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Missouri's Forest Resources in 2004

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Contents

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Missouri's Forest Resources In 2004

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The Forest Service conducted and reported on periodic, statewide forest inventories of Missouri in 1947, 1959, 1972, and 1989 (Gansner 1965, Spencer and Essex 1976, Spencer et al. 1992, USDA 1948). In 1999, field work for the fifth inventory of Missouri began and a new nationwide annual forest inventory system was initiated. The inventory is being conducted by the North Central Research Station's Forest Inventory and Analysis program (NCFIA) and consists of a set of field plots systematically located across the entire State. Each year, a panel that consists of one-fifth of the field plots is measured. A complete inventory consists of measuring, compiling, and reporting the data for all plots (or five panels). By 2003, all five panels had been measured, and results of those measurements (considered the fifth statewide inventory) were reported in Moser et al. 2004. A more extensive issue-oriented report is in preparation at this time.

In 2004, NCFIA continued the annual inventory effort with the first (annual) panel of the sixth Missouri forest inventory. This sixth inventory of Missouri's forest resources will be completed in 2008. Information presented in this report is based on moving average estimates that use the latest measurements of every field plot (five panels: 2000-2004) for estimates of current conditions such as area, number of trees, volume, and biomass. Estimates of change (growth, removals, and mortality) are based on remeasured plots, so for this report only the plots measured in 1999 and then remeasured in 2004 (one panel) provide the estimate of change. In 2005, another panel will be remeasured and estimates of change will be based on two panels of remeasured plots; by 2008 all five panels will have been remeasured. The results in this report are estimates based on sampling techniques presented by Bechtold and Patterson (2005).

Estimates from new inventories are often compared with estimates from earlier inventories to determine trends in forest resources. However, for the comparisons to be valid, the procedures used in the two inventories must be similar. As a result of our ongoing efforts to improve the efficiency and reliability of the inventory, several changes in procedures and definitions have been made since the last Missouri periodic inventory in 1989 (Hahn and Spencer 1991, Spencer et al. 1992). Although these changes will have little impact on statewide estimates of forest area, timber volume, and tree biomass, they may have significant impacts on plot classification variables such as forest type and stand-size class. Some of these changes make it inappropriate to directly compare portions of the 2000–2004 estimates with those published for earlier inventories. Only comparisons that are appropriate and not impacted by changes in procedures are discussed in this report. All of the tables in this report and many others can be generated at our Web site (http://ncrs2.fs.fed.us/4801/fiadb/index.htm).

RESULTS

Area

Total area of forest land[1] in Missouri consisted of 14.7 million acres in 2004 (table 1). Eighteen percent of this area is owned by public agencies and 82 percent is owned by private landowners. In 2004, 4 1/2 percent of total forest land area was dominated by softwoods and 95 percent was dominated by hardwoods. Oak/hickory forests made up 83 percent of the total hardwood area. The pinyon/juniper forest type group (primarily eastern redcedar)[2] constituted more than 70 percent of forest land dominated by softwoods.

Forest land has three components:

(1) Timberland[3]—forest land that is not restricted from harvesting by statute, administrative regulation, or designation and is capable of growing trees at a rate of 20 cubic feet per acre per year

(2) Reserved forest land—land that is restricted from harvesting by statute, administrative regulation, or designation (e.g., state parks, national parks and lakeshores, and Federal wilderness areas)

(3) Other forest land land that is not capable of growing trees at a rate of 20 cubic feet per acre per year and not restricted from harvesting

[1] Forest land is land that is at least 10 percent stocked with trees of any size, or that formerly had such tree cover and is not currently developed for a nonforest use. The minimum area for classification of forest land is one acre.

[2] In inventories before 1999, eastern redcedar was distinguished from pinyon/juniper.

[3] Timberland may not be equivalent to the area actually available for commercial timber harvesting or other access. The actual availability of land for various uses depends upon owner decisions that consider economic, environment, and social factors.

Similar to forest land, timberland area has continued to increase since its low point in the 1972 inventory (fig. 1); however, the total area of 14.2 million acres (table 2) in 2000-2004 was still less than the 15 million acres estimated in the 1947 survey (USDA 1948).

Timberland area was dominated by hardwoods, particularly oak/hickory (11.2 million acres) (table 3 and fig. 2). Hardwoods made up 95.1 percent of the total acreage (table 2), 94 percent of all public land acreage, and 95.3 percent of all private landholdings. The oak-dominant component has increased over the last 50-plus years. The oak/pine, oak/hickory, and white oak forest type groups together constituted 77.6 percent of the total timberland area in 1947, and oak/pine and oak/hickory groups made up 85.8 percent in 2000-2004. For most of the forest type groups, the preponderance of acreage was classified as sawtimber stand-size. The exceptions were pinyon/juniper and oak/pine.

The acreage of timberland in the sawtimber class has increased by over 5 million acres since 1947 (fig. 3). When we combine the sawtimber acreage with the poletimber acreage, it appears that Missouri's forests are composed of many large-diameter and, presumably, old trees.

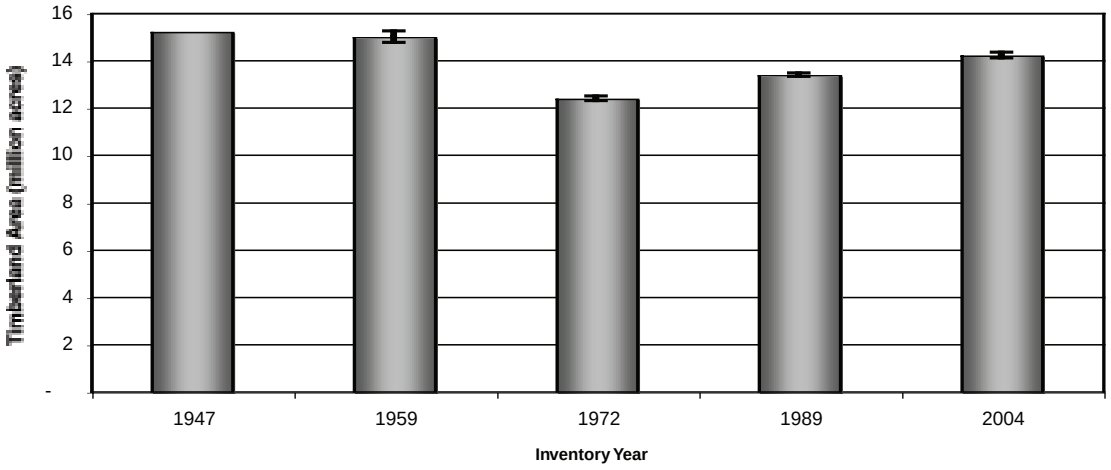

Figure 1.—*Area of timberland (in millions of acres) in Missouri by inventory year, 1947-2004. The vertical line at the top of each bar represents the sampling error associated with each inventory.*

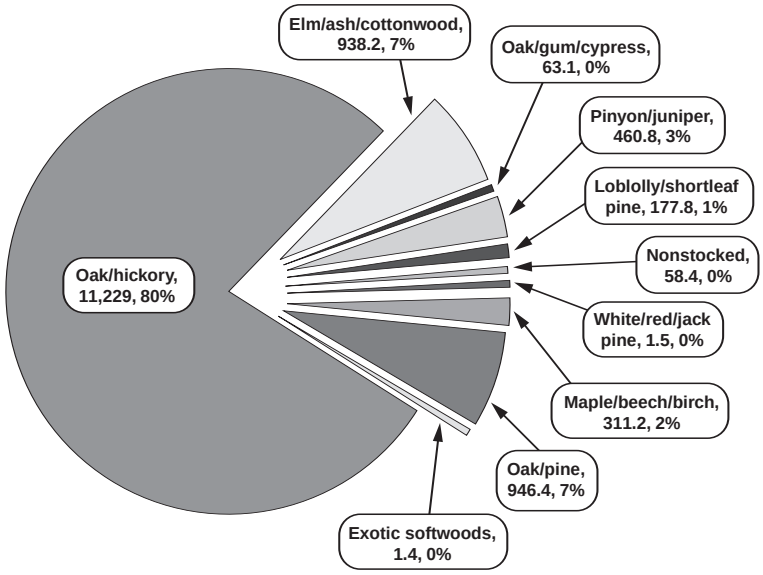

Figure 2.—*Area of timberland in Missouri by forest type group, in thousands of acres and percentage of total timberland area, 2000-2004.*

Increased reforestation, both natural and artificial, appears to have resulted in a negligible number of acres in the nonstocked[4] category.

Volume

The net volume of all live trees on forest land, which includes growing stock, rough trees, and rotten trees, was 18.5 billion cubic feet in 2000-2004 (table 4). Hardwoods constituted 17.1 billion cubic feet and softwoods made up 1.4 billion cubic feet. The net volume of all oaks was 11.4 billion cubic feet or 67 percent of all hardwoods. The net volume of select oaks (red and white) was 5.4 billion cubic feet or 47.0 percent of all oaks and 31.4 percent of all hardwoods. This represents a large increase over the 1972 inventory, which listed the total cubic foot volume of all live trees as 9 billion cubic feet, all hardwoods as 8.6 billion cubic feet, all oaks as 6.4 billion cubic feet, and all select oaks as 2.6 billion cubic feet (Spencer and Essex 1976).

[4] Nonstocked land is timberland that is less than 10 percent stocked with all live trees.

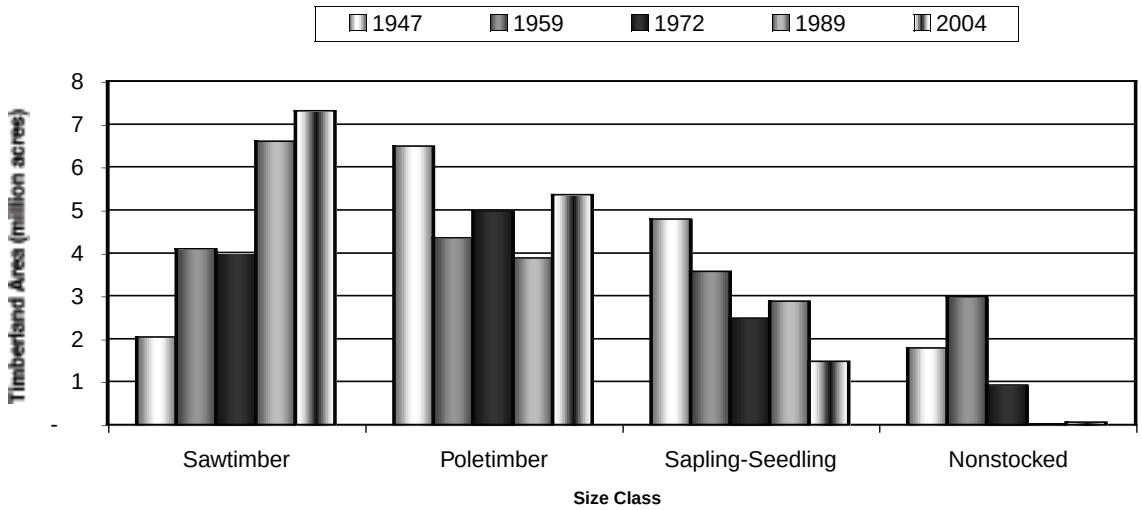

Figure 3.—*Area of timberland (in millions of acres) in Missouri by stand-size class, 1947-2004.*

Net volume of all live trees and salvable dead trees on timberland was 18.1 billion cubic feet in 2000-2004 (table 5 and fig. 4). All live trees made up 17.9 billion cubic feet or 99.3 percent. Of the 15.0 billion cubic feet of growing-stock trees, 10.0 billion cubic feet or 66.4 percent was sawtimber. Sawtimber constituted 66.7 percent of softwood growing-stock volume and 66.1 percent of hardwood growing-stock volume (table 5).

