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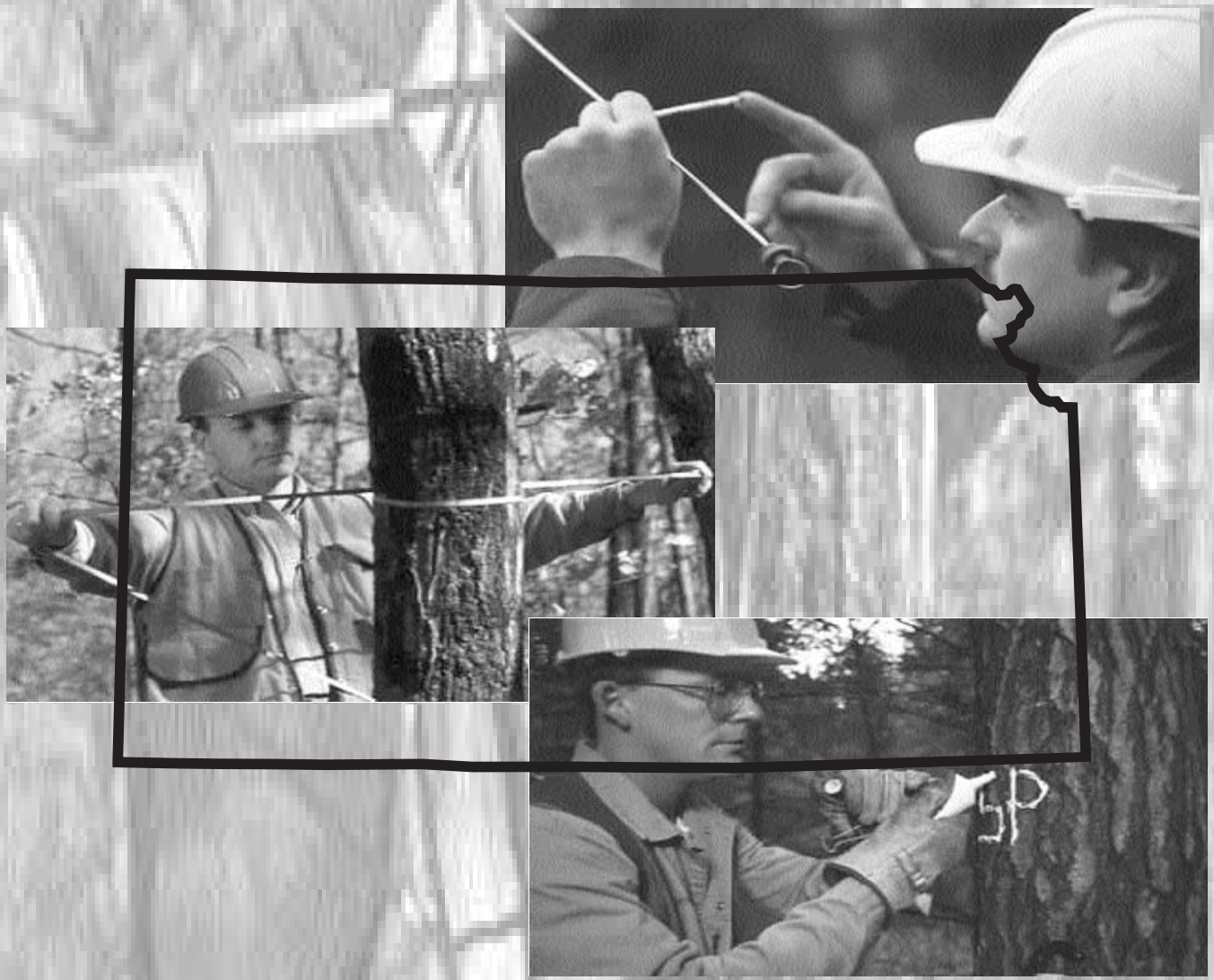
# Kansas' Forest Resources in 2003

W. Keith Moser, Gary J. Brand, and Robert L. Atchison



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# Kansas' Forest Resources in 2003

**About the Authors:**

**W. Keith Moser** and **Gary J. Brand** are Research Foresters with the North Central Research Station, St. Paul, MN.

**Robert L. Atchison** is a Rural Forestry Coordinator with the Kansas Forest Service, Manhattan, KS.

The North Central Research Station's Forest Inventory and Analysis (NCFIA) program began fieldwork for the fifth forest inventory of Kansas forest resources in 2001. This inventory initiated the new annual inventory system in which one-fifth of the field plots (considered one panel) in the State is measured each year. A complete inventory consists of measuring and compiling the data for all plots in all five panels. Once the plots in all panels have been measured, each will be remeasured approximately every 5 years. For example, the field plots measured in 2003 will be remeasured in 2008.

In 2003, NCFIA continued the annual inventory effort with the third panel of the fifth Kansas forest inventory. Previous inventories of Kansas are dated 1936, 1965, 1981, and 1994 (Chase and Strickler 1968, Kansas State College 1939, Leatherberry *et al.* 1999, Raile and Spencer 1984, Spencer *et al.* 1984). This fifth inventory of Kansas forest resources will be completed in 2005. However, because each year's sample is a systematic sample of the State's forest and because timely information is needed about Kansas forest resources, estimates have been prepared from data gathered during the first 3 years of the inventory. Estimates presented in this report are based on measurements from approximately 60 percent of the field plots (or three panels) for a complete inventory. The underlying data are a combination of measurements for the first year's panel in 2001, measurements for the second year's panel in 2002 and measurements for the third year's panel in 2003. The results presented are estimates based on sampling techniques; estimates for this report were compiled assuming the 2001, 2002, and 2003 data represent one sample. As additional annual panels are completed, the precision of the estimates will increase and additional data will be released.

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 Kansas inventory in 1994 (Leatherberry *et al.* 1999). While these changes will have some 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 compare directly portions of the 2001-2003 estimates with those published for earlier inventories. Except for oak/hickory, forest type descriptions in this report are categorized by broad groups not necessarily found in Kansas. Forest type subcategories more accurately describe the forests of the State. This includes elm/ash/locust for maple/beech/birch; eastern redcedar/hardwood for oak/pine, and eastern redcedar for pinyon/juniper.

## RESULTS

### Area

Forest land area totaled 2.2 million acres in 2003 (table 1). Six percent of the forest land was owned by public agencies and 94 percent was owned by private landowners. More than

6 percent of the forest land area was dominated by conifers and 92.8 percent was dominated by hardwoods, with the remainder classified as nonstocked. Oak/hickory forests constituted over 57 percent of the total hardwood area. The pinyon/juniper forest group, primarily made up of eastern redcedar, constituted 87.7 percent of all forest land dominated by conifers.

Timberland area, a subset of forest land area, was 2.13 million acres in 2003. It has continued to increase since its low point in the 1936 inventory (fig. 1). The significant jump in forest land and timberland area since the last periodic inventory is due to many factors, including ingrowth, conversion of agricultural land to forest, and a definitional change. Previously, forest lands that were grazed or providing shelter from the wind were not classified as forest land. Since 2001, such lands have been classified as forest land if they meet standards of 1 acre in size, 120 feet in width, and 10 percent stocking.

The area of timberland by forest type group was dominated by hardwoods (table 2) and particularly by the oak/hickory group (table 3[1] and fig. 2). Hardwoods made up 92.9 percent of the total acreage, 87.3 percent of all public land acreage, and 93.3 percent of all private landholdings. Most forest type groups were in the sawtimber and poletimber stand-size classes, except for the pinyon/juniper (eastern redcedar) group.

Figure 3 shows the area of timberland by stand-size class over the years. The proportion of trees in the poletimber and sawtimber classes has generally increased since the 1965 inventory.

*[1] Under FIA classifications, forest type groups are composed of several, sometimes related, forest types. For example, the oak/pine forest type group consists of the eastern redcedar/hardwood and shortleaf pine forest types. In tables 3 and 6 and figure 2, the maple/beech/birch forest type group in Kansas is primarily made up of elm/ash/locust; pinyon/juniper is entirely eastern redcedar; and oak/pine is mainly redcedar/hardwood.*

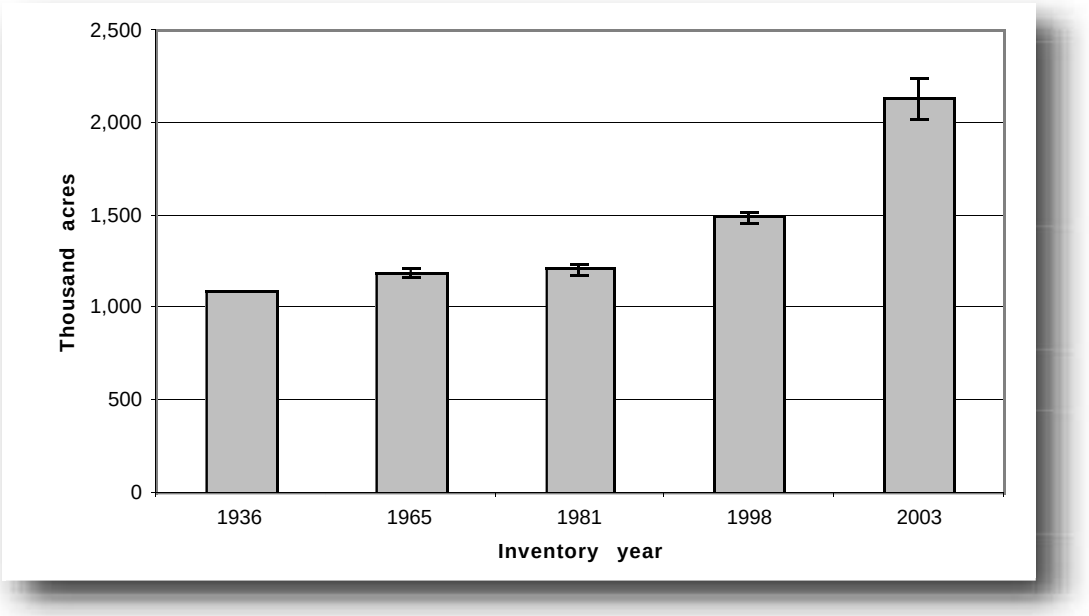


*Figure 1. — Area of timberland in Kansas, 1936–2003. (Note: The vertical line at the top of each bar represents the sampling error associated with each inventory. No sampling error was available for the 1936 survey; timberland areas were calculated using the total forest land area for 1936 multiplied by a ratio of timberland to total forest land from 1965.)*

