



RESOURCE UPDATE FS-15



FORESTS OF Oklahoma, 2012

This resource update provides an overview of forest resources in Oklahoma based on an inventory conducted by the U.S. Forest Service, Forest Inventory and Analysis (FIA) program at the Southern Research Station, in cooperation with Oklahoma Forestry Services (OFS). Estimates are based on field data collected using the FIA annualized sample design and are updated yearly (moving average). The estimates presented in this update are for the 2012 measurement year with comparisons made to data reported in 2011 where appropriate (table 1). The sample plot population in 2012 for Oklahoma consists of 7,535 plots for all units, collected across a period of 5 years in the east (units 1 and 2) and a 10-year cycle for the central and west (units 3-7). Growth, removals, and mortality estimates are based solely on units 1 and 2. Prior to 2009, only units 1 and 2 were surveyed. Currently, all of Oklahoma's forest land is being sampled. Forested area (acres) was calculated for all seven units. The data used in this publication was

accessed from the FIA database, July 12, 2014 (<http://apps.fs.fed.us/Evaluator/evaluator.jsp>).

Overview

The 77 counties of Oklahoma are partitioned into seven FIA survey units (fig.1): Southeast (unit 1), Northeast (unit 2), North Central (unit 3), South Central (unit 4), Southwest (unit 5), High Plains (unit 6), and Great Plains (unit 7). East Oklahoma comprises units 1 and 2, while central and west Oklahoma consist of units 3 through 7. This overview represents the 2012 annual inventory plot data. Data for east Oklahoma includes the initial establishment of fixed plots in 2008. Central and west Oklahoma plot collection started in 2009. Currently east Oklahoma is 60 percent complete (5-year cycle), while west Oklahoma is only 40 percent complete (10-year cycle).

Table 1—Oklahoma forest statistics, change between 2011 and 2012

Forest statistics	2011 estimate	Sampling error (percent)	2012 estimate	Sampling error (percent)	Change since 2011
Forest land					
Area (<i>thousand acres</i>)	12,646.1	1.91	12,654.0	1.68	7.9
Number of live trees ≥1 inch d.b.h. (<i>million trees</i>)	5,571.6	3.02	5,424.9	2.71	-146.7
Net volume live trees ≥5 inches d.b.h. (<i>million cubic feet</i>)	9,578.9	2.72	9,527.1	2.48	-51.8
Live trees aboveground biomass (<i>thousand oven-dry tons</i>)	283,129.0	2.31	281,074.0	2.12	-2,055.0
Net growth live trees ≥5 inches d.b.h. (<i>million cubic feet</i>) ^a	180.1	10.04	169.1	8.51	-11.0
Annual removals of live trees ≥5 inches d.b.h. (<i>million cubic feet</i>) ^b	120.6	23.16	115.4	18.76	-5.2
Annual mortality of live trees ≥5 inches d.b.h. (<i>million cubic feet</i>) ^c	78.5	13.48	82.3	9.88	3.8
Timberland					
Area (<i>thousand acres</i>)	7,573.8	2.51	7,411.7	2.27	-162.1
Number of live trees ≥1 inch d.b.h. (<i>million trees</i>)	3842.2	3.54	3685.7	3.25	-156.5
Net volume live trees ≥5 inches d.b.h. (<i>million cubic feet</i>)	7390.1	3.50	7328.2	3.21	-61.9
Live trees aboveground biomass (<i>thousand oven-dry tons</i>)	213,571.0	3.22	211,296.0	2.94	-2,275.0
Net growth live trees ≥5 inches d.b.h. (<i>million cubic feet</i>) ^a	166.1	10.75	158.9	8.98	-7.2
Annual removals of live trees ≥5 inches d.b.h. (<i>million cubic feet</i>) ^b	136.6	21.05	139.2	16.16	2.6
Annual mortality of live trees ≥5 inches d.b.h. (<i>million cubic feet</i>) ^c	70.5	14.42	74.9	10.56	4.4

^a Net growth estimates based on units 1 and 2.