Cull tree volume (2.6 billion cubic feet) made up 14.3 percent of all live trees (table 5). The softwood cull tree volume of 82.6 million cubic feet represented only 6.1 percent of the total softwood live tree volume, whereas hardwood culls represented 14.9 percent of the total hardwood volume. Given the phototropic (sun-following) growth habit of hardwoods, the poor stem form resulting from inadequate self-pruning, and the history of high grading in hardwood stands, the disparity in the cull percentage is not surprising.

Growing-stock volume has steadily increased in Missouri over the last 55 years (fig. 5). The net volume of growing stock on timberland totaled 15.4 billion cubic feet in 2000-2004 (table 6). Ninety-six percent of growing stock volume (14.8 billion cubic feet) was in hardwood forest types and 3.7 percent (573 million cubic feet) was in softwood forest types (fig. 6). Table 6 shows volume estimates for softwoods and hardwoods for each forest type group. For example, the oak/pine forest type group had 423 million cubic feet of softwoods and 460 million cubic feet of hardwoods.

Table 7 shows net volume of growing stock on timberland by species group, species, and diameter class. The totals for softwood and hardwood volumes, 1.3 billion cubic feet and 14.1 billion cubic feet, respectively, are the same as the totals at the bottom of the species columns in table 6.

The net volume of sawtimber on timberland was 49.0 billion board feet (table 8). As with many other measures of coverage and abundance in Missouri, hardwoods constituted the preponderance of the volume (91 percent or 44.6 billion board feet). Red and white oaks totaled 32.3 billion board feet or 72.5 percent of the hardwood sawtimber total. Trees that were 19 or more inches in diameter were 5.6 percent of the softwood volume (246.7 million board feet) and

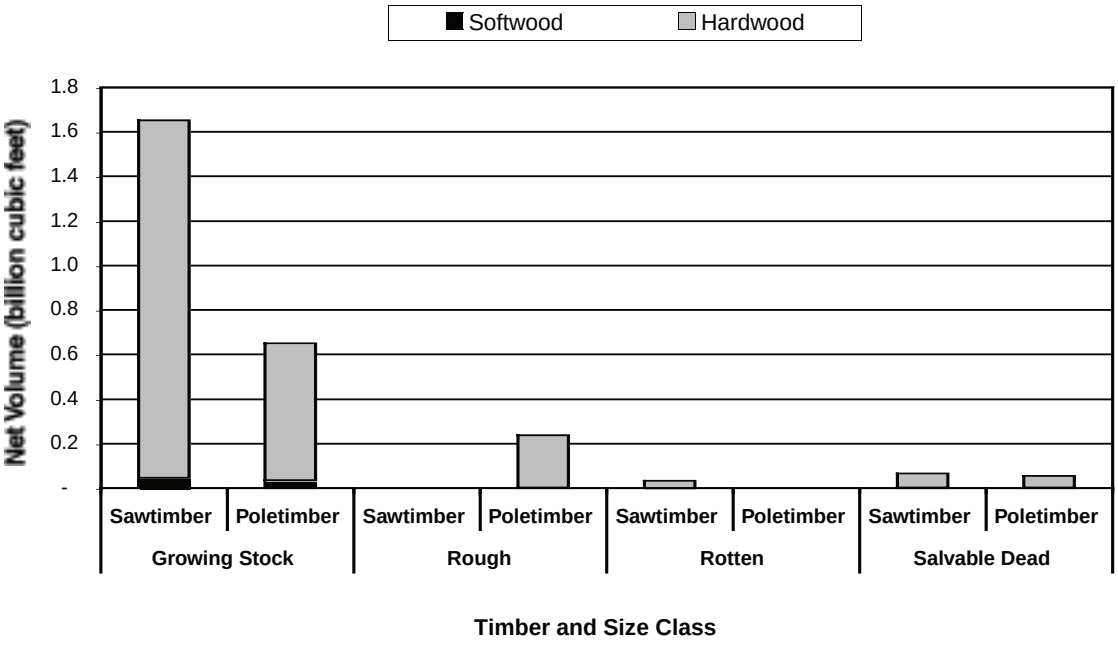

Figure 4.—*Net volume (in billion cubic feet) of all live trees and salvable dead trees on timberland in Missouri by class of timber and softwood/hardwood category, 2000-2004.*

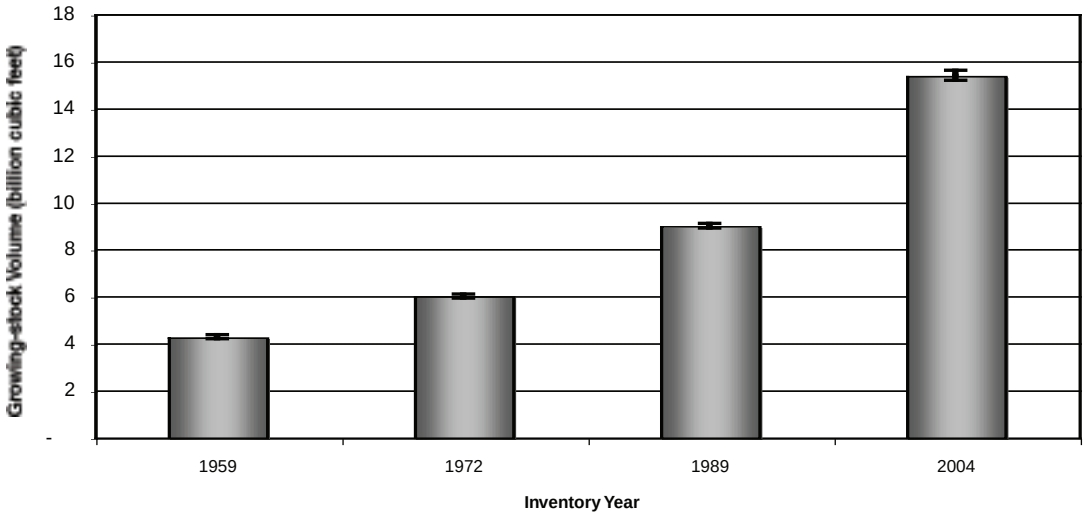

Figure 5.—*Growing-stock volume (in billion cubic feet) on timberland in Missouri, 1959-2004. The vertical line at the top of each bar represents the sampling error associated with each inventory.*

23.1 percent of the hardwood volume (10.3 billion board feet) (table 8). In 1989, the proportions were 3.6 percent and 16.8 percent, respectively (Spencer *et al.* 1992).

Biomass

All live aboveground biomass on timberland in Missouri totaled 566.4 million dry tons in 2000-2004 (table 9). Almost 9 percent of that total, or 48.9 million dry tons, was in trees 1 to 5 inches in d.b.h.; 75.9 percent, or 429.9 million tons, was in growing-stock trees; and 15.5 percent, or 87.7 million tons, was in non-growing-stock trees. Private landowners held 82.2 percent or 465.8 million tons of total biomass, and public owners held 17.8 percent (100.7 million dry tons). Of the 429.9 million dry tons in growing-stock trees, 81.4 percent was on private land and 18.6 percent was on public land. Among non-growing-stock trees, 87.3 percent of the

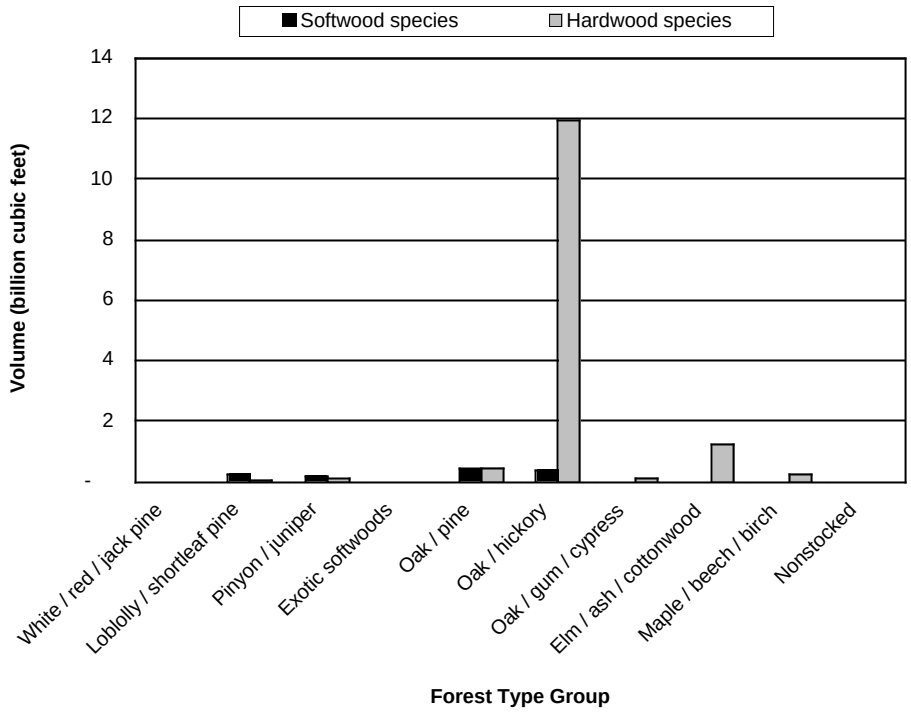

Figure 6.—*Net volume of growing stock, in thousands of cubic feet, for Missouri, 2000-2004.*

biomass was on private land and 12.7 percent was on public land (fig. 7).

Almost 72 percent of the total biomass of the growing-stock trees was in the boles of trees, while the remaining 28 percent was in stumps, tops, and limbs (table 9). Approximately the same proportions existed for the 87.7 million dry tons of non-growing-stock trees: 72.8 percent was in bolewood and 27.2 percent was in stumps, tops, and limbs. The only apparent deviation was the percentage of biomass in publicly owned growing-stock softwoods: 83.3 percent of the biomass was made up of tree boles, and the remaining 16.7 percent constituted the stumps, tops, and limbs. Non-growing-stock softwoods on public land, where there is a relatively small amount of total biomass (187.1 thousand dry tons), also had a slightly higher percentage in the boles, 74.9 percent, than did the total ownership, non-growing-stock percentage of 72.8 percent (table 9).

Growth, Removals, and Mortality

Growth, removals, and mortality[5] estimates are based on comparisons of one panel of data from the previous inventory (1999) to one panel of data from the current inventory (2004). The net growth of growing stock on Missouri's timberland increased, on average, by 919.1 million cubic feet per year from 1999 to 2004 (table 10). Average annual softwood growth was 70.2 million cubic feet per year and average annual hardwood growth was 849.0 million cubic feet per year. Hardwood growth made up 92.4 percent of the total average annual growth in the latest inventory; hardwood growing stock in the 1989 inventory was 90.4 percent of the total volume. Select oaks (white and red) had a net average increase of 239.8 million cubic feet per year. Some of the other species groups with the greatest growth included other soft hardwoods, with a net increase of 104.4 million cubic feet per year, and hickory at 91.1 million cubic feet per year.

