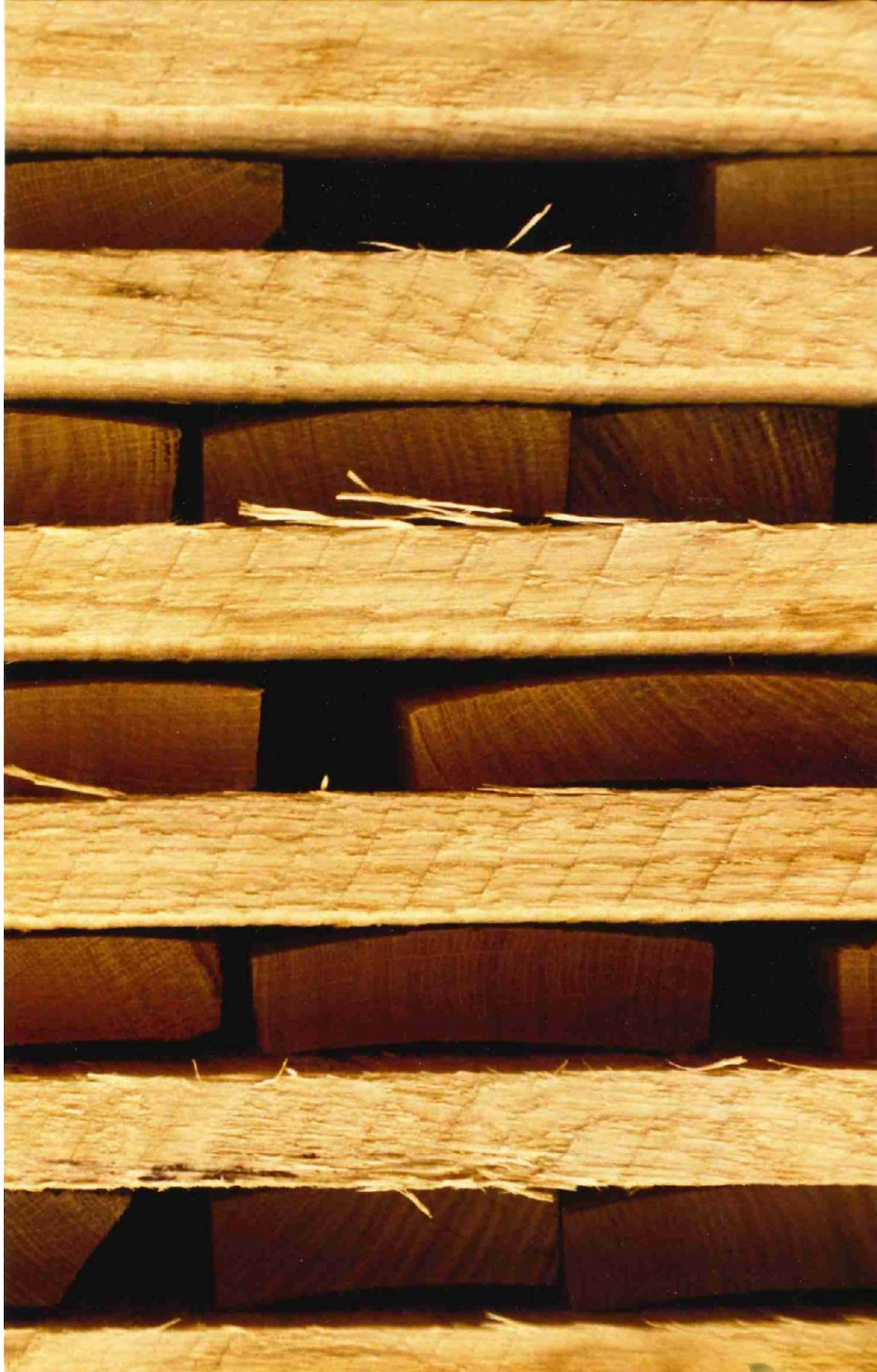


# Missouri's 2019 Timber Products Output Report



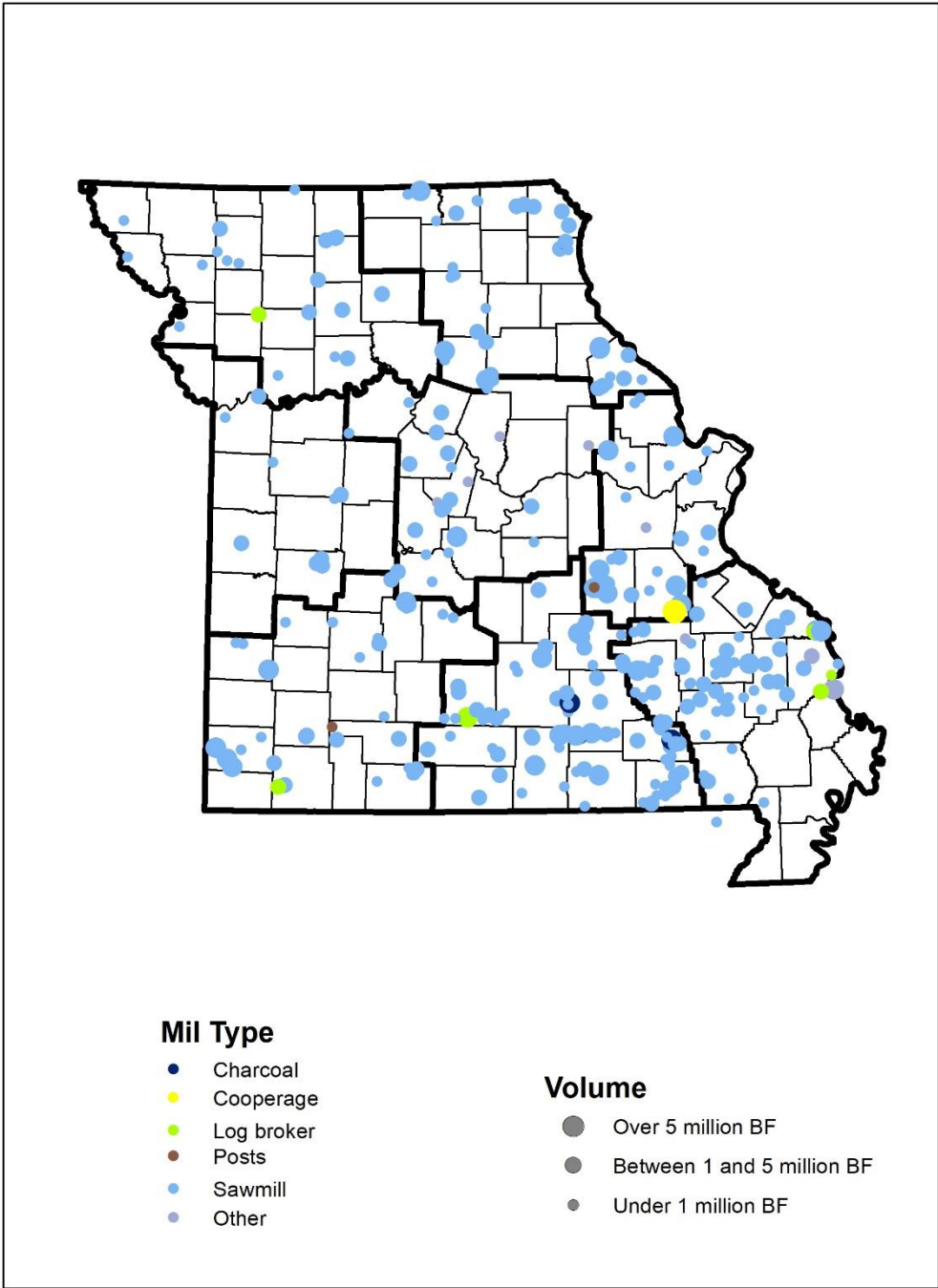


Figure 1 - Locations of active primary wood-using mills with mill size and type, Missouri, 2019

# 2019 MDC Timber Product Output (TPO) Report

---

*Tom Treiman and Mike Morris, Missouri Department of Conservation, Oct. 2020*

In the spring and early summer of 2020, Missouri Department of Conservation foresters set out to conduct interviews with 151 mill owner/operators, a random sample of primary wood processors throughout the state, asking for information on their firms from 2019. In this report we present forest industry trends, harvest levels and other details. Such detailed information is necessary for intelligent planning and decision making in wood procurement, forest resources management, and forest industry development. Likewise, researchers need current forest industry and industrial roundwood information for planning projects.

The spring and early summer of 2020 turned out to be a unique time period for Missouri, the country, and the forest products industry. COVID-19, an economic downturn of unprecedented proportions and political tensions in the US all contributed to the challenge of trying to track down mill owner/operators and ask them detailed questions about private business activity in what seemed, at that point, the far distant past. Many mills were temporarily, or perhaps permanently, shuttered during the survey period, and those that were open were understandably worried about one-on-one interviews. Of the 151 mills randomly selected for this year's survey, we were only able to contact 90, and many of those were not able to give complete responses. Heartfelt thanks are given to the primary wood-using firms who were able to provide information for this study and to the Missouri Department of Conservation Foresters for canvassing the respondents.