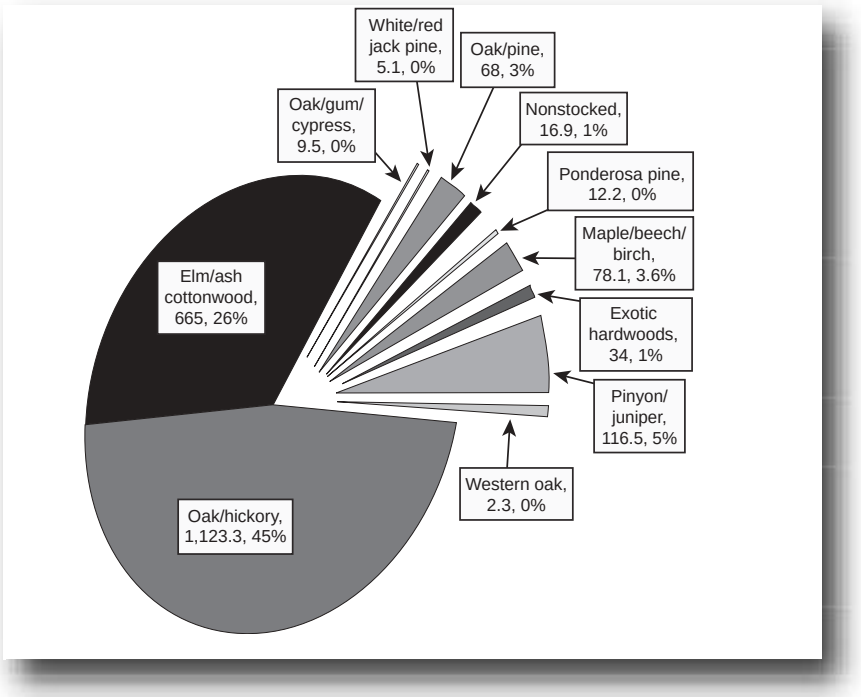


Figure 2. — *Area of timberland in Kansas by forest type group, in thousands of acres and percentage, 2001–2003.*

## Volume

The net volume of all live trees on forest land, which includes growing stock, rough trees, and rotten trees, was almost 2.9 billion cubic feet in 2003 (table 4). Hardwoods constituted just under 2.8 billion cubic feet and softwoods were more than 103 million cubic feet of all live tree volume. Net volume of all oaks was 504 million cubic feet or 18.2 percent of all hardwood live tree volume. Select oaks (red and white) constituted 394 million cubic feet or 78.3 percent of all oaks and 14.2 percent of all hardwood live tree volume.

Net volume of all live trees and salvable dead trees on timberland was 2.86 billion cubic feet (table 5 and fig. 4). Net volume of all live trees was 2.81 billion cubic feet or 98.1 percent of

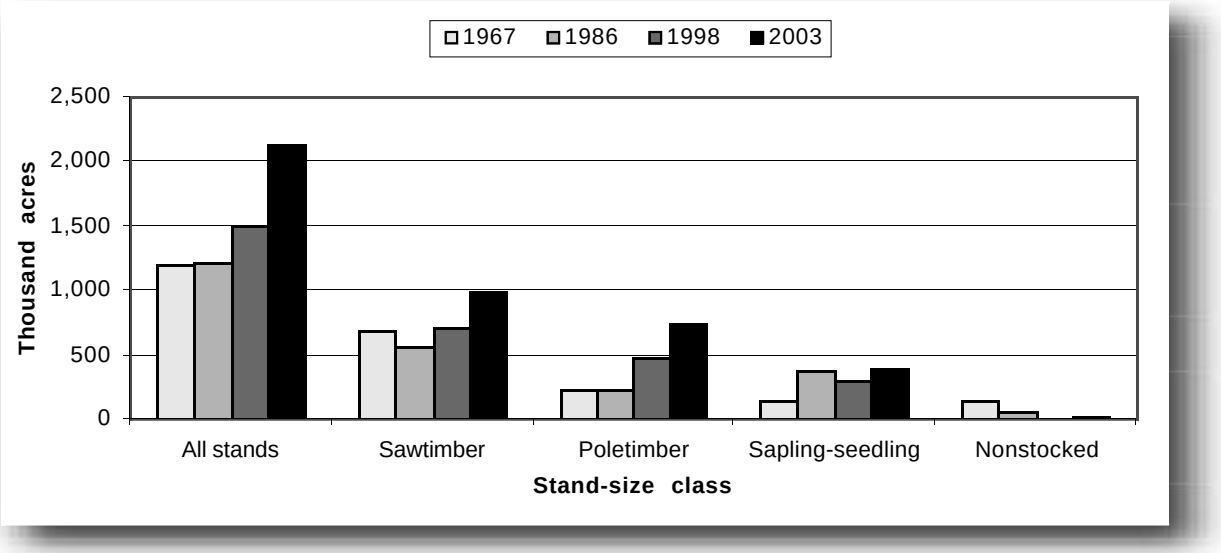


Figure 3. — *Area of timberland in Kansas by stand-size class in thousands of acres, 1965–2003.*

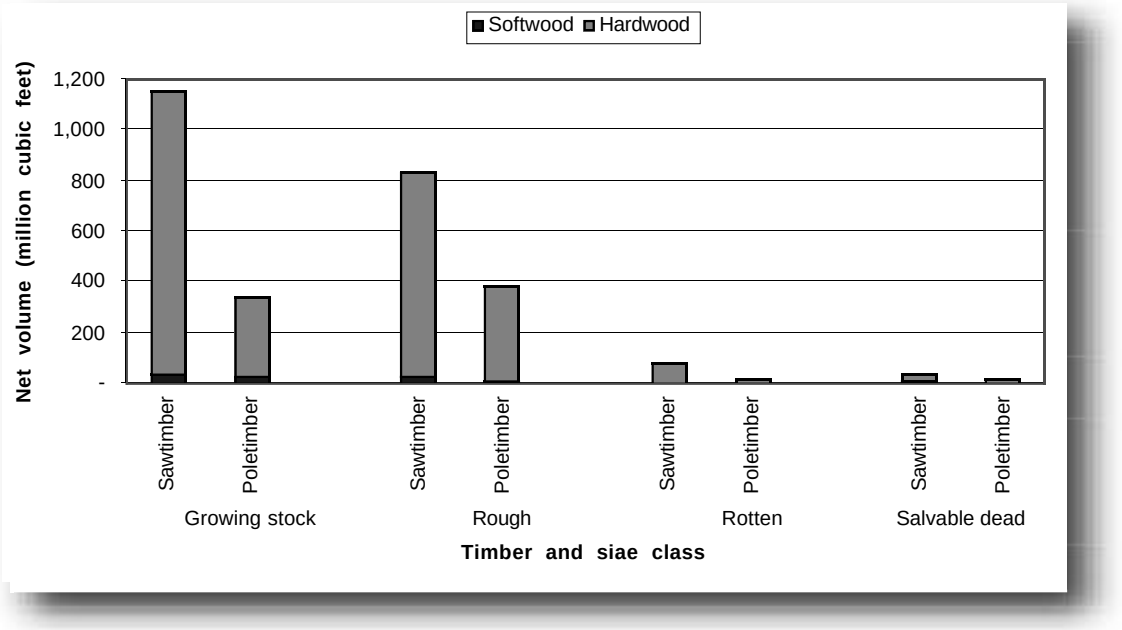


*Figure 4. — Net volume in Kansas by timber class and size class in thousands of cubic feet, 2001–2003.*

total live tree volume. The difference between the all live trees on timberland volume total and the 2.88 billion cubic feet volume of all live tree volume on forest land (table 4) represents the 74 million cubic feet on land that is either of low productivity (incapable of growth greater than 20 cubic feet per acre per year at the culmination of mean annual increment) or reserved (e.g., parks, wilderness areas, etc.). Of the 1.5 billion cubic feet of growing-stock volume, 1.15 billion cubic feet or 77 percent was sawtimber volume. The sawtimber volume percentages for softwoods and hardwoods were 57.6 and 78.0 percent, respectively.

Cull tree volume, at 1.3 billion cubic feet, was 46.8 percent of all live trees. The softwood cull tree volume represented 36.1 percent of the total softwood live tree volume, whereas hardwood culls represented 47.3 percent of the total hardwood volume. The phototropic (sun-following) and decurrent growth habits of hardwoods and the poor stem form resulting from inadequate self-pruning, particularly in more open stands, might explain the disparity in the cull percentage. The large amount of volume growing in low-density stands, particularly those formerly classified as woody pastures, as well as the large number of noncommercial species tallied, would also explain the high total percentage of cull trees.

The net volume of growing stock on timberland totaled 1.49 billion cubic feet (table 6)[2]. The volume has substantially increased since 1965 (fig. 5). Over 97.4 percent of that total was in hardwood forest types and 36.3 million cubic feet (2.4 percent) was in conifer forest types, with the remainder in the nonstocked category. Table 6 reports the volumes for softwoods and hardwoods for each forest type group. For example, the oak/pine group had 14.3 million cubic feet of softwoods and 22.1 million cubic feet of hardwoods (fig. 6).

