USDA
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RESOURCE UPDATE FS-26

Forests of Ohio, 2013

This publication provides an overview of the forest resources in Ohio 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 2001, FIA has implemented an annual inventory in Ohio. For the 2013 inventory, estimates for current variables, such as forest area, volume, and biomass, are based on 4,296 plots (both forested and nonforest) inventoried from 2009-2013. Change variables, such as net growth, removals, and mortality, are based on 4,186 plots collected in 2001-2006 and resampled in 2009-2013. Estimates from earlier annual and periodic inventories are shown for comparison. See Bechtold and Patterson (2005) and O'Connell et al. (2013) for definitions and technical details.

Overview

Ohio's forest land area totals 8.2 million acres and occupies 31 percent of the State's land area (Table 1). Since 2008, there has been a small increase in forest land, though this was within the margin of error. Ninety-six percent of Ohio's forest land, 7.8 million acres, is classified as timberland, 270,000 acres is classified as reserved, and an additional 69,000 acres as forest land low in productivity. The most recent inventory shows that the net volume of trees continued to increase, and the annual net growth in volume continued to outpace annual removals. Annual mortality on forest land averaged 1.0 percent of the current inventory.

Table 1.—Ohio forest statistics, 2013 and 2008. Volumes are for 5-inch and larger diameter trees. Numbers of trees and biomass are for 1-inch and larger diameter trees. Sampling errors in tables in this report represent 68 percent confidence intervals

	2013 Estimate	Sampling error (percent)	2008 Estimate	Sampling error (percent)	Change since 2008 (percent)
Forest Land					
Area (thousand acres)	8,162	1.0	8,044	1.1	1.5
Number of live trees (million trees)	4,145	2.0	4,148	2.2	-0.1
Aboveground biomass of live trees (thousand oven-dry tons)	484,282	1.6	463,765	1.7	4.4
Net volume of live trees (million ft^3)	16,616	1.7	15,990	1.8	3.9
Annual net growth of live trees (thousand ft^3/yr)	452,173	4.3	481,021	5.5	-6.0
Annual mortality of live trees (thousand ft^3/yr)	184,359	5.8	185,764	8.1	-0.8
Annual harvest removals of live trees (thousand ft^3/yr)	205,194	10.8	222,126	15.8	-7.6
Annual other removals of live trees (thousand ft^3/yr)	9,833	33.7	9,701	53.6	1.4
Timberland				0.0	0.0
Area (thousand acres)	7,823	1.1	7,748	1.2	1.0
Number of live trees (million trees)	3,997	2.1	4,033	2.2	-0.9
Aboveground biomass of live trees (thousand oven-dry tons)	462,710	1.7	446,354	1.8	3.7
Net volume of live trees (million ft^3)	15,870	1.8	15,388	1.9	3.1
Net volume of growing-stock trees (million ft^3)	13,528	2.0	13,920	2.0	-2.8
Annual net growth of growing-stock (thousand ft^3/yr)	338,010	3.7	394,382	5.1	-14.3
Annual mortality of growing-stock trees (thousand ft^3/yr)	120,435	6.4	122,759	8.9	-1.9
Annual harvest removals of growing-stock trees (thousand ft^3/yr)	168,619	11.2	183,130	15.4	-7.9
Annual other removals of growing-stock trees (thousand ft^3/yr)	30,286	26.7	18,189	55.5	66.5

Forest Area

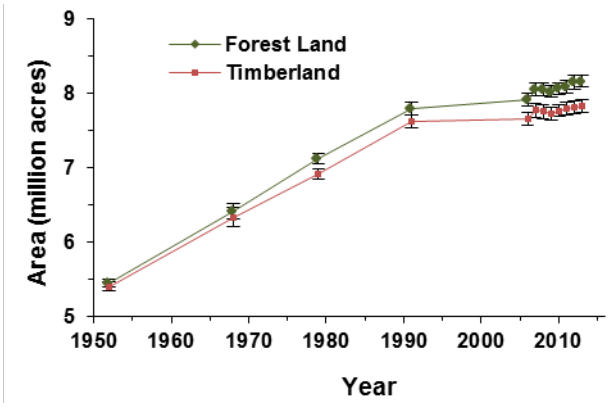

Figure 1.—Forest land and timberland by year, Ohio. Error bars in figures of this report represent the 68-percent confidence interval around the mean.

