs per unit of product will be reduced.

4. It is assumed on a basis of past trends that harvesting, trucking, and processing technology will improve so a worker will be able to harvest and process 20 percent more timber by 1975.

Based on the facts above, it is estimated that the gross value of timber products manufactured in the Ozarks will increase 20 percent from 1960 to 1975. Total wage payments probably will increase about this same amount. The equivalent number of full-time jobs will be about the same as in 1960. Wage payments per worker, however, will be 20 percent higher.

⁷ Ibid, p. 65

⁸ Monthly reports of Missouri Division of Employment Security. Number and wage payment data are for workers who were either covered by social security or unemployment compensation.

The U. S. Forest Service in surveying the timber cut, land use, and tree growth of forest in Missouri in 1959 divided the State into six forest regions on physiographic conditions.⁹ The Ozark area encompassed three regions: Eastern Ozark, Northwestern Ozark, and Southwestern Ozark (Figure 1). The counties in each of these three regions are:

<i>Forestry Region</i>	<i>Counties</i>
Eastern Ozarks	Bollinger, Butler, Carter, Crawford, Dent, Iron, Madison, Oregon, Reynolds, Ripley, Shannon, St. Francois, Washington, and Wayne.
Northwestern Ozarks	Benton, Camden, Cedar, Dallas, Hickory, Laclede, Maries, Miller, Morgan, Phelps, Pulaski, Polk, and St. Clair.
Southwestern Ozarks	Barry, Christian, Douglas, Howell, McDonald, Newton, Ozark, Stone, Taney, Texas, Webster and Wright.

Since much of the statistical data is reported on a basis of these regions, the same regional breakdown was used in this study.

Eastern Ozark

The Eastern Ozark Region includes the most rugged and least accessible land in the Ozarks. In the area are many springs, river valleys, and rugged terrain. The rolling to steep wooded hillsides frequently drop 300 to 400 feet to the narrow river valleys. The large springs indicate that much of the rainfall is removed by underground drainage.

About 70 percent of the total land was classified as forest land in 1959. Forest land area varied from 54 percent in Bollinger County to 85 percent in Carter County.¹⁰

This region is the most densely forested of all the Ozark regions. Although only 37 percent of the total land area of the Ozarks was in this region in 1959, it contained 60 percent of the growing stock—about 37 percent of the State total.¹¹

Since 1947, the volume of the growing stock in the Eastern Ozarks increased 5 percent annually compared with an increase of 2 percent in the state. In addition, the volume of trees standing in sawtimber size has in-

⁹ For the Ozark area, see Krusekopf, H. H., "Forest Soil Areas in the Ozark Region of Missouri," University of Missouri, Agri. Exp. Sta. Res. Bul. 818, Jan. 1963.

¹⁰ Gansner, David A., "Forest Area in Missouri Counties," U. S. Forest Service Research Note CS-4 of the Central States Forest Exp. Sta. March 1963.

¹¹ Gansner, David A., "Timber Volume in Missouri Counties," U. S. Forest Service Research Note CS-9 of the Central States Forest Exp. Sta., July 1963.

