



Forests of Maryland, 2014

Overview

This publication provides an overview of forest resources in Maryland based on inventories conducted by the U.S. 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 2014 inventory, estimates for current variables such as area, volume, and biomass, are based on 1004 plots sampled from 2009-2014. Change variables such as net growth, removals, and mortality are based on 953 samples collected in 2004-2009 and resampled in 2009-2014. Estimates from earlier annual and periodic inventories are shown for comparison. See Bechtold and Patterson (2005) and O’Connell et al. (2013) for definitions and technical details.

There are an estimated 2.5 million acres of forest land in Maryland (Table 1). Since 2008, there has been little change in the estimate of forest land area, however long-term data show decreases in forest land since the 1963 FIA inventory (Fig. 1). According to the 2014 results, there are more than 1.4 billion trees on Maryland’s forest land with an all-live tree aboveground biomass of 185 million tons and a net volume of 6.8 billion cubic feet. Estimates of aboveground biomass and net volume on forest land have increased since 2008. Average annual net growth decreased while average annual mortality increased and there was a small decrease in harvest removal levels since 2008.

Table 1.—Maryland forest statistics, 2014 and 2008. Volumes are for trees 5 inch diameter and larger. Number of trees and biomass are for trees 1 inch diameter and larger.

	2014	Sampling	2008	Sampling	Change
	Estimate	error	Estimate	error	since 2008
	(percent)	(percent)	(percent)	(percent)	(percent)
Forest Land					
Area (thousand acres)	2,468	2.1	2,493	2.3	-1.0
Number of live trees (million trees)	1,417	4.7	1,481	5.2	-4.4
Aboveground biomass of live trees (thousand oven-dry tons)	185,404	3.0	176,350	3.1	5.1
Net volume of live trees (million ft ³)	6,807	3.3	6,469	3.3	5.2
Annual net growth of live trees (thousand ft ³ /yr)	149,240	7.5	196,100	5.9	-23.9
Annual mortality of trees (thousand ft ³ /yr)	71,428	9.2	57,042	9.6	23.2
Annual harvest removals of live trees (thousand ft ³ /yr)	58,847	25.0	62,449	18.1	-5.8
Timberland					
Area (thousand acres)	2,193	2.6	2,271	2.7	-3.4
Number of live trees (million trees)	1,304	5.2	1,379	5.6	-5.4
Aboveground biomass of live trees (thousand oven-dry tons)	162,814	3.6	159,790	3.6	1.9
Net volume of live trees (million ft ³)	5,956	3.9	5,868	3.8	1.5
Net volume of growing stock trees (million ft ³)	5,509	4.0	5,642	3.9	-2.4
Annual net growth of growing stock trees (thousand ft ³ /yr)	118,625	7.5	178,801	7.5	-33.7
Annual mortality of growing stock trees (thousand ft ³ /yr)	44,982	11.2	42,737	10.7	5.3
Annual harvest removals of growing stock trees (thousand ft ³ /yr)	49,261	26.0	54,247	18.7	-9.2



Forest Area

Successive inventories since the early 1960s in Maryland have shown forest land area consistently decreasing, however there was little change in forest area since the first full annual inventory was completed in 2008 (Fig. 1). Timberland accounts for 89 percent of this forest land or 2.2 million acres. Slightly more than 10 percent of forest land is reserved from timber production and less than 1 percent is other forest land identified as not meeting minimum productivity standards.

Seventy-three percent of Maryland’s forest land (1.8 million acres) are privately owned (Fig 2). Private owners include individuals, families, corporations, and other private entities. The remaining 23 percent (680,000) is in public ownership. The largest public owner is the State of Maryland, which holds 298,000 acres of timberland and 146,000 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 76 percent of timberland whereas the area in small-diameter stands is 9 percent. Even within each major forest-type group, most forest land is classified in the large-diameter stand size class.

