



# Tennessee, 2010

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## FOREST INVENTORY & ANALYSIS FACTSHEET



Blue-eyed grass, on The Ames Plantation in west Tennessee. (photo by Christopher Oswalt)

This science update provides an overview of forest resource attributes for the State of Tennessee based on an annual inventory conducted by the Forest Inventory and Analysis (FIA) Program at the Southern Research Station of the U.S. Department of Agriculture Forest Service in cooperation with the Tennessee Department of Agriculture Division of Forestry. These annual estimates, along with Web-posted supplemental tables, will be updated annually. For more information regarding past inventory reports for Tennessee, inventory program information, field sampling methodology, and estimation procedures, please refer to the citations at the end of this report.

### Annual Update

Tennessee forest resources have changed very little since the previous annual inventory in 2009. In 2010, Tennessee forests accounted for an estimated 14 million acres (table 1) of which 13.5 million acres (97 percent) are considered available for timber production (timberland). About 8 billion live trees are estimated to be growing in Tennessee forests, nearly 1,300 trees for every person living in the State. In trees  $\geq 5$  inches diameter at breast height (d.b.h.), the State's forests contain  $>29$  billion cubic feet of wood volume. There has been only small changes in estimates of average annual net growth and removals on forest land, while average annual mortality on forest land has declined 8 percent between 2009 and 2010 (table 1).

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**Table 1—Tennessee forest statistics, associated sampling error, and change between 2009 and 2010**

Forest statistics	2010 estimate	Sampling error	Change since 2009	Forest statistics	2010 estimate	Sampling error	Change since 2009
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			percent				percent
<b>Forest land estimates</b>				<b>Timberland estimates</b>			
Area (acres)	13,955,118	0.74	-0.34	Area (acres)	13,544,746	0.80	-0.02
Number of live trees $\geq 1$ -inch diameter (trees)	7,989,399,552	1.56	0.23	Number of live trees $\geq 1$ -inch diameter (trees)	7,797,813,978	1.60	0.50
Net volume in live trees $\geq 5$ inches diameter ( $ft^3$ )	29,388,722,176	1.36	0.73	Net volume in live trees $\geq 5$ inches diameter ( $ft^3$ )	28,145,028,763	1.42	1.28
Net volume of growing-stock trees ( $ft^3$ )	25,321,217,166	1.51	1.59	Net volume of growing-stock trees ( $ft^3$ )	24,229,910,528	1.57	2.05
All-live tree and sapling aboveground biomass (oven-dry short tons)	773,421,928	1.24	0.48	All-live tree and sapling aboveground biomass (oven-dry short tons)	743,521,335	1.30	1.03
Annual net growth of live trees $\geq 5$ inches ( $ft^3$ /year)	752,190,912	2.79	-2.13	Annual net growth of live trees $\geq 5$ inches ( $ft^3$ /year)	850,528,617	3.58	1.53
Annual removals of live trees $\geq 5$ inches ( $ft^3$ /year)	419,704,832	7.06	-1.72	Annual removals of live trees $\geq 5$ inches ( $ft^3$ /year)	420,637,992	7.03	-9.45
Annual mortality of live trees $\geq 5$ inches ( $ft^3$ /year)	260,987,408	4.98	-8.08	Annual mortality of live trees $\geq 5$ inches ( $ft^3$ /year)	248,602,735	5.16	-7.94



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# TENNESSEE, 2010

## Forest Extent

In 2010, forest land in the State of Tennessee covered an estimated 14 million acres (table 2). The Tennessee landscape has remained  $\geq 50$  percent forested for the past 50 years (Oswalt and others 2009). In fact, from an estimate in 1961 to the current estimate of 14 million acres, forest land has only changed a positive 2 percent. Essentially, while small fluctuations have occurred over the last 5 decades, Tennessee forests are just as plentiful today as they were in the 1960s. Tennessee has lost some forests to urbanization. However, at the same time, abandoned agricultural lands, particularly in the West unit of Tennessee, have reverted back to forests and account for increased forest land in that region (fig. 1). While urbanization does continue to occur and is the primary contributing factor to forest land loss, more of the development pressure is on agricultural land that is much easier to develop. While there is little change statewide, small-scale forest loss can have significant localized impacts and should not be ignored. For example, localized forest loss can contribute to negative impacts on local water quality and availability.