Table 7 shows net volume of growing stock on timberland by species group and diameter class. The totals for softwood and hardwood volumes, 64.3 million cubic feet and 1.4 billion cubic feet, respectively, are the same as the totals at the bottom of the columns in table 6. Total volume of oak growing stock on timberland was 280.1 million cubic feet,

[1] *See the note for table 3.*

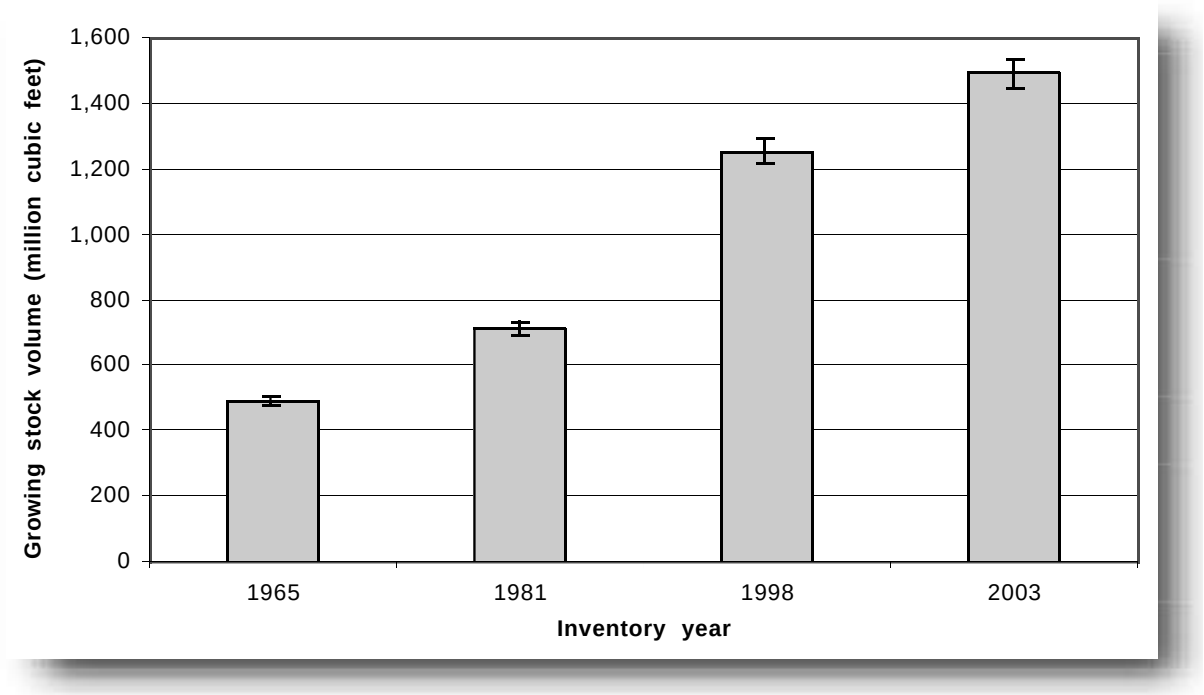


*Figure 5. — Net volume of growing stock on timberland, in millions of cubic feet, for Kansas, 1965–2003. The vertical line at the top of each bar represents the sample error associated with each inventory.*

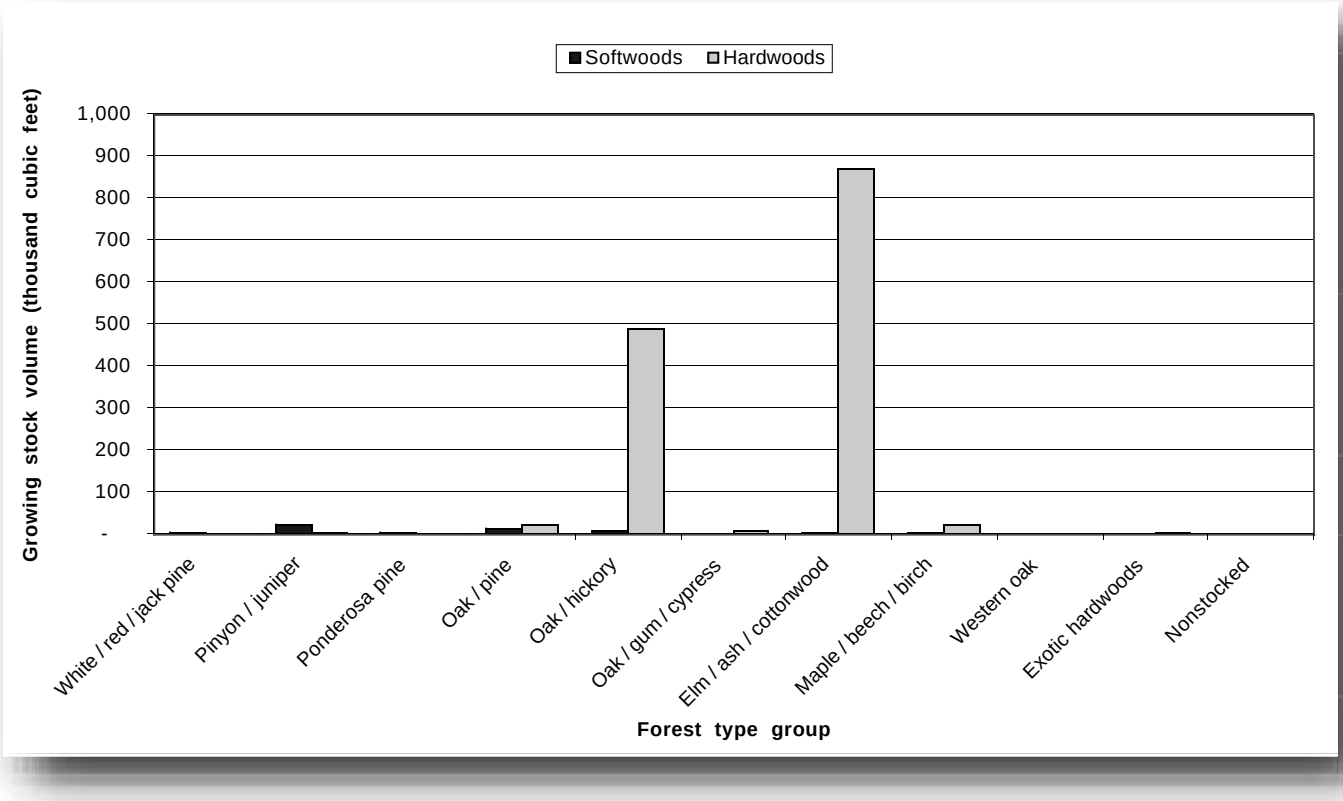


*Figure 6. — Net volume of growing stock in Kansas, in thousands of cubic feet, 2001–2003.*

which was 19.6 percent of all hardwood volume and 18.8 percent of all growing-stock volume. Trees at least 19 inches in diameter constituted 42.3 percent of the net volume of hardwood growing stock.

The net volume of sawtimber on timberland was 5.5 billion board feet (table 8). As with many other measures of coverage and abundance in Kansas, hardwoods constituted the preponderance of the volume (96.7 percent or 5.3 billion board feet). Red and white oaks totaled 1.1 billion board feet or 20.7 percent of the hardwood volume. Trees 19 or more inches in diameter were 56.0 percent of the hardwood volume (3.0 billion board feet). In 1994, the 19+ inch diameter classes constituted 50.8 percent of the total hardwood volume (Leatherberry *et al.* 1999).

## Biomass

The live aboveground biomass on timberland in Kansas totaled 73.5 million dry tons (table 9). Over 5.2 percent of that total was in 1- to 5-inch, 48.5 percent was in growing-stock trees, and 46.2 percent was in non-growing-stock trees. Of the total, 93.1 percent (68.4 million dry tons) was on private land and 6.9 percent (5.0 million dry tons) was on public land. Of the 35.7 million dry tons in growing-stock trees, 90.4 percent was on private land and 9.6 percent was on public land. Among non-growing-stock trees, 95.9 percent was on private land and 4.1 percent was on public land (fig. 7).

Close to 74 percent of the total biomass of the growing-stock trees was in the boles, and the remaining 26.4 percent was in the stumps, tops, and limbs. Approximately the same proportions existed for the 34.0 million dry tons of non-growing-stock trees: 72.6 percent was in bolewood and 27.4 percent was in stumps, tops, and limbs.

An interesting facet of these data is the relatively small proportion of aboveground biomass in non-growing-stock softwood trees (27.7 percent of all softwood biomass) vs. non-growing-stock hardwood trees (47.6 percent of all hardwood biomass). This fact reflects the higher proportion of hardwood volume made up of species of little or no commercial value and the higher likelihood that hardwoods have defects that result in low quality timber.

## Forest Health

The following information about pathogens and insects affecting Kansas forests was adapted from the national Forest Health Monitoring

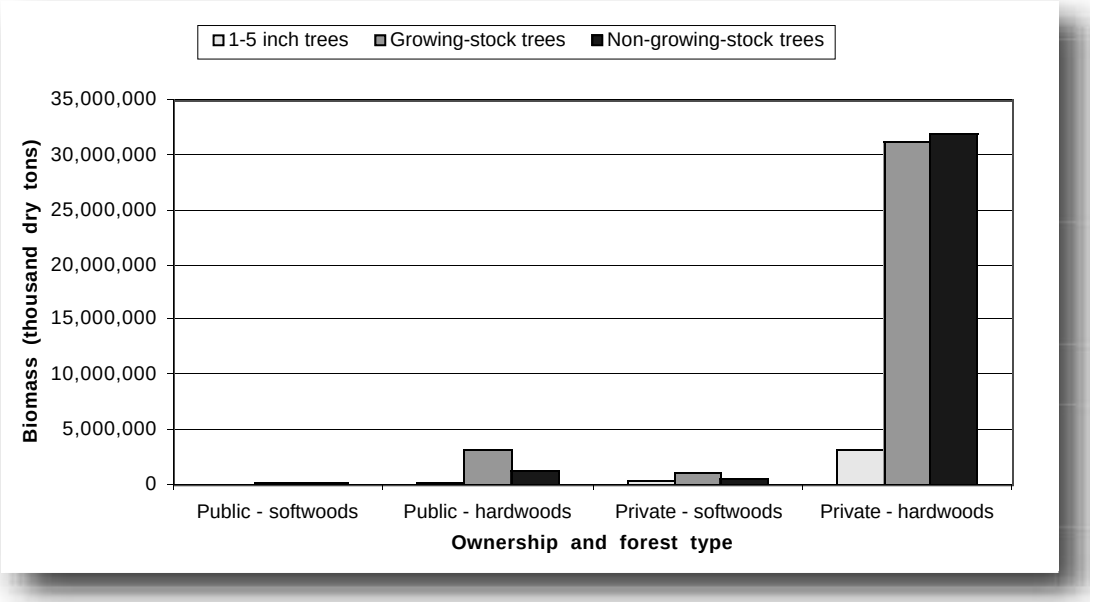


*Figure 7. — Live aboveground biomass in Kansas, in dry tons, by ownership type and forest type, 2001–2003.*

(FHM) program Web page (Aslin and Harris 2004) at: http://www.na.fs.fed.us/spfo/fhm/fhh/fhh-03/ks/ks_03.pdf.

