



Arkansas's Forests, 2018: 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 2018 with resource changes compared against the 2017 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 August 20, 2018 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, and 2017. 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 regeneration information (tables 11 and 12). 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 2017 and 2018

Forest statistics	2017 estimate	Sampling error (percent)	2018 estimate	Sampling error (percent)	Change since 2017
Forest land					
Area (thousand acres)	18,969.9	0.53	18,945.4	0.53	-24.5
Number of live trees ≥1.0 inch d.b.h. (million trees)	11,917.0	1.38	11,971.1	1.39	54.1
Net volume of live trees ≥5.0 inches d.b.h. (million cubic feet)	32,628.0	1.20	33,408.8	1.20	780.8
Live tree aboveground biomass (thousand oven-dry tons)	840,976.8	1.05	858,134.0	1.05	17,157.2
Net annual growth of live trees ≥5.0 inches d.b.h. (million cubic feet per year)	1,151.3	2.34	1,234.6	2.19	83.3
Annual removals of live trees ≥5.0 inches d.b.h. (million cubic feet per year)	724.5	5.55	747.5	5.49	23.0
Annual mortality of live trees ≥5.0 inches d.b.h. (million cubic feet per year)	382.7	3.46	359.3	3.47	-23.4
Timberland					
Area (thousand acres)	18,428.2	0.60	18,398.9	0.61	-29.3
Number of live trees ≥1.0 inch d.b.h. (million trees)	11,728.6	1.42	11,781.4	1.42	52.8
Net volume of live trees ≥5.0 inches d.b.h. (million cubic feet)	31,348.3	1.26	32,071.2	1.26	722.9
Live tree aboveground biomass (thousand oven-dry tons)	808,690.8	1.11	824,507.1	1.12	15,816.3
Net annual growth of live trees ≥5.0 inches d.b.h. (million cubic feet per year)	1,151.7	2.44	1,220.6	2.21	68.9
Annual removals of live trees ≥5.0 inches d.b.h. (million cubic feet per year)	722.3	5.52	754.5	5.52	32.2
Annual mortality of live trees ≥5.0 inches d.b.h. (million cubic feet per year)	363.0	3.55	340.0	3.55	-23.0



Forest Area

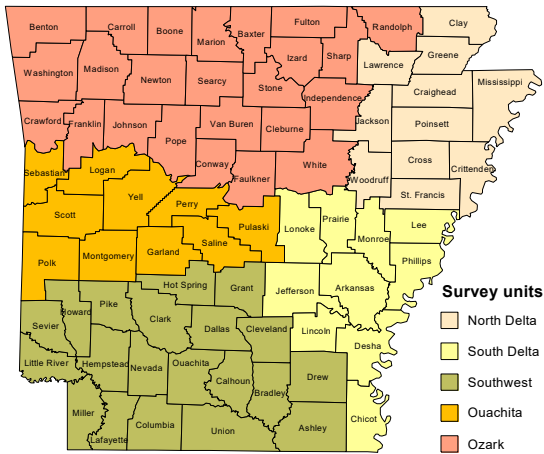


Figure 1—Forest survey units and counties in Arkansas.

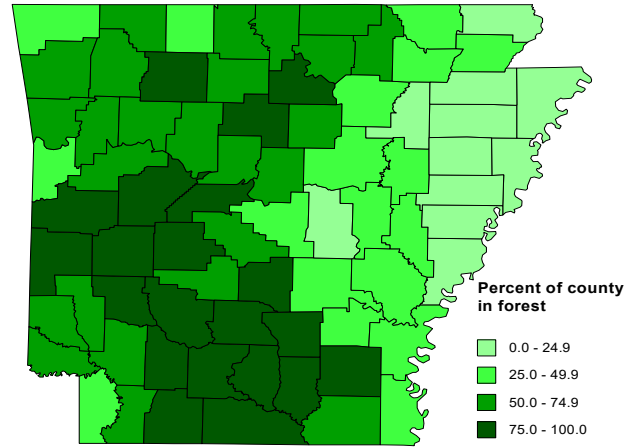


Figure 2—Percent of county area in forest land, 2018.