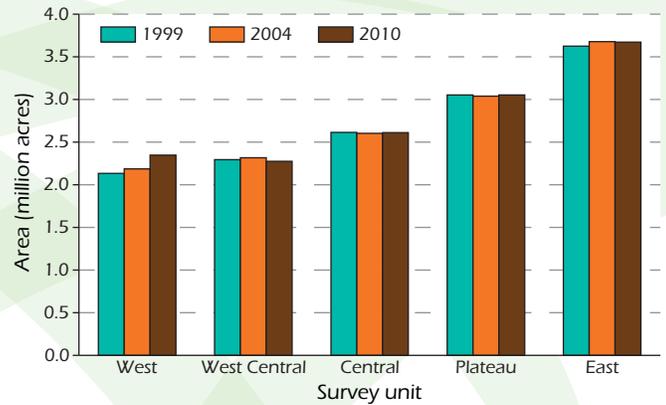


Figure 1—Area of forest land by survey unit and year, Tennessee.

Table 2—Area by land class and survey year, Tennessee

Land class	1961	1971	1980	1989	1999	2004	2010
	<i>thousand acres</i>						
Timberland	13,432	12,820	12,879	13,265	13,305	13,254	13,545
Other/reserved	264	317	430	337	407	566	410
<b>Total forest land</b>	<b>13,696</b>	<b>13,136</b>	<b>13,309</b>	<b>13,603</b>	<b>13,712</b>	<b>13,821</b>	<b>13,955</b>
Nonforest land	12,826	13,339	13,142	12,845	13,260	13,151	13,017
<b>Total land area</b>	<b>26,522</b>	<b>26,475</b>	<b>26,450</b>	<b>26,447</b>	<b>26,972</b>	<b>26,972</b>	<b>26,972</b>
Percent forested	52	50	50	51	51	51	52

## Forest Land Ownership

Tennessee forests are largely within private ownerships across the State. In fact, 84 percent of all forest land or 11.7 million acres in Tennessee is privately owned (fig. 2). About 10 percent or 1.4 million acres is federally owned and managed. The remaining 6 percent of forest land across the State is owned by State and local governments.



Sassafras in autumn, east Tennessee. (photo by Christopher Oswalt)

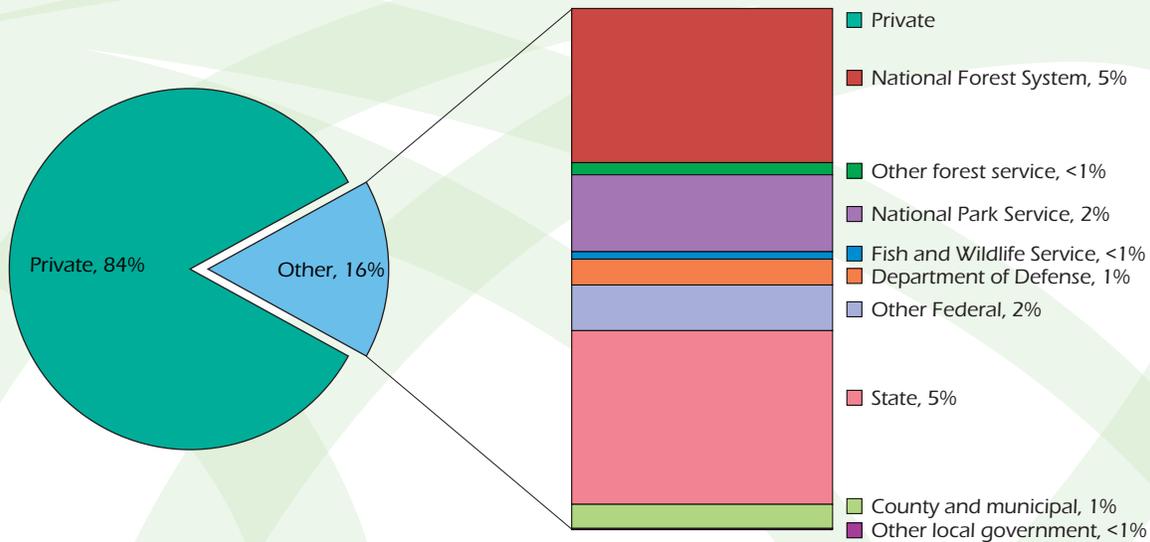


Figure 2—Area of forest land by ownership, Tennessee, 2010.

## Common Trees

The most common tree species in 2010, ranked by the estimated size of the population (number of trees) across all forest land in Tennessee was red maple (table 3). Red maple accounted for nearly 10 percent of all trees in Tennessee forests. Yellow-poplar, the State tree, was the second most common tree species with about 477 million trees in forests across the State.