^b Annual removals estimates based on units 1 and 2.

^c Annual mortality estimates based on units 1 and 2.



Forest Area



Figure 1—County names and survey units in Oklahoma.

Oklahoma's 2012 data show a total forest area of 12.7 million acres (28 percent) of the surveyed land area (table 2). Also, 7.7 million acres (59 percent), of the forest area was considered available for timber production is known as timberland. The remaining forest area was either reserved forest land where timber removals are prohibited by law or unproductive forest land (produces ≤ 20 cubic feet per acre per year). Forest land in 2012 showed a net increase of almost 8,000 acres.

Table 2—Area of forest land and change by survey unit, Oklahoma, 2011 and 2012

Survey unit	2011	2012	Change
<i>thousand acres</i>			
Unit 1: Southeast	4,264.1	4,296.8	32.7
Unit 2: Northeast	1,539.8	1,538.1	-1.7
Unit 3: North Central	1,555.8	1,525.9	-29.9
Unit 4: South Central	2,787.5	2,785.5	-2.0
Unit 5: Southwest	1,784.1	1,819.4	35.3
Unit 6: High Plains	143.8	137.6	-6.2
Unit 7: Great Plains	571.1	550.9	-20.2
Total	12,646.1	12,654.0	7.9

The largest forest-type group in Oklahoma is oak-hickory. Loblolly-shortleaf pine is the largest forest-type group in unit 1, while the elm-ash-cottonwood forest-type is present in most units. Ninety-two softwood and hardwood tree species were tallied on FIA plots within the seven units of Oklahoma. The percent stocking of these species on a plot determines the forest-type group (fig. 2). Loblolly-shortleaf pine and other softwood forest types accounted for 1.8 million acres of the forest land (15 percent), compared to 10.8 million acres for hardwoods (85 percent). The predominant hardwood forest types are oak-pine, oak-hickory, oak-gum-cypress, and elm-ash-cottonwood.

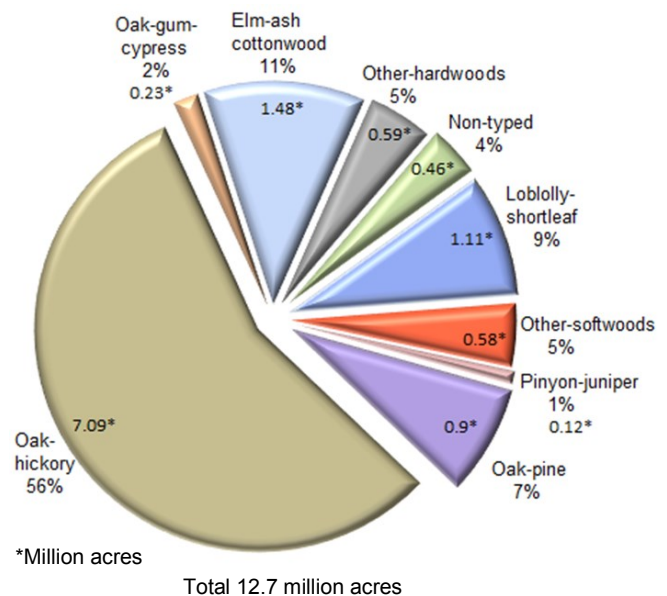
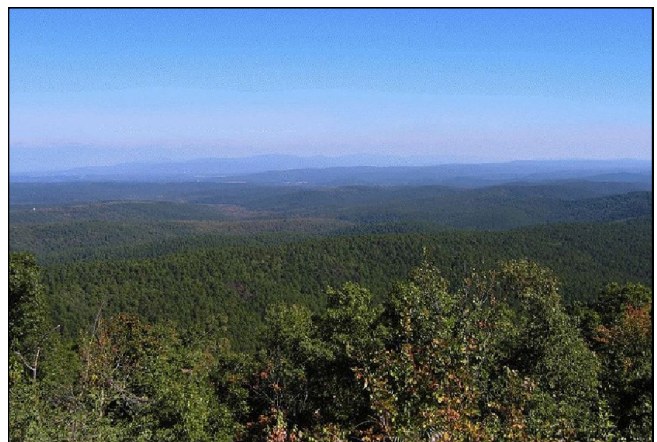


Figure 2—Area of forest land and forest-type group, Oklahoma, 2012.



