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RESOURCE UPDATE FS-14

FORESTS OF Alabama, 2013

This resource update provides an overview of forest resources in Alabama 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 the Alabama Forestry Commission. Estimates are based on field data collected using the FIA annualized sample design and are updated yearly. The estimates presented in this update are for the measurement year 2013 wand are compared to data reported in 2012. The sample plot population in Alabama consists of 5,653 plots, collected across a period of 8 years (about 707 plots, or about 12.5 percent of the data per year).

Growth, removals, and mortality estimates are based on 94 percent of the total sample or about 5,298 plots, and should be viewed accordingly. The data used in this publication were accessed from the FIA database on March 28, 2014.

Early FIA publications concentrated primarily on growing stock trees on timberlands, i.e. commercially important tree species and sizes on forests that could sustain harvest operations. Current FIA reports focus on all of the forest resources, i.e. live trees on forest land.

Overview

Alabama is home to 22.9 million acres of forest land. Forested area has increased by <1 percent (8,100 acres) since 2012 (table 1). The number of live trees on Alabama's forest land in 2013 estimated at 16.6 billion trees, an increase of 0.36 percent from 2012. Net volume increased by 1.88 percent. Both average annual net growth and net removals increased as well from 2012. Estimates of average annual growth of all live species on forests (1.8 million cubic feet) exceed average annual removals (1.3 million cubic feet). These estimates reveal a positive growth to removals balance for the State (table 1).

Table 1—Alabama forest statistics, change between 2012 and 2013[a]

Forest statistics	2012 estimate	Sampling error (percent)	2013 estimate	Sampling error (percent)	Change since 2012
Forest land					
Area (*thousand acres*)	22,902.6	0.52	22,910.7	0.52	8.10
Number of live trees ≥1.0 inches d.b.h. (*million trees*)	16,578.8	1.29	16,637.7	1.31	58.86
Net volume of live trees ≥5.0 inches d.b.h. (*million cubic feet*)	35,559.8	1.26	36,228.9	1.26	669.12
Live tree aboveground biomass (*thousand oven dry tons*)	972,099.3	1.12	98,1213.9	1.13	9,114.60
Net growth live trees ≥5.0 inches (*million cubic feet per year*)	1,807.2	1.82	1,846.5	1.79	39.28
Annual removals of live trees ≥5.0 inches (*million cubic feet per year*)	1,303.5	3.84	1,305.2	3.67	1.75
Annual mortality of live trees ≥5.0 inches (*million cubic feet per year*)	435.8	3.05	434.6	3.70	-1.20
Timberland					
Area (*thousand acres*)	22,838.3	0.52	22,810.2	0.53	-28.12
Number of live trees ≥1.0 inches d.b.h. (*million trees*)	16,540.1	1.29	16,581.4	1.30	41.26
Net volume of live trees ≥5.0 inches d.b.h. (*million cubic feet*)	35,383.6	1.27	35,981.3	1.26	597.68
Live tree aboveground biomass (*thousand oven dry tons*)	967,730.7	1.13	97,4956.1	1.14	7,225.40
Net growth live trees ≥5.0 inches (*million cubic feet per year*)	1,802.9	1.82	1,840.4	1.80	37.46
Annual removals of live trees ≥5.0 inches (*million cubic feet per year*)	1,303.5	3.84	1,305.2	3.67	1.75
Annual mortality of live trees ≥5.0 inches (*million cubic feet per year*)	434.7	3.06	432.8	3.71	-1.90

[a] Estimates for 2013 are comprised of eight panels of data (2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013).

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Forest Area

Alabama is divided into six survey units (fig. 1). The total of forested land in all of the survey units is 22.9 ± 0.12 million acres, and forests occupy 68 percent of the land area in the State. The Southeast survey unit supports more forest acres than any other unit (6.3 million acres) and is 69 percent forested (fig. 2). The North Central unit is ranked second, with 4.4 million acres of forests occupying 67 percent of the region's land area. The Southwest North and West Central units are more densely forested, with 85 percent and 78 percent of their total land area in forest, respectively, but with fewer total forest acres (3.7 million acres). The North unit has the least amount of forest area and forest density, as its 2.1 million acres of forests occupy less than one-half (46 percent) of the region's land area.

