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Nebraska's Forest Resources in 2004

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Nebraska's Forest Resources in 2004

The North Central Research Station's Forest Inventory and Analysis program (NCFIA) began fieldwork for the fourth forest inventory of Nebraska in 2001, in partnership with the Nebraska Forest Service. This inventory initiated the new annual inventory system in which one-fifth of the field plots (considered one panel) in the State are measured each year. A complete inventory consists of measuring, compiling, and reporting the data for all plots (or five panels). Once all panels have been measured, each will be remeasured approximately every 5 years. For example, in Nebraska, the field plots measured in 2001 will be remeasured in 2006.

In 2004, NCFIA continued the annual inventory effort with the fourth panel of the fourth forest inventory. Reports of previous inventories of Nebraska are dated 1955, 1983, and 1994. This fourth inventory of Nebraska's 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 Nebraska's forest resources, estimates have been prepared from data gathered during the first 4 years of the inventory. Estimates presented in this report are based on measurements from approximately 80 percent of the field plots (or four panels) for a complete inventory. The underlying data are a combination of measurements for the first year's panel in 2001, the second year's panel in 2002, the third year's panel in 2003, and the fourth year's panel in 2004. Due to the limited number of field plots, sampling errors are large and estimates in this report should be used with caution. Future estimates that incorporate these data may change when ensuing

panels are completed and all data are compiled. The results presented are estimates based on sampling techniques; estimates were compiled assuming the 2001-2004 data represent one sample. As additional 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 comparison 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 occurred since the last Nebraska inventory in 1994 (Schmidt and Wardle 1998) (See appendix). Some of these changes make it inappropriate to directly compare portions of the 2004 estimates with those published for earlier inventories.

RESULTS

Area

Nebraska is perhaps best known as a land of grains and grasses, with fertile agricultural soils and extensive prairies (Stone and Bagley 1961). However, it is also a State with an expanding and productive forest resource. Nebraska's forests are unique in that they combine aspects of eastern hardwood, western coniferous, and northern boreal forests. Forests in the eastern third of Nebraska are dominated by deciduous species that extend across nearly all soil types, landforms, and physiographic classes (Schmidt and Wardle 1998). Toward the west, the area of forest land

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declines sharply. The majority of western forests are dominated by stands of ponderosa pine associated with escarpments of the Pine Ridge. Although the soils themselves are nutrient-rich and productive, the distribution and extent of forest species in the central and western portions of the State are limited by the harsh continental climate and the lack of available moisture. Native forests are located primarily along water corridors and in lowland sites; more than five times as many native woody species are found in eastern Nebraska as compared to the western part of the State (Schmidt and Wardle 1998).

Despite the current dominance of prairie and agricultural lands today, Nebraska was once covered by a forest of boreal white spruce following the retreat of the Pleistocene ice sheets approximately 10,000 years ago (Wright 1970). Evidence of these prehistoric boreal forests can still be found today in the stands of paper birch and aspen scattered across the northern part of Nebraska. Changing climate and the extensive use of fire by Native Americans eventually pushed the edge of these early forests eastward, leaving trees primarily along the natural firebreaks formed by rivers and streams (Schmidt and Wardle 1986).

Following the arrival of European settlers, government programs designed to promote settlement in the Great Plains often encouraged forestry as well. For example, the Timber Culture Act of 1873 provided 160 acres of land free to settlers who planted 40 acres of trees as part of their homestead (Schmidt and Wardle 1986). Some of these plantings are still evident today. The ecological and economic importance of Nebraska's forested lands later came into sharp focus during the Dust Bowl of the 1930s, during which a legacy of aggressive agricultural practices and an extended drought combined to produce vast dust storms that covered homes and buildings with drifts of eroded topsoil (Croker 1991). In response to the enormity of this disaster, President Franklin Roosevelt instituted the Prairie States

Forestry Project, a system of shelterbelts stretching from Texas to the Canadian border that included more than 4,100 miles of windbreaks in Nebraska alone (Stone and Bagley 1961).

Yet, despite Nebraska's early nickname, the "Tree Planter's State," increasing settlement and the high value of agricultural soils led to a general decline in forest land for much of the time since European settlement. Between the first (1955) and second (1983) inventories of Nebraska's forests, a period of just 28 years, the area of forest land in the State decreased from 903,000 acres to 718,000 acres as forest lands were shifted to agricultural uses (Raile 1986, Schmidt and Wardle 1998). This downward trend made a dramatic turnaround in the latter part of the 20th century, with a 32-percent increase in the area of forest land (from 718,000 to 948,000 acres) between the 1983 and 1994 inventories (Schmidt and Wardle 1998). The 2004 data are consistent with this continuing trend, with the area of forest land currently estimated at 1.25 million acres, or 2.4 percent of the State's total land area (table 1). However, caution needs to be taken in comparing these estimates, due to a definitional change of "forest land." In previous inventories, forest lands that had been grazed or used as shelterbelts were classified as "nonforest with trees." In the 2004 inventory, these lands were classified as forest land if they met the standards for size, width, and stocking. This may account for a portion of the increase in forest land since 1994.

Eighty-eight percent of forest land is owned by private landowners (table 1). There are three components to forest land: (1) Timberland¹—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 at

¹ 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 decisions that consider economic, environment, and social factors.

maximum annual increment; (2) Reserved forest land—land that is restricted from harvesting by statute, administrative regulation, or designation (i.e., national parks); and (3) Other forest land—low productivity forest land that is not capable of growing trees at a rate of 20 cubic feet per acre per year at the culmination of mean annual increment.

In Nebraska, nearly 93 percent of the forest land is timberland. Although timberland is predominant, the 90,700 acres of other forest land is a significant resource. Some acres of other forest land are set aside as reserves. Other acres, largely because of the combined effects of climate and low soil productivity, do not support vigorous tree growth. As a consequence, some forest land contains trees that are of poor form, small size, or inferior quality. However, trees on other forest land are important ecologically because they enhance biodiversity in an environment where trees are relatively scarce.