Average annual removals of growing stock on timberland (table 11) totaled 167.9 million cubic feet per year from 1999 to 2004. Softwood removals were 8.4 million cubic feet per year or

[5] "Growth" refers to estimated average annual growth, "removals" refers to estimated average annual removals, and "mortality" refers to estimated average annual mortality.

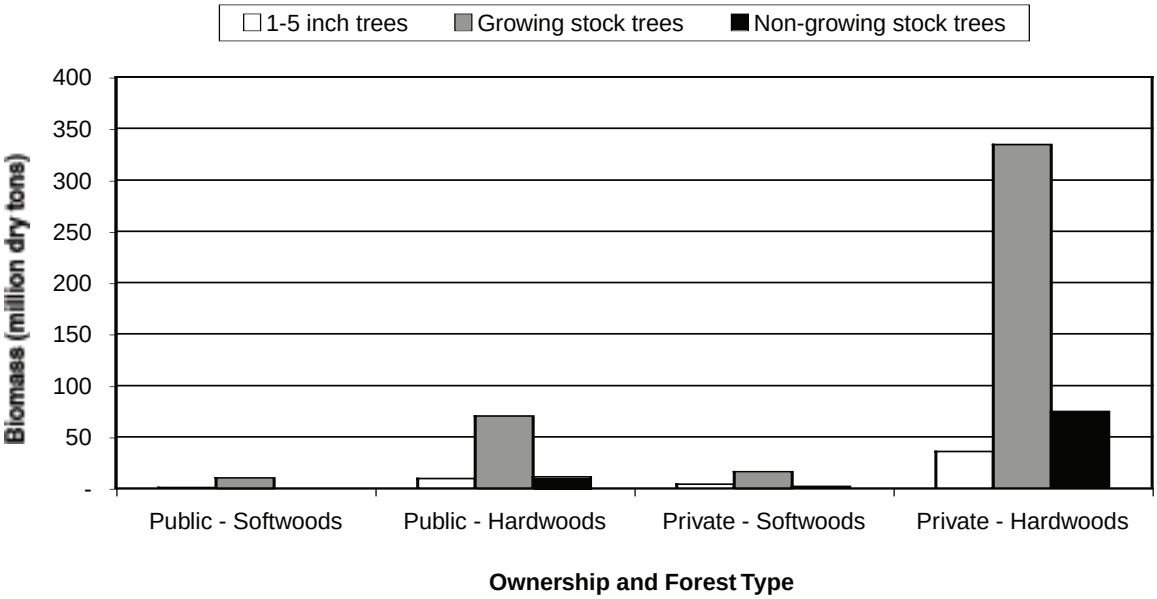

Figure 7.—*Live aboveground biomass in Missouri, in dry tons, by ownership type and forest type, 2000-2004.*

5.0 percent of the total average annual removals. Hardwood removals were 159.5 million cubic feet per year. Average annual removals from private property totaled 149.2 million cubic feet per year, 88.9 percent of all removals. Public land removals averaged 18.7 million cubic feet per year (table 11). The species group category "other red oaks" had the highest average annual removals, at 46.7 million cubic feet per year or 29.3 percent of the total average hardwood removals. The next highest oak species group was "select white oaks," at 37.4 million cubic feet per year (23.5 percent of total hardwood removals), followed by "select red oaks" at 11.4 million cubic feet per year and "other white oaks" at 9.4 million cubic feet per.

Average annual mortality of all growing stock on timberland, 1999 through 2004, was 148.5 million cubic feet per year (table 12). More than 96 percent of the total mortality, or 144 million cubic feet per year, was from hardwoods, while the remaining 4.5 million cubic feet per year was from softwoods. Across all species groups, 13.8 percent of average annual mortality, or 20.5 million cubic feet per year, occurred on public lands. For hardwoods alone, 12.3 percent, or 17.7 million cubic feet per year of average annual mortality, was on public lands; for softwoods alone, 61.8 percent, or 2.8 million cubic feet per year of average annual mortality, was on public land (table 12). Among hardwood species groups, the "other red oaks" category had the highest average annual mortality at 70.4 million cubic feet per year or 48.9 percent of all hardwood mortality. This species group also had the highest average annual mortality on public lands, 12.1 million cubic feet per year. The 17.1 percent of "other red oak" mortality that occurred on public lands was the highest percentage for all hardwoods and undoubtedly reflects the impact of the oak decline complex on the dense, overmature timber disproportionately represented on such lands (Lawrence et al. 2002).

Forest Health Update

The following information about pathogens and insects affecting Missouri forests was excerpted from the National Forest Health Monitoring Program (FHM) Web site at: http://fhm.fs.fed.us/fhh/fhh-04/mo/mo_04.pdf.

Weather Effects—Above average rainfall in the spring of 2004 ended the 2 1/2-year drought in northwestern Missouri. With the rain came severe storms during late May and reports of hail, wind, flood, and tornado damage at many locations across the State. The wet spring was followed by the seventh coolest summer (June-July-August) on record with above average precipitation in much of the State during July and August. Drier conditions returned in the fall, especially in northern Missouri, resulting again in below normal soil moisture conditions in the northwest corner of the State by late November.

Oak Wilt—In 2004, there were 18 confirmed cases of oak wilt caused by Ceratocystis fagacearum out of 45 samples sent to the Missouri Department of Conservation forest health diagnostic lab (similar to 18 of 34 samples confirmed in 2003). Positives for 2004 were obtained from Audrain, Bates, Boone, Callaway, Clay, Green, Harrison, Henry, Johnson, Monroe, Montgomery, St. Charles, and St. Louis Counties. The greatest number of positives were taken from pin oak (10), followed by shingle oak (3), northern red oak (3), black oak (1), and Shumard oak (1). Bacterial leaf scorch is most likely to blame for the high number of false positives obtained this growing season because its diagnostic symptoms look the same as those observed for oak wilt.

Disease Research and Surveys—Missouri forest health specialists collaborated on the baseline *Phytophthora* study conducted by the North Central Research Station in 2004. Four study sites were selected in the State. Preliminary results yielded positives for *Phytophthora* spp. and are awaiting identification. *Phytophthora* species are responsible for a large number of

plant and tree diseases. Recent attention has been centered around *Phytophthora* ramorum, the causal agent of sudden oak death (SOD). SOD nursery surveys were conducted by the Missouri Department of Agriculture, but no SOD was identified. In addition, the University of Missouri conducted a Forest Service-sponsored survey for SOD at 32 forest sites across the State, and again no SOD was detected. These surveys will be conducted again in 2006.

Wood Borers and Oak Decline—Reports of wood borer activity and oak decline remained relatively stable compared to recent years' reports. No large increases in wood borer activity were observed. The abundant rainfall of 2004 may have played a role in limiting wood borer activity in previously drought-stressed areas.

Oak Galls—In recent years, the horned oak gall wasp, gouty oak gall wasp, and jumping oak gall wasp have caused noticeable damage to oaks. Horned oak galls and gouty oak galls continued to be reported at high levels on pin oaks and shingle oaks in Missouri, especially in the St. Louis area. These branch galls can build up in numbers over time resulting in increasing branch dieback and tree decline. Leaf damage on white oaks from the jumping oak gall wasp was very minimal in 2004, reported only from isolated locations around the State.

Gypsy Moth—In 2004, the Missouri Cooperative Gypsy Moth Survey continued its annual effort to detect the presence of gypsy moths by placing and monitoring more than 11,800 traps throughout the State. A total of 18 moths were captured statewide. Continuing the pattern of the past several years, the highest number of moths were captured in the St. Louis area (8 moths in St. Louis County and one moth in St. Charles County). This was followed by captures in southwestern Missouri (Barry, Stone, and Taney Counties), where six moths were found, largely near popular recreational areas. Additionally, two moths were caught in Kansas City (Jackson County) and one in Columbia (Boone County).

In spite of repeated moth captures in some areas, there are no known populations of gypsy moths in Missouri at this time. Sites where gypsy moths have been captured are surveyed with an increased trap density in the following year. In many cases, survey results in the vicinity of past captures have been negative within 1 or 2 years following the original capture. Despite these favorable past results, the risk of gypsy moths establishing in Missouri continues to increase as infested areas in nearby States expand. Statewide gypsy moth monitoring efforts will continue annually in Missouri.

Appendix

Accuracy of the Inventory

Sampling errors measure the uncertainty in estimates derived from a portion of a population rather than from the population as a whole. In the case of the 2000-2004 Missouri forest inventory, a total sample of 9,598 plots were observed over the entire State. Sampling errors for the estimates of statewide totals in this report are

	Estimate	Sampling error (%)
Area of forest land (thousand acres)	14,660.1	0.78
Area of timberland (thousand acres)	14,188.0	0.86
All live volume on forest land (thousand cubic feet)	18,508,110	1.19
All live volume on timberland (thousand cubic feet)	17,948,948	1.25
Growing-stock volume on timberland (thousand cubic feet)	15,377,774	1.34
Sawtimber volume on timberland (thousand board feet)	48,953,600	1.72
All live aboveground biomass on timberland (dry tons)	566,430,864	1.14
Growing-stock growth on timberland (thousand cubic feet per year)	919,125	6.02
Growing-stock mortality on timberland (thousand cubic feet per year)	148,547	12.05
Growing-stock removals on timberland (thousand cubic feet per year)	167,883	19.51

These sampling errors indicate that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated. For example, the estimated growing-stock volume in the State is 15,377.8 million cubic feet with a sampling error of +/- 1.34 percent (+/- 206.1 million cubic feet).

Inventory Methods

Since the 1989 inventory of Missouri, several changes have been made to NCFIA inventory methods to improve the quality of the inventory as well as to meet increasing demands for timely forest resource information. The most significant difference between inventories is the change from periodic to annual inventories. Historically, NCFIA periodically inventoried each State on a cycle that averaged about 12 years. However, the need for timely and consistent data across large regions, combined with national legislative mandates, resulted in NCFIA's implementation of an annual inventory system. Missouri was one of the first States in the North Central region, and in the Nation, to be inventoried with this new system, which in Missouri began with plots measured in 1999.

With the NCFIA annual inventory system, about one-fifth of all field plots are measured each year. In 2003, the entire inventory cycle was completed and all of the plots in Missouri had been measured under the annual system. These measurements (1999-2003) are summarized in a previous report (Moser *et al.* 2004) and a more detailed analysis of the data is currently being prepared (Moser *et al.* in prep.[6]). With the completion of the 2004 measurements, we now have measurements from all 9,598 plots taken over a 5-year period, 2000 to 2004; this includes the 2004 remeasurement of the 1,388 plots that were measured in 1999. All of the plots provide information for estimates of current conditions

[6] Moser, W.K.; Hansen, M.H.; Treiman, T.; et al. 2006. Missouri's forests 1999-2003, Part A. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. Resour. Bull. In prep.

(area, number of trees, volume, and biomass), but only the remeasured plots provide information for estimates of change (growth, removals, and mortality) from 1999 to 2004. Over the next 4 years (2005-2008), all of the panels will be remeasured and current information will be updated each year with new measurements. The number of plots used to calculate change estimates will increase with additional panels of remeasured plots. The smaller number of sample plots available for change estimation is reflected in the estimates presented in this report. Sampling errors for growing-stock growth, removals, and mortality on timberland (6.02 percent, 19.51 percent, and 12.05 percent, respectively) are considerably higher than those for timberland area and growing-stock volume on timberland (0.86 percent and 1.34 percent, respectively). There are other differences between the current and change estimates because of the smaller sample size for change estimation. For example, table 7 reports growing-stock volume in the "other yellow pines" species group; however, table 10 shows no growth in this species group. The "other yellow pines" species group is relatively uncommon in Missouri, and the plots where it was measured have not yet been remeasured.