Table 2—Area of forest land and change, by survey unit, Arkansas, 2017 and 2018

Survey unit	2017	2018	Change
<i>thousand acres</i>			
South Delta	1,448.5	1,440.3	-8.2
North Delta	809.8	807.2	-2.6
Southwest	6,949.7	6,953.0	3.3
Ouachita	3,439.3	3,424.6	-14.7
Ozark	6,322.6	6,320.4	-2.2
All units	18,969.9	18,945.4	-24.5

Table 4—Area of forest land and change, by forest-type group, Arkansas, 2017 and 2018

Forest-type group	2017	2018	Change
<i>thousand acres</i>			
Loblolly-shortleaf pine	5,974.8	6,016.3	41.5
Eastern redcedar	303.5	300.8	-2.7
Oak-pine	1,906.1	1,902.6	-3.5
Oak-hickory	7,624.6	7,574.6	-50.0
Bottomland hardwoods	2,993.2	2,977.1	-16.1
Miscellaneous types	30.5	30.4	-0.1
Nontyped	137.2	143.5	6.3
All groups	18,969.9	18,945.4	-24.5

Table 3—Area of forest land and change, by ownership, Arkansas, 2017 and 2018

Ownership	2017	2018	Change
<i>thousand acres</i>			
National forest	2,524.7	2,531.0	6.3
Other public	1,158.0	1,166.5	8.5
Forest industry	2,421.3	2,500.2	78.9
NIPF	12,865.9	12,747.7	-118.2
All owners	18,969.9	18,945.4	-24.5

NIPF = nonindustrial private forest.

Table 5—Area of forest land in forest plantations and change, by survey unit, Arkansas, 2017 and 2018

Survey unit	2017	2018	Change
<i>thousand acres</i>			
South Delta	180.6	187.6	7.0
North Delta	54.4	48.9	-5.5
Southwest	2,458.7	2,588.5	129.8
Ouachita	594.7	602.5	7.8
Ozark	219.3	209.7	-9.6
All units	3,507.6	3,637.2	129.6

Volume, Biomass, and Trends

Table 6—Volume of softwoods on forest land and change, by survey unit, Arkansas, 2017 and 2018

Survey unit	2017	2018	Change
	<i>million cubic feet</i>		
South Delta	580.7	592.3	11.6
North Delta	170.3	175.4	5.1
Southwest	7,442.6	7,795.5	352.9
Ouachita	3,364.4	3,463.7	99.3
Ozark	2,014.4	2,043.1	28.7
All units	13,572.4	14,070.0	497.6

Table 8—Biomass dry weight of softwoods on forest land and change, by survey unit, Arkansas, 2017 and 2018

Survey unit	2017	2018	Change
	<i>thousand tons</i>		
South Delta	11,736.9	11,953.3	216.4
North Delta	3,387.5	3,496.5	109.0
Southwest	158,119.0	165,121.1	7,002.1
Ouachita	70,049.0	72,103.6	2,054.6
Ozark	43,048.6	43,650.5	601.9
All units	286,341.1	296,325.0	9,983.9

Table 7—Volume of hardwoods on forest land and change, by survey unit, Arkansas, 2017 and 2018

Survey unit	2017	2018	Change
	<i>million cubic feet</i>		
South Delta	2,622.9	2,681.2	58.3
North Delta	1,435.8	1,457.4	21.6
Southwest	4,731.4	4,749.2	17.8
Ouachita	2,563.0	2,624.1	61.1
Ozark	7,702.4	7,826.9	124.5
All units	19,055.6	19,338.8	283.2

Table 9—Biomass dry weight of hardwoods on forest land and change, by survey unit, Arkansas, 2017 and 2018

Survey unit	2017	2018	Change
	<i>thousand tons</i>		
South Delta	68,151.8	69,399.4	1,247.6
North Delta	38,709.7	39,296.3	586.6
Southwest	140,058.7	140,702.4	643.7
Ouachita	78,756.6	80,323.6	1,567.0
Ozark	228,958.7	232,090.0	3,131.3
All units	554,635.5	561,811.7	7,176.2

Table 10—Volume of 15 most dominant species on forest land by 5-inch diameter classes, Arkansas, 2018