There were an estimated 1.16 million acres of timberland in Nebraska in 2004 (table 2). Timberland area has more than doubled since 1984 (fig. 1). According to Schmidt and Wardle (1998), much of the increase in timberland area between 1983 and 1998 stemmed from the decrease in the number of

farm operations, changes in livestock grazing management schemes, and lack of annual soil disturbance on former cropland. Although some changes in the definition of forest land and timberland occurred during this period, we suspect that these agriculture-related factors continue to play a role in the expansion of timberland in Nebraska.

Like many of the Plains States, Nebraska has both eastern hardwoods and western softwoods within its borders (Stone and Bagley 1961). Hardwood stands occupied 715,400 acres or almost 62 percent of all timberland area within the State in 2004 (fig. 2, table 3). The majority of timberland hardwood stands are associated with the elm/ash/cottonwood group (334,300 acres), followed by the oak/ hickory (180,300 acres) and maple/beech/birch (104,200 acres) groups. Forests in the western part of the State are largely dominated by conifers, with ponderosa pine found on 217,300 acres in northwestern Nebraska, accounting for nearly 19 percent of all timberland.

The distribution of Nebraska's timberland area by stand-size class in 2001–2004 generally agreed with that of the 1994 inventory, with the majority of timberland dominated by trees

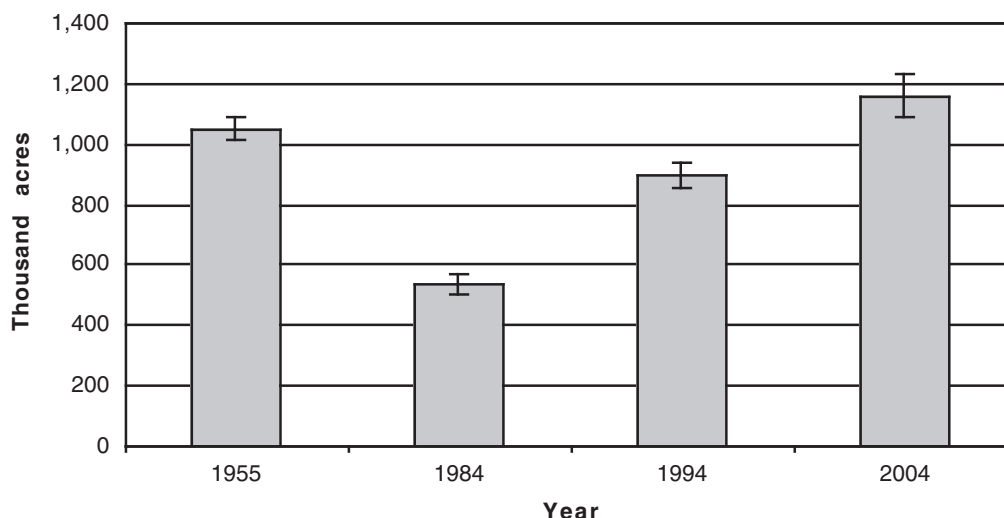


Figure 1.—Area of timberland in Nebraska, 1955–2004. The vertical line at the top of each bar represents the sample error associated with each inventory.

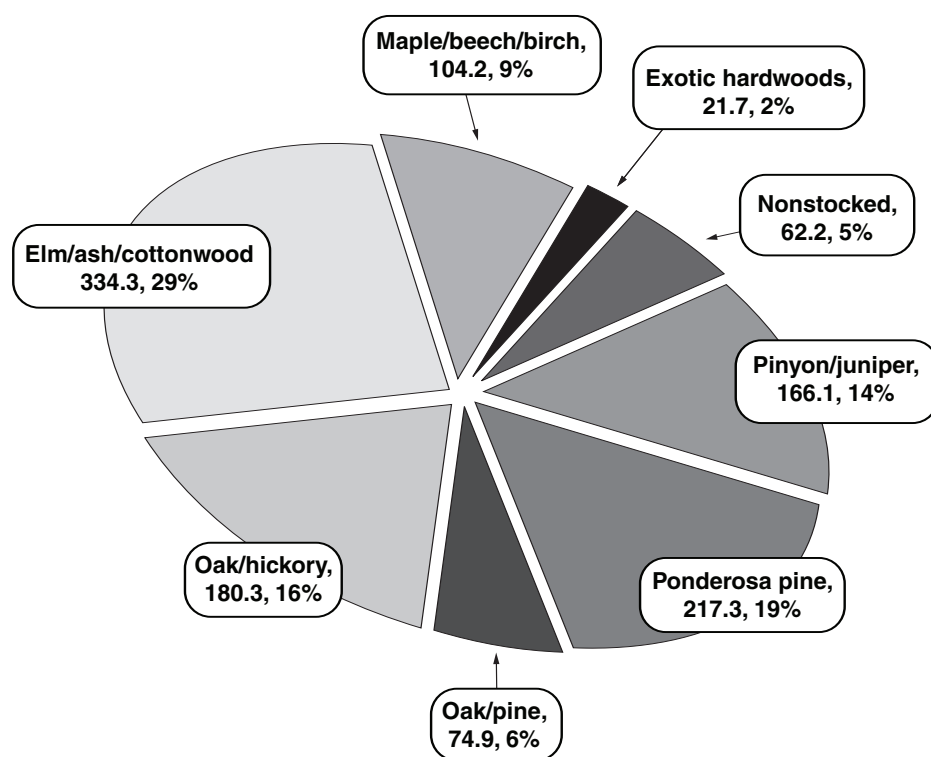


Figure 2.—Area of timberland (in thousands of acres and percentage of total timberland) by forest type in Nebraska, 2001–2004.

in larger size classes. Initial estimates based on the 2004 inventory indicate that sawtimber stands occupied 714,900 acres, or almost two-thirds (62 percent) of all timberland (fig. 3, table 3). Sawtimber refers to a live tree that is 11.0 inches d.b.h (diameter at breast height) for hardwoods or 9.0 inches d.b.h. for conifers and contains at least a 12-foot saw log or two non-contiguous saw logs 8 feet or longer. An additional one-quarter of timberland is classified in the next largest size class, poletimber, which consists of trees at least 5.0 inches d.b.h. Seedlings and sapling stands (seedlings at least 12 inches tall up to 1 inch d.b.h. and young trees between 1.0 and 5.0 inches d.b.h.) account for 8 percent of timberland area. Between 1994 and 2004, the area of timberland classified as nonstocked increased from 1 to over 5 percent of timberland area. Nonstocked timberland is land that has forests as its primary land use but that did not have a sufficient number of trees present during the inventory to be classified into a specific forest type.

