



Forests of Missouri, 2014

This resource update provides an overview of forest resources in Missouri based on an inventory conducted by the U.S. Forest Service, Forest Inventory and Analysis (FIA) program at the Northern Research Station (NRS) in cooperation with the Missouri Department of Conservation. Estimates are based on field data collected using the annualized sample design and are updated yearly. The estimates presented in this update are for the inventory years 2009-2014 (2014) with comparisons made to 2005-2009 (2009). In 2014, NRS-FIA changed to a 7-year inventory cycle, wherein 1/7th (14.3 percent) of the plots will be measured annually. All inventory estimates (both current and change) will continue being based on the most recent measurements taken on these plots. As the 7-year cycle is phased in, the difference between the report year and average date of the recent data will increase from 2 to 3 years.

The difference between the report year and the average midpoint year for change will increase from 4.5 to 6.5 years. For the 2014 report, these differences are 2.3 and 4.8 years, respectively.

Overview

The area of forest land in Missouri increased by 57,000 acres (0.2 percent) from 15.4 million acres in 2009 to 15.5 million acres in 2014 (Table 1). The number of live trees on Missouri's forest land in 2014 was estimated at 8.2 billion trees, a decrease of 3.7 percent from 2009. Live tree aboveground biomass and net volume increased on both forest land and timberland. Average annual net growth, and average annual other removals (e.g., land use change) decreased, while average annual mortality and average annual harvest removals increased from 2009 (Table 1).

Table 1.—Missouri forest statistics, change between 2009 and 2014

	2009 Estimate	Sampling error (percent)	2014 Estimate	Sampling error (percent)	Change since 2009 (percent)
Forest Land					
Area (thousand acres)	15,444.5	0.7	15,475.4	0.7	0.2
Number of live trees ≥1 in diameter (million trees)	8,466.1	1.3	8,150.3	1.2	-3.7
Aboveground biomass of live trees ≥1 in (thousand oven-dry tons)	627,861.4	1.0	647,154.6	1.0	3.1
Net volume of live trees ≥5 in diameter (million cubic ft)	20,414.4	1.1	21,207.3	1.1	3.9
Annual net growth live trees ≥5 in (thousand ft ³ /yr)	529,140.0	3.5	394,743.8	4.1	-25.4
Annual mortality of live trees ≥5 in (thousand ft ³ /yr)	213,661.8	4.3	309,799.9	3.7	45.0
Annual harvest removals of live trees ≥5 in (thousand ft ³ /yr)	161,618.6	8.2	177,749.5	8.1	10.0
Annual other removals of live trees ≥5 in (thousand ft ³ /yr)	30,865.8	23.1	18,512.8	24.6	-40.0
Timberland					
Area (thousand acres)	14,926.1	0.8	14,916.9	0.8	-0.1
Number of live trees ≥1 in diameter (million trees)	8,160.3	1.4	7,862.1	1.3	-3.7
Aboveground biomass of live trees ≥1 in (thousand oven-dry tons)	607,076.1	1.1	624,729.6	1.0	2.9
Net volume of live trees ≥5 in diameter (million ft ³)	19,736.6	1.2	20,459.5	1.2	3.7
Net volume of growing stock trees (million ft ³)	16,507.8	1.3	16,467.2	1.3	-0.2
Annual net growth of growing stock trees (million ft ³ /yr)	462,182.6	3.1	322,022.3	3.7	-30.3
Annual mortality of growing stock trees (million ft ³ /yr)	125,856.9	4.7	201,774.9	4.1	60.3
Annual harvest removals of growing stock trees (million ft ³ /yr)	134,724.6	8.7	150,695.4	8.7	11.9
Annual other removals of growing stock trees (million ft ³ /yr)	26,369.7	24.2	17,589.7	23.6	-33.3

Forest Area



Fall colors in Missouri. Photo by Missouri Department of Conservation, used with permission.

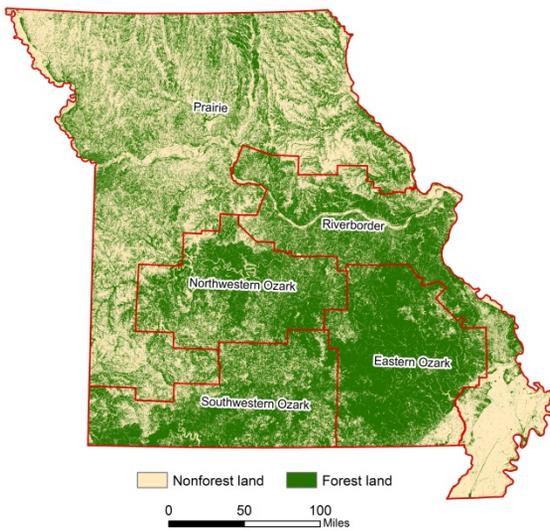


Figure 1.—Forest land cover by Forest Inventory unit, Missouri, 2014.