If you were to rank the importance of tree species in Tennessee by aboveground biomass (dry tons), white oak would rank as the most important tree (table 4) in the 2010 inventory. White oak as a species represented > 11 percent of all aboveground tree biomass in forests of Tennessee in 2010. Chestnut oak, yellow-poplar, and red maple followed in importance. Since white oak is eighth on the list of tree population (table 3) and first on the list of biomass (table 4), this indicates that white oak was represented by fewer but larger specimens. Conversely, these results suggest that red maple, while numerous, was generally represented by smaller trees when found.

In terms of both estimated population and estimated biomass, 17 of the 20 top species are hardwood species. Only eastern redcedar, loblolly pine, and Virginia pine are found on each list. Tennessee has long been considered a State where hardwoods are considered the predominate forest; these results indicate that is still the case today.

**Table 3—The 20 most common trees (ranked by estimated number of trees ≥ 1.0-inch d.b.h.) on forest land, Tennessee, 2010**

Species	Trees	
	number	percent
Red maple	771,767,732	9.7
Yellow-poplar	476,901,664	6.0
Sweetgum	438,681,537	5.5
Blackgum	434,232,619	5.4
Sugar maple	416,781,678	5.2
Eastern redcedar	404,417,373	5.1
Sourwood	374,498,928	4.7
White oak	294,924,908	3.7
Winged elm	273,597,876	3.4
Flowering dogwood	250,411,063	3.1
Loblolly pine	247,179,003	3.1
Virginia pine	225,302,928	2.8
Eastern hophornbeam	212,919,070	2.7
Black cherry	186,046,653	2.3
American beech	183,952,192	2.3
Pignut hickory	182,580,048	2.3
Chestnut oak	171,500,690	2.1
Sassafras	143,576,979	1.8
Eastern redbud	141,322,084	1.8
Mockernut hickory	135,734,922	1.7

d.b.h. = diameter at breast height.

**Table 4—The 20 most common trees (ranked by aboveground weight of live trees ≥ 1.0-inch d.b.h.) on forest land, Tennessee, 2010**

Species	Biomass	
	dry tons	percent
White oak	86,323,889	11.2
Chestnut oak	72,783,059	9.4
Yellow-poplar	62,853,047	8.1
Red maple	42,626,348	5.5
Scarlet oak	36,863,356	4.8
Pignut hickory	35,533,743	4.6
Sugar maple	28,595,557	3.7
Sweetgum	26,682,208	3.4
Northern red oak	24,099,526	3.1
Black oak	23,451,038	3.0
Southern red oak	21,954,867	2.8
Mockernut hickory	20,248,918	2.6
Loblolly pine	18,469,426	2.4
Shagbark hickory	17,550,195	2.3
American beech	15,303,135	2.0
Virginia pine	13,904,168	1.8
Eastern redcedar	13,568,597	1.8
Post oak	12,684,184	1.6
White ash	12,464,820	1.6
Blackgum	11,953,397	1.5

d.b.h. = diameter at breast height.

# TENNESSEE, 2010



Pines at Horse Hitch Gap, Cherokee National Forest. (photo by Christopher Oswalt)

## Stand Origin

In 2010, only 5 percent (694,500 acres) of forests across the State were of artificial origin (planted). Ninety-five percent of all forests in the State originated through natural reproduction (table 5). The loblolly-shortleaf pine forest-type group was represented by the largest percentage of planted area. Over 50 percent of the 921,100 acres of forest classified as loblolly-shortleaf pine forest-type group was considered to have been planted. About 12.5 percent of > 1 million acres within the oak-pine forest-type group was planted. In the case of the acreage classified as planted oak-pine, 100 percent of the area was originally planted with loblolly pine. Over time, natural hardwood species became established within those planted loblolly pine stands and resulted in a oak-pine mix forest.

**Table 5—Area of forest land by forest-type group and stand origin, Tennessee, 2010**

Forest-type group	Total	Stand origin	
		Natural stands	Clear evidence of artificial regeneration
acres			
White-red-jack pine	84,660	81,384	3,276
Loblolly-shortleaf pine	921,108	431,960	489,148
Other eastern softwoods	256,016	256,016	0
Oak-pine	1,008,191	882,464	125,726
Oak-hickory	10,154,527	10,079,627	74,900
Oak-gum-cypress	324,521	324,521	0
Elm-ash-cottonwood	745,326	745,326	0
Maple-beech-birch	333,225	333,225	0
Other hardwoods	40,080	40,080	0
Exotic hardwoods	50,188	50,188	0
Nonstocked	37,276	35,856	1,420
<b>Total</b>	<b>13,955,118</b>	<b>13,260,648</b>	<b>694,470</b>

## Inventory Volume

In 2010 there was an estimated 29 billion cubic feet of standing tree wood volume distributed across the State. About 88 percent of the standing volume in Tennessee is represented by hardwood species (fig. 3). Pine species and other softwood species accounted for only 8 and 4 percent of the total standing tree wood volume in the State, respectively.

