USDA
United States Department of Agriculture

Oklahoma's Forests, 2014

Kerry Dooley and KaDonna Randolph

Forest Service

Southern Research Station

Resource Bulletin SRS–212

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Front cover: top left, forests offer aesthetic benefits including fall foliage. (photo by Kerry Dooley, Oklahoma Forestry Services); top right, the Canadian River edged by forest. (photo by Carri Abner, Oklahoma Forestry Services); bottom, pronghorn antelope live in the grasslands to open woodlands of western Oklahoma. (photo by Dieter Rudolph, Oklahoma Forestry Services). Back cover: top left, mesquite trees on the western Oklahoma landscape. (photo by Dieter Rudolph, Oklahoma Forestry Services); top right, forests offer aesthetic benefits including fall foliage. (photo by Kerry Dooley, Oklahoma Forestry Services); bottom, sunrise over Oklahoma prairie. (photo by Dieter Rudolph, Oklahoma Forestry Services).

A young fawn beds down in a small opening in the forest. (photo by Carri Abner, Oklahoma Forestry Services)

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Woodlands and scrublands surround the Altus-Luger Reservoir near Quartz Mountain. (photo by Carri Abner, Oklahoma Forestry Services)

FOREWORD

The U.S. Department of Agriculture Forest Service, Southern Research Station's (SRS) Forest Inventory and Analysis (FIA) research work unit and cooperating State forestry agencies conduct annual forest inventories of resources in the 13 Southern States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia), the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. In order to provide more frequent and nationally consistent information on America's forest resources, all research stations and their respective FIA work units conduct annual surveys with a common sample design. These surveys are mandated by law through the Agricultural Research Extension and Education Reform Act of 1998 (Farm Bill).

The primary objective in conducting these inventories is to gather the multi-resource information needed to formulate sound forest policies, provide information for economic development, develop forest programs, and provide a scientific basis to monitor forest ecosystems. These data are used to provide an overview of forest resources including, but not limited to, forest area, forest ownership, forest type, stand structure, timber volume, growth, removals, mortality, management activity, down woody material, and invasive species. The information presented is applicable at the State and survey unit level; although it provides the background for more intensive studies of critical situations, it is not designed to reflect resource conditions at small scales.

More information about Forest Service resource inventories is available in "Forest Resource Inventories: An Overview" (U.S. Department of Agriculture Forest Service 1992). More detailed information about sampling methodologies used in the annual FIA inventories can be found in "The Enhanced Forest Inventory and Analysis Program-National Sampling Design and Estimation Procedures" (Bechtold and Patterson 2005).

Data tables included in FIA reports are designed to provide an array of forest resource estimates, but additional tables can be obtained at http://fia.fs.fed.us/tools-data/default.asp Additional information about the FIA program can be obtained at http://fia.fs.fed.us/.

Additional information about any aspect of this or other FIA surveys may be obtained from:

U.S. Department of Agriculture
Forest Service
Forest Inventory and Analysis
Southern Research Station
4700 Old Kingston Pike
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ACKNOWLEDGMENTS

The authors gratefully acknowledge the staff of the Oklahoma Forestry Services who provided reviews and comments on an earlier draft of this report. We would also like to thank SRS-FIA staff, in particular Helen Beresford, Tom Brandeis, Dave Gartner, Janet Griffin, Chris Oswalt, Jason McHan, Ted Ridley, Anita Rose, Angie Rowe, and Jeff Turner for their assistance with data queries, analysis, reporting, and layout. We thank Carri Abner, Donna Burnett, Dacia Meneguzzo, and Maureen Stuart for their review of the manuscript. FIA thanks the Oklahoma Forestry Services for partnering with our program in conducting data collection for the survey that the authors report here. FIA also thanks other public agencies and the many private landowners who provided access to measurement plots.

The following people collected field measurements for this survey.

Carri Abner, Reilly Cloud, Kerry Dooley, Jacob Dyer, Matt Ford, Ken Grayson, Donald Niebyl, Shawn Odom, Dieter Rudolph, Chris Weikart, Matthew Woolley

FIA appreciates their hard work and their consistent efforts to obtain high-quality data.

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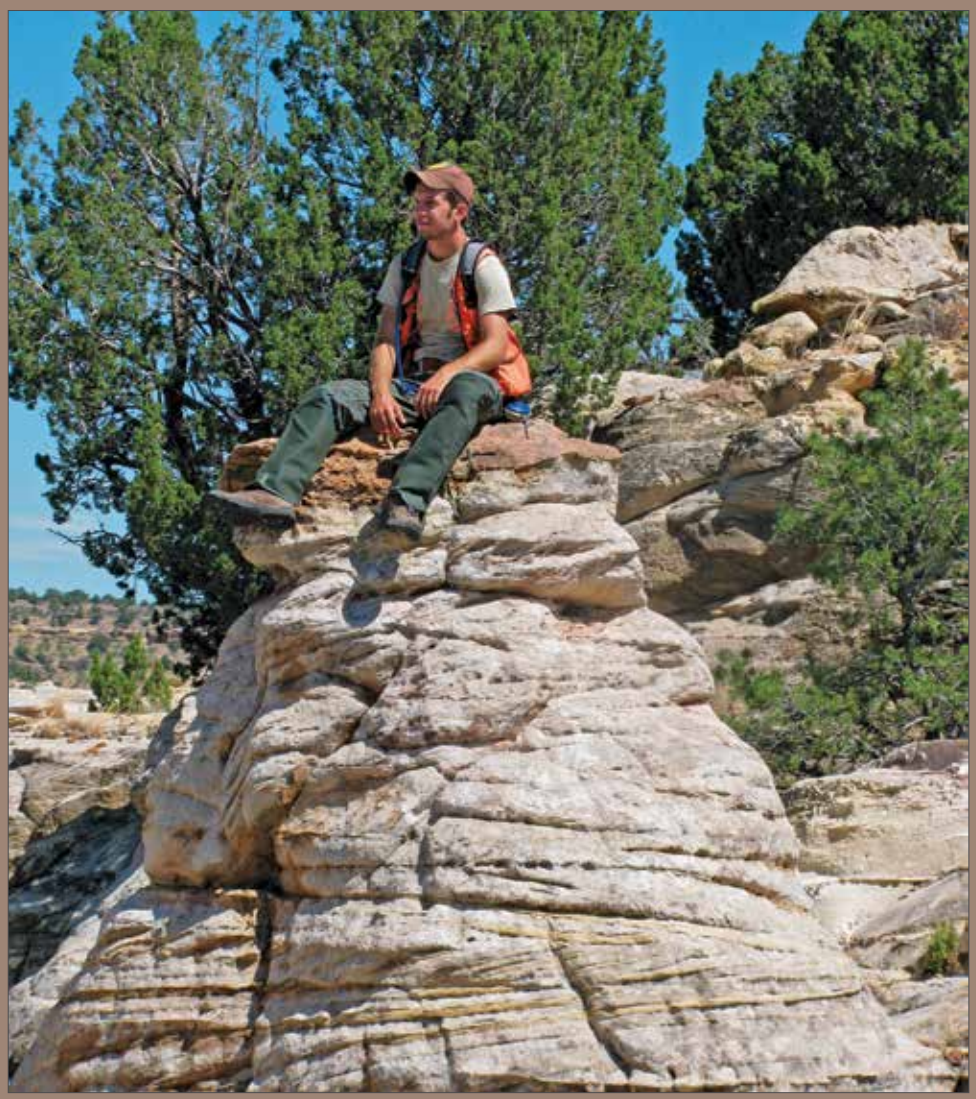

Taking a break during plot data collection in western Oklahoma. (photo by Dieter Rudolph, Oklahoma Forestry Services)

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Several species of turtle make their home in the forests of Oklahoma. (photo by Kerry Dooley, Oklahoma Forestry Services)

HIGHLIGHTS

• There are more than 12.2 million acres of forest land in Oklahoma, greater than one-fourth of the State's area.

• Oak/hickory is the most common forest type group, accounting for 55 percent of the forest area.

• Most of the forest land (64 percent) in Oklahoma is owned by private individuals or families.

• On the whole Oklahoma's forests are evenly distributed between the size classes. This is less true when looking at specific forest-type groups.

• There are an estimated 5.4 billion trees, comprising 94 unique species in the State. The most common species is post oak (*Quercus stellata*).

• Net volume, meaning trees ≥5.0 inches, excluding rotten, missing, and defect cull, was 9.47 billion cubic feet. By individual species, post oak contributed the most to this total.

• Biomass is emerging as a measurement of interest. In Oklahoma the total aboveground dry weight of live trees on forest land is 281.6 million tons, and the total carbon stored in live trees on forest land is 140.8 million tons.

• Net change = gross growth – mortality – removals. The net change for all live trees on forest land was +45.8 million cubic feet. At 89.3 million cubic feet mortality was higher than might have been expected, particularly among some oak groups.

• In total an estimated 3.75 million acres were found to have had at least one disturbance occur over this survey period, with weather being the most common disturbance type.

• Nonnative roses were the invasive species which occurred on the most plots across the State, while Japanese honeysuckle were observed most often severely infesting sites.

In eastern Oklahoma, FIA plots have been re-measured many times. (photo by Matt Ford, Dieter Rudolph, Oklahoma Forestry Services)

INTRODUCTION

With land and water area covering over 44 million acres Oklahoma is the second largest State in the southern FIA region. It is also topographically and ecologically diverse. Much of the State is emblematic of the Great Plains, being mostly flat or with gently rolling hills, with moderate temperatures and rainfall averaging between 25 and 45 inches per year. At its far western edge, Oklahoma extends into the Black Mesa complex, reaching its highest elevation point (4,973 feet). This part of the State averages <20 inches of precipitation per year, and the tree species are more typical of the west or southwest than the Southern United States. The eastern side of Oklahoma also climbs out of the plains into the Ouachita Mountains in the southeast and the Ozark Plateau in the northeast. FIA surveys the State in seven distinct units (fig. 1).

This report is dated 2014, but the data were actually collected over several years using an annual collection method, where a portion of the plots are collected each year. For the two easternmost units, data were collected over about 5 years starting in 2010. The last full survey of these units was completed in 2008, and it was conducted with periodic survey measures where all of the plots are measured in about 1 year. This change in methods led to the decision to wait a year before remeasurement began. In the eastern units, 20 percent of the plots are measured each year, so the data analyzed in this report represents a complete survey cycle.

For the 5 survey units of central and western Oklahoma, data were collected over about 6 years, starting in 2009. These units are on a 10-year cycle, meaning only 10 percent of the plots are measured each year. The central/western data presented in this report represents 60 percent of a complete survey cycle. With the exception of a survey conducted in 1989, for which plot locations were never revisited, this is the first survey of central and western Oklahoma. Therefore, remeasurement period was not a concern. Readers will note that because the plots in these central and western units are being measured for the first time, change data—such as growth and removals—is not yet available for those units. Any change data presented in this report will concern only the two easternmost survey units.

Figure 1—FIA survey units of Oklahoma.

Cypress forests are typical of the wetter areas in eastern Oklahoma. (photo by Carri Abner, Oklahoma Forestry Services)

FOREST AREA

Oklahoma comprises more than 12.2 million acres of forest land, >26 percent of the State's total area. Forest land, and timberland—land which is capable of producing at least 20 cubic feet per acre per year, and is not classified as reserved from timber production per statute or administrative designation—is concentrated in the Southeast survey unit (fig. 2). In this unit, forest land accounts for 61 percent of the area, and timberland makes up 84 percent of the forest land. The Northeast unit also holds significant forest land, 40 percent of total area, with 86 percent of the forest land being timberland. Moving west through the North Central and South Central units, forest land occupies roughly one-third of the land area, but the productive timberland decreases significantly. Finally, in the three western most survey units, forest land makes up little of the land area. It should be noted that because the survey for the western units (units 3–6) is only 60 percent complete, data from these units may have greater sampling error.

Ownership

Private individuals or families own the majority of forest land (64 percent) as well as timberland (60 percent), followed by other corporate owners (those outside of forest industry) owning 18 percent each forest land and timberland (fig. 3). Comparing this cycle to previous cycles (units 1 and 2 only), the significant shifts from forest industry to other private ownerships seen in the late 1990s and early 2000s (Harper and Johnson 2012) have stabilized and relatively little change has occurred in these categories since the last survey (fig. 4). No ownership group had a change in timberland area of more than 20 percent since the last survey cycle and there is no clear pattern of land going from one ownership type to another.

Forest-Type Group and Stand Origin

The forest land is dominated by the oak/hickory forest type group, which accounts for 55 percent of the forest area (fig. 5). This is no surprise, as this group includes the post oak/blackjack oak (*Quercus stellata*/*Quercus marilandica*) forest type, typical of the cross timbers, marginally productive forest lands that cover the transitional zone between forests to the east and prairies or rangelands to the west, as well as the white oak/red oak/hickory forest type common in the more productive east. The remaining 45 percent of forest land area is very diverse, with 9 additional forest-type groups as well as nonstocked forest land. On timberlands, the oak/hickory forest-type group continues to dominate, but

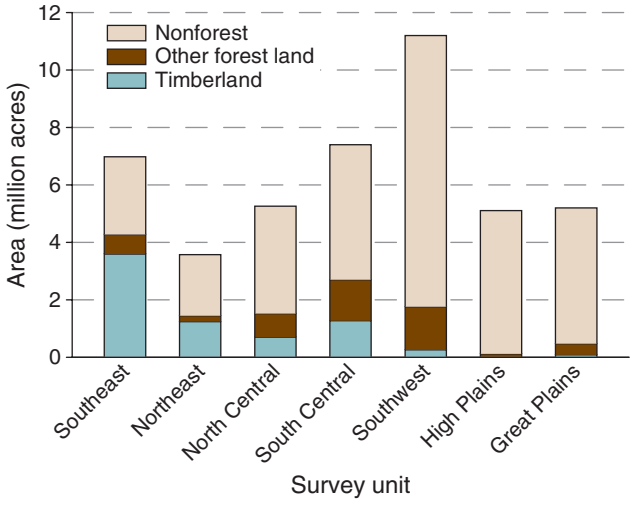

Figure 2—Forest, timberland, and total area by survey unit, Oklahoma, 2014.

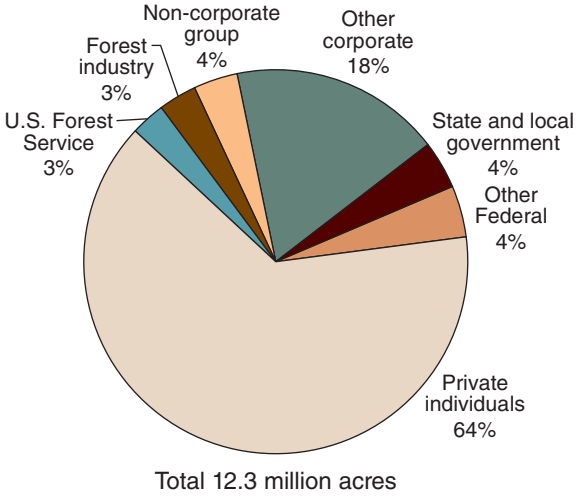

Figure 3—Forest land area by ownership group, Oklahoma, 2014.

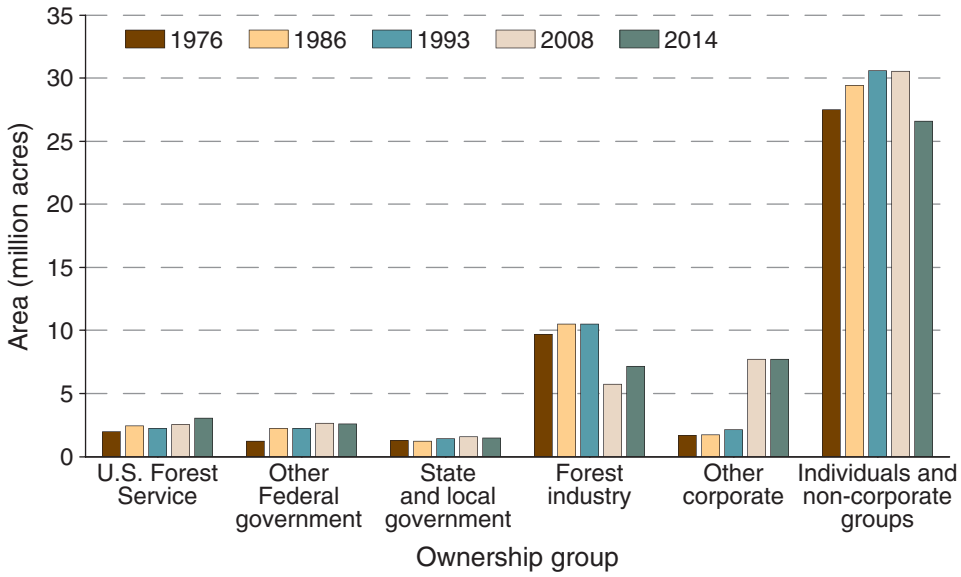

Figure 4—Forest land area by ownership group and survey year, east Oklahoma.

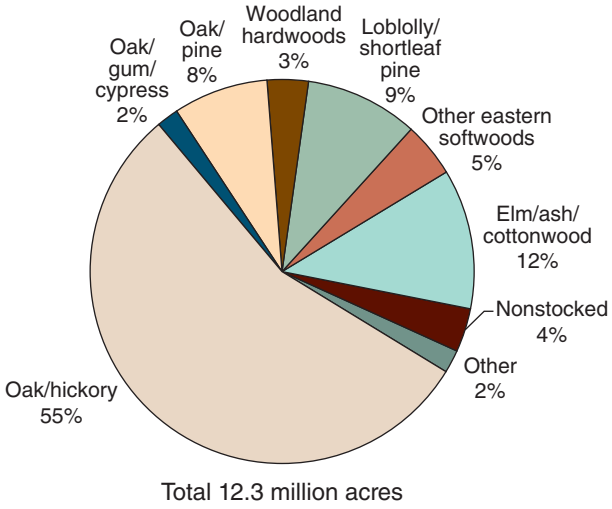

Figure 5—Forest land area by forest-type group, Oklahoma, 2014.

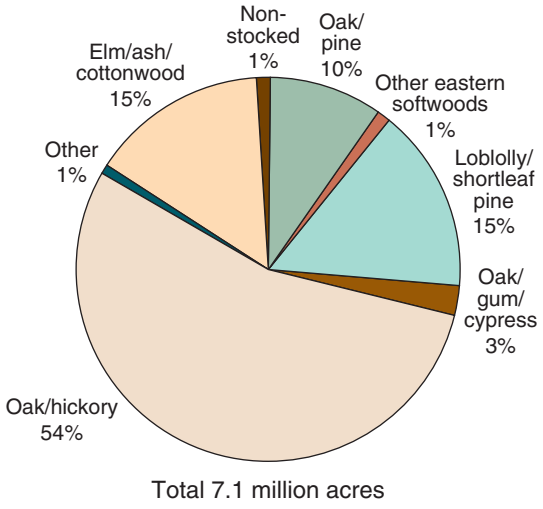

Figure 6—Timberland area by forest-type group, Oklahoma, 2014.

the loblolly/shortleaf, oak/pine, and elm/ash/cottonwood groups all increase in proportion of forest area (fig. 6).

Much of the difference in species distribution in timberlands versus unproductive forest lands can be explained by species' site and habitat needs (Little 1980a, Little 1980b). The greater proportion of pine forest types is further explained by the fact that loblolly (*Pinus taeda*) and shortleaf pine (*Pinus echinata*) are the economically important timber crop trees for the region, and therefore are the most likely species for which a site is to be managed (Liechty and others 2002, Talbert and others 1985, Zeide and Sharrer 2002). Based on field descriptions of the 692,700 acres of forest land that is artificially regenerated, about 95 percent is in the loblolly/shortleaf pine forest type group. These were the only two tree species planted (681,897 acres in loblolly pine, and 10,812 acres in shortleaf pine) even on sites where the forest type was not pine.

Stand Size and Age

Overall the forests of Oklahoma are fairly evenly distributed among the size classes. However, when they are broken down by forest-type group, several deviations from this pattern are apparent (fig. 7). Many of these variances can be attributed to natural differences in growing site and species attributes. For example, many of the oak/gum/cypress forests are found in riparian sites, where the alluvial soils support growth and the moist, often sloped ground, offers some resistance to disturbances such as fire, and makes harvesting unlikely, all of which contribute to larger diameter trees (Little 1980a). On the other end of the spectrum, woodland hardwoods, mostly Honey mesquite trees (*Prosopis glandulosa*), grow in harsh climates and terrain, and often resemble shrubs more than trees (Little 1980b). In addition, the importance of the loblolly/shortleaf forest type as a timber crop appears to affect the size distribution. When broken down by diameter class (fig. 8), we can see that the peak volume of the loblolly/shortleaf forest types (units 1 and 2 only) has been moving to larger size classes since the 1993 survey, and that total volume has increased in each of the last 5 surveys. This likely indicates trees being left to grow rather than being harvested. The decision to delay a harvest will be based on a number of factors, including demand for different products, cost of harvest and transportation, mill locations, and potential for healthy, sustained growth of the trees if the stand is left uncut (Brandeis and Hodges 2015, Brandeis and others 2012).

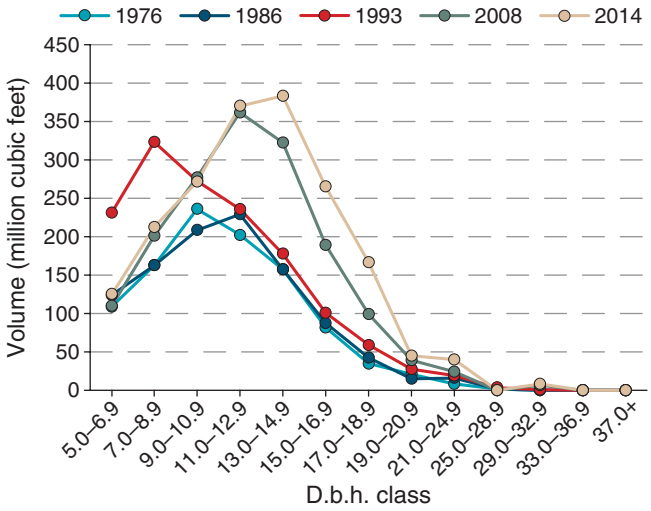

Figure 8—Live net volume of loblolly-shortleaf pine group by diameter class and survey year, Oklahoma.

The age of Oklahoma's forests is fairly normally distributed (fig. 9). The median age groups (21–40 and 41–60 years) contribute 26 percent and 27 percent of the forest land area respectively, and the youngest and oldest groups (nonstocked and 80+ years) account for <5 percent each, with the 1–20 and 61–80 year age groups each holding 20 percent of the area.

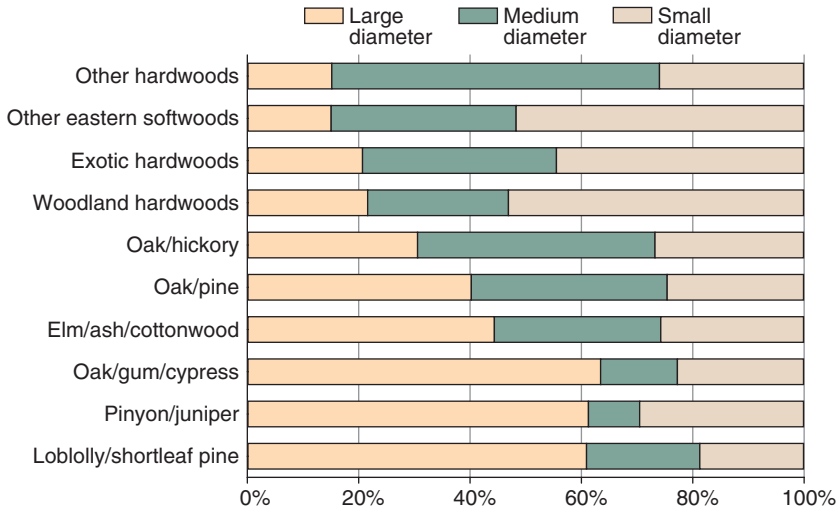

Figure 7—Proportion of forest area stand-size classes by forest-type group, Oklahoma, 2014.

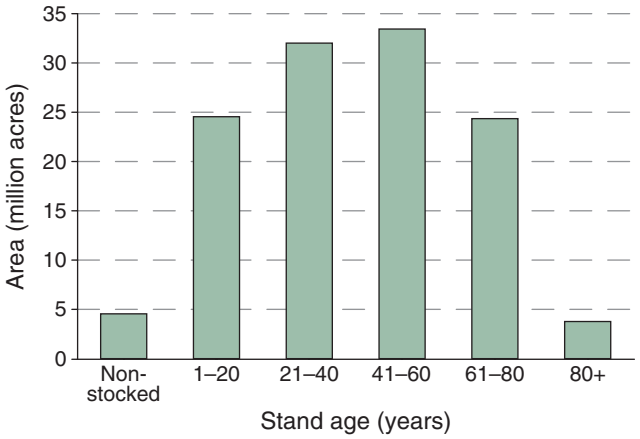

Figure 9—Area of forest land by stand-age class, Oklahoma, 2014.

Preparing to hike into a sparsely forested woodland. (photo by Ken Grayson, U.S. Forest Service)

As one would expect from the predominant forest-type group, oak/hickory contributed the largest percentage of forest area within each age class (table 1). But it is notable that the dominance of oak/hickory increases with the stand age, moving from 48 percent in the 1–40 year old stands, up to 79 percent in the 80+ year old stands. The oak/hickory forest type group contains the post oak/blackjack oak forest type known as the cross timbers. These forests are not valuable as timber sources, and therefore large tracts have been left uncut for long periods of time throughout the State (Johnson and others 2010, Therrel and Stahle 1998). Tree ring analyses at tree ring laboratories, have found stands of 200–400 year old post oak throughout the cross timbers region (Therrell and Stahle 1998). Because the trees in the cross timbers region are slow growing and relatively small, determining the age of trees beyond about 75 years using only field equipment becomes too unreliable, hence the age class grouping of ≥80.

