



Forests of Wisconsin, 2015

This Resource Update provides an overview of forest resources in Wisconsin based on an inventory conducted by the U.S. Forest Service, Forest Inventory and Analysis (FIA) program at the Northern Research Station in cooperation with the Wisconsin Department of Natural Resources (WDNR). Data estimates are based on field data collected using the FIA annualized sample design and are updated yearly. The estimates presented in this update are for the measurement year 2015. For annual inventory years in Wisconsin 2001-2013, the cycle length was equal to 5 years; beginning in 2014, the cycle length was changed to 7 years. The sample plot population for Wisconsin in 2015 consists of 12,141 plots using the annualized sampling and estimation procedures, collected across a period of 6 years (part of 2010, plus all of 2011-2015). Growth, removals, and mortality estimates are based on 6 years of data from 11,579 resampled plots.

The data used in this publication were accessed from the FIA’s National Information Management System in December 2015 and January 2016.

Overview

Wisconsin is home to 17.1 million acres of forest land. Forested area has increased by about 1.2 percent (201,000 acres) since 2010 (Table 1). The number of live trees on Wisconsin’s forest land in 2015 was estimated at 11.4 billion trees, an increase of 3.6 percent from 2010. Net volume experienced an increase of about 6.7 percent. Average annual net growth and average annual mortality increased by 12.7 and 6.9 percent, respectively, since 2010, but the change in harvest level is within the sampling error (Table 1). Similar trends were observed on Wisconsin’s timberlands (Table 1).

Table 1.—Wisconsin forest statistics, change between 2010 and 2015

	2015 Estimate	Sampling error (percent)	2010 Estimate	Sampling error (percent)	Change since 2010
Forest Land					
Area (thousand acres)	17,074.2	0.4	16,872.4	0.5	1.2
Number of live trees ≥1 inch diameter (million trees)	11,444.1	1.1	11,044.3	1.1	3.6
Net volume in live trees ≥5 inch diameter (million cubic feet)	25,355.5	0.9	23,770.1	0.9	6.7
Live tree (≥1 in. diameter) aboveground biomass (thousand oven-dry tons)	654,298.6	0.8	616,451.6	0.8	6.1
Annual net growth live trees ≥5 in. diameter (million ft ³ /yr)	678.7	1.9	602.4	2.0	12.7
Annual harvest removals of live trees ≥5 in. diameter (million ft ³ /yr)	339.9	4.7	337.7	4.6	0.7
Annual mortality of live trees ≥5 in. diameter (million ft ³ /yr)	313.2	2.4	293.1	2.3	6.9
Timberland					
Area (thousand acres)	16,545.6	0.5	16,357.8	0.5	1.2
Number of live trees ≥1 inch diameter (million trees)	11,113.0	1.1	10,725.8	1.2	3.6
Net volume live trees ≥5 inch diameter (million cubic feet)	24,581.8	0.9	23,053.1	1.0	6.6
Live tree (≥1 in. diameter) aboveground biomass (thousand oven-dry tons)	634,734.1	0.8	598,267.3	0.9	6.1
Net growth of growing-stock trees (million ft ³ /yr)	578.1	1.9	537.4	2.0	7.6
Annual harvest removals of growing-stock trees (million ft ³ /yr)	294.1	4.8	292.4	4.8	0.6
Annual mortality of growing-stock trees (million ft ³ /yr)	234.8	2.6	218.5	2.5	7.4



Forest Area

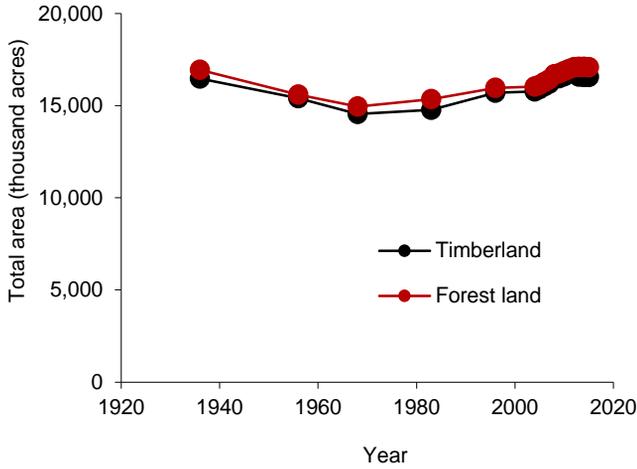


Figure 1.—Area of forest land and timberland by year, Wisconsin.