Other significant changes between the annual inventory system and past periodic inventories include the implementation of new remote sensing technology, a new sampling design and plot configuration, and additional remotely sensed and field data. The advent of remote sensing technology since the 1989 inventory has allowed NCFIA to use classifications of Multi-Resolution Land Characterization (MRLC) data and other available remote sensing and GIS products to stratify the total area of the State and to improve the precision of estimates.

Under the annual inventory system, new algorithms are being used to assign forest type and stand-size class to each condition observed on a plot. These algorithms are being used nationwide by FIA to increase consistency among States. The list of recognized forest types, grouping of these forest types for reporting purposes, models used to assign stocking values to individual trees, definition of nonstocked, and names given to the forest types changed with the new algorithms. As a result, comparisons between the published 2004 inventory results and those published for the 1989 inventory may not be valid. For additional details about algorithms used in both inventories, please contact NCFIA.

Sampling Phases

The annual inventory system is based on a three-phase inventory. In the first phase, classified satellite images and ancillary data are used to stratify the State, while aerial photographs are used to determine if plots could contain forest land and need to be measured. The second phase measures a traditional FIA suite of mensurational variables (basic tree and stand attributes), while the third phase focuses on suite of variables related to the health of the forest.

The only land that could not be sampled was (1) private land where field personnel could not obtain permission from the owner to measure the field plot and (2) plots that could not be accessed because of a hazard or danger to field personnel. The methods used in the preparation of this report make the necessary adjustments to account for sites where access was denied or hazardous.

Phase 1

This inventory used a classification of satellite imagery and ancillary data for stratification. FIA used the imagery to form two initial strata—forest and nonforest. Pixels within 60 m (2 pixel widths) of a forest/nonforest boundary formed two additional strata—forest edge and nonforest edge. Forest pixels within 60 m on the forest side of a forest/nonforest boundary were classified into a forest edge stratum. Pixels within 60 m of the boundary on the nonforest side were classified into a nonforest edge stratum. In addition, all strata were divided into public or private ownership based on information available in the Protected Lands Database (DellaSala *et al.* 2001). The estimated population total for a variable is the sum across all strata of the product of each

stratum's area (from the pixel count) and the variable's mean per unit area (from plot measurements) for the stratum.

Phase 2

Phase 2 of the inventory consisted of the measurement of 9,598 field plots throughout Missouri. Current FIA precision standards for annual inventories require a sampling intensity of one plot for approximately every 6,000 acres. FIA has divided the entire area of the United States into nonoverlapping hexagons, each of which contains 5,937 acres (McRoberts 1999). An array of field plots was established by selecting one plot from each hexagon based on the following rules: (1) if a Forest Health Monitoring (FHM) plot (Mangold 1998) fell within a hexagon, it was selected; (2) if no FHM plot fell within a hexagon, the existing NCFIA plot from the most recent periodic inventory nearest the hexagon center was selected; and (3) if neither FHM nor existing NCFIA plots fell within the hexagon, a new NCFIA plot was established in the hexagon (McRoberts 1999). This array of plots is designated the Federal base sample and is considered an equal probability sample; its measurement is funded by the Federal government. The State of Missouri and the Mark Twain National Forest provided additional funds to increase the sampling intensity in some portions of the State. The 2000-2004 annual inventories collected data from 9,598 phase 2 field plots, of which 3,822 contained forest land.

The total Federal base sample was systematically divided into five interpenetrating, nonoverlapping subsamples or panels. Plots selected for intensification are similarly divided into panels. Each year, the plots in a single panel are measured, and panels are selected on a 5-year, rotating basis (McRoberts 1999). For estimation purposes, the measurement of each panel of plots may be considered an independent systematic sample of all land in a State. Field crews measure vegetation on plots forested at the time of the last inventory and on plots currently classified as forest by trained photointerpreters using aerial photos or digital orthoquads.

Phase 3

NCFIA has two categories of field plot measurements—phase 2 field plots (standard FIA plots) and phase 3 plots (forest health plots). Both types of plot are uniformly distributed both geographically and temporally. Phase 3 plots are measured with the full suite of FHM vegetative and health variables (Mangold 1998) collected as well as the full suite of measures associated with phase 2 plots. Phase 3 plots must be measured between June 1 and August 30 to accommodate the additional measurement of nonwoody understory vegetation, ground cover, soils, and other variables. The five panels of measurements that make up this inventory in Missouri include 462 phase 3 plots. Of these phase 3 plots, 179 contained forest land.

The new national FIA plot configuration (fig. 8) was first used for data collection in Missouri in 1999, the first annual inventory year. This configuration will be used in subsequent years. The national plot configuration requires mapping forest conditions on each plot.

The overall plot layout for the new configuration consists of four subplots. The centers of subplots 2, 3, and 4 are located 120 feet from the center of subplot 1. The azimuths to subplots 2, 3, and 4 are 0, 120, and 240 degrees, respectively, from the center of subplot 1. The center of the new plot is located at the same point as the center of the previous plot if a previous plot existed at the same location. Trees with a d.b.h. of 5 inches and larger are measured on a 24-foot-radius (1/24 acre) circular subplot. Trees with a d.b.h. 1 inch and larger but less than 5 inches are

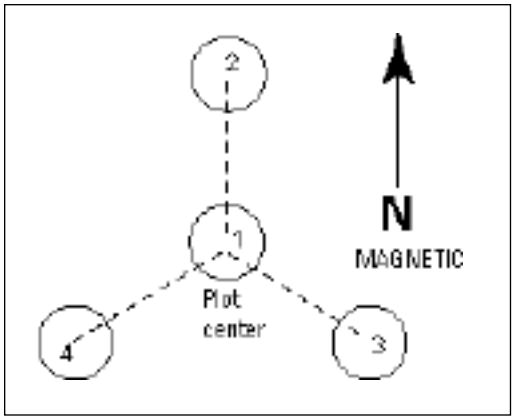

Figure 8.—*Current NCFIA field plot design.*

measured on a 6.8-foot-radius (1/300 acre) circular microplot located 12 feet east of the center of each of the four subplots. Seedlings (trees less than 1 inch d.b.h. and at least 6 inches tall (softwood species) or 12 inches tall (hardwood species) are counted but not individually measured on this same microplot. Forest conditions that occur on any of the four subplots are recorded. Factors that differentiate forest conditions are changes in forest type, stand-size class, land use, ownership, and density. Each condition that occurs anywhere on any of the subplots is identified, described, and mapped if the area of the condition meets or exceeds 1 acre in size.

Field plot measurements are combined with phase 1 estimates in the compilation process and table production. The number of tables presented here is limited. However, at http://ncrs2.fs.fed.us/4801/fiadb/index.htm, other tabular data can be generated. For additional information, contact:

Program Manager
Forest Inventory and Analysis
North Central Research Station
1992 Folwell Ave.
St. Paul, MN 55108

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Missouri Department of Conservation
2901 West Truman Blvd.
Jefferson City, MO 65102
Web site: http://www.mdc.state.mo.us/forest/

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TABLE TITLES

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Table 3.—*Area of timberland by forest type group, forest type, and stand-size class, Missouri, 2000-2004*

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Table 6.—*Net volume of growing stock on timberland by forest type group, forest type, and softwood/hardwood species category, Missouri, 2000-2004*

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Table 8.—*Net volume of sawtimber on timberland by species group, species, and diameter class, Missouri, 2000-2004*

Table 9.—*All live aboveground tree biomass on timberland by owner category, softwood/hardwood species category, and tree biomass component, Missouri, 2000-2004*

TABLES

Table 1. -- Area of forest land by forest type group, forest type, and owner category, Missouri, 2000-2004

(In thousand acres)

Forest type group/ forest type	Owner category			
	All owners	Public	Private	Unidentified owner
Softwood type groups				
White / red / jack pine group				
Eastern white pine	1.5	1.5	- -	- -
All forest types	1.5	1.5	- -	- -
Loblolly / shortleaf pine group				
Shortleaf pine	190.9	112.9	78.0	- -
All forest types	190.9	112.9	78.0	- -
Pinyon / juniper group				
Eastern redcedar	470.9	32.3	438.7	- -
All forest types	470.9	32.3	438.7	- -
Exotic softwoods group				
Scotch pine	1.4	1.4	- -	- -
All forest types	1.4	1.4	- -	- -
All softwood groups	664.8	148.2	516.7	- -
Hardwood type groups				
Oak / pine group				
White pine / red oak / white ash	3.1	- -	3.1	- -
Eastern redcedar / hardwood	634.6	85.4	549.2	- -
Shortleaf pine / oak	373.6	206.4	167.1	- -
All forest types	1,011.3	291.8	719.5	- -
Oak / hickory group				
Oak / hickory group	5.1	0.3	4.8	- -
Post oak / blackjack oak	1,514.8	180.2	1,334.7	- -
White oak / red oak / hickory	6,422.1	1,158.5	5,263.6	- -
White oak	1,607.0	323.5	1,283.5	- -
Northern red oak	122.9	29.8	93.2	- -
Sassafras / persimmon	125.1	20.0	105.1	- -
Sweetgum / yellow-poplar	10.4	- -	10.4	- -
Bur oak	8.5	- -	8.5	- -
Scarlet oak	137.9	71.5	66.4	- -
Yellow-poplar	0.8	0.8	- -	- -
Black walnut	70.1	12.3	57.8	- -
Black locust	15.9	2.2	13.7	- -
Chestnut oak / black oak / scarlet oak	323.1	104.4	218.7	- -
Red maple / oak	5.5	3.8	1.7	- -
Mixed upland hardwoods	1,210.8	82.7	1,128.1	- -
All forest types	11,580.1	1,990.0	9,590.1	- -
Oak / gum / cypress group				
Swamp chestnut oak / cherrybark oak	13.4	- -	13.4	- -
Sweetgum / Nuttall oak / willow oak	6.7	3.1	3.6	- -
Overcup oak / water hickory	39.3	14.7	24.5	- -
Baldcypress / water tupelo	3.7	- -	3.7	- -
Sweetbay / swamp tupelo / red maple	3.1	3.1	- -	- -
All forest types	66.2	20.9	45.3	- -

(Table 1 continued on next page)

(Table 1 continued)

Forest type group/ forest type	Owner category			
	All owners	Public	Private	Unidentified owner
Hardwood type groups				
Elm / ash / cottonwood group				
Elm / ash / cottonwood group	1.4	--	1.4	--
Black ash / American elm / red maple	13.1	2.1	11.0	--
River birch / sycamore	195.3	20.6	174.7	--
Cottonwood	51.3	14.0	37.3	--
Willow	46.2	5.1	41.0	--
Sycamore / pecan / American elm	91.8	16.3	75.5	--
Sugarberry / hackberry / elm / green ash	390.0	44.2	345.8	--
Silver maple / American elm	153.0	27.8	125.2	--
Red maple / lowland	4.0	4.0	--	--
Cottonwood / willow	13.8	6.2	7.6	--
All forest types	959.8	140.3	819.5	--
Maple / beech / birch group				
Sugar maple / beech / yellow birch	159.1	26.2	132.9	--
Black cherry	2.5	0.8	1.7	--
Cherry / ash / yellow-poplar	29.1	--	29.1	--
Hard maple / basswood	51.1	5.5	45.6	--
Elm / ash / locust	75.4	2.2	73.1	--
Red maple / upland	2.5	2.5	--	--
All forest types	319.6	37.2	282.4	--
All hardwood groups	13,936.9	2,480.1	11,456.8	--
Nonstocked	58.4	6.6	51.8	--
All forest groups	14,660.1	2,634.8	12,025.3	--