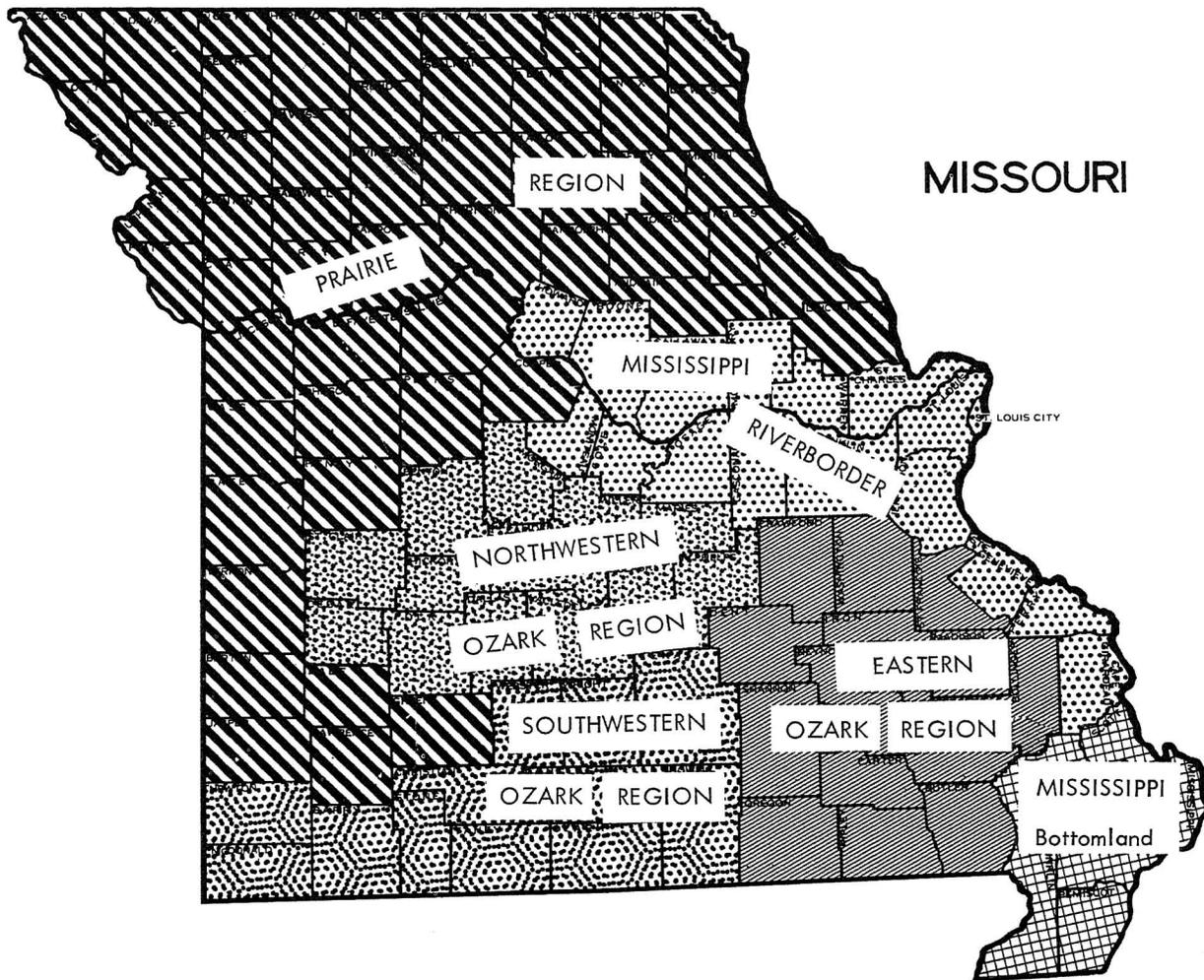


Figure 1. Location of the Forestry Regions in Missouri.

creased about 0.4 percent a year. Unfortunately, the increase has been in the smaller trees. The number of trees standing in size classes over 20 inches was only about two-thirds as large in 1959 as in 1947. Trees of this size usually yield high quality lumber logs, veneer, and cooperage stock. However, this does not portray a bleak future for this area. The volume of trees standing in the 12-to-14 inch diameter classes nearly doubled from 1947 to 1959. More than two-thirds of the sawtimber volume was in these diameter classes in 1959. If a large percent-

age of these trees is left standing, the quality of the sawtimber will increase in the next decade or two.¹²

The most prevalent species are oaks (86 percent of the forested area) and pine.¹³ The dominance of these species led to the establishment of sawmills and industries that specialize in producing cooperage, wood flooring, posts, pallets, and charcoal.

¹² Mendel, Joseph J., "Timber Resources of the Eastern Ozarks," Univ. of Mo. Agri. Exp. Sta. Bul. 779, June 1961, pp. 13-15, revised estimates, Feb. 1965.

¹³ Mendel, loc. cit., p. 19

In 1960, there were 352 sawmills and 80 wood processing plants in the area. McGinnes estimated the number of employees of each type of wood-using industry in the state from May 1960 to September 1963. The number of forest workers in this area was derived from his data plus other data relating to the quantity of timber cut and the amount of lumber used by each type of wood-using industry in the area. Employment was estimated at 2,550 (Table 1).

The annual payroll (\$5,043,000 in 1960) was derived from the number of workers for each wood-using industry and the average annual earnings for the type of worker. The value of the products manufactured was derived from the number of workers in the area and the average output per worker for each wood-using industry. The value of the products manufactured in the Eastern Ozark Region was estimated to be \$19,276,000.

In 1959, Smith estimated the number of workers in the Eastern Ozark area needed to supply the timber for the wood-using industries. Based on his data, it was estimated that 3,257 men were needed to harvest and truck timber to the plants.

The value of the timber delivered to the plants was derived by multiplying the state average price of each

type of lumber by the board feet of the lumber used in the area. The estimated total value was \$6,664,000.

Unpublished data of the University of Missouri School of Forestry show that harvesting and hauling costs are about 60 percent of the value of timber. Thus the timber harvested in the Eastern Ozark Region annually is worth about \$1,456,000 at the stump. Haulers and harvesters get \$2,185,000. Haulers receive an additional \$907,000 for bringing in timber from other states to be processed in the area (Appendix Table 5).

No published data of the net returns to processors were found. An analysis of the records of several producers in Missouri for 1962 indicated that net returns to the operator for labor, capital, and management averaged nearly 8 percent of the gross value of the manufactured products. It was assumed that the operator of an average wood processing plant in this area received an 8 percent return (Appendix Table 5).

