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RESOURCE UPDATE FS-86

Forests of Maine, 2015

This publication provides an overview of the forest resources in Maine based upon inventories conducted by the U.S. Forest Service, Forest Inventory and Analysis (FIA) program of the Northern Research Station. Information about the national and regional FIA program is available online at http://fia.fs.fed.us.

Since 1999, FIA has implemented an annual inventory measuring data on 20 percent of sample plots each year. For the 2015 inventory, estimates for current variables, such as area, volume, and biomass, are based on 3,592 plots inventoried from 2011-2015. Change variables, such as net growth, removals, and mortality, are based on 3,539 plots inventoried in 2006-2010 and resampled in 2011-2015. There are additional tables of data available online (http://www.nrs.fs.fed.us/fia/data-tools/state-reports/ME/default.asp). Estimates from earlier annual and periodic inventories are shown for comparison. See Bechtold and Patterson (2005) and O'Connell et al. (2014) for definitions and technical details.

Overview

Maine contains an estimated 17.5 million acres of forest land (Table 1). The acreage of forest land has been quite stable since 1960, covering more than 89 percent of the State's total land area, excluding census water (Ferguson and Longwood 1960). The number of live trees greater than 1 inch in diameter is approaching 24.4 billion trees.

Total timberland estimates (Table 1) reveal the aboveground biomass has increased 4 percent. Over the same period, the average annual volume for tree growth has increased 18 percent and tree mortality has decreased 13 percent. Tree harvest levels decreased 18 percent since 2010 on timberland.

Table 1.—Maine forest statistics, 2015 and 2010. Volumes estimates are for trees 5 inch and larger in diameter. Number of trees and biomass estimates are for trees 1 inch and larger diameter. Sampling errors and error bars shown in tables and figures in this report represent 68-percent confidence intervals.

	2015 Estimate	Sampling error (percent)	2010 Estimate	Sampling error (percent)	Change since 2010 (percent)
Forest Land					
Area (thousand acres)	17,579	0.4	17,665	0.4	-0.5
Number of live trees (million trees)	24,354	1.5	23,954	1.5	1.7
Aboveground biomass of live trees (thousand oven-dry tons)	706,635	0.9	668,686	1	5.7
Net volume of live trees (million ft^3)	26,955	1.2	25,489	1.2	5.8
Annual net growth of live trees (thousand ft^3/yr)	793,789	1.8	664,269	2.4	19.5
Mortality of live trees (thousand ft^3/yr)	277,394	3.4	326,060	2.9	-14.9
Annual harvest removals of live trees (thousand ft^3/yr)	526,718	5.6	645,611	5.1	-18.4
Annual other removals of live trees (thousand ft^3/yr)	6,774	34.9	5,334	55.3	27
Timberland					
Area (thousand acres)	16,778	0.5	17,042	0.5	-1.6
Number of live trees (million trees)	23,237	1.5	23,159	1.6	0.3
Aboveground biomass of live trees (thousand oven-dry tons)	670,939	1.0	645,136	1.0	4.0
Net volume of live trees (million ft^3)	25,468	1.3	24,526	1.2	3.8
Net volume of growing stock trees (million ft^3)	23,356	1.3	23,025	1.3	1.4
Annual net growth of live trees (thousand ft^3/yr)	728,117	1.7	619,410	2.2	17.6
Annual mortality of growing stock trees (thousand ft^3/yr)	215,234	3.8	246,718	3.2	-12.8
Annual harvest removals of growing stock trees (thousand ft^3/yr)	461,425	5.7	572,958	5.1	-19.5
Annual other removals of growing stock trees (thousand ft^3/yr)	9,847	53.5	10,609	54.9	-7.2

Forest Area

Maine's forest land area has been very stable since 1960 although timberland may be declining slightly (Fig. 1). Privately-owned timberland makes up 90 percent of the forest land area while public ownership including some reserved lands has remained around 10 percent of the total forested area (Fig. 2).

State-level timberland area has remained nearly the same since the spruce budworm salvage operations of the 1980s and 1990s (Fig. 3). But individually, the area of timberland in the white/red/jack pine forest-type group continues to be dominated with large diameter trees (Fig. 4).