The most recent, complete measurement cycles of forested lands in Kansas were finished in 2002 by the USDA Forest Service, FIA, and the Kansas Forest Service. Status was evaluated for all living plot trees. Growing-stock trees were generally healthy trees with very little damage, while rough/rotten trees were often declining due to more major damage. Very little damage was found on the ponderosa pines, but all of the deciduous trees had considerable decline problems on more than one-half of each forest type. The maples had more damaged trees than healthy, growing-stock trees.

Severe drought continued throughout much of the State in 2003, weakening trees and making them more susceptible to insect and disease attack. Green ash is vulnerable to attack by ash borer and lilac borer. These boring pests have caused lodging of green ash in shelterbelt plantings on private lands and were found throughout the State in 2003. Because of the ash borer, a very common pest, use of green ash in windbreaks is limited to very fertile, moist sites. Austrian and some Scotch pine in northwest and southeast Kansas have been attacked by pine pitch moths. Local resource agencies have eradicated the moth in northwest Kansas. In southeast Kansas, the infestation is widespread and will probably not be eradicated. The moth also occurs across the border in Missouri. Pines, especially Scotch pine, are attacked by the pine sawyer. This insect attacks healthy and stressed Scotch pines statewide except for the far southwest and northwest counties. This insect also spreads the nematode that causes pine wilt. Austrian, ponderosa, and Scotch pines can be attacked by pine tip moths. Several species are distributed throughout the State and will most likely attack newly planted trees and trees several years old. Although older trees taller than 10 feet are less likely to be infested, some older and taller Scotch pine trees were infested in western Kansas. Austrian and ponderosa pine can be damaged by Dothistroma needle blight. Damage was reported as light to moderate in the eastern half of Kansas, and timely pesticide applications were used to control the disease.

Dutch elm disease can be a significant problem for American elm trees in riparian areas and cities throughout Kansas. Although incidence of this disease was considered moderate during 2003, most cases were found in parks, ditchbanks, and windbreaks, primarily in the eastern third of the State. Oak wilt continues to be a problem for bur and red oaks in forests along the eastern edge of Kansas. Only a few cases of oak wilt were reported in northeast Kansas. The damage from this disease was found in woodlots and housing developments established in previous oak stands. Kansas has experienced epidemic proportions of damage due to pine wilt and pinewood nematode over the last 3 to 5 years. Heavy mortality linked to this nematode was found frequently throughout Kansas, mostly affecting Scotch pine. The drought exacerbated the problem, and the disease is now moving into Austrian pine in southeast Kansas. Decline of trees was rapid in the fall under these dry conditions, and the disease was a limiting factor in plantings in eastern Kansas. Russian olive canker was a common problem in plantings of windbreaks. The host species, Russian olive, was found to have considerable cankers, flagged branches, and dieback. Several diseases have been reported to cause this syndrome in Kansas, but *Tubercularia* spp. was found most often. Sphaeropsis (Diplodia) blight (*Sphaeropsis sapinea*) levels in Austrian and ponderosa pines were moderate in Kansas in 2003; however, some plantings suffered high tree mortality and decline. Most of the reported incidents occurred in eastern and central Kansas. Thyronectria canker was a serious disease of honey locust plantings in Kansas during 2003. Over 75 percent of the plantings of this tree had 30 to 100 percent disease incidence and were reported in poor health. Most of the plantings were located in central and northwestern Kansas.

## SUMMARY

Continuing long-term trends in Kansas, most measures of forested area and volumes show increases. Area has increased steadily since a low point in 1936; standing volumes have continued to increase since 1950. By and large, the forests of Kansas are healthy, although drought conditions can increase susceptibility to insects and diseases. As additional data become available from ensuing annual inventories, a more precise picture of the trends of Kansas' forests will emerge. Further data related to the three most recent inventories of Kansas (2001, 2002, and 2003) are available at: www.ncrs.fs.fed.us/4801/fiadb/index.htm.

# APPENDIX

## Inventory Methods

Since the 1994 inventory of Kansas, several changes have been made in 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 was the change from periodic inventories 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.

With the NCFIA annual inventory system, about one-fifth of all field plots are measured each year. After 5 years, an entire inventory cycle will be completed. After the first 5 years, NCFIA will report and analyze results as a moving 5-year average. For example, NCFIA will be able to generate a report based on inventory results for 1999 through 2004 or for 2003 through 2006. Although there are great advantages to an annual inventory, one difficulty is reporting on results during the first 4 years. For the 2001-2003 annual panels, approximately 60 percent of all field plots have been measured. Sampling error estimates for the 2003 inventory results are area of forest land, 4.75 percent; area of timberland, 4.96 percent; number of growing-stock trees on timberland, 16.75 percent; volume of growing stock on timberland, 9.28 percent; and volume of sawtimber on timberland, 11.28 percent. These sampling error estimates are higher than those for the last periodic inventory completed in 1994 (i.e., 1.59 percent for timberland area and 2.18 percent for growing-stock volume) because of the smaller sample sizes. Thus, caution should be used when drawing conclusions based on this limited data set. As we complete measurement of additional panels, we will have greater confidence in our results due to the increased number of field plots measured.

Other significant changes between our old and new inventory methodologies include new remote sensing technology, a new sampling design, and additional remotely sensed and field data. The advent of remote sensing technology since the previous inventory in 1994 has allowed NCFIA to use computer-assisted classifications of Multi-Resolution Land Characterization (MRLC) data and other available remote sensing products to stratify the total area of the State and to improve the precision of estimates. Inventories in Kansas before 1999 used manual interpretation of aerial photos to stratify the sample (1950, 1965, 1986, and 1994 samples).

New algorithms were used in 1999-2003 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 and will be used to reassign the forest type and stand-size class of every plot measured in the 1989 inventory when it is updated. This will be done so that changes in forest type and stand-size class will more accurately reflect actual changes in the forest and not changes in how values are computed. 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 (stands with a stocking value of less than 10 percent for all live trees), and names given to the forest types changed with the new algorithms. As a result, comparisons between the published 2001–2003 inventory results and those published for the 1994 inventory may not be valid. For additional details about algorithms used in both inventories, please contact NCFIA.

## Sampling Phases

The 2003 Kansas survey was based on a three-phase inventory. The first phase used classified satellite imagery to stratify the State and aerial

photographs to select plots for measurement. The second phase measured the traditional FIA suite of mensurational variables, and the third phase focused on a 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*

The 2003 inventory used a computer-assisted classification of satellite imagery. FIA used the imagery to form two initial strata—forest and nonforest. Pixels within 60 m (2 pixel widths) of a forest/nonforest edge formed two additional strata—forest/nonforest and nonforest/forest. 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. The estimated population total for a variable is the sum across all strata of the product of each stratum's estimated area and the variable's estimated mean per unit area for the stratum.

### *Phase 2*

Phase 2 of the inventory consisted of the measurement of the annual panel of field plots in Kansas. 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 non-overlapping hexagons, each of which contains 5,937 acres (McRoberts 1999). Across the North Central region, 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 1990 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). In Kansas, we did not use previous plots, so we followed procedure (3) and established new plots. This array of plots is designated the Federal base sample and is considered an equal probability sample. NCFIA uses a combination of its own crews and Kansas Forest Service personnel, the cost of which is funded by the Federal government.

The total Federal base sample of plots was systematically divided into five interpenetrating, nonoverlapping subsamples or 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 plots 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 non-woody understory vegetation, ground cover, soils, and other variables. We anticipate that in Kansas the complete 5-year annual inventory will include measurement of about 48 phase 3 plots.

This should be contrasted with the phase 2 plots where only variables that can be measured throughout the entire year are collected. In Kansas, the complete 5-year annual inventory is expected to incude measurement of about 668 phase 2 forested plots. The 2000–2003 panel results represent field measures on 1,664 phase 2 forested plots and 110 phase 3 plots.

The new national FIA plot design (fig. 8) was first used for data collection in Kansas in 2001, the first annual panel year. This design was also used in the 2002 and 2003 panels and will be used in subsequent years. The national plot configuration requires mapping forest conditions on each plot. Due to the small sample size (20 percent) each year, precision associated with change factors such as mortality will be relatively low. Consequently, we will not report change estimates in Kansas until at least four annual panels have been measured, and even then we anticipate that estimates of change will be limited in detail. When the annual inventory has been completed in 2005, the full range of change data will be available.

The overall plot layout for the new design 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. The center of the new plot is located at the same point as the center of the previous plot (the plot used in the former sampling regime) if a previous plot existed within the sample unit. Trees with a d.b.h. 5 inches and larger are measured on a 24-foot-radius (1/24 acre) circular subplot. All trees less than 5 inches d.b.h. are 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. 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.