Table 1—Proportional area of forest land by forest-type group and stand-age class, Oklahoma, 2014

	Stand-age class (*years*)					
Forest-type group	<1	1–20	21–40	41–60	61–80	>80
	percent					
Loblolly-shortleaf pine	1	16	12	6	6	6
Other eastern softwoods	0	6	8	4	1	0
Pinyon-juniper	0	0	1	2	0	0
Oak-pine	0	8	8	9	8	7
Oak-hickory	1	48	48	59	73	79
Oak-gum-cypress	0	2	2	3	1	4
Elm-ash-cottonwood	0	11	14	13	10	4
Other hardwoods	0	1	1	1	<1	0
Woodland hardwoods	0	7	5	2	1	0
Exotic hardwoods	0	<1	1	<1	0	0
Nonstocked	98	0	0	0	0	0

NUMBER OF TREES, VOLUME, AND BIOMASS

Tracking the number and volume of trees on forest land shifts the focus from acres of land to trees and tree components, yielding information on the available amount of timber and other woody fiber, and species abundance and diversity. Because this is the first complete State report for Oklahoma to include all seven units, we are limited to the eastern units (1 and 2) when looking at trends in the forest resource. Readers will note that with the shift from acres to trees a shift was also made in the data type used, from "forest type groups" to "species" or "species type group". The names for many of the forest type groups and species groups are similar, but they cannot be used as proxies for one another. While the forest type will be based on the dominant species, each forest type group is made up of many tree species. If forest types were used as surrogates for tree species and species groups in the analysis of volume, weight, and number of trees, there would be risk of over- or underestimating the true measurement (Rose and others 2015).

Number of Trees

The number of trees gives us an estimated count of how many live trees of at least 1.0 inch diameter at breast height (d.b.h.) or diameter at root collar (d.r.c.) for woodland species, are present on the forest lands in Oklahoma. The measurement for number of trees is useful for getting a complete picture of how dense and diverse the forest lands are in Oklahoma. There are an estimated 5.4 billion trees, comprising 94 unique species in the State. The most common species counted by far was post oak, which was tallied 40 percent more than the number two species, winged elm (*Ulmus alata*) (table 2). The top 6 species, which include the economically important shortleaf pine (*Pinus echinata*) and loblolly pine (*Pinus taeda*), account for over half (51 percent) of the trees enumerated.

Table 2—Top 20 live-tree species on forest land by count, Oklahoma, 2014

Species	Number of live trees
Post oak	754,973,180
Winged elm	540,701,131
Eastern redcedar	469,396,124
Blackjack oak	392,703,782
Shortleaf pine	305,116,144
Loblolly pine	272,314,006
Black hickory	222,477,159
American elm	193,829,610
Mockernut hickory	141,843,525
Black oak	125,606,812
Sugarberry	105,426,192
Hackberry	104,657,976
Green ash	102,786,423
Pecan	97,506,545
Common persimmon	82,618,145
Eastern redbud	77,013,081
Eastern hophornbeam	72,749,326
Red maple	67,566,270
White oak	67,017,319
White ash	63,060,492

While post oak is the most common tree, it is not uniformly dominant across the State. Looking at species found in each unit, and what proportion the top species contribute to the whole tree count for that unit, provides a better picture of ecosystem changes across the State (fig. 10).

Pine stand at McKinley Rocks in Pushmataha County. (Matt Ford, Oklahoma Forestry Services)

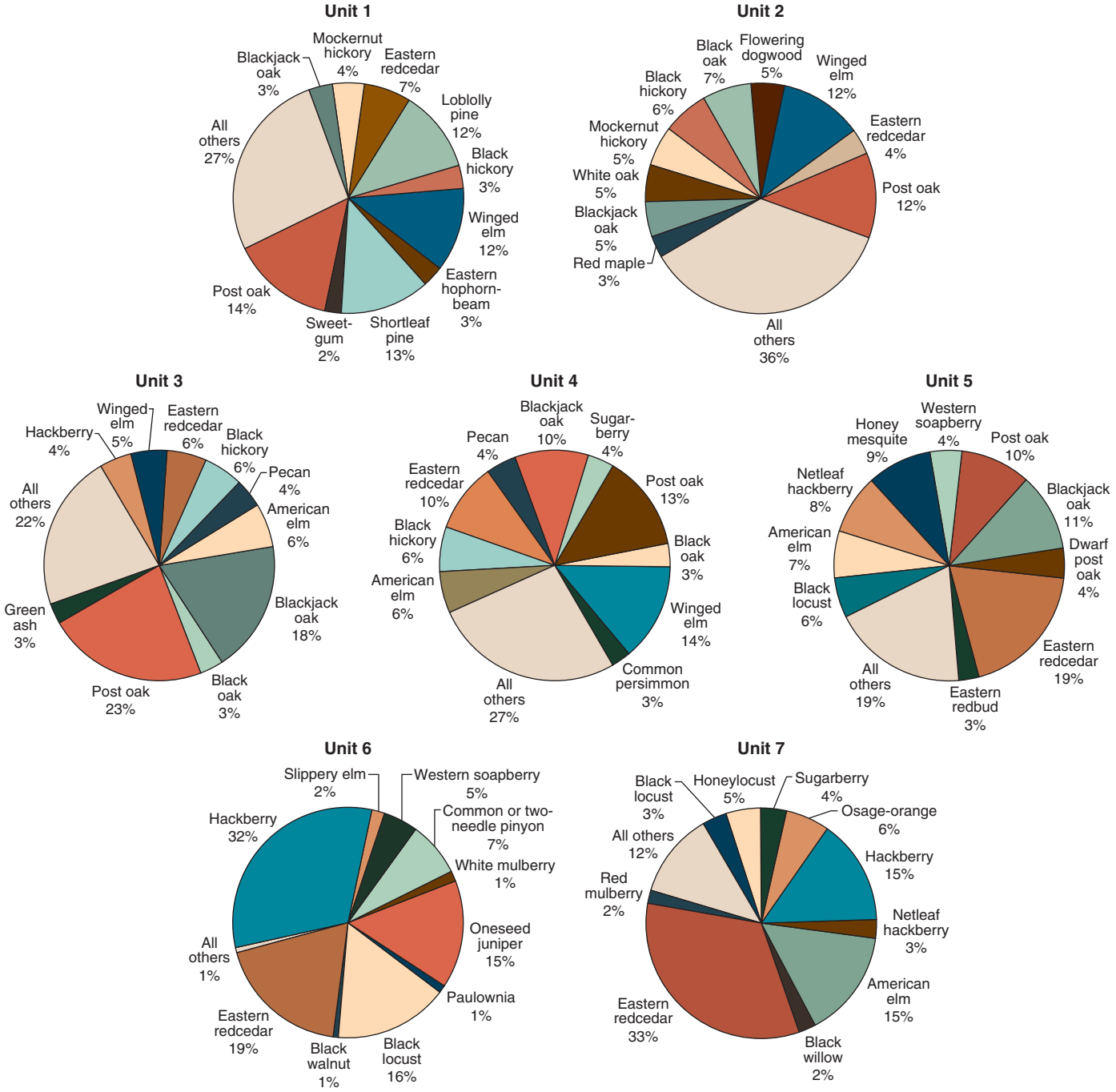

Figure 10—Most common tree species (number of trees) by survey unit, Oklahoma, 2014.

In the Southeast, unit 1, post oak is the most common species, but it does not dominate. The top 4 counted species each contribute between 10 percent and 15 percent to the total count, demonstrating a balanced species mix. This unit is also the most species diverse, with 68 unique species tallied, and is the only unit with economically important loblolly and shortleaf pines in the top ten counts.

With 65 different species, the Northeast unit 2 is also highly diverse. In this unit the counts are a little less balanced, with the top 2 species, post oak and winged elm, being encountered at almost twice the rate of the next 2 species, black oak (*Quercus velutina*) and black hickory (*Carya texana*).

Unit 3, North Central, is the heart of Oklahoma's cross timber forest. In this unit, the post oak and blackjack oak account for 40 percent of the trees tallied. While the 45 individual species found in the unit indicate moderate variety, none of the remaining 43 species account for more than 6 percent of the total.

Unit 4, the South Central unit, was highly diverse with 60 unique species appearing. The distribution among species was also balanced, with each individual species contributing <15 percent to the total count.

The Southwest, unit 5, is moderately diverse with 42 unique species counted, and is the only unit in which the woodland species Pinchot juniper (*Juniperus pinchotii*) was tallied. Starting with the second most common species (blackjack oak) the contributions of each species to the whole are balanced. However eastern redcedar, the most common species, is encountered at nearly twice the rate of any other, showing it to be dominant in the area.

Unit 6, the High Plains, was rather unbalanced in its species distribution. The most common species in this area, hackberry (*Celtis occidentalis*), accounts for 32 percent of all trees counted. In addition,

Forests and woodlands provide habitat to wildlife, including many snake species. (photo by Matt Ford, Oklahoma Forestry Services)

this unit was the least diverse overall, with only 12 species identified. Despite this, the unit did contribute some unique finds. It was the only unit to have an invasive exotic species—princesstree or empress-tree (*Paulownia tomentosa*) number in the top ten species encountered. It is also the only unit to contain oneseed juniper (*Juniperus monosperma*) as well as the only to have pinyon pine (*Pinus edulis*).

In the Great Plains, unit 7, only 28 individual species were encountered. This area shows the least balance in species distribution. As with unit 5, eastern redcedar dominates the tree count, but it is even more exaggerated in this unit. Here the eastern redcedar appear at more than double the rate of any other species. The preponderance of eastern redcedar in units 5 and 7 supports research findings indicating grassland prairie is being converted to juniper forest and echoes to landowner concerns about the expansion or invasion of this tree species on the landscape (Briggs and others 2002a, Briggs and others 2002b, Guldin and others 2015, Johnson and others 2010).

Volume

The 12.2 million acres of forest land in Oklahoma held a net volume (trees ≥5.0 inches, excluding rotten, missing and defect cull) of 9,472.2 million cubic feet. As with area of forest land, the majority of volume is owned by private individuals or families (fig. 11). However where this group held 64 percent of forest area, they own 58 percent of volume. The net volume on timberland was 7,259.2 million cubic feet, and distribution among ownership groups showed a similar pattern as seen in total forest lands: private ownership continued to account for the largest portion of ownership by volume, but proportionally decreased as compared to its share by area.

While 22 different species groups were recorded in Oklahoma, 5 of these groups account for more than 75 percent of the net volume on forest lands: other white oaks (22 percent), loblolly and shortleaf pines (20 percent), other red oaks (12 percent), other eastern soft hardwoods (12 percent) and hickory (10 percent) (fig. 12).

Of the 87 individual species contributing to total volume, post oak ranked highest just as it did by number of trees (table 3).

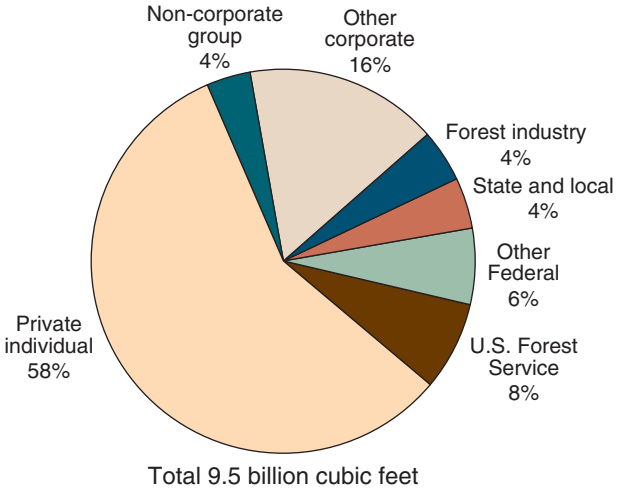

Figure 11—Net volume of live trees on forest land by ownership group, Oklahoma, 2014.

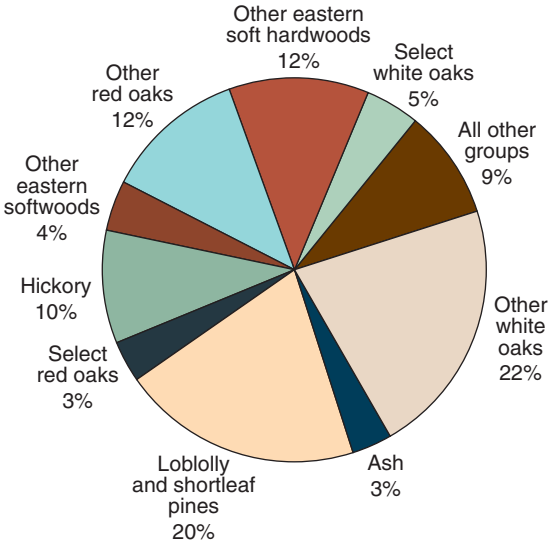

Figure 12—Net volume of live trees on forest land by species group, Oklahoma, 2014.

Table 3—Top 20 tree species on forest land by net volume, Oklahoma, 2014

Species	Volume
	million cubic feet
Post oak	2,016.9
Shortleaf pine	1,121.2
Loblolly pine	798.6
Black oak	501.6
Pecan	408.1
Eastern redcedar	402.3
White oak	302.7
Blackjack oak	278.1
American elm	277.9
Black hickory	256.7
Green ash	234.9
Shumard oak	180.2
Winged elm	166.2
Water oak	152.8
Northern red oak	139.7
Mockernut hickory	137.1
American sycamore	130.0
Eastern cottonwood	127.8
Hackberry	125.4
Southern red oak	124.3

However, none of the other top species stayed in the same order when ranking by number versus volume. In fact there were 6 species on each list that did not appear on the other.

Because this is the first complete State report for Oklahoma to include all seven units, we are limited to the eastern units (1 and 2) when looking at trends in the forest resource. However, these eastern units are also where the majority of the timberlands and most of the traditional forest industry are located within the State, warranting an examination of the timber resource in these units over time. Readers are again alerted to the change in data collection methodology and its possible effect on the numbers when reviewing trend data (see methods and techniques section for more information).

The net volume of live trees on timberland has increased with each survey. Hardwood volume has decreased slightly since 2008, but is still significantly higher than the 1993 survey and earlier (fig. 13). Softwood volume has increased steadily, and is now at an all-time high. The net volume of sawtimber on timberland shows a similar pattern (fig. 14).

Biomass

As opposed to volume or area, biomass is measured by weight. The total aboveground dry weight of live trees (≥1.0 inch) on forest land is 281.6 million tons, and the total carbon stored by live trees on forest land is 140.8 million tons. The most common uses of biomass information relate to bioenergy and carbon sequestration. Depending on a user's specific interest, the biomass calculation used will vary. See appendix tables D.21 through D.23 for several examples. FIA databases offer additional options to suit most inquiries (http://apps.fs.fed.us/Evalidator/evalidator.jsp).

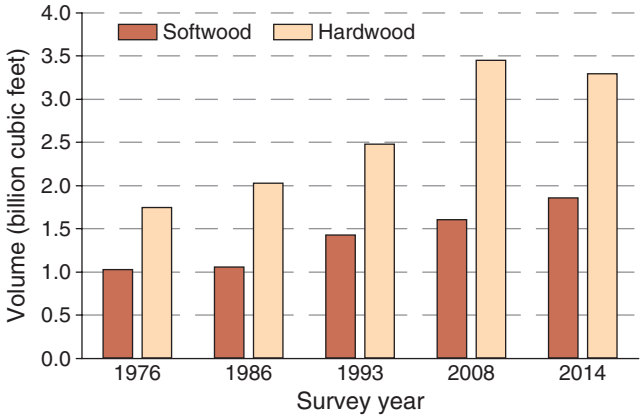

Figure 13—Net volume of live trees on timberland by major species group and survey year, east Oklahoma.

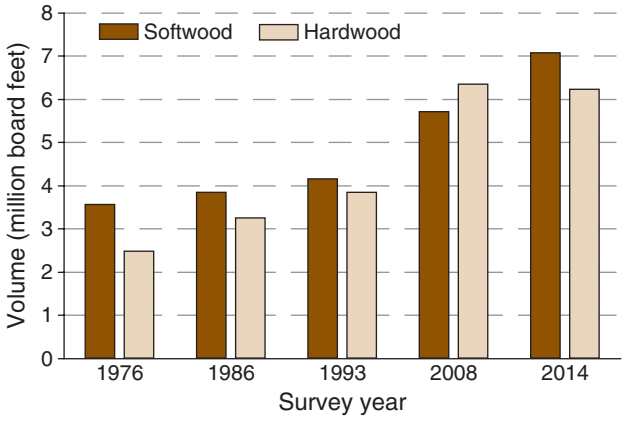

Figure 14—Net volume of sawtimber trees on timberland by major species group and survey year, east Oklahoma.

Thinning loblolly pine stand. (photo by Kurt Atkinson, Oklahoma Forestry Services)

GROWTH, MORTALITY, AND REMOVALS

Forest resource changes and trends are important indicators of sustainability. Comparing volume of growth to that of mortality and removals can show whether forest resources are being over or under-utilized, and whether other factors are impacting the survival of trees.

As stated in the introduction to this report, FIA data collection in western Oklahoma (units 3 through 7) is still in its installation phase, and no plots have been remeasured. Therefore the information in this chapter pertains only to eastern Oklahoma (units 1 and 2). Volume change amounts are presented as average annual change. Readers are reminded that the survey design was changed in 2008 and that the remeasurement period between 2008 and 2014 was staggered: plots were measured between 1.3 and 6.8 years after the previous measurement. Appendices B (Inventory Methods) and C (Data Reliability) provide more information relating to remeasurement period.

Gross growth is the total volume of growth on live trees (≥5.0 inches), net growth is gross growth minus mortality, and net change is net growth minus removals. Net change could be positive or negative. For Oklahoma 2014, the net change for all live trees (≥5.0 inches) on forest land was 45.8 million cubic feet, indicating growth slightly outpaced loss from mortality and removals combined at a ratio of 1.4:1.0 and is at a sustainable level. Loblolly/shortleaf pine net growth-to-removal ratios were slightly higher at 1.5:1.0, indicating the resource is not being over utilized. Some hardwood species groups showed narrower or negative ratios. However, this is due those species groups' high mortality rates during this cycle, rather than heavy harvesting.

Stratifying by even broad categories, such as major species and ownership groups (fig. 15), reveals distinct differences in the components of change. Similarly we can see some difference when compared to the previous survey and when looking on a per acre basis (fig. 16). With loblolly/shortleaf pine being the main species group for which timberland is managed in Oklahoma, it is not surprising that both growth and

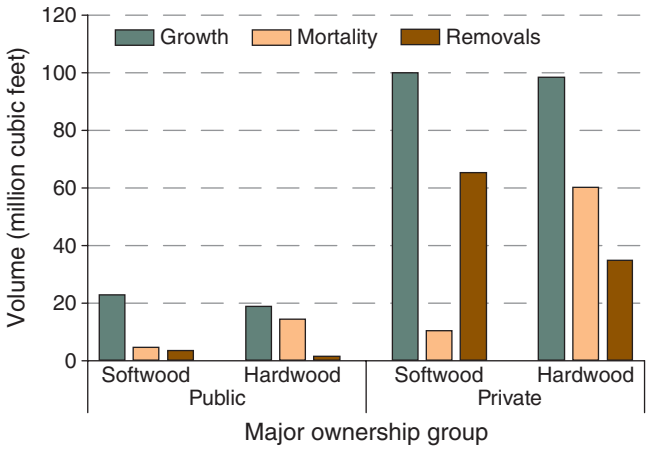

Figure 15—Average annual gross growth, mortality, and removals on forest land by major ownership group and major species group, east Oklahoma, 2014.

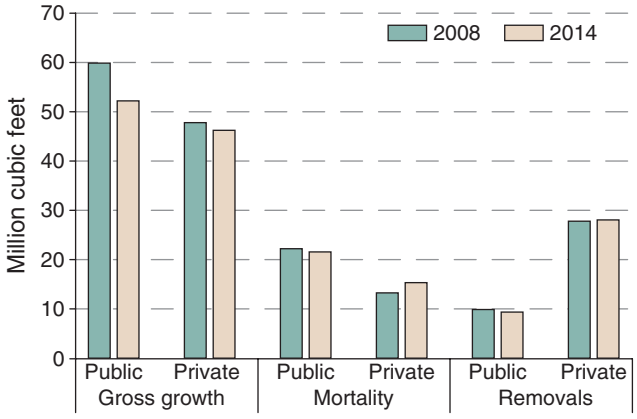

Figure 16—Average annual gross growth, mortality, and removals per acre by major ownership group and survey year, east Oklahoma.

removal of softwoods outpaced that of hardwoods. The high mortality rate of hardwood species in both ownership groups is of note. Looking at a finer level, most of the hardwood mortality occurs primarily in the "other red oaks" group, followed by the "other white oaks" group (table 4). During this survey period Oklahoma experienced many extreme weather events which may impact tree health and/or mortality rates (see the forest disturbance section). It is suspected that these weather events, either directly or in combination with other disturbance agents, are linked to the high mortality of these species groups.

Another way to rate the sustainability of forest resources is to compare the amount of change over time. Average annual growth declined as compared to 2008 numbers. The hardwood mortality cited above appears as a slight uptick in mortality on private land while removals are nearly static.

Additionally, we can glean information about sustainable management of forest resources by comparing the silvicultural activities between the current and previous cycle (fig. 17). In order to best focus attention on forest management, the comparisons were made using the

Table 4—Net growth, mortality, and removals by species group for all live trees (in previous cycle) ≥5.0 inches, east Oklahoma, 2014

Species group	Net growth	Removals	Mortality
	million cubic feet		
Other red oaks	-5.1	9.0	32.6
Other white oaks	11.5	10.4	14.2
Loblolly and shortleaf pines	101.3	67.4	14.2
Other eastern soft hardwoods	6.7	3.7	9.1
Hickory	4.1	3.3	7.1
Select red oaks	3.2	0.2	2.8
Select white oaks	5.9	3.9	2.0
Ash	6.3	2.5	1.6
Other eastern hard hardwoods	0.4	0.4	1.5
Eastern noncommercial hardwoods	1.0	0.4	1.0
Soft maple	1.4	0.4	0.9
Cottonwood and aspen	2.0	0.0	0.7
Other eastern softwoods	6.9	1.2	0.6
Sweetgum	3.9	1.4	0.5
Tupelo and blackgum	0.7	0.5	0.3
Black walnut	0.5	0.3	0.2
Other yellow pines	0.0	0.0	0.0
Woodland softwoods	0.0	0.0	0.0
Hard maple	0.3	0.0	0.0
Beech	0.0	0.0	0.0
Basswood	0.0	0.0	0.0
Woodland hardwoods	0.0	0.0	0.0

0.0 = no sample for the cell or a value of >0.0 but <0.05.

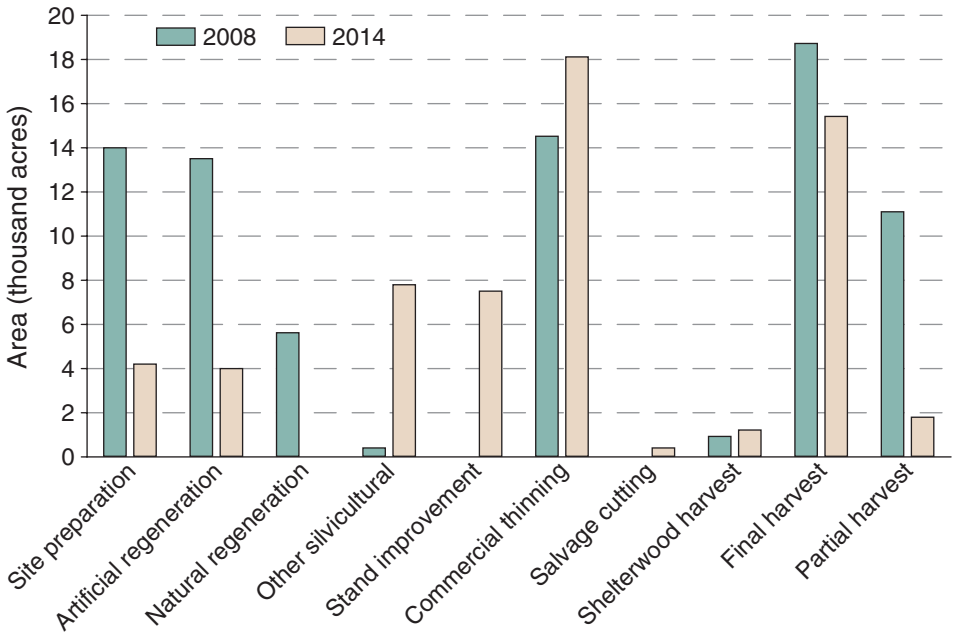

Figure 17—Area of timberland annually undergoing silvicultural treatments 2008 and 2014, east Oklahoma.

loblolly/shortleaf forest-type group, on timberlands, and in units 1 and 2. The observations regarding an apparent decrease in harvest of mature stands, made in earlier chapters of this report, are reflected again in the analysis of management activities undertaken. The 2008 survey shows significantly higher rates of activities at the ends of the management cycle: harvesting, site preparation, and regeneration. While 2014 had a considerable increase in mid-cycle management activities: thinning and selective cutting, and "other" silvicultural activities to improve the commercial value of the stand (e.g., applications of fertilizer or herbicides, or pruning).

