EAST TEXAS FORESTLANDS, 2011

TEXAS A&M FOREST SERVICE

FOREST INVENTORY AND ANALYSIS

TEXAS A&M FOREST SERVICE

Texas A&M Forest Service works in partnership with the U.S. Forest Service to inventory forestlands in East Texas. This joint effort is known as Forest Inventory and Analysis or FIA. Every year highly-trained foresters and technicians measure plots throughout the region. Data collected are used to estimate acres of forestland, numbers and types of trees, volumes and weights of those trees, and components of change including growth, mortality, and removals. This report presents results for the 2011 inventory, which is based on data from 3,781 plots measured primarily in inventory years 2007 through 2011.
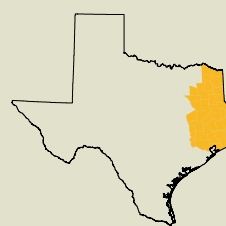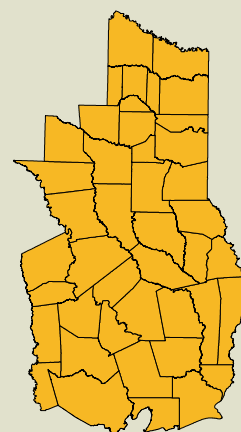
IN THIS REPORT

REGION

Area of Detail

HIGHLIGHTS

Resource Attribute	2011	2010	Change	
Timberland area (million acres)	11.9	12.0	-0.3%	↓
Number of trees (billions)	7.7	7.7	+0.6%	↑
Volume (billion cubic feet)	17.5	17.3	+1.5%	↑
Biomass (million tons)	441.4	436.2	+1.2%	↑
Net growth (million cubic feet per year)	750.2	776.8	-3.4%	↓
Removals (million cubic feet per year)	645.9	715.2	-9.7%	↓
Mortality (million cubic feet per year)	260.9	235.9	+10.6%	↑

Estimates for 2010 are recompiled from the latest database and may differ slightly from estimates in last year's report. Estimates are based on a sample. Sampling errors for the 2011 estimates presented in the table are: timberland area 0.9%, number of trees 2.0%, volume 2.1%, biomass 1.8%, net growth 3.6%, removals 5.7%, and mortality 6.2%.

Forest land is defined as land with at least 10 percent cover (or equivalent stocking) by live trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated.

Timber Investment Management Organizations (TIMOs) buy, manage, and sell timberland on behalf of insurance companies, foundations, pension funds, and other institutional investors.

Real Estate Investment Trusts (REITs) buy, manage, and sell real estate on behalf of private investors.

TIMBERLAND

East Texas is a region that includes the 43 counties depicted in Figure 1. The region encompasses 22.4 million acres of total area. Timberland is forest land (see sidebar) that is not withdrawn by law(s) prohibiting the management for production of wood products and that is capable of growing at least 20 cubic feet per acre per year. There is an estimated 11.9 million acres of timberland, which is 53 percent of the total area in the region.

The density of timberland (as a percentage of total area) by county is displayed in Figure 1. Timberland density ranges from 6 percent to 91 percent. The highest densities are observed in the south central and southeast counties. The lowest densities are observed in counties nearest the Gulf.
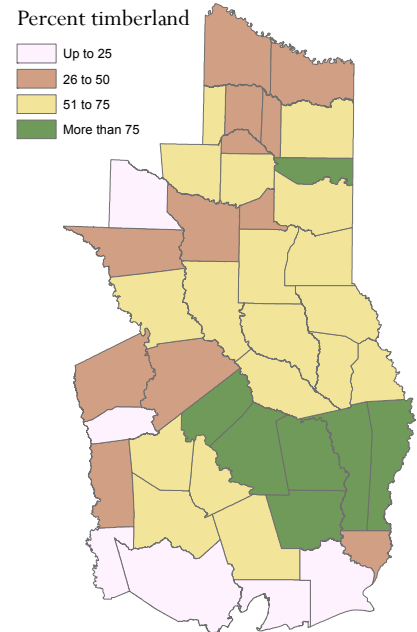

Percent timberland
- Up to 25
- 26 to 50
- 51 to 75
- More than 75

Figure 1. Density of timberland by county.

OWNERSHIP

In East Texas slightly less than 92 percent of the timberland is privately-owned (Figure 2). Family forest landowners are by far the largest group of private owners, accounting for about 54 percent of all timberland. In the past decade timberland held by corporations that own wood-processing facilities (i.e. vertically integrated forest products companies) has transferred to corporations that do not own wood processing facilities (i.e. TIMOs and REITs). TIMOs and REITs currently account for about 25 percent of timberland. Other private ownership classes (i.e. nonindustrial corporate excluding TIMOs and REITs, unincorporated, Native American, and nongovernmental organizations) account for about 13 percent of all timberland.