The loblolly-shortleaf pine forest-type group occupies the largest proportion of forest land in Alabama at 8.7 million acres, 67 percent of which was planted. The next most common forest-type groups are oak-hickory at 7.1 million acres, oak-pine at 3.0 million acres, and oak-gum-cypress at 2.1 million acres (fig. 3). Overall, the majority of Alabama's forests (68 percent) regenerate naturally (i.e., with no evidence of intentional planting). Even though the loblolly-shortleaf pine forest-type group is the largest individual forest-type group, hardwood and mixed oak-pine forest-type groups still comprise 12.9 million acres—56 percent of all forest land.

Figure 1—Forest survey units in Alabama by county.

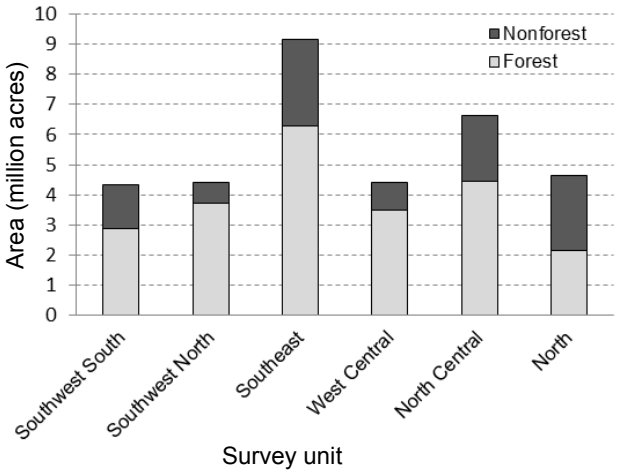

Figure 2—Total land area (minus census water) in Alabama, by land class and survey unit, 2013.

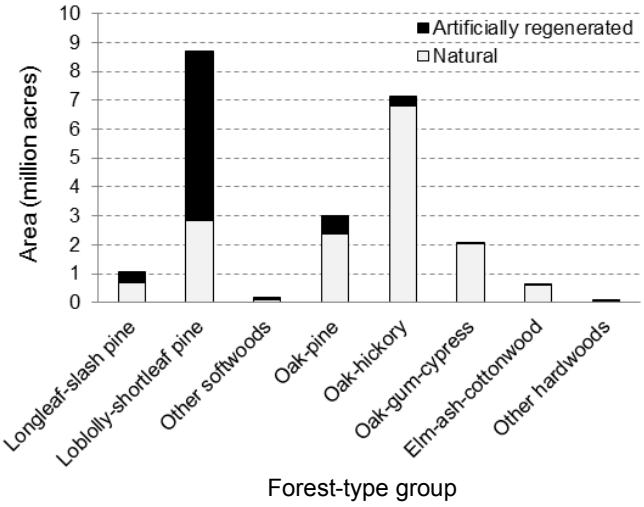

Figure 3—Area of forest land by forest-type group and stand origin, Alabama 2013.

Agricultural land. (photo by Andrew J. Hartsell)

Volume, Biomass, and Trends

Crews recorded 116 species (including unknowns collected to the genus level) on Alabama forest land in the measurement years included in the 2013 dataset. Loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), red maple (*Acer rubrum*), and yellow-poplar *(Liriodendron tulipifera*) are the most numerous species in Alabama (table 2).

Though the loblolly-shortleaf pine forest-type group accounts for 38 percent of Alabama's live tree volume, hardwoods are still dominant overall. Fifty-three percent of Alabama's 36.2 million cubic feet of live tree volume is in hardwood forest types. All red oak species account for over 25 percent of hardwood tree volume in the State.

On average, over 1.3 million cubic feet of wood is removed each year in Alabama's forests. However, 1.8 million are produced by the same forests each year. This gives the State a positive growth-to-removal balance, indicating that more wood is produced than removed (table 1). Dividing average annual growth by annual removals yields a ratio that describes this relationship. A value of one or greater indicates that the average annual estimate of growth exceeds estimated removals. The growth-to-removals ratios for hardwoods and softwoods are 1.6 and 1.3, respectively (fig. 4). This indicates that for every cubic foot removed, 1.6 or 1.3 cubic feet are grown.