Volume

Historically, the FIA program has reported volume as either growing stock or sawtimber volume. However, there is wood volume in non-commercial trees, rotten trees, and rough trees that do not qualify as growing stock. Volume from non-growing-stock trees is often utilized for wood fiber and fuelwood. Non-growing-stock volume is also an important ecological component of the landscape because it provides wildlife habitat and protects soil and water. With the annual inventory system and with an increased interest in FIA data from an ecological perspective, more emphasis has been placed on all live tree volume. There were an estimated 1.799 million cubic feet of all live volume on the 1.25 million acres of forest land in Nebraska in 2004 (table 4) or an average of more than 1,438 cubic feet of all live tree volume for each forest land acre. On the 1.16 million acres of timberland, there were an estimated 1.737 billion cubic feet of all live tree volume (table 5) or the equivalent of 1,496 cubic feet for each timberland acre in

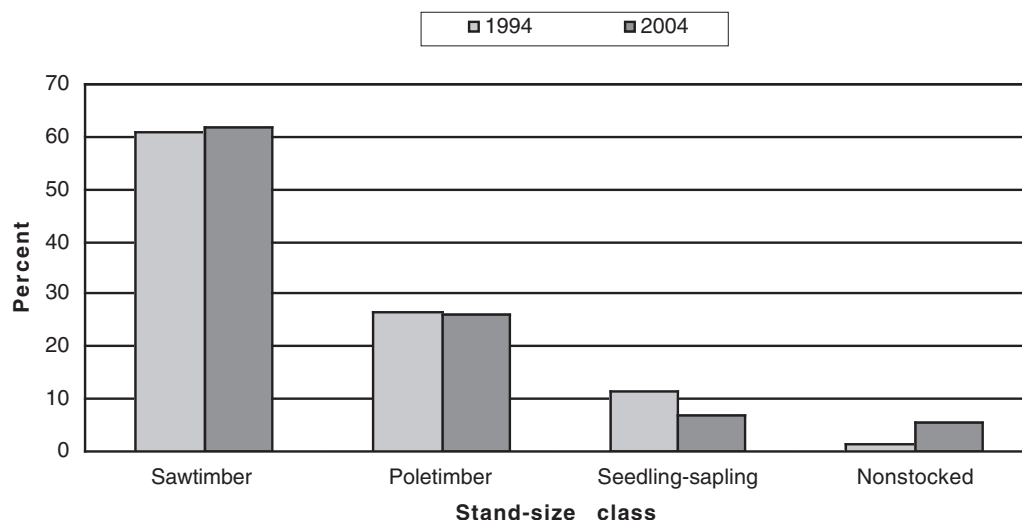


Figure 3.—Stand-size class as a percentage of total timberland area in Nebraska, 1994 and 2004.

Nebraska. Although relatively small, the difference between the timberland total and the 1.799 billion cubic feet volume of all live trees on forest land (table 4) represents 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).

The increase in timberland area between 1984 and 2004 is reflected in the estimated increase in growing-stock volume of both hardwood and softwood species. Growing-stock volume refers to the amount of solid wood on timberland in trees 5 inches d.b.h. or greater, from 1 foot above the ground to a minimum 4-inch top diameter, with deductions made for poor form or defect.

Hardwood stands represented approximately 76 percent of the total growing-stock volume on timberland in 2004 (table 6). The majority of the growing-stock volume is in the elm/ash/ cottonwood species group (47 percent), followed by the oak/hickory group (16 percent) and the maple/beech/birch group (9 percent). Seventy-seven percent of total volume in the softwood type groups is associated with ponderosa pine stands (table 6). Many

stands are a mix of species, sometimes with hardwoods and softwoods intermixed. For instance, almost 4 percent (11.5 million cubic feet) of the growing-stock volume in the softwood type groups is contained in hardwood species. In the hardwood type groups, less than 3 percent (27.4 million cubic feet) of growing-stock volume is in softwood species.

For hardwood species, estimated growing-stock volume increased by nearly 233 percent, from 285.8 million cubic feet in 1984 to 950.7 million cubic feet in 2004 (fig. 4). During this same period, growing-stock volume of softwood species increased by almost 75 percent, from 170.3 million cubic feet to 297.8 million cubic feet (fig. 5).

Fifty-four percent of all growing-stock volume is in trees that are 15 inches d.b.h. and larger (table 7). Thirty-three percent of all growing-stock volume is in trees that are 21 inches and larger; most of this volume is in cottonwood trees. The cottonwood and aspen groups account for 35 percent of all growing-stock volume.

Sawtimber volume, a subset of growing-stock volume, is the volume of the saw log portion of live sawtimber measured in board feet.

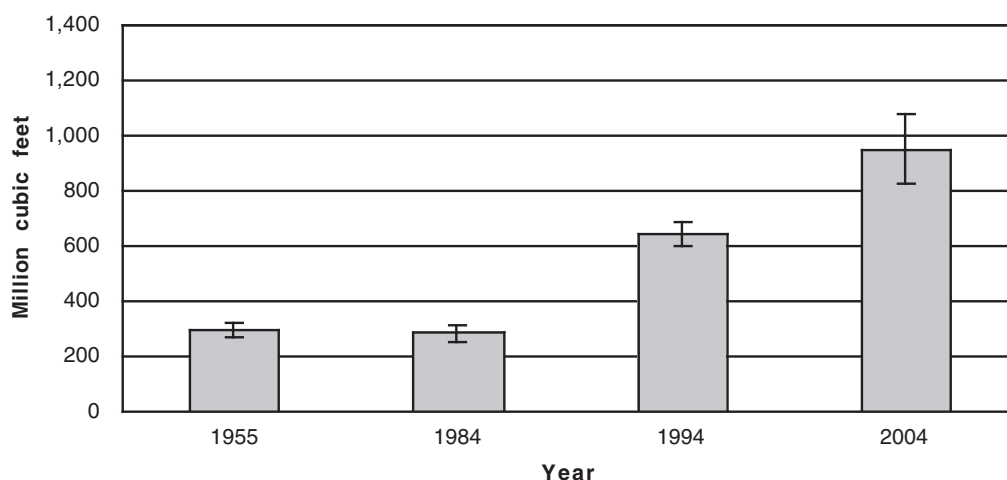


Figure 4.—Hardwood growing-stock volume on timberland in Nebraska, 1955-2004. The vertical line at the top of each bar represents the sample error associated with each inventory.