Deer can be found in and around a variety of forest and woodland types across Oklahoma. (photo by Dieter Rudolph, Oklahoma Forestry Services)

If fire has affected an individual tree it may be recorded as a damage agent if the tree is alive. For dead trees, the cause and year of death is collected. (photo by Kerry Dooley, U.S. Forest Service)

FOREST HEALTH AND DISTURBANCE

Nonnative Invasive Plants

The invasive plants on the FIA watch list (appendix A) were selected because they may seriously impact the ecologic and/or economic functions of forest lands in the Southern United States (Miller and others 2013).

In 2013 updates were made to both the species list and the collection methods used, in an attempt to improve data utility. As this report covers survey data from 2009–2014, the updates result in some complications with data analysis and presentation. Due to the change in collection methods, the cleanest way to present the invasive species data is by number of plots, rather than by acres. Updates to the species list mean that some species were only sought in some of the measurement years (2009–2012 or 2013–2014) and in turn they may be underrepresented in the data. The authors elected to present what data there is for these species rather than omitting the information entirely. However readers should be aware that these species (which are noted in all relevant tables) come from an incomplete sample.

Where possible the authors did use other available data to contribute to the species population estimations: The tree species Bradford/Callery pear (*Pyrus calleryana*), and Tungoil tree (*Vernicia fordii*) were not added as invasive species until 2013. However, these species were recorded as part of the standard FIA tree data in previous years. We incorporated information on the size and number of these species tallied as part of the standard data collection, into the invasive estimates for 2009–2012. There are limitations with this data source: if the trees were <5.0 inches in diameter they would only be counted if on the microplot and only trees rooted within the plot/microplot would be tallied, where data collected within the invasive species protocols will include any presence of the species in question.

FIA data provide information on two important aspects of invasive species impact: (1) the spread or range, and (2) the abundance or severity of infestation (Parker and others 1999). The range of the invasive species is shown as the total count of plots where any amount of the indicated invasive species was found (table 5). Nonnative roses have the widest range, followed by Chinese lespedeza, Japanese honeysuckle,

Table 5—Number of plots with invasive species, Oklahoma, 2014

	Manual version[a]		
Invasive species	4.0	6.0	Total
Nonnative roses	202	110	312
Chinese lespedeza	147	102	249
Japanese Honeysuckle	129	70	199
Chinese/Euoropean privet	83	52	135
Shrubby lespedeza	32	3	35
Silktree, Mimosa	10	6	16
Bush honeysuckles	12	4	16
Tall fescue	13	0	13
Bradford pear[b]	5	6	11
Tree-of-heaven	7	3	10
Wintercreeper	5	3	8
Japanese/glossy privet	6	0	6
Chinaberry	4	0	4
Tamarix[c]	N/A	4	4
Garlic mustard	2	1	3
Kudzu	2	0	2
Giant reed[d]	1	N/A	1
Russion or autumn olive[b]	0	1	1
Princesstree	1	0	1
Nonnative climbing yams	1	0	1
English ivy	0	1	1
Nonnative vincas, Periwinkles	1	0	1
Nepalese browntop	0	1	1
Trifoliate orange[c]	N/A	1	1

N/A = not available.
[a] Because collection protocols changed during this cycle, field manual version is noted.
[b] Modified measurement between 4.0 and 6.0.
[c] Only recorded in 6.0.
[d] Only recorded in 4.0.

and Chinese/European privet. After the four most common species there is a dramatic decrease in the number of plots found with any of the other invasive species: 74 percent reduction in number of plots with Chinese/European privet compared to Shrubby lespedeza, the fifth most common.

The severity of an invasive species at a given location is indicated by what percentage of a subplot was infested. The species are ranked by number of plots with the greatest coverage on a subplot (≥90 percent), then the number of plots with the next coverage level (51–89 percent), and so on (table 6). Incorporating the abundance or severity of the infestation changed the rank of every species encountered, some by as many as eight places. Japanese honeysuckle is the species of greatest concern in this interpretation of the data.

Forest Disturbance

Disturbances such as fire, disease, insects, and weather events, can have a significant effect on forest resources and functions. To be recorded in FIA surveys, a disturbance must affect at least 25 percent of a stand or 50 percent of a particular species within a stand. Most FIA State reports on this suite of data give the amounts in average-annual acres, as opposed to total acres affected since the last survey. Due to the transition in sampling techniques (see appendices B and C for detailed information) there are some complications with the data being averaged annually. Therefore in addition to the average-annual acres disturbed, the authors have elected to also present the total acres with observed disturbances, so that readers may have the most complete information.

Table 6—Number of plots with invasive species present at five coverage levels, Oklahoma, 2014

	Percent cover				
Invasive species	≤1	2–10	11–50	51–89	≥90
Japanese Honeysuckle	64	71	41	19	6
Chinese/Euoropean privet	64	50	13	7	1
Chinese lespedeza	114	74	56	9	0
Bush honeysuckles	4	7	1	3	0
Nonnative roses	179	114	19	2	0
Bradford pear[a]	4	5	0	1	0
Tree-of-heaven	5	4	0	1	0
Kudzu	0	1	0	1	0
Giant reed[b]	0	0	0	1	0
English ivy	0	0	0	1	0
Tall fescue	5	6	2	0	0
Silktree, Mimosa	5	6	2	0	0
Shrubby lespedeza	25	9	1	0	0
Wintercreeper	4	3	1	0	0
Princesstree	0	0	1	0	0
Nonnative vincas, Periwinkles	0	0	1	0	0
Garlic mustard	1	3	0	0	0
Japanese/glossy privet	4	2	0	0	0
Chinaberry	2	2	0	0	0
Saltcedar	2	2	0	0	0
Trifoliate orange[c]	0	1	0	0	0
Nepalese browntop	0	1	0	0	0
Nonnative climbing yams	1	0	0	0	0
Russion or autumn olive[a]	1	0	0	0	0

[a] Modified measurement between 4.0 and 6.0.
[b] Only recorded in 4.0.
[c] Only recorded in 6.0.

In total, an estimated 3.75 million acres were found to have had at least one disturbance occur this survey period. Weather events including drought, wind, flooding, and ice storms had the greatest impact causing disturbance on 1.85 million acres of forest land (table 7). Fire and animal damage, including grazing, also had a significant effect. It should be noted that the totals of each disturbance type in this table add up to greater than 3.75 million. This is due to some sites having multiple disturbances (field crews may record up to 3 per forested condition on each plot).

To derive average annual estimates for plots being re-measured, such as those in the east (units 1 and 2), the acres are divided by the remeasurement period. Because this is the first remeasurement since moving to an annual survey, that period is between 1.3 and 6.8 years in length (about 20 percent of plots measured per year). For plots being measured for the first time, such as units 3–7, field crews record damages that occurred in the last 5 years. This makes the averaging more consistent. But it also means the observation window reaches back as far as 2004 (for the plots measured in 2009), where the rest of the data will be for 2009–2014 only.

Weather extremes have an effect on tree and forest health. Oklahoma has seen both drought and flooding in recent years. (photo by Matt Ford, Oklahoma Forestry Services)

On average, nearly 850 thousand acres, or about 7 percent of forest land, was disturbed annually across the State. As with the total acres disturbed, the top three disturbances on an average-annual-acre basis were fire, weather, and domestic animals, but the order of the top three changed. Domestic animals and grazing rose to the top position of disturbance causing agents. The authors found this a little surprising, so we dug into the data a little deeper. An examination of the disturbance agents at the unit level

Table 7—Total acres disturbed by forest-type group and disturbance type, Oklahoma, 2014

	Disturbance type							
Forest-type group	Insects	Disease	Weather	Fire	Domestic animals	Wild animals	Human-caused damage	Other
Loblolly-shortleaf pine	33,776	5,012	44,520	92,527	0	0	0	6,352
Other eastern softwoods	0	0	114,812	5,461	94,429	0	0	5,667
Oak-pine	17,251	33,832	58,842	85,035	45,652	0	0	6,682
Oak-hickory	48,518	489,143	882,618	693,648	516,135	29,705	9,838	154,695
Oak-gum-cypress	0	14,696	35,064	10,725	21,313	5,495	0	0
Elm-ash-cottonwood	0	0	401,433	29,953	120,621	60,777	0	40,542
Other hardwoods	0	0	2,734	0	2,734	3,811	0	9,110
Woodland hardwoods	10,427	0	158,672	0	158,672	0	0	47,940
Exotic hardwoods	0	0	6,765	5,042	0	0	0	0
Nonstocked	2,655	0	141,944	58,434	140,356	0	0	6,355
Total	112,627	542,683	1,847,404	980,825	1,099,912	99,788	9,838	277,343

reveals a distinction between the eastern and central versus the western areas of the State (table 8). For each unit in the east and central areas (units 1–4) the top disturbance was either weather or fire, more typical forest disturbance agents. This fits with the climate and ecology of that half of the State. The western most units (units 5–7) are drier with more woodlands and scrublands, and in these three units the domestic animal/grazing disturbance is the most common and brings the State average up. The southeast (unit 1) had the greatest total amount of average-annual disturbed acres, in part because this unit has the most total forested acres; as a percentage of forested area only 6 percent were disturbed, compared to 7 percent of the forested area of the whole State. At 9 percent, the southwest (unit 5) had the greatest proportion of forested acres with disturbances.

Damage Agents

In 2013 the variable "damage agent" was added. Many of the damage agents are similar to the disturbance events discussed earlier, but where disturbance elements are observed at the stand level, damage agents are recorded at the individual tree level. With only 2 panels worth of data, we don't yet have enough information to draw statistically sound conclusions. But we can highlight some general trends thus far.

Of the 73 specific damage agents the Southern Research Station catalogues, 44 were recorded at least once in Oklahoma. At 2,164 observations, stem decay was by far the most common specific damage agent. No other specific agent was observed more than 1,000 times and only seven others were observed on more than 100 trees. Expanding out to the most general level, disease is the most common with 3,247 observations recorded (table 9).

Table 9—Number of damage agent observations, grouped at broadest level, Oklahoma, 2014

General agent group	Occurrences
Diseases[a]	3,247
Other damages and symptoms	705
Insects	302
Fire	149
Abiotic damage	118
Animals	90
Human activities	81
Competition	79

[a] Includes decay and rot.

Table 8—Average annual acres disturbed by survey unit and disturbance type, Oklahoma, 2014

	Disturbance agent									
Survey unit	Insects	Disease	Fire	Wild animals	Domestic animals	Weather	Vegetation	Other	Human	Geologic
Southeast	14,403.2	44,487.1	93,552.5	6,204.2	67,054.2	43,753.6	1,279.8	0.0	18,425.0	0.0
Northeast	886.8	15,272.6	25,077.7	3,408.1	16,863.3	45,719.5	0.0	0.0	7,545.2	0.0
North Central	0.0	10,143.2	46,987.2	4,521.4	19,376.3	46,702.0	0.0	0.0	13,491.2	0.0
South Central	4,793.8	37,063.9	34,057.9	9,068.9	35,018.4	40,416.4	2,017.2	0.0	15,082.1	0.0
Southwest	4,533.3	11,528.4	15,953.4	1,713.0	82,066.3	42,932.1	0.0	0.0	10,666.3	0.0
High Plains	0.0	0.0	0.0	0.0	2,273.4	1,867.9	0.0.	0.0	0.0	0.0
Great Plains	0.0	2,109.2	527.3	0.0	28,599.9	2,817.3	0.0	1,967.7	1,581.9	0.0
Total	24,617.1	120,604.4	216,156.0	24,915.6	251,251.8	224,208.8	3,297.0	1,967.7	66,791.7	0.0

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Standing dead trees

In an earlier section of this report, mortality was discussed. Standing dead trees include some of these mortality trees, as well as trees which were dead at the time of the previous survey and are still standing now. Data is collected on this subset of dead trees because they play an important role in non-timber forest products and ecosystem services.

Dead trees will not capture carbon dioxide from the atmosphere as live trees do, but they do store carbon. Having counts of the standing dead trees, along with data on their height, diameter, and stage of decomposition, informs our estimation of carbon storage (EPA 2016, Harmon and others 2013, Woodall and others 2012, Woodall and others 2015). Standing dead trees are used by wildlife to make homes. Information on the species, size, and number of standing dead trees in the forest assists with estimations of available habitat. (Ganey 2016, Walsh and North 2012). Wildfire dynamics are also affected by standing dead trees, and this FIA data can be used as a part of wildfire fuel modeling (Beukema and others 2003).

In the 2009–2014 Oklahoma survey there were more than 138 million standing dead trees, totaling >640 million cubic feet in volume. The species groups "other red oaks" and "other white oaks" account for the majority of the standing dead trees by both count and volume (fig. 18).

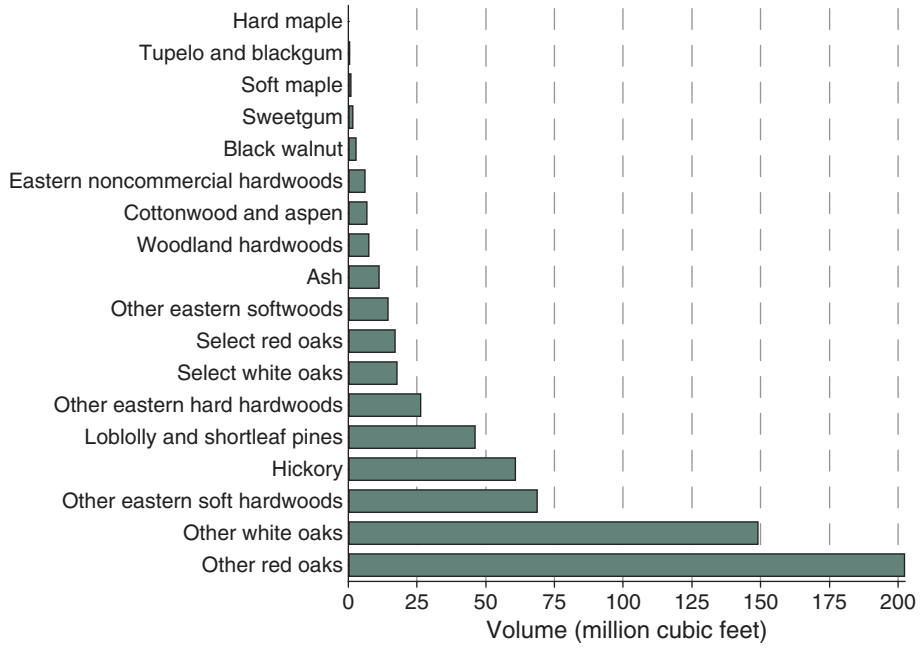

Figure 18—Standing dead volume on forest land by species group, Oklahoma, 2014.

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Pinyon-juniper forests are present in far west Oklahoma. (photo by Dieter Rudolph, Oklahoma Forestry Services

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Feral hogs may cause damage to trees, soil, and other components of the forest. (photo by Matt Ford, Oklahoma Forestry Services)

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GLOSSARY

All-live tree—All living trees including saplings. All size classes, all tree classes, and both saw-log and nonsaw-log species are included. See: FIA tree species list in the field manual.

Average annual mortality—Average annual volume of trees ≥5.0 inches d.b.h. that died from human and natural causes during the intersurvey period, excluding those removed by harvesting, cultural operations, land clearing or changes in land use.

Average annual removals—Average annual volume of trees ≥5.0 inches d.b.h. removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use during the intersurvey period.

Average net annual growth—Average annual net change in volume of trees ≥5.0 inches d.b.h./d.r.c. without taking into account losses from removals (gross growth minus mortality) during the intersurvey period.

Basal area—The cross sectional area of a tree at breast height or of all the trees in a stand, usually expressed in square feet or square feet per acre.

Biomass—For the southern region, total aboveground biomass is estimated using allometric equations and is defined as the aboveground weight of wood and bark in live trees ≥1.0 inch d.b.h./d.r.c. from the ground to the tip of the tree, excluding all foliage (leaves, needles, buds, fruit, and limbs <0.5 inch in diameter). Biomass is expressed as oven-dry weight and the units are tons.

Note: the weight of wood and bark in limbs <0.5 inch in diameter is included in the biomass of small-diameter trees.

Additionally, biomass in the merchantable stem is estimated regionally, where the main and merchantable stems are defined as follows.

Main stem—The central portion of the tree extending from the ground level to the tip for timber species. Woodland species includes from ground level to the tips of all branches of qualifying stems. For timber species trees that fork, the main stem refers to the fork that would yield the most merchantable volume.

Merchantable stem—That portion of the main stem of a timber species tree from a 1-foot stump to a minimum 4-inch top diameter inside or outside bark depending on species. That portion of a woodland species tree from the d.r.c. measurements to the 1.5-inch diameters of all the qualifying stems.

Nationally aboveground and belowground biomass is estimated from each tree's sound volume using a Component Ratio Method that is consistently applied in all FIA regions.

Gross aboveground biomass—Total tree biomass excluding foliage and roots with no deductions made for rotten, missing, or broken-top cubic-foot cull.

Net aboveground biomass—Gross above-ground biomass minus deductions for missing cull, broken-top, and a reduction for a proportion of rotten cull for live or standing dead trees ≥5.0 inches d.b.h (Rotten cull will have a factor to reduce specific gravity separately from sound wood). Live and standing dead trees 1.0 to 4.9 inches only have deductions for broken-top cull. Additional deductions are made for dead trees ≥1.0 inch using decay class.

Belowground biomass—Coarse roots only.

Further, the total net aboveground biomass estimated using the Component Ratio Method is divided into the following components:

Top—That portion of the main stem of a timber species tree above the 4-inch

top diameter. For woodland species, this component of the biomass is included with branches.

Branches—All the branches of a timber species tree excluding the main stem. That portion of all the branches of qualifying stems of woodland species above the 1.5-inch diameter ends.

Bole—See: Merchantable stem.

Stump—That portion of timber species below 1-foot to ground level. That portion of woodland species from all the d.r.c. measurements to ground level.

Blind check—A reinstallation done by a qualified inspection crew without production crew data on hand. The two datasets are maintained separately. Discrepancies between the two sets of data are not reconciled. See: Quality assurance and quality control.

Bole—Trunk or main stem of a tree. (See: Main stem.)

Census water—See: Land use.

Cold check—An inspection done either as part of the training process, or as part of the ongoing quality control program. The inspector has the completed data in-hand at the time of inspection. The inspection can include the whole plot or a subset of the plot. See: Quality assurance and quality control.

Components of change—Volume increment and decrement values that explain the change in inventory between two points in time. Components of change are usually expressed in terms of growing-stock or all-live merchantable volume. These components can be expressed as average annual values by dividing the component by the number of years in the measurement cycle. FIA inventories are designed to measure net change over time, as well as the individual components of change that constitute net change (e.g., growth, removals, mortality). Change estimates are computed for two sequential measurements of each inventory panel. Upon remeasurement, a new initial inventory is established for remeasurement at the next scheduled inventory. As such, computation of change components is not intended to span more than one inventory cycle. Rather, the change estimation process is repeated cycle by cycle. This simplifies field protocols and ensures that change estimation is based on short and relatively constant time intervals (e.g., 5 years). Change estimates for individual panels are combined across multiple panels in the same manner as panels are combined to obtain current inventory parameters such as total standing volume. FIA recognizes the following components of change as prescribed core variables; they usually are expressed in terms of growing-stock or all-live volume, where t is the initial inventory of a measurement cycle, and $t + 1$ is the terminal inventory:

Cut—The volume of trees cut between time t and time $t + 1$. The estimate is based on tree size at the midpoint of the measurement interval (includes cut growth). Tree size at the midpoint is modeled from tree size at time t. Trees felled or killed in conjunction with a harvest or silvicultural operation (whether they are utilized or not) are included, but trees on land diverted from forest to nonforest (diversions) are excluded.

Cut growth—The growth of cut trees between time t and the midpoint of the measurement interval. Tree size at the midpoint is modeled from tree size at time t. This term also includes the subsequent growth on ingrowth trees that achieve the minimum diameter threshold prior to being cut.

Diversion—The volume of trees on land diverted from forest to nonforest (or, for some analyses, this may also include land diverted to reserved forest land and other forest land), whether utilized

or not, between time *t* and time *t* + 1. The estimate is based on tree size at the midpoint of the measurement interval (includes diversion growth). Tree size at the midpoint is modeled from tree size at time *t*.

Diversion growth—The growth of diversion trees from time *t* to the midpoint of the measurement interval. Tree size at the midpoint is modeled from tree size at time *t*. This term also includes the subsequent growth on ingrowth trees that achieve the minimum diameter threshold prior to diversion.

Growth on ingrowth—The growth on trees between the time they grow across the minimum d.b.h./d.r.c. threshold and time *t* + 1.

Ingrowth—The volume of trees at the time that they grow across the minimum d.b.h./d.r.c. threshold between time *t* and time *t* + 1. The estimate is based on the size of trees at the d.b.h./d.r.c. threshold which is 1.0 inch for all-live trees and 5.0 inches for growing-stock trees. This term also includes trees that subsequently die (i.e., ingrowth mortality), are cut (i.e., ingrowth, cut), or diverted to nonforest (i.e., ingrowth diversion); as well as trees that achieve the minimum threshold after an area reverts to a forest land use (i.e., reversion ingrowth).

Mortality—The volume of trees that die from human or natural causes between time *t* and time *t* + 1, besides those cut/harvested. The estimate is based on tree size at the midpoint of the measurement interval (includes mortality growth). Tree size at the midpoint is modeled from tree size at time *t*.

Mortality growth—The growth of non-harvested trees that died from human or natural causes between time *t* and the midpoint of the measurement interval. Tree size at the midpoint is modeled from tree size at time *t*. This term also includes the subsequent growth on ingrowth trees that achieve the minimum diameter threshold prior to mortality.

Reversion volume—The volume of trees on land that reverts from a nonforest land use to a forest land use (or, for some analyses, land that reverts from any source to timberland) between time *t* and time *t* + 1. The estimate is based on tree size at the midpoint of the measurement interval. Tree size at the midpoint is modeled from tree size at time *t* + 1.

Reversion growth—The growth of reversion trees from the midpoint of the measurement interval to time *t* + 1. Tree size at the midpoint is modeled from tree size at time *t* + 1. This term also includes the subsequent growth on ingrowth trees that achieve the minimum diameter threshold after reversion.

Survivor growth—The growth on trees tallied at time *t* that survive until time *t* + 1.

The following components of change may be used to further quantify changes in growing-stock (but not all-live) volume:

Cull decrement—The net gain in growing-stock volume due to reclassification of cull trees to growing-stock trees between two surveys. Cull decrement is the volume of trees that were cull at time *t*, but growing stock at time *t* + 1. The estimate is based on tree size at the midpoint of the measurement interval. Tree size at the midpoint can be modeled from tree at time *t*, time *t* + 1, or both.

Cull decrement growth—The growth from the midpoint of the measurement interval to time *t* + 1 on trees that were cull at time *t*, but growing stock at time *t* + 1. Tree size at the midpoint can be modeled from tree size at time *t*, time *t* + 1, or both.

Cull increment—The net reduction in growing-stock volume due to reclassification of growing stock trees to cull trees between two surveys. Cull increment is the volume of trees that were growing stock at time *t*, but cull at time *t* + 1. The estimate is based on tree size at the midpoint of the measurement

interval (includes cull increment growth). Tree size at the midpoint can be modeled from tree size at time *t*, time *t* + 1, or both.

Cull increment growth—The growth to the midpoint of the measurement interval between time *t* and *t* + 1 of trees that were growing stock at time *t*, but cull trees at time *t* + 1. Tree size at the midpoint can be modeled from tree size at time *t*, time *t* + 1, or both.

Condition class—The combination of discrete landscape and forest attributes that identify, define, and stratify the area associated with a plot. Examples of such attributes include forest type, stand origin, stand size, owner group, reserve status and stand density.

Crown—The part of a tree or woody plant bearing live branches or foliage.

Crown dieback—Recent mortality of branches with fine twigs, which begins at the terminal portion of a branch and proceeds toward the trunk. Dieback is only considered when it occurs in the upper and outer portions of the tree. Dead branches in the lower live crown are not considered as part of crown dieback, unless there is continuous dieback from the upper and outer crown down to those branches.

Cull—Portions of a tree that are unusable for industrial wood products because of rot, form, or other defect. Cull is further categorized as the following:

Broken-top cubic-foot cull—The broken-top proportion of a timber species tree's merchantable portion from the break to the actual or projected 4-inch top diameter outside bark, or to where the central stem forks, where all forks are <4.0 inches diameter. For trees 1.0 to 4.9 inches diameter this is the proportion of the main stem missing due to a broken-top.

Form board-foot cull—The part of the tree's saw-log portion that is sound but not usable for sawn wood products due to sweep, crook, forking, or other physical culls.

Percent board-foot cull—Percentage of sound and unsound board-foot volume, to the nearest 1 percent.

Rotten/missing cull—The proportion of a tree's merchantable portion that is in a decayed state and/or the proportion of a tree's merchantable portion that is missing or absent. Does not include any cull deductions above actual length for broken-top timber trees. Does include cull deductions above actual length for broken-top woodland species. Trees with d.b.h./d.r.c. <5.0 inches have a null value in this field.

Total board-foot cull—The proportion of a timber specie tree's saw-log portion, sound or unsound, but not useable for sawn wood products due to sweep, crook, forking, or other physical defects (form board-foot cull). Softwoods <9.0 inches d.b.h. and hardwoods <11.0 inches d.b.h. have a null value in this field.

Cull tree—Live trees that are unsuitable for the production of some roundwood products, now or prospectively. Cull trees can include those with decay (rotten cull) or poor form, limbiness, or splits (rough cull). Rough cull is suitable for pulpwood and other fiber products.

Cycle—One sequential and complete set of panels.

Diameter at breast height (d.b.h.)—The diameter for tree stem, located at 4.5 feet above the ground (breast height) on the uphill side of a tree. The point of diameter measurement may vary on abnormally formed trees.

