



FORESTS OF Virginia, 2014

This resource update provides an overview of forest resources in Virginia. Information for this factsheet was updated by means of the Forest Inventory and Analysis (FIA) annualized sample design. Each year, 20 percent of the sample plots (one panel) in Virginia are measured by field crews, the data compiled, and new estimates produced. After 5 years of measurements, the full sample complement (a cycle) is complete and a new survey cycle begins. The most reliable trend information (especially that concerning magnitude of change) comes from comparing two full cycles of data. Estimates presented here are for the inventory year 2014 with comparisons made to 2011, which means that only 60 percent of the data are new. Generally speaking, for the 2014 inventory, estimates for variables such as area and volume are based on 4,811 plots measured between 2009 and 2015. Growth, removals, and mortality estimates for the 2014 inventory are based on plots measured between 2002 and 2008, and remeasured between 2009 and 2015.

This update is based on data processed and posted on the FIA database (FIADB) on April 12, 2016 (<http://fia.fs.fed.us/tools-data/>). Definitions can be found in the FIADB user’s manual at <http://fia.fs.fed.us/tools-data/docs/default.asp>. Additional information can be found in the report Virginia’s Forests, 2011 (Rose 2013).

Overview

Overall, area of forest land in Virginia increased slightly between 2011 and 2014 (table 1). Number of live trees on forest land remained stable between 2011 and 2014. Volume increased by 5.9 percent. There was a 9.5-percent increase in growth, a 9.5-percent decrease in annual removals, and annual mortality increased by 0.9 percent.

Table 1—Virginia forest statistics, change between 2011 and 2014

Forest statistics	2011 Estimate	Sampling error (percent)	2014 Estimate	Sampling error (percent)	Change since 2011 (percent)
Forest land					
Area (thousand acres)	15,907.0	0.65	16,042.8	0.61	0.85
Number of live trees ≥1 inch d.b.h. (million trees)	11,483.5	1.62	11,496.4	1.58	0.11
Net volume live trees ≥5 inches d.b.h. (million cubic feet)	35,167.5	1.29	37,229.9	1.20	5.86
Live trees aboveground biomass (thousand oven-dry tons)	897,287.1	1.15	940,417.4	1.07	4.81
Net growth live trees ≥5 inches d.b.h. (million cubic feet per year)	1,037.4	2.49	1,136.2	2.29	9.52
Annual removals of live trees ≥5 inches d.b.h. (million cubic feet per year)	544.9	7.12	493.0	7.10	-9.52
Annual mortality of live trees ≥5 inches d.b.h. (million cubic feet per year)	302.1	4.16	304.9	4.12	0.91
Timberland					
Area (thousand acres)	15,315.8	0.75	15,388.8	0.72	0.48
Number of live trees ≥1 inch d.b.h. (million trees)	11,190.2	1.68	11,156.3	1.65	-0.30
Net volume live trees ≥5 inches d.b.h. (million cubic feet)	33,702.5	1.37	35,548.3	1.28	5.48
Live trees aboveground biomass (thousand oven-dry tons)	860,309.5	1.23	897,519.2	1.16	4.33
Net growth live trees ≥5 inches d.b.h. (million cubic feet per year)	1,042.0	2.54	1,113.5	2.33	6.86
Annual removals of live trees ≥5 inches d.b.h. (million cubic feet per year)	561.8	7.04	510.5	7.00	-9.13
Annual mortality of live trees ≥5 inches d.b.h. (million cubic feet per year)	281.2	4.21	293.0	4.22	4.19



Forest Area

Total land area of Virginia is 25.4 million acres, not including census water. Of this, 16.0 million acres (63 percent) was forested in 2014, an increase of 0.85 percent from 2011 (table 1). Virginia is divided into five survey units (fig. 1). Each of the five units was between 58 percent and 69 percent forested. There were increases in forest land in all units, except for the Southern Mountains (table 2).

