



Arkansas's Forests, 2019: Annual Update

This resource update is a brief look at some of the basic metrics that describe the status of and changes to forest resources in Arkansas. Estimates presented here are for the survey year 2019 with resource changes compared against the 2018 survey year. This information is based on field data collected using the Forest Inventory and Analysis (FIA) annualized sample design, and it is updated yearly. Arkansas has about 5,700 sample plots across the State; each year, 20 percent of these plots (one panel) are visited and measured by field crews, the data compiled, and new estimates produced. It is important that users keep in mind that each year of new estimates, and the subsequent resource changes, are influenced by the newest 20 percent of the sample; the older, and unchanged, data make up the remaining 80 percent of the sample. This small sample may result in some rather sharp spikes in estimates when comparing successive survey years, but in most instances the annualized design should give a reasonable indication of directional trends in the resource such as increasing, decreasing, or no change. After 5 years of measurements, the full sample complement (a cycle) is complete and a new survey cycle begins. Because the 20-percent panel sample size is rather small, the strongest and most reliable trend information (especially that concerning magnitude of change) comes from comparing two full cycles of data.

Data used in this update were accessed from the FIA database on September 6, 2019 at <https://fia.fs.fed.us/tools-data/>. Some of the data may not match previously published reports because of changes made in reprocessing. Users can also access previously published Arkansas updates at <https://www.fs.usda.gov/srsfia/states/arkansas.shtml> to evaluate longer time spans: Resource Updates 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, and 2018. Most of the tables throughout the updates are similar to facilitate comparisons.

Overview

The update includes estimates of various parameters along with descriptive statistics (table 1), forest land area (table 2), ownership (table 3), forest-type groups (table 4), forest plantation area (table 5), volume (tables 6 and 7), biomass (tables 8 and 9), and species volumes (table 10), along with maps of Arkansas's survey units (fig. 1) and percent of county in forest area (fig. 2) plus white oak effective density analysis (fig. 3 and 4). Many of the estimates are presented by survey unit so users can assess resource attributes and change in a specific region of interest.

Table 1—Arkansas forest statistics, change between 2018 and 2019

Forest statistics	2018 estimate	Sampling error (percent)	2019 estimate	Sampling error (percent)	Change since 2018
Forest land					
Area (thousand acres)	18,945.4	0.53	18,926.3	0.54	-19.1
Number of live trees ≥ 1.0 inch d.b.h. (million trees)	11,971.1	1.39	11,978.7	1.37	7.6
Net volume of live trees ≥ 5.0 inches d.b.h. (million cubic feet)	33,408.8	1.20	34,282.3	1.22	873.5
Live tree aboveground biomass ≥ 1.0 inches d.b.h. (thousand oven dry tons)	858,134.0	1.05	878,049.9	1.07	19,915.9
Net annual growth of live trees ≥ 5.0 inches d.b.h. (million cubic feet per year)	1,234.6	2.19	1,338.1	2.03	103.5
Annual removals of live trees ≥ 5.0 inches d.b.h. (million cubic feet per year)	747.5	5.49	711.2	5.58	-36.3
Annual mortality of live trees ≥ 5.0 inches d.b.h. (million cubic feet per year)	359.3	3.47	316.5	3.42	-42.8
Timberland					
Area (thousand acres)	18,398.9	0.61	18,393.9	0.61	-5.0
Number of live trees ≥ 1.0 inch d.b.h. (million trees)	11,781.4	1.42	11,789.4	1.40	8.0
Net volume of live trees ≥ 5.0 inches d.b.h. (million cubic feet)	32,071.2	1.26	32,937.7	1.28	866.5
Live tree aboveground biomass ≥ 1.0 inches d.b.h. (thousand oven dry tons)	824,507.1	1.12	844,430.4	1.13	19,923.3
Net annual growth of live trees ≥ 5.0 inches d.b.h. (million cubic feet per year)	1,220.6	2.21	1,323.9	2.07	103.3
Annual removals of live trees ≥ 5.0 inches d.b.h. (million cubic feet per year)	754.5	5.52	720.4	5.64	-34.1
Annual mortality of live trees ≥ 5.0 inches d.b.h. (million cubic feet per year)	340.0	3.55	301.0	3.48	-39.0