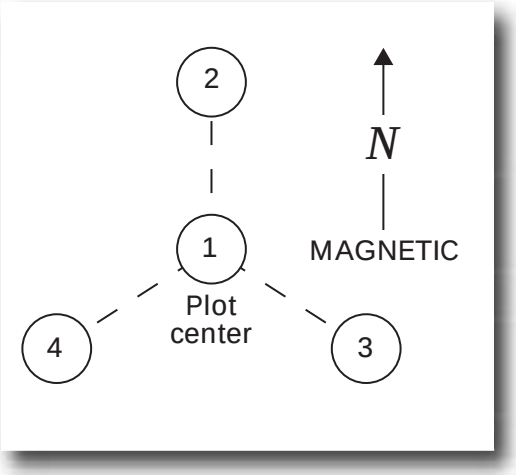


Figure 8. — *Current NCFIA field plot design.*

Field plot measurements are combined with phase 1 estimates in the compilation process and table production. The number of published tables generated from less than five panels of data is limited. However, at www.ncrs.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

or

State Forester
Kansas Forest Service
2610 Claflin Road
Manhattan, KS 66502

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## TABLE TITLES

**TABLES**

Table 1. -- Area of forest land by forest type group, forest type, and owner category, Kansas, 2001-2003

(In thousand acres)

| Forest type group/ forest type | Owner category | | | |
|---|---|---|---|---|
| | All owners | Public | Private | Unidentified owner |
| **Softwood type groups** | | | | |
| White / red / jack pine group | | | | |
| Red pine | 5.1 | 5.1 | -- | -- |
| All forest types | 5.1 | 5.1 | -- | -- |
| Pinyon / juniper group | | | | |
| Eastern redcedar | 125.1 | 2.4 | 122.7 | -- |
| All forest types | 125.1 | 2.4 | 122.7 | -- |
| Ponderosa pine group | | | | |
| Ponderosa pine | 12.2 | 12.2 | -- | -- |
| All forest types | 12.2 | 12.2 | -- | -- |
| All softwood groups | 142.5 | 19.8 | 122.7 | -- |
| **Hardwood type groups** | | | | |
| Oak / pine group | | | | |
| Eastern redcedar / hardwood | 75.1 | -- | 75.1 | -- |
| All forest types | 75.1 | -- | 75.1 | -- |
| Oak / hickory group | | | | |
| Post oak / blackjack oak | 124.8 | 10.5 | 114.3 | -- |
| White oak / red oak / hickory | 252.1 | 21.2 | 230.9 | -- |
| Northern red oak | 11.6 | -- | 11.6 | -- |
| Bur oak | 45.1 | -- | 45.1 | -- |
| Black walnut | 40.9 | -- | 40.9 | -- |
| Mixed upland hardwoods | 708.4 | 18.2 | 690.2 | -- |
| All forest types | 1,182.9 | 49.9 | 1,133.1 | -- |
| Oak / gum / cypress group | | | | |
| Swamp chestnut oak / cherrybark oak | 9.5 | -- | 9.5 | -- |
| All forest types | 9.5 | -- | 9.5 | -- |

(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 | 2.5 | -- | 2.5 | -- |
| Black ash / American elm / red maple | 1.2 | -- | 1.2 | -- |
| River birch / sycamore | 39.1 | -- | 39.1 | -- |
| Cottonwood | 109.3 | 31.9 | 77.3 | -- |
| Willow | 21.3 | 5.2 | 16.0 | -- |
| Sycamore / pecan / American elm | 42.5 | -- | 42.5 | -- |
| Sugarberry / hackberry / elm / green ash | 415.3 | 24.3 | 391.1 | -- |
| Silver maple / American elm | 10.2 | -- | 10.2 | -- |
| Cottonwood / willow | 32.5 | -- | 32.5 | -- |
| All forest types | 673.8 | 61.5 | 612.4 | -- |
| Maple / beech / birch group | | | | |
| Sugar maple / beech / yellow birch | 19.9 | -- | 19.9 | -- |
| Elm / ash / locust | 67.9 | 7.9 | 60.0 | -- |
| All forest types | 87.8 | 7.9 | 79.9 | -- |
| Western oak group | | | | |
| Deciduous oak woodland | 2.3 | -- | 2.3 | -- |
| All forest types | 2.3 | -- | 2.3 | -- |
| Exotic hardwoods group | | | | |
| Other exotic hardwoods | 36.5 | 2.5 | 34.0 | -- |
| All forest types | 36.5 | 2.5 | 34.0 | -- |
| All hardwood groups | 2,068.0 | 121.6 | 1,946.3 | -- |
| Nonstocked | 16.9 | -- | 16.9 | -- |
| **All forest groups** | 2,227.3 | 141.4 | 2,085.9 | -- |

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, Kansas, 2001-2003

(In thousand acres)

| Major forest type group and stand origin | Owner category | | | |
|---|---|---|---|---|
| | All owners | Public | Private | Unidentified owner |
| **Softwood type groups** | | | | |
| Natural | 105.6 | -- | 105.6 | -- |
| Planted | 28.3 | 17.4 | 10.9 | -- |
| All softwood types | 133.9 | 17.4 | 116.5 | -- |
| **Hardwood type groups** | | | | |
| Natural | 1,942.4 | 119.2 | 1,823.2 | -- |
| Planted | 38.1 | -- | 38.1 | -- |
| All hardwood types | 1,980.4 | 119.2 | 1,861.3 | -- |
| Nonstocked | 16.9 | -- | 16.9 | -- |
| **All groups** | 2,131.2 | 136.5 | 1,994.7 | -- |

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.

Tables continued on next page.

Table 3. -- Area of timberland by forest type group, forest type, and stand-size class, Kansas, 2001-2003

(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 | | | | | |
| Red pine | 5.1 | 5.1 | -- | -- | -- |
| All forest types | 5.1 | 5.1 | -- | -- | -- |
| Pinyon / juniper group | | | | | |
| Eastern redcedar | 116.5 | 10.9 | 37.3 | 68.3 | -- |
| All forest types | 116.5 | 10.9 | 37.3 | 68.3 | -- |
| Ponderosa pine group | | | | | |
| Ponderosa pine | 12.2 | -- | 12.2 | -- | -- |
| All forest types | 12.2 | -- | 12.2 | -- | -- |
| All softwood groups | 133.9 | 16.0 | 49.6 | 68.3 | -- |
| **Hardwood type groups** | | | | | |
| Oak / pine group | | | | | |
| Eastern redcedar / hardwood | 68.1 | 34.5 | 9.9 | 23.7 | -- |
| All forest types | 68.1 | 34.5 | 9.9 | 23.7 | -- |
| Oak / hickory group | | | | | |
| Post oak / blackjack oak | 92.0 | 20.5 | 47.4 | 24.1 | -- |
| White oak / red oak / hickory | 249.6 | 107.8 | 75.1 | 66.7 | -- |
| Northern red oak | 11.6 | 11.6 | -- | -- | -- |
| Bur oak | 45.1 | 45.1 | -- | -- | -- |
| Black walnut | 40.9 | 24.1 | 14.0 | 2.8 | -- |
| Mixed upland hardwoods | 684.0 | 184.2 | 380.4 | 119.4 | -- |
| All forest types | 1,123.3 | 393.3 | 516.9 | 213.1 | -- |
| Oak / gum / cypress group | | | | | |
| Swamp chestnut oak / cherrybark oak | 9.5 | -- | 9.5 | -- | -- |
| All forest types | 9.5 | -- | 9.5 | -- | -- |

(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 | 2.5 | -- | 2.5 | -- | -- |
| Black ash / American elm / red maple | 1.2 | -- | 1.2 | -- | -- |
| River birch / sycamore | 39.1 | 29.3 | 7.4 | 2.4 | -- |
| Cottonwood | 106.6 | 106.6 | -- | -- | -- |
| Willow | 21.3 | -- | -- | 21.3 | -- |
| Sycamore / pecan / American elm | 42.5 | 21.2 | 21.4 | -- | -- |
| Sugarberry / hackberry / elm / green ash | 409.2 | 283.2 | 85.4 | 40.6 | -- |
| Silver maple / American elm | 10.2 | 10.2 | -- | -- | -- |
| Cottonwood / willow | 32.5 | 32.5 | -- | -- | -- |
| All forest types | 665.0 | 483.0 | 117.8 | 64.3 | -- |
| Maple / beech / birch group | | | | | |
| Sugar maple / beech / yellow birch | 19.9 | 19.9 | -- | -- | -- |
| Elm / ash / locust | 58.2 | 22.7 | 27.3 | 8.2 | -- |
| All forest types | 78.1 | 42.6 | 27.3 | 8.2 | -- |
| Western oak group | | | | | |
| Deciduous oak woodland | 2.3 | -- | 2.3 | -- | -- |
| All forest types | 2.3 | -- | 2.3 | -- | -- |
| Exotic hardwoods group | | | | | |
| Other exotic hardwoods | 34.0 | 12.7 | 10.6 | 10.6 | -- |
| All forest types | 34.0 | 12.7 | 10.6 | 10.6 | -- |
| All hardwood groups | 1,960.4 | 966.1 | 694.5 | 319.9 | -- |
| Nonstocked | 16.9 | -- | -- | -- | 16.9 |
| **All forest groups** | 2,131.2 | 982.1 | 744.1 | 388.1 | 16.9 |

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, Kansas, 2001-2003

(In thousand cubic feet)

| Species group/ species | Owner category | | | |
|---|---|---|---|---|
| | All owners | Public | Private | Unidentified owner |
| **Softwoods** | | | | |
| Loblolly and shortleaf pines | | | | |
| Shortleaf pine | 2,862 | 2,862 | -- | -- |
| All species | 2,862 | 2,862 | -- | -- |
| Eastern white and red pines | | | | |
| Red pine | 4,822 | 4,822 | -- | -- |
| Eastern white pine | 2,703 | 2,703 | -- | -- |
| All species | 7,525 | 7,525 | -- | -- |
| Other eastern softwoods | | | | |
| Eastern redcedar | 82,603 | 4,970 | 77,633 | -- |
| Ponderosa pine | 10,551 | 6,423 | 4,128 | -- |
| All species | 93,154 | 11,393 | 81,761 | -- |
| Total softwoods | 103,541 | 21,780 | 81,761 | -- |
| **Hardwoods** | | | | |
| Select white oaks | | | | |
| White oak | 9,189 | -- | 9,189 | -- |
| Bur oak | 173,602 | 5,000 | 168,602 | -- |
| Chinkapin oak | 112,288 | 10,167 | 102,121 | -- |
| All species | 295,079 | 15,167 | 279,912 | -- |
| Select red oaks | | | | |
| Northern red oak | 92,091 | 3,996 | 88,095 | -- |
| Shumard oak | 7,281 | -- | 7,281 | -- |
| All species | 99,372 | 3,996 | 95,376 | -- |
| Other white oaks | | | | |
| Post oak | 66,906 | 11,874 | 55,033 | -- |
| All species | 66,906 | 11,874 | 55,033 | -- |
| Other red oaks | | | | |
| Blackjack oak | 20,758 | 58 | 20,700 | -- |
| Pin oak | 16,144 | 342 | 15,801 | -- |
| Black oak | 6,194 | 122 | 6,072 | -- |
| All species | 43,095 | 522 | 42,573 | -- |

(Table 4 continued on next page)