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table 2. -- Area of timberland by major forest type group, stand origin, and owner category, Missouri, 2000-2004

(In thousand acres)

Major forest type group and stand origin	Owner category			
	All owners	Public	Private	Unidentified owner
Softwood type groups				
Natural	608.2	116.1	492.1	- -
Planted	33.4	21.2	12.2	- -
All softwood types	641.6	137.3	504.3	- -
Hardwood type groups				
Natural	13,465.1	2,223.4	11,241.7	- -
Planted	22.9	7.0	15.9	- -
All hardwood types	13,488.0	2,230.4	11,257.5	- -
Nonstocked	58.4	6.6	51.8	- -
All groups	14,188.0	2,374.3	11,813.7	- -

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table 3. -- Area of timberland by forest type group, forest type, and stand-size class, Missouri, 2000-2004

(In thousand acres)

Forest type group/ forest type	Stand-size class				
	All stands	Sawtimber	Poletimber	Sapling-seedling	Non-stocked
Softwood type groups					
White / red / jack pine group					
Eastern white pine	1.5	1.5	- -	- -	- -
All forest types	1.5	1.5	- -	- -	- -
Loblolly / shortleaf pine group					
Shortleaf pine	177.8	123.1	49.8	4.9	- -
All forest types	177.8	123.1	49.8	4.9	- -
Pinyon / juniper group					
Eastern redcedar	460.8	90.1	232.5	138.1	- -
All forest types	460.8	90.1	232.5	138.1	- -
Exotic softwoods group					
Scotch pine	1.4	1.4	- -	- -	- -
All forest types	1.4	1.4	- -	- -	- -
All softwood groups	641.6	216.2	282.4	143.0	- -
Hardwood type groups					
Oak / pine group					
White pine / red oak / white ash	3.1	3.1	- -	- -	- -
Eastern redcedar / hardwood	569.7	113.2	327.6	128.9	- -
Shortleaf pine / oak	373.6	244.1	120.3	9.2	- -
All forest types	946.4	360.4	447.9	138.1	- -
Oak / hickory group					
Oak / hickory group	5.1	2.6	1.8	0.7	- -
Post oak / blackjack oak	1,399.7	546.7	754.3	98.7	- -
White oak / red oak / hickory	6,267.4	3,469.9	2,305.3	492.1	- -
White oak	1,573.1	1,098.5	457.5	17.1	- -
Northern red oak	118.9	86.8	30.5	1.6	- -
Sassafras / persimmon	121.4	8.3	31.6	81.5	- -
Sweetgum / yellow-poplar	10.4	2.5	2.7	5.2	- -
Bur oak	8.5	7.2	- -	1.3	- -
Scarlet oak	126.5	80.3	42.3	3.8	- -
Yellow-poplar	0.8	- -	0.8	- -	- -
Black walnut	66.5	39.6	17.7	9.1	- -
Black locust	15.9	7.2	8.8	- -	- -
Chestnut oak / black oak / scarlet oak	311.6	169.0	110.1	32.5	- -
Red maple / oak	3.8	- -	- -	3.8	- -
Mixed upland hardwoods	1,199.5	440.8	506.9	251.7	- -
All forest types	11,229.0	5,959.6	4,270.4	999.1	- -
Oak / gum / cypress group					
Swamp chestnut oak / cherrybark oak	13.4	6.5	6.9	- -	- -
Sweetgum / Nuttall oak / willow oak	6.7	- -	6.7	- -	- -
Overcup oak / water hickory	36.2	34.6	1.6	- -	- -
Baldcypress / water tupelo	3.7	3.7	- -	- -	- -
Sweetbay / swamp tupelo / red maple	3.1	3.1	- -	- -	- -
All forest types	63.1	47.9	15.2	- -	- -

(Table 3 continued on next page)

(Table 3 continued)

Forest type group/ forest type	Stand-size class				
	All stands	Sawtimber	Poletimber	Sapling-seedling	Non-stocked
Hardwood type groups					
Elm / ash / cottonwood group					
Elm / ash / cottonwood group	1.4	- -	1.4	- -	- -
Black ash / American elm / red maple	12.5	2.8	9.1	0.6	- -
River birch / sycamore	181.9	117.3	44.0	20.5	- -
Cottonwood	51.3	39.2	10.6	1.5	- -
Willow	46.2	14.7	5.1	26.4	- -
Sycamore / pecan / American elm	87.4	71.6	14.3	1.4	- -
Sugarberry / hackberry / elm / green ash	386.9	218.0	114.1	54.7	- -
Silver maple / American elm	153.0	119.4	26.8	6.8	- -
Red maple / lowland	4.0	- -	3.4	0.5	- -
Cottonwood / willow	13.8	13.8	- -	- -	- -
All forest types	938.2	596.8	228.9	112.5	- -
Maple / beech / birch group					
Sugar maple / beech / yellow birch	150.7	75.4	52.4	22.9	- -
Black cherry	2.5	- -	- -	2.5	- -
Cherry / ash / yellow-poplar	29.1	- -	11.2	17.9	- -
Hard maple / basswood	51.1	28.7	18.7	3.7	- -
Elm / ash / locust	75.4	16.8	32.2	26.3	- -
Red maple / upland	2.5	- -	- -	2.5	- -
All forest types	311.2	120.9	114.4	75.9	- -
All hardwood groups	13,488.0	7,085.6	5,076.8	1,325.6	- -
Nonstocked	58.4	- -	- -	- -	58.4
All forest groups	14,188.0	7,301.8	5,359.1	1,468.6	58.4

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table 4. -- Net volume of all live trees on forest land by species group, species, and owner category, Missouri, 2000-2004

(In thousand cubic feet)

Species group/ species	Owner category			
	All owners	Public	Private	Unidentified owner
Softwoods				
Loblolly and shortleaf pines				
Shortleaf pine	834,091	494,980	339,111	- -
All species	834,091	494,980	339,111	- -
Other yellow pines				
Scotch pine	927	454	474	- -
Virginia pine		- -		- -
All species	927	454	474	- -
Eastern white and red pines				
Eastern white pine	6,303	3,828	2,476	- -
All species	6,303	3,828	2,476	- -
Cypress				
Baldcypress	306	- -	306	- -
All species	306	- -	306	- -
Other eastern softwoods				
Eastern redcedar	569,691	58,080	511,611	- -
All species	569,691	58,080	511,611	- -
Total softwoods	1,411,319	557,342	853,978	- -
Hardwoods				
Select white oaks				
White oak	3,737,812	838,557	2,899,255	- -
Swamp white oak	70,219	4,176	66,043	- -
Bur oak	103,457	12,905	90,553	- -
Swamp chestnut oak	6,791	3,055	3,736	- -
Chinkapin oak	366,057	47,675	318,382	- -
All species	4,284,336	906,369	3,377,968	- -
Select red oaks				
Cherrybark oak	8,515	783	7,732	- -
Northern red oak	1,000,264	213,956	786,308	- -
Shumard oak	82,106	7,074	75,032	- -
All species	1,090,885	221,813	869,072	- -
Other white oaks				
Overcup oak	16,279	15,536	743	- -
Chestnut oak	455	455	- -	- -
Post oak	1,941,170	235,746	1,705,424	- -
All species	1,957,904	251,736	1,706,167	- -

(Table 4 continued on next page)

(Table 4 continued)

Species group/ species	Owner category			
	All owners	Public	Private	Unidentified owner
Hardwoods				
Other red oaks				
Scarlet oak	614,499	286,314	328,185	- -
Northern pin oak	6,344	5,711	632	- -
Southern red oak	58,535	15,245	43,290	- -
Shingle oak	215,094	10,397	204,697	- -
Blackjack oak	235,619	18,559	217,059	- -
Pin oak	179,969	19,595	160,375	- -
Willow oak	4,591	1,579	3,013	- -
Black oak	2,790,908	571,690	2,219,218	- -
All species	4,105,558	929,089	3,176,469	- -
Hickory				
Bitternut hickory	227,703	24,101	203,602	- -
Pignut hickory	156,366	28,612	127,754	- -
Pecan	31,247	1,314	29,933	- -
Shellbark hickory	47,436	14,618	32,818	- -
Shagbark hickory	480,011	27,608	452,403	- -
Black hickory	412,573	83,376	329,196	- -
Mockernut hickory	337,214	67,334	269,880	- -
All species	1,692,551	246,964	1,445,587	- -
Hard maple				
Black maple	2,796	- -	2,796	- -
Sugar maple	271,633	35,462	236,171	- -
All species	274,429	35,462	238,968	- -
Soft maple				
Red maple	47,716	9,854	37,862	- -
Silver maple	349,016	74,655	274,361	- -
All species	396,732	84,509	312,223	- -
Beech				
American beech	8,339	5,889	2,449	- -
All species	8,339	5,889	2,449	- -
Sweetgum				
Sweetgum	28,266	6,971	21,294	- -
All species	28,266	6,971	21,294	- -
Tupelo and blackgum				
Water tupelo	10,909	50	10,859	- -
Blackgum	88,190	26,452	61,737	- -
Swamp tupelo	82	30	52	- -
All species	99,180	26,532	72,648	- -
Ash				
White ash	243,488	16,852	226,636	- -
Green ash	181,689	15,645	166,044	- -
Blue ash	8,483	518	7,966	- -
All species	433,660	33,014	400,646	- -

(Table 4 continued on next page)

(Table 4 continued)

Species group/ species	Owner category			
	All owners	Public	Private	Unidentified owner
Hardwoods				
Cottonwood and aspen				
Eastern cottonwood	145,759	30,523	115,236	- -
Swamp cottonwood	32	32	- -	- -
All species	145,791	30,555	115,236	- -
Basswood				
American basswood	32,419	3,240	29,179	- -
All species	32,419	3,240	29,179	- -
Yellow-poplar				
Yellow-poplar	22,151	10,553	11,598	- -
All species	22,151	10,553	11,598	- -
Black walnut				
Black walnut	530,521	68,797	461,724	- -
All species	530,521	68,797	461,724	- -
Other eastern soft hardwoods				
Boxelder	62,859	15,516	47,344	- -
Ohio buckeye	5,406	910	4,496	- -
European Alder		- -		- -
River birch	35,186	444	34,742	- -
Northern catalpa	786	- -	786	- -
Sugarberry	3,647	612	3,035	- -
Hackberry	310,697	10,540	300,157	- -
Butternut	6,612	4,229	2,383	- -
American sycamore	325,522	57,748	267,773	- -
Black cherry	102,093	10,117	91,976	- -
Black willow	46,957	7,800	39,157	- -
Sassafras	40,145	3,238	36,907	- -
Winged elm	26,183	5,940	20,242	- -
American elm	337,687	21,222	316,465	- -
Slippery elm	116,852	19,881	96,971	- -
All species	1,420,632	158,197	1,262,435	- -
Other eastern hard hardwoods				
Flowering dogwood	9,772	1,933	7,838	- -
Common persimmon	27,669	2,575	25,094	- -
Waterlocust	2,418	564	1,854	- -
Honeylocust	249,384	14,439	234,946	- -
Kentucky coffeetree	11,034	741	10,293	- -
Mulberry spp.	153	60	93	- -
White mulberry	9,356	197	9,159	- -
Red mulberry	68,507	9,401	59,106	- -
Black locust	50,373	9,715	40,658	- -
Rock elm	74	- -	74	- -
All species	428,741	39,625	389,117	- -

