



Forests of Illinois, 2016

This update provides an overview of forest resources in Illinois following an inventory by the U.S. Forest Service, Forest Inventory and Analysis program, Northern Research Station. Estimates are derived from field data collected using an annualized sample design and are updated yearly. Estimates of current variables such as area, volume, and biomass are based on 5,991 plots measured in 2011-2016. Change variables such as net growth, removals, and mortality are based on 5,915 plots measured in 2006-2011 and resampled in 2011-2016. See Bechtold and Patterson (2005), O'Connell et al. (2014), Gormanson et al. (2017) for more details.

for 94 percent of forest land; 6 percent of forest land is reserved or unproductive.



Photo by Dave Jansen, used with permission.

Overview

Illinois is home to 4.9 million acres of forest land, a gain of nearly 3 percent since 2011 (Table 1). Timberland accounts

Table 1.—Illinois forest statistics, 2016

	2016 estimate	Sampling error (%)	2011 estimate	Sampling error (%)	Change since 2011 (%)
Forest Land					
Area (thousand acres)	4,981.4	1.6	4,847.5	1.6	2.8
Number of live trees ≥1 inch diameter (million trees)	2,070.3	2.6	2,042.4	2.5	1.4
Aboveground biomass of live trees ≥1 inch diameter (million oven-dry tons)	256.6	2.1	242.4	2.2	5.9
Net volume of live trees ≥5 inches diameter (million ft ³)	9,469.2	2.3	8,920.4	2.4	6.2
Net growth of live trees ≥5 inches diameter (million ft ³ /yr)	180.7	6.2	188.3	7.3	-4.0
Annual mortality of live trees ≥5 inches diameter (million ft ³ /yr)	151.9	5.6	129.3	6.7	17.5
Annual harvest removals of live trees ≥5 inches diameter (million ft ³ /yr)	49.7	19.7	45.5	18.3	9.2
Annual other removals of live trees ≥5 inches diameter (million ft ³ /yr)	18.6	40.8	20.2	35.3	-7.7
Timberland					
Area (thousand acres)	4,668.2	1.8	4,532.9	1.8	3.0
Number of live trees ≥1 inch diameter (million trees)	1,958.3	2.7	1,926.3	2.7	1.7
Aboveground biomass of live trees ≥1 inch diameter (million oven-dry tons)	239.9	2.3	226.7	2.4	5.8
Net volume of live trees ≥5 inches diameter (million ft ³)	8,825.6	2.5	8,323.9	2.6	6.0
Net volume of growing-stock trees ≥5 inches diameter (million ft ³)	7,106.7	2.8	6,921.9	2.8	2.7
Net growth of growing-stock trees ≥5 inches diameter (million ft ³ /yr)	146.4	6.3	156.7	6.4	-6.6
Annual mortality of growing-stock trees ≥5 inches diameter (million ft ³ /yr)	98.2	6.7	86.7	7.4	13.3
Annual harvest removals of growing-stock trees ≥5 inches diameter (million ft ³ /yr)	36.3	17.9	42.2	19.1	-14.0
Annual other removals of growing-stock trees ≥5 inches diameter (million ft ³ /yr)	14.5	39.9	11,006.1	29.8	31.8

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 steadily increasing (Fig. 1). Forest land occurs throughout most of the State, however, it is largely concentrated in the western and southern portions of Illinois, particularly within the Shawnee National Forest (Fig. 2). The majority of forest land in Illinois (83 percent) is privately owned.

Hardwoods are the dominant species types in Illinois. Two hardwood-dominated forest-type groups—oak/hickory and elm/ash/cottonwood—occupy 92 percent of forest land in Illinois. The oak/hickory group alone occupies over two-thirds of forest land, the bulk of which resides in the white oak/red oak/hickory forest type (1.7 million acres). Softwood-dominated forest-type groups, with 74,500 acres, represent nearly 1 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. The average age of forest stands continues to increase, with 51 percent of stands aged 61 years or older in 2016 (Fig. 3).