Species	Total	Diameter class (<i>inches</i>)					
		5.0-9.9	10.0-14.9	15.0-19.9	20.0-24.9	25.0-29.9	30+
	<i>million cubic feet</i>						
Loblolly pine	8,825.0	2,623.7	3,335.0	1,842.9	768.3	220.7	34.4
Shortleaf pine	3,960.7	703.2	1,623.6	1,293.5	326.2	14.2	0.0
White oak	2,980.9	575.4	1,085.7	820.4	344.0	107.8	47.6
Sweetgum	2,235.6	588.8	732.9	510.8	207.0	120.5	75.5
Post oak	1,605.9	410.1	629.3	378.6	150.1	20.8	17.0
Northern red oak	963.9	130.5	343.3	298.8	143.3	41.7	6.4
Southern red oak	840.6	107.4	233.7	268.1	145.1	53.8	32.4
Black oak	754.9	113.6	276.7	212.8	109.0	36.1	6.7
Water oak	750.4	129.9	184.4	205.7	120.6	73.9	35.9
Cherrybark oak	728.9	59.8	109.8	153.7	164.3	109.2	132.0
Black hickory	659.1	305.8	259.5	79.8	10.1	3.8	0.0
Eastern redcedar	649.6	377.5	222.3	48.8	1.0	0.0	0.0
Willow oak	646.9	75.4	114.9	170.4	176.3	67.3	42.5
Overcup oak	606.2	37.9	95.2	124.0	167.5	109.9	71.9
Baldcypress	593.2	26.4	83.0	78.3	133.3	65.0	207.3
Other species	6,606.9	1,947.2	1,882.0	1,341.0	766.2	367.2	303.5
All species	33,408.7	8,212.6	11,211.3	7,827.6	3,732.3	1,411.9	1,013.1

White Oak Advanced Regeneration

Concerns have been raised about the decline of oak forests in the Eastern United States. Much of this decline can be traced to maturing forests (succession), species replacement, cutting, and ineffective fire management. In order to address these concerns, this update looked closely at white oak (*Quercus alba* L.) forests across Arkansas, an Eastern State considered important in sustained development and high volumes (ranked 4th in Eastern States). An important element in identifying at-risk white oak forests is an assessment of the status of accumulated white oak advanced regeneration (saplings ≥ 1.0 but < 5.0 inches in dbh) in the understory of established forests. This assessment uses the minimum standard of 200-300 vigorous rooted white oak saplings per acre (considered adequate stocking) as necessary for successful stand replacement after disturbance. Operating from a premise that all overstory stand components originated from the advanced regeneration stage, an evaluation of the sapling component is essential for evaluating, understanding, establishing policy, and managing for the future sustainability of the white oak ecosystem in Arkansas.

There were 7,120,100 acres of forest land across Arkansas with at least one white oak present in the stand (table 11). Of most concern is the 5,187,700 acres with white oak trees in the overstory but no white oak saplings present. These forests are in danger of not having a white oak component in the replacement forest if disturbed. Only

1,932,400 acres of Arkansas forests had white oak advanced regeneration (saplings) present, 10 percent of all forest land (table 11).

Knowing if white oak advanced regeneration is present is important, but evaluating the stocking levels of this regeneration is even more important. Across all of Arkansas forest land, only 481,400 acres had adequate stocking in white oak advanced regeneration (table 12). In contrast, 18,031,500 acres had low white oak stocking or no advanced regeneration, 95 percent of the State's forest land. In this assessment, a white oak community was defined as a forest where white oak was either the number 1, 2, or 3 dominant species in the stand. There were 4,875,600 acres of these types of forests (table 12). Notable was that 3,762,600 of these acres had no white oak advanced regeneration and 892,900 acres had inadequate regeneration. If all of Arkansas's white oak communities were disturbed or cut, only 220,000 acres would come back as a white oak community.

It is important to monitor, describe, and document baseline states of ecosystem components. This is an important first step in risk assessment of threatened ecosystems.

Table 11—Area of forest land by white oak presence and absence categories, Arkansas, 2018

White oak occurrence category	thousand acres
White oak saplings +	506.3
White oak trees -	
White oak saplings -	5,187.7
White oak trees +	
White oak saplings +	1,426.1
White oak trees +	
White oak saplings -	11,825.2
White oak trees -	
All forest land	18,945.4

+ = present; - = not present; saplings are ≥ 1.0 but < 5.0 inches dbh; trees are ≥ 5.0 inches dbh.

Table 12—Area of forest land by white oak sapling density (per acre) classes, Arkansas 2018

White oak saplings per acre	All forest land	Forest land with white oak number 1, 2, or 3 dominant in overstory
thousand acres		
0	17,013.0	3,762.6
0.1 - 100	1,018.5	624.2
101 - 200	432.5	268.7
201 - 300	302.4	138.0
301 - 400	66.9	15.0
401 - 500	37.8	29.8
501 - 600	39.0	18.9
601 - 700	17.2	6.6
701 - 800	7.7	6.5
801 - 900	1.5	0.0
>900	8.9	5.2
Total State	18,945.4	4,875.6

How to Cite This Publication

Rosson, James F., Jr. 2020. Arkansas's Forests, 2018: Annual Update. Resource Update FS-279. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 4 p.



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The published report is available online at <https://doi.org/10.2737/FS-RU-279>