

EAST TEXAS FORESTLANDS, 2010

TEXAS FOREST SERVICE

FOREST INVENTORY AND ANALYSIS

Texas Forest Service works in partnership with the U.S. Forest Service to inventory forestlands in the 43 counties of 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 2010 inventory, which is based on data from 3,777 plots measured primarily between 2006 and 2010.



The Texas A&M University System

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HIGHLIGHTS

- * 12.0 million acres of timberland
- * 91.8 percent of timberland is private
- * 7.7 billion live trees
- * 17.3 billion cubic feet of volume
- * 437.6 million tons of biomass
- * 779.3 million cu ft of annual net growth
- * 717.0 million cu ft of annual removals

REGION

East Texas is a region that includes the 43 counties depicted in Figure 1. The region encompasses 22.4 million acres of total area and 21.4 million acres of land. 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. There is an estimated 12.2 million acres of forestland in East Texas, which is 57 percent of the total land area.

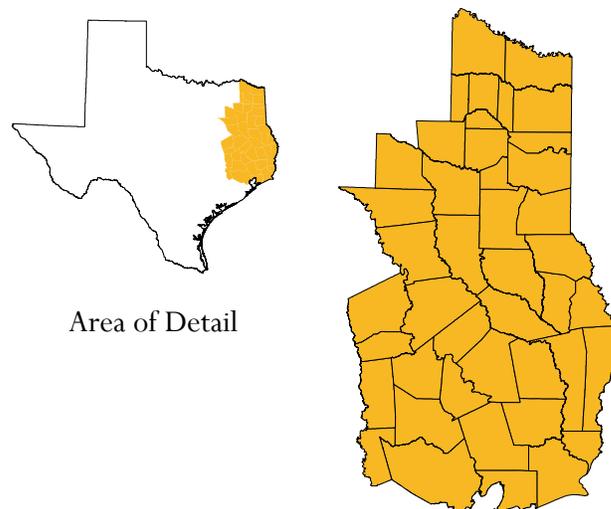


Figure 1. The region identified as East Texas.

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There are 7.7 billion live trees on timberland in East Texas.

Industrial and nonindustrial are terms that identify private owners who own and operate a primary wood processing plant (industrial) and those who don't (nonindustrial).

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

Timberland is forestland that is not withdrawn by law(s) prohibiting the management for production of wood products and that is capable of growing at least 20 cubic feet per acre per year. Nearly all East Texas forestland, 12.0 million of the 12.2 million acres, is classified as timberland. The small amount of forestland not classified as timberland is either unproductive (44 thousand acres) or reserved from producing wood products (127 thousand acres).

The density of timberland (as a percentage of total land area) by county is displayed in Figure 2. Timberland density ranges from 9 percent (Chambers County) to 90 percent (Newton County). The highest densities are observed in the south central and southeast counties. The lowest densities are observed in counties nearest the Gulf.

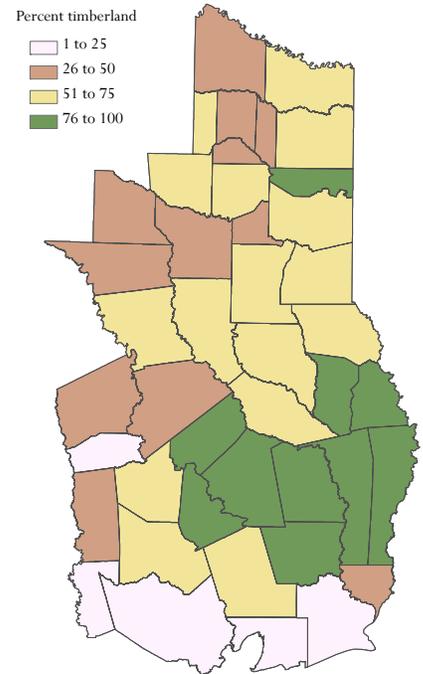


Figure 2. Density of timberland by county.

OWNERSHIP

Of the 12.0 million acres of timberland, 92 percent is privately owned. East Texas has undergone major shifts in private ownership this past decade, primarily a transfer of land from forest industry to nonindustrial private owners (see sidebar for an explanation of terms). Information from several sources (i.e., FIA, National Woodland Owner Survey, and timberland transactions) suggests forest industry accounts for no more than 50 thousand acres. Nonindustrial private corporations, which include REITs and TIMOs (see sidebar), account for 3.0 to 3.4 million acres and family forest landowners account for 7.5 to 8.0 million acres.

Slightly more than 8 percent of timberland is publicly owned (Figure 3). There is an estimated 658 thousand acres on National Forests, accounting for 67 percent of all public timberland. The State of Texas and the Department of Defense account for an estimated 117 and 126 thousand acres, respectively.