Sawtimber volume is generally measured with the International 1/4-inch rule. Sawtimber volume in Nebraska totaled more than 4.9 billion board feet (table 8). Seventy-five percent of the sawtimber volume is in hardwood trees. Almost half (43 percent) of sawtimber volume is in the cottonwood and aspen species group. Ponderosa pine, Rocky Mountain juniper, and eastern redcedar together account for more than 99 percent of softwood sawtimber volume and more than 24 percent of total sawtimber volume.

Biomass

Live aboveground tree biomass in Nebraska's timberland area was estimated to be 39.1 million dry tons. All live aboveground tree biomass is estimated for growing-stock trees, non-growing-stock trees, and all live 1- to 5-inch d.b.h. trees. More than 66 percent of tree biomass is in growing-stock trees, with an additional 29 percent in non-growing-stock trees and the remaining 5 percent in trees 1 to 5 inches d.b.h. (table 9). For both

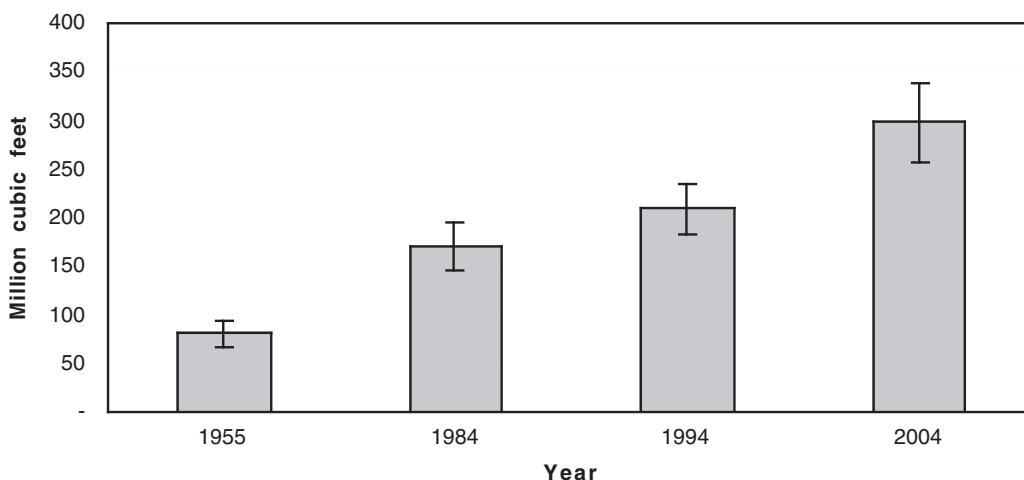


Figure 5.—Softwood growing-stock volume on timberland in Nebraska, 1955-2004. The vertical line at the top of each bar represents the sample error associated with each inventory.

growing-stock and non-growing-stock trees, nearly three-fourths of total aboveground biomass is in the bole of trees. The remaining aboveground biomass is in stumps, tops, and limbs. About 80 percent (31.0 million dry tons) of all live aboveground tree biomass is in hardwood species. Biomass estimates are increasing in importance for analyses of questions relating to carbon sequestration, wood fiber availability for fuel, and assessment of fuel loads in forest stands.

SUMMARY

The results from the first 4 years of the annual inventory of Nebraska completed in 2004 are consistent with the trend of increasing forest land and increasing growing-stock volume observed throughout the second half of the 20th century. As additional data become available under the annual inventory system, a clearer picture of the status and direction of Nebraska's forests will emerge. Additional data related to the three most recent periodic inventories of Nebraska (1994, 1983, 1955) are available at: www.fia.fs.fed.us

APPENDIX

Inventory Methods

Since the 1994 inventory of Nebraska, several changes have been made in the NCFIA inventory methods to improve the quality of the inventory as well as meet the increasing demands for timely forest resource information. The most significant change between the inventories was the change from periodic inventories to annual inventories. Historically, NCFIA 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 an annual inventory system, approximately one-fifth of all field plots are measured in any single year. After 5 years, the entire inventory will be completed. After the initial 5-year period, NCFIA will report and analyze results as a moving 5-year average. For example, NCFIA will be able to generate inventory results for 2001 through 2005 or for 2002 through 2006. Although there are great advantages for an annual inventory, one difficulty is reporting on results in the first 4 years. With the 2004 inventory, 80 percent of all field plots have been measured. Sampling error estimates for the 2004 inventory are 5.91 percent for forest land area, 6.20 percent for timberland area, 10.80 percent for number of growing-stock trees on timberland, 10.53 percent for volume of growing stock on timberland, and 12.05 percent for volume of sawtimber on timberland. These sampling error estimates are much higher than those for the last periodic inventory completed in 1994 (i.e., 4.8 percent for timberland area and 6.1 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 ensuing measurements, we will have additional confidence in our results due

to the increased number of field plots measured. As each measurement year is completed, the precision of estimates will improve.

Other significant changes between inventories include the implementation of new remote sensing technology and a new field plot design, development of new volume models, and gathering of additional remotely sensed and field data. The advent of remote sensing technology since the previous inventory in 1994 has allowed NCFIA to use 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 estimates.

