



Forests of New York, 2014

This resource update provides an overview of the forest resources in New York based on inventories 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 and are updated yearly.¹ (See footnote on page 4). Information about the national and regional FIA program is available online at <http://fia.fs.fed.us>. Since 2002, FIA has implemented an annual inventory in New York. For the 2014 inventory, estimates for current variables such as area, volume, and biomass are based on 4,779 plot samples collected from 2009-2014. Change variables such as net growth, removals, and mortality are based on 4,573 plots collected in 2005-2009 and remeasured 2009-2014. 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

New York's forest land area totals 18.9 million acres and occupies 63 percent of the State's land area (Table 1). Since completion of the first cycle of annual plots in 2008, there has been little change in forest area (Fig. 1). Eighty-three percent of New York's forest land, 15.7 million acres, is classified as timberland, 3.1 million acres is classified as reserved, and an additional 43,000 acres as forest land low in productivity. The most recent inventory shows the net volume of trees on forest land and timberland continued to increase, and annual growth continued to outpace annual removals. Annual mortality of growing-stock trees on timberland averaged 0.9 percent of the current inventory. This was the same mortality rate as found during the 2007 inventory (Widmann et al. 2012).

Table 1.—New York forest statistics, 2014 and 2009. Volumes are for 5-inch and larger diameter trees. Numbers of trees and biomass are for trees 1-inch diameter and larger. Sampling errors in tables in this report represent 68 percent confidence intervals

	2014 Estimate	Sampling error (percent)	2009 Estimate	Sampling error (percent)	Change since 2009 (percent)
Forest Land					
Area (thousand acres)	18,930	0.6	18,964	0.7	-0.2
Number of live trees (million trees)	12,104	1.3	12,141	1.3	-0.3
Aboveground biomass of live trees (thousand oven-dry tons)	1,140,163	0.9	1,090,235	1.0	4.6
Net volume of live trees (million ft ³)	41,737	1.0	39,905	1.1	4.6
Annual net growth of live trees (thousand ft ³ /yr)	735,109	3.2	720,722	4.2	2.0
Annual mortality of live trees (thousand ft ³ /yr)	479,966	3.5	500,494	4.2	-4.1
Annual harvest removals of live trees (thousand ft ³ /yr)	266,720	8.2	339,731	10.4	-21.5
Annual other removals of live trees (thousand ft ³ /yr)	17,985	32.5	17,833	67.9	0.9
Timberland					
Area (thousand acres)	15,748	0.7	15,798	0.8	-0.3
Number of live trees (million trees)	9,599	1.5	9,743	1.5	-1.5
Aboveground biomass of live trees (thousand oven-dry tons)	919,780	1.1	879,169	1.2	4.6
Net volume of live trees (million ft ³)	33,580	1.2	32,082	1.3	4.7
Net volume of growing-stock trees (million ft ³)	29,912	1.3	29,285	1.4	2.1
Annual net growth of growing-stock (thousand ft ³ /yr)	611,653	2.6	600,514	3.7	1.9
Annual mortality of growing-stock trees (thousand ft ³ /yr)	259,452	4.4	269,900	5.3	-3.9
Annual harvest removals of growing-stock trees (thousand ft ³ /yr)	218,999	8.3	276,248	10.4	-20.7
Annual other removals of growing-stock trees (thousand ft ³ /yr)	29,565	26.9	29,493	46.1	0.2



Forest Area

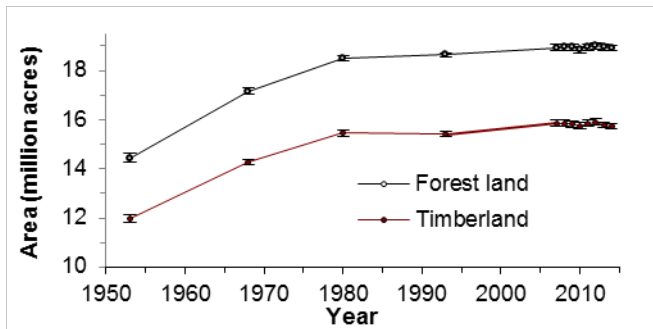


Figure 1.—Forest land and timberland by year, New York. Error bars in figures in this report represent 68-percent confidence intervals around the mean.