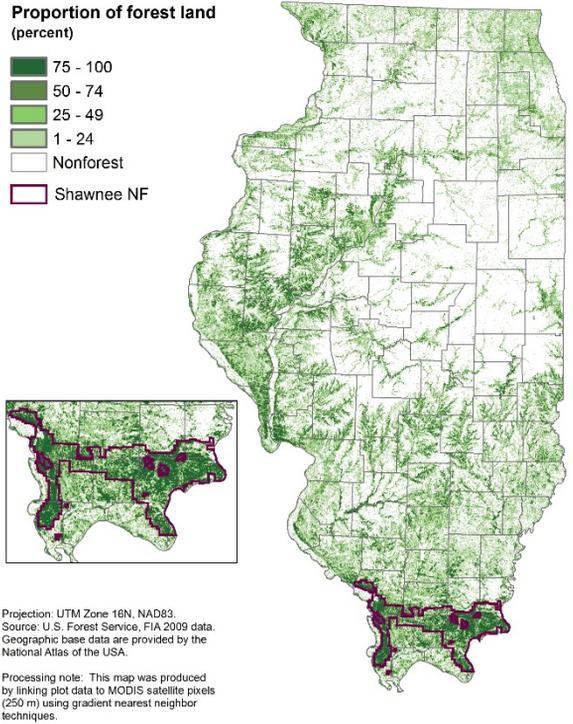


Figure 2.—Distribution of forest land, Illinois, 2009.

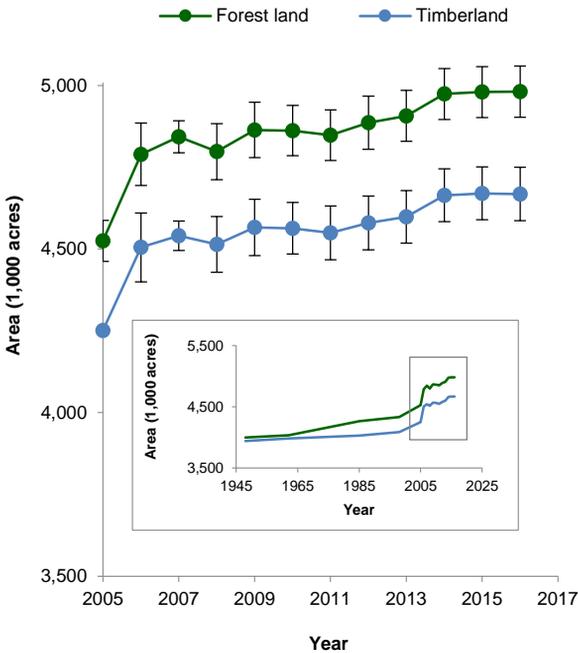


Figure 1.—Area of timberland and forest land by year, Illinois.

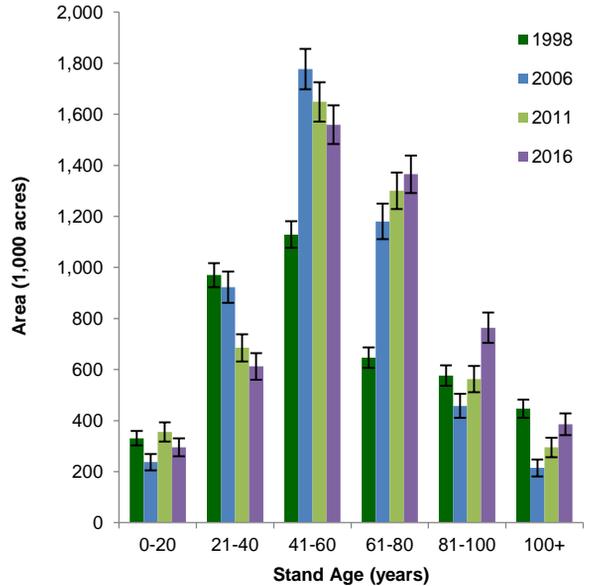


Figure 3.—Area of forest land by stand age and inventory year, Illinois, 2016.