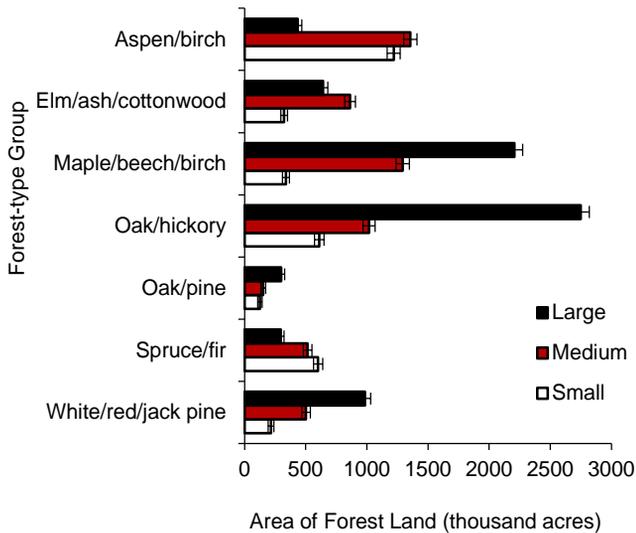


Figure 2.—Area of forest land by forest-type group and stand-size class, Wisconsin, 2015. Error bars represent one standard error, the 68 percent confidence interval.

The total area of Wisconsin’s forest land and timberland has remained relatively stable, with modest increases over the last decade (Fig. 1).

Some forest-type groups are much more common than others. Oak/hickory is the single most common forest-type group (4.4 million acres) and it is found primarily in the large stand-size class (Fig. 2). The maple/beech/birch forest-type group is slightly less common (3.8 million acres) and it is similarly distributed across stand-size classes (Fig. 2). The aspen/birch forest-type group is also abundant (3.0 million acres), but it occurs largely in medium and small stand-size classes (Fig. 2).

Wisconsin is divided into five survey units (Fig. 3). Statewide, there are 17.1 million acres of forest land area with nearly 60 percent of all forest land found in the northern two survey units. There are 4.4 million acres of forest land in the northeastern unit and 5.7 million acres of forest land in the northwestern unit.

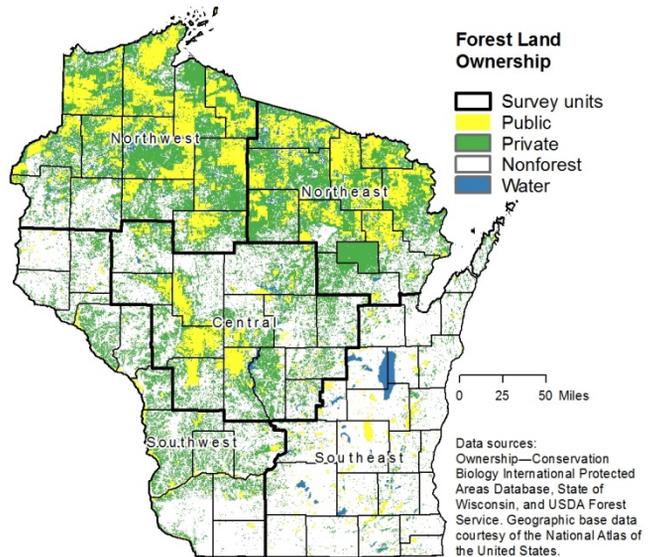


Figure 3.—Distribution of public and private forest ownership in Wisconsin.

Volume Trends on Forest Land and Timberland

As an annual inventory, the data collected by FIA offer the chance to document and evaluate forest trends.

Looking at live-tree volume of the state’s most common trees on forest land, eastern white pine (*Pinus strobus*) had the greatest increase between 2010 and 2015 (Table 2, Fig. 4; 18 percent). Red pine (*Pinus resinosa*) and northern red oak (*Quercus rubra*) also underwent double digit gains.

Of these 10 most common trees in Wisconsin, the patterns in sawtimber volume are a little different. Eastern white pine still posted the biggest gains since 2010, but the second largest gains were made by red maple (*Acer rubrum*). Eight different species in the top 10 had double digit growth in sawtimber volume. By contrast, quaking aspen (*Populus tremuloides*) actually underwent a decline in total sawtimber volume of 2.1 percent, well below the state’s total gain of 9.2 percent.

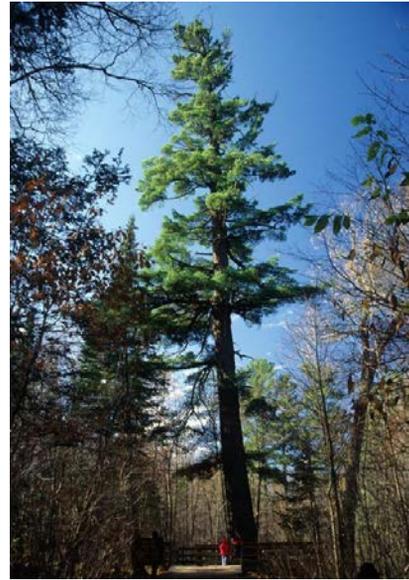


Figure 4.—Eastern white pine (*Pinus strobus*) underwent the largest gains in volume, both as live trees on forest land and sawtimber on timberland. Photo by Steven Katovich, U.S. Forest Service, via bugwood.org

Table 2.—Volume and change in volume of the most common live trees on forest land and sawtimber on timberland, Wisconsin, 2010-2015

