



# Missouri's Forest Resources, 2009

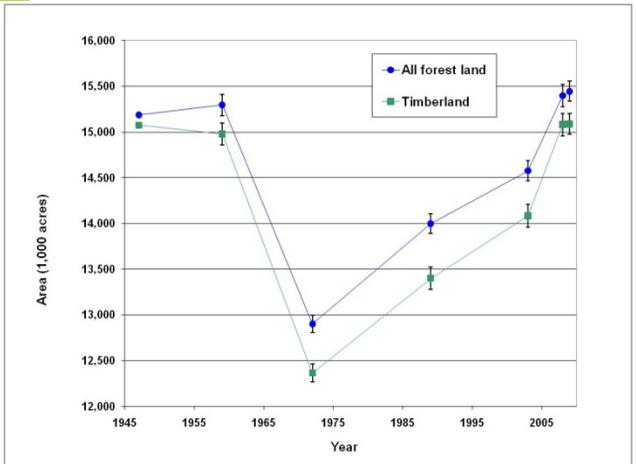
Research Note NRS-80

This publication provides an overview of forest resource attributes for Missouri based on an annual inventory conducted by the Forest Inventory and Analysis (FIA) program at the Northern Research Station of the U.S. Forest Service. These estimates, along with web-posted core tables, will be updated annually. For more information, please refer to page 4 of this report.

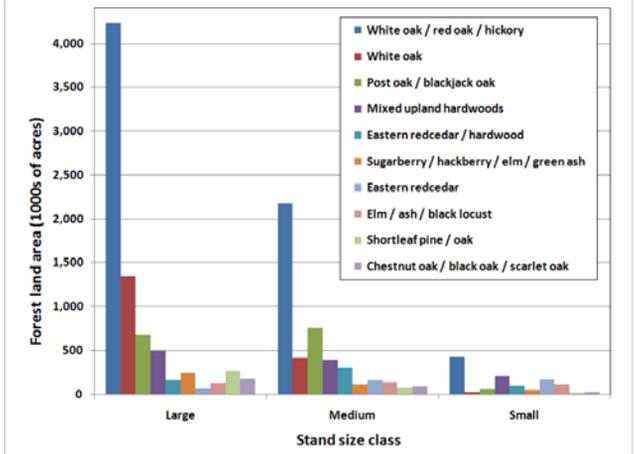
**Table 1.—Annual estimates, uncertainty, and change**

	2009 Estimate	Sampling error (%)	Change since 2004 (%)
<b>Forest Land Estimates</b>			
Area (1000 acres)	15,446.1	0.7	5.4
Number of all live trees 1 inch diameter or larger (million trees)	8,466.2	1.3	2.4
Biomass of all live trees 1 inch diameter or larger (1,000 tons)	627,829.1	1.0	9.3
Net volume of live trees (million cubic feet)	20,413.2	1.1	10.3
Annual net growth of live trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	530,167.6	3.5	-5.0
Annual mortality of live trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	214,873.2	4.3	-15.0
Annual harvest removals of live trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	162,037.5	8.2	-3.9
Annual other removals of live trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	30,787.4	23.1	26.5
<b>Timberland Estimates</b>			
Area (1000 acres)	15,089.3	0.8	6.5
Number of all live trees 1 inch diameter or larger (million trees)	8,246.1	1.3	3.5
Biomass of all live trees 1 inch diameter or larger (1,000 tons)	614,253.8	1.0	10.5
Net volume of live trees (million cubic feet)	19,986.3	1.2	11.6
Net volume of growing stock trees (million cubic feet)	16,737.5	1.3	9.1
Annual net growth of growing stock trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	492,349.5	3.2	-13.6
Annual mortality of growing stock trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	128,977.4	4.7	-15.0
Annual harvest removals of growing stock trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	135,162.7	8.7	-0.8
Annual other removals of growing stock trees (thousand ft <sup>3</sup> yr <sup>-1</sup> )	30,160.2	23.9	-15.4