Diameter at root collar (d.r.c.)—The diameter of a tree or stem measured at the ground line or stem root collar, measured outside of the bark. This method is used for

woodland species; each stem is measured and the measurements of all stems are mathematically combined for the total tree d.r.c.

Diameter class—A classification of trees based on diameter outside bark, measured at breast height (d.b.h.) above the ground or at root collar (d.r.c.). Note: Diameter classes are commonly in 2-inch increments, beginning with 2-inches. Each class provides a range of values with the class name being the approximate midpoint. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h.

Disturbance—Natural or human-caused disruption that is ≥1.0 acre in size and results in mortality and/or damage to 25 percent of all trees in a stand or 50 percent of an individual species' count or, in the case when the disturbance does not initially affect tree growth or health (e.g. grazing, browsing, flooding, etc.), affects 25 percent of the soil surface or understory vegetation. For initial forest plot establishment the disturbance must be within the last 5 years. For remeasured plots only those disturbances that have occurred since the previous inventory are recognized.

Diversion—See: Components of change.

Dry weight—The oven-dry weight of biomass.

Federal land—An ownership class of public lands owned by the U.S. Government. See: Ownership.

Fixed-radius plot—A circular sampled area with a specified radius in which all trees of a given size, shrubs, or other items are tallied.

Forest industry land—See: Ownership.

Forest land—Land that is at least 10 percent stocked by forest trees of any size, or land formerly having such tree cover, and is not currently developed for a nonforest use. The minimum area for classification as forest land is 1 acre and must also be at least 120 feet wide. Unimproved roads and trails, streams and other bodies of water, or natural clearings in forested areas shall be classified as forest, if <120 feet in width or 1.0 acre in size. Forest land is divided into timberland, reserved forest land, and other forest land.

Forest type—A classification of forest land based upon and named for the tree species that forms the plurality of live-tree stocking. A forest-type classification for a field location indicates the predominant live-tree species cover for the field location; hardwoods and softwoods are first grouped to determine predominant group, and forest type is selected from the predominant group.

Forest-type group—A combination of forest types that share closely associated species or site requirements.

Growing-stock trees—Live large-diameter timber species trees with one-third or more of the gross board-foot volume in the entire saw-log portion meeting grade, soundness, and size requirements or the potential to do so for medium-diameter and small-diameter trees. A growing-stock tree must have one 12-foot log or two noncontiguous 8-foot merchantable logs, now (large diameter) or prospectively (medium diameter and small diameter), to qualify as growing stock.

Hardwoods—Tree species belonging to the botanical divisions Magnoliophyta, Ginkgophyta, Cycadophyta, or Pteridophyta, usually angiospermic, dicotyledonous, broad-leaved and deciduous.

Soft hardwoods—Hardwood species with an average specific gravity of ≤0.50, such as gums, yellow-poplar, cottonwoods, red maple, basswoods, and willows.

Har*d hardwoods*—Hardwood species with an average specific gravity >0.50, such as oaks, hard maples, hickories, and beech.

Hot check—An inspection done as part of the training or quality assurance processes. The inspector is present on the plot with the cruiser and provides immediate feedback regarding data quality. Hot checks can be done on training plots or production plots. See: Quality assurance and quality control.

Land—The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains.

Land cover—For lands with at least 10 percent coverage by vegetation, the dominant vegetation. For lands with less than 10 percent vegetative cover, other kind of material that covers the land surface. A given land cover may have many land uses and vice versa.

Land use—The purpose of human activity on the land; it is often, but not always, related to land cover.

Current southern regional land use categories are as follows:

Accessible timberland—Land that is within the population of interest, has access permitted, is on a subplot that can be occupied at subplot center, can safely be visited, and meets the criteria for forest land (see: forest land).

Accessible other forest land—Land that meets the definition of accessible forest land, but is incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions because of inferior site conditions. Inferior conditions include sterile soils, dry climate, poor drainage, high elevation, steepness and soil rockiness.

Agricultural land—Land managed for crops, pasture, or other agricultural use. The area must be at least 1.0 acre in size and 120 feet wide (with the exception of windbreak/shelterbelt, which has no minimum width). This land use includes cropland, pasture (improved through cultural practices), idle farmland, orchard, Christmas tree plantation, maintained wildlife opening, and windbreak/shelterbelt.

Rangeland—Land primarily composed of grasses, forbs, or shrubs. This includes lands vegetated naturally or artificially to provide a plant cover managed like native vegetation and does not meet the definition of pasture. The area must be at least ≥1.0 acre in size and ≤120 feet wide.

Developed—Land used primarily by humans for purposes other than forestry or agriculture. This land use includes cultural (business, industrial/commercial, residential, and other places of intense human activity), rights-of-way (improved roads, railway, power lines, maintained canal), recreation (parks, skiing, golf courses), and mining.

Other—Land parcels ≥1.0 acre in size and ≥120 feet wide, which do not fall into one of the uses described above. Examples include undeveloped beaches, barren land (rock, sand), marshes, bogs, ice, and snow. This land use includes nonvegetated, wetland, beach, and nonforest-chaparral.

Census water—Rivers and streams that are >200 feet wide and lakes, reservoirs, and similar bodies of water ≥4.5 acres in size.

Noncensus water—Lakes, reservoirs, ponds and similar bodies of water ≥1.0 acre but <4.5 acres in size; and rivers, streams, canals and similar that are ≥30 feet wide, but ≤200 feet wide.

Nonsampled—Not sampled due to denied access, hazardous conditions, being outside the U.S. or other reasons.

Large-diameter trees—Softwoods ≥9.0 inches d.b.h./d.r.c. and hardwoods ≥11.0 inches d.b.h./d.r.c. These trees were called sawtimber-sized trees in prior surveys. See: Stand-size class.

Main stem—The central portion of the tree extending from the ground level to the tip for timber species. For woodland species the main stem extends from the ground level to the tips of all branches of qualifying stems. For timber species trees that fork, the main stem follows the fork that would yield the most merchantable volume.

Measurement quality objective (MQO)—A data user's estimate of the precision, bias, and completeness of data necessary to satisfy a prescribed application (e.g., Resource Planning Act, assessments by State foresters, forest planning, forest health analyses). Describes the acceptable tolerance for each data element. MQOs consist of two parts: a statement of the tolerance and a percentage of time when the collected data are required to be within tolerance. MQOs can only be assigned where standard methods of sampling or field measurements exist, or where experience has established upper or lower bounds on precision or bias. MQOs can be set for measured data elements, observed data elements, and derived data elements.

Medium-diameter tree—Softwood timber species 5.0 to 8.9 inches d.b.h./d.r.c. and hardwood timber species 5.0 to 10.9 inches d.b.h./d.r.c. These trees were called poletimber-sized trees in prior surveys. See: Stand-size class.

Microplot—A circular, fixed-radius plot with a radius of 6.8 feet (0.003 acre) that is used to sample trees <5.0 inches d.b.h./d.r.c. Point center is 90 degrees and 12 feet offset from point center of each subplot.

Mortality—See: Components of change.

National forest land—See: Ownership.

Noncensus water—See: Land use.

Nonforest land—Land that does not support or has never supported, forests, and lands formerly forested where use for timber management is precluded by development for other uses. Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining rights-of-way, power line clearings of any width, and noncensus water.

Nonindustrial private forest land—See: Ownership.

Operability—The viability of operating logging equipment in the vicinity of the condition. Operability classes are as follows:

No problems.

Seasonal access due to water conditions in wet weather.

Mixed wet and dry areas typical of multichanneled streams punctuated with dry islands.

Broken terrain, cliffs, gullies, outcroppings, etc., which would severely limit equipment, access, or use.

Year-round water problems (includes islands).

Slopes 20 to 40 percent.

Slopes >40 percent.

Other forest land—Forest land other than timberland and reserved forest land. It includes available and reserved forest land that is incapable of producing 20 cubic feet per acre per year of wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

Other public land—See: Ownership.

Other removals—The volume of trees removed from the inventory by cultural operations such as timber stand improvement, land clearing, and other changes in land use, resulting in the removal of the trees from timberland.

Ownership—A legal entity having control of a parcel or group of parcels of land. An ownership may be an individual; a combination of persons; a legal entity such as corporation, partnership, club, or trust; or a public agency.

Phase 1 (P1)—FIA activities related to remote sensing, the primary purpose of which is to label plots and obtain stratum weights for population estimates.

Phase 2 (P2)—FIA activities conducted on the network of ground plots. The primary purpose is to obtain field data that enable classification and summarization of area, tree, and other attributes associated with forest land uses.

Phase 3 (P3)—A subset of Phase 2 plots where additional attributes related to forest health are measured.

Plantation—Stands that currently show evidence of being planted or artificially seeded.

Poletimber-sized tree—Softwood timber species 5.0 to 8.9 inches d.b.h. and hardwood timber species 5.0 to 10.9 inches d.b.h. Now referred to as medium-diameter trees.

Private land—See: Ownership.

Productivity class—A classification of forest land in terms of potential annual cubic-foot volume growth per acre at culmination of mean annual increment (MAI) in fully stocked natural stands.

Quality assurance (QA)—The total integrated program for ensuring that the uncertainties inherent in FIA data are known and do not exceed acceptable magnitudes, within a stated level of confidence. Quality assurance encompasses the plans, specifications, and policies affecting the collection, processing, and reporting of data. It is the system of activities designed to provide program managers and project leaders with independent assurance that total system quality control is being effectively implemented.

Quality control (QC)—The routine application of prescribed field and laboratory procedures (e.g., random check cruising, periodic calibration, instrument maintenance, use of certified standards, etc.) in order to reduce random and systematic errors and ensure that data are generated within known and acceptable performance limits. Quality control also ensures the use of qualified personnel; reliable equipment and supplies; training of personnel; good field and laboratory practices; and strict adherence to standard operating procedures.

Reserved forest land—Forest land where management for the production of wood products is prohibited through statute or administrative designation. Examples include national forest wilderness areas and national parks and monuments.

Reversion—Land that reverts from a nonforest land use to a forest land use. See: Components of change.

Sapling—Live trees 1.0 to 4.9 inches d.b.h./d.r.c.

Seedling—Live trees <1.0 inch d.b.h./d.r.c. that are ≥6.0 inches in height for softwoods and ≥12.0 inches in height for hardwoods and >0.5 inch d.b.h./d.r.c. at ground level for longleaf pine.

Site index—The average total height that dominant and codominant trees in fully-stocked, even-aged stands will obtain at key ages (usually 25 or 50 years).

Small-diameter trees—Trees 1.0 to 4.9 inches in d.b.h./d.r.c. These were called sapling-seedling sized trees in prior surveys. See: Stand-size class.

Softwoods—Tree species belonging to the botanical division Coniferophyta, usually evergreen having needles or scale-like leaves.

Species group—A collection of species used for reporting purposes.

Stand—Vegetation or a group of plants occupying a specific area and sufficiently uniform in species composition, age arrangement, structure, and similar factors as to be distinguished from the vegetation on adjoining areas.

Stand age—A stand descriptor that indicates the average age of the live dominant and codominant trees in the predominant stand-size class of a condition.

Standing dead tree—A dead tree ≥5.0 inches d.b.h./d.r.c. that has a bole which has an unbroken actual length of at least 4.5 feet (1.0 feet for woodland species), and lean <45 degrees from vertical as measured from the base of the tree to 4.5 feet.

Stand origin—A classification of forest stands describing their means of growth origin.

Planted—Planted or artificially seeded.

Natural—No evidence of artificial regeneration.

Stand-size class—A classification of forest land based on the diameter-class distribution of live trees in the stand. See definitions of large-, medium-, and small-diameter trees.

Large-diameter stands—Stands at least 10 percent stocked with live trees, with ½ or more of total stocking in large- and medium-diameter trees, and with large-diameter tree stocking at least equal to medium-diameter tree stocking.

Medium-diameter stands—Stands at least 10 percent stocked with live trees, with ½ or more of total stocking in medium- and large-diameter trees, and with medium-diameter tree stocking exceeding large-diameter tree stocking.

Small-diameter stands—Stands at least 10 percent stocked with live trees, in which small-diameter trees account for at least ⅔ of total stocking.

Nonstocked stands—Stands <10 percent stocked with live trees.

Stand structure—The predominant canopy structure for the condition, only considering the vertical position of the dominant and codominant trees in the stand and not considering trees that are intermediate or overtopped. As a general rule, a different story should comprise 25 percent of the stand.

Nonstocked—The condition is <10 percent stocked.

Single-storied—Most of the dominant/codominant tree crowns form a single canopy (i.e., most of the trees are approximately the same height).

Multistoried—Two or more recognizable levels characterize the crown canopy. Dominant/codominant trees of many sizes (diameters and heights) for a multilevel canopy.

State, county, and municipal land—See: Ownership.

Stocking—1) At the tree level, stocking is the density value assigned to a sampled tree (usually in terms of numbers of trees or basal area per acre), expressed as a percent of the total tree density required to fully utilize the growth potential of the land. 2) At the stand level, stocking refers to the sum of the stocking values of all trees sampled.

Subplot—A circular area with a fixed horizontal radius of 24.0 feet (1/24 acre), primarily used to sample trees ≥5.0 inches at d.b.h./d.r.c.

Survivor tree—A sample tree alive at both the current and previous inventories.

Timberland—Forest land that is producing or capable of producing 20 cubic feet per acre or more per year of wood at culmination of MAI. Timberland excludes reserved forest lands.

Treatment—Forestry treatments are a form of human disturbance. The term treatment further implies that a silvicultural application has been prescribed. This does not include occasional stumps of unknown origin or sparse removals for firewood, Christmas trees, or other miscellaneous purposes. The area affected by any treatment must be at least 1.0 acre in size.

None—No observable treatment.

Cutting—The removal of trees from a stand. SRS FIA cutting categories are the following:

Clearcut harvest—The removal of the majority of the merchantable trees in a stand; residual stand stocking is under 50 percent.

Partial harvest—Removal primarily consisting of highest quality trees. Residual consists of lower quality trees because of high grading or selection harvest (e.g. uneven aged, group selection, high grading, species selection).

Seed-tree/shelterwood harvest—Crop trees are harvested leaving seed source trees either in a shelterwood or seed tree. Also includes the final harvest of the seed trees.

Commercial thinning—The removal of trees (usually of medium-diameter) from medium-diameter stands leaving sufficient stocking of growing-stock trees to feature in future stand development. Also included are thinning in large-diameter stands where medium-diameter trees have been removed to improve quality of those trees featured in a final harvest.

Timber stand improvement (cut trees only)—The cleaning, release, or other stand improvement involving noncommercial cutting applied to an immature stand that leaves sufficient stocking.

Salvage cutting—The harvesting of dead or damaged trees or of trees in danger of being killed by insects, disease, flooding, or other factors in order to save their economic value.

Site preparation—Clearing, slash burning, chopping, disking, ripping, bedding, or other practices clearly intended to prepare a site for either natural or artificial regeneration.

Artificial regeneration—Following a disturbance or treatment (usually cutting), a new stand where at least 50 percent of the live trees present resulted from planting or direct seeding.

Natural regeneration—Following a disturbance or treatment (usually cutting), a new stand where at least 50 percent of the live trees present (of any size) were established through the growth of existing trees and/or natural seeding or sprouting.

Other silvicultural treatment—The use of fertilizers, herbicides, girdling, pruning, or other activities designed to improve the commercial value of the residual stand, or chaining, which is a practice used on woodlands to encourage wildlife forage.

Tree—A woody perennial plant, typically large, carrying a more or less definite crown; sometimes defined as attaining a minimum diameter of 3 inches and a minimum height of 15 feet at maturity. For FIA, any plant on the tree list in the current field manual is measured as a tree.

Tree class—An assessment of the general quality of a tree.

Cull species—Species measured at d.r.c. and timber species (measured at d.b.h.) that would not produce saw-logs. See national list of nonsaw-log species.

Growing stock—Live large-diameter timber species (excludes nonsaw-log species) trees with one-third or more of the gross board-foot volume in the entire saw-log portion meeting grade, soundness, and size requirements or the potential to do so for medium-diameter trees. A growing-stock tree must have one 12-foot log or two noncontiguous 8-foot merchantable logs, now (large-diameter) or prospectively (medium-diameter), to qualify as growing stock.

Rough cull—Trees that do not contain at least one 12-foot saw log or two 8-foot logs now or prospectively, primarily because of roughness or poor form. Less than ⅓ of its gross board-foot volume meets size, soundness, and grade requirements and <½ of the cubic-foot cull is rotten or unsound.

Rotten cull—Trees that do not contain at least one 12-foot saw log or two 8-foot logs now or prospectively and/or do not meet grade specifications for percent sound primarily because of rot. All species not having ⅓ or more of its gross board-foot volume meeting size, soundness, and grade requirements, and over ½ of the cubic-foot cull is rotten or unsound.

Tree grade—A classification of the saw-log portion of large-diameter trees based on: (1) the grade of the butt log, or (2) the ability to produce at least one 12-foot or two 8-foot logs in the upper section of the saw-log portion. Tree grade is an indicator of quality; grade 1 is the best quality.

Volume—A measure of the solid content of the tree stem used to measure wood quantity.

Gross board-foot volume—Total board-foot volume of wood inside bark without deductions for total board-foot cull.

Gross cubic-foot volume—Total cubic-foot volume of wood inside bark without deductions for rotten, missing, or broken-top cull.

Net board-foot volume—Gross board-foot volume minus deductions for total board-foot cull.

Net cubic-foot volume—Gross cubic-foot volume minus deductions for rotten, missing, and broken-top cull.

INVASIVE SPECIES WATCH LIST

Common Name	Scientific Name
Tree/tree-form	
Tree-of-heaven	*Ailanthus altissima*
Silktree, mimosa	*Albizia julibrissin*
Paper mulberry[a]	*Boussonetia papyrifera*
Camphortree[a]	*Cinnamomum camphora*
Chinese parasoltree[a]	*Firmiana simplex*
Glossy buckthorn[a]	*Frangula alnus*
Chinaberry	*Melia azedarach*
Princesstree, royal paulownia	*Paulownia tomentosa*
Trifoliate-orange[a]	*Poncirus trifoliata*
Bradford pear[b]	*Pyrus calleryana*
Brazilian pepper[a]	*Schinus terebinthifolious*
Tamarix group: saltcedar[a]	*Tamarix* spp.
Tallowtree, popcorntree	*Triadica sebifera*
Tungoil tree[b]	*Vernicia fordii*
Shrub	
Coral ardisia, hen's eyes[a]	*Ardisia crenata*
Japanese barberry[a]	*Berberis thunbergii*
Silverthorn, thorny olive	*Elaeagnus pungens*
Olive group: autumn olive, Russian olive[c]	*Elumbellate, E. angustifolia*
Winged burning bush	*Euonymus alatus*
Lespedeza group: shrubby lespedeza, Thunberg's lespedeza	*Lespedeza bicolor, L. thunbergii*
Privet group 1: Japanese privet, glossy privet	*Ligustrum japonicum, L. lucidum*
Privet group 2: Chinese privet, European privet, Border privet, California privet	*L. sinsense, L. vulgare, L. obtusifolium, L. ovalifolium*
Bush honeysuckle group: tatarian honeysuckle, amur honeysuckle, morrow's honeysuckle, Sweet-breath-of-sprint, Bell's honeysuckle	*Lonicera tatarica, L. maackii, L. morrowii, L. fragrantissima, Lonicera x bella*
Leatherleaf mahonia[a]	*Mahonia bealei*
Sacred bamboo, nandina	*Nandina domestica*
Japanese knotweed[a]	*Polygonum cuspidatum*
Rose group: multiflora rose, macartney rose, Cherokee rose, other nonnative roses	*Rosa multiflora, R. bracteata, R. laevigata, Rosa* spp.
Japanese meadowsweet[a]	*Spiraea japonica*
Vine	
Five-leaf akebia, chocolate vine[a]	*Akebia quinata*
Amur peppervine[a]	*Ampelopsis brevipedunculata*
Oriental bittersweet	*Celastrus orbiculatus*
Yam group: air yam, Chinese yam, water yam	*Dioscorea bulbifera, D. oppositifolia, D. alata*
Winter creeper	*Euonymus fortunei*
Ivy group: English ivy, atlantic ivy, colchis ivy	*Hedera helix, H. hibernica, H. colchica*
Japanese honeysuckle	*Lonicera japonica*
Kudzu	*Pueraria Montana*
Vinca group: common periwinkle, bigleaf periwinkle	*Vinca minor, V. major*
Wisteria group: Chinese wisteria, Japanese wisteria	*Wisteria sinensis, W. floribunda*

continued

Forester Kerry Dooley with the invasive species Chinese tallowtree found near an FIA plot. (photo by Ken Grayson, U.S. Forest Service)

INVASIVE SPECIES WATCH LIST (continued)

Common name	Scientific name
Grass	
Giant Reed[d]	*Arundo donax*
Weeping lovegrass[a]	*Eragrostis curvula*
Cogongrass	*Imperata cylindrical*
Nepalese browntop	*Microstegium vimineum*
Chinese silvergrass	*Miscanthus sinensis*
Bamboo group: golden bamboo, bamboo spp.	*Phyllostachys aurea, Bambusa* spp.
Tall fescue	*Schedonorus phoenix*
Fern	
Japanese climbing fern	*Lygodium japonicum*
Herb	
Garlic mustard	*Alliaria petiolata*
Chinese lespedeza	*Lespedeza cuneata*
Lirope group: big blue lilyturf, monkey grass[a]	*Liriope muscari, L. spicata*
Crownvetch[a]	*Securigera varia*
Tropical soda apple[d]	*Solanum viarum*

[a] Plants only included in 6.x inventory years.

[b] In 4.x were measured as part of tree data, but not as invasive species.

[c] Russian and autumn olive measured seperately in 4.x, as one group in 6.x.

[d] Plants only included in 4.x inventory years.

INVENTORY METHODS

This report covers the eighth inventory of 18 counties in east Oklahoma and the second inventory of 59 counties in central and west Oklahoma. Although it is called the Oklahoma 2014 survey, it covers data collected during the period 2009–2014.

The eighth inventory in east Oklahoma was conducted from January 2010 to August 2014 and represents a complete assessment of all plots in east Oklahoma under the FIA annualized inventory system. Estimates of growth, removals, and mortality are given as annual averages and reflect the change in status of trees measured in the seventh inventory and then remeasured in the eighth inventory. The seventh inventory of east Oklahoma was the first inventory conducted under the new annualized inventory system. Under the annual inventory system, 20 percent (1 panel) of the total number of plots in east Oklahoma are measured every year over a 5-year period (1 cycle). Each panel of plots is selected on a subgrid which is slightly offset from the previous panel, so that each panel covers essentially the same sample area (both spatially and in intensity) as the prior panel. In the sixth year the plots that were measured in the first panel are remeasured.

Oklahoma FIA program coordinator Carri Abner collecting tree height data. (photo by Kerry Dooley, U.S. Forest Service)

All previous surveys (survey six and earlier) were conducted as periodic surveys where all the plots were measured over a 1 to 2 year period. There were also differences in other areas of survey design and measurement methods (Harper and Johnson 2012). Although survey seven was considered annualized, it was completed on an accelerated basis so that plot remeasurements, and thus estimates of change, could be achieved more quickly. That is to say, all plots were inventoried in an approximate 18 month timeframe rather than over 5 years as was done during the eighth inventory. As a result, the remeasurement period for plots measured in both the seventh and eighth surveys ranged between 1.3 and 6.8 years. This may affect the variance of some estimates. Remeasurement period should be less variable between the eighth and ninth surveys.

The second inventory of west/central Oklahoma began in January 2009. Under the annual inventory system, 10 percent (1 panel) of the total number of plots in west Oklahoma are measured every year over a 10-year period (1 cycle). This report summarizes the first 6 years of data collection which equates to approximately 60 percent of all plots in this part of the State.

Forester Matt Ford preparing to measure a timber tree. (photo by Carri Abner, Oklahoma Forestry Services)

The first inventory of west/central Oklahoma was conducted April 1988 to August 1990 (Rosson 1995). Changes in survey design, variables collected, and data processing procedures prevent reliable comparisons between the first and second inventories in west/central Oklahoma. Estimates of growth, mortality, and removals for west/central Oklahoma will be available once the third inventory is complete.

The Oklahoma 2014 inventory in both the east and west/central parts of the State, was a three-phase, fixed-plot design conducted on an annual basis. Phase 1 (P1) provides the area estimates for the inventory. Phase 2 (P2) involves on-the-ground measurements of sample plots by field personnel. Phase 3 (P3) is a subset of the P2 plot system where additional measurements are made by field personnel to aid in the assessment of forest health. The three phases of the sampling method are based on a hexagonal-grid design, with successive phases being sampled with less intensity. There are 16 P2 hexagons for every P3 hexagon. P2 and P3 hexagons represent about 6,000 and 96,000 acres, respectively.

Phase 1

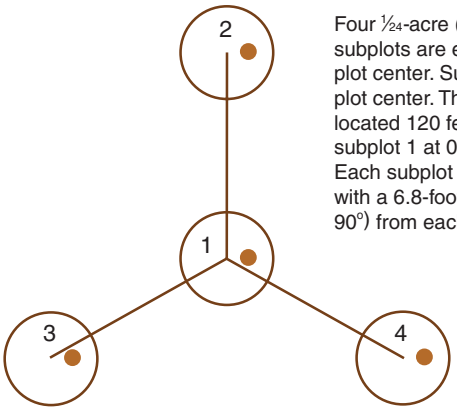
For the 2014 inventory of Oklahoma the P1 forest area estimate was based on classifying National Land Cover Database (NLCD) points. Stratification of forest and nonforest was performed at the unit level. Area estimation of all lands and ownerships was based on the probability of selection of P2 plot locations. As a result, the known forest land area (for specific ownerships) does not always agree with area estimates based on probability of selection. For example, the acreage of national forests, published by the National Forest System, will not agree exactly with the statistical estimate of national forest land derived by Forest Inventory and Analysis (FIA). These numbers could differ substantially for very small areas.