(Table 4 continued on next page)

(Table 4 continued)

Species group/ species	Owner category			
	All owners	Public	Private	Unidentified owner
Hardwoods				
Eastern noncommercial hardwoods				
Ailanthus	75	- -	75	- -
Serviceberry spp.	610	156	453	- -
Common serviceberry		- -	- -	- -
Pawpaw	153	- -	153	- -
Chittamwood, gum bumelia	1,799	633	1,166	- -
American hornbeam, musclewood	2,607	128	2,479	- -
American chestnut		- -		- -
Eastern redbud	11,544	1,817	9,726	- -
Hawthorn spp.	639	202	437	- -
Cockspur hawthorn	41	- -	41	- -
Downy hawthorn	43	43	- -	- -
Osage-orange	121,863	3,269	118,595	- -
Apple spp.	78	- -	78	- -
Eastern hophornbeam	3,310	65	3,245	- -
Cherry and plum spp.		- -	- -	- -
Chokecherry			- -	- -
American plum	517	310	207	- -
Willow spp.		- -		- -
Peachleaf willow	1,144	1,144	- -	- -
Smoketree	213	161	52	- -
Other or unknown tree	60	- -	60	- -
All species	144,696	7,927	136,768	- -
Total hardwoods	17,096,791	3,067,243	14,029,548	- -
All species groups	18,508,110	3,624,584	14,883,525	- -

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

Table 5. -- Net volume of all live trees and salvable dead trees on timberland
by class of timber and softwood/hardwood species category, Missouri, 2000-2004

(In thousand cubic feet)

Class of timber	All species	Softwood species	Hardwood species
Live trees			
Growing-stock trees			
Sawtimber			
Saw log portion	8,629,018	751,981	7,877,037
Upper stem portion	1,549,173	96,234	1,452,939
Total	10,178,191	848,216	9,329,976
Poletimber	5,199,583	422,701	4,776,882
All growing-stock trees	15,377,774	1,270,916	14,106,858
Cull trees			
Rough trees[1]			
Sawtimber size	1,651,521	45,813	1,605,708
Poletimber size	649,344	34,337	615,007
Total	2,300,865	80,150	2,220,715
Rotten trees[1]			
Sawtimber size	236,555	2,160	234,395
Poletimber size	33,754	253	33,501
Total	270,309	2,413	267,896
All live cull trees	2,571,175	82,563	2,488,611
All live trees	17,948,948	1,353,480	16,595,469
Salvable dead trees			
Sawtimber size	66,682	2,631	64,051
Poletimber size	54,556	2,717	51,840
All salvable dead trees	121,238	5,348	115,890
All classes	18,070,187	1,358,828	16,711,359

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

[1] Includes noncommercial species.

Table 6. -- Net volume of growing stock on timberland by forest type group, forest type, and softwood/hardwood species category, Missouri, 2000-2004

(In thousand cubic feet)

Forest type group/ forest type	All species	Softwood species	Hardwood species
Softwood type groups			
White / red / jack pine group			
Eastern white pine	3,382	3,188	194
All forest types	3,382	3,188	194
Loblolly / shortleaf pine group			
Shortleaf pine	327,904	276,512	51,392
All forest types	327,904	276,512	51,392
Pinyon / juniper group			
Eastern redcedar	241,354	167,249	74,106
All forest types	241,354	167,249	74,106
Exotic softwoods group			
Scotch pine	322	322	- -
All forest types	322	322	- -
All softwood groups	572,963	447,271	125,692
Hardwood type groups			
Oak / pine group			
White pine / red oak / white ash	3,210	1,589	1,621
Eastern redcedar / hardwood	335,515	134,950	200,565
Shortleaf pine / oak	544,869	286,618	258,251
All forest types	883,593	423,156	460,437
Oak / hickory group			
Oak / hickory group	15,186	129	15,058
Post oak / blackjack oak	1,303,753	55,082	1,248,672
White oak / red oak / hickory	7,154,173	235,684	6,918,489
White oak	2,191,612	35,097	2,156,515
Northern red oak	170,764	2,048	168,715
Sassafras / persimmon	36,273	2,098	34,175
Sweetgum / yellow-poplar	11,914	311	11,603
Bur oak	3,955	- -	3,955
Scarlet oak	157,503	8,922	148,581
Yellow-poplar	1,984	- -	1,984
Black walnut	69,722	705	69,017
Black locust	13,099	135	12,963
Chestnut oak / black oak / scarlet oak	353,772	24,678	329,093
Red maple / oak	681	- -	681
Mixed upland hardwoods	834,110	26,939	807,171
All forest types	12,318,500	391,827	11,926,672

(Table 6 continued on next page)

(Table 6 continued)

Forest type group/ forest type	All species	Softwood species	Hardwood species
Hardwood type groups			
Oak / gum / cypress group			
Swamp chestnut oak / cherrybark oak	15,249	51	15,198
Sweetgum / Nuttall oak / willow oak	8,239	- -	8,239
Overcup oak / water hickory	59,220	- -	59,220
Baldcypress / water tupelo	12,805	- -	12,805
Sweetbay / swamp tupelo / red maple	9,582	- -	9,582
All forest types	105,095	51	105,044
Elm / ash / cottonwood group			
Elm / ash / cottonwood group	1,109	- -	1,109
Black ash / American elm / red maple	6,309	- -	6,309
River birch / sycamore	225,742	711	225,030
Cottonwood	114,274	48	114,226
Willow	26,174	- -	26,174
Sycamore / pecan / American elm	148,893	1,291	147,602
Sugarberry / hackberry / elm / green ash	445,997	1,689	444,308
Silver maple / American elm	230,483	- -	230,483
Red maple / lowland	2,583	- -	2,583
Cottonwood / willow	33,225	- -	33,225
All forest types	1,234,789	3,739	1,231,050
Maple / beech / birch group			
Sugar maple / beech / yellow birch	162,609	2,534	160,075
Black cherry	200	- -	200
Cherry / ash / yellow-poplar	8,917	99	8,818
Hard maple / basswood	51,090	552	50,538
Elm / ash / locust	38,122	1,497	36,625
All forest types	260,938	4,683	256,255
All hardwood groups	14,802,915	823,457	13,979,458
Nonstocked	1,896	188	1,708
All forest groups	15,377,774	1,270,916	14,106,858

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

Table 7. -- Net volume of growing stock on timberland by species group, species, and diameter class, Missouri, 2000-2004

(In thousand cubic feet)

Species group/ species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods											
Loblolly and shortleaf pines											
Shortleaf pine	798,490	53,933	104,142	155,968	183,475	136,205	80,805	42,578	31,308	10,076	- -
All species	798,490	53,933	104,142	155,968	183,475	136,205	80,805	42,578	31,308	10,076	- -
Other yellow pines											
Scotch pine	551	121	107	322	- -	- -	- -	- -	- -	- -	- -
Virginia pine		- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
All species	551	121	107	322	- -	- -	- -	- -	- -	- -	- -
Eastern white and red pines											
Eastern white pine	5,596	62	498	660	2,191	2,186	- -	- -	- -	- -	- -
All species	5,596	62	498	660	2,191	2,186	- -	- -	- -	- -	- -
Cypress											
Baldcypress	306	- -	- -	- -	306	- -	- -	- -	- -	- -	- -
All species	306	- -	- -	- -	306	- -	- -	- -	- -	- -	- -
Other eastern softwoods											
Eastern redcedar	465,973	136,344	127,493	90,740	53,403	37,407	12,273	3,362	1,813	3,138	- -
All species	465,973	136,344	127,493	90,740	53,403	37,407	12,273	3,362	1,813	3,138	- -
Total softwoods	1,270,916	190,460	232,241	247,691	239,375	175,798	93,078	45,939	33,122	13,214	- -
Hardwoods											
Select white oaks											
White oak	3,292,584	208,488	322,284	441,669	517,577	543,372	448,368	316,882	213,484	247,663	32,796
Swamp white oak	56,325	2,687	3,886	6,161	9,294	5,998	9,981	6,520	7,448	4,351	- -
Bur oak	61,606	3,195	5,005	4,763	7,769	6,929	8,429	3,542	- -	14,933	7,041
Swamp chestnut oak	6,791	106	- -	- -	224	- -	- -	- -	1,914	1,491	3,055
Chinkapin oak	219,683	18,147	28,367	35,475	31,836	27,655	20,809	19,878	10,606	20,231	6,677
All species	3,636,988	232,623	359,543	488,068	566,701	583,955	487,586	346,822	233,452	288,670	49,570
Select red oaks											
Cherrybark oak	8,515	194	524	1,394	1,141	571	3,639	1,053	- -	- -	- -
Northern red oak	874,887	33,720	58,932	75,791	95,974	119,114	110,756	100,982	112,558	136,604	30,457
Shumard oak	73,371	5,838	6,674	8,678	9,998	12,565	6,564	6,170	1,524	15,362	- -
All species	956,774	39,752	66,129	85,862	107,113	132,249	120,958	108,205	114,082	151,966	30,457
Other white oaks											
Overcup oak	9,303	45	- -	249	849	- -	627	- -	- -	1,412	6,121
Chestnut oak	455	- -	- -	- -	- -	455	- -	- -	- -	- -	- -
Post oak	1,518,180	150,754	255,104	283,314	247,214	222,115	164,661	85,427	55,094	39,744	14,753
All species	1,527,938	150,799	255,104	283,563	248,064	222,570	165,288	85,427	55,094	41,156	20,874
Other red oaks											
Scarlet oak	549,787	30,076	56,253	81,005	91,242	86,553	87,111	52,428	34,870	26,885	3,363
Northern pin oak	632	233	- -	399	- -	- -	- -	- -	- -	- -	- -
Southern red oak	52,459	4,303	4,713	5,530	8,375	8,202	3,670	1,834	3,396	8,964	3,471
Shingle oak	185,018	17,435	22,421	27,485	21,683	17,802	24,944	15,549	13,545	18,496	5,657
Blackjack oak	158,538	21,128	24,482	23,231	27,121	19,716	16,786	11,648	6,428	2,160	5,838
Pin oak	167,890	5,535	10,556	16,630	23,458	28,832	16,537	17,623	14,496	30,024	4,199
Willow oak	4,591	212	274	232	771	470	642	- -	- -	1,990	- -
Black oak	2,471,214	127,749	219,595	342,557	423,328	403,744	334,047	248,532	176,294	190,052	5,318
All species	3,590,129	206,671	338,295	497,071	595,977	565,319	483,737	347,615	249,029	278,571	27,845
Hickory											
Bitternut hickory	196,375	23,243	31,201	28,938	36,366	25,284	28,765	10,473	9,415	2,691	- -
Pignut hickory	139,902	14,891	20,176	24,258	24,287	20,904	17,695	8,338	1,225	8,129	- -
Pecan	23,518	1,017	1,314	3,193	3,713	5,863	3,606	2,882	1,929	- -	- -
Shellbark hickory	43,197	2,536	4,218	5,681	4,528	4,627	856	2,920	2,230	15,602	- -
Shagbark hickory	433,553	51,244	70,312	84,326	67,293	50,956	49,691	31,859	13,548	14,324	- -
Black hickory	367,492	57,037	74,283	66,607	70,854	44,298	27,693	14,362	10,780	1,578	- -
Mockernut hickory	295,679	41,890	54,127	60,407	57,721	33,922	23,160	13,889	4,376	6,187	- -
All species	1,499,717	191,858	255,632	273,410	264,762	185,853	151,465	84,723	43,503	48,511	- -