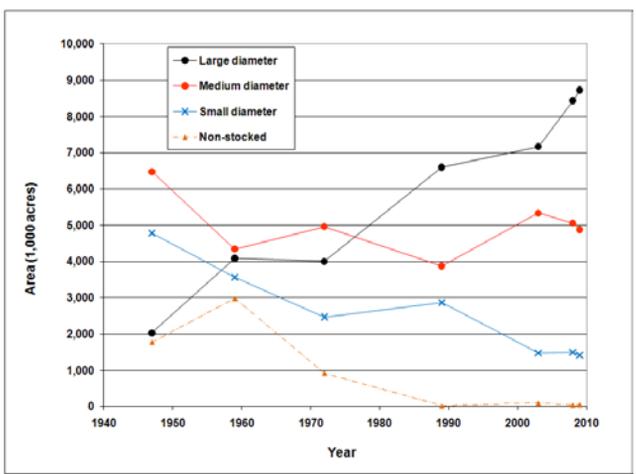
Note: When available, sampling errors/bars provided in figures and tables represent 68 percent confidence intervals



**Figure 1.—Area of forest land and timberland by year.**



**Figure 2.—Area of forest land area by top 10 forest types and stand-size class, 2005 - 2009.**

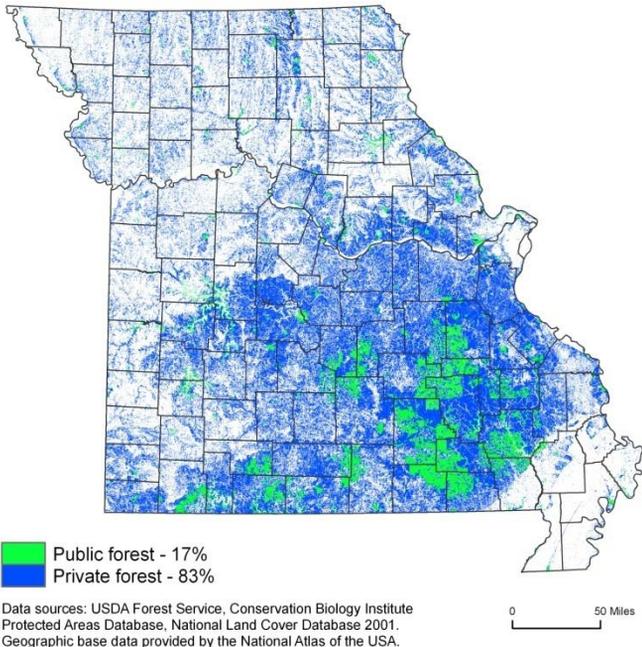


**Figure 3.—Area of timberland by stand-size class and year, 1947 - 2009.**

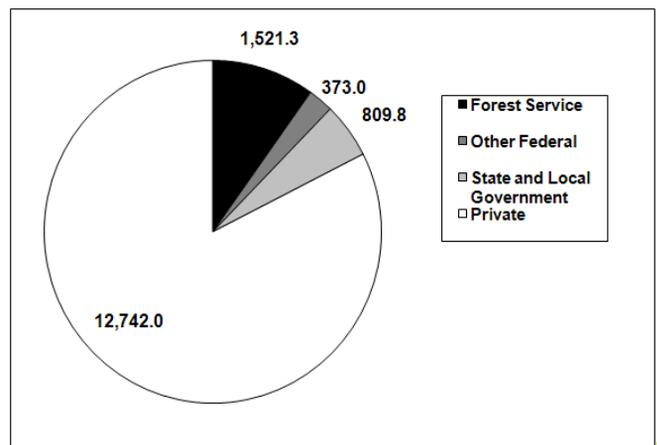


**Table 2.—Top 10 tree species by statewide volume estimates, 2005-2009**

	Species	Volume of live trees on forest land 2009 (1,000,000 ft <sup>3</sup> )	Sampling error (%)	Change since 2004 (%)	Net volume of sawtimber trees on timberland 2009 (million board feet)	Sampling error (%)	Change since 2004 (%)
1	White oak	4,050.7	2.8	8.4	12,442.8	3.5	14.4
2	Black oak	2,891.6	3.2	3.6	9,349.1	4.0	6.8
3	Post oak	2,091.0	3.6	7.7	4,494.4	4.8	12.6
4	Northern red oak	1,055.6	5.4	5.6	3,759.4	6.6	8.2
5	Shortleaf pine	923.0	6.7	10.7	3,912.7	7.2	19.4
6	Eastern redcedar	684.1	5.4	20.2	761.5	10.5	-27.7
7	Scarlet oak	666.7	5.9	8.5	2,141.3	6.7	14.3
8	Black walnut	640.1	6.3	20.7	1,803.8	8.1	24.7
9	Shagbark hickory	550.2	6.0	14.6	1,340.5	8.7	21.4
10	Black hickory	452.5	5.0	9.7	908.6	8.6	8.8
	<b>Other softwood species</b>	<b>12.6</b>	<b>67.8</b>	<b>68.0</b>	<b>55.5</b>	<b>71.4</b>	<b>108.6</b>
	<b>Other hardwood species</b>	<b>6,395.0</b>	<b>2.6</b>	<b>14.5</b>	<b>14,548.1</b>	<b>4.0</b>	<b>19.9</b>
	<b>All species</b>	<b>20,413.2</b>	<b>1.1</b>	<b>10.3</b>	<b>55,517.7</b>	<b>1.7</b>	<b>13.7</b>