New algorithms were used in 2001-2004 to assign forest type and stand-size class to each condition observed on a plot. These algorithms are being used nationwide by FIA to provide consistency among States and will be used to reassign the forest type and stand-size class of every plot in the 1994 inventory when it is updated. This will be done so that changes in forest type and stand-size class will reflect actual changes in the forest and not changes in how values are computed. The list of recognized forest types, groupings of these forest types for reporting purposes, equations 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 previous inventories may not be valid. For additional details about algorithms used in previous inventories, please contact NCFIA.

Sampling Phases

The 2004 Nebraska 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 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 2004 inventory used a 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 sample of field plots in Nebraska. 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. This array of plots is designated the Federal base sample and is considered an equal probability sample; its measurement in Nebraska is funded by the Federal government. The State of Nebraska provides additional support for the inventory measurements by supplying field crews.

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)—to optimize our ability to collect data when available for measurement. Both types of plot are systematically 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. We anticipate that in Nebraska the complete 5-year annual inventory will involve about 30 phase 3 field plots. On the remaining plots, referred to as phase 2 plots, only variables that can be measured throughout the entire year are collected. In Nebraska, the complete 5-year annual inventory is expected to involve about 400 phase 2 forested plots. The 1999-2004 annual inventory results represent field measures on 304 phase 2 forested plots and 21 phase 3 field plots.

The new national FIA plot configuration was first used for data collection during the 2001 inventory of Nebraska 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 until at least three annual panels have been remeasured, and even then we anticipate that estimates of change will be limited in detail.

The overall plot configuration 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 if a previous plot existed within the sample unit. Trees that are 5 inches d.b.h. 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 at 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.

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.fia.fs.fed.us, other tabular data can be generated. For additional information, contact:

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TABLE TITLES

Table 1.—Area of forest land by forest type group, forest type, and owner category, Nebraska, 2001-2004

Table 2.—Area of timberland by major forest type group, stand origin, and owner category, Nebraska, 2001-2004

Table 3.—Area of timberland by forest type group, forest type, and stand-size class, Nebraska, 2001-2004

Table 4.—Net volume of all live trees on forest land by species group, species, and owner category, Nebraska, 2001-2004

Table 5.—Net volume of all live trees and salvable dead trees on timberland by class of timber and softwood/hardwood species category, Nebraska, 2001-2004

Table 6.—Net volume of growing stock on timberland by forest type group, forest type, and softwood/hardwood species category, Nebraska, 2001-2004

Table 7.—Net volume of growing stock on timberland by species group, species, and diameter class, Nebraska, 2001-2004

Table 8.—Net volume of sawtimber on timberland by species group, species, and diameter class, Nebraska, 2001-2004

Table 9.—All live aboveground tree biomass on timberland by owner category, softwood/hardwood species category, and tree biomass component, Nebraska, 2001-2004



TABLES

Table 1. -- Area of forest land by forest type group, forest type, and owner category, Nebraska 2001 - 2004

(In thousand acres)

Forest type group/ forest type	Owner category		
	All owners	Public	Private Unidentified owner
Softwood type groups			
Pinyon / juniper group			
Eastern redcedar	159.3	18.3	141.0
Rocky Mountain juniper	7.5	--	7.5
All forest types	166.8	18.3	148.5
Ponderosa pine group			
Ponderosa pine	217.3	39.0	178.3
All forest types	217.3	39.0	178.3
All softwood groups	384.1	57.3	326.8
Hardwood type groups			
Oak / pine group			
Eastern redcedar / hardwood	89.1	1.2	87.9
All forest types	89.1	1.2	87.9
Oak / hickory group			
White oak / red oak / hickory	8.5	--	8.5
Bur oak	90.0	--	90.0
Mixed upland hardwoods	118.4	16.1	102.3
All forest types	216.9	16.1	200.8
Elm / ash / cottonwood group			
Elm / ash / cottonwood group	1.7	--	1.7
River birch / sycamore	3.3	--	3.3
Cottonwood	147.2	43.3	103.9
Willow	9.3	--	9.3
Sycamore / pecan / American elm	11.7	--	11.7
Sugarberry / hackberry / elm / green ash	124.1	9.0	115.2
Silver maple / American elm	9.4	--	9.4
Cottonwood / willow	44.3	7.2	37.1
All forest types	351.1	59.4	291.6
Maple / beech / birch group			
Sugar maple / beech / yellow birch	7.0	--	7.0
Hard maple / basswood	37.4	--	37.4
Elm / ash / locust	69.0	5.6	63.4
All forest types	113.4	5.6	107.8
Exotic hardwoods group			
Other exotic hardwoods	21.7	--	21.7
All forest types	21.7	--	21.7
All hardwood groups	792.3	82.4	709.9
Nonstocked	75.3	9.1	66.2
All forest groups	1,251.7	148.7	1,102.9

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, Nebraska, 2001-2004

(In thousand acres)

Major forest type group and stand origin	Owner category		
	All owners	Public	Private Unidentified owner
Softwood type groups			
Natural	355.6	31.5	324.1
Planted	27.8	25.8	2.0
All softwood types	383.4	57.3	326.1
Hardwood type groups			
Natural	715.4	78.6	636.8
All hardwood types	715.4	78.6	636.8
Nonstocked	62.2	1.7	60.5
All groups	1,161.0	137.6	1,023.4

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 3. -- Area of timberland by forest type group, forest type, and stand-size class, Nebraska 2001 - 2004

(In thousand acres)