Volume, Biomass, and Trends

Illinois' forest land contains over 2.0 billion trees (greater than or equal to 1 inch diameter at breast height [d.b.h.]) (Table 1). Ninety-seven tree species were recorded on Illinois forest land in 2016.

American elm (203.4 million trees), hackberry (141.7 million trees), sugar maple (126.6 million trees), and black cherry (100.5 million trees) are the most numerous species on forest land (Table 2); together, these four species account for 28 percent of the total number of trees in Illinois. Twenty species of oak were recorded on forest land; these species 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 approximately one-third of total live-tree volume. Live-tree and sapling biomass totals 256.6 million tons on forest land, which equates to 128.3 million tons of carbon in Illinois' forests (Table 1).

Net growth of live trees on forest land decreased by 4 percent since 2011 (Table 1). Silver maple had the highest growth in 2016, accounting for 10 percent of growth statewide. Collectively, oak species (37.3 million ft³) represent 21 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 2011 (Table 1). Silver maple had the greatest mortality in Illinois, followed by American elm (12.6 million ft³) and black oak; these species accounted for over 25 percent of total mortality.

Average annual removals of live trees on forest land totaled an estimated 68.3 million ft³ (Table 1). Removals due to harvesting accounted for 73 percent of total removals in 2016. White oak and black oak accounted for 14 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, 2016

Common name	Latin name	Number (million trees) ^a	Net Volume (million ft ³) ^b	Aboveground biomass (thousand tons) ^a	Average annual net growth (thousand ft ³) ^b	Average annual mortality (thousand ft ³) ^b	Average annual harvest removals (thousand ft ³) ^b
White oak	<i>Quercus alba</i>	49.4	998.5	27,796.1	8,742.1	7,584.4	3,773.4
Silver maple	<i>Acer saccharinum</i>	58.1	861.4	18,023.0	18,871.4	13,484.8	4,606.5
Black oak	<i>Quercus velutina</i>	38.7	642.6	17,935.1	8,646.7	12,437.1	3,069.6
Northern red oak	<i>Quercus rubra</i>	21.3	442.3	12,538.0	1,365.8	9,613.8	1,187.4
Eastern cottonwood	<i>Populus deltoides</i>	12.4	418.0	7,709.8	13,135.4	3,663.4	3,530.2
Shagbark hickory	<i>Carya ovata</i>	74.3	352.6	11,769.7	6,705.2	2,338.7	1,318.5
Green ash	<i>Fraxinus pennsylvanica</i>	96.6	344.8	9,432.7	5,881.2	5,486.2	1,194.1
Black walnut	<i>Juglans nigra</i>	48.5	331.3	8,308.6	12,988.8	2,358.9	1,060.2
Sugar maple	<i>Acer saccharum</i>	126.6	319.0	9,906.9	9,845.7	1,386.0	2,855.4
American sycamore	<i>Platanus occidentalis</i>	11.2	318.6	6,610.9	6,932.8	2,203.4	--
Hackberry	<i>Celtis occidentalis</i>	141.7	311.5	8,563.9	12,464.0	2,936.3	253.1
Pignut hickory	<i>Carya glabra</i>	36.0	306.7	9,962.3	9,703.2	1,794.6	221.6

^a Trees ≥1 inch d.b.h.

^b 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.

Maturing Oak Resource

Covering over two-thirds of forest land, oak/hickory stands are the dominant component of Illinois forests. Oak/hickory stands are mature; 70 percent of forest area is in the large diameter size class and 56 percent of stands are over 60 years old.