The average annual wage payment to trucking and harvesting personnel was \$949 per man (Appendix Table 6). Sawmill employees received \$1,071 per year and workers in other wood processing plants, \$2,721. Most employees worked part-time. The average annual income to management and capital for sawmill operators was

TABLE 1 — ESTIMATED NUMBER OF FIRMS AND EMPLOYEES, WAGES PAID, AND GROSS VALUE OF PRODUCTS IN VARIOUS WOOD USING INDUSTRIES, EASTERN OZARK REGION, MISSOURI, 1960

Item	Firms ^a	Employees ^b	Wages Paid ^b	Gross Value of Product ^b
	Number	Number	1,000 Dollars	1,000 Dollars
Harvesters and Haulers		3,257 ^c		3,641 ^d
Sawmills	352	1,152	1,234	5,462
Other Wood Processors				
Cooperage	12	252	703	3,300
Dimension Stock	2	47	121	497
Flooring	5	224	706	2,619
Furniture and Millwork	1	16	57	176
Gunstock	1	46	188	846
Handlestock	11	222	591	964
Pallet and Container	20	348	741	2,259
Poles, Posts and Piling	10	89	244	1,892
Charcoal	15	140	409	1,084
Other Minor Products	3	16	49	177
Subtotal	80	1,400	3,809	13,814
Total	432	2,552	5,043	19,276

^a Data from McCormick, L. E., and Smith Richard C. "Directory of Sawmills and Other Wood Using Plants in Missouri", Univ. of Mo., Agr. Ext. Cir. 773, Feb. 1961.

^b Data derived from "Forest Survey Timber Cut Tables, Missouri, 1958", Forest Service, U. S. Department of Agriculture, multilithed, undated; McGinnes, E. H., Jr., "The Wood Using Industries of Missouri," Missouri Business, Vol. 14, No. 2, November 1963, pp. 4-15.

^c Data derived from Smith, Richard C., "Forest in the Economy of the Missouri Eastern Ozarks," University of Missouri Business and Economic Review, Vol. 1, No. 6, Nov.-Dec., 1960, pp. 25-37.

^d Produced in Missouri

\$1,241. Income to operators of other wood using plants was \$13,817. The low returns to sawmill operators indicates that many small mills operate only part of the year.

Within the Eastern Ozark Region 3,257 workers were employed in harvesting and hauling timber to processing plants. An almost equal number were employed in processing the timber—1,504 in sawmills and 1,480 in other wood processing plants (Figure 2). Many of the employees and employers held two jobs. Their other job was usually either part-time farming or another wood processing operation.

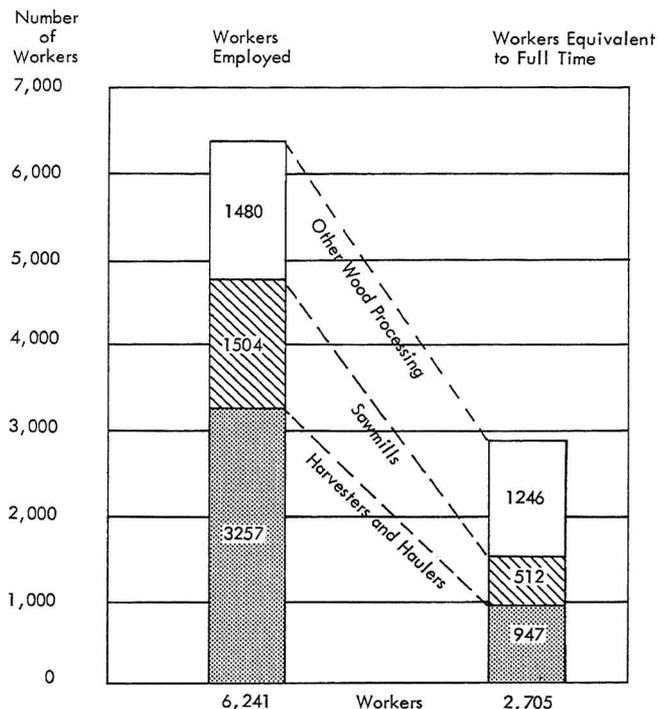


Figure 2. Employment in Wood Using Industries, Eastern Ozark Region, Missouri 1960.

This was especially true for the harvesting, hauling, and sawmill operations. Since this work could be done during periods of slack farming activities, it provided needed employment for many of the farmers who had a small farming unit and for those who had an idle truck.

This part-time activity is apt to be characteristic of the hardwood industry in the future in the Ozarks. However, to obtain an estimate of job opportunities in the wood-using industries, the number that would have been fully employed (a 40 hour week 52 weeks) during the year was derived.¹⁴ The number employed in harvesting

¹⁴ The number of full-time employees was derived by dividing total wage payment by \$3,266 [the average hourly wage payment of lumber and wood products workers in the State (May 1960—September 1963) times 2,080 hours]. These data were obtained from the Missouri Division of Employment Security and includes wage payments only to the workers who were covered either by Social Security or Unemployment Compensation. The number of operators of sawmills was reduced to reflect net returns equivalent to wages paid their full-time employees.

and hauling would have been 947 and in sawmills, 512, or about 30 percent as many workers as are currently employed in these two operations.