(Table 4 continued)

| Species group/ species | Owner category | | | |
|---|---|---|---|---|
| | All owners | Public | Private | Unidentified owner |
| **Hardwoods** | | | | |
| Hickory | | | | |
| Bitternut hickory | 22,323 | 223 | 22,100 | -- |
| Pecan | 34,551 | 124 | 34,427 | -- |
| Shellbark hickory | 3,347 | -- | 3,347 | -- |
| Shagbark hickory | 25,360 | 3,209 | 22,151 | -- |
| Black hickory | 3,737 | -- | 3,737 | -- |
| Mockernut hickory | 2,539 | -- | 2,539 | -- |
| All species | 91,855 | 3,556 | 88,300 | -- |
| Hard maple | | | | |
| Sugar maple | 8,472 | 1,546 | 6,926 | -- |
| All species | 8,472 | 1,546 | 6,926 | -- |
| Soft maple | | | | |
| Red maple | 71 | -- | 71 | -- |
| Silver maple | 57,376 | 14,550 | 42,826 | -- |
| All species | 57,448 | 14,550 | 42,897 | -- |
| Ash | | | | |
| White ash | 23,665 | -- | 23,665 | -- |
| Green ash | 221,109 | 12,358 | 208,752 | -- |
| Blue ash | 233 | -- | 233 | -- |
| All species | 245,007 | 12,358 | 232,650 | -- |
| Cottonwood and aspen | | | | |
| Eastern cottonwood | 331,753 | 76,541 | 255,213 | -- |
| Plains cottonwood | 16,163 | -- | 16,163 | -- |
| All species | 347,917 | 76,541 | 271,376 | -- |
| Basswood | | | | |
| American basswood | 7,319 | -- | 7,319 | -- |
| All species | 7,319 | -- | 7,319 | -- |
| Black walnut | | | | |
| Black walnut | 174,443 | 3,329 | 171,114 | -- |
| All species | 174,443 | 3,329 | 171,114 | -- |

(Table 4 continued on next page)

(Table 4 continued)

| Species group/ species | Owner category | | | |
|---|---|---|---|---|
| | All owners | Public | Private | Unidentified owner |
| **Hardwoods** | | | | |
| Other eastern soft hardwoods | | | | |
| Boxelder | 44,159 | 2,888 | 41,271 | -- |
| Ohio buckeye | 1,511 | -- | 1,511 | -- |
| Texas buckeye | | -- | | -- |
| Northern catalpa | 12,997 | -- | 12,997 | -- |
| Sugarberry | 3,927 | -- | 3,927 | -- |
| Hackberry | 353,566 | 10,221 | 343,345 | -- |
| American sycamore | 105,792 | 4,583 | 101,209 | -- |
| Black cherry | 6,900 | -- | 6,900 | -- |
| Black willow | 49,654 | 2,931 | 46,723 | -- |
| White willow | 182 | -- | 182 | -- |
| American elm | 235,964 | 10,182 | 225,782 | -- |
| Siberian elm | 47,568 | 1,624 | 45,944 | -- |
| Slippery elm | 14,365 | 86 | 14,279 | -- |
| All species | 876,585 | 32,516 | 844,069 | -- |
| Other eastern hard hardwoods | | | | |
| Common persimmon | 601 | -- | 601 | -- |
| Honeylocust | 113,735 | 1,705 | 112,030 | -- |
| Kentucky coffeetree | 10,562 | 857 | 9,705 | -- |
| Mulberry spp. | 7,064 | 6,426 | 638 | -- |
| White mulberry | 114 | -- | 114 | -- |
| Red mulberry | 126,560 | 6,576 | 119,985 | -- |
| Black locust | 3,876 | -- | 3,876 | -- |
| Rock elm | 254 | -- | 254 | -- |
| All species | 262,766 | 15,564 | 247,202 | -- |

(Table 4 continued on next page)

(Table 4 continued)

| Species group/ species | Owner category | | | |
|---|---|---|---|---|
| | All owners | Public | Private | Unidentified owner |
| **Hardwoods** | | | | |
| Eastern noncommercial hardwoods | | | | |
| Pawpaw | | -- | | -- |
| Chittamwood, gum bumelia | 674 | -- | 674 | -- |
| American hornbeam, musclewood | 345 | -- | 345 | -- |
| Eastern redbud | 5,151 | 378 | 4,772 | -- |
| Hawthorn spp. | | -- | | -- |
| Downy hawthorn | | -- | | -- |
| Osage-orange | 188,563 | 6,160 | 182,403 | -- |
| Eastern hophornbeam | 881 | -- | 881 | -- |
| Cherry and plum spp. | 83 | -- | 83 | -- |
| American plum | 530 | -- | 530 | -- |
| Western soapberry | 1,916 | -- | 1,916 | -- |
| Peachleaf willow | 4,450 | -- | 4,450 | -- |
| Russian-olive | 287 | -- | 287 | -- |
| All species | 202,880 | 6,538 | 196,342 | -- |
| Total hardwoods | 2,779,144 | 198,055 | 2,581,089 | -- |
| **All species groups** | 2,882,685 | 219,835 | 2,662,850 | -- |

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, Kansas, 2001-2003

(In thousand cubic feet)

| Class of timber | All species | Softwood species | Hardwood species |
|---|---|---|---|
| **Live trees** | | | |
| **Growing-stock trees** | | | |
| Sawtimber | | | |
| Saw log portion | 1,030,593 | 32,680 | 997,913 |
| Upper stem portion | 120,573 | 4,371 | 116,202 |
| Total | 1,151,167 | 37,051 | 1,114,115 |
| Poletimber | 341,592 | 27,273 | 314,319 |
| **All growing-stock trees** | 1,492,758 | 64,324 | 1,428,434 |
| **Cull trees** | | | |
| Rough trees[1] | | | |
| Sawtimber size | 837,304 | 23,947 | 813,357 |
| Poletimber size | 382,067 | 12,333 | 369,734 |
| Total | 1,219,371 | 36,280 | 1,183,091 |
| Rotten trees[1] | | | |
| Sawtimber size | 81,120 | -- | 81,120 |
| Poletimber size | 15,708 | -- | 15,708 |
| Total | 96,828 | -- | 96,828 |
| **All live cull trees** | 1,316,199 | 36,280 | 1,279,919 |
| **All live trees** | 2,808,958 | 100,604 | 2,708,354 |
| **Salvable dead trees** | | | |
| Sawtimber size | 40,013 | 5,223 | 34,790 |
| Poletimber size | 15,461 | 930 | 14,531 |
| **All salvable dead trees** | 55,475 | 6,153 | 49,321 |
| **All classes** | 2,864,432 | 106,757 | 2,757,675 |

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.

Tables continued on next page.

Table 6. -- Net volume of growing stock on timberland by forest type group, forest type, and softwood/hardwood species category, Kansas, 2001-2003

(In thousand cubic feet)

| Forest type group/ forest type | All species | Softwood species | Hardwood species |
|---|---|---|---|
| **Softwood type groups** | | | |
| White / red / jack pine group | | | |
| Red pine | 6,653 | 6,653 | - - |
| All forest types | 6,653 | 6,653 | - - |
| Pinyon / juniper group | | | |
| Eastern redcedar | 24,811 | 22,349 | 2,462 |
| All forest types | 24,811 | 22,349 | 2,462 |
| Ponderosa pine group | | | |
| Ponderosa pine | 4,869 | 4,641 | 228 |
| All forest types | 4,869 | 4,641 | 228 |
| All softwood groups | 36,333 | 33,643 | 2,690 |
| **Hardwood type groups** | | | |
| Oak / pine group | | | |
| Eastern redcedar / hardwood | 36,402 | 14,335 | 22,068 |
| All forest types | 36,402 | 14,335 | 22,068 |
| Oak / hickory group | | | |
| Post oak / blackjack oak | 35,191 | 924 | 34,267 |
| White oak / red oak / hickory | 171,863 | 908 | 170,956 |
| Northern red oak | 28,795 | - - | 28,795 |
| Bur oak | 44,644 | - - | 44,644 |
| Black walnut | 20,685 | 177 | 20,507 |
| Mixed upland hardwoods | 198,819 | 8,624 | 190,194 |
| All forest types | 499,997 | 10,633 | 489,364 |
| Oak / gum / cypress group | | | |
| Swamp chestnut oak / cherrybark oak | 9,481 | 125 | 9,356 |
| All forest types | 9,481 | 125 | 9,356 |

(Table 6 continued on next page)

(Table 6 continued)

| Forest type group/ forest type | All species | Softwood species | Hardwood species |
|---|---|---|---|
| **Hardwood type groups** | | | |
| Elm / ash / cottonwood group | | | |
| Elm / ash / cottonwood group | 260 | -- | 260 |
| Black ash / American elm / red maple | 970 | 154 | 817 |
| River birch / sycamore | 59,550 | -- | 59,550 |
| Cottonwood | 255,198 | 363 | 254,835 |
| Willow | 3,234 | -- | 3,234 |
| Sycamore / pecan / American elm | 77,953 | -- | 77,953 |
| Sugarberry / hackberry / elm / green ash | 410,379 | 2,086 | 408,294 |
| Silver maple / American elm | 28,445 | -- | 28,445 |
| Cottonwood / willow | 39,376 | -- | 39,376 |
| All forest types | 875,365 | 2,603 | 872,763 |
| Maple / beech / birch group | | | |
| Sugar maple / beech / yellow birch | 10,568 | 554 | 10,013 |
| Elm / ash / locust | 15,569 | 2,263 | 13,307 |
| All forest types | 26,137 | 2,817 | 23,320 |
| Western oak group | | | |
| Deciduous oak woodland | 412 | -- | 412 |
| All forest types | 412 | -- | 412 |
| Exotic hardwoods group | | | |
| Other exotic hardwoods | 6,406 | 89 | 6,317 |
| All forest types | 6,406 | 89 | 6,317 |
| All hardwood groups | 1,454,201 | 30,602 | 1,423,600 |
| Nonstocked | 2,224 | 80 | 2,145 |
| **All forest groups** | 1,492,758 | 64,324 | 1,428,434 |