Oak species represent 11 percent of trees (greater than or equal to 1 inch d.b.h.) in the oak/hickory forest-type group. Among saplings (1 to 4.9 inch d.b.h.), oaks represent a small proportion (6 percent) of total abundance; elms (in the other eastern soft hardwoods species group) are most numerous, followed by hickory, hard maple (largely sugar maple) and ash (Fig. 4). Oaks are also a small understory component (6 percent of seedlings [less than 1 inch d.b.h. and at least 1 foot tall]), whereas the ashes and elms represent 33 percent of seedlings. In contrast, oaks are more numerous in the large diameter classes (Fig 5). Nearly half (48 percent) of all Illinois oak trees (greater than or equal to 5 inches d.b.h.) are 13 inches or greater, a 2 percent increase from 2011.

As oaks continue to mature and senesce, the future of Illinois’ oak resource becomes uncertain. While elm and ash are predominant in the smaller diameter classes, their health and growth is threatened by insects and diseases, including emerald ash borer and Dutch elm disease. Therefore, maples may replace oaks as dominant overstory species. Successful seedling regeneration and sapling development will be an important factor in maintaining a healthy oak resource.

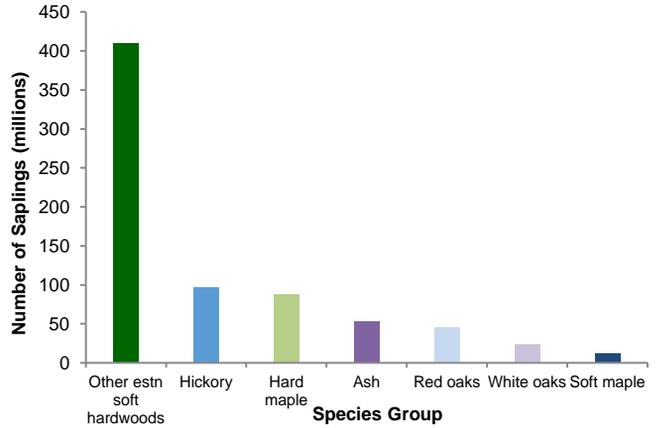


Figure 4.—Number of saplings by species group, Illinois, 2016.

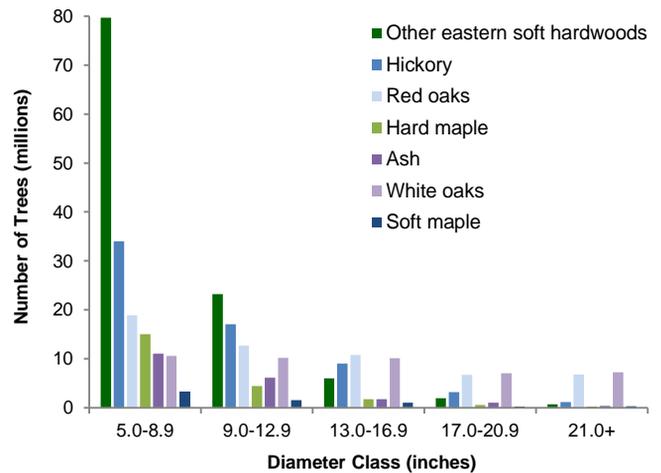


Figure 5.—Number of trees by diameter class and species group, Illinois, 2016.

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.

Gormanson, D.D.; Pugh, S.A.; Barnett, C.J.; Miles, P.D.; Morin, R.S.; Sowers, P.A.; Westfall, J.A. 2017. **Statistics and quality assurance for the Northern Research Station Forest Inventory and Analysis Program, 2016**. Gen. Tech. Rep. NRS-166. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 23 p.

O’Connell, B.M.; Conkling, B. L.; Wilson, A.M. [et. al.]. 2016 **The Forest Inventory and Analysis database: database description and user guide for Phase 2 (ver. 6.1.1)**. Washington, DC: U.S. Department of Agriculture, Forest Service. 870 p. <http://www.fia.fs.fed.us/library/database-documentation/>.

How to Cite This Publication

Crocker, Susan J. 2017. **Forests of Illinois, 2016**. Resource Update FS-112. 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
 Northern FIA: <http://nrs.fs.fed.us/fia/>
 National FIA: <http://fia.fs.fed.us>

USDA is an equal opportunity provider, employer, and lender

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