Species	Latin name	Volume of live trees on forest land (million ft ³)	Sampling error (%)	Change since previous inventory	Volume of sawtimber trees on timberland (million bdf ^t)	Sampling error (%)	Change since previous inventory	Previous live volume on forest land	Previous sawtimber volume on timberland
Sugar maple	<i>Acer saccharum</i>	2724.5	3.2	6.4	6513.8	4.3	10.7	2560.6	5883.8
Red maple	<i>Acer rubrum</i>	2643.6	2.6	6.8	4923.9	4.0	14.6	2475.8	4298.3
Northern red oak	<i>Quercus rubra</i>	2102.8	4.0	10.3	7902.6	4.5	14.1	1907.2	6927.3
Eastern white pine	<i>Pinus strobus</i>	1898.7	5.4	18.0	8584.6	6.1	17.4	1609.4	7310.0
Quaking aspen	<i>Populus tremuloides</i>	1785.6	3.1	0.4	3129.3	4.8	-2.1	1778.5	3197.0
Red pine	<i>Pinus resinosa</i>	1784.4	5.0	11.8	7077.9	5.7	13.3	1596.6	6246.0
American basswood	<i>Tilia americana</i>	1289.9	3.9	6.2	3958.6	4.6	10.6	1214.9	3578.4
Northern white-cedar	<i>Thuja occidentalis</i>	901.8	6.3	8.6	2375.2	7.6	10.2	830.5	2155.3
White oak	<i>Quercus alba</i>	875.8	4.7	3.1	2596.5	5.9	0.0	849.2	2595.5
Black ash	<i>Fraxinus nigra</i>	687.9	5.0	8.7	936.6	8.0	13.8	633.1	822.8
Other softwoods		2161.9	2.9	4.1	5358.7	4.4	2.1	2076.5	5246.6
Other hardwoods		6498.5	1.8	4.2	14087.3	2.6	4.4	6237.8	13492.7
Total		25355.5	0.9	6.7	67445.1	1.5	9.2	23770.0	61753.7

Changing Abundance of Red Pine Timberland

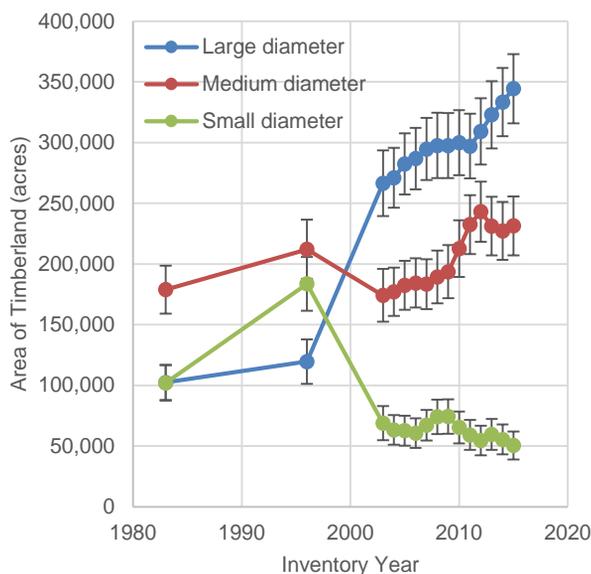


Figure 5.—Area of red pine forest type on timberland that has evidence of origin by artificial regeneration by diameter class and inventory year, Wisconsin. Error bars represent one standard error, the 68 percent confidence interval.

Additional Inventory Resources

Hansen, M.H.; Perry, C.H.; Brand, G.; McRoberts, R.E. 2008. **Wisconsin's forest, 2004: statistics and quality assurance.** Resour. Bull. NRS-24. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 98 p.

Perry, C.H.; Everson, V.A.; Brown, I.K.; Cummings-Carlson, J.; Dahir, S.E. [et al.]. 2008. **Wisconsin's forests, 2004.** Resour. Bull. NRS-23. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 104 p.

Perry, C.H.; Everson, V.A.; Butler, B.J.; Crocker, S.J.; Dahir, S.E. [et al.]. 2012. **Wisconsin's Forests 2009.** Resour. Bull. NRS-67. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 62 p. [Includes DVD].

There is some concern about the acreage of red pine available for harvest. In particular, will there be sufficient plantation acreage to support a thriving red pine economy in the future?

While the FIA data cannot predict the future, it does offer some clues. One dataset to examine is the area of timberland in the red pine forest type that has evidence of being established artificially (Fig. 5). The acreage of large diameter red pine plantation is trending upward while the area of medium diameter plantation is stable over the last few years. Although there is not a significant change, the area of small diameter red pine plantation appears to be decreasing. Taken together, these data suggest that the current and near-term volume of plantation is growing at the expense of small diameter plantations that are not being replaced (replanted). These data support the concerns expressed and a more detailed analysis should be undertaken to elucidate the problem more clearly.



Figure 6.—Red pine plantations are an important forest resource. Photo courtesy of Steven Katovich, U.S. Forest Service, via bugwood.org.

How to Cite This Publication

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