The number fully employed in other wood processing plants would have been 1,246 or about 84 percent as large as the number currently listed as employed. In total, the harvesting, hauling, and sawmill operation provided employment for about 54 percent of the full-time workers whereas other processing plants provided employment for about 46 percent. These relationships may be altered in the future if more timber is imported. It is assumed, however, that by 1975 current practices will be followed.

On the basis of the assumptions of prices and production for the Ozark area, it is estimated that the gross value of the timber products manufactured in the Eastern Ozark Region will increase from \$19,276,000 in 1960 to \$23,131,000 in 1975. Total wage payments will increase from \$8,135,000 to \$9,762,000. The number of equivalent full-time workers will be 2,705, the same as in 1960 (Figure 2).

Northwestern Ozark Area

The most distinctive feature of this area is the Lake of the Ozarks, a body of water covering approximately 50,000 acres, created in 1931 when a private power dam was built on the Osage River. The impounded water with many coves among the wooded hills provides a pleasant setting for water recreation. More than 6,000 summer homes and 500 resorts and motels have been built along the shoreline. Overnight accommodations are available for more than 18,000 families.

Recreational activities have affected the use of the timber resources. The lake is near the center of the timbered area. As the lake is approached, the terrain becomes rougher and more heavily wooded and land values increase. Site and aesthetic values exceed the timber value of trees, so land near the lake is divided into small holdings where cottages, boat docks and other recreational facilities can be built. Site values extend several miles from the lake. The cost of consolidating land holdings for timber production is high, and few units yield a return from the sale of timber sufficient to justify commercial development.

The density and quality of trees is far below that of the Eastern Ozarks even though the soil and climatic conditions are similar. Although the forested area is about 58 percent as large as the Eastern Ozarks, the volume of growing stock and sawtimber is only about 36 percent as large.¹⁵ The sawtimber cut in 1958 was even less—23 percent of the Eastern Ozark total.¹⁶ Less of the area is classified as forest land (50 percent) than in the Eastern

¹⁵ Op. cit., Gansner, "Forest Areas in Missouri Counties."

¹⁶ Op. cit., "Forest Survey Timber Cut Tables."

TABLE 2 — ESTIMATED NUMBER OF FIRMS AND EMPLOYEES, WAGES PAID AND GROSS VALUE OF PRODUCTS IN VARIOUS WOOD USING INDUSTRIES, NORTHWESTERN OZARK REGION, MISSOURI 1960

Item	Firms ^a	Employees ^b	Wages Paid ^b	Gross Value of Product ^b
	Number	Number	1,000 Dollars	1,000 Dollars
Harvesters and Haulers		1,042 ^c		1,665 ^d
Sawmills	80	281	301	1,332
Other Wood Processors				
Cooperage	8	117	326	1,532
Dimension Stock	3	49	126	518
Flooring	2	125	394	1,462
Gunstock	2	65	266	1,196
Novelty	7	108	227	784
Pallet and Container	2	53	113	344
Charcoal	7	46	135	355
Subtotal	31	563	1,587	6,191
Total	111	844	1,888	7,523

For footnotes see Table 1.

Ozarks (71 percent). The amount of forest land in this region varies from 31 percent in Polk county to 70 percent in Camden county. Although oaks, hickories, and pines are the major species, they are less prevalent in this area than in the Eastern Ozarks. There are more black walnut and elm trees.¹⁷

As a result of the low quality of the timber and the recreational trade, relatively more workers are employed in charcoal and novelty manufacture than in the Eastern Ozarks. Fewer sawmills are present.

In 1960, eighty sawmills and 31 other processing plants manufactured timber products with a gross value of \$7,524,000. They employed 844 workers (Table 2). A total of 1,042 workers were needed to harvest and haul the sawtimber to the plants. Most of the timber used by plants other than sawmills and charcoal kilns was bought outside the area. More than 70 percent of the firms other than sawmills manufactured either cooperage, charcoal, or novelties.

Costs and returns to the wood-using industries in the Northwestern area were estimated (Appendix Table 7). The average annual wages varied from \$1,071 for sawmill workers to \$2,819 for people in other processing plants (Appendix Table 8).

About 52 percent of the workers were employed in the harvesting and hauling operation, whereas only 18 percent were employed in sawmills in this region. The relatively smaller number involved in sawmill activity in this area compared with the Eastern Ozarks was caused by the movement of lumber into the area to be processed. About 30 percent of the workers were employed in processing plants.

As in the Eastern Ozarks, most of the harvesters, haulers, and sawmill employees were employed only one-third of the time. If all workers had been fully employed, it is estimated that about 36 percent of the workers would have been employed in harvesting and hauling, 12 percent in the sawmills and 51 percent in other wood processing plants (Figure 3). By 1975 about this same number of full-time workers could be employed in the region. The gross value of manufactured products probably will increase from \$7,524,000 in 1960 to \$9,029,000 in 1975.