Following relatively new (2019) USFS guidelines, the survey sample consisted of 151 mills, out of approximately 400 mills that were or had been operating in Missouri at the time of previous TPO efforts in 2019 (another random sample) and 2015 (a complete census of all mills). The 90 responses represent about a 60% response rate. (Response Table 1.)

Because of this low response rate, analyses in this report are based on a combination of this new data and reprocessed data from earlier surveys, which may not match earlier published data. Totals are calculated based on the samples mills current data, and on data from previous years for mills that were not sampled.

(Response Table 2.) Given the age of some of the data, all results should be used with caution.

<b>Interview Results</b>	<b>Surveys</b>	<b>Rate</b>
In-person	90	59.6%
Unavailable	23	15.2%
Refused	13	8.6%
Forms not in	25	3.3%
<b>Total</b>	<b>151</b>	

Response Table 1 - Response rates for the 2020 TPO survey

<b>Data Year</b>	<b># Mills</b>	<b>Pct</b>
2020	89	25.7%
2019	50	14.5%
2016	175	50.6%
2014	19	5.5%
2011	11	3.2%
2008	2	0.6%

Response Table 2 – Table of the year of the most recent data (on products, mill types, species and source counties) for each mill

Data from surrounding states (imports from Missouri) is unavailable at the time of writing. As other states report, figures in this report may become out-of-date.

All board foot data in this report have been converted to International 1/4-inch scale by applying a multiplier of 1.08 to all roundwood volumes reported in Scribner Decimal C scale by sawmills and handle mills, a multiplier of 1.04 to all roundwood volumes reported in Scribner Decimal C scale by veneer and cooperage mills, a multiplier of 1.38 to all roundwood volume reported in Doyle scale by sawmills and handle mills, and a multiplier of 1.14 to all roundwood volume reported in Doyle scale by veneer and cooperage mills.

- In 2019, Missouri’s primary wood using industry was comprised of 333 sawmills, 3 cooperage mills, 5 post and pole mills, 4 charcoal plants, 8 log brokers, and 10 mills producing other products (Table 1).