Phase 2

Bechtold and Patterson (2005) describe P2 and P3 ground plots and explain their use. These plots are clusters of four points arranged so that one point is central and the other three lie 120 feet from it at azimuths of 0, 120, and 240 degrees (fig. B.1). Each point is the center of a circular subplot with a fixed 24-foot radius. Trees ≥5.0 inches d.b.h./d.r.c. are measured in these subplots. Each subplot in turn contains a circular microplot with a fixed 6.8-foot radius, located 12 feet and 90 degrees from the subplot center. Trees 1.0 to 4.9 inches d.b.h./d.r.c. and seedlings (<1.0 inch d.b.h.) are measured in these microplots.

Sometimes a plot cluster straddles two or more land use or forest condition classes (Bechtold and Patterson 2005). There are seven condition-class variables that require mapping of a unique condition on a plot: land use, forest type, stand size, ownership, stand density, regeneration status, and reserved status. A new condition is defined and mapped each time one of these variables change during plot measurement.

In this report, statewide estimates are based on a total of 5,089 phase 2 plots which comprises the full complement of plots in the east (1,782 plots) and 60 percent of the plots to be measured in the west/central units (3,307 plots).



Four 1/24-acre (24-foot radius) subplots are established relative to plot center. Subplot 1 is located at plot center. The other 3 subplots are located 120 feet from the center of subplot 1 at 0°, 120°, and 240°. Each subplot contains a microplot with a 6.8-foot radius, 12 feet (at 90°) from each subplot center.

Figure B.1—FIA survey plot layout.

Phase 3

Data on forest health variables (P3) are collected on about 1/16th of the P2 sample plots. P3 data are coarse descriptions, and are meant to be used as general indicators of overall forest health over large geographic areas. P3 data collection includes variables pertaining to tree crown health, down woody material (DWM), and foliar ozone injury. Tree crown health and DWM measurements are collected by using the same plot design used during P2 data collection.

Due to budgetary constraints only four-fifths of the P3 data were collected in the 2014 survey. In addition methodology changed significantly on most of these variables during the survey cycle. As a result, the number of plots and the comparability of data across surveys were reduced to such an extent that we did not cover any of the P3 variables in this report. It is hoped that at the end of the next cycle enough data will be available for analysis of these variables.

Summary

Users wishing to make rigorous comparisons of data between surveys should be aware of any changes in methodologies between measurements. The most valuable and powerful trend information is obtained when the same plots are revisited from one survey to the next and measured in the same way. Determining the strength of a trend, or determining the level of confidence associated with a trend, is difficult or impossible when sampling methods change over time.

DATA RELIABILITY

A relative standard of accuracy has been incorporated into the forest survey. This standard satisfies user demands, minimizes human and instrumental sources of error, and keeps costs within prescribed limits. The two primary types of error are measurement error and sampling error.

Measurement Error

There are three elements of measurement error: (1) biased error, caused by instruments not properly calibrated; (2) compensating error, caused by instruments of moderate precision; and (3) accidental error, caused by human error in measuring and compiling. All of these are held to a minimum by the Forest Inventory and Analysis (FIA) quality assurance (QA) program. The goal of the QA program is to provide a framework of quality assessment and quality control procedures to assure the production of complete, accurate, and unbiased forest assessments for given standards. These methods include use of nationally standardized field manuals, use of portable data recorders, thorough entry-level training, periodic review training, supervision, use of spot checks, editing checks, and an emphasis on careful work. Additionally, data quality is assessed and documented by using performance measurements and post-survey assessments. These assessments are then used to identify areas of the data collection process that need improvement or refinement in order to meet the program's quality objectives.

Each variable collected by FIA is assigned a compliance level, generally referred to as measurement quality objective (MQO), and a measurement tolerance level (sometimes referred to as simply "tolerance"). As the name implies, measurement tolerance is the allowable distance from the "true" value (i.e., the value the quality assurance forester obtains) of a given variable. The measurement tolerances take a variety of forms—sometimes a percentage of the total true measurement; sometimes a specified measurement such as feet or inches; sometimes a class or division level. MQOs are how often crews are expected to stay within the given measurement tolerances; they are either given as +/– percentage or listed as "no tolerance". The MQOs are documented in the FIA National Field Manual (U.S. Department of Agriculture Forest Service 2014; U.S. Department of Agriculture Forest Service 2007).

Evaluation of field data repeatability is accomplished by calculating the differences between data collected by the field crew and data collected by the QA crew on blind-check plots. Results of these calculations are compared to the established MQOs. In the analysis of blind-check data, an observation is within tolerance when the difference between the field crew observation and the QA crew observation does not exceed the assigned tolerance for that variable. For many categorical variables, the tolerance is "no error" allowed, so only observations that are identical are within the tolerance level. Tables C.1–C.8 show the results of various blind checks for Oklahoma during this cycle.

Table C.1—Results of blind checks (quality assurance) for Oklahoma on plot-level variables, 2014

Plot variables	Number of observations	Number within tolerance	Percent within tolerance
Plot status	43	41	95
Distance to road	35	28	80
Water on plot	35	28	80
Latitude-longitude	24	24	100
Plot in correct county	79	79	100
Plot accessibility	79	57	72

Sampling Error

Sampling error is associated with the natural and expected deviation of the sample from the true population mean. This deviation is susceptible to a mathematical evaluation of the probability of error. Sampling errors for State totals are based on one standard deviation. That is, there is a 68.27-percent probability that the confidence interval given for each sample estimate will cover the true population mean.

The size of the sampling error generally increases as the size of the area or population examined decreases. For this particular survey the sampling error may be higher even when making evaluations at the broadest level, simply due to survey method changes. Only 60 percent of the plots in west/central Oklahoma have been surveyed at the time of this analysis. Barring a major disaster that affects one of the next four panels, the effect of using only 60 percent of the plots in west/central Oklahoma is that percent sampling error is higher now than it will be when all of west/central Oklahoma is measured. To a lesser extent, the data in eastern Oklahoma concerning change variables may have higher percent sampling error due to variability in remeasurement period—for example finding the annual mortality when only averaging over 1.3 years will not be as robust as when averaging over 6.8 years.

Beyond that specific caveat, readers should be aware that as totals are stratified by forest type, species, diameter class, ownership, or other subunits, the sampling error may increase and be greatest for the smallest divisions. There may be instances where a smaller component does not have a proportionately larger sampling error. This can happen when the post-defined strata are more homogeneous than the larger strata, thereby having a smaller variance.

For specific post-defined strata the sampling error can be calculated by using the following formula. Sampling errors obtained by this method are only approximations of reliability because this process assumes constant variance across all subdivisions of totals.

$$SE_s = SE_t \frac{\sqrt{X_t}}{\sqrt{X_s}}$$

where

SE_s = sampling error for subdivision of survey unit or State total

SE_t = sampling error for survey unit or State total

X_s = sum of values for the variable of interest (area or volume) for subdivision of survey unit or State

X_t = total area or volume for survey unit or State

For example, the estimate of sampling error for softwood live-tree net volume on forest land in the Southeast unit is computed as:

$$SE_s = 2.82\% \left[\frac{\sqrt{4{,}172{,}294{,}396}}{\sqrt{1{,}922{,}304{,}959}} \right] = 4.16\%$$

Thus, the estimated sampling error is 4.16 percent, and the resulting 68.27-percent confidence interval for softwood live-tree net volume on forest land in the Southeast unit is 1,922.31 ± 79.97 million cubic feet.

The following figures illustrate some of the ways a sample size may be reduced and the effect of that smaller size on the sampling error. Looking at total forest land area (fig. C.1) we see that the sampling error for the west/central units decreases each year as the population of plots evaluated increases.

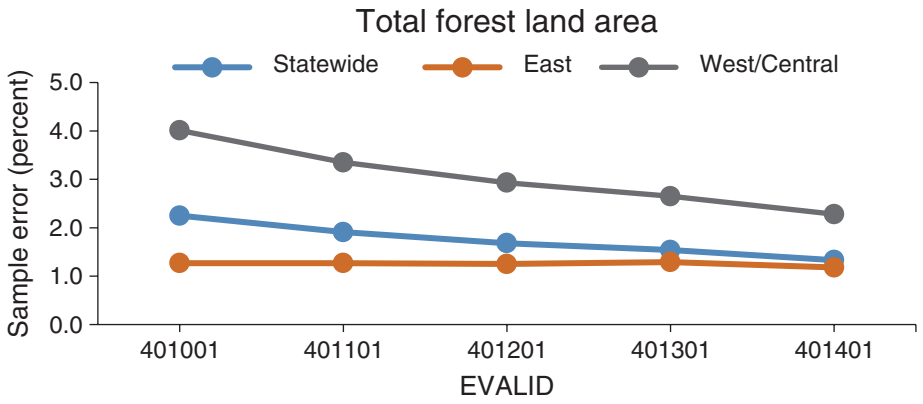


Figure C.1—Sampling error over time on forest land by survey unit group and whole State, Oklahoma.

Because data collection in west/central Oklahoma is only 60 percent complete, its error is higher than east Oklahoma even at its lowest; also note the effect west Oklahoma has on the statewide sampling error—because east Oklahoma is stable the whole State estimated error is pulled by the central/western error. By the most recent survey the statewide error is almost as low as east Oklahoma and we anticipate that once the west/central Oklahoma survey is complete the statewide sampling error will be lower than either area.

If we look at the largest area (statewide) but stratify by forest type (fig. C.2) we see that the error is considerably higher than it is for total forest area. The magnitude of difference will depend on how common the particular data sub-set is.

Finally, we see the largest sampling errors when we use a smaller sample size, area, and data stratification (fig. C.3).

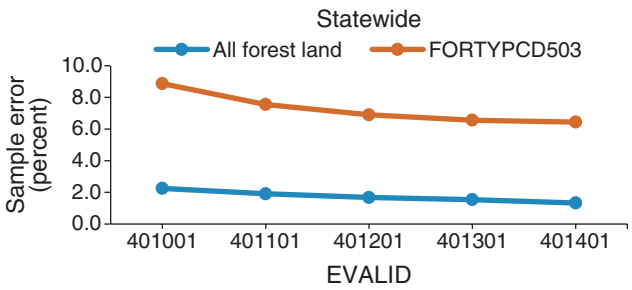


Figure C.2—Sampling error over time on a specific forest type and total forest land, Oklahoma.

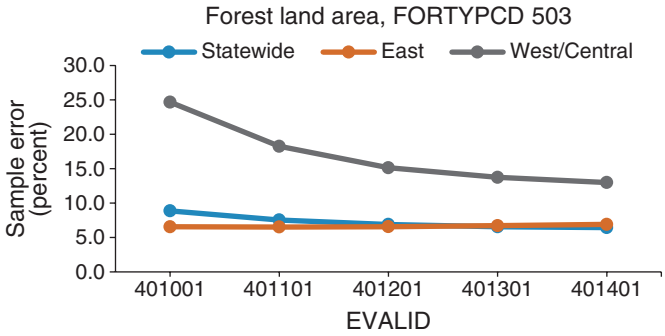


Figure C.3—Sampling error over time on a specific forest type by survey unit group and whole State, Oklahoma.

Table C.2—Results of blind checks (quality assurance) for Oklahoma on condition-level variables, 2014

Condition variables	Number of observations	Number within tolerance	Percent within tolerance
Condition status	99	96	97
Reserved status	40	39	98
Owner group	40	39	98
Field forest type	40	35	88
Field forest type group	40	38	95
Stand-size class	40	33	83
Regeneration status	40	39	98
Tree density	40	40	100
Artificial regeneration species	5	5	100
Owner class	40	38	95
Stand age	28	13	46
Disturbance 1	40	36	90
Disturbance year 1	4	4	100
Disturbance 2	4	4	100
Disturbance year 2	1	1	100
Disturbance 3	1	1	100
Treatment 1	40	38	95
Treatment year 1	3	3	100
Treatment 2	3	3	100
Physiographic class	40	32	80
Present land use	40	40	100
Total acres	26	23	88
Percent forest	32	26	81
Stand structure	40	28	70
Operability	40	33	83
Site class	28	26	93
Chaining	43	43	100
Harvest type 1	12	12	100
Live canopy	24	14	58
Live and missing canopy	24	14	58
Fire	28	27	96
Grazing	28	27	96

Table C.3—Results of blind checks (quality assurance) for Oklahoma on subplot-level variables, 2014

Subplot variables	Number of observations	Number within tolerance	Percent within tolerance
Subplot center condition	316	308	97
Microplot center condition	307	307	100
Subplot slope	81	78	96
Subplot aspect	81	60	74
Snow/Water depth	81	77	95
Existence of change, boundary	11	9	82
Boundary change type	6	4	67
Contrasting condition	19	15	79
Left azimuth	4	3	75
Right azimuth	4	2	50
Existence of corner	4	4	100
Corner azimuth	1	1	100
Corner distance	1	1	100
Boundary status	9	9	100

Length and diameter measurements are collected on live trees, standing dead trees, and a subset of downed trees to calculate various volumes. (photo by Carri Abner, Oklahoma Forestry Services)

Table C.4—Results of blind checks (quality assurance) for Oklahoma on tree/seedling-level variables, 2014

Tree and seedling variables	Number of observations	Number within tolerance	Percent within tolerance
Condition number	381	358	94
Azimuth	358	324	91
Horizontal distance	343	330	96
Present tree status	381	377	99
Reconcile	32	30	94
Standing dead	51	51	100
Species	381	357	94
Genus	381	380	100
Live dbh	279	205	73
Live dbh: both diameter checks = 0	76	60	79
Live dbh.: both diameter checks >0	5	5	100
Live dbh.: mixed diameter checks	5	1	20
Sound dead d.b.h.	10	10	100
Decayed dead d.b.h.	13	13	100
Live rotten/missing cull	8	8	100
Dead rotten/missing cull	7	5	71
Number of d.r.c. stems	24	24	100
Diameter root collar	24	20	83
Total length	302	255	84
Live tree actual length	6	4	67
Dead tree actual length	16	13	81
Crown class	302	257	85
Compacted crown ratio	301	253	84
Decay class	51	51	100
Tree Class	225	194	86
Tree grade	39	22	56
Board foot cull	39	30	77
Dieback incidence	121	121	100
Dieback severity	71	71	100
Utilization class	20	20	100
Abnormal termination	86	83	97
Seedling species	110	103	94
Seedling genus	110	110	100
Seedling count	110	86	78

Table C.5— Results of blind checks (quality assurance) for Oklahoma on invasive species-level variables, 2014

Invasive species variables	Number of observations	Number within tolerance	Percent within tolerance
Invasive cover	38	32	84

Table C.6—Observation report on tree damage for Oklahoma, 2014

Tree damage report	Observations found by both	Observations found by just cruiser	Observations found by just QA
All damage codes	19	17	16
Bark beetles damage codes	1	0	0
Boring insects damage codes	0	1	0
Stem decay damage codes	8	10	8
Fire damage codes	4	5	1
Wild Animal damage codes	1	0	2
Abiotic damage codes	1	0	0
Competition damage codes	0	1	0
Other damage codes	4	0	5

QA = quality assurance.

Table C.7—Observation report on missing/added trees/seedlings for Oklahoma, 2014

Missing/extra tree/ seedling report	Observations found by both	Observations found by just cruiser	Observations found by just QA
		number	
Trees	401	4	15
Seedlings	110	5	15

QA = quality assurance.

Table C.8—Observation report on invasive species for Oklahoma, 2014

Invasives	Observations found by both	Observations found by just cruiser	Observations found by just QA
Invasive species	38	11	13

QA=quality assurance.

Forester Dieter Rudolph collecting a diameter measurement. (photo by Carri Abner, Oklahoma Forestry Services)

Forester Matt Ford setting a course to the data collection plot. (photo by Carri Abner, Oklahoma Forestry Services)

Table D.1—Percentage of area by land status, Oklahoma, 2014

Land status	Area
	percent
Accessible forest land	
Unreserved forest land	
Timberland	15.3
Unproductive	10.6
Total	25.9
Reserved forest land	
Productive	0.3
Unproductive	0.2
Total	0.5
Total forest land	26.3
Nonforest and other area	
Nonforest land	68.6
Water	
Noncensus water	0.5
Census water	2.0
Total	71.1
Nonsampled area	
Access denied	2.5
Hazardous conditions	0.0
All area	100.0
Total area (*thousands of acres*)	44,735.2

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.1.1—Area by survey unit and land status, Oklahoma, 2014

			Unreserved			Reserved				
Unit	Total area	All forest	Total	Timber-land	Un-productive	Total	Productive	Un-productive	Nonforest land	Census water
					thousand acres					
Southeast	6,983.3	4,278.0	4,159.2	3,599.8	559.3	118.8	112.8	6.0	2,481.7	223.7
Northeast	3,577.1	1,441.8	1,436.0	1,238.2	197.8	5.8	5.8	0.0	1,930.3	205.0
North Central	5,262.4	1,514.5	1,514.5	698.5	816.1	0.0	0.0	0.0	3,524.6	223.3
South Central	7,402.5	2,703.2	2,677.1	1,267.1	1,410.0	26.1	15.1	11.0	4,577.2	122.2
Southwest	11,201.6	1,755.3	1,693.2	256.6	1,436.6	62.2	0.0	62.2	9,344.6	101.7
High Plains	5,107.2	114.2	114.2	0.0	114.2	0.0	0.0	0.0	4,993.0	0.0
Great Plains	5,201.0	466.9	465.8	80.8	385.0	1.1	1.1	0.0	4,706.9	27.1
All survey units	44,735.2	12,273.9	12,060.0	7,140.9	4,919.1	213.9	134.8	79.2	31,558.3	902.9

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.2—Area of forest land by ownership class and land status, Oklahoma, 2014

Ownership class	All forest land	Unreserved			Reserved		
		Total	Timber-land	Un-productive	Total	Productive	Un-productive
	thousand acres						
U.S. Forest Service							
National forest	342.0	309.0	302.7	6.2	33.0	33.0	0.0
National grassland	14.8	14.8	0.0	14.8	0.0	0.0	0.0
Total	356.9	323.8	302.7	21.1	33.0	33.0	0.0
Other Federal							
Bureau of Land Management	9.1	9.1	0.0	9.1	0.0	0.0	0.0
U.S. Fish and Wildlife Service	83.5	0.0	0.0	0.0	83.5	21.3	62.2
Dept. of Defense/Dept. of Energy	397.2	369.3	315.0	54.4	27.9	21.9	6.0
Other Federal	42.4	29.9	29.9	0.0	12.6	12.6	0.0
Total	532.3	408.3	344.9	63.5	123.9	55.8	68.2
State and local government							
State	378.1	321.1	187.3	133.9	56.9	45.9	11.0
Local	116.8	116.8	64.5	52.4	0.0	0.0	0.0
Total	494.9	438.0	251.7	186.3	56.9	45.9	11.0
Nonindustrial private							
Undifferentiated private	10,889.9	10,889.9	6,241.6	4,648.3	0.0	0.0	0.0
Total	10,889.9	10,889.9	6,241.6	4,648.3	0.0	0.0	0.0
All classes	12,273.9	12,060.0	7,140.9	4,919.1	213.9	134.8	79.2

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.3—Area of forest land by forest-type group and site productivity class, Oklahoma, 2014

Forest-type group	All classes	Site productivity class (*cubic feet/acre/year*) 0–19	20–49	50–84	85–119	120–164	165–224	225+
		thousand acres						
Softwood types								
Loblolly-shortleaf pine	1,168.8	13.3	243.6	609.2	230.0	68.3	4.4	0.0
Other eastern softwoods	565.5	485.2	74.5	0.0	5.9	0.0	0.0	0.0
Pinyon-juniper	112.7	112.7	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	1,847.0	611.1	318.1	609.2	235.9	68.3	4.4	0.0
Hardwood types								
Oak-pine	983.0	281.0	274.2	357.7	28.9	27.5	13.6	0.0
Oak-hickory	6,768.9	2,839.8	2,944.6	810.7	135.2	23.3	15.3	0.0
Oak-gum-cypress	226.3	36.4	100.8	42.0	23.9	16.3	6.8	0.0
Elm-ash-cottonwood	1,445.5	366.3	843.2	173.4	30.3	5.9	10.6	16.0
Other hardwoods	80.4	49.7	15.6	9.2	5.9	0.0	0.0	0.0
Woodland hardwoods	425.9	417.9	7.9	0.0	0.0	0.0	0.0	0.0
Exotic hardwoods	45.7	28.1	12.6	5.0	0.0	0.0	0.0	0.0
Total hardwoods	9,975.6	4,019.3	4,198.9	1,397.9	224.2	73.1	46.2	16.0
Nonstocked	451.4	367.8	51.2	19.3	5.2	6.4	1.5	0.0
All groups	12,273.9	4,998.3	4,568.1	2,026.4	465.3	147.7	52.1	16.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.4—Area of forest land by forest-type group and stand-size class, Oklahoma, 2014

Forest-type group	All classes	Stand-size class			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	thousand acres				
Softwood types					
Loblolly-shortleaf pine	1,168.8	712.7	237.4	218.7	0.0
Other eastern softwoods	565.5	85.1	188.2	292.2	0.0
Pinyon-juniper	112.7	69.1	10.4	33.2	0.0
Total softwoods	1,847.0	866.9	436.0	544.1	0.0
Hardwood types					
Oak-pine	983.0	396.4	345.2	241.4	0.0
Oak-hickory	6,768.9	2,075.3	2,883.4	1,810.2	0.0
Oak-gum-cypress	226.3	143.7	31.1	51.5	0.0
Elm-ash-cottonwood	1,445.5	642.1	431.6	371.8	0.0
Other hardwoods	80.4	12.2	47.4	20.8	0.0
Woodland hardwoods	425.9	92.0	107.8	226.1	0.0
Exotic hardwoods	45.7	9.5	15.9	20.3	0.0
Total hardwoods	9,975.6	3,371.2	3,862.3	2,742.1	0.0
Nonstocked	451.4	0.0	0.0	0.0	451.4
All groups	12,273.9	4,238.1	4,298.3	3,286.1	451.4

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.5—Area of forest land by forest-type group and stand-age class, Oklahoma, 2014

Forest-type group	All classes	Stand-age class (*years*) 1–20	21–40	41–60	61–80	81–100	101–120	121–140	141–160	161–180	181–200	201+	Non-stocked
						thousand acres							
Softwood types													
Loblolly-shortleaf pine	1,168.8	401.7	385.5	211.2	145.8	15.9	5.9	0.0	0.0	0.0	0.0	0.0	2.9
Other eastern softwoods	565.5	149.4	259.4	122.8	33.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinyon-juniper	112.7	0.0	35.6	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	1,847.0	551.0	680.6	411.0	179.7	15.9	5.9	0.0	0.0	0.0	0.0	0.0	2.9
Hardwood types													
Oak-pine	983.0	199.1	251.6	303.8	202.5	20.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0
Oak-hickory	6,768.9	1,180.0	1,529.6	1,983.1	1,767.3	296.4	6.0	0.0	0.0	0.0	0.0	0.0	6.5
Oak-gum-cypress	226.3	36.8	57.9	88.9	26.8	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm-ash-cottonwood	1,445.5	277.0	460.6	448.6	243.5	15.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other hardwoods	80.4	15.2	36.7	24.7	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland hardwoods	425.9	180.4	161.3	71.5	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exotic hardwoods	45.7	11.9	22.0	11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	9,975.6	1,900.4	2,519.8	2,932.3	2,256.5	348.2	11.9	0.0	0.0	0.0	0.0	0.0	6.5
Nonstocked	451.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	451.4
All groups	12,273.9	2,451.4	3,200.3	3,343.3	2,436.2	364.1	17.8	0.0	0.0	0.0	0.0	0.0	460.8

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.6—Area of timberland by forest-type group and stand origin, Oklahoma, 2014

Forest-type group	Total	Stand origin	
		Natural stands	Artificial regeneration
	thousand acres		
Softwood types			
Loblolly-shortleaf pine	1,106.8	572.8	534.1
Other eastern softwoods	80.3	78.0	2.4
Total softwoods	1,187.1	650.7	536.4
Hardwood types			
Oak-pine	680.8	600.6	80.2
Oak-hickory	3,889.8	3,828.0	61.8
Oak-gum-cypress	179.0	179.0	0.0
Elm-ash-cottonwood	1,064.4	1,064.4	0.0
Other hardwoods	30.6	30.6	0.0
Woodland hardwoods	7.9	7.9	0.0
Exotic hardwoods	17.6	17.6	0.0
Total hardwoods	5,870.2	5,728.3	142.0
Nonstocked	83.6	75.1	8.5
All groups	7,140.9	6,454.1	686.8

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.7—Area of forest land disturbed annually by forest-type group and disturbance class, Oklahoma, 2014

Forest-type group[b]	Disturbance class[a]							
	Insects	Disease	Weather	Fire	Domestic animals	Wild animals	Human	Other natural
	acres							
Softwood types								
Loblolly-shortleaf pine	8.3	1.9	9.4	23.3	0.0	0.0	2.6	0.0
Other eastern softwoods	0.0	0.0	2.6	0.0	0.0	0.0	0.4	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Total softwoods	8.3	1.9	12.1	23.3	0.6	0.0	2.9	0.0
Hardwood types								
Oak-pine	2.1	2.8	2.6	11.8	2.1	0.0	0.0	0.0
Oak-hickory	3.1	49.9	54.7	75.1	67.9	4.9	17.2	0.0
Oak-gum-cypress	0.0	5.6	0.6	2.7	0.0	0.0	0.7	0.0
Elm-ash-cottonwood	0.0	0.0	25.6	2.6	8.4	3.9	3.4	1.3
Other hardwoods	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Exotic hardwoods	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	5.2	58.3	83.5	92.2	78.5	9.7	21.4	1.3
Nonstocked	2.0	0.0	0.0	1.7	5.6	0.0	2.0	0.0
All groups	15.5	60.2	95.5	117.1	84.6	9.7	26.3	1.3

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

[b] Based on past conditions.