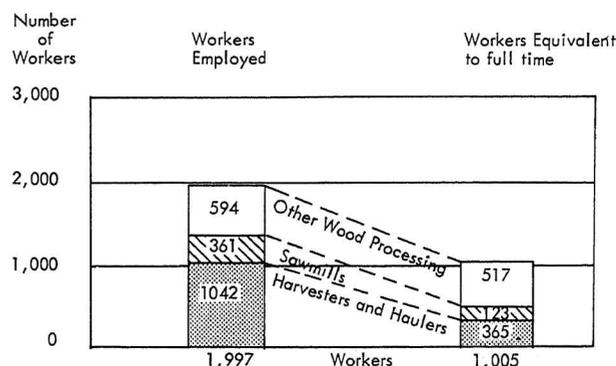


Figure 3. Employment in Wood Using Industries, Northwestern Ozark Region, Missouri 1960.

Southwestern Ozarks

The Southwestern Ozark Region contains four large lakes with about 100,000 acres of surface and 2,000 miles of shoreline. Three lakes were formed by erecting dams on the White River and one by a dam on the North Fork River. All were built for flood control and power purposes. Private recreational facilities have been developed on two of the lakes. About 300 motels and resorts and approximately the same number of summer homes have

¹⁷ Op. cit., Gansner, "Timber Volume in Missouri Counties."

TABLE 3 — ESTIMATED NUMBER OF FIRMS AND EMPLOYEES, WAGES PAID AND GROSS VALUE OF PRODUCTS IN VARIOUS WOOD USING INDUSTRIES, SOUTHWESTERN OZARK REGION, MISSOURI, 1960

Item	Firms ^a	Employees ^b	Wages Paid ^b	Gross Value of Product ^b
	Number	Number	1,000 Dollars	1,000 Dollars
Harvesters and Haulers		3,425 ^c		4,111 ^d
Sawmills	142	1,140	1,221	5,405
Other Wood Processors				
Cooperage	15	357	996	4,675
Dimension Stock	2	54	139	571
Flooring	8	406	1,281	4,747
Furniture and Millwork	7	132	471	1,448
Handlestock	6	138	367	599
Novelty	8	200	421	1,452
Pallet and Container	12	335	714	2,175
Poles, Posts and Piling	11	110	301	2,339
Charcoal	4	43	126	333
Other Minor Products	1	7	22	77
Subtotal	74	1,782	4,838	18,416
Total	216	2,922	6,059	23,821

For footnotes, see Table 1.

been built. Governmental control of the shoreline has restricted development on the other two lakes.

More than 100 motels and resort facilities have been built since 1960. Summer home construction has proceeded far less rapidly than on the Lake of the Ozarks. Location in relation to the metropolitan centers may be the reason. St. Louis and Kansas City are six to eight hours driving time from the area; the Lake of the Ozarks is only about two hours driving time from each of these two cities. Consequently, there is less demand for lots in the Southwestern than in the Northwestern Region. Site affects land values only near the shoreline. As a result more of the land has been devoted primarily to timber production than in the Lake of the Ozarks area.

More timber is harvested here than in the other Ozark regions. Although the timbered area is 73 percent as large as that in the Eastern Ozark Region and 27 percent larger than that in the Northwestern Region,¹⁸ there was slightly more sawtimber cut than in the Eastern Ozarks and four times as much was cut as in the Northwestern Ozarks in 1958.¹⁹

The amount of the area forested varies from 40 percent in Newton county to 77 percent in Taney county. The average for the area is 55 percent.²⁰

The amount of growing stock in this region is only 35 percent as large as in the Eastern Ozarks but it has 45 percent as much sawlog material.²¹

About 90 percent of the timber volume is oaks with

black oak the most common species. Shortleaf pine is found on about 7 percent of the area.²¹

The Southwestern Region is an important timber producing area of the Ozarks. More than one-quarter of the timber cut in Missouri in 1958 was grown here. One-half of the shortleaf pine harvested came from this area.²²

There were 142 sawmills and 74 other wood processing plants in the Southwestern Ozark Region in 1960, producing products estimated to be worth \$23,821,000 (Table 3). About 1,140 workers were employed in sawmills which processed \$5.4 million worth of products. Approximately 3,425 workers were employed in harvesting and hauling the timber to these plants, while other wood processing plants employed 1,782. Much of the wood flooring produced in the State is manufactured here.

The procedure used to allocate returns to the factors of production in other areas was used here also (Appendix Table 9). The average annual income for workers employed by the forest industries was estimated to be \$1,490 (Appendix Table 10). If all workers had been fully employed, 3,100 workers could have been used (Figure 4). About 34 percent would have been involved in harvesting and hauling, 16 percent in sawmill activities and 50 percent in other wood processing plants. This is also the number of full-time worker equivalents that are expected to be employed in this region in 1975. Gross value of products manufactured probably will amount to \$28,585,000 by that date.

¹⁸ Ibid

¹⁹ Loc. cit. "Forest Survey Timber Cut Tables."

²⁰ Op. cit. Gansner, "Forest Areas in Missouri Counties."

²¹ Op. cit. Gansner, "Timber Volume in Missouri Counties."