Forest Area

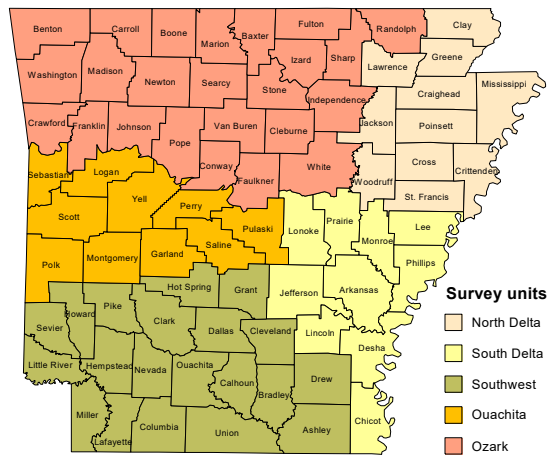


Figure 1—Forest survey units and counties in Arkansas.

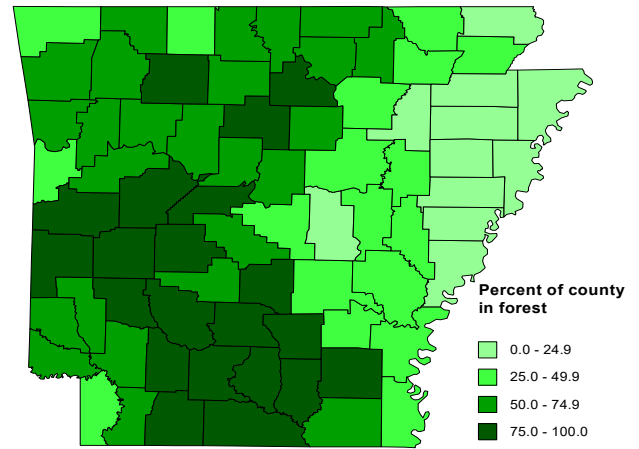


Figure 2—Percent of county area in forest land, 2019.

Table 2—Area of forest land and change, by survey unit, Arkansas, 2018 and 2019

Survey unit	2018	2019	Change
<i>thousand acres</i>			
South Delta	1,440.3	1,447.4	7.1
North Delta	807.2	804.2	-3.0
Southwest	6,953.0	6,938.5	-14.5
Ouachita	3,424.6	3,434.3	9.7
Ozark	6,320.4	6,301.9	-18.5
All units	18,945.4	18,926.3	-19.1

Table 4—Area of forest land and change, by forest-type group, Arkansas, 2018 and 2019

Forest-type group	2018	2019	Change
<i>thousand acres</i>			
Loblolly-shortleaf pine	6,016.3	6,105.8	89.5
Eastern redcedar	300.8	299.0	-1.8
Oak-pine	1,902.6	1,898.5	-4.1
Oak-hickory	7,574.6	7,486.8	-87.8
Bottomland hardwoods	2,977.1	2,959.1	-18.0
Miscellaneous types	30.4	35.8	5.4
Nontyped	143.5	141.5	-2.0
All groups	18,945.4	18,926.3	-19.1

Table 3—Area of forest land and change, by ownership, Arkansas, 2018 and 2019

Ownership	2018	2019	Change
<i>thousand acres</i>			
National forest	2,531.0	2,532.4	1.4
Other public	1,166.5	1,168.9	2.4
Forest industry	2,500.2	2,650.1	149.9
NIPF	12,747.7	12,574.9	-172.8
All owners	18,945.4	18,926.3	-19.1

NIPF = nonindustrial private forest.