Forest type group/ forest type	Stand-size class			
	All stands	Sawtimber	Pole/timber	Sapling- seedling
Softwood type groups				
Pinyon / juniper group				
Eastern redcedar	158.6	35.1	110.6	12.9
Rocky Mountain juniper	7.5	7.5	--	--
All forest types	166.1	42.6	110.6	12.9
Ponderosa pine group				
Ponderosa pine	217.3	187.2	15.1	15.1
All forest types	217.3	187.2	15.1	15.1
All softwood groups	383.4	229.7	125.7	28.0
Hardwood type groups				
Oak / pine group				
Eastern redcedar / hardwood	74.9	24.6	33.6	16.7
All forest types	74.9	24.6	33.6	16.7
Oak / hickory group				
White oak / red oak / hickory	8.5	8.5	--	--
Bur oak	67.7	37.7	30.0	--
Mixed upland hardwoods	104.1	71.5	32.6	--
All forest types	180.3	117.7	62.6	--
Elm / ash / cottonwood group				
Elm / ash / cottonwood group	1.7	--	1.7	--
River birch / sycamore	3.3	3.3	--	--
Cottonwood	137.9	121.4	14.6	1.9
Willow	9.3	1.9	--	7.4
Sycamore / pecan / American elm	11.7	6.2	5.4	--
Sugarberry / hackberry / elm / green ash	124.1	94.7	18.5	11.0
Silver maple / American elm	9.4	9.4	--	--
Cottonwood / willow	36.8	36.8	--	--
All forest types	334.3	273.8	40.3	20.3
Maple / beech / birch group				
Sugar maple / beech / yellow birch	7.0	--	7.0	--
Hard maple / basswood	37.4	37.4	--	--
Elm / ash / locust	59.8	18.5	34.4	6.9
All forest types	104.2	55.9	41.4	6.9
Exotic hardwoods group				
Other exotic hardwoods	21.7	13.2	--	8.5
All forest types	21.7	13.2	--	8.5
All hardwood groups	715.4	485.1	177.9	52.4
Nonstocked	62.2	--	--	62.2
All forest groups	1,161.0	714.9	303.6	80.4

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, Nebraska 2001 - 2004

(In thousand cubic feet)

Species group/ species	Owner category			
	All owners	Public	Private	Unidentified owner
Softwoods				
Other yellow pines				
Scotch pine	798	798	--	--
All species	798	798	--	--
Other eastern softwoods				
Rocky Mountain juniper	24,805	416	24,389	--
Eastern redcedar	134,280	9,149	125,131	--
Norway spruce	144	--	144	--
Ponderosa pine	251,232	52,119	199,113	--
All species	410,460	61,684	348,776	--
Total softwoods	411,259	62,483	348,776	--
Hardwoods				
Select white oaks				
Bur oak	267,238	10,212	257,026	--
Chinkapin oak	4,819	443	4,377	--
All species	272,057	10,654	261,403	--
Select red oaks				
Northern red oak	11,226	548	10,677	--
All species	11,226	548	10,677	--
Other red oaks				
Black oak	4,288	--	4,288	--
All species	4,288	--	4,288	--
Hickory				
Bitternut hickory	6,281	250	6,031	--
All species	6,281	250	6,031	--
Soft maple				
Silver maple	19,495	2,310	17,185	--
All species	19,495	2,310	17,185	--
Ash				
Green ash	110,157	10,347	99,810	--
All species	110,157	10,347	99,810	--
Cottonwood and aspen				
Eastern cottonwood	513,451	166,986	346,465	--
Plains cottonwood	6,190	--	6,190	--
All species	519,641	166,986	352,655	--
Basswood				
American basswood	62,136	--	62,136	--
All species	62,136	--	62,136	--
Black walnut				
Black walnut	20,781	1,555	19,226	--
All species	20,781	1,555	19,226	--

(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	40,663	1,426	39,238	--
Northern catalpa	709	--	709	--
Hackberry	75,821	8,973	66,849	--
Black cherry	460	--	460	--
Black willow	26,363	3,328	23,035	--
American elm	61,507	8,035	53,472	--
Siberian elm	30,189	73	30,116	--
Slippery elm	23,391	747	22,644	--
All species	259,104	22,581	236,523	--
Other eastern hard hardwoods				
Honeylocust	23,734	--	23,734	--
Kentucky coffeetree	6,074	--	6,074	--
Mulberry spp.	3,672	--	3,672	--
White mulberry	128	--	128	--
Red mulberry	47,513	15,000	32,513	--
Black locust	6,832	--	6,832	--
All species	87,953	15,000	72,954	--
Eastern noncommercial hardwoods				
American hornbeam, musclewood	--	--	--	--
Osage-orange	7,956	117	7,839	--
Eastern hophornbeam	4,671	151	4,520	--
Chokecherry	--	--	--	--
American plum	--	--	--	--
Peachleaf willow	1,460	282	1,178	--
Russian-olive	864	--	864	--
All species	14,950	549	14,401	--
Total hardwoods	1,388,069	230,780	1,157,289	--
All species groups	1,799,328	293,263	1,506,065	--

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 salvageable dead trees on timberland by class of timber and softwood/hardwood species category, Nebraska, 2001-2004

(In thousand cubic feet)

Class of timber	All species	Softwood species	Hardwood species
Live trees			
Growing-stock trees			
Sawtimber			
Saw log portion	905,647	212,066	693,581
Upper stem portion	100,460	32,087	68,373
Total	1,006,107	244,153	761,954
Poletimber	246,801	71,967	174,834
All growing-stock trees	1,252,908	316,120	936,787
Cull trees			
Rough trees ¹			
Sawtimber size	309,098	65,373	243,724
Poletimber size	111,054	23,101	87,953
Total	420,152	88,474	331,678
Rotten trees ¹			
Sawtimber size	34,789	--	34,789
Poletimber size	3,354	--	3,354
Total	38,143	--	38,143
All live cull trees	458,295	88,474	369,821
All live trees	1,711,203	404,595	1,306,608
Salvageable dead trees			
Sawtimber size	14,745	3,851	10,894
Poletimber size	11,247	1,803	9,444
All salvageable dead trees	25,992	5,654	20,338
All classes	1,737,195	410,249	1,326,946

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 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, Nebraska, 2001-2004

(In thousand cubic feet)