Only 33,000 acres (3 percent) of the white/red/jack pine forest-type group are considered small diameter stands. Twenty-five percent of the timberland area for the maple-beech-birch forests are considered small diameter-sized stands.

On the other hand, the area of aspen/birch forests dominated with large diameter-sized trees is less than 15 percent of the total area for this forest-type group. The intensely managed spruce/fir forest-type group contains a higher percentage in smaller diameter stands. Small diameter stands make up 39 percent of the total area, while medium diameter-sized stands and large diameter-sized stands contain 32 and 29 percent, respectively.

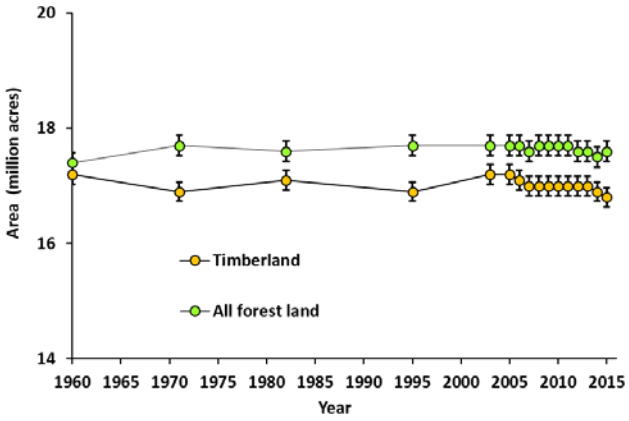

Figure 1.—Area of Forest land and timberland by year, Maine.

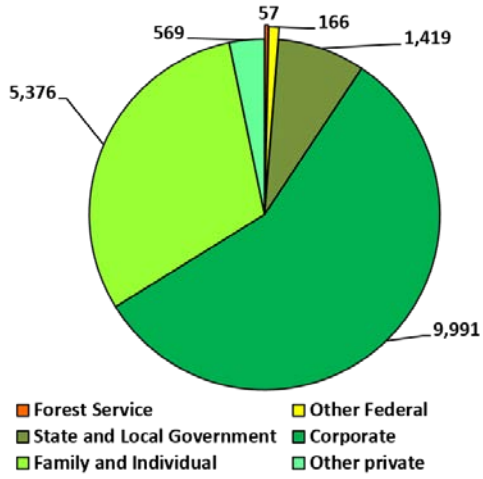

Figure 2.—Major ownership groups by area of forest land, in thousand acres, Maine, 2015.

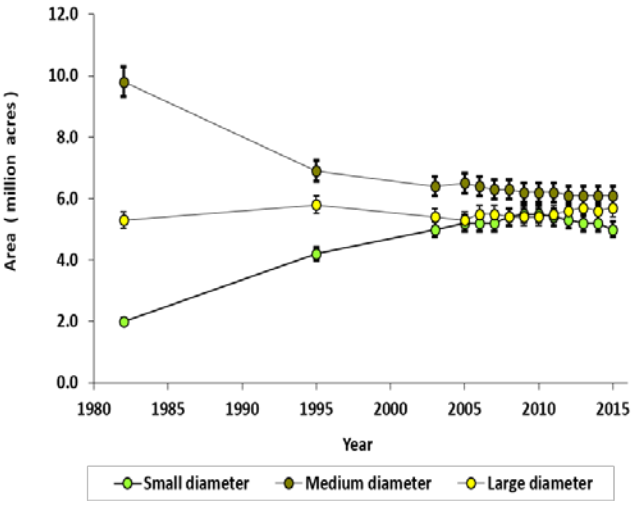

Figure 3.—Area of timberland by stand-size class and survey year, Maine, 1982-2014.