Slightly more than 8 percent of timberland is publicly owned (Figure 2). There is an estimated 653 thousand acres of U.S. Forest Service, accounting for 66 percent of all public timberland. The State of Texas and the Department of Defense/Energy account for an estimated 111 and 118 thousand acres, respectively.
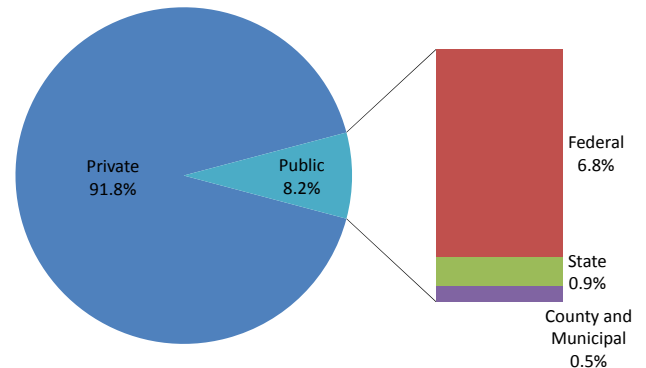

Private 91.8%
Public 8.2%
Federal 6.8%
State 0.9%
County and Municipal 0.5%

Figure 2. Distribution of timberland by ownership group.

Softwood species are trees with needle-, scale-, or awl-like leaves. Most, but not all, stay green all year.

The most common softwood tree in East Texas is loblolly pine.

Stand structure refers to the horizontal and vertical distribution of plants in a stand.

Nonstocked is a category that includes forestlands that for any number of reasons few trees were sampled (e.g., the period immediately after harvesting or natural disturbance but before regeneration).

FOREST TYPES

At 5.3 million acres, pine is the most abundant forest type in East Texas (Figure 3). Oak-hickory is second, accounting for just under one-quarter of all timberlands. Oak-pine and oak-gum-cypress are also abundant (> 1.4 million acres). Elm-ash-cottonwood and several other types account for relatively small amounts of timberland.
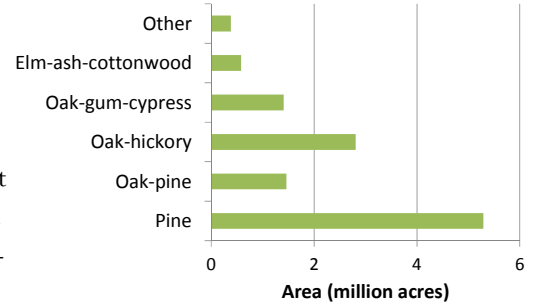

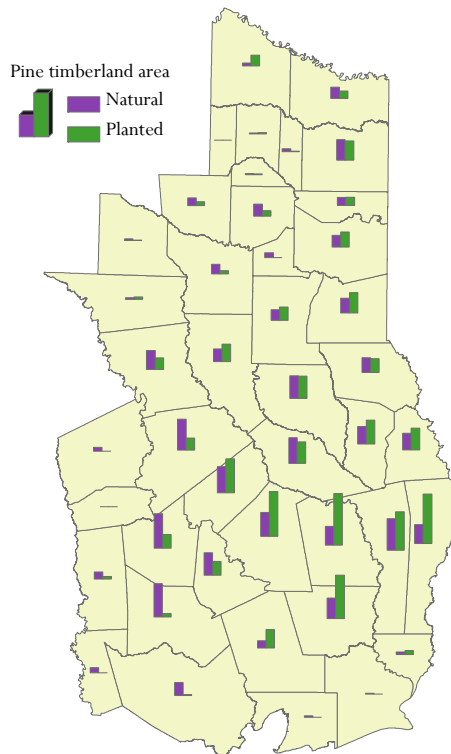Figure 3. Timberland area by forest type.

Figure 4. Pine timberland area by county.

Planting was evident on a little more than half (51 percent) of the 5.3 million acres of pine timberland with the balance (49 percent) naturally regenerated. In Figure 4 bars are used to show the amount of pine timberland by county in East Texas. Separate bars are used to show artificially and naturally regenerated amounts. Excepting the counties nearest the Gulf, pine timberland area tends to increase as one moves from west to east. In the western counties, there tends to be more natural pine than planted pine. This changes for the most part in the south central and eastern counties where planted pine is more common than natural pine.

