



Forests of Maryland, 2017

This publication provides an overview of forest resources in Maryland based on inventories conducted by the USDA Forest Service, Forest Inventory and Analysis (FIA) program of the Northern Research Station. From 2004–2013, FIA employed an annual inventory measuring data on 20 percent of all sample plots each year in Maryland. Beginning in 2014, FIA is on a 7-year cycle, inventorying 14.3 percent of all plots annually. For the 2017 inventory, estimates for current variables such as area, volume, and biomass are based on 982 plots (431 forested) collected from 2011–2017. Change variables, such as net growth, removals, and mortality, are based on 936 plots (391 forested) collected in 2006–2011 and resampled in 2011–2017. Estimates from earlier annual and periodic inventories are shown for comparison. See Bechtold and Patterson (2005), O’Connell et al. (2013), and Gormanson et al. (2017) for definitions and technical details. A complete set of inventory tables is available at <https://doi.org/10.2737/FS-RU-166>.

Overview

There are an estimated 2.5 million acres of forest land in Maryland (Table 1). Since 2012, there has been little change in the estimated forest land area, however long-term data show decreases in forest land since the 1963 FIA inventory (Fig. 1). According to the 2017 results, there are an estimated 1.4 billion trees on Maryland’s forest land with an all-live tree aboveground biomass of 191 million tons and a net volume of 7 billion cubic feet. Yellow-poplar (*Liriodendron tulipifera*) is the most voluminous species followed by loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), and white oak (*Quercus alba*). Total annual growth of all live trees on timberland outpaced total removals by a ratio (G:R) of 2.3:1 and annual mortality averaged 1 percent on timberland when calculated as a percentage of current volume.

Table 1.—Maryland forest statistics, 2017 and 2012. Sampling errors and error bars shown in the tables and figures in this report represent 68 percent confidence intervals for the estimated values.

	2017 Estimate	Sampling error (percent)	2012 Estimate	Sampling error (percent)	Change since 2012 (percent)
Forest Land					
Area (thousand acres)	2,460	2.1	2,446	2.4	0.5
Number of live trees ≥1 inch diameter (million trees)	1,422	5.0	1,406	5.1	1.1
Aboveground biomass of live trees ≥1 inch (thousand oven-dry tons)	190,756	2.9	180,697	3.1	5.6
Net volume of live trees ≥5 inches diameter (million ft ³)	7,031	3.2	6,646	3.3	5.8
Annual net growth live trees ≥5 inches (thousand ft ³ /yr)	138,220	7.6	152,993	8.8	-9.7
Annual mortality of live trees ≥ 5 inches (thousand ft ³ /yr)	77,590	8.6	71,859	10.1	8.0
Annual harvest removals of live trees ≥5 inches (thousand ft ³ /yr)	43,866	30.2	67,256	25.5	-34.8
Annual other removals of live trees ≥5 inches (thousand ft ³ /yr)	15,347	33.3	12,725	40.8	20.6
Timberland					
Area (thousand acres)	2,168	2.6	2,163	2.9	0.2
Number of live trees ≥1 inch diameter (million trees)	1,309	5.5	1,296	5.6	1.0
Aboveground biomass of live trees ≥1 inch (thousand oven-dry tons)	167,034	3.5	157,633	3.6	6.0
Net volume of live trees ≥5 inches diameter (million ft ³)	6,131	3.8	5,785	3.8	6.0
Net volume of growing-stock trees (million ft ³)	5,725	3.9	5,392	4.0	6.2
Annual net growth of growing stock trees (thousand ft ³ /yr)	112,803	7.5	123,860	8.4	-8.9
Annual mortality of growing-stock trees (thousand ft ³ /yr)	45,813	10.8	44,703	11.6	2.5
Annual harvest removals of growing-stock trees (thousand ft ³ /yr)	35,302	32.7	59,084	25.4	-40.3
Annual other removals of growing-stock trees (thousand ft ³ /yr)	13,227	35.7	17,274	34.6	-23.4



Forest Area

Successive inventories since the early 1960s in Maryland have shown forest land area consistently decreasing, however there has been little change in forest area since the first full annual inventory was completed in 2008 (Fig. 1). Timberland accounts for 88 percent of this forest land or 2.2 million acres. An estimated 12 percent of forest land is reserved from timber production and less than one-half percent is other forest land identified as not meeting minimum productivity standards.