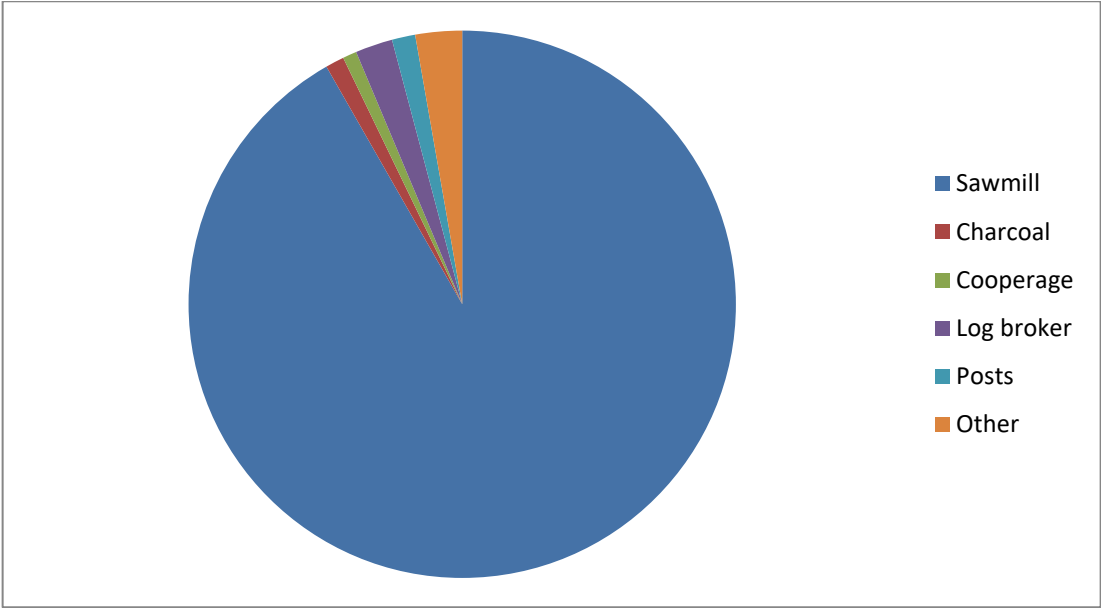


Figure 2 - Mills by type, 2019.

- Circular sawmills accounted for 54% of total volume and band sawmills for about 29%. (Table 8)

- Since the 1990s, the number of mills in Missouri has changed little, compared to major declines earlier in the 20<sup>th</sup> century.

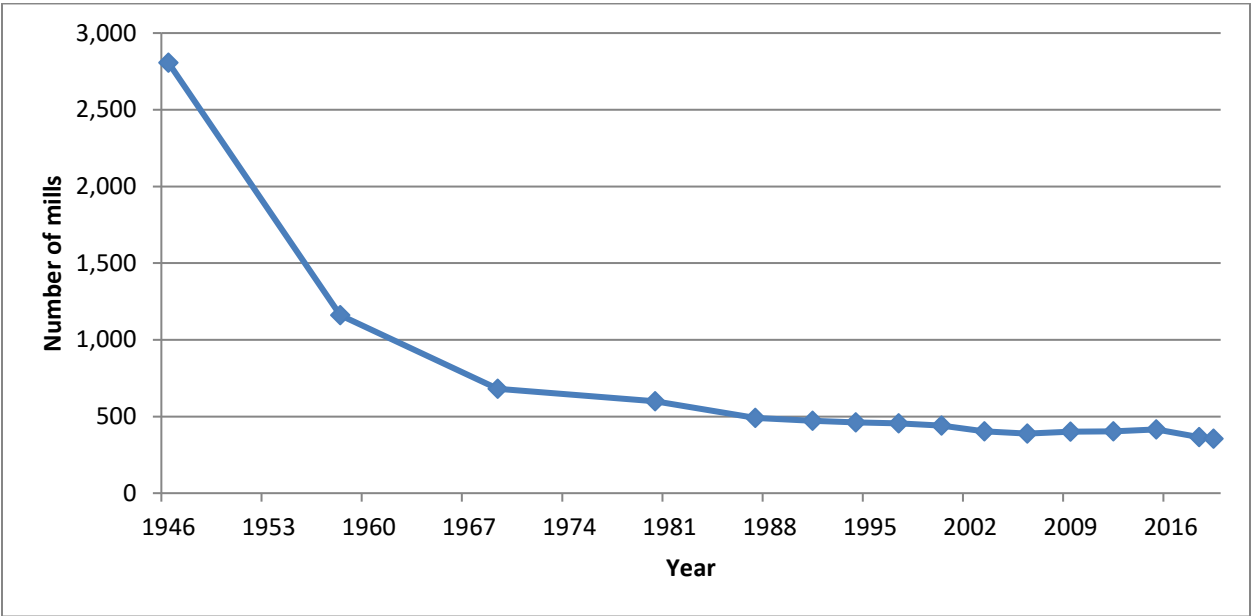


Figure 3 - Number of Missouri mills over time.

- In 2019 the total number of sawmills in Missouri was 333 compared with 342 mills in 2015.

- There were 33 large mills (with an annual lumber production of 5 million board feet or more) fewer than the 36 in 2015, while the number of medium mills (under 1 million BF) increased by 9.

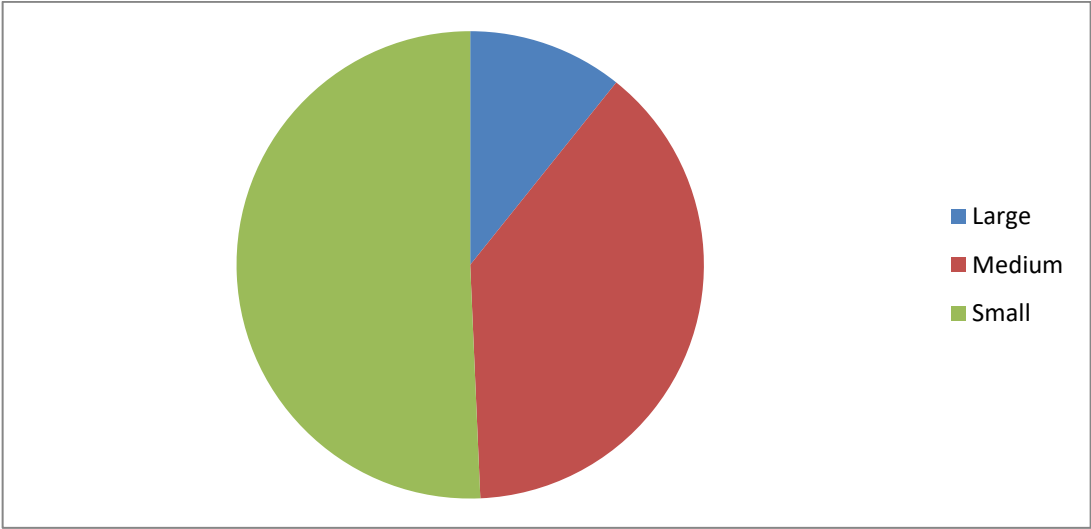


Figure 4 - Mills by size, 2019.