STAND STRUCTURE

Just over half of the timberland area consists of trees that are large in size and if harvested could supply high-value products such as sawtimber (Figure 5). Medium-diameter stands, which represent 22 percent of timberland, consist predominately of trees of a size typically used to produce pulp and various composite products. Just under one quarter of timberland consists of small-diameter trees generally considered precommercial given current utilization standards. The balance is classified as nonstocked (see sidebar).
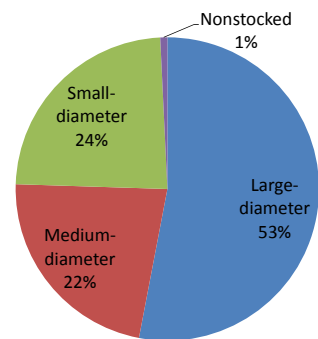

Figure 5. Distribution of timberland by stand-size class.

![Texas A&M Forest Service logo]

Volume reported here is net cubic foot volume from a 1-foot high stump to a minimum 4-inch top diameter outside bark in live trees with a minimum diameter of 5 inches.

For reporting purposes, trees are grouped into diameter classes. The number is the midpoint of the diameter class. For example, the 12-inch class includes trees 11.0 to 12.9 inches in diameter.

Average net volume per acre of timberland is 1,470 cubic feet per acre.

There is an estimated 17.5 billion cubic feet of volume on timberland in East Texas. Softwood species account for 57 percent and hardwoods account for 43 percent of the total.

The distribution of volume by major species group and tree diameter class (see sidebar for explanation) is displayed in Figure 6. For softwoods, volume levels increase quickly and peak in the 10-inch diameter class and then decrease as diameter increases. Hardwood volume levels increase and hit a plateau in the 10-inch diameter classes and then gradually drop as diameter increases. Softwood volumes exceed hardwood volumes, excepting for some of the largest diameter classes. Softwood volumes rise well above hardwood volumes in the 8- to 22- inch diameter classes.

In Figure 7 bars are used to show volume on timberland in East Texas counties. Separate bars are used for softwoods and hardwoods. Softwood volumes are highest in the south central and southeastern counties. In many of these counties softwood volumes greatly exceed hardwood volumes. In 19 of 43 counties hardwood volume exceeds softwood volume. These counties are, for the most part, in the northern and western areas of the region.
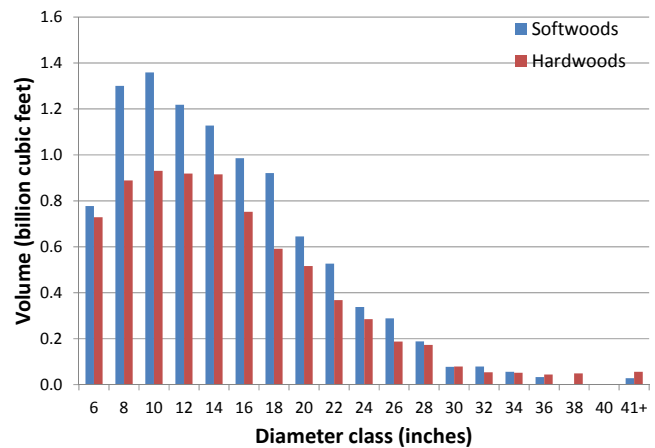

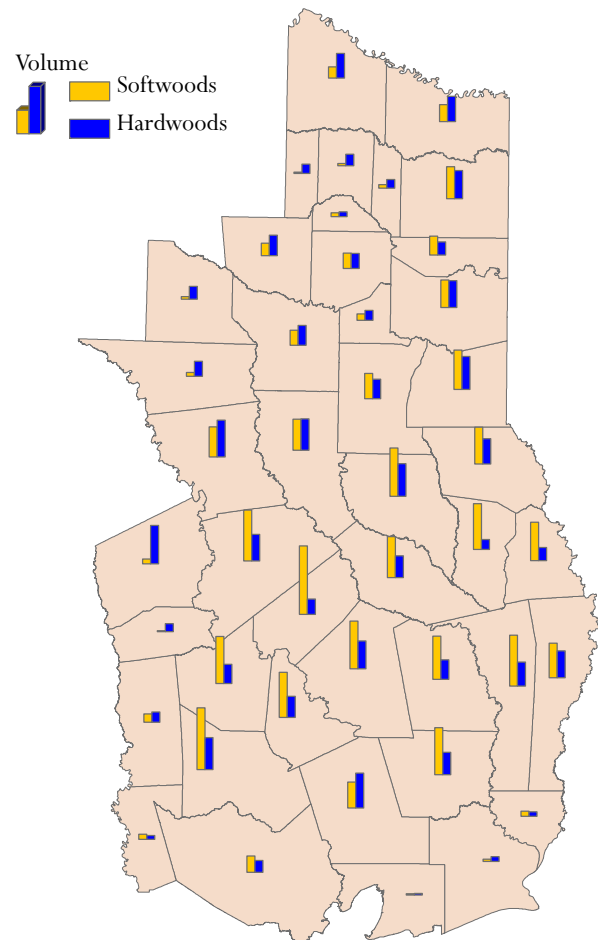Figure 6. Distribution of volume on timberland by species group and diameter class.