Across the Commonwealth, approximately 82 percent of the forest land in Virginia is privately owned, a number which has remained consistent over the years. One noticeable change in ownership in Virginia has been that of forest industry owned land. In 2001, forest industry owned just over 1.0 million acres of timberland. In 2011, forest industry owned just under 196,000 acres of timberland. By 2014, that number had dropped to 178,500 acres. This continues a trend going back to the 1990s in the Commonwealth as well as in the South.

The oak-hickory forest-type group occupied the largest proportion of forest land in Virginia at 9.7 million acres (60 percent of forest land) (fig. 2). The next most predominate forest-type group was loblolly-shortleaf pine at 3.1 million acres (19 percent of forest land), 70 percent of which was in

stands with evidence of artificial regeneration. Overall, about 83 percent of the forest land in Virginia was naturally regenerated and about 17 percent artificially regenerated. This ratio has remained consistent over the last few years. The small amount of planted oak-hickory and oak-pine are likely pine plantation failures rather than true hardwood plantings.

Forest land in Virginia is maturing (fig. 3). Area of large-diameter sized stands has been increasing, while that of medium- and small-diameter stands has been decreasing. Large-diameter stands now account for 65 percent of the forest land in Virginia. Since 2001, forest land area in large-diameter stands increased by 13 percent. This is in contrast to decreases in medium- and small-diameter stands. By forest-type group, 47 percent of loblolly-shortleaf pine was in large-diameter stands, as was 73 percent of oak-hickory.



Figure 1—Counties and forest survey units in Virginia.

Table 2—Area of forest land by survey unit and year, Virginia

Survey unit	2007	2011	2014	Change
				since 2011
	-----thousand acres-----			percent
Coastal Plain	3,784.1	3,704.0	3,706.3	0.06
Southern Piedmont	3,759.7	3,791.3	3,845.5	1.43
Northern Piedmont	2,518.9	2,518.0	2,544.9	1.07
Northern Mountains	2,729.2	2,778.4	2,854.0	2.72
Southern Mountains	3,076.6	3,115.3	3,092.1	-0.74
All units	15,868.5	15,907.0	16,042.8	0.85

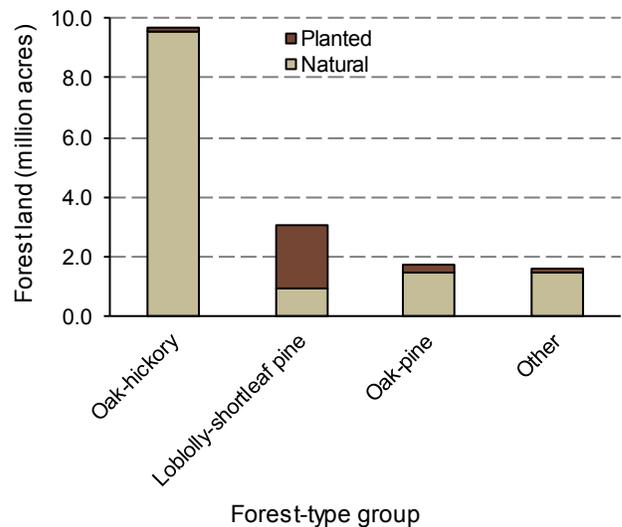


Figure 2—Area of forest land by forest-type group and stand origin, Virginia, 2014.

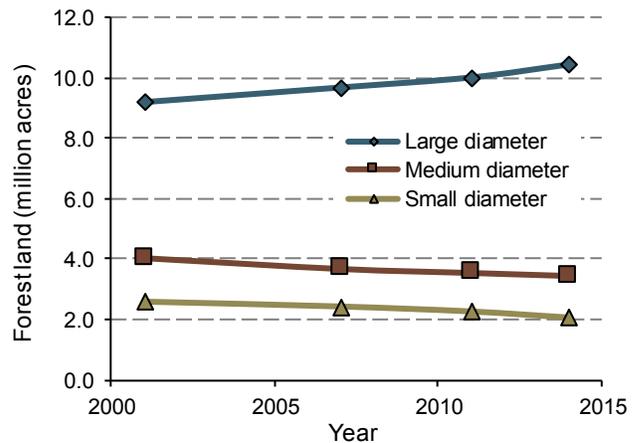


Figure 3—Area of forest land by year and stand-size class, Virginia.