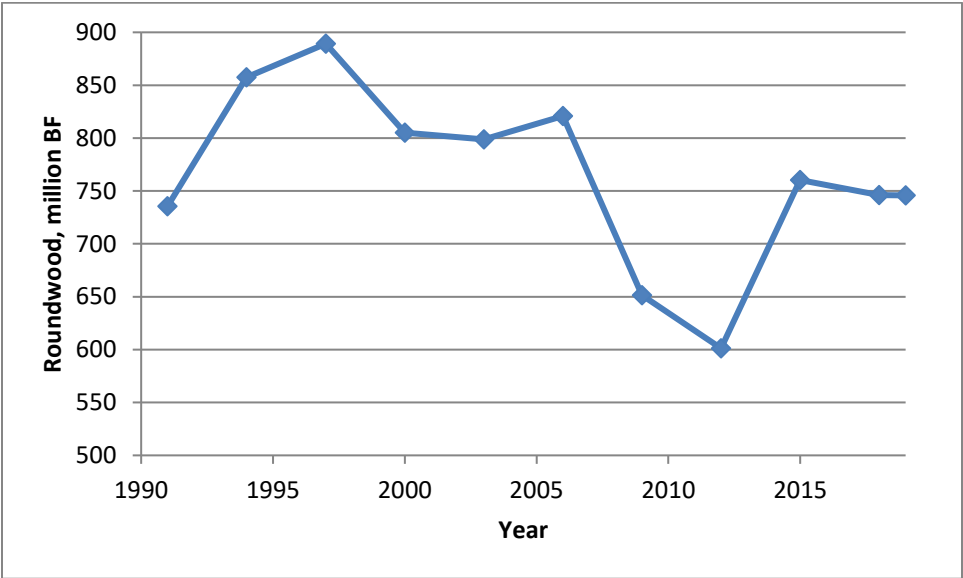


Figure 5 - Mill receipts over time.

- In 2019, the primary wood-using mills in Missouri processed about 745,700 MBF of industrial roundwood, about the same as in 2018. (Table 2)
- About 59,000 MBF harvested from other states was reported by Missouri mills. (Table 4)
- Based on 2009 data (the latest available), other states, primarily Kentucky and Iowa, imported about 44,600 MBF of roundwood from Missouri (including from Missouri log brokers.)
- About 6.5% of the industrial roundwood processed by Missouri mills consisted of softwood species (Table 2).
- About 89% consisted of sawlogs and bolts. (Table 8)
- In 2019, the MDC's Ozark Region was the leading supplier of industrial roundwood in Missouri, with about 230,000 MBF, or about 34% of the total industrial roundwood produced. The Southeast Region was second with 22%. (Table 2)



- The top counties for industrial roundwood supply included Shannon, Texas, Washington, and Wayne.

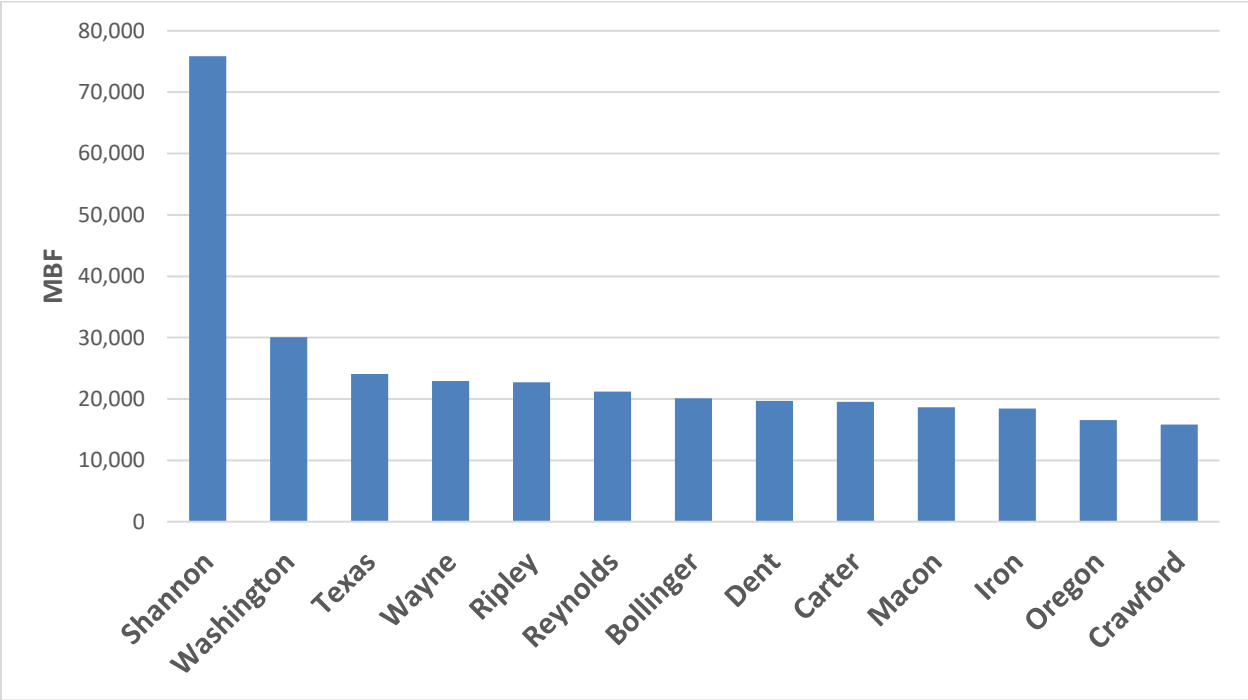


Figure 6 - Top counties by harvest, 2019.