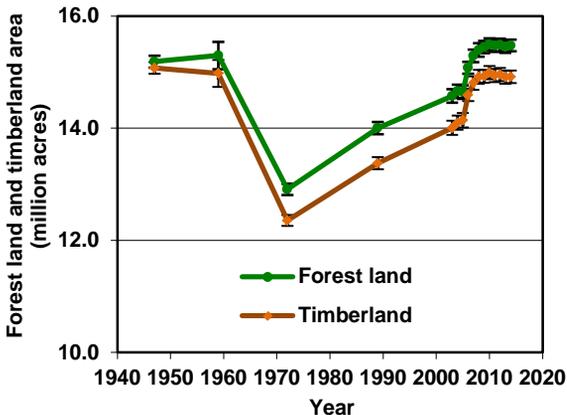


Figure 2.—Area of forest land and timberland in Missouri, by year. Sampling errors and error bars shown in the tables and figures in this report represent 68% confidence intervals for the estimated values.

Missouri is divided into five inventory units (Fig. 1). Forest land area is 15.5 million acres \pm 11,000 acres, almost 35 percent of total land area in the State. The Eastern Ozark unit, at 71 percent forested, is the most forested unit, followed by the Northwest Ozark and Southwest Ozark units, which are both almost 50 percent forested.

After plummeting after the 1959 inventory, both forest land and timberland area have been increasing since 1972. (Fig. 2). There are now more acres of forest land than there were during the first inventory of Missouri's forests in 1947.

The oak/hickory forest-type group accounts for 80 percent of the forest land area in the State (Fig. 3). In the Eastern Ozark, Southwest Ozark, and Northwestern Ozark units, the oak/hickory, oak/pine, and oak/gum/cypress forest-type groups, combined account for more than 90 percent of the forest land area. The second most common forest-type group is the elm/ash/cottonwood forest-type group, which occurs on only 7 percent of the forest land area. Less than a half of a percent of the forest land in the State is nonstocked.

Eighty-two percent of the forest land in the State is owned by private individuals or groups. More than 90 percent of the forest land in the Prairie unit is privately owned. The Eastern Ozark unit has 33 percent of forest land area in public ownership; this is the largest proportion of public ownership of all the units.

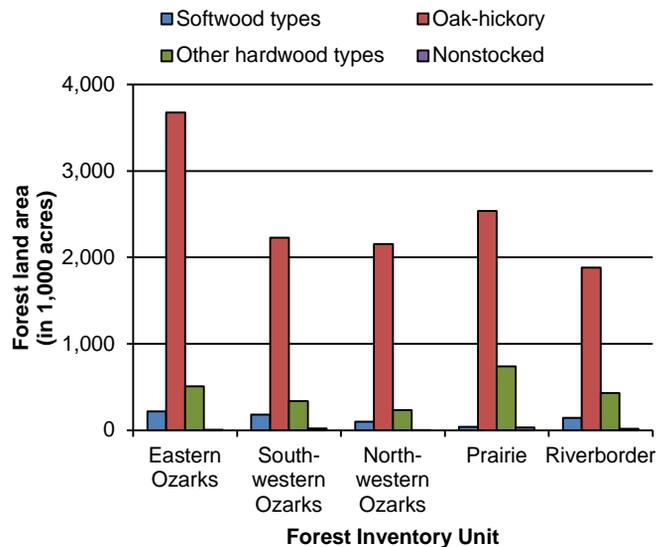


Figure 3.—Area of forest land by Forest Inventory unit and forest-type group, Missouri, 2014.

Volume, Biomass, and Trends

Ninety species of trees were recorded on Missouri forest land during 2009-2014. Two-thirds of Missouri’s 21.2 billion cubic feet of live-tree volume on forest land is represented by just 10 species (Table 2). Oak species make up 58 percent of the live-tree volume on forest land, with white oak (*Quercus alba*) alone accounting for 20 percent of the total. Eighty percent of the volume comes from growing-stock trees.

In terms of sawtimber volume on timberland, eastern redcedar is not in the list of top 10 species, falling to number 24. Eastern redcedar is the most numerous tree species on forest land in Missouri, but only 5 percent are sawtimber size.