Oak/hickory is the dominant forest-type group in Maryland, covering 61 percent of the forest land (Fig. 4). In fact, 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 the most prevalent. Loblolly pine/short leaf pine is the most abundant softwood forest-type group within the State, accounting for 13 percent of forest land. The maple/beech/birch forest-type group is prevalent in the western counties of Garrett and Allegany.

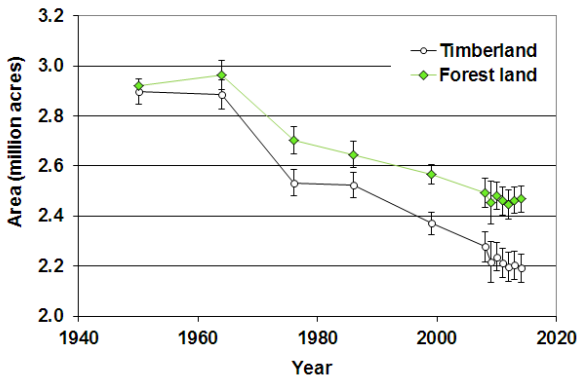


Figure 1.—Forest land and timberland area by year, Maryland. Error bars shown in figures in this report represent a 68 percent confidence interval around the mean.

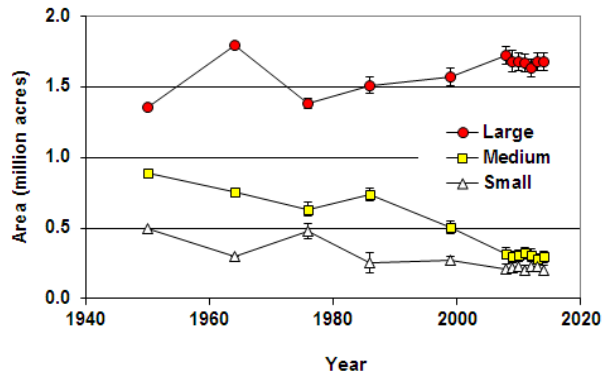


Figure 3.—Timberland area by stand-size class and year, Maryland.

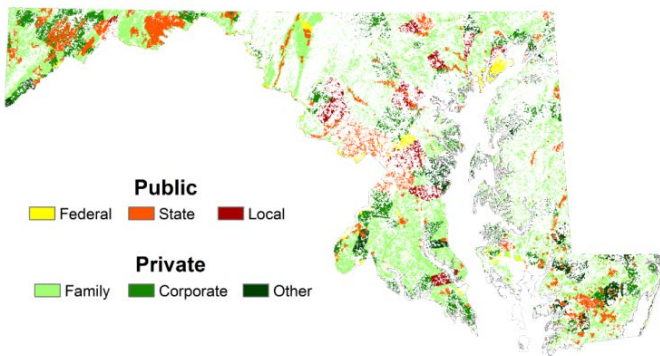


Figure 2.—Distribution of forest land by major owner group, Maryland 2014.

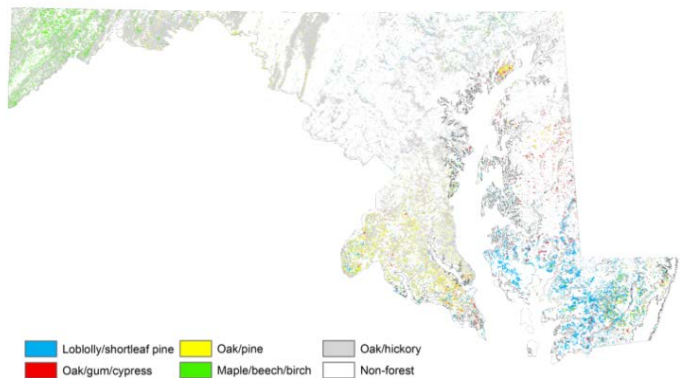


Figure 4.—Distribution of major forest type groups, Maryland, 2014.

Volume, Biomass, and Trends

The net volume of trees on forest land increased by 5 percent to 6.8 billion cubic feet. Yellow-poplar continues to be the most voluminous species followed by red maple, loblolly pine, and white oak (Table 2). Changes in live volume since 2008 varied across species. Loblolly pine showed the largest change in net volume, increasing by more than 20 percent.