- The red oak group was the most harvested species group in 2019, accounting for 44% of the total industrial roundwood volume. White oaks at about 28% and hickory at 6.6%, were other major species harvested. (Table 2)

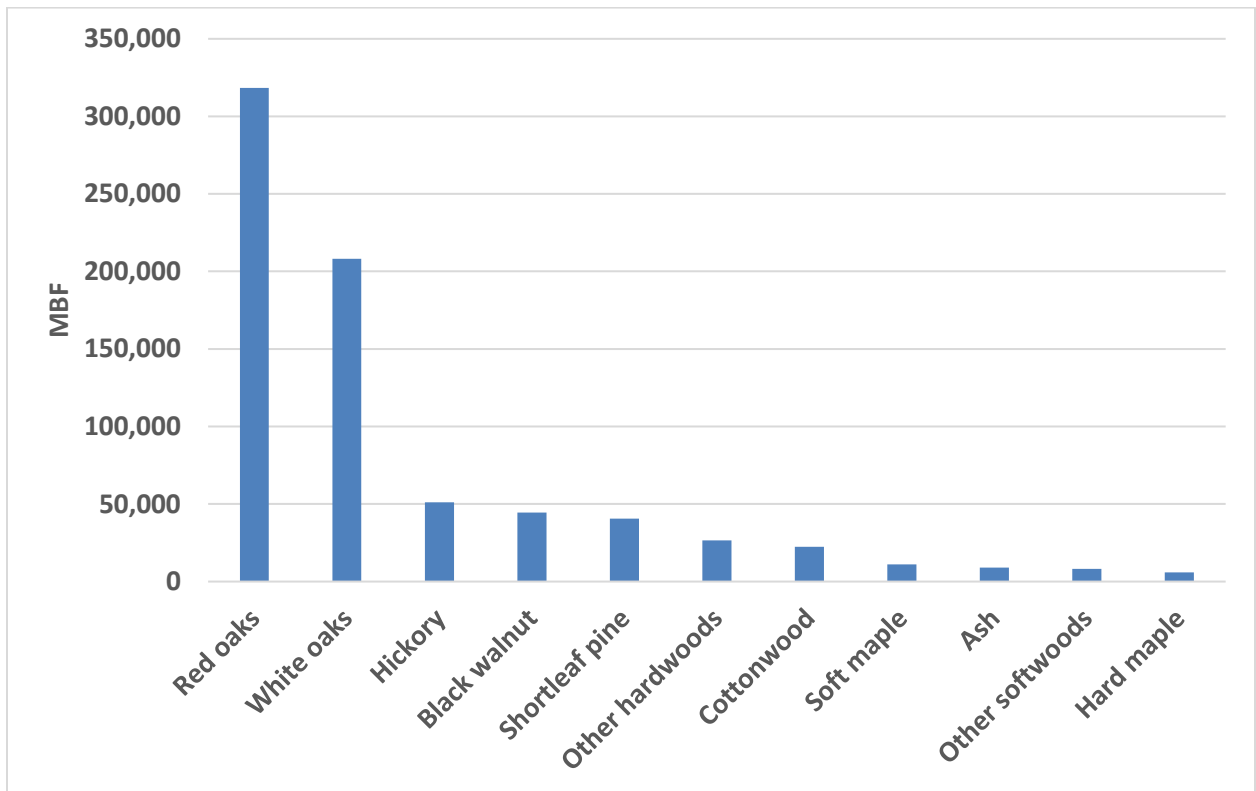


Figure 7 - Top species, 2019.

- Comparing harvest results from the 2019 primary wood processor survey with 2019 growth results from Forest Inventory and Analysis plot work, shows that the Northeast, Ozark and Southeast Regions cut the largest percentage of their growth (about 55% to 60%) while the Kansas City Region cut the smallest percentage of growth (21%). About 86% of red oak growth and 55% of white oak growth were harvested statewide. (Table 5)

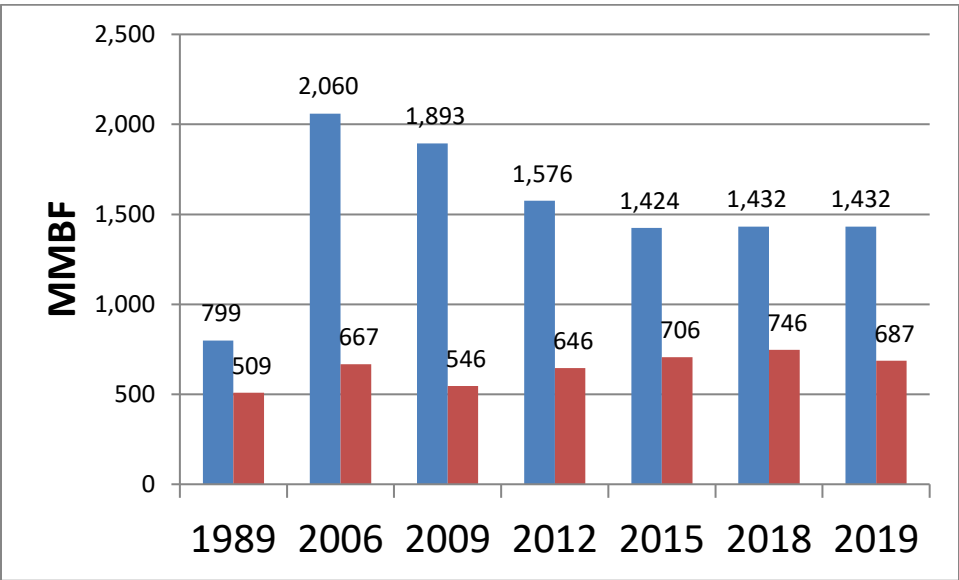


Figure 8 – Growth vs. harvest over time.