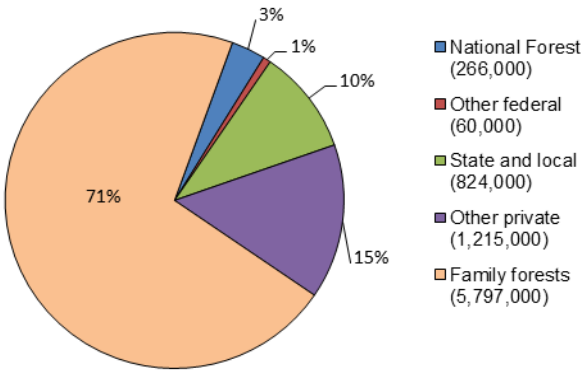

Figure 2.—Forest land ownership, Ohio, 2013

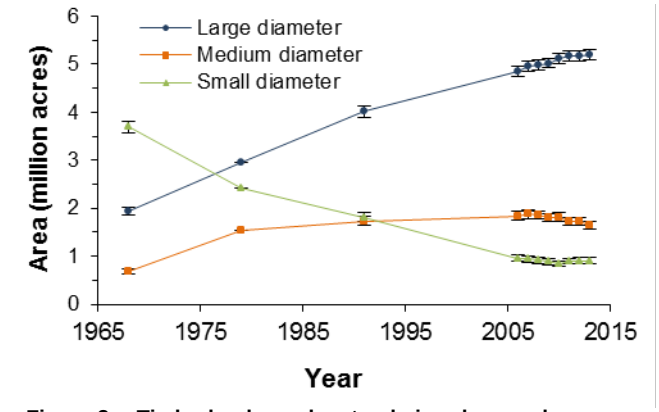

Figure 3.—Timberland area by stand-size class and year, Ohio, 2013.

Successive inventories have shown forest land area consistently increasing, although inventories since 1991 show a slowing in this trend (Fig.1). Across the State, forest land losses from development have been more than offset by gains in forest land because of farm land reverting to forest. Because of increased development and a slowing in farm land losses, recent changes in total forest land have been small. These trends may indicate that the area of forest land in Ohio is peaking. Future changes in forest land will depend on the pace of land development and, to a great extent, on the economics of farming.

Eighty-six percent of Ohio's forests are privately owned (7.0 million acres; Fig. 2). These ownerships include families and individuals, corporations, and other private entities. The remaining 14 percent (831,000 million acres) is in public ownership. The largest public owner is the State which holds 505,000 acres of forest land, followed by the Wayne National Forest with 266,000 acres of forest land.

Ohio'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 while the area of small and medium diameter stands has been decreasing. Acreage in large diameter stands now accounts for 66 percent of timberland whereas the area in medium diameter stands is 24 percent and the area in small diameter stands is 12 percent.

Oak/hickory is the predominate forest-type group, occupying 62 percent of the forest land (Fig. 4). Since the 2008 inventory, the proportions of forest land occupied by the oak/hickory and maple/beech/birch forest-type groups have changed by less than 1 percent.