The sawtimber volume on timberland increased by 4 percent to total 22.3 billion board feet. Yellow-poplar was the leading sawtimber species by volume, followed by loblolly pine, white oak, and red maple. Since 2008 loblolly pine had the largest increases in board foot volume (21.6 percent).

Aboveground biomass on forest land totaled 185 million dry tons. This was a 5 percent increase since 2008. Eighty-eight percent of biomass is contained in trees on timberland. Aboveground biomass on timberland averaged 88 dry tons per acre.

In terms of average annual growth and removals on timberland, yellow-poplar experienced the largest annual volume growth and also the largest estimated removals of all tree species in Maryland. (Fig. 5).

Together yellow-poplar and loblolly pine account for 47 percent of growth and 35 percent of removals.

Total annual growth outpaced total removals by a ratio of 1.7:1 from 2008 to 2014, although ratios varied considerably between species (Fig. 5). Among the most voluminous species, sweetgum had the largest growth-to-removals (G:R) ratio (2.9:1) and white oak had the smallest (1.3:1). As a percentage of current volume, annual mortality averaged 1.0 percent on timberland. White oak had the highest mortality rate among the top five most voluminous species, averaging 1 percent per year.

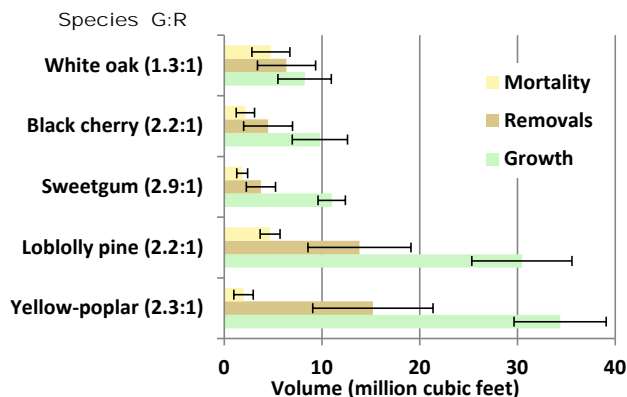


Figure 5.—Average annual net growth, removals, and mortality of net volume on timberland, and growth-to-removals ratio (G:R) for select species, Maryland, 2014.

Table 2.—Top 10 species by net volume and percent change on forest land; sawtimber volume and percent age change on timberland; and biomass on forest land, Maryland, 2014.

	Volume of live trees on forest land (million ft3)	Sampling error (percent)	Percent change since 2008	Volume of sawtimber trees on timberland (million board feet)	Sampling error (percent)	Percent change since 2008	Aboveground biomass on forest land (million tons)	Sampling error (percent)
Yellow-poplar	1,316	11.0	9.0	5,918	13.3	8.0	27	10.8
Red maple	730	8.6	-1.5	1,848	12.0	-10.0	21	8.0
Loblolly pine	725	11.5	20.7	2,235	11.8	21.6	16	11.2
White oak	525	10.7	6.8	2,036	13.2	10.9	17	10.6
Sweetgum	455	11.9	-4.1	1,420	14.3	1.0	12	11.1
Chestnut oak	311	15.6	9.0	950	19.3	14.3	10	15.3
Northern red oak	271	13.8	14.2	967	18.1	8.2	9	13.4
Black cherry	237	17.2	4.8	547	24.9	3.7	6	16.5
Black oak	214	14.5	3.4	829	16.7	8.6	7	14.5
American beech	190	17.3	1.4	567	22.9	-2.9	6	16.3
All species	6,807	3.3	5.2	22,326	5.0	3.8	185	3.0

Flowering Dogwood Trees are Declining

Flowering dogwood (*Cornus florida*) is a shade tolerant native tree that grows in the understory from Maine to the Gulf of Mexico. It is valued for its spectacular flowering in the spring, the high quality of its fruit as food for wildlife, and its red and purple fall foliage. Dogwood also plays an important role in the calcium cycle in eastern forests.