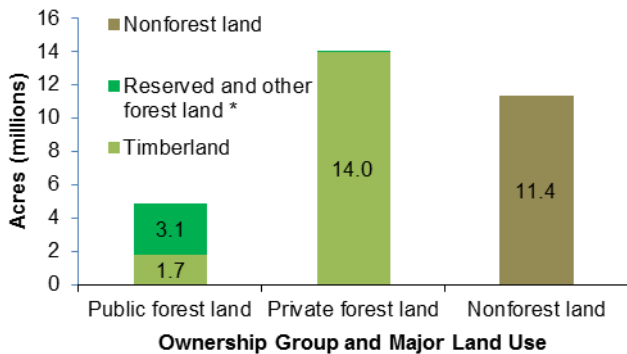


Figure 2.—Land area by major use and major ownership category, New York, 2014. *Reserved applies only to public forest land. Less than 100,000 acres of private forest land is classified as other forest land.

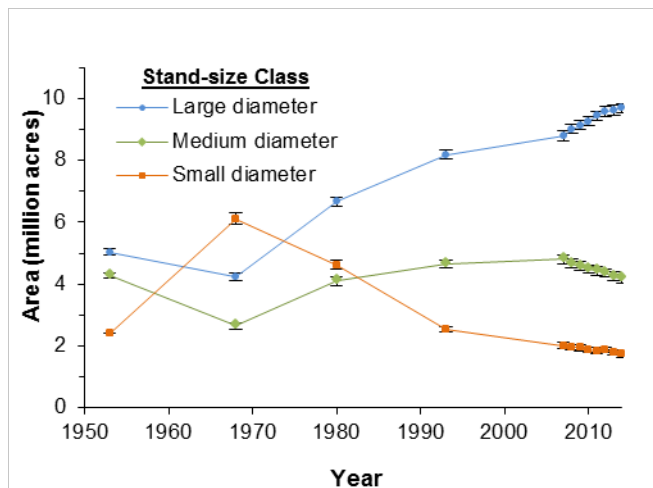


Figure 3.—Timberland by stand-size class and year, New York.

Successive inventories have shown forest land area stable since 2007 (Fig.1). Historically (1952-2012), forest land lost to development has been offset by gains in forest land because of abandoned farm land reverting to forest. Recent changes in forest land reflect the continued development of forest land to nonforest uses and a slowing in farm land losses. Although annual changes in total forest land have been small and within the range of sampling error, decreases in forest land area since 2012, may indicate that the area of forest land in New York has peaked. Future changes in forest land will depend on the pace of land development and to a great extent on the economics of farming.

Seventy-six percent of New York's forests are privately owned (14.0 million acres) (Fig. 2). These ownerships include families and individuals, corporations, and other private entities. The remaining 24 percent (4.9 million acres) is in public ownership. The largest public owner is the State, which holds 1.1 million acres of timberland and 3.0 million acres of reserve forest land.

New York's forests have been maturing as can be seen in the distribution of timberland by stand-size classes (Fig. 3). Since the 1968 inventory, acreage of large-diameter stands has been increasing and the area of medium and small diameter stands has been decreasing. Acreage in large diameter stands now accounts for 62 percent of timberland whereas the area in medium diameter stands is 27 percent and in small diameter stands is 11 percent.

Ninety percent of New York's forests are composed of hardwood forest type groups. The Maple/beech/birch forest-type group occupies 55 percent of forest land and the Oak/hickory group occupies 23 percent (Fig. 4). Since the 2007 inventory, the proportion of forest land occupied by these groups has changed by less than 1 percent.

