



# Forests of Illinois, 2015

This publication provides an overview of forest resources in Illinois based on an annual inventory conducted by the U.S. Forest Service, Forest Inventory and Analysis (FIA) program at the Northern Research Station. Estimates are based on field data collected using the FIA annualized sample design and are updated yearly. Information about the FIA program is available at <http://fia.fs.fed.us>. For the 2015 inventory, estimates for current variables such as area, volume, and biomass are based on 5,996 plot samples collected from 2010-2015. Change variables such as net growth, removals, and mortality are based on 5,922 plots collected in 2005-2010 and remeasured in 2010-2015. See Bechtold and Patterson (2005) and O’Connell et al. (2014) for definitions and technical details.

## Overview

Illinois is home to 4.9 million acres of forest land, a gain of 2 percent since 2010 (Table 1). Timberland accounts for 94 percent of forest land, while the remaining 6 percent of forest land is reserved or unproductive.

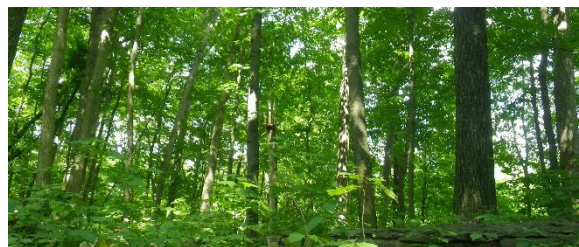


Photo by Emily Crumley, used with permission.

Table 1.—Illinois’ forest statistics, 2015

	2015 estimate	Sampling error (%)	Change since 2010 (%)
<b>Forest Land</b>			
Area (thousand acres)	4,979.6	1.6	2.4
Number of live trees ≥1 in diameter (million trees)	2,080.2	2.6	0.7
Net volume of live trees ≥5 in diameter (million ft <sup>3</sup> )	9,353.1	2.3	6.2
Live-tree aboveground biomass (thousand oven-dry tons)	253,891.0	2.2	6.3
Net growth of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	178,987.5	6.3	-12.8
Annual harvest removals of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	47,542.7	16.0	7.2
Annual other removals of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	19,921.9	38.9	46.2
Annual mortality of live trees ≥5 in (thousand ft <sup>3</sup> /yr)	152,213.2	5.7	16.7
<b>Timberland</b>			
Area (thousand acres)	4,670.1	1.8	2.7
Number of live trees ≥1 in diameter (million trees)	1,967.9	2.8	1.1
Net volume of live trees ≥5 in diameter (million ft <sup>3</sup> )	8,719.7	2.5	6.3
Net volume of growing-stock trees ≥5 in diameter (million ft <sup>3</sup> )	7,040.6	2.8	2.6
Live-tree aboveground biomass (thousand oven-dry tons)	237,440.4	2.3	6.4
Net growth of growing-stock trees ≥5 in (thousand ft <sup>3</sup> /yr)	146,084.6	6.2	-11.8
Annual harvest removals of growing-stock trees ≥5 in (thousand ft <sup>3</sup> /yr)	40,034.9	17.4	-2.5
Annual other removals of growing-stock trees ≥5 in (thousand ft <sup>3</sup> /yr)	13,875.8	40.3	33.1
Annual mortality of growing-stock trees ≥5 in (thousand ft <sup>3</sup> /yr)	96,809.7	6.7	6.8

Note: Sampling errors in tables and figures in this report represent 68% confidence intervals for estimated values.