Volume, Biomass, and Trends

Volume of all-live trees ≥ 5.0 inches diameter at breast height (d.b.h.) on forest land in 2014 totaled 37.2 billion cubic feet (fig. 4). Hardwoods accounted for 76 percent of this volume and softwoods 24 percent. This was an increase of 5.9 percent since 2011. Analysis of volume by diameter class showed increases in all classes between 2011 and 2014.

Crews recorded 123 species (not including unknowns) of live trees on forest land in Virginia. Yellow-poplar, loblolly pine, and chestnut oak were the most voluminous species (table 3). Between 2011 and 2014, volume of yellow-poplar increased by 8.3 percent and that of loblolly pine increased by 15.7 percent.

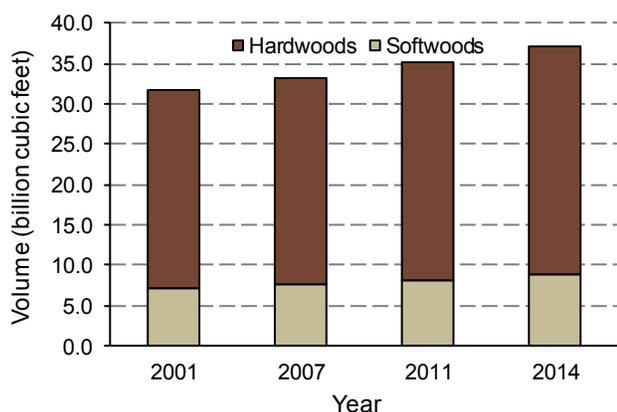


Figure 4—Volume of all-live trees ≥ 5.0 inches d.b.h. on forest land by year and major species group, Virginia.

Virginia had 940.4 million oven-dry tons of live-tree biomass on forest land (table 1). This was an increase of 4.8 percent since 2011. This change mirrored the increase in volume, which was up by 5.9 percent.

Overall, net growth of live trees on forest land increased by nearly 10 percent to 1.1 billion cubic feet per year (table 4). Removals declined by 9.5 percent. Softwood removals accounted for 43.5 percent of the total. Mortality was about the same overall.

Table 3—Number of live trees ≥ 1.0 inch d.b.h. and volume of live trees ≥ 5.0 inches d.b.h. (top 15 species for volume) on forest land, Virginia, 2014

Species	Number	Volume
	<i>million trees</i>	<i>million cubic feet</i>
Yellow-poplar	902.5	6,033.9
Loblolly pine	1,298.8	5,563.2
Chestnut oak	328.8	3,399.9
White oak	411.6	3,232.5
Red maple	1,407.6	2,425.7
Northern red oak	146.0	1,855.1
Virginia pine	469.2	1,280.8
Sweetgum	774.7	1,262.9
Scarlet oak	158.2	1,080.0
Black oak	109.0	985.7
Eastern white pine	176.8	933.3
Pignut hickory	181.2	725.8
Mockernut hickory	203.4	664.6
American beech	263.2	660.4
Southern red oak	125.8	607.6

Table 4—Average annual net growth, removals, and mortality of live trees on forest land by survey year, survey unit, and major species group, Virginia