- Using USFS formulae, Missouri mills produced about 1.8 million green tons of residues in 2019. The bulk of this was coarse residues (suitable for chipping) from hardwoods (Table 6).
- Weighting responses by mill volume, less than 5% of mill residues went unused. Over 30% were used for charcoal and 33% or so were used for “miscellaneous and other” purposes (

- Table 7).
- While 95% of sawmill residues are currently being utilized, very little harvest residue is utilized. According to 2009 data, 102.6 million cubic feet of wood was utilized in that year. An additional 71.6 million cubic feet of wood was generated from logging slash, logging residues, cull trees, etc. The vast majority of this woody material is not currently being utilized.
- Using 2019 price data from Missouri Timber Price Trends (TPT), an estimated \$172 million could potentially have been paid to landowners for the timber harvested. This includes about \$70 million for red oaks, \$47 million for white oaks and nearly \$26 million for walnut. TPT price figures are, however, based only on reports from MDC, consulting or other professional foresters. As such they represent prices at well-managed, marked and monitored timber sales. For those landowners who do not use a professional forester, the presumption is that prices are significantly lower, so the actual total paid to landowners in 2019 is surely less than \$172 million.
- In 2018, the most recent available data, forest products, wood, lumber, paper and related industries contributed \$9.7 billion to the Missouri economy, in 2019 dollars. These industries support over 41,000 jobs at a payroll of over \$2.6 billion and are responsible for nearly \$800 million in taxes that help to run our state and country, including \$103 million in state sales tax. These numbers include logging and sawmill operations, secondary wood products, furniture and cabinet makers, log cabins, paperboard manufacturing and so on. The grand total includes not only the direct effect of jobs in the industry but secondary effects in the economy as a whole. Secondary effects are the changes in economic activity from subsequent rounds of re-spending of primary dollars. There are two types of secondary effects: 1) Indirect effects

are the changes in sales, income, or employment within the region in backward-linked industries supplying goods and services to forest products industry. 2) Induced effects are the increased sales within the region from household spending of the income earned in the forest products and supporting industries. Forest products employees spend the income they earn from tourism on housing, utilities, groceries, and other consumer goods and services. This generates sales, income, and employment throughout the region's economy.

**Table 1 – Number of active primary wood-using mills by MDC Region, Missouri, 2019.**

Type	Size	# of Mills	MDC Region								2018 # of mills
			Central	Kansas City	Northeast	Northwest	Ozark	Southeast	Southwest	St. Louis	
Sawmill	Large <sup>1</sup>	33	4		4		8	6	5	6	36
	Medium <sup>2</sup>	132	14	6	17	10	41	28	11	5	123
	Small <sup>3</sup>	168	10	8	24	12	43	34	24	13	183
<b>Subtotal</b>		<b>333</b>	<b>28</b>	<b>14</b>	<b>45</b>	<b>22</b>	<b>92</b>	<b>68</b>	<b>40</b>	<b>24</b>	<b>342</b>
Charcoal	Large	2					2				
	Small	2			1		1				
<b>Subtotal</b>		<b>4</b>			<b>1</b>		<b>3</b>				<b>3</b>
Cooperage	Large	1								1	
	Small	2	1					1			
<b>Subtotal</b>		<b>3</b>	<b>1</b>					<b>1</b>		<b>1</b>	<b>2</b>
Log broker	Large	2					1	1			
	Medium	5				1	1	2	1		
	Small	1						1			
<b>Subtotal</b>		<b>8</b>				<b>1</b>	<b>2</b>	<b>4</b>	<b>1</b>		<b>9</b>
Posts	Medium	2					2				
	Small	3					1		1	1	
<b>Subtotal</b>		<b>5</b>					<b>3</b>		<b>1</b>	<b>1</b>	<b>5</b>
Other	Large	1						1			
	Medium	1						1			
	Small	8	4		1		2			1	
<b>Subtotal</b>		<b>10</b>	<b>4</b>		<b>1</b>		<b>2</b>	<b>2</b>		<b>1</b>	<b>13</b>
<b>Total</b>		<b>363</b>	<b>33</b>	<b>14</b>	<b>47</b>	<b>23</b>	<b>102</b>	<b>75</b>	<b>42</b>	<b>27</b>	<b>374</b>