Figure 7. Net cubic foot volume on timberland by species group and county.

Biomass reported here is aboveground oven-dry weight of live trees with a diameter of at least 1 inch.

Hardwood species are trees that have broad leaves. Many, but not all, drop their leaves in the fall.

The most common hardwood tree in East Texas is sweetgum.

There is an average of 37 tons per acre of biomass on timberland in East Texas.

BIOMASS

There is an estimated 441.4 million tons of biomass on timberland in East Texas. Hardwood species account for 52 percent and softwood species 48 percent of the total.

Biomass by diameter class and major species group is displayed in Figure 8. Biomass levels for hardwood and softwood species increase as diameter increases up to the 10-inch diameter class and then declines as diameter increases.
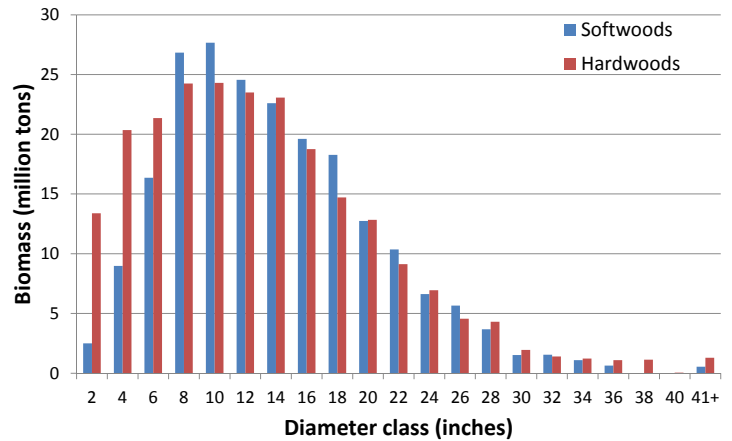

Figure 8. Distribution of biomass on timberland by species group and diameter class.

There is considerably more hardwood biomass than softwood biomass in the smallest diameter classes. Softwood biomass exceeds hardwood biomass in the 8-inch and 10-inch classes. Biomass for the two species groups track one another closely in several of the intermediate and large diameter classes. Hardwood biomass outpaces softwood biomass in the largest diameter classes (36+ inches).

Biomass per acre of timberland is displayed in Figure 9. Values range between 26 and 51 tons per acre. Three of the five counties with highest values are grouped together in the southwestern section of the region (Montgomery, San Jacinto, and Trinity Counties).

Small diameter trees (2- and 4-inch diameter classes) from precommercial thinnings and commercial harvests are a potential source of material for facilities producing energy from biomass.

Tons per acre
Up to 30
31 to 35
36 to 40
41 to 45
46 and higher

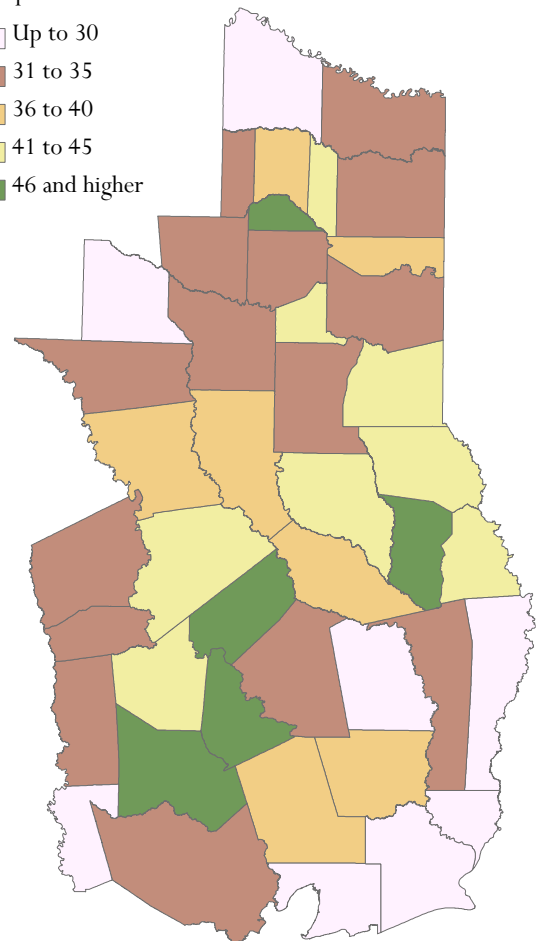Figure 9. Biomass per acre of timberland by county.