Forest type group/ forest type	All species	Softwood species	Hardwood species
Softwood type groups			
Pinyon / juniper group			
Eastern redcedar	67,838	60,378	7,459
All forest types	67,838	60,378	7,459
Ponderosa pine group			
Ponderosa pine	229,972	225,930	4,042
All forest types	229,972	225,930	4,042
All softwood groups	297,810	286,308	11,501
Hardwood type groups			
Oak / pine group			
Eastern redcedar / hardwood	39,774	18,060	21,714
All forest types	39,774	18,060	21,714
Oak / hickory group			
White oak / red oak / hickory	8,240	--	8,240
Bur oak	88,015	2,999	85,017
Mixed upland hardwoods	103,582	908	102,673
All forest types	199,837	3,907	195,930
Elm / ash / cottonwood group			
Elm / ash / cottonwood group	6,459	--	6,459
River birch / sycamore	4,536	--	4,536
Cottonwood	349,011	4,042	344,968
Willow	5,378	--	5,378
Sycamore / pecan / American elm	2,474	--	2,474
Sugarberry / hackberry / elm / green ash	102,937	300	102,637
Silver maple / American elm	15,693	--	15,693
Cottonwood / willow	97,987	--	97,987
All forest types	584,473	4,342	580,131
Maple / beech / birch group			
Sugar maple / beech / yellow birch	5,199	--	5,199
Hard maple / basswood	70,917	--	70,917
Elm / ash / locust	40,956	808	40,148
All forest types	117,072	808	116,264
Exotic hardwoods group			
Other exotic hardwoods	9,579	247	9,331
All forest types	9,579	247	9,331
All hardwood groups	950,735	27,365	923,370
Nonstocked	4,363	2,447	1,916
All forest groups	1,252,908	316,120	936,787

(Table 6 continued on next page)

(Table 6 continued)

Forest type group/ forest type	All species	Softwood species	Hardwood species
Hardwood type groups			
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 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, Nebraska 2001 - 2004

(In thousand cubic feet)

Species group/ species	All classes	Diameter class (inches at breast height)											29.0+
		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			
Softwoods													
Other yellow pines													
Scotch pine	644	100	--	--	544	--	--	--	--	--	--	--	--
All species	644	100	--	--	544	--	--	--	--	--	--	--	--
Other eastern softwoods													
Rocky Mountain juniper	8,265	635	1,620	1,245	1,132	3,633	--	--	--	--	--	--	--
Eastern redcedar	84,080	20,874	19,363	15,293	15,211	9,419	2,400	1,518	--	--	--	--	--
Norway spruce	144	144	--	--	--	--	--	--	--	--	--	--	--
Ponderosa pine	222,988	9,787	19,445	36,626	51,410	37,789	25,973	16,094	20,118	5,747	--	--	--
All species	315,476	31,439	40,428	53,164	67,754	50,841	28,373	17,612	20,118	5,747	--	--	--
Total softwoods	316,120	31,539	40,428	53,164	68,298	50,841	28,373	17,612	20,118	5,747	--	--	--
Hardwoods													
Select white oaks													
Bur oak	149,999	7,217	12,069	20,112	17,157	16,091	9,298	17,022	11,512	25,672	13,848	--	--
Chinkapin oak	4,819	--	--	1,029	1,354	--	--	2,437	--	--	--	--	--
All species	154,818	7,217	12,069	21,141	18,511	16,091	9,298	19,459	11,512	25,672	13,848	--	--
Select red oaks													
Northern red oak	4,803	--	800	--	--	--	--	1,940	2,063	--	--	--	--
All species	4,803	--	800	--	--	--	--	1,940	2,063	--	--	--	--
Other red oaks													
Black oak	4,288	--	--	--	620	999	--	--	2,669	--	--	--	--
All species	4,288	--	--	--	620	999	--	--	2,669	--	--	--	--
Hickory													
Bitternut hickory	6,184	418	561	1,876	728	2,601	--	--	--	--	--	--	--
All species	6,184	418	561	1,876	728	2,601	--	--	--	--	--	--	--
Soft maple													
Silver maple	13,060	973	491	2,110	2,328	2,427	--	2,034	2,697	--	--	--	--
All species	13,060	973	491	2,110	2,328	2,427	--	2,034	2,697	--	--	--	--
Ash													
Green ash	71,661	7,272	13,268	13,921	10,922	7,924	5,750	--	4,554	8,050	--	--	--
All species	71,661	7,272	13,268	13,921	10,922	7,924	5,750	--	4,554	8,050	--	--	--
Cottonwood and aspen													
Eastern cottonwood	439,851	1,364	3,925	9,406	16,304	11,799	23,295	16,832	28,739	167,587	160,601	--	--
Plains cottonwood	442	442	--	--	--	--	--	--	--	--	--	--	--
All species	440,293	1,806	3,925	9,406	16,304	11,799	23,295	16,832	28,739	167,587	160,601	--	--
Basswood													
American basswood	46,981	806	2,487	1,551	2,655	3,148	8,954	11,833	5,553	9,994	--	--	--
All species	46,981	806	2,487	1,551	2,655	3,148	8,954	11,833	5,553	9,994	--	--	--
Black walnut													
Black walnut	16,341	768	1,411	1,937	1,102	4,429	1,147	--	2,309	3,238	--	--	--
All species	16,341	768	1,411	1,937	1,102	4,429	1,147	--	2,309	3,238	--	--	--

(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	15,785	711	843	2,629	1,187	1,037	--	--	2,470	6,908	--
Northern catalpa	709	--	359	351	--	--	--	--	--	--	--
Hackberry	36,435	4,277	5,656	3,420	4,829	2,701	2,638	--	4,889	8,024	--
Black willow	18,147	1,222	2,377	1,083	2,234	1,815	4,598	1,880	--	2,936	--
American elm	32,146	5,345	6,249	6,745	6,046	5,066	2,696	--	--	--	--
Siberian elm	18,596	1,251	2,826	2,389	1,668	4,129	4,359	1,974	--	--	--
Slippery elm	16,601	788	1,730	1,953	2,983	4,882	2,512	1,752	--	--	--
All species	138,419	13,595	20,040	18,570	18,947	19,630	16,803	5,606	7,359	17,868	--
Other eastern hard hardwoods											
Honeylocust	9,870	1,358	2,264	1,019	732	--	--	1,961	2,537	--	--
Kentucky coffeetree	5,838	--	442	386	937	2,784	1,288	--	--	--	--
Mulberry spp.	3,382	204	672	509	825	1,173	--	--	--	--	--
Red mulberry	15,076	2,215	3,461	1,851	4,524	1,822	1,204	--	--	--	--
Black locust	5,772	399	1,254	381	2,498	--	1,239	--	--	--	--
All species	39,939	4,176	8,093	4,146	9,516	5,779	3,731	1,961	2,537	--	--
Total hardwoods	936,787	37,031	63,144	74,659	81,633	74,827	68,980	59,665	69,993	232,408	174,449
All species groups	1,252,908	68,569	103,573	127,822	149,931	125,668	97,353	77,277	90,111	238,155	174,449