(Table 7 continued on next page)

(Table 7 continued)

Species group/ species	All classes	Diameter class (inches at breast height) 5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Hardwoods											
Hard maple											
Black maple	2,717	140	99	589	- -	- -	- -	- -	1,888	- -	- -
Sugar maple	209,690	34,718	33,471	38,621	32,220	23,031	17,363	13,269	10,816	6,180	- -
All species	212,407	34,858	33,571	39,211	32,220	23,031	17,363	13,269	12,704	6,180	- -
Soft maple											
Red maple	34,514	6,190	7,001	5,379	2,870	1,522	846	3,894	2,717	4,095	- -
Silver maple	238,054	8,108	13,269	16,273	17,394	26,192	37,554	12,360	19,950	57,548	29,406
All species	272,568	14,297	20,270	21,652	20,265	27,714	38,401	16,254	22,667	61,643	29,406
Beech											
American beech	570	48	127	- -	- -	395	- -	- -	- -	- -	- -
All species	570	48	127	- -	- -	395	- -	- -	- -	- -	- -
Sweetgum											
Sweetgum	24,357	1,636	3,139	3,027	2,843	2,399	3,542	5,043	2,730	- -	- -
All species	24,357	1,636	3,139	3,027	2,843	2,399	3,542	5,043	2,730	- -	- -
Tupelo and blackgum											
Water tupelo	9,712	157	147	- -	723	1,549	4,683	1,041	1,413	- -	- -
Blackgum	73,537	14,176	12,037	12,540	8,879	9,277	2,463	4,885	3,215	6,065	- -
Swamp tupelo	52	52	- -	- -	- -	- -	- -	- -	- -	- -	- -
All species	83,301	14,384	12,184	12,540	9,602	10,826	7,146	5,925	4,628	6,065	- -
Ash											
White ash	191,765	21,408	24,626	31,345	24,120	21,509	25,872	19,692	14,052	9,139	- -
Green ash	150,658	12,246	18,864	21,634	22,202	19,941	24,544	9,498	8,686	13,042	- -
Blue ash	4,915	492	721	1,729	896	1,078	- -	- -	- -	- -	- -
All species	347,337	34,146	44,211	54,709	47,218	42,528	50,416	29,190	22,739	22,182	- -
Cottonwood and aspen											
Eastern cottonwood	137,781	1,907	2,391	1,870	6,259	2,036	10,626	18,799	19,489	24,169	50,235
All species	137,781	1,907	2,391	1,870	6,259	2,036	10,626	18,799	19,489	24,169	50,235
Basswood											
American basswood	25,667	1,166	2,605	3,602	3,881	773	3,186	- -	4,307	6,146	- -
All species	25,667	1,166	2,605	3,602	3,881	773	3,186	- -	4,307	6,146	- -
Yellow-poplar											
Yellow-poplar	14,926	213	796	986	1,770	4,555	2,804	876	2,926	- -	- -
All species	14,926	213	796	986	1,770	4,555	2,804	876	2,926	- -	- -
Black walnut											
Black walnut	424,658	21,397	39,460	54,442	74,681	63,237	51,202	46,134	35,942	38,163	- -
All species	424,658	21,397	39,460	54,442	74,681	63,237	51,202	46,134	35,942	38,163	- -
Other eastern soft hardwoods											
Boxelder	31,027	4,556	4,758	5,126	3,233	5,190	3,554	2,509	2,101	- -	- -
Ohio buckeye	4,146	1,468	973	141	1,122	441	- -	- -	- -	- -	- -
European Alder		- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
River birch	26,388	1,502	2,875	4,039	5,986	7,256	1,880	2,850	- -	- -	- -
Northern catalpa	326	- -	- -	326	- -	- -	- -	- -	- -	- -	- -
Sugarberry	3,500	530	765	534	1,671	- -	- -	- -	- -	- -	- -
Hackberry	258,635	22,798	32,785	37,917	38,540	31,867	23,663	24,280	12,667	28,721	5,398
Butternut	3,226	144	386	294	1,228	1,174	- -	- -	- -	- -	- -
American sycamore	300,197	6,559	11,633	14,259	23,487	28,614	36,002	31,750	32,339	80,577	34,977
Black cherry	77,367	14,762	16,052	15,901	11,670	9,737	6,065	858	- -	2,322	- -
Black willow	32,553	2,872	2,155	5,893	5,661	1,191	4,021	6,147	1,464	3,148	- -
Sassafras	22,541	7,470	4,590	4,462	2,342	2,032	- -	1,645	- -	- -	- -
Winged elm	21,686	9,091	7,484	1,976	806	654	1,676	- -	- -	- -	- -
American elm	240,004	53,954	52,440	48,375	28,826	14,596	19,995	12,758	7,582	1,477	- -
Slippery elm	92,239	23,549	20,398	15,772	13,483	5,875	7,503	3,538	2,121	- -	- -
All species	1,113,836	149,255	157,294	155,017	138,056	108,627	104,359	86,334	58,274	116,245	40,375

(Table 7 continued on next page)

(Table 7 continued)

Species group/ species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Hardwoods											
Other eastern hard hardwoods											
Flowering dogwood	4,267	3,755	512	--	--	--	--	--	--	--	--
Common persimmon	21,963	9,382	6,834	3,740	1,670	337	--	--	--	--	--
Waterlocust	1,854	57	180	--	845	--	--	773	--	--	--
Honeylocust	139,446	12,275	17,938	25,731	18,619	21,062	7,152	17,021	6,177	8,116	5,355
Kentucky coffeetree	6,345	734	506	1,382	739	2,984	--	--	--	--	--
Mulberry spp.	93	93	--	--	--	--	--	--	--	--	--
White mulberry	3,586	257	499	822	315	469	--	--	1,224	--	--
Red mulberry	21,425	3,791	5,362	5,158	1,754	1,415	578	3,366	--	--	--
Black locust	38,924	3,274	5,694	8,115	5,369	8,369	5,076	908	2,120	--	--
All species	237,904	33,618	37,525	44,949	29,310	34,636	12,807	22,068	9,521	8,116	5,355
Total hardwoods	14,106,858	1,128,629	1,628,274	2,019,979	2,148,719	2,010,703	1,710,888	1,216,684	891,084	1,097,781	254,117
All species groups	15,377,774	1,319,089	1,860,515	2,267,669	2,388,093	2,186,502	1,803,965	1,262,623	924,206	1,110,995	254,117

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

Table 8. -- Net volume of sawtimber on timberland by species group, species, and diameter class, Missouri, 2000-2004

(In thousand board feet)[1]

Species group/ species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Softwoods									
Loblolly and shortleaf pines									
Shortleaf pine	3,318,325	778,265	940,856	712,896	430,178	229,953	170,278	55,900	- -
All species	3,318,325	778,265	940,856	712,896	430,178	229,953	170,278	55,900	- -
Other yellow pines									
Scotch pine	1,660	1,660	- -	- -	- -	- -	- -	- -	- -
All species	1,660	1,660	- -	- -	- -	- -	- -	- -	- -
Eastern white and red pines									
Eastern white pine	23,692	3,010	10,120	10,562	- -	- -	- -	- -	- -
All species	23,692	3,010	10,120	10,562	- -	- -	- -	- -	- -
Cypress									
Baldcypress	1,268	- -	1,268	- -	- -	- -	- -	- -	- -
All species	1,268	- -	1,268	- -	- -	- -	- -	- -	- -
Other eastern softwoods									
Eastern redcedar	1,052,647	502,708	275,913	181,979	56,753	14,809	7,740	12,745	- -
All species	1,052,647	502,708	275,913	181,979	56,753	14,809	7,740	12,745	- -
Total softwoods	4,397,593	1,285,643	1,228,158	905,437	486,931	244,762	178,018	68,645	- -
Hardwoods									
Select white oaks									
White oak	10,899,299	- -	2,529,676	2,611,590	2,118,420	1,466,008	968,153	1,076,850	128,603
Swamp white oak	204,793	- -	45,548	29,084	47,257	30,205	33,720	18,979	- -
Bur oak	215,948	- -	38,150	33,305	39,668	16,418	- -	62,931	25,477
Swamp chestnut oak	28,360	- -	1,105	- -	- -	- -	8,766	6,692	11,797
Chinkapin oak	639,165	- -	155,115	132,198	98,191	92,017	47,957	88,695	24,993
All species	11,987,565	- -	2,769,593	2,806,177	2,303,535	1,604,647	1,058,596	1,254,147	190,870
Select red oaks									
Cherrybark oak	31,817	- -	5,623	2,828	18,123	5,242	- -	- -	- -
Northern red oak	3,473,193	- -	475,914	595,648	555,314	504,259	558,331	655,580	128,148
Shumard oak	256,713	- -	49,706	62,854	32,864	30,765	7,646	72,878	- -
All species	3,761,722	- -	531,242	661,330	606,302	540,267	565,976	728,458	128,148
Other white oaks									
Overcup oak	42,342	- -	4,449	- -	3,308	- -	- -	6,964	27,622
Chestnut oak	2,313	- -	- -	2,313	- -	- -	- -	- -	- -
Post oak	3,994,668	- -	1,202,927	1,075,375	798,185	412,078	262,762	183,781	59,558
All species	4,039,323	- -	1,207,376	1,077,688	801,493	412,078	262,762	190,745	87,180
Other red oaks									
Scarlet oak	1,883,977	- -	452,297	430,298	431,825	258,364	170,110	127,076	14,006
Southern red oak	180,457	- -	41,437	40,789	18,192	8,966	16,547	40,306	14,220
Shingle oak	574,067	- -	107,441	88,404	123,766	76,707	66,013	87,463	24,272
Blackjack oak	435,199	- -	135,064	98,380	83,566	57,453	31,263	9,997	19,476
Pin oak	656,007	- -	115,726	142,873	81,755	86,707	70,355	140,176	18,416
Willow oak	18,488	- -	3,781	2,295	3,160	- -	- -	9,253	- -
Black oak	8,782,761	- -	2,101,392	2,010,236	1,660,777	1,225,532	861,024	900,636	23,164
All species	12,530,955	- -	2,957,137	2,813,276	2,403,041	1,713,728	1,215,312	1,314,907	113,554
Hickory									
Bitternut hickory	561,102	- -	180,374	125,565	142,790	52,252	46,763	13,358	- -
Pignut hickory	399,298	- -	120,204	103,743	87,940	41,447	6,093	39,872	- -
Pecan	87,042	- -	17,894	28,357	17,483	13,942	9,365	- -	- -
Shellbark hickory	149,365	- -	21,903	22,485	4,138	14,117	10,831	75,890	- -
Shagbark hickory	1,104,603	- -	325,693	247,172	241,109	154,927	65,974	69,728	- -
Black hickory	840,386	- -	350,469	219,670	137,678	71,382	53,429	7,758	- -
Mockernut hickory	674,663	- -	279,036	164,399	112,439	67,552	21,162	30,075	- -
All species	3,816,459	- -	1,295,573	911,391	743,578	415,619	213,617	236,680	- -

(Table 8 continued on next page)

(Table 8 continued)