Cheaha State park is one of the many places one can enjoy the beauty of Alabama's forests. (photo by Andrew J. Hartsell)

Table 2—Number and volume of all-live trees (top 15 species), Alabama 2013

Species	Number	Volume
	(million trees)	*(million ft^3)*
Loblolly pine	3,682,072,023	13,049,954,332
Sweetgum	2,263,807,134	2,868,612,693
Water oak	1,223,836,788	1,968,248,179
Red maple	1,057,829,840	650,629,468
Yellow-poplar	544,486,340	1,920,524,400
Blackgum	501,397,464	626,070,537
Flowering dogwood	464,883,368	40,380,587
Sweetbay	384,987,775	496,462,495
Black cherry	364,227,512	185,765,098
American hornbeam, musclewood	352,425,978	71,511,340
Laurel oak	345,368,690	553,438,940
White oak	340,182,009	1,968,248,179
Winged elm	310,419,440	142,835,833
Mockernut hickory	295,029,430	502,420,356
Virginia pine	287,713,951	498,476,616

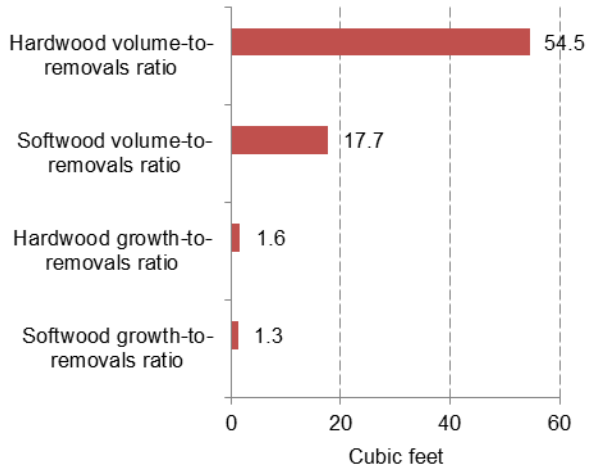

Figure 4—Growth-to-removals ratios and volume-to-removals ratios for all live hardwood and softwood species on forest land, Alabama 2013.

Dividing standing volume by average annual removals produces a volumes- to-removals ratio. This ratio provides scale and context to the amount of wood removed each year across Alabama. Alabama's hardwood volume-to-removals ratio is 54.5, revealing that for every cubic foot of hardwood removals there remains 54.5 cubic feet left standing. Softwood volume to removals ratio is lower at 17.7. However, this means that almost 18.0 cubic feet remain in the forest for every softwood cubic foot removed (fig. 4). These ratios reveal that Alabama's forests are trending toward continual replenishment and are not likely to be overharvested any time in the near future.

Productivity of Alabama's Forests

Over two-thirds of the forests in the State are considered natural in origin. Thirty-two percent of Alabama's forests originated from artificial measures such as planting either by hand or mechanical processes (table 3). Most of these artificially derived stands are considered plantations. The predominant species planted in these forests is loblolly pine.

Table 3—Total area, volume, average annual growth and average annual removals of all-live tree species, Alabama 2013

Resource	Stand origin	
	Natural	Planted
	- thousand acres -	
Total forest area	15,630.5	7,280.2
	- million cubic feet-	
Total all-live volume	27,548.0	8,680.9
Average annual growth of all-live	945.4	901.2
Average annual removals of all-live	751.0	554.2

The majority of Alabama's standing volume is found on natural forests as well. Over 76 percent of the State's standing volume is found on natural forests. Natural stands have over a 2-to-1 advantage over artificial stands in terms of tree volume.

Forests of artificial origin account for almost one-half (49 percent) of the State's average annual growth of all-live species. Likewise, over 42 percent (554 million cubic feet per year) of the State's average annual removals occurred in planted stands. This indicates that plantations play a vital role in Alabama's timber economy, as they tend to be more productive than naturally occurring forests. One reason for this is that these forests tend to receive more intensive management than natural stands. Secondly, planted forests tend to be younger than older forests, and younger trees grow at a faster rate than older trees. This explains why natural stands have greater standing volume. Older trees typically found on natural forests tend to be older and larger. Plantations on the other hand tend to be composed of younger, faster growing trees.

The combination of the two stand origins provides the State with a diverse landscape of differing forest types. Each type provides a unique set of attributes to be enjoyed by both outdoor enthusiasts and industry alike.

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Grey squirrel. (photo by Andrew J. Hartsell)

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