



Forests of Delaware, 2017

This publication provides an overview of forest resources in Delaware 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 with a cycle length of 5 years, measuring data on 20 percent of all sample plots each year in Delaware. Beginning in 2014, FIA is on a 7-year cycle, inventorying 14 percent of all plots annually. For the 2017 inventory, estimates for current variables such as area, volume, and biomass are based on 397 plots (140 forested) collected from 2011–2017. Change variables such as net growth, removals, and mortality are based on 377 samples (124 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. (2017), Gormanson et al. (2017), and USDA Forest Service (2016) for definitions and technical details. A complete set of inventory tables is available at <https://doi.org/10.2737/FS-RU-168>.

Overview

Delaware has an estimated 356,000 acres of forest land (Table 1). Since 2012 there has been no substantial change in forest land area, however long-term data shows a decrease (12 percent) in the amount of forest land since the 1986 FIA inventory (Fig. 1). According to the 2017 results, there are approximately 247 million trees 1 inch or greater containing 26 million tons of biomass and 947 million cubic feet of net volume in trees 5 inches or greater. Annual mortality of live trees on forest land has increased by 57 percent since the 2012 inventory. Annual net growth of growing stock trees on timberland outpaced annual harvest removals of growing stock trees by a ratio (growth:removals) of 1.7:1 and annual mortality of growing stock trees averaged 1.1 percent on timberland when calculated as a percentage of the net volume of growing stock trees.

Table 1.—Delaware forest statistics, 2017 and 2012. Volumes are for trees 5-inch diameter and larger. Number of trees and biomass are for trees 1-inch diameter and larger. Sampling errors in this and other tables represent 68 percent confidence intervals.

	2017 Estimate	Sampling error (%)	2012 Estimate	Sampling error (%)	Change since 2012 (%)
Forest Land					
Area (thousand acres)	356	3.8	348	4.5	2.4
Number of live trees (million trees)	247	10.8	231	10.2	6.9
Aboveground biomass of live trees (thousand oven-dry tons)	25,711	5.2	24,116	5.9	6.6
Net volume of live trees (million ft ³)	947	5.8	881	6.3	7.6
Annual net growth live trees (thousand ft ³ /yr)	17,679	15.8	18,960	12.0	-6.8
Annual mortality of live trees (thousand ft ³ /yr)	11,717	17.0	7,482	21.3	56.6
Annual harvest removals of live trees (thousand ft ³ /yr)	11,230	38.6	9,094	42.6	23.5
Timberland					
Area (thousand acres)	342	4.2	332	5.0	3.0
Number of live trees (million trees)	243	10.9	221	10.7	9.8
Aboveground biomass of live trees (thousand oven-dry tons)	24,425	5.6	22,894	6.5	6.7
Net volume of live trees (million ft ³)	890	6.1	832	6.7	7.1
Net volume of growing stock trees (million ft ³)	817	6.5	766	7.0	6.6
Annual net growth of growing stock trees (thousand ft ³ /yr)	15,001	15.4	15,361	12.1	-2.3
Annual mortality of growing stock trees (thousand ft ³ /yr)	8,614	19.3	5,613	23.1	53.5
Annual harvest removals of growing stock trees (thousand ft³/yr)	8,940	38.1	7,788	43.1	14.8



Forest Area

Delaware's forest land area decreased by 16 percent from its highest point in 1986 (403,000 acres) to its lowest point in 2011 (340,00 acres). However, since 2011, forest land estimates have increased by 5 percent to an estimate of 356,000 acres of forest land, which may be an indication of a stabilizing forest land base (Fig. 1). Timberland accounts for 96 percent of this forest land or 342,000 acres. Three percent of forest land is reserved from timber production and 1 percent of the forest land does not meet minimum productivity standards.

Seventy-eight percent of Delaware's forests (279,000 acres) are privately owned (Fig. 2). Private owners include individuals, families, corporations, and other private entities. The remaining 22 percent (77,000 acres) is in public ownership. The largest public owner is the State of Delaware, which holds approximately 54,000 acres of timberland and 8,000 acres of reserved forest.

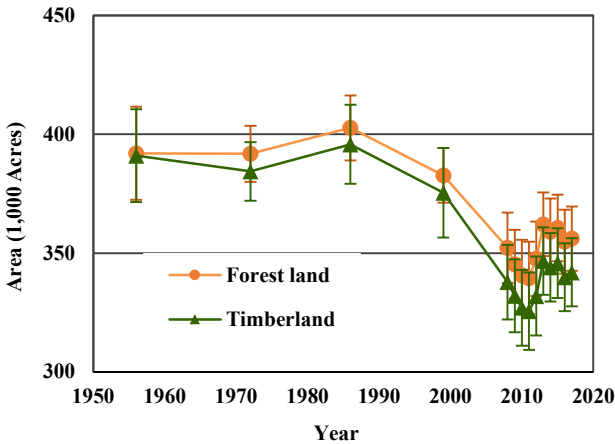


Figure 1.—Forest land and timberland area by year, Delaware, 1957-2017. Error bars shown in figures in this and other graphs represent 68 percent confidence interval.

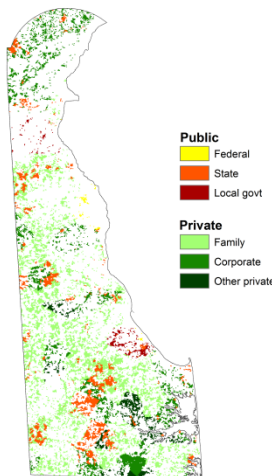


Figure 2.—Distribution of forest land by major owner group, Delaware, 2014.