Ouachita National Forest located in eastern Oklahoma and western Arkansas. (photo courtesy of Ouachita National Forest)

Volume, Biomass, and Trends

Results of the 2012 inventory show a net volume of softwoods on forest land of 2.2 billion cubic feet (table 3). Of that, 1.8 billion cubic feet (81.7 percent) was concentrated in east Oklahoma, units 1 and 2. The remaining 407.7 million cubic feet (18.3 percent) was in central and west Oklahoma, units 3-7. As stated previously, the inventory in central and west Oklahoma (units 3-7) is only 40 percent complete and should be viewed as an incomplete estimate.

Table 3—Net volume of softwood (≥5 inches d.b.h.) on forest land by survey unit, Oklahoma, 2011 and 2012

Survey unit	2011	2012	Change
<i>thousand cubic feet</i>			
Unit 1: Southeast	1,688,750.7	1,748,218.2	59,467.5
Unit 2: Northeast	71,331.6	74,266.4	2,934.8
Unit 3: North Central	62,112.3	50,938.6	—
Unit 4: South Central	176,970.3	171,391.4	—
Unit 5: Southwest	98,359.9	97,479.9	—
Unit 6: High Plains	18,960.5	16,980.3	—
Unit 7: Great Plains	59,240.4	70,952.4	—
Total	2,175,725.7	2,230,227.1	—

— = Incomplete estimate for 2011 and 2012.

The 2012 inventory also shows a total of 7.3 billion cubic feet of volume of hardwood on forest land in Oklahoma (table 4). Of that, 3.8 billion cubic feet (52.6 percent), was in east Oklahoma, units 1 and 2. The remaining 3.5 billion cubic feet (47.4 percent), was in central and west Oklahoma (units 3-7).

Table 4—Net volume of hardwood (≥5 inches d.b.h.) on forest land by survey unit, Oklahoma 2011 and 2012

Survey unit	2011	2012	Change
<i>thousand cubic feet</i>			
Unit 1: Southeast	2,258,194.9	2,243,526.0	-14,668.9
Unit 2: Northeast	1,588,041.3	1,591,870.6	3,829.3
Unit 3: North Central	1,067,152.5	1,012,152.1	—
Unit 4: South Central	1,657,492.3	1,650,553.3	—
Unit 5: Southwest	565,880.1	576,515.7	—
Unit 6: High Plains	14,070.0	12,044.1	—
Unit 7: Great Plains	252,366.3	210,254.6	—
Total	7,403,197.3	7,296,916.5	—

— = Incomplete estimate for 2011 and 2012.

Biomass is an important resource in Oklahoma. FIA has been calculating these numbers for many years. The 2012 data show 48.5 million tons of softwoods (dry weight) on all forest land in Oklahoma (table 5). The majority of biomass was in east Oklahoma (units 1 and 2), almost 40 million tons (81.9 percent) of softwood biomass above-ground on forested land. Central and west Oklahoma (units 3-7) had 8.8 million tons (18.1 percent) of softwood biomass.

Table 5—Biomass dry weight of softwood on forest land by survey unit, Oklahoma, 2011 and 2012

Survey unit	2011	2012	Change
<i>short tons</i>			
Unit 1: Southeast	36,803.0	38,057.9	1,254.5
Unit 2: Northeast	1,613.0	1,678.7	65.7
Unit 3: North Central	1,471.5	1,166.4	—
Unit 4: South Central	3,345.8	3,337.5	—
Unit 5: Southwest	2,450.7	2,435.1	—
Unit 6: High Plains	304.5	270.9	—
Unit 7: Great Plains	1,381.2	1,567.3	—
Total	47,370.1	48,513.8	—

— = Incomplete estimate for 2011 and 2012.