²² Loc. cit. "Forest Survey Timber Cut Tables."

SUMMARY FOR ENTIRE MISSOURI OZARKS

There were 574 sawmills and 185 other wood processing plants in the Missouri Ozarks in 1960 (Table 4). These firms employed 14,801 workers and manufactured products worth \$50,620,000. The timber delivered to these plants was valued at \$16,180,000 and \$9,417,000 worth of it was produced in Missouri. Approximately 7,724 workers were employed to harvest and haul the timber to processing plants.

An estimated \$20,669,000 in wages was paid to workers by the timber industries. The operators of wood processing firms received an estimated return of \$4,043,000 for their capital investment and labor (Appendix Table 11).

The average annual wage paid to employees was estimated to be \$1,472 in 1960, but employers received an average return of \$5,327 for their labor and capital investment (Appendix Table 12).

Certain phases of the wood-using industry are seasonal in nature and provide employment for farm and trucking workers during their slack periods. This is especially true for those workers involved in harvesting, hauling, and sawing timber. The number of man hours used for harvesting and hauling timber was equivalent to the full-time activities of 2,351 workers; the comparable number used in sawmilling was 1,141. However, there were 7,724 and 3,147 workers employed, respectively, in these pursuits (Figure 5). Although some of the other wood processing plants operated seasonally, most of them worked

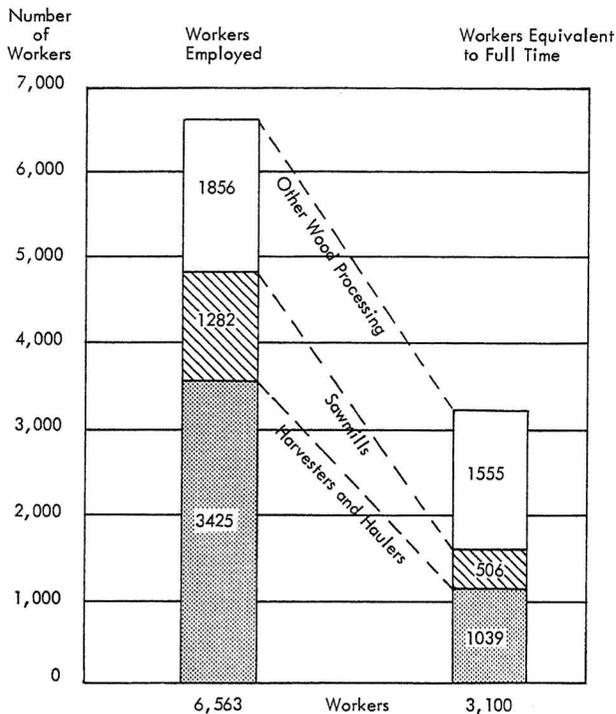


Figure 4. Employment in Wood Using Industries, Southwestern Ozark Region, Missouri 1960.

TABLE 4 — ESTIMATED NUMBER OF FIRMS AND EMPLOYEES, WAGES PAID AND GROSS VALUE OF PRODUCTS IN VARIOUS WOOD USING INDUSTRIES IN THE EASTERN, NORTHWESTERN AND SOUTHWESTERN OZARK REGIONS, MISSOURI, 1960

Item	Firms ^a	Employees ^b	Wages Paid ^b	Gross Value of Product ^b
	Number	Number	1,000 Dollars	1,000 Dollars
Harvesters and Haulers		7,724 ^c		9,417 ^d
Sawmills	574	2,573	2,756	12,199
Other Wood Processors				
Cooperage	35	726	2,025	9,507
Dimension Stock	7	150	386	1,586
Flooring	15	755	2,381	8,828
Furniture and Millwork	8	148	528	1,624
Gunstock	3	111	454	2,042
Handlestock	17	360	958	1,563
Novelty	15	308	648	2,236
Pallet and Container	34	736	1,568	4,778
Poles, Posts and Piling	21	199	545	4,231
Charcoal	26	229	670	1,772
Other Minor Products	4	23	71	254
Subtotal	185	3,745	10,234	38,421
Total	759	6,318	12,990	50,620

For footnotes see Table 1.