Species group/ species	All classes	Diameter class (inches at breast height) 9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Hardwoods									
Hard maple									
Black maple	8,704	- -	- -	- -	- -	- -	8,704	- -	- -
Sugar maple	485,279	- -	152,532	109,419	82,417	62,401	50,404	28,106	- -
All species	493,983	- -	152,532	109,419	82,417	62,401	59,108	28,106	- -
Soft maple									
Red maple	69,147	- -	12,436	6,644	3,731	17,057	11,862	17,418	- -
Silver maple	857,451	- -	75,490	114,431	164,767	54,226	87,152	245,968	115,418
All species	926,598	- -	87,925	121,075	168,498	71,282	99,014	263,386	115,418
Beech									
American beech	1,993	- -	- -	1,993	- -	- -	- -	- -	- -
All species	1,993	- -	- -	1,993	- -	- -	- -	- -	- -
Sweetgum									
Sweetgum	74,794	- -	12,963	11,023	16,116	22,622	12,071	- -	- -
All species	74,794	- -	12,963	11,023	16,116	22,622	12,071	- -	- -
Tupelo and blackgum									
Water tupelo	42,480	- -	3,298	7,059	21,204	4,671	6,248	- -	- -
Blackgum	158,578	- -	41,116	42,888	11,350	22,275	14,468	26,482	- -
All species	201,059	- -	44,415	49,947	32,554	26,946	20,715	26,482	- -
Ash									
White ash	534,165	- -	109,202	99,635	121,755	93,665	67,047	42,861	- -
Green ash	456,194	- -	100,408	92,321	115,585	45,121	41,439	61,320	- -
Blue ash	9,042	- -	4,080	4,963	- -	- -	- -	- -	- -
All species	999,401	- -	213,690	196,919	237,340	138,786	108,486	104,181	- -
Cottonwood and aspen									
Eastern cottonwood	628,304	- -	29,121	9,889	52,496	94,277	98,587	121,894	222,040
All species	628,304	- -	29,121	9,889	52,496	94,277	98,587	121,894	222,040
Basswood									
American basswood	90,282	- -	19,631	3,895	15,938	- -	21,139	29,679	- -
All species	90,282	- -	19,631	3,895	15,938	- -	21,139	29,679	- -
Yellow-poplar									
Yellow-poplar	66,133	- -	8,666	23,164	14,660	4,474	15,170	- -	- -
All species	66,133	- -	8,666	23,164	14,660	4,474	15,170	- -	- -
Black walnut									
Black walnut	1,446,842	- -	356,831	301,869	242,890	216,495	164,856	163,901	- -
All species	1,446,842	- -	356,831	301,869	242,890	216,495	164,856	163,901	- -
Other eastern soft hardwoods									
Boxelder	75,659	- -	14,855	23,818	16,179	11,313	9,495	- -	- -
Ohio buckeye	7,171	- -	5,128	2,043	- -	- -	- -	- -	- -
River birch	82,644	- -	27,576	33,433	8,615	13,020	- -	- -	- -
Sugarberry	7,769	- -	7,769	- -	- -	- -	- -	- -	- -
Hackberry	724,143	- -	178,717	144,717	105,987	105,560	54,178	115,161	19,823
Butternut	11,076	- -	5,654	5,421	- -	- -	- -	- -	- -
American sycamore	1,220,742	- -	103,883	129,345	164,418	145,992	150,461	372,367	154,276
Black cherry	141,133	- -	53,847	45,004	27,967	3,915	- -	10,399	- -
Black willow	94,837	- -	24,850	5,302	17,836	27,129	6,297	13,422	- -
Sassafras	27,784	- -	10,878	9,413	- -	7,493	- -	- -	- -
Winged elm	13,539	- -	3,728	2,760	7,051	- -	- -	- -	- -
American elm	383,097	- -	133,374	66,146	89,779	54,901	32,541	6,356	- -
Slippery elm	146,810	- -	62,495	26,731	33,110	15,516	8,958	- -	- -
All species	2,936,403	- -	632,755	494,133	470,941	384,838	261,930	517,706	174,099

(Table 8 continued on next page)

(Table 8 continued)

Species group/ species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+
Hardwoods									
Other eastern hard hardwoods									
Common persimmon	9,304	- -	7,708	1,597	- -	- -	- -	- -	- -
Waterlocust	7,525	- -	3,950	- -	- -	3,575	- -	- -	- -
Honeylocust	378,021	- -	86,078	97,317	32,773	77,615	27,642	35,144	21,451
Kentucky coffeetree	17,165	- -	3,406	13,759	- -	- -	- -	- -	- -
White mulberry	9,137	- -	1,470	2,165	- -	- -	5,501	- -	- -
Red mulberry	32,744	- -	8,110	6,551	2,683	15,400	- -	- -	- -
Black locust	100,294	- -	24,720	38,564	23,401	4,084	9,526	- -	- -
All species	554,190	- -	135,442	159,954	58,856	100,673	42,669	35,144	21,451
Total hardwoods	44,556,007	- -	10,454,892	9,753,142	8,250,653	5,809,134	4,220,009	5,015,416	1,052,760
All species groups	48,953,600	1,285,643	11,683,050	10,658,579	8,737,584	6,053,896	4,398,027	5,084,061	1,052,760

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the volume rounds to less than 1 thousand board feet. Columns and rows may not add to their totals due to rounding.

[1] International 1/4-inch rule.

Table 9. -- All live aboveground tree biomass on timberland by owner category, softwood/hardwood species category, and tree biomass component, Missouri, 2000-2004

(In thousand dry tons)

Owner category and softwood/hardwood category	All components	Tree biomass component						
		All live 1-5 inch trees	Growing-stock trees			Non-growing-stock trees		
			Total	Boles	Stumps, tops, and limbs	Total	Boles	Stumps, tops, and limbs
Public								
Softwoods	10,494	619	9,687	8,074	1,614	187	140	47
Hardwoods	90,178	9,054	70,206	50,377	19,830	10,918	7,964	2,954
Total	100,672	9,673	79,894	58,450	21,443	11,105	8,104	3,001
Private								
Softwoods	21,249	3,732	15,718	11,915	3,803	1,799	1,290	509
Hardwoods	444,510	35,473	334,253	238,845	95,408	74,783	54,440	20,343
Total	465,759	39,206	349,971	250,760	99,211	76,582	55,731	20,852
All ownerships								
Softwoods	31,743	4,351	25,405	19,989	5,417	1,987	1,430	556
Hardwoods	534,688	44,528	404,460	289,222	115,238	85,701	62,404	23,297
Total	566,431	48,879	429,865	309,210	120,655	87,687	63,834	23,853

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the aboveground tree biomass rounds to less than 1 dry ton. Columns and rows may not add to their totals due to rounding.

Table 10. -- Average annual net growth of growing stock on timberland by species group and owner category, Missouri, 1999 to 2004

(In thousand cubic feet per year)

Species group	Owner category			
	All owners	Public	Private	Unidentified owner
Softwoods				
Loblolly and shortleaf pines	26,054	13,416	12,638	- -
Other eastern softwoods	44,110	5,826	38,284	- -
Total softwoods	70,164	19,242	50,922	- -
Hardwoods				
Select white oaks	201,738	29,898	171,840	- -
Select red oaks	38,102	3,010	35,091	- -
Other white oaks	98,911	9,360	89,551	- -
Other red oaks	155,660	38,416	117,243	- -
Hickory	91,101	11,783	79,318	- -
Hard maple	11,831	1,643	10,188	- -
Soft maple	40,745	9,517	31,228	- -
Beech	-218	-218	- -	- -
Sweetgum	2,590	1,884	706	- -
Tupelo and blackgum	3,138	-58	3,195	- -
Ash	33,569	2,379	31,189	- -
Cottonwood and aspen	4,806	1,994	2,812	- -
Basswood	-3,359	87	-3,447	- -
Yellow-poplar	341	217	124	- -
Black walnut	36,755	1,593	35,162	- -
Other eastern soft hardwoods	104,377	888	103,489	- -
Other eastern hard hardwoods	28,876	4,552	24,324	- -
Total hardwoods	848,961	116,946	732,015	- -
All species groups	919,125	136,189	782,937	- -

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

Table 11. -- Average annual removals of growing stock on timberland by species group and owner category, Missouri, 1999 to 2004

(In thousand cubic feet per year)

Species group	Owner category			
	All owners	Public	Private	Unidentified owner
Softwoods				
Loblolly and shortleaf pines	5,034	481	4,553	- -
Other eastern softwoods	3,380	2,653	727	- -
Total softwoods	8,414	3,134	5,280	- -
Hardwoods				
Select white oaks	37,427	2,633	34,794	- -
Select red oaks	11,366	1,809	9,557	- -
Other white oaks	9,399	1,077	8,322	- -
Other red oaks	46,739	5,383	41,355	- -
Hickory	13,319	1,053	12,266	- -
Hard maple	833	440	393	- -
Soft maple	1,443	- -	1,443	- -
Tupelo and blackgum	2,764	2,707	57	- -
Ash	2,194	- -	2,194	- -
Cottonwood and aspen	18,056	- -	18,056	- -
Basswood	1,196	- -	1,196	- -
Black walnut	3,372	92	3,280	- -
Other eastern soft hardwoods	6,085	58	6,028	- -
Other eastern hard hardwoods	5,273	306	4,968	- -
Total hardwoods	159,468	15,558	143,911	- -
All species groups	167,883	18,692	149,191	- -

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

Table 12. -- Average annual mortality of growing stock on timberland by species group and owner category, Missouri, 1999 to 2004

(In thousand cubic feet per year)

Species group	Owner category			
	All owners	Public	Private	Unidentified owner
Softwoods				
Loblolly and shortleaf pines	3,312	2,787	524	- -
Other eastern softwoods	1,196	- -	1,196	- -
Total softwoods	4,507	2,787	1,720	- -
Hardwoods				
Select white oaks	18,008	2,124	15,884	- -
Select red oaks	16,351	1,122	15,229	- -
Other white oaks	3,114	328	2,786	- -
Other red oaks	70,452	12,051	58,401	- -
Hickory	4,064	410	3,654	- -
Hard maple	118	32	86	- -
Soft maple	7,057	- -	7,057	- -
Sweetgum	- -	- -	- -	- -
Tupelo and blackgum	92	- -	92	- -
Ash	4,356	- -	4,356	- -
Cottonwood and aspen	- -	- -	- -	- -
Basswood	4,313	- -	4,313	- -
Black walnut	368	- -	368	- -
Other eastern soft hardwoods	13,916	1,663	12,254	- -
Other eastern hard hardwoods	1,832	- -	1,832	- -
Total hardwoods	144,039	17,729	126,310	- -
All species groups	148,547	20,517	128,030	- -

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates that the volume rounds to less than 1 thousand cubic feet. Columns and rows may not add to their totals due to rounding.

Moser, W. Keith; Hansen, Mark H.; Treiman, Thomas; Moltzan, Bruce; Lawrence, Robert; Brand, Gary J.

2006. **Missouri's forest resources in 2004.** Resour. Bull. NC-257. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 37 p.

Reports the initial results of five annual panels (2000-2004) of the inventory of Missouri's forest resources and one panel (2004) of growth, removals, and mortality. Includes information on forest area, number of trees, volume, biomass, growth, removals, mortality, and forest health.

KEY WORDS: Annual inventory, forest area, forest type, volume, biomass, Missouri

The Forest Inventory and Analysis Web site is: www.fia.fs.fed.us

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