<sup>1</sup> More than 5 million bf

<sup>2</sup> Between 1 and 5 million bf

<sup>3</sup> Less than 1 million bf

**Table 2 – Harvest volume by species group and MDC Region, Missouri, 2019.**

Species Group	Total (MO)	Pct. of Total	MDC Region								Out of State
			Central	Kansas City	Northeast	Northwest	Ozark	Southeast	Southwest	St. Louis	
Shortleaf pine	37,146.0	5.4%	334.6				23,192.9	6,163.2	252.7	7,202.7	3,475.3
Other softwoods	7,030.3	1.1%	1,924.5	121.3	209.2	61.2	1,112.6	411.7	2,986.5	203.4	1,190.1
White oaks	194,593.5	27.9%	21,827.6	4,428.3	18,669.9	5,335.9	59,778.9	45,130.1	16,143.3	23,279.6	13,534.7
Red oaks	302,050.7	42.7%	22,836.8	4,482.9	18,499.2	5,283.4	118,756.0	71,245.6	31,676.9	29,269.9	16,184.7
Hickory	47,880.2	6.9%	4,359.7	657.4	3,096.3	1,047.9	20,107.9	13,201.7	2,628.7	2,780.6	3,282.0
Hard maple	4,620.9	0.8%	398.8	105.6	445.3	3.3	30.3	2,184.0	657.1	796.5	1,255.8
Soft maple	10,491.1	1.5%	1,475.5	289.4	4,589.5	1,821.9	151.3	1,179.3	325.3	658.8	648.3
Ash	7,288.9	1.2%	741.6	316.6	1,055.0	472.7	174.2	3,039.4	1,198.3	291.2	1,820.8
Cottonwood	21,061.2	3.0%	2,691.9	1,187.7	7,437.0	6,867.2	89.7	934.2	564.6	1,289.0	1,290.6
Black walnut	32,580.9	6.0%	3,402.9	3,639.9	1,150.4	3,644.0	5,520.4	1,652.3	12,993.3	577.6	11,824.9
Other hardwoods	22,051.7	3.5%	2,678.1	995.1	2,883.6	2,013.6	1,455.6	7,585.0	3,291.4	1,149.2	4,409.2
<b>Total</b>	<b>686,795.5</b>		<b>62,672.0</b>	<b>16,224.3</b>	<b>58,035.5</b>	<b>26,551.2</b>	<b>230,369.8</b>	<b>152,726.5</b>	<b>72,717.9</b>	<b>67,498.5</b>	<b>58,916.3</b>
Pct. of Total			8.4%	2.2%	7.8%	3.6%	30.9%	20.5%	9.8%	9.1%	

**Table 3 – Harvest volume by county in MBF, Missouri, 2019.**

County	Region	Volume
Adair	Northeast	2,922.4
Andrew	Northwest	209.2
Atchison	Northwest	203.6
Audrain	Central	3,630.3
Barry	Southwest	7,174.8
Barton	Southwest	2,496.5
Bates	Kansas City	1,927.2
Benton	Kansas City	1,993.6
Bollinger	Southeast	20,128.2
Boone	Central	7,952.0
Buchanan	Northwest	1,623.4
Butler	Southeast	8,320.3
Caldwell	Northwest	617.3
Callaway	Central	2,370.1
Camden	Central	6,098.5
Cape Girardeau	Southeast	15,629.8
Carroll	Northwest	2,520.7
Carter	Ozark	19,517.0
Cass	Kansas City	647.8
Cedar	Southwest	1,939.4
Chariton	Northwest	6,771.2
Christian	Southwest	6,440.2
Clark	Northeast	7,415.0
Clay	Kansas City	288.4
Clinton	Northwest	197.4
Cole	Central	5,434.1
Cooper	Central	1,931.4
Crawford	St. Louis	15,855.6
Dade	Southwest	2,056.5
Dallas	Southwest	3,548.6
Daviess	Northwest	1,575.2
De Kalb	Northwest	282.9
Dent	Ozark	19,707.2
Douglas	Ozark	13,869.6
Dunklin	Southeast	276.7
Franklin	St. Louis	6,995.0
Gasconade	Central	4,857.6
Gentry	Northwest	1,774.0

County	Region	Volume
Greene	Southwest	2,938.4
Grundy	Northwest	3,380.2
Harrison	Northwest	793.0
Henry	Kansas City	1,966.2
Hickory	Southwest	2,060.0
Holt	Northwest	220.8
Howard	Central	3,149.5
Howell	Ozark	7,645.1
Iron	Southeast	18,458.7
Jackson	Kansas City	232.8
Jasper	Southwest	2,609.1
Jefferson	St. Louis	6,507.8
Johnson	Kansas City	1,268.5
Knox	Northeast	1,875.8
Laclede	Southwest	6,680.6
Lafayette	Kansas City	541.6
Lawrence	Southwest	5,473.0
Lewis	Northeast	2,642.6
Lincoln	St. Louis	3,716.6
Linn	Northwest	1,175.6
Livingston	Northwest	3,113.6
McDonald	Southwest	5,754.3
Macon	Northeast	18,665.9
Madison	Southeast	15,845.1
Maries	Central	5,082.9
Marion	Northeast	1,242.5
Mercer	Northwest	610.4
Miller	Central	4,380.3
Mississippi	Southeast	116.0
Moniteau	Central	1,821.8
Monroe	Northeast	2,839.8
Montgomery	Central	4,168.7
Morgan	Central	7,029.5
New Madrid	Southeast	2,304.6
Newton	Southwest	9,236.5
Nodaway	Northwest	418.7
Oregon	Ozark	16,552.1
Osage	Central	3,624.4
Ozark	Ozark	8,636.8
Pemiscot	Southeast	41.8



County	Region	Volume
Perry	Southeast	12,570.2
Pettis	Kansas City	801.7
Phelps	Ozark	5,702.4
Pike	Northeast	6,174.0
Platte	Kansas City	133.8
Polk	Southwest	2,948.1
Pulaski	Ozark	6,304.2
Putnam	Northeast	882.3
Ralls	Northeast	3,300.8
Randolph	Northeast	4,789.6
Ray	Northwest	879.2
Reynolds	Southeast	21,214.7
Ripley	Ozark	22,728.5
St Charles	St. Louis	1,024.7
St Clair	Kansas City	4,420.8
Ste. Genevieve	Southeast	2,230.9
St Francois	Southeast	3,048.2
St Louis	St. Louis	903.0
Ste Genevieve	Southeast	2,743.6
Saline	Central	1,187.5
Schuyler	Northeast	983.1

County	Region	Volume
Scotland	Northeast	2,168.9
Scott	Southeast	4,789.8
Shannon	Ozark	75,843.7
Shelby	Northeast	980.6
Stoddard	Southeast	2,506.1
Stone	Southwest	3,344.7
Sullivan	Northeast	1,275.4
Taney	Southwest	3,597.3
Texas	Ozark	24,054.0
Vernon	Kansas City	2,002.1
Warren	St. Louis	1,953.1
Washington	St. Louis	30,056.4
Wayne	Southeast	22,902.0
Webster	Southwest	4,421.8
Worth	Northwest	211.4
Wright	Ozark	9,809.2
City of St. Louis	St. Louis	603.1
<b>Subtotal</b>		687,510.3
<i>Not reported</i>		784.6
Out of State		58,318.2
<b>Grand Total</b>		746,613.1