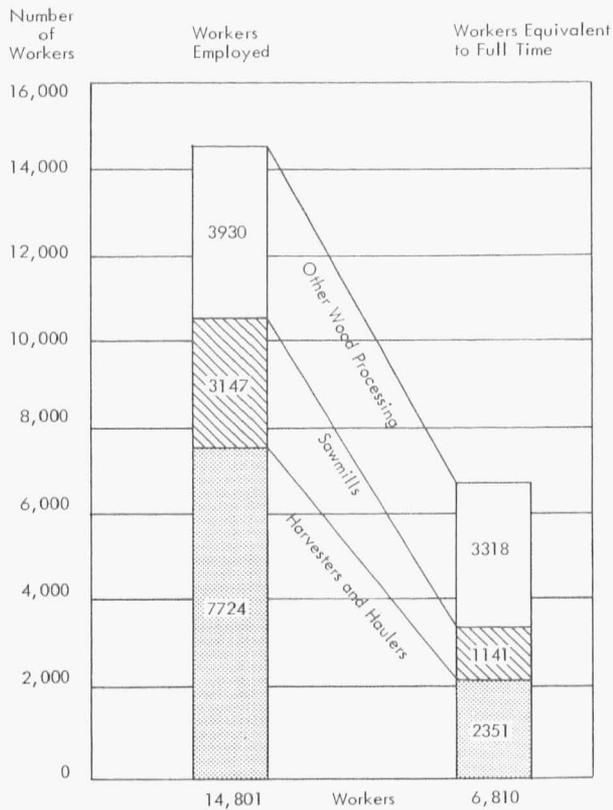


Figure 5. Employment in Wood Using Industries, Eastern, Northwestern and Southwestern Ozark Regions, Missouri 1960.

nearly full-time. There were 3,318 equivalent full-time jobs in these plants compared with the 3,930 employed.

About one-third of the man hours in the wood-using industry are to harvest and haul timber to the processing plants in the Ozark area. About one-sixth are involved in sawing the timber into timber products and one-half of the hours are used in processing the lumber into high quality products.

The contribution of the timber resource to incomes of local residents has increased substantially in recent years. The quantity of lumber currently produced is more than three times the volume in the 1930's.²³ This has been accomplished at the same time the volume of saw-timber was increasing about 0.4 percent a year.

It is anticipated that if current management practices are continued the timber resource will yield about 20 percent more harvestable trees in 1975 than in 1960. The gross value of the products manufactured could be worth \$60,743,000 with an annual payroll of \$24,803,000. The number of full-time equivalent jobs could be 6,810, the same as in 1960, but wage payments per worker may be 20 percent higher.

²³ King, D. B., E. V. Roberts and R. K. Winters "Forest Resources and Industries of Missouri," Missouri Agr. Exp. Sta. Res. Bul. 452, p. 38 and "Forest Survey Timber Cut Tables, Missouri 1958."



APPENDIX

TABLE 5 — COSTS AND RETURNS FROM WOOD USING INDUSTRIES,
EASTERN OZARKS REGION, MISSOURI, 1960^a

Item	Returns to			Cost to Processor of			Net Return to Labor, Capital & Management ^c	Value of Products F.O.B. Plants
	Growers of Timber	Harvesters and Haulers	Total ^b	Materials	Wages	Other Expenses		
	<u>1,000 Dollars</u>							
Suppliers of Timber to —								
Sawmiller	604 ^d	907	1,511					
Processor	852 ^d	1,278 ^f	2,130					
Processor	2,116 ^e	907 ^f	3,023					
Total	<u>3,572</u>	<u>3,092</u>	<u>6,664</u>					
Sawmill Operators				1,511	1,234	2,280	437	5,462
Other Wood Processors				<u>5,153</u>	<u>3,809</u>	<u>3,746</u>	<u>1,105</u>	<u>13,813</u>
Total				<u>6,664</u>	<u>5,043</u>	<u>6,026</u>	<u>1,542</u>	<u>19,275</u>

^a Data derived from McCormick, L. E. and Smith Richard C., "Directory of Sawmills and Other Wood Using Plants in Missouri" Mo. Agr. Ext. Cir. 773, Feb. 1961; "Forest Survey Timber Cut Tables, Missouri, 1958", Forest Service U. S. Department of Agriculture, multilithed undated; McGinnes, E. H., Jr., "The Wood Using Industries of Missouri", Missouri Business, Vol. 14, No. 2, Nov. 1963.

^b Allocated on a basis of 40 percent to growers and 60 percent to harvesters and haulers as indicated by unpublished data, School of Forestry, University of Missouri

^c Estimated to be 8 percent of the manufactured value of products as indicated by unpublished data, School of Forestry, University of Missouri

^d Growers in Missouri

^e Growers and harvesters outside of Missouri

^f Haulers in Missouri.

TABLE 6--ESTIMATED NUMBER OF EMPLOYEES, WAGES, PROFITS, AND AVERAGE ANNUAL INCOME PER WORKER, WOOD USING INDUSTRIES, EASTERN OZARK REGION, MISSOURI, 1960

Item	Employees	Employers	Wages	Net Return to Labor, Capital & Management*	Average Annual Income per	
	Number	Number	Dollars	1,000 Dollars	Employees	Employer
Harvesters and Haulers	3,257		3,092		949	
Sawmill Operators	1,152	352	1,234	437	1,071	1,241
Other Wood Processors	1,400	80	3,809	1,105	2,721	13,813
Total	<u>5,809</u>	<u>432</u>	<u>8,135</u>	<u>1,542</u>	<u>1,400</u>	<u>3,569</u>

*Estimated to be 8 percent of the manufactured value of products as indicated by unpublished data School of Forestry, University of Missouri.