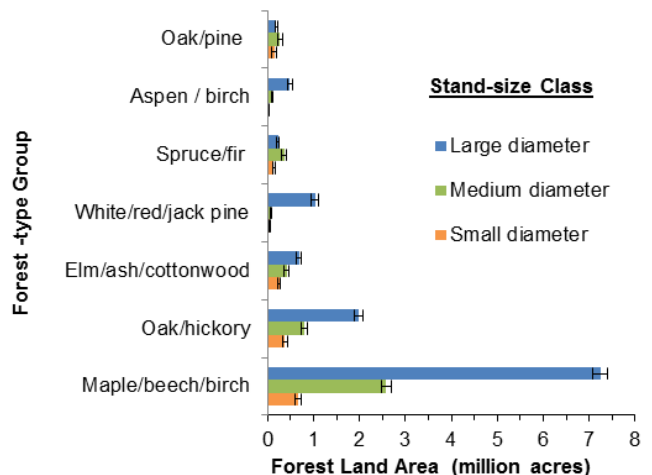


Figure 4.—Forest land by stand-size class (based on small, medium, and large trees) for top seven forest-type groups in acres, New York, 2014.

Volume, Biomass, and Trends

Across all forest land, the net volume of trees increased by 4.6 percent to 41.7 billion cubic feet. Red maple continued to be the most voluminous species followed by sugar maple, white pine, and hemlock (Table 2). Changes in volume since 2009 were inconsistent across species. While all major species exhibited increases in net volume, white pine and northern red oak had the largest increases, 11.7 and 10.1 percent, respectively. Yellow birch and sugar maple had the smallest increases, 1.1 and 1.8 percent respectively.

Sawtimber volume on timberland increased by 6.9 percent to 95.5 billion board feet. Sugar maple is the leading sawtimber species by volume, followed by red maple, white pine, and northern red oak. Since 2009, northern red oak and white pine had the largest increases in board foot volume, 19.5 and 13.9 percent, respectively. Of the major species, yellow birch and American beech were the only major species to decrease in sawtimber volume, -5.5, and -2.8 percent, respectively.

Aboveground biomass on forest land totaled 1.1 billion dry tons. This was a 4.6 percent increase since 2009. On timberland, aboveground biomass, averaged 58 dry tons per acre, for all live trees 1 inch and larger in diameter. Sixty-two percent is in the merchantable boles of growing-stock trees with the remainder in rough and rotten trees, and the upper stems and limbs of growing stock trees.

In terms of average annual growth and removals of net volume on timberland, red maple experienced the largest annual net growth in volume, and sugar maple had the largest removals (Fig. 5). Together red and sugar maples account for 27 percent of both net growth and removals. Total annual net growth outpaced total removals by a ratio of 2.3:1, although ratios varied considerably between species. Red maple had a growth to removals ratio of 3.5:1, whereas the ratio for sugar maple was 1.5:1. As a percentage of current net volume, annual mortality averaged 1.1 percent on timberland. Beech had the highest mortality rate, averaging 2.1 percent per year.

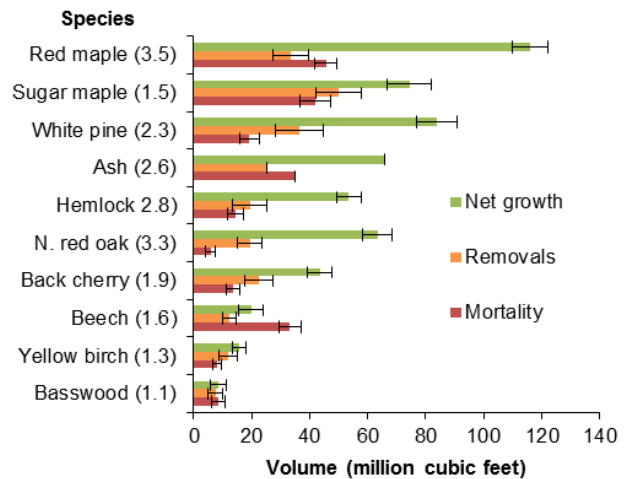


Figure 5.—Average annual net growth, removals, and mortality of net volume on timberland, and growth to removals ratios (G/R) in parentheses, New York, (2005-2009) to (2009-2014).