Standing volume was greatest in the East FIA unit and decreases from east to west in each unit with the exception of the West unit. Standing volume was slightly greater in the West unit as opposed to the West Central unit (fig. 3). The West Central unit, where Nashville is located, contained the lowest standing volume across all species groups with the exception of hard hardwoods which was lowest in the West unit. The East unit contained the greatest standing volume across all FIA units in Tennessee for each of the four species groups (fig. 3).

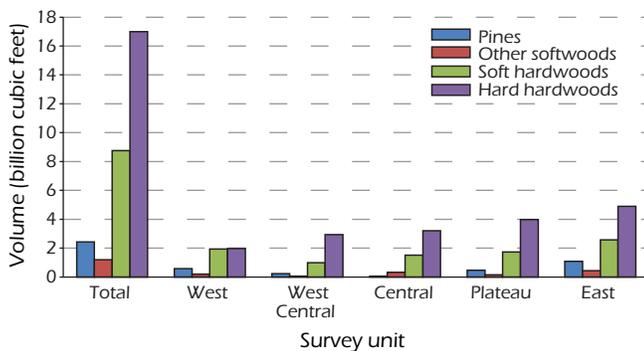


Figure 3—Standing live tree volume (≥ 5.0 inches d.b.h.) by survey unit and species group, on forest land, Tennessee, 2010.

## Average Annual Net Growth, Removals, and Mortality

Average annual net growth (gross growth minus mortality) and removals of all-live volume on forest land have changed very little since 2009 (fig. 4). Average annual mortality declined an estimated 8 percent since 2009. Average annual removals for the period between 2006 and 2010 remain about 23 percent below levels estimated for the period of 1999 to 2002.

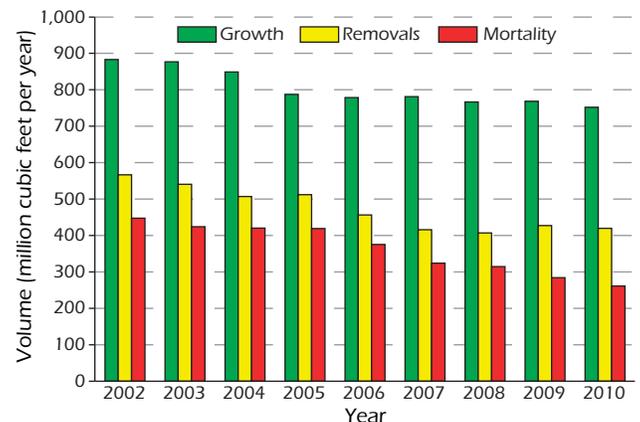


Figure 4—Estimated average annual net growth, removals, and mortality on forest land by year, Tennessee.

Net Growth (*ft<sup>3</sup> per year*)  
 Total = 752,190,904  
 Pines = 106,699,056  
 Other softwoods = 30,139,701  
 Soft hardwoods = 250,624,671  
 Hard hardwoods = 364,727,476

Mortality (*ft<sup>3</sup> per year*)  
 Total = 260,987,406  
 Pines = 41,670,401  
 Other softwoods = 7,928,353  
 Soft hardwoods = 73,291,968  
 Hard hardwoods = 138,096,683

Removals (*ft<sup>3</sup> per year*)  
 Total = 419,704,843  
 Pines = 41,670,401  
 Other softwoods = 7,928,353  
 Soft hardwoods = 73,291,968  
 Hard hardwoods = 138,096,683

Note: This data was accessed and compiled from the FIA database (FIADB) on November 1, 2011. Publicly available data from the FIADB is regularly updated when data collection and/or processing anomalies are found and corrected. Small changes to estimates can also be attributed to the addition of newly collected data.

## References

- 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.
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- U.S. Department of Agriculture Forest Service. 2005. Forest inventory and analysis national core field guide. Volume 1: field data collection procedures for phase 2 plots, version 3.0. [www.fia.fs.fed.us/library/field-guides-methods-proc/doc/2006/core\\_ver\\_3-0\\_10\\_2005.pdf](http://www.fia.fs.fed.us/library/field-guides-methods-proc/doc/2006/core_ver_3-0_10_2005.pdf).

## Additional Tennessee Inventory Information

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- Oswalt, C.M. 2008. Tennessee's forest land area was stable 1999-2005 but early successional forest area declined. Res. Note SRS-15. Asheville, NC: U.S. Department of Agriculture Forest Service, Southeastern Forest Experiment Station. 4 p.

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Blackgum, in autumn, east Tennessee. (photo by Christopher Oswalt)

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