**Figure 4.—Area of forest land by major owner group (public and private). White area represents nonforest.** Map courtesy of D.M. Meneguzzo



**Figure 5.—Area of forest land, 2005-2009, in 1,000s of acres, by major ownership group.**

## Black walnut in Missouri

Black walnut (*Juglans nigra*) is a highly valuable hardwood found throughout Missouri (Fig. 6). The wood from this species is highly prized and generally used for high-end products such as furniture and gunstocks. The presence of black walnut on a landowner's property can provide considerable income and can improve wildlife habitat. While normally distributed as individual trees in mixed-species stands, some sites contain high volumes per acre of black walnut (Fig. 7).

Black walnut volume in Missouri has increased over 200 percent since 1989. The relative proportions by diameter class have trended towards larger diameters (Fig. 8). Timber products analysis (Treiman *et al.* 2008) found that 6.1 million cubic feet of industrial black walnut roundwood were produced, 54 percent of which went to Missouri sawmills and manufacturers. Another 26 percent went to foreign customers.

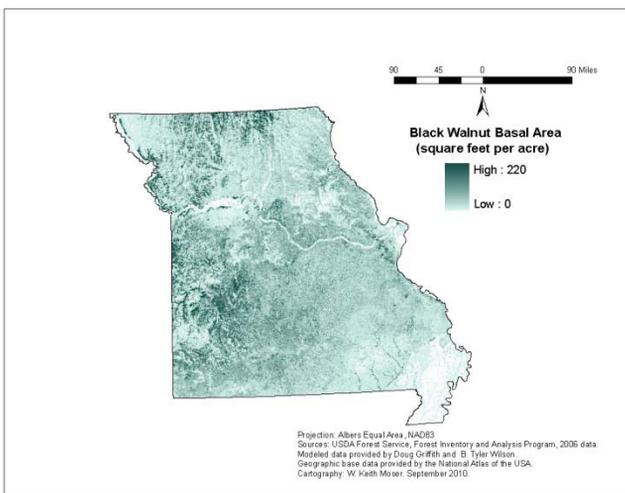


Figure 6.—Black walnut basal area in Missouri, 2006.

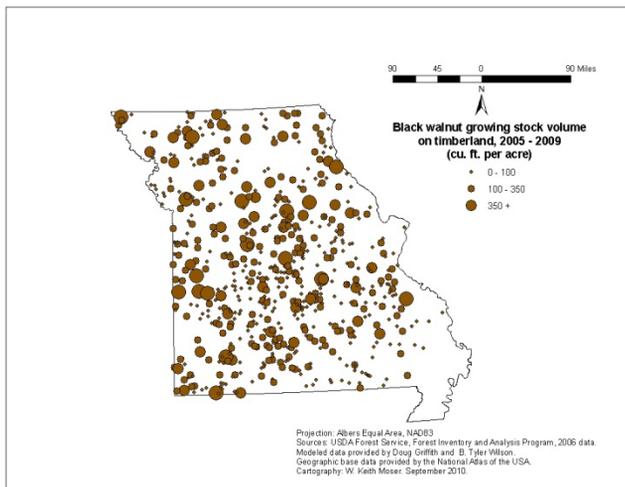


Figure 7.—Growing stock volume of black walnut on Missouri timberland, 2005-2009.

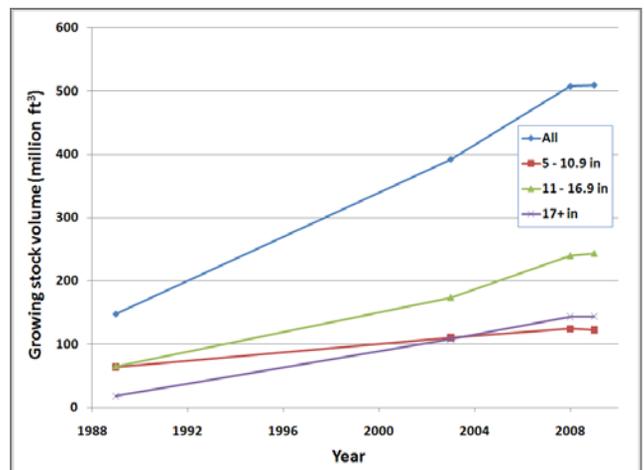


Figure 8.—Growing stock volume of black walnut on timberland, 1984-2009, by total and diameter class.