TABLE 7 — COSTS AND RETURNS FROM WOOD USING INDUSTRIES,
NORTHWESTERN OZARK REGION, MISSOURI, 1960^a

Item	Returns to			Cost to Processor of			Net Return to Labor, Capital & Management ^c	Value of Products F. O. B. Plants
	Growers of Timber	Harvesters and Haulers	Total ^b	Materials	Wages	Other Expenses		
<u>1,000 Dollars</u>								
Suppliers of Timber to —								
Sawmiller	148 ^d	221	369					
Processor	518 ^d	778 ^f	1,296					
Processor	450 ^e	193 ^f	643					
Total	1,116	1,192	2,308					
Sawmill Operators				369	301	561	101	1,332
Other Wood Processors				1,939	1,587	2,170	495	6,191
Total				2,308	1,888	2,731	596	7,523

For footnotes, see Appendix Table 5.

TABLE 8--ESTIMATED NUMBER OF EMPLOYEES, WAGES, PROFITS, AND AVERAGE ANNUAL INCOME PER WORKER, WOOD USING INDUSTRIES, NORTHWESTERN OZARK REGION, MISSOURI, 1960

Item	Employees	Employers	Wages	Net Return to Labor, Capital & Management*	Average Annual Income per		
					Employee	Employer	
					Number	Number	1,000 Dollars
Harvesters and Haulers	1,042		1,192			1,144	
Sawmill Operators	281	80	301	101		1,071	1,263
Other Wood Processors	563	31	1,587	495		2,819	15,968
Total	1,886	111	3,080	596		1,633	5,369

*For footnote, see Appendix Table 6.

TABLE 9 — COSTS AND RETURNS FROM WOOD USING INDUSTRIES,
SOUTHWESTERN OZARK REGION, MISSOURI, 1960^a

Item	Returns to			Cost to Processor of			Net Return to Labor, Capital & Management ^c	Value of Products F. O. B. Plants
	Growers of Timber	Harvesters and Haulers	Total ^b	Materials	Wages	Other Expenses		
<u>1,000 Dollars</u>								
Suppliers of Timber to —								
Sawmiller	599 ^d	898	1,497					
Processor	1,046 ^d	1,568 ^f	2,614					
Processor	2,168 ^e	929 ^f	3,097					
Total	3,813	3,395	7,208					
Sawmill Operators				1,497	1,221	2,255	432	5,405
Other Wood Processors				5,711	4,838	6,394	1,473	18,416
Total				7,208	6,059	8,649	1,905	23,821

*For footnotes, see Appendix Table 5.

TABLE 10--ESTIMATED NUMBER OF EMPLOYEES, WAGES, PROFITS, AND AVERAGE ANNUAL INCOME PER WORKER, WOOD USING INDUSTRIES, SOUTHWESTERN OZARK REGION, MISSOURI, 1960

Item	Employees	Employers	Wages	Net Return to Labor, Capital & Management*	Average Annual Income per	
	Number	Number	1,000 Dollars	1,000 Dollars	Employee	Employer
Harvesters and Haulers	3,425		3,395		991	
Sawmill Operators	1,140	142	1,221	432	1,071	3,042
Other Wood Processors	1,782	74	4,838	1,473	2,715	19,905
Total	6,347	216	9,454	1,905	1,490	8,819

*For footnote, see Appendix Table 6.

TABLE 11 — COSTS AND RETURNS FROM WOOD USING INDUSTRIES IN EASTERN, NORTHWESTERN AND SOUTHWESTERN OZARK REGIONS, MISSOURI, 1960^a

Item	Returns to			Cost to Processor of			Net Return to Labor, Capital & Management ^c	Value of Products F. O. B. Plants
	Growers of Timber	Harvesters and Haulers	Total ^b	Materials	Wages	Other Expenses		
				1,000 Dollars				
Suppliers of Timber to —								
Sawmiller	1,351 ^d	2,026	3,377					
Processor	2,416 ^d	3,624 ^f	6,040					
Processor	4,734 ^e	2,029 ^f	6,763					
Total	8,501	7,679	16,180					
Sawmill Operators				3,377	2,756	5,096	970	12,199
Other Wood Processors				12,803	10,234	12,310	3,074	38,421
Total				16,180	12,990	17,406	4,044	50,620

For footnotes, see Appendix Table 5.

TABLE 12--ESTIMATED NUMBER OF PERSONS EMPLOYED, WAGES, PROFITS, AND AVERAGE ANNUAL INCOME PER WORKER, WOOD USING INDUSTRIES IN THE EASTERN, NORTHWESTERN AND SOUTHWESTERN OZARK REGIONS, MISSOURI, 1960

Item	Employees	Employer	Wages	Net Return to Labor, Capital & Management	Average Annual Income per	
	Number	Number	1,000 Dollars	1,000 Dollars	Employee	Employer
Harvesters and Haulers	7,724		7,679		994	
Sawmill Operators	2,573	574	2,756	970	1,071	1,690
Other Wood Processors	3,745	185	10,234	3,073	2,733	16,611
Total	14,042	759	20,669	4,043	1,472	5,327

*For footnote see Appendix Table 6.