Since the 1970s, a fungal disease of unknown origin with no known cure has been eliminating dogwood from the landscape. This disease, known as dogwood anthracnose, is caused by the fungus *Discula destructiva*. It was first identified in New York and has caused extensive mortality of dogwoods throughout the eastern hardwood forests. Previous to this disease, dogwood was one of the most numerous species in the understory of eastern hardwood forest.

In the last 5 years the number of dogwood trees 1 inch diameter and larger has undergone large decreases in many states (Fig. 6). Although sampling errors for individual inventory years are large, the trend of decreasing numbers of over four inventory cycles is apparent. In Maryland the average density of dogwood trees on timberland has decreased from 28 trees/acre in 1986 to five trees/acre in 2014 (Fig.7).

Although the recent decline indicates that few trees are resistant to the disease, there are still an estimated 11 million dogwoods in Maryland forests. A cultivar was cloned from a tree discovered in Maryland that showed resistance to the disease. This cultivar and other disease resistant varieties are now sold by tree nurseries. Hopefully trees resistant to dogwood anthracnose appear within wild populations, or forests will be significantly altered aesthetically and ecologically.

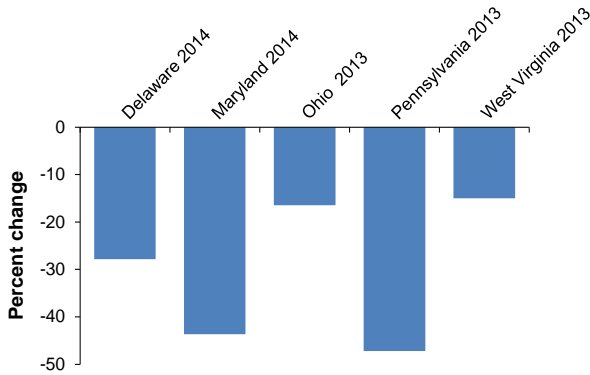


Figure--6. Percent change in numbers of dogwood trees over most recent 5-year period, by state, trees 1 inch diameter and larger.

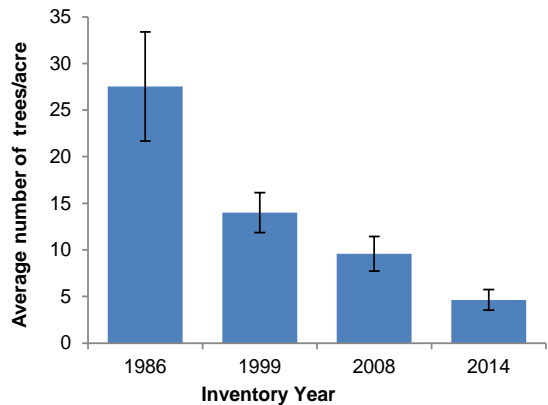


Figure--7. Average number of dogwood trees per acre of timberland, trees 1 inch diameter and larger, by inventory year, Maryland.

Literature Cited

Bechtold, W.A.; Patterson, P.L., eds. 2005. **The enhanced Forest Inventory and Analysis program: national sampling design and estimation procedures**. Gen. Tech. Rep. SRS-80. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 85 p.

O’Connell, B.M.; LaPoint, E.B.; Turner, J.A.; et al. 2013. **The Forest Inventory and Analysis database: database description and users manual version 5.16 for Phase 2**. Washington, DC: U.S. Department of Agriculture, Forest Service. (<http://www.fia.fs.fed.us/library/database-documentation/>)

USDA Forest Service. 2012. **Forest inventory and analysis national core field guide, Vol. 1, field data collection procedures for Phase 2 plots, Ver. 6.0**. Washington, DC: U.S. Department of Agriculture, Forest Service. Available at www.fia.fs.fed.us/library/field-guides-methods-proc (accessed Oct 2014).

More information on Maryland Forests

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