Table 2.—Net volume, and percent change in net volume on forest land; sawtimber volume and percent change on timberland, and biomass on forest land, New York, 2014, (top 10 species by net volume)

Species	Volume of live trees on forest land (million ft ³)	Sampling error (percent)	Percent change since 2009	Volume of sawtimber trees on timberland (million bdf)	Sampling error (percent)	Percent change since 2009	Aboveground biomass on forest land (million tons)	Sampling error (percent)
Red maple	6,565	2.6	5.1	11,911	4.1	3.6	180	2.5
Sugar maple	6,360	3.0	1.8	13,092	4.5	1.4	203	3.0
White pine	3,366	5.7	11.7	11,961	6.4	13.9	59	5.6
Hemlock	3,203	4.9	6.5	7,135	6.3	4.1	61	4.9
White ash	2,446	4.1	1.2	5,741	5.8	2.2	76	3.9
Beech	2,438	3.9	4.2	3,388	7.2	-5.5	83	3.5
Northern red oak	2,316	5.4	10.1	8,605	6.4	19.5	74	5.2
Black cherry	2,152	5.1	3.8	5,834	7.0	6.6	55	5.0
Yellow birch	2,001	4.5	1.1	2,103	8.6	-2.8	60	4.4
Red spruce	1,086	6.8	2.1	1,020	12.0	2.4	20	6.3
Other softwoods	2,249	6.4	1.2	4,877	10.0	5.4	44	6.4
Other hardwoods	7,555	2.8	5.0	19,797	4.2	10.8	224	2.8
All Species	41,737	1.0	4.6	95,464	1.7	6.9	1140	0.9

Decline in Paper Birch Continues

Paper birch (*Betula papyrifera*) is an iconic symbol of the northern New York and New England landscape as many people find it aesthetically beautiful. It is characterized as being a fast growing species in early successional stands, becoming established after disturbances, such as wildfire. In New York, paper birch reaches its greatest concentration in the eastern portion of the Adirondack region. In Essex County it represents 7 percent of the total volume in the county. Since 2007, numbers of paper birch have declined an average of 22 percent across all diameter classes (Fig. 6).

Comparing average components of change for paper birch to that of all species, the annual gross growth of paper birch as a percentage of total current volume was considerably lower (1.7 versus 2.9) (Table 3), and in addition to having a lower growth rate, the annual mortality rate for paper birch was much higher than that for all species (4.0 versus 1.1). This resulted in paper birch having a net annual growth rate of -2.3 percent. Because 58 percent of paper birch grows on State-owned reserved forest land, where harvesting is prohibited, the removal rate for paper birch is lower than that for all species. Since 2009, paper birch volume has declined by 2.7 percent per year.

Paper birch is intolerant of the shaded conditions in which many trees grow. The high mortality for paper birch will likely continue, as 22 percent of paper birch trees are in an intermediate or overtopped crown position and have live crown ratios of 20 percent or less. These trees have fallen behind their associates in competing for light resulting in poor vigor, as indicated by their low live crown ratios. In the absence of large scale wildfires and other disturbances, paper birch will play a less prominent role in New York's future forest.

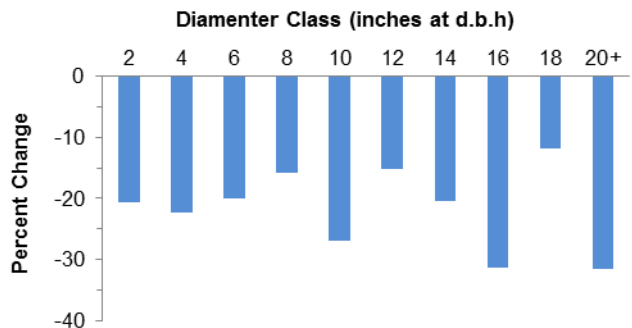


Figure 6.—Percentage change in numbers of paper birch by diameter class, 2007 to 2014, on forest land, New York.

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Table 3.—Components of average annual change expressed as a percentage of current volume, paper birch and all species, (2005-2009) to (2009-2014), New York

	Gross Growth	Mortality	Net Growth	Removals	Net Change
	Percent.....				
Paper birch	1.7	4.0	-2.3	0.4	-2.7
All species	2.9	1.1	1.8	0.7	1.1

¹One-fifth of the plots were measured annually from 2007 thru 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 (14.3 percent) of the plots are measured annually.

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