Table D.8—Area of forest land treated annually by forest-type group and treatment class (cutting), Oklahoma, 2014

Forest-type group[b]	Total treated	Treatment class: Cutting[a]					
		Final harvest	Partial harvest	Seed-tree/ shelterwood harvest	Commercial thinning	Timber stand improvement	Salvage cutting
	thousand acres						
Softwood types							
Loblolly-shortleaf pine	55.9	19.6	3.4	1.2	20.1	10.7	0.8
Other eastern softwoods	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	55.9	19.6	3.4	1.2	20.1	10.7	0.8
Hardwood types							
Oak-pine	7.8	3.3	1.9	2.6	0.0	0.0	0.0
Oak-hickory	20.9	8.8	2.9	0.0	3.7	3.2	2.2
Oak-gum-cypress	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm-ash-cottonwood	1.6	1.6	0.0	0.0	0.0	0.0	0.0
Other hardwoods	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exotic hardwoods	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	30.2	13.6	4.9	2.6	3.7	3.2	2.2
Nonstocked	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All groups	86.1	33.3	8.3	3.8	23.8	13.9	3.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Forest type group based on current conditions.

[b] Forest type group based on past conditions.

Table D.8.1—Area of forest land treated annually by forest-type group and treatment class (regeneration), Oklahoma, 2014

Forest-type group[a]	Treatment class[a]			
	Site preparation	Artificial regeneration	Natural regeneration	Other silvicultural
	thousand acres			
Softwood types				
Loblolly-shortleaf pine	8.7	8.5	0.0	7.8
Other eastern softwoods	0.0	0.0	0.0	0.0
Total softwoods	8.7	8.5	0.0	7.8
Hardwood types				
Oak-pine	7.2	8.7	2.7	1.8
Oak-hickory	4.1	8.9	2.7	4.7
Oak-gum-cypress	0.0	0.0	0.0	0.0
Elm-ash-cottonwood	0.0	0.0	0.0	0.0
Other hardwoods	0.0	0.0	0.0	0.0
Exotic hardwoods	0.0	0.0	0.0	0.0
Total hardwoods	11.3	17.6	5.4	6.5
Nonstocked	0.0	0.0	0.0	0.4
All groups	20.0	26.2	5.4	14.8

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.8.2—Area of timberland treated annually by forest-type group and treatment class, (cutting) Oklahoma, 2014

Forest-type group[b]	Treatment class[a]						
		Cutting					
	Total treated	Final harvest	Partial harvest	Seed-tree/ shelterwood harvest	Commercial thinning	Timber stand improvement	Salvage cutting
	acres						
Softwood types							
Loblolly-shortleaf pine	53.7	19.6	3.4	1.2	20.1	8.5	0.8
Other eastern softwoods	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	53.7	19.6	3.4	1.2	20.1	8.5	0.8
Hardwood types							
Oak-pine	7.8	3.3	1.9	2.6	0.0	0.0	0.0
Oak-hickory	20.9	8.8	2.9	0.0	3.7	3.2	2.2
Oak-gum-cypress	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elm-ash-cottonwood	1.6	1.6	0.0	0.0	0.0	0.0	0.0
Other hardwoods	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	30.2	13.6	4.9	2.6	3.7	3.2	2.2
Nonstocked	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All groups	83.9	33.3	8.3	3.8	23.8	11.7	3.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

HARVEST_TYPE[1,2,3]_SRS code 16 (Salvage Cutting) started with Field Guide 4.0

[a] Based on current conditions.

[b] Based on past conditions.

Table D.8.3—Area of timberland treated annually by forest-type group and treatment class (regeneration), Oklahoma, 2014

Forest-type group[a]	Treatment class[a]			
	Site preparation	Artificial regeneration	Natural regeneration	Other silvicultural
	thousand acres			
Softwood types				
Loblolly-shortleaf pine	8.7	8.5	0.0	7.8
Other eastern softwoods	0.0	0.0	0.0	0.0
Total softwoods	8.7	8.5	0.0	7.8
Hardwood types				
Oak-pine	7.2	8.7	2.7	1.8
Oak-hickory	4.1	8.9	2.7	4.7
Oak-gum-cypress	0.0	0.0	0.0	0.0
Elm-ash-cottonwood	0.0	0.0	0.0	0.0
Other hardwoods	0.0	0.0	0.0	0.0
Exotic hardwoods	0.0	0.0	0.0	0.0
Total hardwoods	11.3	17.6	5.4	6.5
Nonstocked	0.0	0.0	0.0	0.4
All groups	20.0	26.2	5.4	14.8

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.9—Area of timberland by forest-type group and stand-size class, Oklahoma, 2014

Forest-type group	All classes	Stand-size class			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	thousand acres				
Softwood types					
Loblolly-shortleaf pine	1,106.8	668.5	230.0	208.4	0.0
Other eastern softwoods	80.3	14.8	20.9	44.7	0.0
Total softwoods	1,187.1	683.2	250.9	253.1	0.0
Hardwood types					
Oak-pine	680.8	294.3	260.3	126.1	0.0
Oak-hickory	3,889.8	1,514.9	1,473.4	901.5	0.0
Oak-gum-cypress	179.0	130.5	25.2	23.3	0.0
Elm-ash-cottonwood	1,064.4	528.6	292.1	243.7	0.0
Other hardwoods	30.6	6.9	13.1	10.7	0.0
Woodland hardwoods	7.9	7.9	0.0	0.0	0.0
Exotic hardwoods	17.6	2.6	6.8	8.2	0.0
Total hardwoods	5,870.2	2,485.7	2,071.0	1,313.5	0.0
Nonstocked	83.6	0.0	0.0	0.0	83.6
All groups	7,140.9	3,169.0	2,321.9	1,566.5	83.6

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.10—Number of live trees on forest land by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 1.0–2.9	3.0–4.9	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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
	million trees															
Softwood																
Loblolly and shortleaf pines	577.4	267.7	124.3	65.5	42.8	27.3	21.7	15.5	7.4	3.9	0.8	0.5	0.0	0.0	0.0	0.0
Other yellow pines	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern softwoods	469.4	263.8	106.6	51.6	25.7	13.1	5.6	1.7	0.9	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Woodland softwoods	20.2	6.3	4.7	2.3	2.0	1.5	1.2	1.0	0.7	0.3	0.0	0.2	0.0	0.1	0.0	0.1
Total softwoods	1,067.3	537.7	235.6	119.5	70.6	41.9	28.5	18.2	9.0	4.5	1.0	0.7	0.0	0.1	0.0	0.1
Hardwood																
Select white oaks	89.9	37.4	17.0	10.9	7.3	5.7	4.5	2.5	1.6	1.2	0.7	0.8	0.2	0.1	0.0	0.0
Select red oaks	65.5	30.1	12.3	6.1	5.3	3.8	2.6	1.9	1.2	0.6	0.5	0.7	0.2	0.1	0.1	0.0
Other white oaks	792.5	314.0	144.0	131.7	88.3	50.8	27.6	16.4	10.3	5.1	2.3	1.7	0.2	0.1	0.0	0.0
Other red oaks	601.4	327.5	136.0	56.3	32.1	18.6	11.8	8.5	3.7	2.4	2.1	1.5	0.5	0.4	0.1	0.0
Hickory	505.1	290.2	104.4	47.6	25.7	15.0	8.8	5.4	3.5	1.7	1.1	1.1	0.4	0.1	0.1	0.0
Hard maple	10.2	7.2	0.9	1.0	0.4	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	72.1	54.2	11.4	3.2	1.7	0.6	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Beech	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	54.1	33.0	9.0	5.8	2.6	1.7	0.9	0.5	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Tupelo and blackgum	50.2	32.3	11.6	2.5	1.5	0.7	0.7	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Ash	166.6	99.1	28.3	15.6	10.1	5.9	3.7	1.9	0.8	0.6	0.3	0.3	0.1	0.0	0.0	0.0
Cottonwood and aspen	13.3	4.7	2.0	1.8	1.4	0.7	0.6	0.4	0.5	0.2	0.1	0.3	0.2	0.1	0.1	0.0
Basswood	0.8	0.0	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	17.4	3.9	5.1	2.0	1.9	1.5	1.2	0.6	0.6	0.2	0.3	0.1	0.1	0.1	0.0	0.0
Other eastern soft hardwoods	1,196.7	772.9	243.4	87.1	42.4	22.4	11.7	7.0	4.1	2.3	1.9	0.9	0.2	0.4	0.0	0.0
Other eastern hard hardwoods	258.3	178.9	49.6	15.2	7.9	3.7	1.4	0.9	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0
Eastern noncommercial hardwoods	384.4	288.3	60.0	20.2	8.6	3.7	1.7	1.0	0.5	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Woodland hardwoods	46.9	14.6	8.9	12.9	5.5	2.7	1.2	0.6	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Total hardwoods	4,326.0	2,488.8	844.6	420.0	242.8	137.8	78.8	48.0	28.2	15.2	9.8	7.7	2.2	1.5	0.4	0.1
All species	5,393.3	3,026.5	1,080.1	539.5	313.4	179.7	107.3	66.1	37.3	19.7	10.8	8.4	2.2	1.6	0.4	0.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.10.1—Number of live trees on timberland by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 1.0–2.9	3.0–4.9	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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
								million trees								
Softwood																
Loblolly and shortleaf pines	551.2	254.0	119.4	63.1	41.7	26.2	20.7	14.6	6.9	3.5	0.7	0.4	0.0	0.0	0.0	0.0
Other yellow pines	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern softwoods	202.3	117.7	48.4	19.6	8.8	5.0	1.5	0.5	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total softwoods	753.8	371.7	167.8	82.8	50.7	31.2	22.2	15.1	7.3	3.6	0.8	0.4	0.0	0.0	0.0	0.0
Hardwood																
Select white oaks	78.5	33.2	14.4	9.8	6.3	5.0	3.8	2.1	1.5	1.0	0.7	0.6	0.1	0.1	0.0	0.0
Select red oaks	54.0	24.6	10.2	4.9	4.6	3.0	2.2	1.6	1.0	0.6	0.3	0.6	0.2	0.0	0.1	0.0
Other white oaks	411.5	168.1	75.2	62.0	44.8	26.5	14.4	8.4	6.1	3.0	1.5	1.3	0.2	0.1	0.0	0.0
Other red oaks	335.9	178.6	75.5	29.2	16.0	11.9	8.4	6.7	3.2	2.4	2.0	1.3	0.5	0.3	0.1	0.0
Hickory	399.0	230.1	81.7	36.2	20.6	11.8	7.2	4.3	2.9	1.4	1.1	1.0	0.4	0.1	0.1	0.0
Hard maple	8.5	7.2	0.0	0.7	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	69.2	52.8	10.0	3.1	1.6	0.6	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Beech	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	52.1	32.4	9.0	5.5	2.2	1.2	0.7	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Tupelo and blackgum	46.3	30.8	10.2	2.2	1.4	0.6	0.6	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Ash	149.1	89.3	26.2	13.6	8.2	5.2	3.1	1.7	0.8	0.5	0.3	0.3	0.1	0.0	0.0	0.0
Cottonwood and aspen	8.3	2.4	0.4	1.2	1.4	0.7	0.5	0.4	0.4	0.2	0.1	0.3	0.1	0.1	0.1	0.0
Basswood	0.8	0.0	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	12.1	3.9	2.9	1.3	1.3	0.8	0.8	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Other eastern soft hardwoods	840.6	536.1	177.7	60.6	30.6	15.6	8.2	4.5	2.9	1.9	1.2	0.7	0.1	0.4	0.0	0.0
Other eastern hard hardwoods	159.4	108.6	33.4	8.6	4.9	2.0	0.9	0.7	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Eastern noncommercial hardwoods	255.6	195.2	40.3	11.9	4.8	1.9	0.8	0.3	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Woodland hardwoods	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total hardwoods	2,881.2	1,693.8	567.4	250.7	148.9	86.9	51.8	31.9	20.2	11.4	7.7	6.6	1.9	1.4	0.4	0.1
All species	3,635.1	2,065.5	735.2	333.6	199.6	118.2	74.0	47.0	27.5	15.1	8.5	7.0	1.9	1.4	0.4	0.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.11—Number of growing-stock trees on timberland by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*)												
		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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
	million trees													
Softwood														
Loblolly and shortleaf pines	163.6	56.1	38.1	24.8	20.0	13.8	6.4	3.3	0.7	0.4	0.0	0.0	0.0	0.0
Other eastern softwoods	8.6	4.8	2.3	1.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	172.2	60.9	40.4	26.0	20.3	13.9	6.5	3.3	0.7	0.4	0.0	0.0	0.0	0.0
Hardwood														
Select white oaks	19.8	6.1	4.2	3.4	2.6	1.4	0.9	0.6	0.3	0.2	0.0	0.0	0.0	0.0
Select red oaks	10.5	2.2	2.1	1.9	1.5	1.0	0.6	0.4	0.2	0.4	0.2	0.0	0.0	0.0
Other white oaks	84.9	29.1	25.0	14.3	7.0	4.4	2.6	1.2	0.7	0.4	0.0	0.0	0.0	0.0
Other red oaks	39.3	9.2	8.0	6.7	4.8	4.2	1.9	1.7	1.3	1.0	0.3	0.1	0.0	0.0
Hickory	44.1	16.6	11.2	6.3	3.8	2.5	1.6	0.9	0.4	0.4	0.2	0.1	0.1	0.0
Hard maple	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	2.0	0.7	0.5	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Sweetgum	7.7	3.5	1.6	1.1	0.7	0.4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Tupelo and blackgum	2.7	0.9	0.8	0.3	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Ash	14.8	5.5	3.5	2.4	1.5	1.0	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Cottonwood and aspen	2.7	0.3	0.7	0.2	0.3	0.2	0.2	0.2	0.1	0.3	0.0	0.1	0.1	0.0
Black walnut	1.7	0.0	0.4	0.2	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Other eastern soft hardwoods	28.8	12.2	6.5	4.1	1.9	1.8	0.6	0.5	0.6	0.3	0.0	0.2	0.0	0.0
Other eastern hard hardwoods	3.9	1.6	1.1	0.6	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	263.3	88.3	65.5	41.7	25.2	17.7	9.5	5.9	4.2	3.4	0.9	0.7	0.2	0.1
All species	435.5	149.1	105.9	67.7	45.5	31.6	16.0	9.2	4.9	3.7	0.9	0.7	0.2	0.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

Table D.12—Net[a] volume of live trees on forest land by ownership class and land status, Oklahoma, 2014

Ownership class	All forest land	Unreserved			Reserved		
		Total	Timber-land	Un-productive	Total	Productive	Un-productive
	million cubic feet						
U.S. Forest Service							
National forest	705.1	638.7	632.2	6.5	66.4	66.4	0.0
National grassland	2.4	2.4	0.0	2.4	0.0	0.0	0.0
Total	707.5	641.2	632.2	9.0	66.4	66.4	0.0
Other Federal							
Bureau of Land Management	1.9	1.9	0.0	1.9	0.0	0.0	0.0
U.S. Fish and Wildlife Service	66.5	0.0	0.0	0.0	66.5	39.5	27.1
Dept. of Defense/Dept. of Energy	497.4	466.4	442.1	24.3	31.0	25.7	5.3
Other Federal	40.7	23.3	23.3	0.0	17.4	17.4	0.0
Total	606.5	491.6	465.5	26.2	114.9	82.6	32.3
State and local government							
State	311.2	225.8	183.8	41.9	85.5	79.2	6.3
Local	94.9	94.9	54.8	40.1	0.0	0.0	0.0
Total	406.1	320.6	238.6	82.0	85.5	79.2	6.3
Nonindustrial private							
Undifferentiated private	7,752.0	7,752.0	5,922.9	1,829.0	0.0	0.0	0.0
Total	7,752.0	7,752.0	5,922.9	1,829.0	0.0	0.0	0.0
All classes	9,472.2	9,205.4	7,259.2	1,946.2	266.7	228.1	38.6

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.13—Net[a] volume of live trees on forest land by forest-type group and stand-size class, Oklahoma, 2014

Forest-type group	All classes	Stand-size class: Large diameter	Medium diameter	Small diameter	Non-stocked
		million cubic feet			
Softwood types					
Loblolly-shortleaf pine	1,641.9	1,400.5	220.7	20.8	0.0
Other eastern softwoods	191.1	67.1	100.2	23.8	0.0
Pinyon-juniper	74.3	71.5	1.6	1.2	0.0
Total softwoods	1,907.4	1,539.0	322.5	45.8	0.0
Hardwood types					
Oak-pine	900.9	607.2	268.9	24.8	0.0
Oak-hickory	4,808.1	2,587.6	2,036.3	184.2	0.0
Oak-gum-cypress	317.3	269.5	41.1	6.7	0.0
Elm-ash-cottonwood	1,424.1	1,056.4	334.7	33.0	0.0
Other hardwoods	34.9	18.7	15.2	1.0	0.0
Woodland hardwoods	54.3	28.6	18.8	7.0	0.0
Exotic hardwoods	14.8	6.3	7.9	0.6	0.0
Total hardwoods	7,554.4	4,574.3	2,722.8	257.3	0.0
Nonstocked	10.4	0.0	0.0	0.0	10.4
All groups	9,472.2	6,113.4	3,045.3	303.1	10.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.13.1—Net[a] volume of live trees on timberland by forest-type group and stand-size class, Oklahoma, 2014

Forest-type group	All classes	Stand-size class: Large diameter	Medium diameter	Small diameter	Non-stocked
		million cubic feet			
Softwood types					
Loblolly-shortleaf pine	1,530.3	1,298.5	215.1	16.7	0.0
Other eastern softwoods	38.0	16.1	14.7	7.1	0.0
Total softwoods	1,568.3	1,314.6	229.8	23.9	0.0
Hardwood types					
Oak-pine	744.5	510.5	220.1	13.9	0.0
Oak-hickory	3,376.2	2,086.0	1,173.8	116.4	0.0
Oak-gum-cypress	290.1	254.7	31.1	4.3	0.0
Elm-ash-cottonwood	1,250.5	967.3	257.5	25.7	0.0
Other hardwoods	13.3	5.4	7.6	0.2	0.0
Woodland hardwoods	8.6	8.6	0.0	0.0	0.0
Exotic hardwoods	6.7	1.8	4.7	0.1	0.0
Total hardwoods	5,689.8	3,834.3	1,695.0	160.6	0.0
Nonstocked	1.1	0.0	0.0	0.0	1.1
All groups	7,259.2	5,148.9	1,924.8	184.4	1.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.14—Net[a] volume of live trees on forest land by species group and ownership group, Oklahoma, 2014

Species group	All ownerships	Ownership group				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet					
Softwood						
Loblolly and shortleaf pines	1,919.8	497.2	70.6	92.7	0.0	1,259.4
Other yellow pines	0.5	0.0	0.0	0.0	0.0	0.5
Other eastern softwoods	402.3	4.2	24.2	27.3	0.0	346.7
Woodland softwoods	72.4	0.0	0.0	4.4	0.0	67.9
Total softwoods	2,395.1	501.3	94.8	124.5	0.0	1,674.5
Hardwood						
Select white oaks	432.3	53.4	10.7	30.4	0.0	337.8
Select red oaks	330.4	20.2	53.2	12.4	0.0	244.7
Other white oaks	2,045.8	54.7	114.5	70.4	0.0	1,806.2
Other red oaks	1,131.2	11.1	81.9	29.3	0.0	1,008.9
Hickory	901.1	30.8	42.6	36.0	0.0	791.6
Hard maple	10.3	0.0	2.9	0.4	0.0	7.1
Soft maple	87.9	5.0	17.4	16.4	0.0	49.2
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	106.4	7.7	19.6	0.0	0.0	79.1
Tupelo and blackgum	52.7	13.2	0.4	0.1	0.0	39.0
Ash	319.4	1.8	35.4	13.9	0.0	268.3
Cottonwood and aspen	127.8	0.0	43.2	2.7	0.0	81.8
Basswood	1.0	0.1	0.0	0.0	0.0	0.9
Black walnut	92.7	0.0	1.6	2.1	0.0	89.0
Other eastern soft hardwoods	1,117.3	5.3	80.3	59.7	0.0	972.0
Other eastern hard hardwoods	126.8	2.6	5.6	6.9	0.0	111.7
Eastern noncommercial hardwoods	137.8	0.2	2.2	0.6	0.0	134.8
Woodland hardwoods	55.9	0.0	0.1	0.3	0.0	55.5
Total hardwoods	7,077.1	206.2	511.8	281.6	0.0	6,077.5
All species	9,472.2	707.5	606.5	406.1	0.0	7,752.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.14.1—Net[a] volume of live trees on timberland by species group and ownership group, Oklahoma, 2014

Species group	All ownerships	Ownership group				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet					
Softwood	1,810.1	463.8	56.3	40.4	0.0	1,249.6
Loblolly and shortleaf pines	1,810.1	463.8	56.3	40.4	0.0	1,249.6
Other yellow pines	0.5	0.0	0.0	0.0	0.0	0.5
Other eastern softwoods	161.4	1.9	9.5	2.0	0.0	147.9
Total softwoods	1,972.1	465.7	65.8	42.4	0.0	1,398.1
Hardwood						
Select white oaks	380.2	47.5	9.1	17.6	0.0	306.0
Select red oaks	287.9	8.2	51.1	9.2	0.0	219.4
Other white oaks	1,209.9	53.4	67.3	51.3	0.0	1,037.9
Other red oaks	924.4	10.2	68.3	18.6	0.0	827.3
Hickory	776.7	26.4	33.4	33.0	0.0	684.0
Hard maple	7.3	0.0	0.2	0.0	0.0	7.1
Soft maple	87.0	4.2	17.4	16.4	0.0	49.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	88.7	5.4	4.2	0.0	0.0	79.1
Tupelo and blackgum	43.7	4.2	0.4	0.0	0.0	39.0
Ash	287.5	1.4	35.0	11.5	0.0	239.6
Cottonwood and aspen	116.7	0.0	42.0	2.7	0.0	72.0
Basswood	1.0	0.1	0.0	0.0	0.0	0.9
Black walnut	64.8	0.0	0.2	0.8	0.0	63.8
Other eastern soft hardwoods	846.1	5.2	66.2	30.9	0.0	743.9
Other eastern hard hardwoods	84.6	0.0	3.5	4.2	0.0	76.9
Eastern noncommercial hardwoods	72.1	0.1	1.6	0.2	0.0	70.3
Woodland hardwoods	8.6	0.0	0.0	0.0	0.0	8.6
Total hardwoods	5,287.2	166.5	399.6	196.2	0.0	4,524.8
All species	7,259.2	632.2	465.5	238.6	0.0	5,922.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.15—Net[a] volume of live trees on forest land by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
							million cubic feet							
Softwood														
Loblolly and shortleaf pines	1,919.8	125.6	214.9	276.4	374.8	389.3	269.1	173.9	47.5	40.0	0.0	8.3	0.0	0.0
Other yellow pines	0.5	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern softwoods	402.3	89.3	98.9	94.0	60.9	25.8	20.9	6.1	6.4	0.0	0.0	0.0	0.0	0.0
Woodland softwoods	72.4	2.6	5.2	7.0	10.2	13.8	9.2	6.1	0.0	6.1	0.0	4.7	0.0	7.3
Total softwoods	2,395.1	217.7	319.4	377.5	446.0	428.9	299.3	186.0	53.9	46.1	0.0	13.0	0.0	7.3
Hardwood														
Select white oaks	432.3	25.9	40.0	54.7	67.8	53.9	47.3	45.8	34.2	43.1	10.1	9.5	0.0	0.0
Select red oaks	330.4	14.9	27.9	36.4	38.5	39.1	36.2	24.6	16.0	42.1	20.5	10.5	11.5	12.4
Other white oaks	2,045.8	238.9	361.7	366.5	302.4	254.6	207.4	134.1	75.6	76.8	14.6	9.4	3.8	0.0
Other red oaks	1,131.2	93.2	123.3	133.6	148.2	151.3	100.9	88.6	101.6	91.6	46.3	40.8	11.8	0.0
Hickory	901.1	80.8	113.9	125.3	120.9	107.2	95.5	62.2	50.8	69.3	37.7	12.0	25.5	0.0
Hard maple	10.3	2.1	1.4	3.4	1.5	0.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	87.9	7.6	8.1	5.8	3.3	1.9	8.2	4.9	7.0	9.8	8.9	13.6	8.8	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	106.4	13.7	15.6	19.3	15.4	16.2	8.6	9.2	3.1	5.4	0.0	0.0	0.0	0.0
Tupelo and blackgum	52.7	5.4	7.9	7.4	8.7	8.3	8.3	3.1	3.7	0.0	0.0	0.0	0.0	0.0
Ash	319.4	36.5	50.1	52.0	54.2	38.4	24.2	18.8	16.0	18.6	1.0	9.5	0.0	0.0
Cottonwood and aspen	127.8	4.1	7.0	6.8	8.3	9.8	14.2	12.7	9.5	24.6	7.3	14.9	8.7	0.0
Basswood	1.0	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	92.7	4.4	8.1	10.1	15.0	9.3	15.2	5.7	8.9	5.4	5.5	5.3	0.0	0.0
Other eastern soft hardwoods	1,117.3	164.9	177.4	169.3	129.6	120.4	94.2	64.0	76.8	50.1	12.0	47.6	0.0	11.0
Other eastern hard hardwoods	126.8	26.4	31.1	24.4	14.0	12.9	7.3	6.1	0.6	0.9	3.1	0.0	0.0	0.0
Eastern noncommercial hardwoods	137.8	30.1	31.2	22.8	14.8	12.9	9.5	2.9	2.7	5.2	5.8	0.0	0.0	0.0
Woodland hardwoods	55.9	11.5	9.6	9.0	6.8	4.1	2.6	2.2	1.5	3.8	4.8	0.0	0.0	0.0
Total hardwoods	7,077.1	760.7	1,015.1	1,046.6	949.3	841.4	679.6	485.9	407.8	446.6	177.5	173.1	70.0	23.4
All species	9,472.2	978.4	1,334.5	1,424.1	1,395.3	1,270.3	978.8	672.0	461.7	492.7	177.5	186.1	70.0	30.7