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, Nebraska 2001 - 2004

¹
(In thousand board feet)

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									
Other yellow pines									
Scotch pine	2,470	--	2,470	--	--	--	--	--	--
All species	2,470	--	2,470	--	--	--	--	--	--
Other eastern softwoods									
Rocky Mountain juniper	29,377	5,948	5,395	18,033	--	--	--	--	--
Eastern redcedar	224,778	82,927	77,739	46,006	11,201	6,905	--	--	--
Ponderosa pine	952,033	169,512	246,678	185,663	130,849	83,478	105,225	30,628	--
All species	1,206,188	258,387	329,812	249,702	142,050	90,384	105,225	30,628	--
Total softwoods	1,208,658	258,387	332,282	249,702	142,050	90,384	105,225	30,628	--
Hardwoods									
Select white oaks									
Bur oak	548,704	--	80,993	76,973	44,975	83,348	57,208	130,722	74,485
Chinkapin oak	18,713	--	6,506	--	--	12,207	--	--	--
All species	567,417	--	87,499	76,973	44,975	95,555	57,208	130,722	74,485
Select red oaks									
Northern red oak	20,266	--	--	--	--	9,751	10,515	--	--
All species	20,266	--	--	--	--	9,751	10,515	--	--
Other red oaks									
Black oak	20,759	--	2,766	4,669	--	--	13,324	--	--
All species	20,759	--	2,766	4,669	--	--	13,324	--	--
Hickory									
Bitternut hickory	16,261	--	3,448	12,813	--	--	--	--	--
All species	16,261	--	3,448	12,813	--	--	--	--	--
Soft maple									
Silver maple	41,635	--	9,668	10,453	--	9,128	12,386	--	--
All species	41,635	--	9,668	10,453	--	9,128	12,386	--	--
Ash									
Green ash	168,700	--	45,530	34,390	26,145	--	21,937	40,697	--
All species	168,700	--	45,530	34,390	26,145	--	21,937	40,697	--
Cottonwood and aspen									
Eastern cottonwood	2,091,065	--	71,589	53,399	110,713	83,848	146,020	874,466	751,030
All species	2,091,065	--	71,589	53,399	110,713	83,848	146,020	874,466	751,030
Basswood									
American basswood	228,170	--	13,632	16,480	47,448	63,929	30,190	56,491	--
All species	228,170	--	13,632	16,480	47,448	63,929	30,190	56,491	--
Black walnut									
Black walnut	58,339	--	4,844	20,512	5,445	--	11,357	16,180	--
All species	58,339	--	4,844	20,512	5,445	--	11,357	16,180	--

Table 8 continued on next page)

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(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	52,564	--	4,899	4,516	--	--	11,169	31,980	--
Hackberry	107,209	--	22,131	12,189	12,349	--	22,766	37,774	--
Black willow	57,633	--	9,057	7,322	19,530	8,237	--	13,488	--
American elm	61,286	--	26,513	22,743	12,030	--	--	--	--
Siberian elm	55,858	--	7,279	19,033	20,348	9,198	--	--	--
Slippery elm	55,555	--	13,604	22,474	11,594	7,883	--	--	--
All species	390,105	--	83,482	88,278	75,850	25,317	33,935	83,242	--
Other eastern hard hardwoods									
Honeylocust	23,105	--	3,050	--	--	8,658	11,398	--	--
Kentucky coffeetree	21,213	--	3,910	11,739	5,564	--	--	--	--
Mulberry spp.	8,412	--	3,428	4,984	--	--	--	--	--
Red mulberry	31,837	--	18,806	7,767	5,264	--	--	--	--
Black locust	15,914	--	10,433	--	5,480	--	--	--	--
All species	100,481	--	39,627	24,491	16,308	8,658	11,398	--	--
Total hardwoods	3,703,198	--	362,087	342,458	326,885	296,186	348,270	1,201,797	825,516
All species groups	4,911,856	258,387	694,369	592,160	468,935	386,570	453,495	1,232,425	825,516

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, Nebraska, 2001-2004

(In thousand dry tons)

Owner category and softwood/hardwood category	Tree biomass component							
	All components	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	1,213	131	892	713	179	191	155	36
Hardwoods	4,313	101	3,184	2,413	772	1,027	755	272
Total	5,526	232	4,076	3,126	951	1,218	910	308
Private								
Softwoods	6,844	573	4,741	3,733	1,008	1,530	1,143	387
Hardwoods	26,712	980	17,120	12,626	4,494	8,612	6,279	2,334
Total	33,557	1,553	21,862	16,359	5,503	10,142	7,422	2,720
All ownerships								
Softwoods	8,057	704	5,633	4,446	1,187	1,721	1,298	423
Hardwoods	31,025	1,081	20,305	15,039	5,266	9,639	7,034	2,605
Total	39,083	1,785	25,938	19,485	6,453	11,360	8,332	3,028

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 thousand dry ton. Columns and rows may not add to their totals due to rounding.

Meneguzzo, Dacia M.; Moser, W. Keith; Brand, Gary J.; Hansen, Mark H.; Lovett, William R.

2006. **Nebraska's forest resources in 2004.** Resour. Bull. NC-256. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 25 p.

Reports the initial results of the first four annual panels (2001-2004) of the fifth forest inventory of Nebraska. Includes information on forest area; volume; biomass; and forest health.

KEY WORDS: Annual inventory, forest land, timberland, forest type, volume, biomass, Nebraska

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For further information contact:



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