The hardwood biomass data show 232.6 million tons on all forest land in Oklahoma (table 6). The majority of hardwood biomass was in east Oklahoma (units 1 and 2), with 123.0 million tons (52.9 percent) aboveground on all forested land. Central and west Oklahoma (units 3-7) had 109.5 million tons of hardwood biomass (47.1 percent). The 2012 trend shows a slight increase in softwood volume and biomass and a slight decrease in hardwood volume and biomass in east Oklahoma (units 1 and 2).

Table 6—Biomass dry weight of hardwoods on forest land by survey unit, Oklahoma, 2011 and 2012

Survey unit	2011	2012	Change
<i>short tons</i>			
Unit 1: Southeast	74,871.4	74,407.1	-464.3
Unit 2: Northeast	48,696.4	48,612.5	-83.9
Unit 3: North Central	33,825.2	32,343.9	—
Unit 4: South Central	53,834.6	53,156.6	—
Unit 5: Southwest	17,182.2	17,917.4	—
Unit 6: High Plains	499.0	426.6	—
Unit 7: Great Plains	6,850.3	5,695.9	—
Total	235,759.3	232,560.1	—

— = Incomplete estimate for 2011 and 2012.

Oklahoma's Carbon 2012

The Oklahoma Carbon Project is a small-scale pilot, voluntary program that verifies, certifies, and registers Oklahoma's carbon offsets. This section provides some information on carbon found on Oklahoma forest land by survey unit. To reiterate, users should be aware that surveys are completed on a 5-year cycle in east (units 1 and 2) and a 10-year cycle in central and west (units 3-7) Oklahoma. Lower variability in the estimates is likely as the cycles near completion. This analysis is based on the FIA annual inventory conducted in 2012 in cooperation with OFS; due to temporal factors associated with this sample in west Oklahoma, only east Oklahoma will be reviewed. Note that all carbon is measured in short tons.

The comparison (inventory year 2011 to 2012) of above-ground carbon in east Oklahoma showed unit 1 with a 0.71 percent change (table 7) and unit 2 with a -0.04 percent change. The overall change in east Oklahoma is <0.75 percent and thus showed no significant change.

Table 7—Aboveground carbon in live trees (≥1 inch d.b.h.) by survey unit Oklahoma, 2011 and 2012

Survey unit	2011	2012	Change
<i>short tons</i>			
Unit 1: Southeast	55,837.4	56,232.5	395.1
Unit 2: Northeast	25,154.7	25,145.6	-9.1
Unit 3: North Central	17,648.4	16,755.2	—
Unit 4: South Central	28,590.2	28,247.1	—
Unit 5: Southwest	9,816.5	10,176.2	—
Unit 6: High Plains	401.8	348.7	—
Unit 7: Great Plains	4,115.7	3,631.6	—
Total	141,564.7	140,536.9	—

— = Incomplete estimate for 2011 and 2012 units.

The belowground carbon (table 8) for east Oklahoma survey units (comparing 2011 to 2012), showed unit 1 at 0.83 percent change and unit 2 at -0.05 percent change. The change in east Oklahoma is <1 percent, which is not a significant change.

Table 8—Belowground carbon in live trees (≥1 inch d.b.h.) by survey unit, Oklahoma, 2011 and 2012

Survey unit	2011	2012	Change
<i>short tons</i>			
Unit 1: Southeast	11,627.1	11,724.1	97.0
Unit 2: Northeast	4,952.9	4,950.2	-2.7
Unit 3: North Central	3,493.5	3,310.4	—
Unit 4: South Central	5,693.3	5,619.1	—
Unit 5: Southwest	1,983.3	2,055.9	—
Unit 6: High Plains	84.8	73.7	—
Unit 7: Great Plains	830.6	739.8	—
Total	28,665.5	28,473.2	—

— = Incomplete estimate for 2011 and 2012 units.



Canadian River Watershed. (photo courtesy of Carri Abner, Oklahoma Forestry Services, FIA)

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