Survey year and unit	Net Growth			Removals			Mortality		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
<i>million cubic feet per year</i>									
2011									
Coastal Plain	306.1	182.6	123.5	174.0	113.0	61.0	93.9	38.2	55.7
Southern Piedmont	248.4	124.1	124.3	214.8	121.5	93.3	57.7	22.9	34.8
Northern Piedmont	155.5	38.5	116.9	67.5	21.4	46.1	60.4	19.2	41.2
Northern Mountains	135.3	14.6	120.7	32.9	5.9	26.9	41.1	13.7	27.5
Southern Mountains	192.2	24.0	168.3	55.7	12.2	43.5	49.0	7.5	41.5
All units	1,037.4	383.7	653.7	544.9	274.0	270.9	302.1	101.4	200.7
2014									
Coastal Plain	320.5	213.8	106.7	148.6	84.2	64.4	66.0	23.5	42.6
Southern Piedmont	348.8	163.6	185.2	191.1	102.2	88.9	57.8	21.0	36.8
Northern Piedmont	164.0	51.0	113.0	52.5	14.4	38.2	64.3	16.9	47.4
Northern Mountains	121.2	10.4	110.8	30.1	4.7	25.4	59.6	18.7	40.8
Southern Mountains	181.7	23.5	158.2	70.7	9.1	61.6	57.1	9.1	48.0
All units	1,136.2	462.3	673.9	493.0	214.5	278.5	304.9	89.2	215.6

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

Bottomland Forests of Virginia

Bottomland forests, sometimes known as forested wetlands, are home to a diverse array of plant and animal life. In addition, these forests provide wood products, flood control, and clean drinking water in surrounding areas.

As of 2014, there were 753,437 acres of bottomland forests (oak-gum-cypress and elm-ash-cottonwood forest-type groups) in Virginia (table 5). This was a 4.3-percent increase since 2007. The vast majority (91 percent) of bottomland forests were in the Coastal Plain and Piedmont regions of the Commonwealth. Of the 79 tree species tallied in bottomland forests, red maple was both the most numerous and the most voluminous single species in these forests (table 6). Yellow-poplar and American sycamore were second and third, respectively, for volume. Sweetgum and green ash were second and third, respectively, for number of trees.



Maritime swamp with baldcypress, First Landing State Park, Virginia Beach City, VA. (photo © Gary P. Fleming).

Table 5—Area of bottomland forests (oak-gum-cypress and elm-ash-cottonwood forest-type groups) by survey unit and year, Virginia

Survey unit	2007	2011	2014	Sampling error
	<i>acres</i>			<i>percent</i>
Coastal Plain	427,763	459,772	444,243	10.0
Southern Piedmont	118,170	131,438	126,760	18.3
Northern Piedmont	122,713	129,536	113,502	19.1
Northern Mountains	22,273	21,154	23,379	43.1
Southern Mountains	31,391	33,917	45,553	31.2
All units	722,310	775,817	753,437	7.6

Table 6—Number of live trees ≥1.0 inch d.b.h. and volume of live trees ≥5.0 inches d.b.h. (top 10 species for volume) in bottomland forests (oak-gum-cypress and elm-ash-cottonwood forest-type groups), Virginia, 2014

Species	Number	SE	Volume	SE
	<i>million trees</i>	<i>percent</i>	<i>million cubic feet</i>	<i>percent</i>
Red maple	97.9	15.5	409.2	14.4
Yellow-poplar	27.4	36.1	158.4	18.6
American sycamore	6.1	25.4	154.8	20.3
Sweetgum	46.3	23.6	136.8	17.8
Swamp tupelo	19.9	35.4	124.5	26.1
Green ash	33.8	23.4	103.4	23.0
Baldcypress	4.0	50.5	70.2	48.1
River birch	12.4	36.2	61.9	22.0
Water tupelo	2.9	58.5	52.2	55.2
Loblolly pine	7.7	37.8	48.1	26.1
Total (top 10)	258.3	12.1	1,319.6	9.7
Total (all species)	446.6	10.1	1,803.7	9.0

SE = Sampling error (based on one standard deviation).

Literature Cited

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