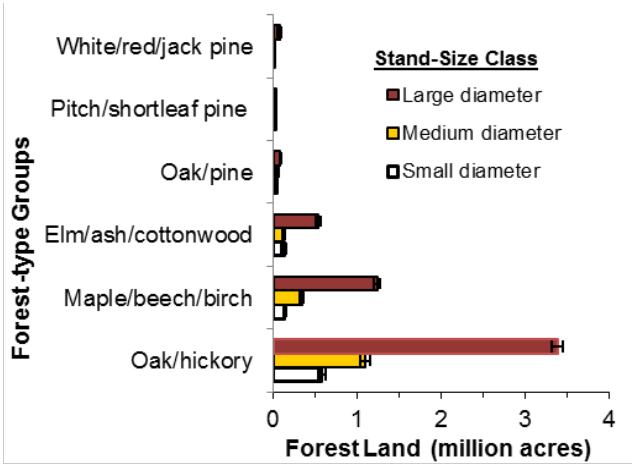

Figure 4.—Forest land area by stand-size class (based on small, medium, and large trees) for the top seven forest-type groups by acres, Ohio, 2013.

Volume, Biomass, and Trends

Across all forest land the net volume of trees increased by 3.9 percent to 16.6 billion cubic feet. Red maple continued to be the most voluminous species followed by yellow-poplar, sugar maple, and black cherry (Table 2). Changes in volume since 2008 differed between species. The top three species exhibited increases in net volume larger than the average increase for all species combined. Sugar maple, yellow-poplar, and red maple, increased by10.0, 8.5, and 6.0 percent, respectively; while white ash, beech, black oak, and white oak decreased in volume -7.4, -4.5, -1.7, and -1.3 percent, respectively.

Sawtimber volume on timberland increased by 1.3 percent to 50.6 billion board feet. Yellow-poplar is the leading sawtimber species by volume, followed by red maple, sugar maple, white oak, and northern red oak. Since 2008, many species decreased in sawtimber volume. Beech, white ash, black oak, black cherry, and white oak decreased by -13.9, -13.2, -8.7, -5.2, and -1.3 percent, respectively.

Aboveground biomass of live tress on forest land totaled 484 million dry tons. This was a 4.4 percent increase since 2008. Seventy percent of the live tree biomass is contained in the merchantable boles of timber species trees on timberland. Aboveground biomass on timberland averaged 59 dry tons per acre.

In terms of average annual growth and removals on timberland, red maple and yellow-poplar experienced the largest annual growth in volume since 2008, and yellow-poplar followed by black cherry had the largest removals (Fig. 5). Yellow-poplar alone accounts for 14 percent of the growth and 11 percent of removals. Total annual growth outpaced total removals by a ratio of 1.8:1 from 2008 to 2013, although ratios varied considerably between species. Red maple had a growth to removals ratio of 3.5:1, whereas the ratios for the oaks were lower, white oak (1.2:1), black/scarlet oak (1.4:1) and northern red oak (1.9:1). As a percentage of current volume, annual mortality averaged 1.1 percent on timberland. Ash species had the highest mortality rate, averaging 3.5 percent per year, whereas yellow-poplar had the lowest, averaging 0.3 percent per year.

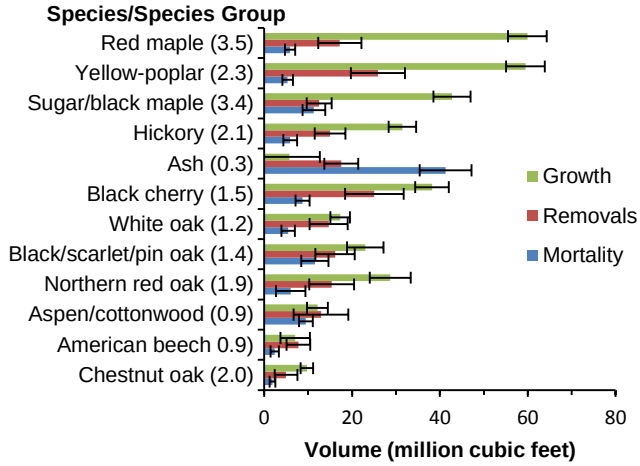

Figure 5.—Average annual net growth, removals, and mortality of net sound volume on timberland, and growth to removals ratio (G/R), Ohio, 2008-2013.