**Table 4 –Volume of wood received from other states, Missouri, 2019.**

<b>State</b>	<b>Volume</b>
Arkansas	16,167.7
Illinois	21,352.5
Indiana	710.7
Iowa	4,433.9
Kansas	6,794.7
Kentucky	4,021.3
Michigan	423.0
Nebraska	853.0
Oklahoma	2,945.3
Tennessee	616.1
<i>Not reported</i>	784.6
<b>Total</b>	<b>59,102.8</b>

**Table 5 – Percentage of 2019 growth of sawtimber on forestland (from FIA plot data) harvested (from mill survey), by species group and by MDC Region Missouri, 2019.**

<b>Species Group</b>	<b>Total</b>
Shortleaf pine	38.0%
Other softwoods	23.2%
White oaks	54.8%
Red oaks	86.3%
Hickory	36.4%
Hard maple	27.1%
Soft maple	67.9%
Ash	52.4%
Cottonwood	139.2%
Black walnut	61.9%
Other hardwoods	10.3%
<b>Total</b>	<b>52.1%</b>

Region	Total
Northwest	34.5%
Kansas City	21.4%
Central	35.5%
Northeast	59.9%
St. Louis	48.1%
Southeast	55.4%
Southwest	38.4%
Ozark	57.8%
<b>Total</b>	<b>52.1%</b>

**Table 6 – Estimated residue in green tons, Missouri, 2019.**

Residue	Conifer	Hardwood	Total
Bark	232,019	27,840	259,859
Coarse	914,428	65,448	979,876
Fine	532,279	38,097	570,375
Total	1,678,726	131,384	1,810,110

**Table 7 – Use of residues, weighted by mill size, Missouri, 2019.**

<b>Residue Use</b>	<b>Total</b>
A: Used for manufacture of fiber products	10.3%
B: Used for manufacture of composite products	1.0%
C: Used for charcoal	30.8%
D: Used for fuel at this mill	5.8%
E: Used for fuel elsewhere	3.3%
F: Used for domestic fuel	3.9%
G: Used for miscellaneous uses	33.0%
H: Used for other	7.6%
I: Not used	4.3%

**Table 8 - Volume received by mill and roundwood types in MBF, Missouri, 2019.**

<b>Mill Type</b>	<b>Sawlogs and bolts</b>	<b>Veneer logs</b>	<b>Cabin logs</b>	<b>Charcoal wood</b>	<b>Cooperage logs</b>	<b>Excelsior/shaving bolts</b>	<b>Other</b>	<b>Poles</b>	<b>Posts</b>	<b>Total</b>
Band sawmill	206,972.7	25.0			9,416.0		870.0			<b>217,283.7</b>
Circular sawmill	403,730.8		180.0		2,070.0		90.0	400.0	300.0	<b>406,770.8</b>
Scragg sawmill	38,846.8						220.0	6,000.0		<b>45,066.8</b>
Portable Bandsaw	2,816.7								2.0	<b>2,818.7</b>
Export logs - domestic		4,889.0			250.0					<b>5,139.0</b>
Export logs - international	4,871.4	1,892.4								<b>6,763.8</b>
Log broker	2,558.5									<b>2,558.5</b>
Tight cooperage					1,759.6					<b>1,759.6</b>
Untreated post mill	39.0							96.0	2,810.0	<b>2,945.0</b>
Treated post mill									750.0	<b>750.0</b>
Charcoal kiln				23,453.6						<b>23,453.6</b>
Excelsior/shavings mill	2,575.8					6,555.2				<b>9,131.0</b>
Other	263.9						17,908.6	4,000.0		<b>22,172.5</b>
<b>Total</b>	<b>662,675.7</b>	<b>6,806.4</b>	<b>180.0</b>	<b>23,453.6</b>	<b>13,495.6</b>	<b>6,555.2</b>	<b>19,088.6</b>	<b>10,496.0</b>	<b>3,862.0</b>	<b>746,613.1</b>

**Table 9 - Volume received by species group and roundwood types in MBF, Missouri, 2019.**

Species Group	Sawlogs and bolts	Veneer logs	Cabin logs	Char-coal wood	Cooper-age logs	Excelsior /shaving bolts	Other	Poles	Posts	Total
Shortleaf pine	23,318.2			3,520.0		5,120.0	27.0	5,076.0	3,560.1	<b>40,621.3</b>
Other softwoods	6,343.3					1,435.2	140.0		301.9	<b>8,220.4</b>
White oaks	179,306.2	3,508.3	72.0	3,193.1	13,301.1		7,235.5	1,512.0		<b>208,128.2</b>
Red oaks	295,585.7	1.7	54.0	13,044.7			6,377.3	3,172.0		<b>318,235.3</b>
Hickory	46,542.4	210.7	18.0	3,207.4			975.7	208.0		<b>51,162.2</b>
Hard maple	5,875.2						1.4			<b>5,876.7</b>
Soft maple	10,603.4			96.0			440.0			<b>11,139.4</b>
Ash	8,109.8			96.0			904.0			<b>9,109.8</b>
Cottonwood	21,911.8						440.0			<b>22,351.8</b>
Black walnut	40,453.8	3,074.3			162.2		715.5			<b>44,405.7</b>
Other hardwoods	23,724.6	11.5	36.0	296.3	32.4		1,832.1	528.0		<b>26,460.9</b>
<b>Total</b>	<b>661,774.4</b>	<b>6,806.4</b>		<b>23,453.6</b>	<b>13,495.6</b>	<b>6,555.2</b>	<b>19,088.6</b>	<b>10,496.0</b>	<b>3,862.0</b>	<b>745,711.8</b>

