



# Forests of Rhode Island, 2015

This report provides an overview of forest resources in Rhode Island based on an inventory conducted by the U.S. Forest Service, Forest Inventory and Analysis (FIA) program of the Northern Research Station. Estimates are based on field data collected using the FIA annualized sample design. Results are for the measurement years 2010-2015 with comparisons made to 2005-2010\* (see footnote on bottom of page 2). Forest resource measurements were taken on 143 plots with about 20 percent of the plots measured each year. Estimates will be updated and published annually.

For core tables and more information, including definitions and technical details, please refer to the inventory citations on page 4 of this report or visit <http://fia.fs.fed.us>.

## Overview

As of 2015, Rhode Island has an estimated 370,000 acres of forest land (Table 1). The forest land area has not substantially changed since 2010. The estimated number of live trees on Rhode Island’s forest land in 2015 is 164 million containing a total aboveground biomass of 26 million tons. The estimated volume of trees, ≥5 inch diameter at breast height, is 902 million ft<sup>3</sup>. The estimated annual net growth of these trees is 18 million ft<sup>3</sup>/yr with annual mortality, harvest removals, and other removals, such as land clearing, equal to 28, 4, and 3 percent of the annual growth, respectively.

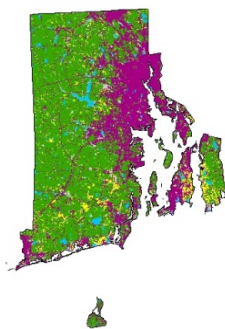
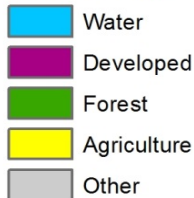
**Table 1.—Rhode Island forest statistics, 2005-2010 and 2010-2015**

	2010 Estimate	Sampling error (percent)	2015 Estimate	Sampling error (percent)	Change since 2010 (percent)
<b>Forest Land</b>					
Area (thousand acres)	352.0	4.1	369.8	3.6	5.1
Number of live trees ≥1 in diameter (million trees)	177.5	8.2	164.4	7.6	-7.4
Live tree aboveground biomass (thousand oven-dry tons)	23,304.4	5.2	25,559.6	4.8	9.7
Net volume live trees ≥5 in diameter (million ft <sup>3</sup> )	819.7	5.8	901.6	5.2	10.0
Net growth live trees ≥5 in (thousand ft <sup>3</sup> /yr)	20,130.7	13.3	18,200.9	17.5	-9.6
Annual mortality of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	4,272.0	19.4	5,150.7	18.8	20.6
Annual harvest removals of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	749.5	68.6	674.9	55.1	-10.0
Annual other removals of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	2,961.1	79.5	501.4	67.3	-83.1
<b>Timberland</b>					
Area (thousand acres)	339.7	4.4	356.1	4.0	4.8
Number of live trees ≥1 in diameter (million trees)	172.3	8.5	160.1	7.9	-7.1
Live tree aboveground biomass (thousand oven-dry tons)	22,566.1	5.4	24,767.1	5.1	9.8
Net volume live trees ≥5 in diameter (million ft <sup>3</sup> )	796.8	6.0	876.6	5.5	10.0
Net volume of growing stock trees (million ft <sup>3</sup> )	728.2	6.6	771.0	6.4	5.9
Net growth live trees ≥5 in (thousand ft <sup>3</sup> /yr)	17,403.1	12.2	16,811.4	14.5	-3.4
Annual mortality of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	3,077.8	22.5	2,913.7	22.7	-5.3
Annual harvest removals of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	667.6	68.3	565.7	57.6	-15.3
Annual other removals of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	3,052.8	63.5	434.4	70.2	-85.8



# Forest Area

## Land Cover



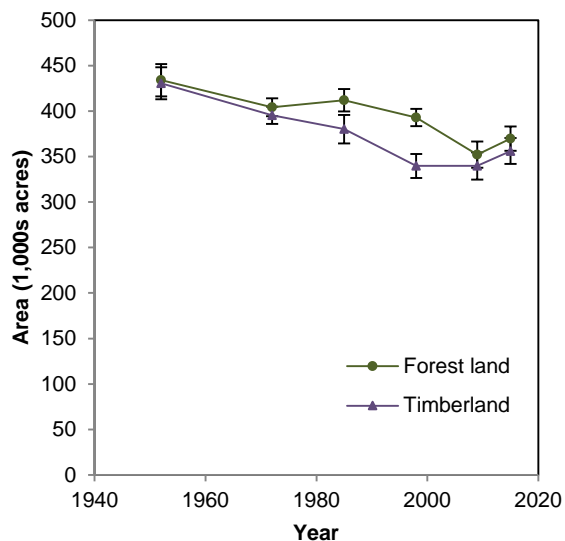
**Figure 1.—Forest and other land cover, Rhode Island, 2011.**

Source: National Land Cover Database (Jin et al. 2013).