Table 5—Area of forest land in forest plantations and change, by survey unit, Arkansas, 2018 and 2019

Survey unit	2018	2019	Change
<i>thousand acres</i>			
South Delta	187.6	185.1	-2.5
North Delta	48.9	53.3	4.4
Southwest	2,588.5	2,675.8	87.3
Ouachita	602.5	605.4	2.9
Ozark	209.7	205.9	-3.8
All units	3,637.2	3,725.5	88.3

Volume, Biomass, and Trends

Table 6—Volume of softwoods on forest land and change, by survey unit, Arkansas, 2018 and 2019

Survey unit	2018	2019	Change
<i>million cubic feet</i>			
South Delta	592.3	631.8	39.5
North Delta	175.4	180.5	5.1
Southwest	7,795.5	8,021.3	225.8
Ouachita	3,463.7	3,576.9	113.2
Ozark	2,043.1	2,124.2	81.1
All units	14,070.0	14,534.7	464.7

Table 8—Biomass dry weight of softwoods on forest land and change, by survey unit, Arkansas, 2018 and 2019

Survey unit	2018	2019	Change
<i>thousand tons</i>			
South Delta	11,953.3	12,701.3	748.0
North Delta	3,496.5	3,594.4	97.9
Southwest	165,121.1	169,778.7	4,657.6
Ouachita	72,103.6	74,407.1	2,303.5
Ozark	43,650.5	45,252.5	1,602.0
All units	296,325.0	305,734.0	9,409.0

Table 7—Volume of hardwoods on forest land and change, by survey unit, Arkansas, 2018 and 2019

Survey unit	2018	2019	Change
<i>million cubic feet</i>			
South Delta	2,681.2	2,735.5	54.3
North Delta	1,457.4	1,492.6	35.2
Southwest	4,749.2	4,794.7	45.5
Ouachita	2,624.1	2,702.3	78.2
Ozark	7,826.9	8,022.4	195.5
All units	19,338.8	19,747.6	408.8

Table 9—Biomass dry weight of hardwoods on forest land and change, by survey unit, Arkansas, 2018 and 2019

Survey unit	2018	2019	Change
<i>thousand tons</i>			
South Delta	69,399.4	70,710.5	1,311.1
North Delta	39,296.3	40,131.7	835.4
Southwest	140,702.4	141,915.9	1,213.5
Ouachita	80,323.6	82,516.0	2,192.4
Ozark	232,090.0	237,044.4	4,954.4
All units	561,811.7	572,318.5	10,506.8

Table 10—Volume of 15 most dominant species on forest land by 5-inch diameter classes, Arkansas, 2019

		Diameter class (<i>inches</i>)					
Species	Total	5.0-	10.0-	15.0-	20.0-	25.0-	30+
		9.9	14.9	19.9	24.9	29.9	
<i>million cubic feet</i>							
Loblolly pine	9,128.6	2,728.0	3,415.9	1,911.7	796.4	235.1	41.4
Shortleaf pine	4,060.0	692.5	1,649.8	1,354.9	347.8	14.9	0.0
White oak	3,032.9	574.9	1,092.1	836.2	367.1	115.6	47.0
Sweetgum	2,314.1	596.0	745.4	529.5	234.8	118.8	89.6
Post oak	1,621.4	410.7	629.2	376.3	163.8	19.4	22.0
Northern red oak	989.8	129.1	336.3	321.3	147.7	49.0	6.4
Southern red oak	874.7	109.9	236.8	276.9	142.4	71.2	37.5
Water oak	776.7	139.4	183.4	209.1	138.6	62.5	43.6
Black oak	750.1	110.9	273.2	211.8	107.7	39.1	7.5
Cherrybark oak	733.9	60.9	113.4	146.8	173.5	97.7	141.7
Eastern redcedar	671.3	384.6	233.1	52.7	1.0	0.0	0.0
Black hickory	669.0	310.9	256.6	87.1	10.2	4.1	0.0
Willow oak	656.2	78.1	116.7	174.9	169.3	77.8	39.4
Baldcypress	632.1	25.9	84.8	74.8	121.4	82.5	242.7
Overcup oak	602.2	37.8	93.0	119.5	154.5	125.1	72.4
Other species	6,769.1	1,987.3	1,901.6	1,357.7	791.4	373.7	357.8
All species	34,282.1	8,376.9	11,361.3	8,041.2	3,867.6	1,486.5	1,149.0