Delaware's forests steadily matured between the 1972 and 2008 inventories, as is illustrated by the distribution of timberland by stand-size class (Fig. 3). Stand size ratios have remained relatively constant since the 2008 inventory. Acreage in sawtimber stands accounts for 77 percent of timberland while the area in seedling-sapling size stands is only 10 percent. Within each major forest-type group, most timberland is classified in the sawtimber stand-size class (Fig. 4).

Oak/hickory is the dominant forest-type group on timberland in Delaware, covering 51 percent of the acreage. The oak/hickory forest-type group is most prevalent in all but the southernmost part of the State where the loblolly pine/shortleaf pine forest-type group dominates. Loblolly pine/short leaf pine is the most abundant softwood forest-type group in the State, accounting for 19 percent of the timberland.

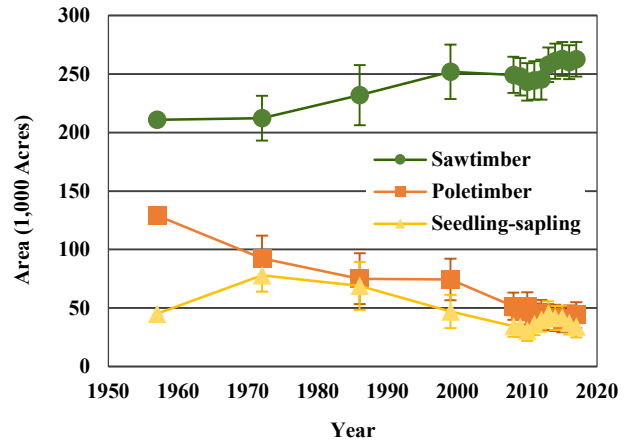


Figure 3.—Timberland area by stand-size class and year, Delaware, 1957-2017.

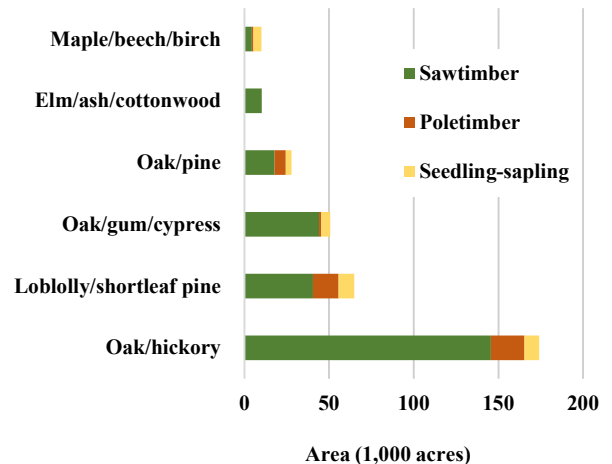


Figure 4.—Timberland area for the top six forest-type groups by stand-size classes, Delaware, 2017.

Volume, Biomass, and Trends

The net volume of trees on forest land increased by 8 percent to 947 million cubic feet since 2012. Red maple (*Acer rubrum*) continues to be the most voluminous species followed by yellow-poplar (*Liriodendron tulipifera*) and loblolly pine (*Pinus taeda*) (Table 2). Changes in live volume since 2012 varied across species and interpretation is difficult given the high sampling errors for most species. Yellow-poplar, white oak (*Quercus alba*), and blackgum (*Nyssa sylvatica*) showed the highest percentage increases since 2012 while willow oak (*Q. phellos*) and black cherry (*Prunus serotina*) showed a decrease in volume of live trees on forest land.

The sawtimber volume on timberland increased by 9 percent to 3 billion board feet since 2012. Red maple was the leading sawtimber species by volume, followed by yellow-poplar and loblolly pine. Sawtimber volume estimates for yellow-poplar, blackgum, and black cherry showed the greatest increases since 2012.

Aboveground biomass on forest land totaled 26 million dry tons. Ninety-five percent of biomass is contained in trees on timberland. Aboveground biomass on timberland averaged 71 dry tons per acre (Table 1).

Table 2.—Top 10 species by net volume and percentage change since 2012 on forest land; sawtimber volume and percentage change since 2012 on timberland, Delaware, 2017.

	Volume of live trees on forest land (million ft ³)	Sampling error (%)	Change since 2012 (%)	Volume of sawtimber trees on timberland (million board feet)	Sampling error (%)	Change since 2012 (%)
Red maple	193	12.0	0.7	565	15.7	1.9
Yellow-poplar	140	23.2	28.4	466	24.8	31.3
Loblolly pine	127	17.9	0.8	441	19.7	- 4.9
Sweetgum	112	14.8	9.1	371	19.5	13.9
White oak	76	17.1	21.8	316	19.6	25.7
Willow oak	44	33.4	- 3.3	235	35.3	- 0.1
Blackgum	38	18.8	17.8	113	25.2	31.2
Southern red oak	34	25.7	9.1	125	29.1	19.8
Black cherry	20	28.9	- 0.5	39	55.0	30.0
Scarlet oak	18	37.2	8.4	65	43.3	8.6
Total of all species	947	5.8	7.6	3,161	8.1	8.5

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