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, Ohio, 2013, (top 10 species by net volume)

Species	Volume of live trees on forest land (million ft^3)	Sampling error (percent)	Percent change since 2008	Volume of sawtimber trees on timberland (million bdft)	Sampling error (percent)	Percent change since 2008	Aboveground biomass on forest land (million tons)	Sampling error (percent)
Red maple	1,716	5.3	6.0	3,986	7.6	1.0	49	5.0
Yellow-poplar	1,682	6.9	8.5	6,656	8.4	10.0	36	6.7
Sugar maple	1,466	5.3	10.0	3,809	7.2	6.1	50	5.0
Black cherry	1,158	5.8	3.6	2,612	9.1	-5.2	31	5.6
White ash	956	6.4	-7.4	2,813	8.8	-13.2	29	6.1
White oak	941	7.0	-1.3	3,764	8.2	-1.3	31	7.0
Northern red oak	908	7.9	9.1	3,759	9.5	8.4	29	7.7
Shagbark hickory	549	7.7	12.9	1,618	9.7	14.3	19	7.6
American beech	497	9.9	-4.5	1,619	13.7	-13.9	15	9.5
Black oak	491	10.2	-1.7	1,839	12.5	-8.7	16	10.0
Other softwoods	646	11.7	15.5	2,048	14.6	30.5	13	10.9
Other hardwoods	5,606	2.9	2.2	16,056	4.3	-0.9	167	2.8
All Species	16,616	1.7	3.9	50,578	2.5	1.3	484	1.6

Characteristics of Ohio's Family Forest Owners

The National Woodland Owner Survey (NWOS), conducted by the USDA Forest Service's Forest Inventory and Analysis program, studies private forest landowners' attitudes, management objectives, and concerns (Butler 2008). The NWOS has most recently focused on family and individual forest owners with 10 acres or more of forest land. The NWOS (2011-2013) found that there are an estimated 143,000 family forest owners holding 10 acres or more of forest land, totaling 4.9 million acres of forest land in Ohio. This represents 60 percent of the forest land in Ohio. Focusing on these 143,000 family forest ownerships with 10+ acres, the NWOS found they have the characteristics listed in Table 3. Landowners' low priority to timber production does not mean that they will not harvest trees. The relatively high number of owners who harvest trees means that when conditions are right, many will harvest trees, although the low priority and lack of written management plans suggest that these harvests are not part of a long-term management plan. Owners tend to be fairly old and many have owned their land for decades.

Because most of Ohio's forest land is held by thousands of private landowners, decisions by these owners will have a great influence on Ohio's future forest. More information on the NWOS can be found at: http://www.fia.fs.fed.us/nwos/

Table 3.—Summary of responses to the National Woodland Owner Survey, family forest land ownerships with 10+ acres in Ohio, 2011-2013

Owner:	Owners (percent)	Acres (percent)
Uses woodland property as primary residence	78	76
Is retired.	49	47
Is 55 years old or older	61	72
Is 65 years old or older	46	37
Has owned land for more than 25 years	43	44
Has an annual income below $100,000	83	73
Receives no income from wooded land owned	83	78
Has posted land to restrict public access	59	64
Plans to improve wildlife habitat in next 5 years	36	41
Wants their wooded land to stay wooded	91	90
Is likely or extremely likely to give away land in the next 5 years *	11	10
Felt getting advice on how to transfer land to next genneration would be helpful or very helpful *	47	48
Felt that timber production was an important or very important reason for owning forest land*	23	31
Has cut trees for commercial reasons	42	51
Has cut trees for personal use	62	62
Has cut or removed trees for sale in past 5 years	20	26
Has cut or removed trees for own use in past 5 years	50	48
Plans to cut trees for sale in next 5 years	20	25
Plans to cut trees for own use in next 5 years	46	45
Has not received forest management advice	82	76
Has a written management plan	12	17
Is not familiar with cost share programs	69	62
Is not familiar with forestry related tax programs	81	74
Felt getting advice on woodland management would be helpful or very helpful*	48	51
Felt getting advice on more favorable tax policies would be helpful or very helpful*	64	66

*includes two highest responses on a five-point Likert scale

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