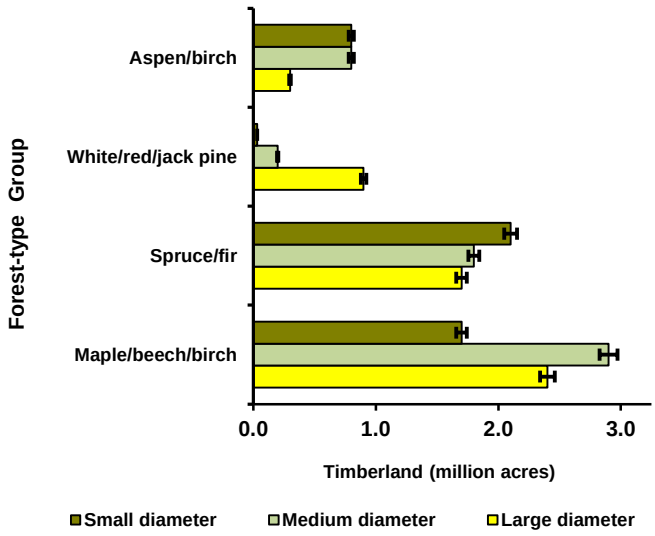

Figure 4.—Area of timberland by stand-size class for the major forest-type groups in acres, Maine, 2014.

Forest Composition

Maine contains nearly 27 billion cubic feet of wood within its forests, an increase of 5.8 percent since 2010. This volume is composed of 55 percent softwood and 45 percent hardwood tree species. Softwood species comprise over 65 percent of the sawtimber volume on timberland.

Forest-type groups are based on a plurality of the sampled trees stocking values within a given plot condition. In Maine, the maple/beech/birch forest-type group is the most common, followed by spruce/fir, aspen/birch, and finally white/red/jack pine (Fig. 4). These forest-type groups represent 42, 33, 11, and 7 percent of timberland, respectively (Fig. 4).

Maine's forests contain a wide variety of tree species with over 40 species sampled in 2015.

In terms of volume, red spruce is the most common tree in Maine, a change from 2014 when red maple was the most common by volume (McCaskill 2015). Collectively, the 10 most voluminous tree species account for 83 percent of the total volume of live trees on forest land in Maine (Table 2). However, in terms of number of trees, balsam fir is the most common species in Maine with almost 9 billion stems; red maple is second most common with almost 3 billion stems and red spruce is third most common with almost 2.5 billion stems (Fig. 5).

There has been almost a 20 percent increase in balsam fir by live tree volume on forest land, a 14 percent increase in northern red oak, and 10 percent increase in red spruce since 2010 (Table 2).

When it comes to sawtimber on timberland, eastern white pine is the most common species by volume, followed by red spruce and eastern hemlock (Table 2). Notably, there has been *almost* an 11 percent increase in balsam fir by sawtimber volume, a 19 percent increase in northern red oak, and a 12 percent decrease in paper birch by sawtimber volume since 2010 (Table 2).

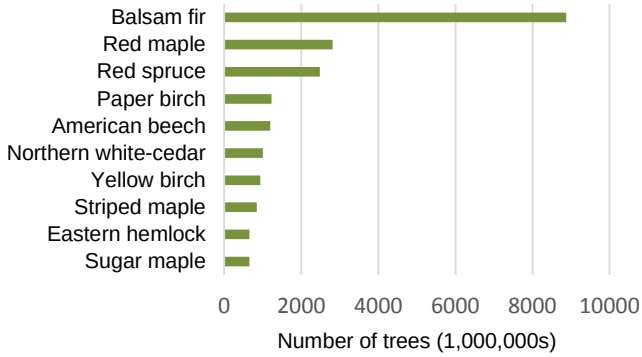

Figure 5.—Number of trees ≥1 inch diameter by species, Maine, 2015.

Table 2.—Net volume and percent change in net volume on forest land; sawtimber volume and percent change on timberland, Maine, 2015, (top 10 species by net volume).

Rank	Species	Volume of live trees on forest land (1,000,000 ft^3)	Sampling error (%)	Change since 2010 (%)	Volume of sawtimber trees on timberland (1,000,000 bdft)	Sampling error (%)	Change since 2010 (%)
1	Red spruce	3,352.1	3.9	9.9	8,047.4	4.9	4.3
2	Red maple	3,268.6	2.8	2.6	4,787.2	5.0	0.3
3	Eastern white pine	3,074.4	5.1	11	10,695.8	5.7	5.2
4	Balsam fir	2,681.7	2.8	19.7	2,788.5	4.9	10.9
5	Northern white-cedar	2,201.9	5.0	-0.6	4,579.4	6.1	-3.1
6	Eastern hemlock	2,026.3	5.1	3.7	5,672.7	5.9	2.5
7	Sugar maple	1,996.5	5.7	-2.1	5,241.6	7.3	-5.9
8	Yellow birch	1,686.8	3.9	5.8	3,384.0	6.3	-7.1
9	Paper birch	1,126.9	4.4	-0.8	1,011.4	8.3	-12.4
10	Northern red oak	968.9	6.6	13.7	2,718.0	8.3	18.8
	Other softwood species	1,528.0	5.6	5.6	3,397.4	7.6	7.5
	Other hardwood species	3,043.0	3.4	1.3	4,966.9	5.7	-3.4
	All species	26,955.1	1.2	5.8	57,290.2	2.0	1.6