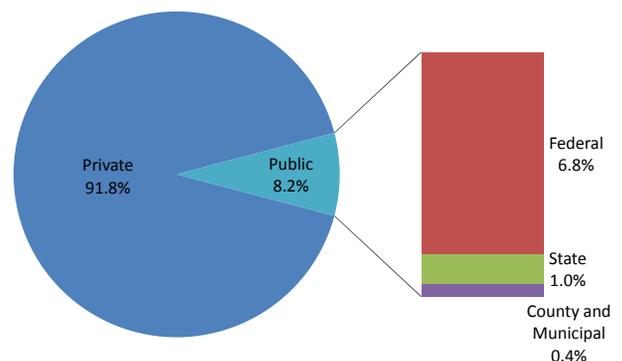


Figure 3. Distribution of timberland by ownership group.

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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 (harvesting or natural disturbance such as wind or fire) few trees were sampled.

FOREST TYPES

At 5.2 million acres, pine is the most abundant type in East Texas (Figure 4). Oak-hickory is second, accounting for just under one-quarter of all timberlands. Oak-pine and oak-gum-cypress are also abundant (> 1 million acres). Elm-ash-cottonwood and several other types account for relatively small amounts of timberland.

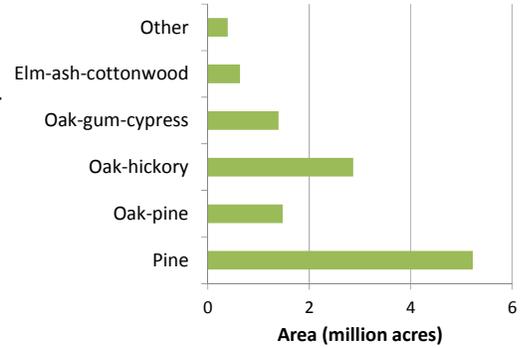


Figure 4. Timberland area by forest type.

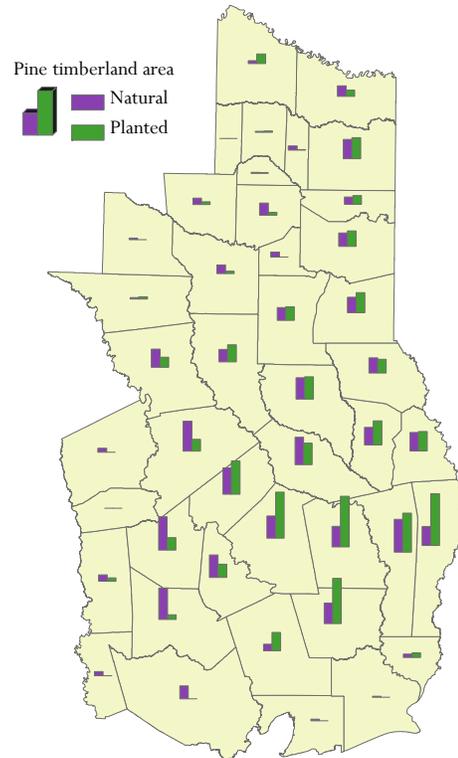


Figure 5. Pine timberland area by county.

Artificial regeneration (planted or artificially seeded) was evident on a little more than half (51 percent) of the 5.2 million acres of pine timberland with the balance (49 percent) naturally regenerated. In Figure 5 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 and north to south. 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 6). Medium-diameter stands, which represent 22 percent of timberland, consist predominantly of trees of a size typically used to produce pulp and various composite products. One quarter of timberland consists of small-diameter trees generally considered precommercial given current utilization standards. The balance is classified as nonstocked (see sidebar for definition).

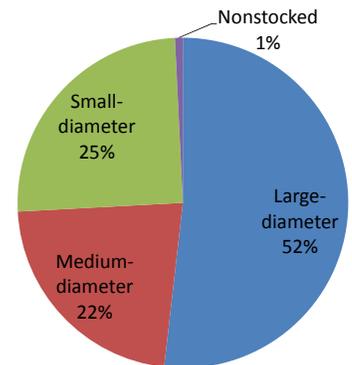


Figure 6. Distribution of timberland by stand-size class.

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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 1,447 cubic feet per acre.

VOLUME

There is an estimated 17.3 billion cubic feet of volume on timberland in East Texas. Softwood species account for 56 percent and hardwoods account for 44 percent of the total.

The distribution of volume by major species group and tree diameter class (see sidebar for explanation) is displayed in Figure 7. For softwoods, volume levels increase quickly and peak in the 10-inch diameter class at slightly less than 1.3 billion cubic feet and then decrease as diameter increases. Hardwood volume levels

increase and hit a plateau in the 10- to 14-inch diameter classes and then gradually drop as diameter increases. Softwood volumes exceed hardwood volumes, excepting for some of the larger diameter classes (e.g., 28-inch diameter class). Softwood volumes rise well above hardwood volumes in the 8- to 18-inch diameter classes.