Most of aboveground tree biomass is in the bole (70 percent), followed by tops and limbs (17 percent), saplings (9 percent), and stumps (4 percent). The aboveground live-tree biomass on forest land increased from 627.9 million short tons in 2009 to 647.2 million short tons in 2014 (Fig. 4).

Every year between 2009 and 2014, there was an average of 523.8 million cubic feet of growing-stock volume added to the timberland of Missouri through growth (average annual gross growth). From this average annual gross growth, an average of 201.8 million cubic feet of growing stock died each year (average annual mortality). This resulted in an average annual net growth of growing stock of 322.0 million cubic feet per year (Fig. 5). The average annual removals of growing stock during the same period was 168.3 million cubic feet. Subtracting mortality and removals from growth resulted in a net gain of 153.7 million cubic feet of growing stock per year between 2009 and 2014 on timberland.

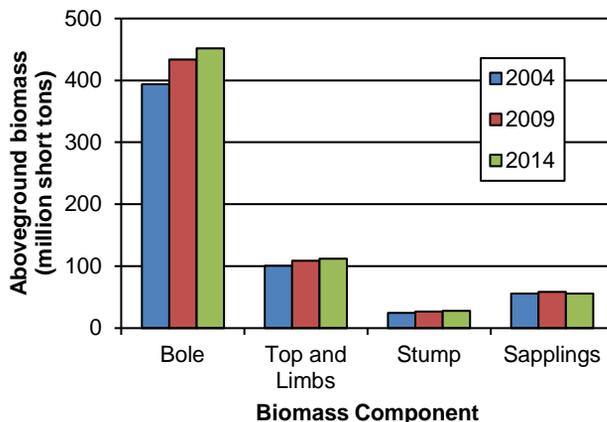


Figure 4.—Aboveground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in million dry short tons, on forest land by tree component, Missouri, 2004, 2009, and 2014.

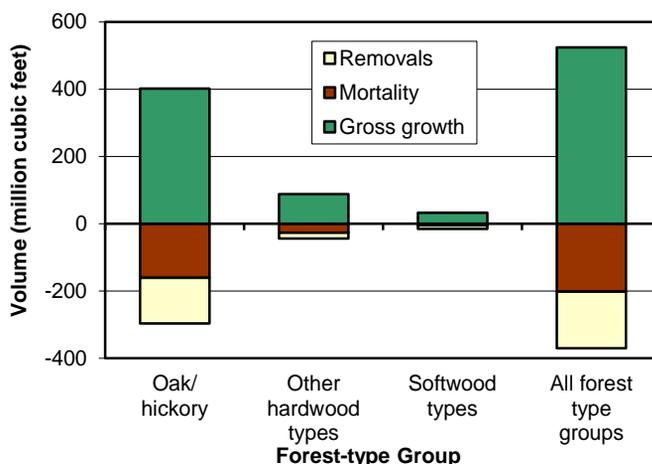


Figure 5.—Average annual gross growth, average annual mortality, and average annual removals of growing-stock on timberland by top 5 forest-type groups, Missouri, 2014.

Table 2.—Top 10 tree species by volume estimates on forest land and timberland, Missouri, 2014

Rank	Species	Volume of live trees on forest land (million ft ³)	Sampling error (%)	Change since 2009 (%)	Volume of sawtimber trees on timberland (million board feet)	Sampling error (%)	Change since 2009 (%)
1	White oak	4,180.2	2.8	3.2	12,810.0	3.5	4.4
2	Black oak	2,901.6	3.1	0.3	9,308.0	3.9	0.3
3	Post oak	2,091.5	3.6	0.0	4,348.9	4.8	-2.4
4	Shortleaf pine	1,000.1	6.9	8.4	4,182.8	7.1	10.5
5	Northern red oak	991.6	5.8	-6.1	3,526.9	6.8	-4.3
6	Eastern redcedar	761.8	5.0	11.4	451.3	11.0	-40.4
7	Black walnut	700.1	6.2	9.4	1,905.2	8.1	9.2
8	Shagbark hickory	595.8	6.1	8.3	1,494.0	8.3	11.6
9	Scarlet oak	548.6	6.5	-17.7	1,840.4	7.9	-14.6
10	American sycamore	456.3	12.3	10.3	1,740.0	14.0	11.1
	Other softwood species	19.8	59.2	57.1	76.9	71.2	38.6
	Other hardwood species	6,959.9	2.4	8.2	14,624.3	3.8	7.3
	All species	21,207.3	1.1	3.9	56,308.7	1.7	2.9

Missouri's Timber Product Output, 2012

Primary wood-using mills in Missouri were surveyed to determine the size and composition of the State's primary wood-using industry, its use of roundwood, and the generation and disposition of wood residues. Below are some preliminary findings from that survey. A full report is in preparation as more detailed information is analyzed.