A Closer Look at Early Succession Forest Habitat: Is There Enough?

The long-term vitality and productivity of Maine's forest depends on an even distribution of stand-size classes to ensure a flow of goods and services that Maine's citizenry are accustomed to. The diversity of forest types and stand sizes makes it a challenge to understand how these values are distributed across the State. In particular, early succession forest (or small diameter stands) are critical to wildlife that depend on young forest as a source of food, cover, and territory.

Although the optimal distribution of stand sizes depends on a variety of factors, such as species composition and the kind of goods and services desired, a useful standard is to have 5 to15 percent in regeneration, 30 to 40 percent in sapling-pole, 40 to 50 percent in sawtimber, and <10 percent in large sawtimber (DeGraaf et al. 2007). Maine's forest land is approaching these structural targets as the distribution is 30, 36, and 34 percent in small, medium, and large size stands, respectively.

However, there is still a lack of large sawtimber stands. Not all forest types are well balanced. This is because the overall distribution is dominated by maple/beech/birch and spruce/fir forests that account for three-fourths of the State's forest land and have substantial amounts of young forest.

To highlight the need for close examination of information on young forest, consider the spruce/fir forest-type group. Separating out the specific types that make up this group, shows that there is a major difference between the spruce and fir types and the northern white-cedar type that is included in the group (Fig. 6). Forty-five percent of the spruce and fir types are in the small-diameter size class compared to only 7 percent for northern white-cedar.

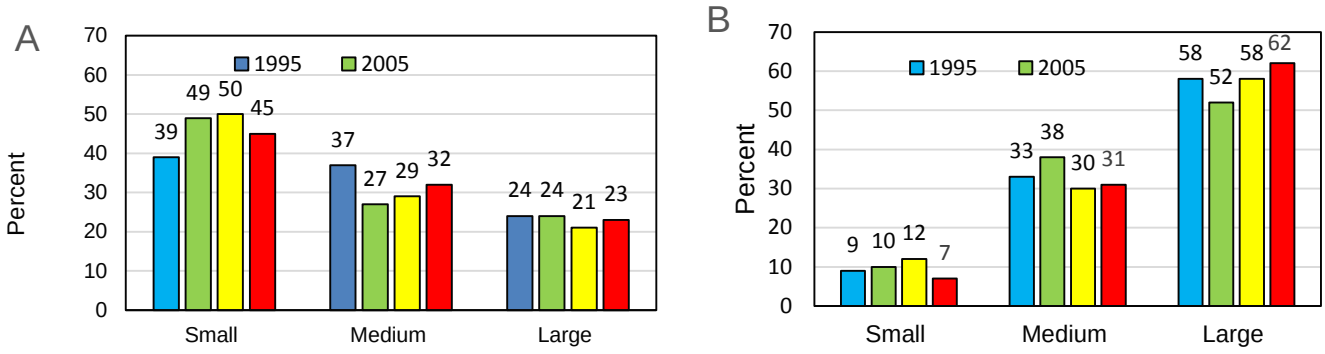

Figure 6.—Area of forest land classified as spruce/fir (A) and northern white-cedar (B) by stand-size class and inventory year, Maine. Includes all forest types of the spruce/fir group except tamarack and northern white-cedar.

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Contact Information
Emily S. Huff, Research Forester
USDA Forest Service, Northern Research Station
160 Holdsworth Way
Amherst, MA 01003
Ph: 413-545-1655/ Fax: 545-1860
ehuff@fs.fed.us

The published report is available online at http://treesearch.fs.fed.us