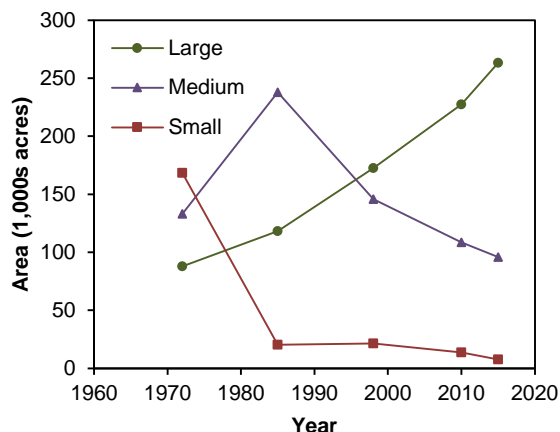
An estimated 56 percent of the land area of Rhode Island meets the FIA definition of forest land. This forest land is not evenly distributed across the State (Fig. 1). The distribution is largely determined by development patterns and, to a lesser extent, arable lands—if left alone, most land in the State would naturally revert to forest. Areas surrounding Providence and along the coast have the lowest occurrences of forest land.

The area of forest land in Rhode Island has decreased from an estimated 434,000 acres of in 1952, the first year FIA started collecting data in the State, to an estimated 370,000 acres in 2015, the nominal year of the most recent inventory results (Fig. 2). The general decrease from the earliest estimates is presumably due to increased development. The forest land estimates in 2010 and 2015 are not substantially different, but FIA will continue to monitor this trend to see if the recession or other factors may be allowing increased reversion of nonforest land to forest land.

There have been relatively few stand replacing events over the past few decades and this has resulted in the percentage of the forest land that is in the largest stand size class\*\* steadily increasing (Fig. 3). This has important implications for forest resilience (i.e., the ability of the forests to withstand severe weather events or insect infestations), wildlife habitat, and other ecological functions.



**Figure 2.—Area of forest land and timberland, Rhode Island, 1952-2015. Sampling errors and error bars shown in the tables and figures in this report represent 68 percent confidence intervals for the estimated values.**



**Figure 3.—Area of timberland by stand-size class\*\*, Rhode Island, 1972-2015.**

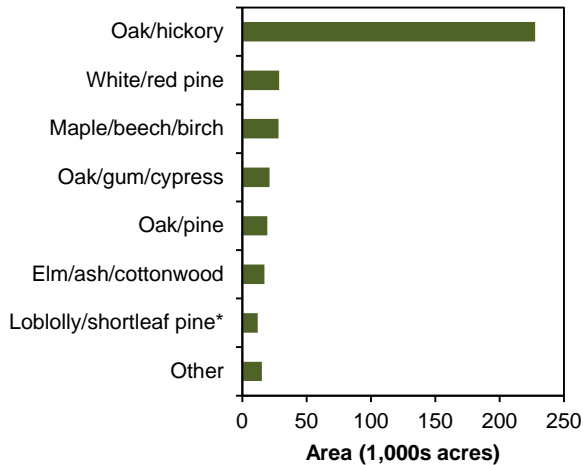
\*One-fifth of the plots were measured annually from 1999 through 2013 resulting in a complete set of samples for every 5 years of data collection. In 2014, this 5-year cycle was changed to 7 years, wherein 1/7th of the plots are measured annually. The complete set of plots will be retained. All inventory estimates (both current and change) will continue to be based on the most recent measurements and remeasurements taken on these plots.

\*\*Small: dominated by trees less than 5.0 inches diameter at breast height (d.b.h.); Medium: dominated by trees 5.0 to 8.9 inches d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods; Large: dominated by trees ≥9.0 inches for softwoods and 11.0 inches d.b.h. for hardwoods.

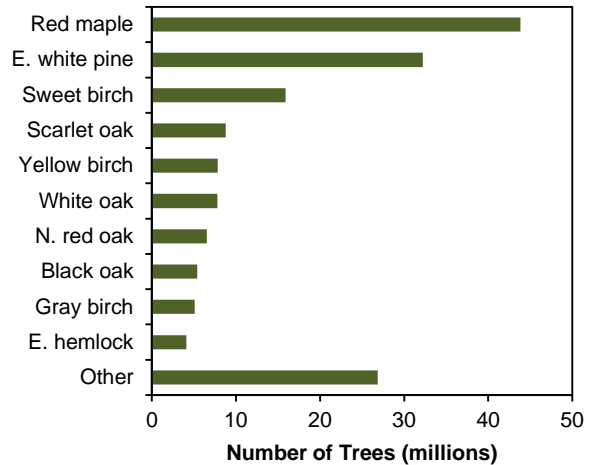
# Forest Composition

There are many different ways to characterize the composition of forests, three are presented here: forest-type groups, volume, and numbers of stems. Each provides a somewhat different view of the resource and there are many other potential metrics that can be examined.

Forest-type groups are amalgamations of forest types which are calculated based on the plurality of trees within the plot/condition. In Rhode Island, the oak/hickory forest-type group is by far the most common forest-type group, representing 62 percent of the State’s forest land (Fig. 4). In Rhode Island, this group is indeed dominated by oaks, northern red, scarlet, black, and white oaks in particular, but it also includes substantial amounts of red maple and other species.