There were 122.7 million cubic feet of industrial roundwood harvested from Missouri's forests in 2012, a 20 percent increase from 2009. Saw logs accounted for more than 85 percent of industrial roundwood harvested in 2012 (Fig. 6). Pulpwood, which was the second most harvested product, only accounted for 3 percent of the total harvest.

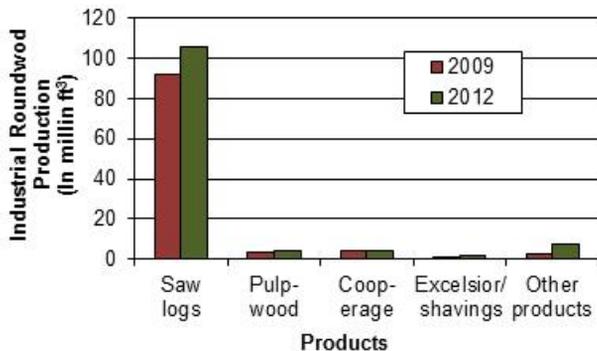


Figure 6.—Industrial roundwood production by product, Missouri, 2009 and 2012.

Three-fourths of the species harvested were oaks (Fig. 7). Other important species harvested were shortleaf pine, black walnut, hickory, and eastern redcedar. Between 2009 and 2012, eastern redcedar and ash, which are in the top 10 for the most harvested species groups, decreased by 19 percent and 8 percent, respectively.

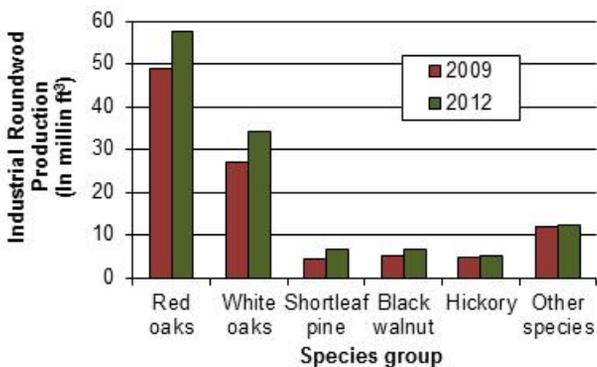


Figure 7.—Industrial roundwood production by species group, Missouri, 2009 and 2012.

One-third of the mill residues generated during the processing of industrial roundwood was used for charcoal (Fig. 8). Sixteen percent of the mill residues were used for industrial fuelwood, residential fuelwood, or wood pellets, and another 13 percent were used for fiber products such as pulp and particleboard. Nine percent of the mill residues went unused.

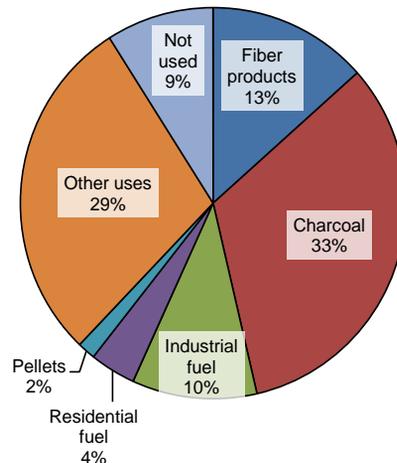


Figure 6.—Distribution of residues generated by primary wood-using mills by method of disposal, Missouri, 2012.

Additional Inventory Resources

Piva, Ronald J.; Treiman, Thomas B. 2012. **Missouri timber industry: an assessment of timber product output and use, 2009.** Resour. Bull. NRS-74. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 88 p.

Raeker, Gus; Moser, W. Keith; Butler, Brett J.; Fleming, John; [et al.] 2011. **Missouri's forests 2008.** Resour. Bull. NRS-54. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 55 p. [DVD included].

Metadata

Information published in this report and in related tables is based on Forest Inventory and Analysis database (FIADB), accessed in February 2015. Data were collected under field guides 4.0 to 6.02, compiled in National Information Management System (NIMS) version 6.0, installed on November 15, 2012. Due to occasional changes to NIMS and FIADB, trend analyses should be made using FIA's online estimation tools, not by comparing published reports or tables. FIA estimates, tabular data, and maps may be generated at <http://www.fia.fs.fed.us/tools-data>.

How to Cite This Publication

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