# Forest Area

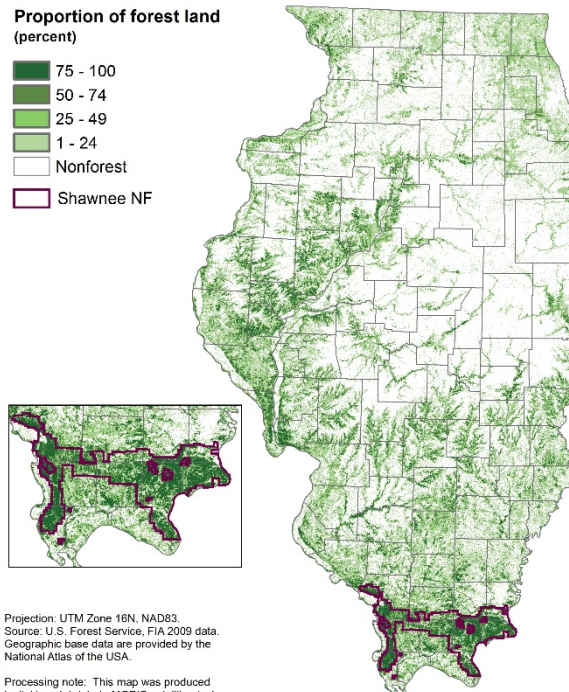
Since 1945, the area of forest land in Illinois has been on the rise (Fig. 1). Forest land occurs throughout most the State, however, it is concentrated in the western and southern portions of Illinois (Fig. 2). The majority of forest land in Illinois (83 percent) is privately owned.

Hardwoods are the dominant species types in Illinois. Two hardwood forest-type groups—oak/hickory and elm/ash/cottonwood—occupy 92 percent of forest land in Illinois. The oak/hickory group alone occupies just over two-thirds of forest land, the bulk of which resides in the white oak/red oak/hickory forest type (1.7 million acres). Softwoods, with 80,600 acres, represent nearly 2 percent of forest land.

Forest land consists mainly of sawtimber stands (76 percent); 15 percent of forest land is made up of poletimber stands, 8 percent contain sapling-seedling stands, and 1 percent is nonstocked. Since 1998, the average age of forest stands has increased, with 49 percent of stands 61 years or older in 2015 (Fig. 3).

**Proportion of forest land (percent)**

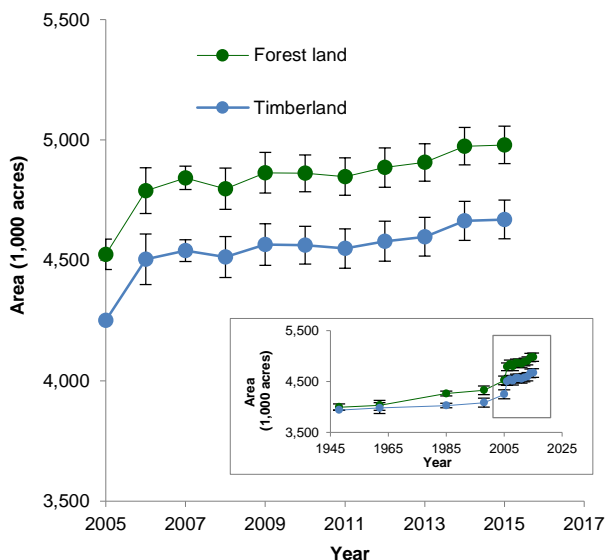
- 75 - 100
- 50 - 74
- 25 - 49
- 1 - 24
- Nonforest
- Shawnee NF



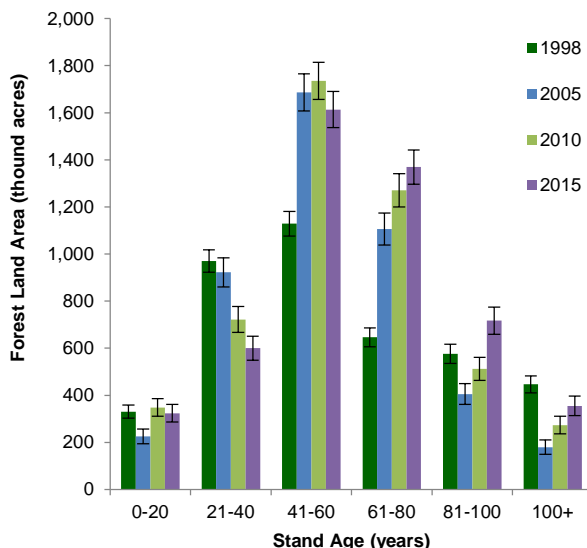
Projection: UTM Zone 16N, NAD83.  
Source: U.S. Forest Service, FIA 2009 data.  
Geographic base data are provided by the National Atlas of the USA.

Processing note: This map was produced by linking plot data to MODIS satellite pixels (250 m) using gradient nearest neighbor techniques.