White Oak: Effective Density Analysis

Although total volume characteristics describing white oak resources at the State level are important, this only provides a glimpse of the white oak situation. Breakdowns by State regions (survey units) also help illuminate more detailed resource traits. Another important technique that helps clarify resource characteristics is effective density analysis. This technique, combining area and volume, shows how the white oak resource is distributed across the landscape according to defined stand characteristics. For example, it is clear that forest land area was not evenly distributed across the landscape by ownership and forest type group (tables 3 and 4). Likewise, resource attributes on forest land, i.e. live-tree volume, were not spread evenly across the landscape (tables 6 and 7). Each forest stand is unique, which can be attributed to various factors such as disturbance history, stand density, stand basal area, stand age, stand structure, and stand species composition. Therefore, it may be informative to know how much of the State's white oak volume is in these different types of stand classes. The effective density graphs are also important illustrations that describe the amount of forest land that was in a marginally productive status. These stands may be lands that are either understocked or indicative of a situation where the age structure indicates too many stands in the young age or early stand development stages, thus contributing little to the State's overall white oak inventory. What is dramatically shown in these effective density graphs is that a large proportion of the State's white oak volume was on only a small

proportion of Arkansas's forest land. In contrast, a large amount of forest land was in stands that had little, or no, white oak volume in a respective stand.

Most of Arkansas's 3.0 billion cubic feet of white oak volume was in the 10.0- to 14.9-inch dbh class, representing 1.1 billion cubic feet or one-third of the State's volume (table 10). However, the white oak volume was not evenly spread across all forest land, and the distribution of this variation in white oak volume, by stand yield classes, across the landscape is quite dramatic (fig. 3). The y-axis represents the per-acre volume classes, ranging from 0 cubic feet per acre to stands with ≥ 2000 cubic feet of white oak volume per acre. Almost two-thirds of Arkansas's forest land was composed of stands that had no white oak volume. Sixty-one percent of white oak volume is on 31 percent of forest land, stands with 1–499 and 500–999 cubic feet per acre. In contrast, 19 percent of white oak volume is in stands with more than 1500 cubic feet per acre but occurs on only 2 percent of forest land.

Figure 4 provides the same type of effective density information for the valuable larger white oak trees (>15.0 inches dbh). Stands with more than 1500 cubic feet per acre of white oak volume occurred on less than 1 percent of forest land, but these types of stands held more than 19 percent of the large diameter white oak volume.

These types of data provide policymakers, procurement specialists, and land managers some of the information necessary to manage for the future sustainability of the white oak resource.

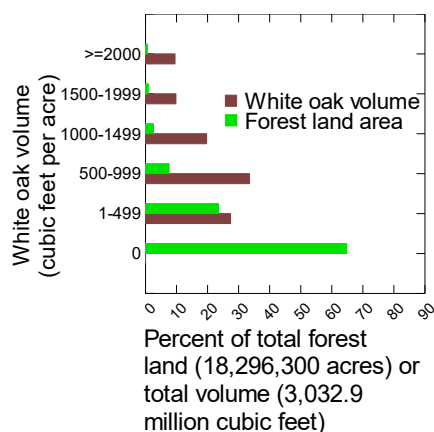


Figure 3—Effective density for volume of live-tree white oak ≥ 5.0 inches dbh on forest land by volume per acre classes, Arkansas, 2019.

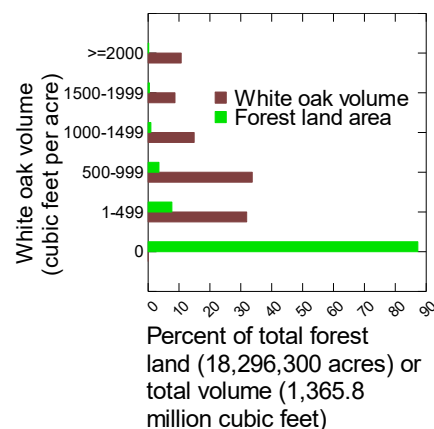


Figure 4—Effective density for volume of live-tree white oak ≥ 15.0 inches dbh on forest land by volume per acre classes, Arkansas, 2019.

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