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, Kansas, 2001-2003

(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 | 2,506 | 248 | 1,084 | 1,174 | -- | -- | -- | -- | -- | -- | -- |
| All species | 2,506 | 248 | 1,084 | 1,174 | -- | -- | -- | -- | -- | -- | -- |
| Eastern white and red pines | | | | | | | | | | | |
| Red pine | 3,301 | -- | -- | -- | -- | 1,200 | 2,101 | -- | -- | -- | -- |
| Eastern white pine | 845 | -- | -- | -- | 845 | -- | -- | -- | -- | -- | -- |
| All species | 4,147 | -- | -- | -- | 845 | 1,200 | 2,101 | -- | -- | -- | -- |
| Other eastern softwoods | | | | | | | | | | | |
| Eastern redcedar | 51,491 | 11,574 | 12,487 | 7,918 | 11,738 | 4,698 | 3,076 | -- | -- | -- | -- |
| Ponderosa pine | 6,181 | -- | 1,880 | -- | 849 | 1,655 | 1,795 | -- | -- | -- | -- |
| All species | 57,671 | 11,574 | 14,367 | 7,918 | 12,587 | 6,354 | 4,871 | -- | -- | -- | -- |
| Total softwoods | 64,324 | 11,822 | 15,451 | 9,092 | 13,432 | 7,554 | 6,973 | -- | -- | -- | -- |
| **Hardwoods** | | | | | | | | | | | |
| Select white oaks | | | | | | | | | | | |
| Bur oak | 91,585 | 1,178 | 2,180 | 4,883 | 9,677 | 3,214 | 7,427 | 4,554 | 8,143 | 40,748 | 9,580 |
| Chinkapin oak | 54,481 | 1,430 | 2,740 | 6,702 | 2,578 | 4,446 | 1,620 | 5,533 | 3,134 | 26,298 | -- |
| All species | 146,066 | 2,609 | 4,921 | 11,585 | 12,254 | 7,661 | 9,047 | 10,086 | 11,276 | 67,047 | 9,580 |
| Select red oaks | | | | | | | | | | | |
| Northern red oak | 72,550 | 3,650 | 2,613 | 3,111 | 2,135 | 7,634 | 4,468 | 7,672 | 8,894 | 22,995 | 9,379 |
| Shumard oak | 7,123 | -- | 422 | 457 | 935 | 1,215 | 1,653 | 2,442 | -- | -- | -- |
| All species | 79,673 | 3,650 | 3,034 | 3,567 | 3,070 | 8,849 | 6,121 | 10,114 | 8,894 | 22,995 | 9,379 |
| Other white oaks | | | | | | | | | | | |
| Post oak | 33,493 | 7,472 | 9,639 | 8,159 | 3,597 | 2,165 | -- | -- | 2,462 | -- | -- |
| All species | 33,493 | 7,472 | 9,639 | 8,159 | 3,597 | 2,165 | -- | -- | 2,462 | -- | -- |
| Other red oaks | | | | | | | | | | | |
| Blackjack oak | 2,073 | 226 | 971 | -- | 877 | -- | -- | -- | -- | -- | -- |
| Pin oak | 16,144 | 589 | 1,040 | 2,039 | 1,613 | 1,464 | -- | -- | 2,728 | 6,672 | -- |
| Black oak | 2,644 | 351 | 706 | -- | -- | 1,587 | -- | -- | -- | -- | -- |
| All species | 20,861 | 1,165 | 2,717 | 2,039 | 2,490 | 3,051 | -- | -- | 2,728 | 6,672 | -- |

(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** | | | | | | | | | | | |
| Hickory | | | | | | | | | | | |
| Bitternut hickory | 18,587 | 2,304 | 3,828 | 473 | 1,309 | 6,117 | 2,079 | 2,478 | -- | -- | -- |
| Pecan | 15,711 | 992 | 1,813 | 2,216 | 6,450 | -- | -- | -- | -- | 4,239 | -- |
| Shellbark hickory | 3,347 | 423 | 1,087 | -- | -- | 1,837 | -- | -- | -- | -- | -- |
| Shagbark hickory | 20,807 | 4,779 | 7,388 | 2,444 | 4,896 | 1,300 | -- | -- | -- | -- | -- |
| Black hickory | 975 | -- | -- | -- | 975 | -- | -- | -- | -- | -- | -- |
| Mockernut hickory | 1,842 | -- | -- | -- | -- | -- | 1,842 | -- | -- | -- | -- |
| All species | 61,268 | 8,498 | 14,114 | 5,133 | 13,631 | 9,253 | 3,921 | 2,478 | -- | 4,239 | -- |
| Hard maple | | | | | | | | | | | |
| Sugar maple | 4,654 | 474 | 1,004 | -- | -- | 3,176 | -- | -- | -- | -- | -- |
| All species | 4,654 | 474 | 1,004 | -- | -- | 3,176 | -- | -- | -- | -- | -- |
| Soft maple | | | | | | | | | | | |
| Silver maple | 47,818 | 1,060 | 981 | 2,466 | -- | 4,648 | 5,199 | 5,862 | 11,367 | 4,402 | 11,834 |
| All species | 47,818 | 1,060 | 981 | 2,466 | -- | 4,648 | 5,199 | 5,862 | 11,367 | 4,402 | 11,834 |
| Ash | | | | | | | | | | | |
| White ash | 22,461 | 3,806 | 1,617 | 2,029 | 4,381 | 1,361 | -- | 3,979 | -- | 5,287 | -- |
| Green ash | 131,548 | 5,060 | 8,832 | 17,243 | 19,801 | 22,516 | 11,475 | 21,303 | 13,737 | 11,581 | -- |
| Blue ash | 233 | -- | 233 | -- | -- | -- | -- | -- | -- | -- | -- |
| All species | 154,241 | 8,865 | 10,682 | 19,272 | 24,182 | 23,877 | 11,475 | 25,283 | 13,737 | 16,868 | -- |
| Cottonwood and aspen | | | | | | | | | | | |
| Eastern cottonwood | 224,904 | 196 | -- | 2,167 | 3,008 | 7,272 | 9,088 | 13,569 | 17,423 | 51,445 | 120,736 |
| Plains cottonwood | 16,163 | -- | -- | -- | 2,984 | -- | 2,272 | -- | -- | 10,906 | -- |
| All species | 241,067 | 196 | -- | 2,167 | 5,992 | 7,272 | 11,360 | 13,569 | 17,423 | 62,351 | 120,736 |
| Basswood | | | | | | | | | | | |
| American basswood | 1,877 | 190 | 601 | -- | 1,087 | -- | -- | -- | -- | -- | -- |
| All species | 1,877 | 190 | 601 | -- | 1,087 | -- | -- | -- | -- | -- | -- |
| Black walnut | | | | | | | | | | | |
| Black walnut | 108,683 | 7,115 | 9,534 | 14,297 | 11,539 | 25,988 | 15,961 | 10,410 | 13,838 | -- | -- |
| All species | 108,683 | 7,115 | 9,534 | 14,297 | 11,539 | 25,988 | 15,961 | 10,410 | 13,838 | -- | -- |

(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 soft hardwoods | | | | | | | | | | | |
| Boxelder | 16,508 | 149 | 304 | 1,415 | 1,253 | -- | -- | 5,508 | -- | -- | 7,880 |
| Ohio buckeye | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern catalpa | 1,719 | -- | -- | -- | 1,719 | -- | -- | -- | -- | -- | -- |
| Hackberry | 241,015 | 16,667 | 25,609 | 22,707 | 25,537 | 30,066 | 41,102 | 22,366 | 14,867 | 42,103 | -- |
| American sycamore | 89,851 | 496 | 571 | 1,054 | -- | 1,575 | 7,345 | -- | -- | 34,100 | 44,709 |
| Black cherry | 871 | 225 | -- | -- | 645 | -- | -- | -- | -- | -- | -- |
| Black willow | 26,299 | 474 | 1,015 | 1,791 | 3,496 | 3,628 | 2,034 | 2,894 | 3,245 | 7,723 | -- |
| American elm | 75,553 | 13,158 | 14,009 | 12,334 | 5,847 | 7,627 | 5,515 | 4,421 | -- | 5,844 | 6,797 |
| Siberian elm | 5,352 | 421 | -- | 859 | 1,427 | -- | -- | 2,644 | -- | -- | -- |
| Slippery elm | 6,598 | 1,242 | 1,304 | 917 | 894 | -- | -- | 2,240 | -- | -- | -- |
| All species | 463,765 | 32,822 | 42,812 | 41,077 | 40,819 | 42,897 | 56,996 | 40,074 | 18,112 | 89,769 | 59,386 |
| Other eastern hard hardwoods | | | | | | | | | | | |
| Common persimmon | 462 | 235 | 227 | -- | -- | -- | -- | -- | -- | -- | -- |
| Honeylocust | 31,650 | 5,505 | 4,173 | 4,902 | 4,867 | 1,172 | 2,891 | -- | 5,051 | 3,090 | -- |
| Kentucky coffeetree | 8,002 | 352 | 1,280 | 1,153 | 669 | -- | -- | -- | 4,549 | -- | -- |
| Mulberry spp. | 2,140 | 563 | 260 | -- | 1,317 | -- | -- | -- | -- | -- | -- |
| Red mulberry | 21,260 | 967 | 4,210 | 5,132 | 823 | -- | 3,301 | -- | 3,286 | 3,551 | -- |
| Black locust | 1,200 | -- | 556 | 644 | -- | -- | -- | -- | -- | -- | -- |
| Rock elm | 254 | -- | 254 | -- | -- | -- | -- | -- | -- | -- | -- |
| All species | 64,968 | 7,613 | 10,959 | 11,831 | 7,676 | 1,172 | 6,192 | -- | 12,886 | 6,641 | -- |
| Total hardwoods | 1,428,434 | 81,728 | 110,998 | 121,593 | 126,337 | 140,008 | 125,272 | 117,877 | 112,724 | 280,983 | 210,915 |
| **All species groups** | 1,492,758 | 93,550 | 126,449 | 130,685 | 139,769 | 147,562 | 132,245 | 117,877 | 112,724 | 280,983 | 210,915 |

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.