**Figure 2.—Distribution of forest land, Illinois, 2009.**



**Figure 1.—Area of timberland and forest land by year, Illinois. Error bars represent 68 percent confidence interval around the estimate.**



**Figure 3.—Area of forest land by stand age and inventory year, Illinois, 2015.**

## Volume, Biomass, and Trends

Illinois' forest land contains over 2.0 billion trees (greater than 1 inch diameter at breast height [d.b.h.]) (Table 1). This represents an 18 percent decrease, nearly half a billion trees, since 1998, which is largely due to aging forests. Ninety-nine tree species were recorded on Illinois forest land in 2015. American elm (212.0 million trees), hackberry (142.4 million trees), sugar maple (123.6 million trees), and black cherry (100.4 million trees) are the most numerous species on forest land; together, these 4 species account for 28 percent of the total number of trees in Illinois. Twenty species of oak were recorded on forest land, which comprise 10 percent of trees by number.

White oak is the most voluminous species on forest land, followed by silver maple and black oak (Table 2). Oak species make up one-third of total live-tree volume. Live-tree and sapling biomass totals 253.8 million tons on forest land, which equates to 126.9 million tons of carbon in Illinois' forests (Table 1).

Forest growth decreased by 12 percent since 2010 (Table 1). Silver maple had the highest growth in 2015, accounting for 12 percent of growth statewide. Collectively, oak species (38.6 million ft<sup>3</sup>) represent 22 percent of growth, with white oak and black oak being the largest contributors (Table 2).

In contrast to growth, mortality on forest land increased by 17 percent since 2010 (Table 1). American elm, at 15.9 million ft<sup>3</sup>, had the greatest mortality in Illinois, followed by silver maple (12.6 million ft<sup>3</sup>), black oak (11.0 million ft<sup>3</sup>), and northern red oak (9.8 million ft<sup>3</sup>).

Average annual removals of live trees on forest land totaled an estimated 67.4 million ft<sup>3</sup>, for a growth-to-removals ratio of 2.65 (Table 1). Removals due to harvesting accounted for 70 percent of total removals in 2015. White oak and black oak accounted for 22 percent of total harvest removals (Table 2).

**Table 2.—Number, volume, biomass, growth, mortality, and removals of live trees on forest land by species for the top 12 tree species by net volume, Illinois, 2015.**

Common name	Latin name	Number (million trees) <sup>a</sup>	Net Volume (million ft <sup>3</sup> ) <sup>b</sup>	Aboveground biomass (thousand dry tons) <sup>a</sup>	Average annual net growth (thousand ft <sup>3</sup> ) <sup>b</sup>	Average annual mortality (thousand ft <sup>3</sup> ) <sup>b</sup>	Average annual harvest removals (thousand ft <sup>3</sup> ) <sup>b</sup>
white oak	<i>Quercus alba</i>	49.7	974.8	27,139.1	12,165.2	7,798.0	5,356.8
silver maple	<i>Acer saccharinum</i>	58.9	840.3	17,607.8	20,773.6	12,650.2	4,460.0
black oak	<i>Quercus velutina</i>	37.7	651.9	18,137.3	8,405.0	10,652.7	5,049.6
northern red oak	<i>Quercus rubra</i>	21.4	442.4	12,516.7	3,718.6	10,225.1	1,876.1
eastern cottonwood	<i>Populus deltoides</i>	12.6	401.7	7,411.2	10,955.2	4,905.7	3,470.4
shagbark hickory	<i>Carya ovata</i>	74.9	354.8	11,830.6	6,985.0	1,836.5	1,358.3
green ash	<i>Fraxinus pennsylvanica</i>	94.0	336.3	9,236.6	6,810.4	5,670.2	1,327.7
black walnut	<i>Juglans nigra</i>	49.6	326.3	8,208.4	13,051.3	1,947.8	1,746.7
American sycamore	<i>Platanus occidentalis</i>	11.2	314.1	6,521.0	7,304.7	1,664.3	--
hackberry	<i>Celtis occidentalis</i>	142.4	308.3	8,488.4	12,296.5	2,684.9	225.8
sugar maple	<i>Acer saccharum</i>	123.6	301.6	9,396.5	7,559.1	1,327.3	2,790.4
pignut hickory	<i>Carya glabra</i>	35.7	290.0	9,435.9	4,898.3	2,270.2	240.2

<sup>a</sup> Trees ≥1 inch d.b.h.