Seventy-two percent of Maryland’s forest land (1.8 million acres) is privately owned (Fig 2). Private owners include individuals, families, corporations, and other private entities. The remaining 28 percent (685,000 acres) is in public ownership. The largest public owner is the state of Maryland, which holds 299,000 acres of timberland and 152,000 acres of reserved forest.

Maryland’s forests have been maturing as illustrated by the distribution of timberland by stand-size class (Fig. 3). Since the 1973 inventory, there has been a general

trend of increasing acreage in large-diameter stands and decreasing acreage in medium- and small-diameter stands. Acreage in large-diameter stands now accounts for 79 percent of timberland whereas the area in small-diameter stands is 8 percent. Even within each major forest-type group, most forest land is classified in the large-diameter stand size class (Fig. 4).

Oak/hickory is the dominant forest-type group in Maryland, covering 59 percent of the forest land (Fig. 4). The oak/hickory group makes up more than 50 percent of the forest land area in all but the southern most counties of Dorchester, Somerset, St. Mary’s, Talbot, Wicomico, and Worcester, where the loblolly pine/shortleaf pine forest-type group is one of the most prevalent. Loblolly pine/short leaf pine is the most abundant softwood forest-type group within the State, accounting for 16 percent of the forest land. The maple/beech/birch forest-type group is prevalent in the western counties of Garrett and Allegany.

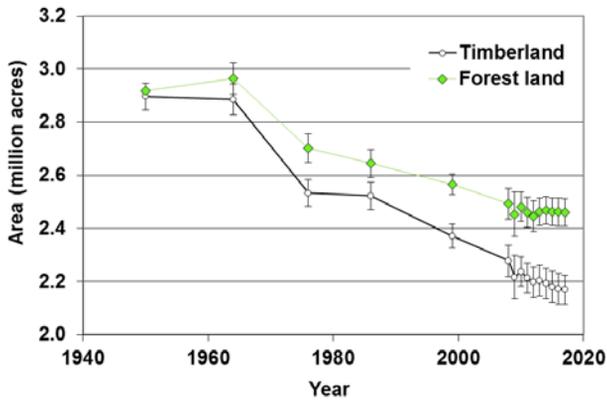


Figure 1.—Forest land and timberland area by year, Maryland.

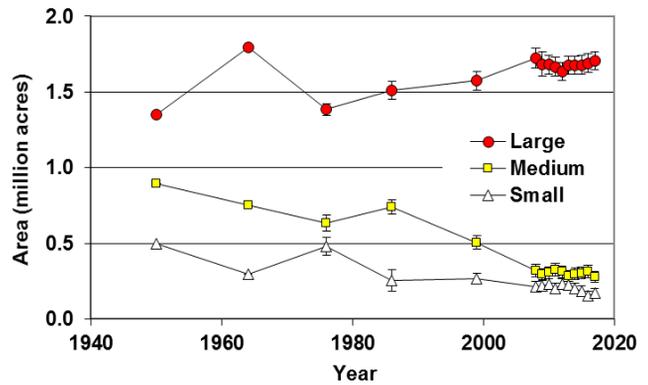


Figure 3.—Timberland area by stand-size class and year, Maryland.

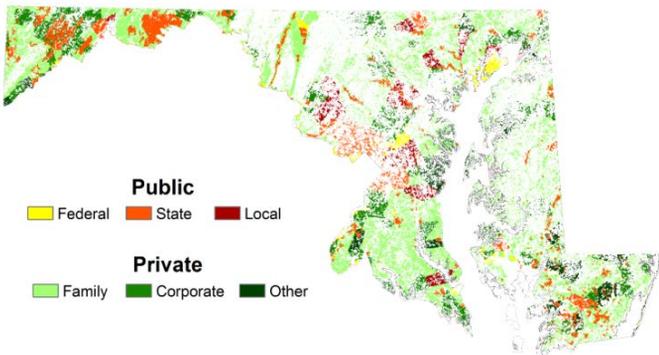


Figure 2.—Distribution of forest land by major owner group, Maryland.