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.15.1—Net[a] volume of live trees on timberland by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
							million cubic feet							
Softwood														
Loblolly and shortleaf pines	1,810.1	121.5	209.8	265.0	357.2	365.5	249.4	156.3	45.9	31.1	0.0	8.3	0.0	0.0
Other yellow pines	0.5	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern softwoods	161.4	37.2	37.9	40.5	19.0	9.0	11.6	3.3	2.9	0.0	0.0	0.0	0.0	0.0
Total softwoods	1,972.1	158.8	248.1	305.5	376.2	374.5	261.0	159.6	48.9	31.1	0.0	8.3	0.0	0.0
Hardwood														
Select white oaks	380.2	23.4	35.4	48.8	60.2	47.2	44.1	39.9	32.9	31.9	6.8	9.5	0.0	0.0
Select red oaks	287.9	12.4	24.7	28.9	32.6	32.1	30.3	22.6	13.5	41.8	20.5	4.6	11.5	12.4
Other white oaks	1,209.9	120.5	198.0	206.9	174.8	144.9	135.7	86.8	54.4	61.9	12.8	9.4	3.8	0.0
Other red oaks	924.4	56.8	73.0	98.8	114.8	131.3	89.7	87.6	95.9	85.8	46.3	32.6	11.8	0.0
Hickory	776.7	64.0	95.1	101.2	102.2	88.3	83.4	54.0	48.3	65.1	37.7	12.0	25.5	0.0
Hard maple	7.3	1.6	0.6	2.1	0.9	0.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	87.0	7.4	7.8	5.3	3.3	1.9	8.2	4.9	7.0	9.8	8.9	13.6	8.8	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	88.7	12.6	12.8	14.1	13.4	12.3	5.8	9.2	3.1	5.4	0.0	0.0	0.0	0.0
Tupelo and blackgum	43.7	4.6	7.2	6.3	8.0	6.4	4.4	3.1	3.7	0.0	0.0	0.0	0.0	0.0
Ash	287.5	33.0	42.5	46.4	45.9	35.5	23.4	17.5	14.1	18.6	1.0	9.5	0.0	0.0
Cottonwood and aspen	116.7	2.5	6.6	6.8	6.9	9.8	11.5	10.8	9.5	24.6	4.1	14.9	8.7	0.0
Basswood	1.0	0.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	64.8	3.0	5.2	5.7	10.7	7.6	9.8	2.2	4.5	5.4	5.5	5.3	0.0	0.0
Other eastern soft hardwoods	846.1	120.7	135.5	122.4	95.5	84.3	71.4	55.6	53.3	40.2	8.8	47.6	0.0	11.0
Other eastern hard hardwoods	84.6	16.5	21.3	14.5	9.9	11.5	6.3	1.0	0.6	0.0	3.1	0.0	0.0	0.0
Eastern noncommercial hardwoods	72.1	18.5	19.1	12.9	7.4	4.3	4.2	0.0	0.7	2.9	2.1	0.0	0.0	0.0
Woodland hardwoods	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	4.8	0.0	0.0	0.0
Total hardwoods	5,287.2	498.1	685.4	721.3	686.4	618.2	528.1	396.3	341.4	397.2	162.3	159.1	70.0	23.4
All species	7,259.2	656.9	933.5	1,026.8	1,062.6	992.8	789.1	556.0	390.2	428.3	162.3	167.4	70.0	23.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.16—Net[a] volume of live trees on forest land by forest-type group and stand origin, Oklahoma, 2014

Forest-type group	Total	Stand origin	
		Natural stands	Artificial regeneration
	million cubic feet		
Softwood types			
Loblolly-shortleaf pine	1,641.9	988.3	653.7
Other eastern softwoods	191.1	188.6	2.6
Pinyon-juniper	74.3	74.3	0.0
Total softwoods	1,907.4	1,251.1	656.2
Hardwood types			
Oak-pine	900.9	888.2	12.7
Oak-hickory	4,808.1	4,803.2	4.8
Oak-gum-cypress	317.3	317.3	0.0
Elm-ash-cottonwood	1,424.1	1,424.1	0.0
Other hardwoods	34.9	34.9	0.0
Woodland hardwoods	54.3	54.3	0.0
Exotic hardwoods	14.8	14.8	0.0
Total hardwoods	7,554.4	7,536.9	17.5
Nonstocked	10.4	10.3	0.1
All groups	9,472.2	8,798.3	673.8

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.16.1—Net[a] volume of live trees on timberland by forest-type group and stand origin, Oklahoma, 2014

Forest-type group	Total	Stand origin	
		Natural stands	Artificial regeneration
	million cubic feet		
Softwood types			
Loblolly-shortleaf pine	1,530.3	879.6	650.7
Other eastern softwoods	38.0	35.4	2.6
Total softwoods	1,568.3	915.0	653.3
Hardwood types			
Oak-pine	744.5	731.8	12.7
Oak-hickory	3,376.2	3,371.4	4.8
Oak-gum-cypress	290.1	290.1	0.0
Elm-ash-cottonwood	1,250.5	1,250.5	0.0
Other hardwoods	13.3	13.3	0.0
Woodland hardwoods	8.6	8.6	0.0
Exotic hardwoods	6.7	6.7	0.0
Total hardwoods	5,689.8	5,672.3	17.5
Nonstocked	1.1	1.0	0.1
All groups	7,259.2	6,588.3	670.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.17—Net[a] volume of growing-stock trees on timberland by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
							million cubic feet							
Softwood														
Loblolly and shortleaf pines	1,728.9	110.0	195.7	254.8	347.5	351.7	236.8	149.5	43.5	31.1	0.0	8.3	0.0	0.0
Other eastern softwoods	39.5	9.9	10.7	11.1	4.5	0.7	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	1,768.4	120.0	206.5	266.0	352.0	352.5	239.2	149.5	43.5	31.1	0.0	8.3	0.0	0.0
Hardwood														
Select white oaks	248.1	16.2	25.9	35.9	45.4	35.7	29.0	27.4	18.8	13.8	0.0	0.0	0.0	0.0
Select red oaks	196.2	6.2	12.5	19.5	23.0	22.1	20.4	17.2	8.6	29.3	20.5	4.6	0.0	12.4
Other white oaks	658.7	64.2	121.1	123.5	95.9	86.5	67.5	40.2	31.3	25.0	3.5	0.0	0.0	0.0
Other red oaks	618.2	21.8	42.8	63.7	75.6	91.4	58.1	67.4	69.7	73.5	35.0	13.6	5.6	0.0
Hickory	449.5	33.4	55.1	59.6	61.2	57.7	50.0	39.5	23.5	26.7	17.4	12.0	13.4	0.0
Hard maple	2.7	0.5	0.2	1.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	49.2	2.0	3.1	1.5	2.3	0.0	6.0	2.3	4.6	9.8	8.9	0.0	8.8	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	76.5	8.9	9.9	12.5	13.0	11.2	5.5	7.0	3.1	5.4	0.0	0.0	0.0	0.0
Tupelo and blackgum	27.4	2.0	4.1	3.5	4.8	5.2	2.2	1.8	3.7	0.0	0.0	0.0	0.0	0.0
Ash	156.1	14.6	20.6	24.2	25.3	24.3	13.5	9.7	11.0	3.4	0.0	9.5	0.0	0.0
Cottonwood and aspen	94.9	0.7	3.7	2.4	5.4	5.3	9.1	10.8	9.5	24.6	0.0	14.9	8.7	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	33.5	0.1	1.9	1.5	5.5	4.7	4.5	2.2	2.3	5.4	5.5	0.0	0.0	0.0
Other eastern soft hardwoods	304.0	29.5	33.0	38.5	27.2	39.5	19.2	19.6	34.5	16.6	2.5	32.8	0.0	11.0
Other eastern hard hardwoods	23.2	3.5	5.6	4.6	3.2	5.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	2,938.4	203.6	339.4	391.9	388.3	389.6	286.0	245.0	220.6	233.4	93.2	87.4	36.4	23.4
All species	4,706.8	323.6	545.9	657.9	740.3	742.1	525.3	394.5	264.0	264.5	93.2	95.7	36.4	23.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.18—Net[a] volume of growing-stock trees on timberland by species group and ownership group, Oklahoma, 2014

Species group	All ownerships	Ownership group				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
		million cubic feet				
Softwood						
Loblolly and shortleaf pines	1,728.9	456.5	55.4	37.8	0.0	1,179.2
Other eastern softwoods	39.5	0.6	1.9	0.0	0.0	36.9
Total softwoods	1,768.4	457.2	57.3	37.8	0.0	1,216.2
Hardwood						
Select white oaks	248.1	42.2	3.5	10.6	0.0	191.8
Select red oaks	196.2	5.3	46.2	7.0	0.0	137.7
Other white oaks	658.7	36.0	38.0	31.9	0.0	552.8
Other red oaks	618.2	7.4	49.5	12.5	0.0	548.8
Hickory	449.5	21.0	18.1	13.5	0.0	397.0
Hard maple	2.7	0.0	0.2	0.0	0.0	2.5
Soft maple	49.2	1.1	5.5	8.8	0.0	33.8
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	76.5	5.3	4.1	0.0	0.0	67.2
Tupelo and blackgum	27.4	3.7	0.1	0.0	0.0	23.6
Ash	156.1	0.1	17.7	4.4	0.0	133.9
Cottonwood and aspen	94.9	0.0	34.2	2.7	0.0	58.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	33.5	0.0	0.0	0.0	0.0	33.5
Other eastern soft hardwoods	304.0	3.2	33.3	12.4	0.0	255.0
Other eastern hard hardwoods	23.2	0.0	1.6	2.1	0.0	19.5
Total hardwoods	2,938.4	125.2	252.1	105.9	0.0	2,455.2
All species	4,706.8	582.3	309.3	143.8	0.0	3,671.3

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.19—Net[a] volume of sawtimber trees on timberland by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 9.0–10.9	11.0–12.9	13.0–14.9	15.0–16.9	17.0–18.9	19.0–20.9	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
						million board feet						
Softwood												
Loblolly and shortleaf pines	7,102.7	941.6	1,585.5	1,814.1	1,335.7	891.0	272.1	203.7	0.0	59.0	0.0	0.0
Other eastern softwoods	85.5	45.8	21.7	3.8	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	7,188.2	987.4	1,607.2	1,817.9	1,349.9	891.0	272.1	203.7	0.0	59.0	0.0	0.0
Hardwood												
Select white oaks	727.6	0.0	155.7	143.8	129.0	130.6	93.8	74.6	0.0	0.0	0.0	0.0
Select red oaks	757.4	0.0	78.6	85.0	90.4	83.6	42.7	158.9	113.1	27.3	0.0	77.9
Other white oaks	1,563.9	0.0	350.8	367.8	317.1	200.2	167.1	139.7	21.2	0.0	0.0	0.0
Other red oaks	2,262.1	0.0	261.0	360.1	259.1	322.5	352.1	392.3	199.0	81.0	34.9	0.0
Hickory	1,392.3	0.0	212.0	234.0	226.9	192.8	122.3	145.8	101.5	72.5	84.4	0.0
Hard maple	3.6	0.0	1.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	235.4	0.0	7.5	0.0	27.3	11.5	24.4	55.6	52.9	0.0	56.2	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	208.5	0.0	47.9	48.9	26.6	36.6	17.2	31.3	0.0	0.0	0.0	0.0
Tupelo and blackgum	71.0	0.0	14.9	19.7	9.5	8.6	18.3	0.0	0.0	0.0	0.0	0.0
Ash	413.1	0.0	83.4	95.2	58.6	45.3	54.5	18.7	0.0	57.4	0.0	0.0
Cottonwood and aspen	477.0	0.0	19.0	22.4	42.0	54.8	50.7	138.9	0.0	93.4	55.9	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	117.4	0.0	18.5	17.2	17.1	8.7	9.4	22.5	24.0	0.0	0.0	0.0
Other eastern soft hardwoods	977.2	0.0	92.3	154.4	87.5	93.6	175.8	90.3	14.2	200.7	0.0	68.3
Other eastern hard hardwoods	35.9	0.0	10.6	21.4	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	9,242.5	0.0	1,354.1	1,571.9	1,295.0	1,188.7	1,128.3	1,268.6	525.8	532.3	231.4	146.2
All species	16,430.7	987.4	2,961.4	3,389.8	2,644.9	2,079.7	1,400.4	1,472.3	525.8	591.4	231.4	146.2

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.20—Net[a] volume of sawtimber trees on timberland by species group and ownership group, Oklahoma, 2014

Species group	All ownerships	Ownership group				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million board feet					
Softwood						
Loblolly and shortleaf pines	7,102.7	1,997.4	264.3	178.7	0.0	4,662.2
Other eastern softwoods	85.5	0.0	4.7	0.0	0.0	80.8
Total softwoods	7,188.2	1,997.4	269.1	178.7	0.0	4,743.0
Hardwood						
Select white oaks	727.6	135.6	4.4	19.7	0.0	567.9
Select red oaks	757.4	10.0	236.0	24.6	0.0	486.8
Other white oaks	1,563.9	84.7	82.2	96.7	0.0	1,300.3
Other red oaks	2,262.1	18.3	193.6	34.4	0.0	2,015.8
Hickory	1,392.3	56.5	33.8	27.2	0.0	1,274.8
Hard maple	3.6	0.0	0.0	0.0	0.0	3.6
Soft maple	235.4	0.0	30.9	56.2	0.0	148.4
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	208.5	12.0	3.7	0.0	0.0	192.8
Tupelo and blackgum	71.0	8.4	0.0	0.0	0.0	62.6
Ash	413.1	0.0	27.4	17.4	0.0	368.3
Cottonwood and aspen	477.0	0.0	181.1	15.3	0.0	280.6
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	117.4	0.0	0.0	0.0	0.0	117.4
Other eastern soft hardwoods	977.2	2.1	141.7	58.5	0.0	774.9
Other eastern hard hardwoods	35.9	0.0	3.2	7.6	0.0	25.2
Total hardwoods	9,242.5	327.6	938.0	357.5	0.0	7,619.3
All species	16,430.7	2,325.1	1,207.1	536.2	0.0	12,362.3

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Excludes rotten, missing, and form cull defects volume.

Table D.21—Aboveground dry weight[a] of live trees on forest land by ownership class and land status, Oklahoma, 2014

Ownership class	All forest land	Unreserved			Reserved		
		Total	Timber-land	Un-productive	Total	Productive	Un-productive
	thousand tons						
U.S. Forest Service							
National forest	17,937.2	16,185.1	15,981.2	203.9	1,752.1	1,752.1	0.0
National grassland	193.2	193.2	0.0	193.2	0.0	0.0	0.0
Total	18,130.4	16,378.3	15,981.2	397.1	1,752.1	1,752.1	0.0
Other Federal							
Bureau of Land Management	93.2	93.2	0.0	93.2	0.0	0.0	0.0
U.S. Fish and Wildlife Service	2,014.3	0.0	0.0	0.0	2,014.3	1,119.5	894.9
Dept. of Defense/Dept. of Energy	14,216.6	13,414.5	12,624.1	790.3	802.1	640.2	162.0
Other Federal	1,246.3	837.5	837.5	0.0	408.8	408.8	0.0
Total	17,570.4	14,345.1	13,461.6	883.5	3,225.3	2,168.5	1,056.8
State and local government							
State	8,631.4	6,336.0	5,104.7	1,231.4	2,295.4	2,117.8	177.6
Local	2,869.3	2,869.3	1,627.5	1,241.8	0.0	0.0	0.0
Total	11,500.6	9,205.3	6,732.1	2,473.2	2,295.4	2,117.8	177.6
Nonindustrial private							
Undifferentiated private	234,441.7	234,441.7	175,122.5	59,319.1	0.0	0.0	0.0
Total	234,441.7	234,441.7	175,122.5	59,319.1	0.0	0.0	0.0
All classes	281,643.1	274,370.4	211,297.5	63,072.9	7,272.8	6,038.3	1,234.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0.= no sample for the cell or a value of >0.0 but <0.05.

[a] Calculation based on regional biomass equation.

Table D.22—Aboveground dry weight[a] of live trees on forest land by species group and diameter class, Oklahoma, 2014

Species group	All classes	Diameter class (*inches*) 1.0–2.9	3.0–4.9	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	21.0–24.9	25.0–28.9	29.0–32.9	33.0–36.9	37.0+
								thousand tons								
Softwood																
Loblolly and shortleaf pines	45,099.3	743.6	1,840.1	3,188.7	4,902.9	6,080.0	8,174.9	8,443.4	5,829.6	3,788.8	1,061.1	866.7	0.0	179.5	0.0	0.0
Other yellow pines	13.1	0.0	0.0	4.2	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern softwoods	12,715.1	848.7	1,612.0	2,819.1	2,531.5	2,204.3	1,383.5	578.0	457.7	132.1	148.4	0.0	0.0	0.0	0.0	0.0
Woodland softwoods	1,338.4	10.4	52.4	57.9	103.2	127.5	181.0	233.9	162.0	100.7	0.0	102.4	0.0	95.9	0.0	111.0
Total softwoods	59,165.9	1,602.6	3,504.5	6,069.9	7,546.5	8,411.9	9,739.4	9,255.3	6,449.2	4,021.6	1,209.5	969.2	0.0	275.5	0.0	111.0
Hardwood																
Select white oaks	12,861.6	139.5	388.9	716.6	1,068.1	1,455.0	1,827.8	1,487.1	1,375.3	1,348.6	1,047.8	1,392.2	326.8	287.9	0.0	0.0
Select red oaks	10,126.6	135.7	354.6	409.6	755.9	968.8	1,038.3	1,077.7	1,021.8	752.9	564.7	1,339.3	633.6	330.6	352.2	390.9
Other white oaks	63,344.4	1,206.3	2,857.8	7,040.9	10,014.7	10,080.3	8,472.1	7,383.8	6,234.8	4,123.9	2,448.2	2,562.4	469.3	312.9	137.2	0.0
Other red oaks	40,396.4	1,452.3	3,122.8	3,615.9	4,224.0	4,283.6	4,523.3	4,578.9	2,966.6	2,609.9	3,098.9	2,788.1	1,430.4	1,331.8	369.8	0.0
Hickory	28,308.0	1,140.8	2,299.4	2,396.1	2,981.2	3,235.4	3,163.3	2,866.3	2,652.9	1,731.2	1,509.3	1,979.5	1,222.4	356.0	774.1	0.0
Hard maple	326.6	22.8	15.0	58.1	37.0	93.5	44.2	26.7	0.0	29.3	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	2,709.5	244.3	317.6	206.9	215.6	149.1	77.5	52.8	192.3	124.6	166.3	219.2	200.3	346.5	196.5	0.0
Beech	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	2,767.1	133.4	168.7	353.5	349.1	422.0	339.8	356.5	198.6	237.1	86.5	121.9	0.0	0.0	0.0	0.0
Tupelo and blackgum	1,520.6	115.3	240.6	110.6	157.2	148.6	185.4	190.2	200.4	71.3	101.0	0.0	0.0	0.0	0.0	0.0
Ash	7,492.4	323.8	580.0	951.5	1,143.0	1,085.3	1,058.7	748.5	442.3	360.2	279.5	313.0	66.8	139.9	0.0	0.0
Cottonwood and aspen	3,476.1	20.4	35.6	88.2	142.5	138.7	167.9	222.8	352.4	283.3	215.1	601.5	441.1	456.9	309.8	0.0
Basswood	27.4	0.0	8.1	7.8	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	3,101.0	16.8	123.9	124.7	239.9	303.6	455.2	290.2	489.2	182.5	292.4	180.9	197.3	204.1	0.0	0.0
Other eastern soft hardwoods	32,704.6	2,600.5	4,551.3	3,504.0	3,754.3	3,617.0	2,882.9	2,726.1	2,121.6	1,585.2	1,883.3	1,300.0	397.6	1,485.1	0.0	295.8
Other eastern hard hardwoods	5,738.2	785.8	1,055.8	814.8	915.4	734.6	407.3	374.9	224.7	210.8	35.1	64.5	114.4	0.0	0.0	0.0
Eastern noncommercial hardwoods	5,555.8	1,013.9	1,171.5	943.4	786.4	521.9	330.6	276.0	190.6	57.8	56.5	104.0	103.4	0.0	0.0	0.0
Woodland hardwoods	2,019.3	42.5	83.3	440.9	348.2	307.6	232.5	134.9	77.7	65.7	41.8	100.8	143.3	0.0	0.0	0.0
Total hardwoods	222,477.2	9,395.6	17,374.8	21,783.5	27,143.9	27,545.0	25,206.7	22,793.2	18,741.4	13,774.3	11,826.5	13,067.4	5,746.8	5,251.8	2,139.6	686.7
All species	281,643.1	10,998.3	20,879.2	27,853.4	34,690.4	35,956.9	34,946.1	32,048.5	25,190.6	17,795.9	13,036.0	14,036.5	5,746.8	5,527.3	2,139.6	797.7

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Calculations based on TREE_REGIONAL_BIOMASS.REGIONAL_DRYBIOT.

Table D.23—Total carbon[a] of live trees on forest land by ownership class and land status, Oklahoma, 2014

Ownership class	All forest land	Unreserved			Reserved		
		Total	Timber-land	Un-productive	Total	Productive	Un-productive
	thousand tons						
U.S. Forest Service							
National forest	8,968.6	8,092.5	7,990.6	101.9	876.0	876.0	0.0
National grassland	96.6	96.6	0.0	96.6	0.0	0.0	0.0
Total	9,065.2	8,189.2	7,990.6	198.6	876.0	876.0	0.0
Other Federal							
Bureau of Land Management	46.6	46.6	0.0	46.6	0.0	0.0	0.0
U.S. Fish and Wildlife Service	1,007.2	0.0	0.0	0.0	1,007.2	559.7	447.4
Dept. of Defense/Dept. of Energy	7,108.3	6,707.2	6,312.1	395.2	401.1	320.1	81.0
Other Federal	623.2	418.7	418.7	0.0	204.4	204.4	0.0
Total	8,785.2	7,172.5	6,730.8	441.7	1,612.7	1,084.2	528.4
State and local government							
State	4,315.7	3,168.0	2,552.3	615.7	1,147.7	1,058.9	88.8
Local	1,434.6	1,434.6	813.7	620.9	0.0	0.0	0.0
Total	5,750.3	4,602.6	3,366.1	1,236.6	1,147.7	1,058.9	88.8
Nonindustrial private							
Undifferentiated private	117,220.8	117,220.8	87,561.3	29,659.6	0.0	0.0	0.0
Total	117,220.8	117,220.8	87,561.3	29,659.6	0.0	0.0	0.0
All classes	140,821.6	137,185.2	105,648.7	31,536.4	3,636.4	3,019.2	617.2

Numbers in rows and columns may not sum to totals due to rounding.

0.0.= no sample for the cell or a value of >0.0 but <0.05.

[a] Estimates of carbon calculated by multiplying aboveground dry tree biomass by 0.5. Calculations based on TREE_REGIONAL_BIOMASS.REGIONAL_DRYBIOT.

Table D.24—Average annual net growth of live trees by ownership class and land status, Oklahoma, 2014 (2008–2008 to 2010–2014)

Ownership class[a]	Timberland	Forest land
	million cubic feet per year	
U.S. Forest Service		
National forest	16.3	17.4
Total	16.3	17.4
Other Federal		
U.S. Fish and Wildlife Service	0.0	0.5
Dept. of Defense/ Dept. of Energy	3.7	2.4
Other Federal	-0.3	-0.7
Total	3.4	2.3
State and local government		
State	1.6	3.1
Local	0.2	0.1
Total	1.8	3.2
Nonindustrial private		
Other	127.3	127.9
Total	127.3	127.9
All classes	148.7	150.8

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.
[a] Based on current conditions.

Table D.25—Average annual net growth of live trees on forest land by forest-type group and stand-size class, Oklahoma, 2014 (2008–2008 to 2010–2014)

Forest-type group[a]	All classes	Stand-size class[a]			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	million cubic feet per year				
Softwood types					
Loblolly-shortleaf pine	85.7	47.6	25.8	12.3	0.0
Other eastern softwoods	2.5	0.7	1.3	0.5	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0
Total softwoods	88.2	48.3	27.1	12.7	0.0
Hardwood types					
Oak-pine	22.8	10.9	8.3	3.6	0.0
Oak-hickory	31.2	6.2	17.6	7.4	0.0
Oak-gum-cypress	4.0	2.0	1.9	0.1	0.0
Elm-ash-cottonwood	4.4	2.7	0.4	1.3	0.0
Other hardwoods	0.2	0.0	0.1	0.1	0.0
Total hardwoods	62.6	21.8	28.2	12.5	0.0
Nonstocked	0.1	0.0	0.0	0.0	0.1
All groups	150.8	70.2	55.3	25.3	0.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on past conditions.