The forests of Rhode Island contain a wide variety of tree species, with 45 species observed on the FIA plots inventoried between 2010 and 2015. In terms of total volume (Table 2) and number of trees (Fig. 5), red maple is the most common tree in the State. This species accounts for an estimated 21 percent of the volume and 27 percent of the number of trees. Rankings of the next most common species vary substantially depending on whether volume or number of trees are examined, but includes eastern white pine and a number of oak and birch species. Collectively, the 10 most common tree species account for 91 percent of the volume of live trees and 84 percent of the number of trees in the State.



**Figure 4.—Area of forest land by forest-type group, Rhode Island, 2010-2015.** \*Represented by the pitch pine forest type in Rhode Island.

**Figure 5.—Number of trees ≥ 1 in diameter by species, Rhode Island, 2010-2015.**

**Table 2.—Top 10 trees species by volume estimates, Rhode Island, 2010-2015**

Rank	Species	Volume of live trees on forest land (million ft <sup>3</sup> )	Sampling error (%)	Change since 2010 (%)	Volume of sawtimber trees on timberland (million board ft)	Sampling error (%)	Change since 2010 (%)
1	Red maple	193.5	10.5	-2.6	318.0	18.9	-17.2
2	Eastern white pine	169.5	19.8	29.5	761.1	21.2	31.1
3	Northern red oak	131.8	17.2	21.5	507.8	20.3	25.1
4	Scarlet oak	90.3	15.6	20.1	222.9	18.5	25.2
5	Black oak	89.1	17.8	5.8	302.5	20.4	4.1
6	White oak	75.5	13.9	26.7	252.4	18.8	33.5
7	Pitch pine	21.4	48.1	13.8	78.8	52.5	15.9
8	Sweet birch	17.2	29.0	-22.9	9.6	50.3	-67.9
9	Blackgum	14.8	33.1	-6.3	36.0	51.7	-24.8
10	Yellow birch	14.5	33.4	19.8	20.7	41.6	24.0
	All species	901.6	5.2	10.0	2,689.2	8.3	11.6

# Timber Removals Across Southern New England

Across the Southern New England states of Connecticut, Massachusetts, and Rhode Island, an estimated 63 million cubic feet of wood is being removed annually, 2 percent of which comes from Rhode Island. Most of this wood, 86 percent, is being removed due to harvesting, including both commercial and noncommercial purposes, such as firewood harvesting. The remaining 14 percent of the removals are due primarily to land use conversions. The overall growth to removals ratio is 5:1 indicating the region is producing five times more wood than is being harvested.

Looking just at the wood being removed for harvesting, most of it is coming from a relatively few species and fairly narrow diameter size class. Across the region, northern red oak, red maple, and eastern white pine are the dominant species being harvested (Fig. 6). Most of the trees being harvested range in diameter from 10 to 19 inches (Fig. 7). These harvesting patterns are related to relative abundance of species, preferences for certain species for timber and firewood, and harvesting practices.

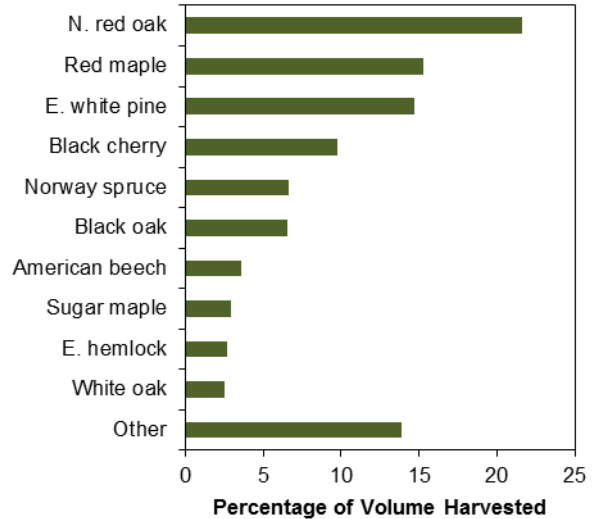


Figure 6.—Percentage of volume harvested by species, Southern New England, 2015.

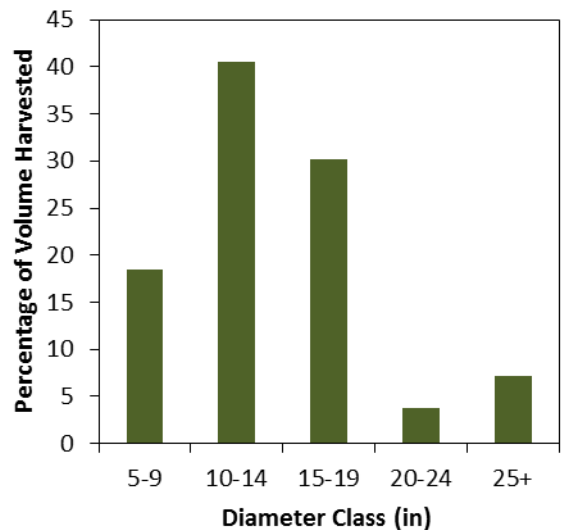


Figure 7.—Percentage of volume harvested by diameter class, Southern New England, 2015.

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### How to Cite This Publication

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