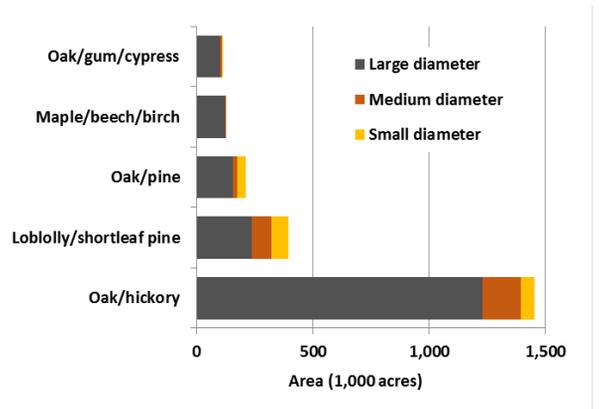


Figure 4.—Area of forest land by selected forest-type groups and stand size classes, Maryland, 2017.

Volume, Biomass, and Trends

The net volume of trees on forest land increased by nearly 6 percent to an estimated 7 billion cubic feet since 2012 (Table 1). Yellow-poplar continued to be the most voluminous species followed by loblolly pine, red maple, and white oak (Table 2). Changes in live volume since 2012 varied across species. American beech exhibited the largest change in net volume, increasing by more than 26 percent.

The sawtimber volume on timberland increased by 8.4 percent to total 23.5 billion board feet since 2012. Yellow poplar was the leading sawtimber species by volume, followed by loblolly pine, white oak, and red maple. Of these species, loblolly pine exhibited the largest increase in sawtimber volume since 2012 (27 percent).

Aboveground biomass on forest land totaled 191 million dry tons. This was a 6 percent increase since 2012. Eighty-seven percent of biomass was contained in trees on timberland. Aboveground biomass on forest land averaged 77 dry tons per acre.

In terms of average annual growth and removals on timberland, loblolly pine and yellow-poplar had the largest growth and also the largest estimated removals of all tree species in Maryland (Fig. 5). Yellow-poplar and loblolly pine collectively accounted for 51 percent of the total growth and 40 percent of all removals.

Total annual growth outpaced total removals by a ratio 2.3:1 in 2017, although ratios varied considerably among species (Fig. 5). Among the most voluminous

species, loblolly pine had the largest growth-to-removals (G:R) ratio (5.2:1) and white oak had the smallest (1.3:1). As a percentage of current volume, annual mortality averaged 1.0 percent on timberland. Red maple had the highest mortality rate among the top five most voluminous species, averaging 1.8 percent per year.

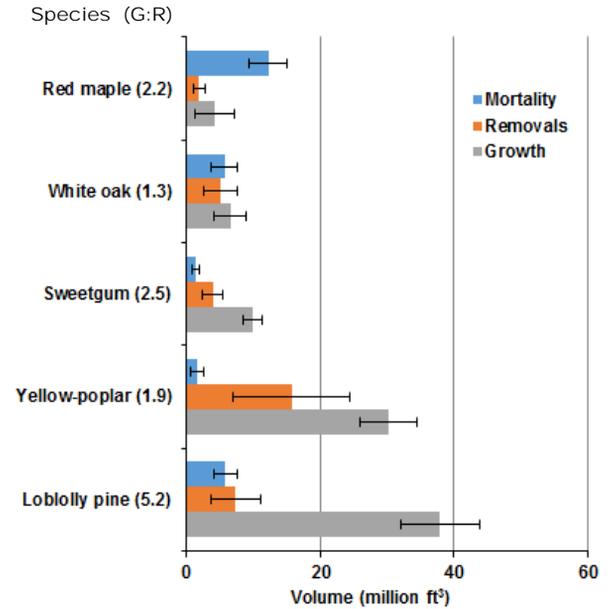


Figure 5.—Average annual net growth, removals, and mortality of net volume on timberland, and growth-to-removals ratio (G:R) for select species, Maryland, 2017.

Table 2.—Top 10 species by net volume and percentage change on forest land; sawtimber volume and percentage change on timberland; and biomass on forest land, Maryland, 2017.