(Tables continued on next page)

Table 8. – Net volume of sawtimber on timberland by species group, species, and diameter class, Kansas, 2001-2003

(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 | 5,238 | 5,238 | -- | -- | -- | -- | -- | -- | -- |
| All species | 5,238 | 5,238 | -- | -- | -- | -- | -- | -- | -- |
| Eastern white and red pines | | | | | | | | | |
| Red pine | 14,964 | -- | -- | 5,308 | 9,655 | -- | -- | -- | -- |
| Eastern white pine | 3,656 | -- | 3,656 | -- | -- | -- | -- | -- | -- |
| All species | 18,619 | -- | 3,656 | 5,308 | 9,655 | -- | -- | -- | -- |
| Other eastern softwoods | | | | | | | | | |
| Eastern redcedar | 140,189 | 42,966 | 59,872 | 22,881 | 14,470 | -- | -- | -- | -- |
| Ponderosa pine | 20,687 | -- | 4,054 | 7,616 | 9,017 | -- | -- | -- | -- |
| All species | 160,875 | 42,966 | 63,926 | 30,497 | 23,487 | -- | -- | -- | -- |
| Total softwoods | 184,733 | 48,204 | 67,582 | 35,805 | 33,142 | -- | -- | -- | -- |
| **Hardwoods** | | | | | | | | | |
| Select white oaks | | | | | | | | | |
| Bur oak | 419,181 | -- | 46,001 | 15,427 | 36,273 | 22,496 | 39,903 | 207,277 | 51,805 |
| Chinkapin oak | 218,167 | -- | 12,295 | 21,454 | 7,786 | 27,096 | 15,423 | 134,114 | -- |
| All species | 637,347 | -- | 58,295 | 36,881 | 44,059 | 49,592 | 55,325 | 341,391 | 51,805 |
| Select red oaks | | | | | | | | | |
| Northern red oak | 323,050 | -- | 9,944 | 36,992 | 22,104 | 38,564 | 45,744 | 120,303 | 49,399 |
| Shumard oak | 30,638 | -- | 4,397 | 5,802 | 8,117 | 12,321 | -- | -- | -- |
| All species | 353,688 | -- | 14,341 | 42,795 | 30,221 | 50,885 | 45,744 | 120,303 | 49,399 |
| Other white oaks | | | | | | | | | |
| Post oak | 38,468 | -- | 16,482 | 10,126 | -- | -- | 11,859 | -- | -- |
| All species | 38,468 | -- | 16,482 | 10,126 | -- | -- | 11,859 | -- | -- |
| Other red oaks | | | | | | | | | |
| Blackjack oak | 4,057 | -- | 4,057 | -- | -- | -- | -- | -- | -- |
| Pin oak | 62,324 | -- | 7,211 | 6,952 | -- | -- | 13,504 | 34,658 | -- |
| Black oak | 7,491 | -- | -- | 7,491 | -- | -- | -- | -- | -- |
| All species | 73,872 | -- | 11,268 | 14,442 | -- | -- | 13,504 | 34,658 | -- |

(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** | | | | | | | | | |
| Hickory | | | | | | | | | |
| Bitternut hickory | 59,238 | -- | 6,340 | 30,072 | 10,237 | 12,589 | -- | -- | -- |
| Pecan | 53,042 | -- | 30,069 | -- | -- | -- | -- | 22,973 | -- |
| Shellbark hickory | 8,849 | -- | -- | 8,849 | -- | -- | -- | -- | -- |
| Shagbark hickory | 29,160 | -- | 22,966 | 6,195 | -- | -- | -- | -- | -- |
| Black hickory | 4,609 | -- | 4,609 | -- | -- | -- | -- | -- | -- |
| Mockernut hickory | 8,904 | -- | -- | -- | 8,904 | -- | -- | -- | -- |
| All species | 163,802 | -- | 63,983 | 45,116 | 19,141 | 12,589 | -- | 22,973 | -- |
| Hard maple | | | | | | | | | |
| Sugar maple | 15,567 | -- | -- | 15,567 | -- | -- | -- | -- | -- |
| All species | 15,567 | -- | -- | 15,567 | -- | -- | -- | -- | -- |
| Soft maple | | | | | | | | | |
| Silver maple | 203,485 | -- | -- | 20,002 | 23,129 | 26,826 | 52,887 | 20,869 | 59,772 |
| All species | 203,485 | -- | -- | 20,002 | 23,129 | 26,826 | 52,887 | 20,869 | 59,772 |
| Ash | | | | | | | | | |
| White ash | 88,871 | -- | 18,075 | 5,878 | -- | 18,441 | -- | 26,478 | -- |
| Green ash | 457,639 | -- | 82,835 | 97,751 | 52,343 | 100,195 | 66,894 | 57,621 | -- |
| All species | 526,510 | -- | 100,910 | 103,628 | 52,343 | 118,636 | 66,894 | 84,099 | -- |
| Cottonwood and aspen | | | | | | | | | |
| Eastern cottonwood | 1,068,823 | -- | 13,548 | 32,785 | 43,141 | 67,825 | 87,755 | 277,380 | 546,388 |
| Plains cottonwood | 79,138 | -- | 12,838 | -- | 10,741 | -- | -- | 55,559 | -- |
| All species | 1,147,961 | -- | 26,386 | 32,785 | 53,882 | 67,825 | 87,755 | 332,939 | 546,388 |
| Basswood | | | | | | | | | |
| American basswood | 5,585 | -- | 5,585 | -- | -- | -- | -- | -- | -- |
| All species | 5,585 | -- | 5,585 | -- | -- | -- | -- | -- | -- |
| Black walnut | | | | | | | | | |
| Black walnut | 361,799 | -- | 50,876 | 118,797 | 75,108 | 49,966 | 67,052 | -- | -- |
| All species | 361,799 | -- | 50,876 | 118,797 | 75,108 | 49,966 | 67,052 | -- | -- |

(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 soft hardwoods | | | | | | | | | |
| Boxelder | 67,004 | -- | 5,056 | -- | -- | 24,387 | -- | -- | 37,561 |
| Northern catalpa | 7,280 | -- | 7,280 | -- | -- | -- | -- | -- | -- |
| Hackberry | 822,750 | -- | 115,175 | 138,841 | 191,630 | 103,162 | 70,479 | 203,463 | -- |
| American sycamore | 453,255 | -- | -- | 7,049 | 34,842 | -- | -- | 176,781 | 234,583 |
| Black cherry | 2,588 | -- | 2,588 | -- | -- | -- | -- | -- | -- |
| Black willow | 101,878 | -- | 13,729 | 14,642 | 9,054 | 12,600 | 14,291 | 37,563 | -- |
| American elm | 167,839 | -- | 26,713 | 34,155 | 25,246 | 19,876 | -- | 29,237 | 32,612 |
| Siberian elm | 18,176 | -- | 6,186 | -- | -- | 11,990 | -- | -- | -- |
| Slippery elm | 14,923 | -- | 4,127 | -- | -- | 10,796 | -- | -- | -- |
| All species | 1,655,693 | -- | 180,854 | 194,687 | 260,772 | 182,810 | 84,769 | 447,044 | 304,756 |
| Other eastern hard hardwoods | | | | | | | | | |
| Honeylocust | 74,754 | -- | 20,104 | 4,915 | 12,618 | -- | 22,817 | 14,300 | -- |
| Kentucky coffeetree | 23,308 | -- | 2,762 | -- | -- | -- | 20,546 | -- | -- |
| Mulberry spp. | 5,333 | -- | 5,333 | -- | -- | -- | -- | -- | -- |
| Red mulberry | 49,171 | -- | 3,435 | -- | 14,631 | -- | 15,004 | 16,100 | -- |
| All species | 152,565 | -- | 31,633 | 4,915 | 27,249 | -- | 58,368 | 30,401 | -- |
| Total hardwoods | 5,336,342 | -- | 560,614 | 639,741 | 585,903 | 559,128 | 544,159 | 1,434,677 | 1,012,120 |
| **All species groups** | 5,521,075 | 48,204 | 628,195 | 675,546 | 619,045 | 559,128 | 544,159 | 1,434,677 | 1,012,120 |

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, Kansas, 2001-2003

(In dry tons)

| Owner category and softwood/hardwood category | Tree biomass component | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Growing-stock trees | | | Non-growing-stock trees | | |
| | All components | All live 1-5 inch trees | Total | Boles | Stumps, tops, and limbs | Total | Boles | Stumps, tops, and limbs |
| **Public** | | | | | | | | |
| Softwoods | 376,155 | 2,945 | 248,296 | 200,718 | 47,579 | 124,914 | 104,094 | 20,819 |
| Hardwoods | 4,670,902 | 214,012 | 3,182,246 | 2,386,591 | 795,654 | 1,274,644 | 894,432 | 380,213 |
| Total | 5,047,057 | 216,957 | 3,430,542 | 2,587,309 | 843,233 | 1,399,558 | 998,526 | 401,032 |
| **Private** | | | | | | | | |
| Softwoods | 2,066,831 | 373,273 | 1,070,563 | 760,673 | 309,890 | 622,995 | 446,502 | 176,494 |
| Hardwoods | 66,361,984 | 3,239,635 | 31,170,691 | 22,888,941 | 8,281,750 | 31,951,657 | 23,232,356 | 8,719,302 |
| Total | 68,428,815 | 3,612,908 | 32,241,254 | 23,649,614 | 8,591,640 | 32,574,653 | 23,678,857 | 8,895,795 |
| **All ownerships** | | | | | | | | |
| Softwoods | 2,442,986 | 376,218 | 1,318,859 | 961,391 | 357,469 | 747,909 | 550,596 | 197,313 |
| Hardwoods | 71,032,886 | 3,453,647 | 34,352,937 | 25,275,533 | 9,077,404 | 33,226,302 | 24,126,788 | 9,099,514 |
| Total | 73,475,872 | 3,829,865 | 35,671,796 | 26,236,923 | 9,434,873 | 33,974,211 | 24,677,384 | 9,296,827 |

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.

Moser, W. Keith; Atchison, Robert L.; Brand, Gary J.

2005. **Kansas' forest resources in 2003.** Resour. Bull. NC-244. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 35 p.

Reports the results of the first three yearly panels (2001-2003) of the fifth inventory of Kansas' forest resources. Includes information on forest area; volume; biomass; growth, removals, and mortality; and forest health.

KEY WORDS: Annual inventory, forest area, forest type, volume, biomass, Kansas.

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