<sup>b</sup> Trees ≥5 inches d.b.h.

Note: Table cells without observations are indicated by --. A value of 0 is due to rounding of a small value.

# National Woodland Owner Survey

An estimated 76 percent of Illinois' forest land is owned by families, individuals, trusts, and estates, collectively referred to as family forest owners (Table 3). To better understand this important group of landowners, the FIA program conducts the National Woodland Owner Survey (NWOS; [www.fia.fs.fed.us/nwos](http://www.fia.fs.fed.us/nwos)). Between 2011 and 2013, 177 family forest ownerships with at least 10 acres of forest land in Illinois participated in the NWOS.

As of 2013, there are an estimated 76,000 family forest ownerships with 10 or more acres of forest land in Illinois. The average size of these family forest holdings is 45 acres and the average length of ownership is 27 years. The most common activity on family forest land is cutting trees for personal use, such as firewood (Table 3). Eight-nine percent of family forest owners are male. Additional attributes of these family forest ownerships are included in Table 3. Supplementary results and details about the NWOS are available in Butler et al. (2016).

## Inventory Sources

Bechtold, W.A.; Patterson, P.L., eds. 2005. **The enhanced Forest Inventory and Analysis Program: national sampling design and estimation procedures**. Gen. Tech. Rep. SRS-80. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 85 p.

Crocker, S. J. [et al.]. 2013. **Illinois' Forests 2010**. Resour. Bull. NRS-86. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 52 p.

O'Connell, B.M.; LaPoint, E. B.; Turner, J.A. [et. al.]. 2014. **The Forest Inventory and Analysis database: database description and user guide version 6.0.1 for Phase 2**. Washington, DC: U.S. Department of Agriculture, Forest Service. 748 p. <http://www.fia.fs.fed.us/library/database-documentation/>.

**Table 3.—Selected attributes of family forest ownerships (10+ ac), Illinois, 2013. (Sampling errors are listed parenthetically)**

Attribute	Percentage of ownerships	Percentage of acreage
<b>Size of holdings<sup>a</sup></b>		
10-49 ac	76 (10)	40 (4)
50-99 ac	15 (2)	22 (3)
100+ ac	10 (1)	38 (4)
<b>Reasons for owning<sup>b</sup></b>		
Beauty	76 (10)	70 (5)
Wildlife	75 (10)	80 (5)
Family legacy	63 (9)	66 (5)
Land investment	36 (6)	41 (4)
Timber production	19 (4)	28 (4)
<b>Forestry activities</b>		
Harvesting (personal)	36 (7)	38 (4)
Harvesting (commercial) <sup>c</sup>	20 (5)	24 (3)
Received advice	20 (4)	28 (4)
Management plan	17 (3)	26 (4)
Cost-share	13 (3)	25 (3)
<b>Demographics</b>		
Age (65+)	55 (9)	58 (6)
Gender (male)	89 (13)	84 (6)

<sup>a</sup> Numbers may not sum to 100 due to rounding.

<sup>b</sup> Includes owners who rated topics as important or very important.

<sup>c</sup> In the previous 5 years.

## Literature Cited

Butler, B.J.; Hewes, J.H.; Dickinson, B.; Andrejczyk, K.; Butler, S.M.; Markowski-Lindsay, M. 2016. **USDA Forest Service National Woodland Owner Survey: National, regional, and state statistics for family forest and woodland ownerships with 10+ acres, 2011-2013**. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 39 p.

### How to Cite This Publication

Crocker, S.J.; Butler, B.J. 2016. **Forests of Illinois, 2015**. Resource Update FS-85. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 4 p.

### Contact Information

Susan J. Crocker, Research Forester  
USDA Forest Service, Northern Research Station  
1992 Folwell Ave.  
St. Paul, MN 55108  
Ph: 651-649-5136 / Fax: 651-649-5140  
[scrocker@fs.fed.us](mailto:scrocker@fs.fed.us)  
Northern FIA: <http://nrs.fs.fed.us/fia/>  
National FIA: <http://fia.fs.fed.us>

USDA is an equal opportunity provider and employer

The published report is available online at <http://treearch.fs.fed.us>