Table D.25.1—Average annual net growth of live trees on timberland by forest-type group and stand-size class, Oklahoma, 2014 (2008–2008 to 2010–2014)

Forest-type group[a]	All size classes	Stand-size class[a]			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	million cubic feet per year				
Softwood types					
Loblolly-shortleaf pine	84.2	46.1	25.9	12.3	0.0
Other eastern softwoods	1.7	0.7	0.6	0.3	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0
Total softwoods	85.9	46.8	26.5	12.6	0.0
Hardwood types					
Oak-pine	22.6	10.9	8.7	2.9	0.0
Oak-hickory	32.4	7.1	18.5	6.8	0.0
Oak-gum-cypress	3.5	2.0	1.4	0.1	0.0
Elm-ash-cottonwood	4.1	2.6	0.3	1.2	0.0
Other hardwoods	0.2	0.0	0.1	0.1	0.0
Total hardwoods	62.8	22.7	28.9	11.2	0.0
Nonstocked	0.1	0.0	0.0	0.0	0.1
All groups	148.7	69.4	55.4	23.8	0.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on past conditions.

Table D.26—Average annual net growth of live trees on forest land by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	101.3	16.3	-0.5	1.8	0.0	83.7
Other eastern softwoods	6.9	0.2	0.4	0.2	0.0	6.1
Total softwoods	108.2	16.5	-0.1	2.0	0.0	89.8
Hardwood						
Select white oaks	5.9	0.9	-0.4	0.1	0.0	5.2
Select red oaks	3.2	0.4	0.7	0.1	0.0	2.0
Other white oaks	11.4	0.9	0.2	0.8	0.0	9.6
Other red oaks	-5.1	-2.5	-1.6	-0.4	0.0	-0.5
Hickory	4.1	0.7	0.5	0.2	0.0	2.7
Hard maple	0.3	0.0	0.0	0.0	0.0	0.3
Soft maple	1.4	0.3	0.7	-0.2	0.0	0.7
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	3.9	0.3	0.6	0.0	0.0	3.0
Tupelo and blackgum	0.7	-0.1	0.1	0.0	0.0	0.8
Ash	6.3	0.1	1.0	0.0	0.0	5.2
Cottonwood and aspen	2.0	0.0	0.8	0.1	0.0	1.2
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.4	0.0	0.0	0.0	0.0	0.4
Other eastern soft hardwoods	6.7	0.1	-0.4	0.6	0.0	6.4
Other eastern hard hardwoods	0.3	0.0	0.0	0.1	0.0	0.3
Eastern noncommercial hardwoods	1.0	0.0	0.1	0.0	0.0	0.9
Total hardwoods	42.6	0.9	2.3	1.2	0.0	38.1
All species	150.8	17.4	2.3	3.2	0.0	127.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.26.1—Average annual net growth of live trees on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	99.9	15.6	-0.1	0.7	0.0	83.7
Other eastern softwoods	5.2	0.0	0.4	0.0	0.0	4.8
Total softwoods	105.1	15.6	0.3	0.7	0.0	88.5
Hardwood						
Select white oaks	5.6	0.8	-0.4	0.0	0.0	5.3
Select red oaks	3.0	0.0	0.7	0.2	0.0	2.0
Other white oaks	11.5	0.8	0.6	0.5	0.0	9.6
Other red oaks	-2.0	-2.4	0.0	-0.4	0.0	0.9
Hickory	4.0	0.8	0.1	0.3	0.0	2.8
Hard maple	0.3	0.0	0.0	0.0	0.0	0.3
Soft maple	1.5	0.2	0.7	-0.2	0.0	0.9
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	3.3	0.2	0.0	0.0	0.0	3.0
Tupelo and blackgum	1.0	0.1	0.1	0.0	0.0	0.8
Ash	5.7	0.0	1.0	0.0	0.0	4.7
Cottonwood and aspen	2.0	0.0	0.8	0.1	0.0	1.2
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.4	0.0	0.0	0.0	0.0	0.4
Other eastern soft hardwoods	5.9	0.1	-0.6	0.5	0.0	5.9
Other eastern hard hardwoods	0.3	0.0	0.0	0.1	0.0	0.3
Eastern noncommercial hardwoods	1.0	0.0	0.1	0.0	0.0	0.9
Total hardwoods	43.6	0.7	3.1	1.1	0.0	38.7
All species	148.7	16.3	3.4	1.8	0.0	127.3

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.27—Average annual net growth of growing-stock trees on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	96.1	15.5	-0.1	0.6	0.0	80.1
Other eastern softwoods	1.3	0.0	0.0	0.0	0.0	1.3
Total softwoods	97.5	15.5	0.0	0.6	0.0	81.5
Hardwood						
Select white oaks	6.2	1.0	0.1	0.2	0.0	4.9
Select red oaks	3.9	0.1	0.8	0.3	0.0	2.6
Other white oaks	9.3	0.9	0.6	0.3	0.0	7.6
Other red oaks	0.2	-2.1	0.5	-0.2	0.0	1.9
Hickory	2.8	0.7	0.0	0.0	0.0	2.2
Hard maple	0.1	0.0	0.0	0.0	0.0	0.0
Soft maple	1.4	0.1	0.2	0.0	0.0	1.1
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	2.5	0.2	0.0	0.0	0.0	2.3
Tupelo and blackgum	0.5	0.1	0.0	0.0	0.0	0.3
Ash	4.0	0.0	0.6	-0.2	0.0	3.6
Cottonwood and aspen	2.2	0.0	0.8	0.1	0.0	1.3
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern soft hardwoods	2.8	0.1	-0.1	0.1	0.0	2.7
Other eastern hard hardwoods	0.1	0.0	0.1	0.1	0.0	0.0
Eastern noncommercial hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	36.0	1.2	3.6	0.7	0.0	30.4
All species	133.5	16.7	3.6	1.3	0.0	111.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.27.1—Average annual net growth of sawtimber on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	424.7	80.0	1.1	3.6	0.0	339.9
Other eastern softwoods	2.7	0.0	0.0	0.1	0.0	2.6
Total softwoods	427.4	80.0	1.1	3.7	0.0	342.6
Hardwood						
Select white oaks	29.6	6.0	0.1	1.0	0.0	22.5
Select red oaks	19.7	0.6	5.3	1.7	0.0	12.1
Other white oaks	28.1	3.2	1.5	1.8	0.0	21.6
Other red oaks	14.3	-11.6	3.8	-0.6	0.0	22.8
Hickory	11.7	3.2	-1.0	-0.3	0.0	9.8
Hard maple	0.1	0.0	0.0	0.0	0.0	0.1
Soft maple	8.6	0.0	1.3	0.3	0.0	7.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	5.3	0.5	0.2	0.0	0.0	4.6
Tupelo and blackgum	0.9	0.3	0.0	0.0	0.0	0.6
Ash	12.2	0.0	0.2	-0.6	0.0	12.7
Cottonwood and aspen	15.9	0.0	6.4	0.4	0.0	9.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.0	0.0	0.0	0.0	0.0	0.0
Other eastern soft hardwoods	9.0	0.1	0.5	0.1	0.0	8.2
Other eastern hard hardwoods	-0.8	0.0	0.7	0.3	0.0	-1.7
Eastern noncommercial hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	154.5	2.2	19.1	4.0	0.0	129.2
All species	581.8	82.2	20.2	7.6	0.0	471.8

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.28—Average annual mortality of live trees by ownership class and land status, Oklahoma, 2014 (2008–2008 to 2010–2014)

Ownership class[a]	Timberland	Forest land
	million cubic feet per year	
U.S. Forest Service		
National forest	5.4	6.0
Total	5.4	6.0
Other Federal		
U.S. Fish and Wildlife Service	0.0	0.2
Dept. of Defense/ Dept. of Energy	6.4	7.6
Other Federal	0.9	1.8
Total	7.3	9.6
State and local government		
State	2.0	2.5
Local	0.5	0.7
Total	2.5	3.2
Nonindustrial private		
Other	63.8	70.5
Total	63.8	70.5
All classes	79.1	89.3

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.29—Average annual mortality of live trees on forest land by forest-type group and stand-size class, Oklahoma, 2014 (2008–2008 to 2010–2014)

Forest-type group[a]	All classes	Stand-size class			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	million cubic feet per year				
Softwood types					
Loblolly-shortleaf pine	13.4	11.9	0.7	0.7	0.0
Other eastern softwoods	0.3	0.1	0.2	0.0	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0
Total softwoods	13.7	12.0	0.9	0.7	0.0
Hardwood types					
Oak-pine	5.2	2.8	2.1	0.3	0.0
Oak-hickory	58.3	34.7	21.0	2.6	0.0
Oak-gum-cypress	3.1	2.7	0.2	0.2	0.0
Elm-ash-cottonwood	9.1	5.3	3.3	0.5	0.0
Other hardwoods	0.0	0.0	0.0	0.0	0.0
Total hardwoods	75.6	45.5	26.6	3.5	0.0
Nonstocked	0.0	0.0	0.0	0.0	0.0
All groups	89.3	57.5	27.5	4.3	0.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on past conditions.

Table D.29.1—Average annual mortality of live trees on timberland by forest-type group and stand-size class, Oklahoma, 2014 (2008–2008 to 2010–2014)

Forest-type group[a]	All classes	Stand-size class[a]			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	million cubic feet per year				
Softwood types					
Loblolly-shortleaf pine	11.9	10.6	0.6	0.7	0.0
Other eastern softwoods	0.3	0.1	0.2	0.0	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0
Total softwoods	12.2	10.7	0.7	0.7	0.0
Hardwood types					
Oak-pine	4.8	2.8	1.7	0.3	0.0
Oak-hickory	49.9	31.3	16.5	2.1	0.0
Oak-gum-cypress	3.1	2.7	0.2	0.2	0.0
Elm-ash-cottonwood	9.1	5.3	3.3	0.5	0.0
Other hardwoods	0.0	0.0	0.0	0.0	0.0
Total hardwoods	66.9	42.1	21.7	3.1	0.0
Nonstocked	0.0	0.0	0.0	0.0	0.0
All groups	79.1	52.8	22.5	3.8	0.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on past conditions.

Table 30—Average annual mortality of live trees on forest land by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	14.2	1.9	1.9	0.6	0.0	9.8
Other eastern softwoods	0.6	0.0	0.0	0.0	0.0	0.5
Total softwoods	14.8	1.9	1.9	0.7	0.0	10.4
Hardwood						
Select white oaks	2.0	0.2	0.7	0.2	0.0	1.0
Select red oaks	2.8	0.3	0.2	0.3	0.0	2.1
Other white oaks	14.2	0.2	0.8	0.2	0.0	13.0
Other red oaks	32.6	2.8	3.9	1.3	0.0	24.6
Hickory	7.1	0.4	0.6	0.3	0.0	5.9
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.9	0.0	0.1	0.0	0.0	0.8
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	0.5	0.0	0.1	0.0	0.0	0.4
Tupelo and blackgum	0.3	0.2	0.0	0.0	0.0	0.0
Ash	1.6	0.0	0.1	0.2	0.0	1.3
Cottonwood and aspen	0.7	0.0	0.2	0.0	0.0	0.5
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.2	0.0	0.0	0.0	0.0	0.1
Other eastern soft hardwoods	9.1	0.0	1.0	0.0	0.0	8.1
Other eastern hard hardwoods	1.5	0.0	0.1	0.0	0.0	1.4
Eastern noncommercial hardwoods	1.0	0.0	0.0	0.0	0.0	1.0
Total hardwoods	74.5	4.1	7.8	2.5	0.0	60.2
All species	89.3	6.0	9.6	3.2	0.0	70.5

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table 30.1—Average annual mortality of live trees on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	12.7	1.6	0.9	0.4	0.0	9.8
Other eastern softwoods	0.5	0.0	0.0	0.0	0.0	0.4
Total softwoods	13.2	1.6	0.9	0.4	0.0	10.2
Hardwood						
Select white oaks	1.9	0.2	0.7	0.1	0.0	1.0
Select red oaks	2.8	0.3	0.2	0.3	0.0	2.1
Other white oaks	10.6	0.2	0.6	0.2	0.0	9.7
Other red oaks	29.6	2.8	2.9	1.0	0.0	22.8
Hickory	6.1	0.3	0.6	0.2	0.0	5.0
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.8	0.0	0.1	0.0	0.0	0.7
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	0.4	0.0	0.0	0.0	0.0	0.4
Tupelo and blackgum	0.0	0.0	0.0	0.0	0.0	0.0
Ash	1.6	0.0	0.1	0.2	0.0	1.2
Cottonwood and aspen	0.7	0.0	0.2	0.0	0.0	0.5
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.1	0.0	0.0	0.0	0.0	0.1
Other eastern soft hardwoods	8.8	0.0	1.0	0.0	0.0	7.8
Other eastern hard hardwoods	1.5	0.0	0.1	0.0	0.0	1.3
Eastern noncommercial hardwoods	1.0	0.0	0.0	0.0	0.0	1.0
Total hardwoods	65.9	3.8	6.4	2.0	0.0	53.7
All species	79.1	5.4	7.3	2.5	0.0	63.8

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.31—Average annual mortality of growing-stock trees on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	10.4	1.4	0.9	0.3	0.0	7.7
Other eastern softwoods	0.2	0.0	0.0	0.0	0.0	0.2
Total softwoods	10.6	1.5	0.9	0.4	0.0	7.9
Hardwood						
Select white oaks	0.6	0.2	0.0	0.0	0.0	0.5
Select red oaks	0.9	0.1	0.0	0.0	0.0	0.8
Other white oaks	4.8	0.1	0.4	0.1	0.0	4.2
Other red oaks	18.5	2.4	1.4	0.4	0.0	14.3
Hickory	3.1	0.1	0.5	0.2	0.0	2.3
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.2	0.0	0.0	0.0	0.0	0.2
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	0.4	0.0	0.0	0.0	0.0	0.3
Tupelo and blackgum	0.0	0.0	0.0	0.0	0.0	0.0
Ash	0.6	0.0	0.0	0.2	0.0	0.3
Cottonwood and aspen	0.5	0.0	0.2	0.0	0.0	0.2
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.1	0.0	0.0	0.0	0.0	0.1
Other eastern soft hardwoods	2.6	0.0	0.4	0.0	0.0	2.2
Other eastern hard hardwoods	0.6	0.0	0.0	0.0	0.0	0.6
Eastern noncommercial hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	32.9	2.9	3.0	1.1	0.0	26.0
All species	43.6	4.4	3.9	1.4	0.0	33.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.31.1—Average annual mortality of sawtimber on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	42.0	5.9	4.1	0.9	0.0	31.1
Other eastern softwoods	0.3	0.0	0.0	0.0	0.0	0.3
Total softwoods	42.3	5.9	4.1	0.9	0.0	31.4
Hardwood						
Select white oaks	0.0	0.0	0.0	0.0	0.0	0.0
Select red oaks	2.1	0.0	0.0	0.0	0.0	2.1
Other white oaks	12.6	0.0	1.2	0.0	0.0	11.4
Other red oaks	65.2	12.6	6.1	1.3	0.0	45.2
Hickory	8.0	0.0	1.5	0.5	0.0	5.9
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.0	0.0	0.0	0.0	0.0	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	1.0	0.0	0.0	0.0	0.0	1.0
Tupelo and blackgum	0.0	0.0	0.0	0.0	0.0	0.0
Ash	1.4	0.0	0.0	1.0	0.0	0.4
Cottonwood and aspen	0.8	0.0	0.8	0.0	0.0	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.4	0.0	0.0	0.0	0.0	0.4
Other eastern soft hardwoods	3.4	0.0	0.6	0.0	0.0	2.7
Other eastern hard hardwoods	2.9	0.0	0.0	0.0	0.0	2.9
Eastern noncommercial hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	97.7	12.6	10.2	2.8	0.0	72.1
All species	140.0	18.5	14.3	3.7	0.0	103.5

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.32—Average annual net removals of live trees by ownership class and land status, Oklahoma, 2014 (2008–2008 to 2010–2014)

Ownership class[a]	Timberland	Forest land
	million cubic feet per year	
U.S. Forest Service		
National forest	3.0	3.0
Total	3.0	3.0
Other Federal		
Dept. of Defense/ Dept. of Energy	0.1	0.1
Total	0.1	0.1
State and local government		
State	3.5	1.7
Total	3.5	1.7
Nonindustrial private		
Other	116.3	100.2
Total	116.3	100.2
All classes	122.9	105.0

Numbers in rows and columns may not sum to totals due to rounding.
0.0 = no sample for the cell or a value of >0.0 but <0.05.
[a] Based on current conditions.

Table D.33—Average annual removals of live trees on forest land by forest-type group and stand-size class, Oklahoma, 2014 (2008–2008 to 2010–2014)

Forest-type group[a]	All classes	Stand-size class[a]			Non-stocked
		Large diameter	Medium diameter	Small diameter	
	million cubic feet per year				
Softwood types					
Loblolly-shortleaf pine	65.4	51.7	13.4	0.2	0.0
Other eastern softwoods	0.2	0.0	0.1	0.0	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0
Total softwoods	65.5	51.7	13.6	0.2	0.0
Hardwood types					
Oak-pine	5.6	0.2	4.4	1.1	0.0
Oak-hickory	26.9	11.0	13.4	2.5	0.0
Oak-gum-cypress	0.3	0.0	0.1	0.1	0.0
Elm-ash-cottonwood	6.6	5.6	0.0	1.0	0.0
Other hardwoods	0.0	0.0	0.0	0.0	0.0
Total hardwoods	39.4	16.8	17.9	4.7	0.0
Nonstocked	0.0	0.0	0.0	0.0	0.0
All groups	105.0	68.5	31.5	4.9	0.0

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on past conditions.

Table D.33.1—Average annual removals of live trees on timberland by forest-type group and stand-size class, Oklahoma, 2014 (2008–2008 to 2010–2014)

Forest-type group[a]	All classes	Stand-size class[a]			
		Large diameter	Medium diameter	Small diameter	Non-stocked
	million cubic feet per year				
Softwood types					
Loblolly-shortleaf pine	65.2	51.5	13.4	0.2	0.0
Other eastern softwoods	3.3	0.0	2.1	1.2	0.0
Pinyon-juniper	0.0	0.0	0.0	0.0	0.0
Total softwoods	68.6	51.5	15.6	1.4	0.0
Hardwood types					
Oak-pine	6.7	0.2	5.4	1.1	0.0
Oak-hickory	36.6	15.2	17.6	3.9	0.0
Oak-gum-cypress	0.3	0.0	0.1	0.1	0.0
Elm-ash-cottonwood	10.7	9.3	0.4	1.0	0.0
Other hardwoods	0.0	0.0	0.0	0.0	0.0
Total hardwoods	54.3	24.6	23.5	6.1	0.0
Nonstocked	0.1	0.0	0.0	0.0	0.1
All groups	122.9	76.2	39.1	7.5	0.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on past conditions.

Table D.34—Average annual removals of live trees on forest land by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	67.4	2.8	0.0	0.6	0.0	64.1
Other eastern softwoods	1.2	0.0	0.0	0.0	0.0	1.2
Total softwoods	68.6	2.8	0.0	0.6	0.0	65.3
Hardwood						
Select white oaks	3.9	0.0	0.0	0.0	0.0	3.9
Select red oaks	0.2	0.0	0.0	0.0	0.0	0.2
Other white oaks	10.4	0.1	0.0	0.8	0.0	9.6
Other red oaks	9.0	0.0	0.1	0.1	0.0	8.9
Hickory	3.3	0.0	0.0	0.3	0.0	3.0
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.4	0.0	0.0	0.0	0.0	0.4
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	1.3	0.0	0.0	0.0	0.0	1.3
Tupelo and blackgum	0.5	0.1	0.0	0.0	0.0	0.4
Ash	2.5	0.0	0.0	0.0	0.0	2.5
Cottonwood and aspen	0.0	0.0	0.0	0.0	0.0	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.2	0.0	0.0	0.0	0.0	0.2
Other eastern soft hardwoods	3.7	0.0	0.0	0.0	0.0	3.7
Other eastern hard hardwoods	0.4	0.0	0.0	0.0	0.0	0.4
Eastern noncommercial hardwoods	0.4	0.0	0.0	0.0	0.0	0.4
Total hardwoods	36.3	0.2	0.1	1.2	0.0	34.9
All species	105.0	3.0	0.1	1.7	0.0	100.2

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.34.1—Average annual removals of live trees on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	68.8	2.8	0.0	1.5	0.0	64.6
Other eastern softwoods	4.0	0.0	0.0	0.9	0.0	3.2
Total softwoods	72.8	2.8	0.0	2.4	0.0	67.7
Hardwood						
Select white oaks	4.7	0.0	0.0	0.0	0.0	4.7
Select red oaks	0.6	0.0	0.0	0.0	0.0	0.6
Other white oaks	15.2	0.1	0.0	0.8	0.0	14.4
Other red oaks	9.7	0.0	0.1	0.2	0.0	9.4
Hickory	3.6	0.0	0.0	0.1	0.0	3.4
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.4	0.0	0.0	0.0	0.0	0.4
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	1.3	0.0	0.0	0.0	0.0	1.3
Tupelo and blackgum	0.5	0.1	0.0	0.0	0.0	0.4
Ash	3.5	0.0	0.0	0.0	0.0	3.5
Cottonwood and aspen	0.0	0.0	0.0	0.0	0.0	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.2	0.0	0.0	0.0	0.0	0.2
Other eastern soft hardwoods	8.7	0.0	0.0	0.0	0.0	8.6
Other eastern hard hardwoods	0.9	0.0	0.0	0.0	0.0	0.9
Eastern noncommercial hardwoods	0.7	0.0	0.0	0.0	0.0	0.7
Total hardwoods	50.1	0.2	0.1	1.2	0.0	48.6
All species	122.9	3.0	0.1	3.5	0.0	116.3

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.35—Average annual removals of growing-stock trees on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million board feet per year					
Softwood						
Loblolly and shortleaf pines	65.7	2.7	0.0	1.2	0.0	61.8
Other eastern softwoods	1.2	0.0	0.0	0.2	0.0	0.9
Total softwoods	66.8	2.7	0.0	1.4	0.0	62.8
Hardwood						
Select white oaks	3.8	0.0	0.0	0.0	0.0	3.8
Select red oaks	0.1	0.0	0.0	0.0	0.0	0.1
Other white oaks	9.1	0.1	0.0	0.3	0.0	8.7
Other red oaks	5.5	0.0	0.0	0.0	0.0	5.5
Hickory	1.7	0.0	0.0	0.1	0.0	1.6
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.2	0.0	0.0	0.0	0.0	0.2
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	1.2	0.0	0.0	0.0	0.0	1.2
Tupelo and blackgum	0.3	0.1	0.0	0.0	0.0	0.2
Ash	0.8	0.0	0.0	0.0	0.0	0.8
Cottonwood and aspen	0.0	0.0	0.0	0.0	0.0	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.2	0.0	0.0	0.0	0.0	0.2
Other eastern soft hardwoods	4.0	0.0	0.0	0.0	0.0	4.0
Other eastern hard hardwoods	0.2	0.0	0.0	0.0	0.0	0.2
Eastern noncommercial hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	27.2	0.2	0.0	0.4	0.0	26.7
All species	94.1	2.9	0.0	1.8	0.0	89.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Table D.35.1—Average annual removals of sawtimber on timberland by species group and ownership group, Oklahoma, 2014 (2008–2008 to 2010–2014)

Species group	All ownerships	Ownership group[a]				
		U.S. Forest Service	Other Federal	State and local government	Forest industry	Non-industrial private
	million cubic feet per year					
Softwood						
Loblolly and shortleaf pines	253.1	8.6	0.0	5.4	0.0	239.1
Other eastern softwoods	1.0	0.0	0.0	0.8	0.0	0.3
Total softwoods	254.1	8.6	0.0	6.1	0.0	239.4
Hardwood						
Select white oaks	5.7	0.0	0.0	0.0	0.0	5.7
Select red oaks	0.0	0.0	0.0	0.0	0.0	0.0
Other white oaks	22.7	0.0	0.0	0.3	0.0	22.4
Other red oaks	16.2	0.0	0.0	0.0	0.0	16.2
Hickory	2.2	0.0	0.0	0.0	0.0	2.2
Hard maple	0.0	0.0	0.0	0.0	0.0	0.0
Soft maple	0.0	0.0	0.0	0.0	0.0	0.0
Beech	0.0	0.0	0.0	0.0	0.0	0.0
Sweetgum	0.0	0.0	0.0	0.0	0.0	0.0
Tupelo and blackgum	0.0	0.0	0.0	0.0	0.0	0.0
Ash	0.0	0.0	0.0	0.0	0.0	0.0
Cottonwood and aspen	0.0	0.0	0.0	0.0	0.0	0.0
Basswood	0.0	0.0	0.0	0.0	0.0	0.0
Black walnut	0.8	0.0	0.0	0.0	0.0	0.8
Other eastern soft hardwoods	13.8	0.0	0.0	0.0	0.0	13.8
Other eastern hard hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Eastern noncommercial hardwoods	0.0	0.0	0.0	0.0	0.0	0.0
Total hardwoods	61.3	0.0	0.0	0.3	0.0	61.0
All species	315.4	8.6	0.0	6.5	0.0	300.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = no sample for the cell or a value of >0.0 but <0.05.

[a] Based on current conditions.

Dooley, Kerry; Randolph, KaDonna. 2017. Oklahoma's forests, 2014. Resour. Bull. SRS–212. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 99 p.

This resource bulletin describes the principal findings of the 2014 forest inventory of Oklahoma (conducted 2009–2014) and examines changes since the previous survey of Oklahoma in 2008. Topics presented include forest area, volume, biomass, number of trees, growth, mortality, removals, forest health, silvicultural treatments, and forest ownership.

Keywords: FIA, forest health, forest inventory, forest ownership, forest survey, forest trends, Oklahoma.

June 2017

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Native rock in the shape of Oklahoma. (photo by Jacob Dyer, Oklahoma Forestry Services)

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