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Average annual net growth (see sidebar for an explanation) of live trees on timberland is estimated at 750.2 million cubic feet throughout East Texas. Softwoods account for 83 percent of net growth and hardwoods 17 percent. Average annual removals of live trees on timberland is estimated at 645.9 million cubic feet. Softwoods account for 76 percent of removals and hardwoods 24 percent.

One approach to measuring sustainability is to compare net growth to removals. If net growth exceeds removals, then inventory levels would be expected to increase. If net growth is less than removals, then inventory levels would be expected to decrease. Overall, net growth exceeds removals by 104.3 million cubic feet per year and inventory levels are expected to increase.

Net growth and removals by species group are displayed in Figure 10. Net growth exceeds removals for softwoods, suggesting inventory levels will increase. Removals exceed net growth for hardwoods, suggesting inventory levels will decline as long as this condition persists.

Average annual mortality of hardwoods has increased steadily since 2006 (Figure 11). Inventory foresters have noted weather (i.e., hurricanes) as a primary factor. Higher levels of mortality are contributing to reduced net growth in hardwoods.
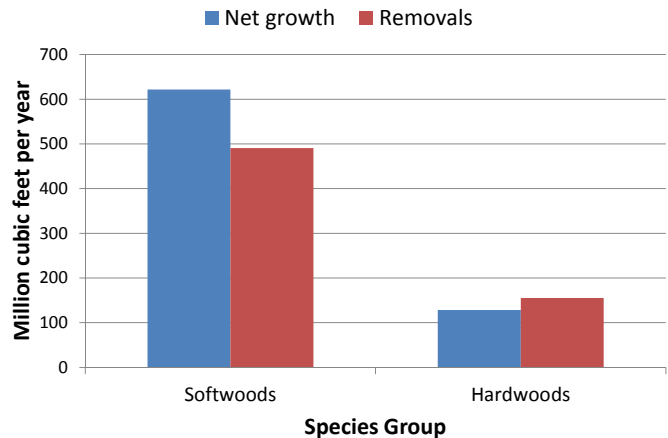

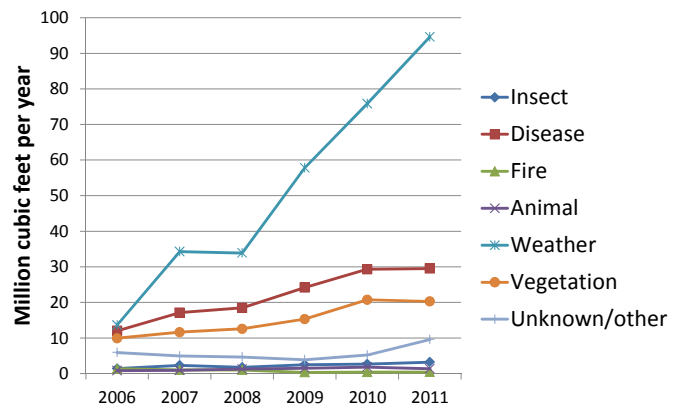Figure 10. Net growth and removals of all live on timberland by species group.

Figure 11. Hardwood mortality by cause of death, 2006-2011.

Net growth is gross growth minus mortality.

Values of net growth and removals are annual averages over the measurement period, which is approximately five years for most plots. For example, a plot measured in 2010 was likely previously measured in 2005 and the change observed on that plot is the change that occurred during that time period.

Data by forest type and county/region are reported in the appendix.

Estimates are based on a sample and are therefore subject to sampling error.

FIA Data is on-line at
http://www.fia.fs.fed.us/
tools-data/

MORE INFORMATION

This report was prepared by Chris Edgar, Forest Resource Analyst, Texas A&M Forest Service. Feel free to contact him with questions about information in this report or about Forest Inventory and Analysis. He can be reached by phone at 979/458-6630 or by e-mail at cedgar@tfs.tamu.edu.