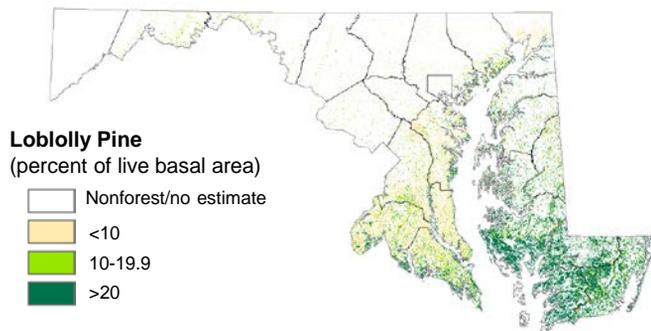
	Volume of live trees on forest land (million ft ³)	Sampling error (percent)	Percent change since 2012	Volume of sawtimber trees on timberland (million board feet)	Sampling error (percent)	Percent change since 2012	Aboveground biomass on forest land (million tons)	Sampling error (percent)
Yellow-poplar	1,344	11.2	3.6	5,982	13.7	2.8	27	11.0
Loblolly pine	844	11.1	25.0	2,580	11.7	27.4	19	10.8
Red maple	731	8.8	0.0	1,902	12.4	-0.8	21	8.2
White oak	533	10.8	1.4	2,148	13.4	6.2	17	10.7
Sweetgum	458	12.2	-0.2	1,430	15.0	0.8	12	11.3
Chestnut oak	291	16.4	11.5	925	20.5	21.6	9	16.1
Northern red oak	273	14.6	12.8	1,067	18.3	26.5	9	14.4
Black cherry	231	17.4	0.8	563	24.8	3.6	6	16.8
American beech	227	16.4	26.1	742	21.3	41.9	6	15.6
Black oak	194	15.4	-3.1	745	18.2	-0.1	7	15.4
Other softwoods	256	17.9	-0.7	753	20.8	7.3	5	9.2
Other hardwoods	1,650	5.9	3.9	4,672	8.4	7.3	53	3.5
All species	7,031	3.2	5.8	23,510	4.9	8.5	191	2.9

A Closer look at Loblolly Pine in Maryland

There are about 172 million loblolly pine trees on Maryland’s forest land, making it the second most abundant species, behind red maple; it is the most abundant species for trees 5 inches and greater in diameter. Loblolly pine is managed as a commercial species, growing primarily in the southern and eastern shore regions of the State (Fig. 6).

Estimates of loblolly pine abundance have increased since 2015 in all tree diameter classes. However, the gain is greatest in the sapling tree size class (1-4.9 inch diameter) (Fig. 7). Data collected over the last decade also suggest an increase in the proportion of loblolly trees growing in natural stands. While sawtimber volume has been increasing, the volume of high quality loblolly pine wood (grade 1) has remained constant since 2008, indicating that the volume gains are primarily due to increases in lower grade wood (Fig. 8).

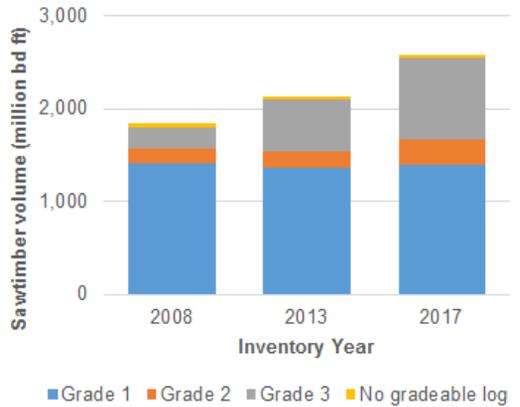
These trends may be due to in part to the closure and divestment of many of Maryland’s forest industry businesses between 2000 and 2010. Loblolly pine has been less intensively managed, resulting in fewer acres to reforest. Often less managed stands are left to regenerate naturally. Naturally regenerating stands may have larger seedling and sapling counts than those that are planted deliberately where spacing is planned and competing vegetation controlled.



Figure—6. Loblolly pine distribution in Maryland, 2009.



Figure—7. Loblolly pine abundance by diameter class and inventory year, Maryland. Data label above the bar is the percent of loblolly pine trees in naturally regenerating (nonplanted) stands.



Figure—8. Loblolly pine sawtimber volume on timberland by tree grade and year.

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More information on Maryland Forests

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