### Thousand canker disease

On the horizon, however, is thousand cankers disease (TCD). Known to occur in Colorado and Tennessee and caused by a walnut twig beetle (*Pityophthorus juglandis*) carrying a lethal fungus (*Geosmithia morbida*), this disease threatens black walnuts in Missouri. Treiman and Tuttle (2009) compare the effect of this disease to that of chestnut blight and emerald ash borer – the effective elimination of a species.

The loss of black walnut would not be trivial to Missouri. In an analysis of potential economic effects, Treiman and Tuttle (2009) estimated the annual value of loss to the state wood products industry at \$36.3 million. The nut producing industry would lose a further \$35.3 million per year. Estimates of the total economic impact from the loss of trees in urban and park areas (generally not counted in FIA inventories) could amount to over \$65 million. Summing these values into the future, Treiman and Tuttle estimated that TCD could cost the state up to \$851 million.



### Citation for this Publication

Moser, W.K.; Barnett, C.H.; Hansen, M.H.; Treiman, T.B. 2010. **Missouri's forest resources, 2009**. Res. Note. NRS-80. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 4 p.

### FIA Program Information

Bechtold, W.A.; Patterson, P.L. 2005. **The enhanced forest inventory and analysis program: national sampling design and estimation procedures**. Gen. Tech. Rep. SRS-80. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 85 p.

Smith, W.B. 2002. **Forest inventory and analysis: a national inventory and monitoring program**. Environmental Pollution. 116: 233-242.

USDA Forest Service. 2007. **Forest inventory and analysis national core field guide, Vol. 1, field data collection procedures for phase 2 plots, ver. 4.0**. Available at <http://www.fia.fs.fed.us/library/field-guides-methods-proc/> (verified Aug. 31 2009).

### Additional Missouri Inventory Information

Butler, B.J. 2008. **Family forest owners of the United States, 2006**. Gen. Tech. Rep. NRS-27. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 72 p.

Gansner, D.A. 1965. **Missouri's forests, 1959**. Resour. Bull. CS-2. Columbus, OH: U.S. Department of Agriculture, Forest Service, Central States Forest Experiment Station. 53 p.

Raeker, G.; Moser, W.K.; Fleming J.; Morris, M.; Treiman, T.B. In press. **Missouri's forests 2004-2008**. Resource Bulletin. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station.

Spencer, J.S., Jr.; Essex, B.L. 1976. **Timber in Missouri, 1972**. Resour. Bull. NC-30. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 108 p.

Spencer, J.S., Jr.; Roussopoulos, S.M.; Massengale, R.A. 1992. **Missouri's forest resource, 1989: an analysis**. Resour. Bull. NC-139. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 84 p.

Treiman, T.; Tuttle, J.G.; Piva, R. 2008. **Missouri timber industry--an assessment of timber product output and use, 2006**. Resource Bulletin. Jefferson City, MO: Missouri Department of Conservation. 78 p.

Treiman T.B.; Tuttle J. 2009. **Thousand cankers disease of black walnut: How much will it hurt Missouri's pocketbook?** Forest Managers Report #16. Jefferson City, MO: Missouri Department of Conservation. 4 p.

U.S. Department of Agriculture, Forest Service. 1948. **Forest resources of Missouri, 1947**. Forest Survey Release 6. Columbus, OH: U.S. Department of Agriculture, Forest Service, Central States Forest Experiment Station. 19 p.

### Contact Information

Lead Analyst: W. Keith Moser, (651) 649-5155, [wkmoser@fs.fed.us](mailto:wkmoser@fs.fed.us)

Data processing/access: Chuck Barnett, (610) 557-4031, [cjbarnett@fs.fed.us](mailto:cjbarnett@fs.fed.us)

Estimates, tabular data, and maps from this report may be generated at: <http://www.fia.fs.fed.us/tools-data/>

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternate means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, DC 20250-9410, or call (800)795-3272 (voice) or (202)720-6382 (TDD). USDA is an equal opportunity provider and employer.