In Figure 8 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 20 of 43 counties hardwood volume exceeds softwood volume. These counties are, for the most part, in the northern and western areas of the region.

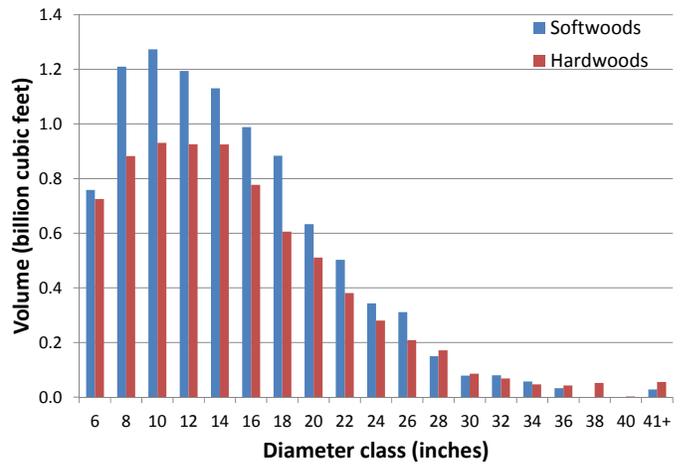


Figure 7. Distribution of volume on timberland by species group and diameter class.

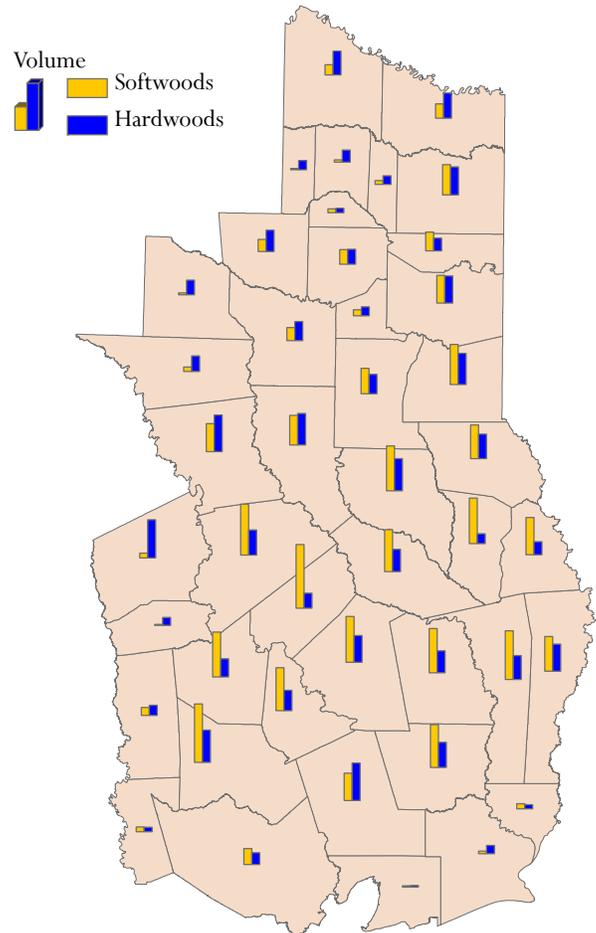


Figure 8. Net cubic foot volume on timberland by species group and county.

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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 36.5 tons per acre of biomass on timberland in East Texas.

BIOMASS

There is an estimated 437.6 million tons on timberland in East Texas. Hardwood species account for 53 percent and softwood species 47 percent of the total.

Biomass by diameter class and major species group is displayed in Figure 9. Biomass levels for hardwood and softwood species increase as diameter increases up to the 10-inch diameter class and then declines as diameter increases.

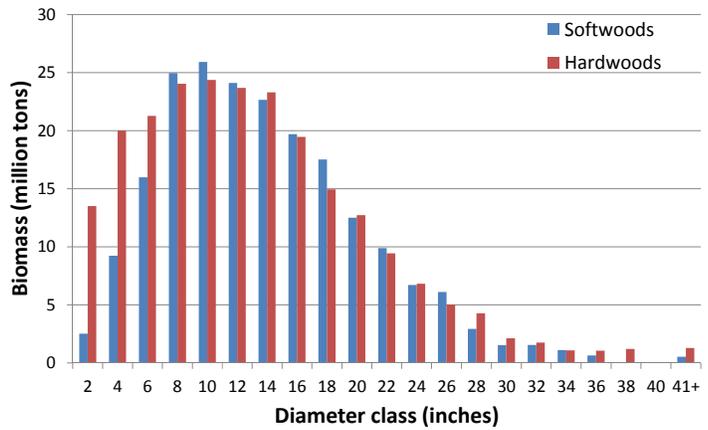


Figure 9. Distribution of biomass on timberland by species group and diameter class.

There is considerably more hardwood biomass than softwood biomass in the small diameter classes (2-inch and 4-inch). Beginning with the 8-inch diameter class, the amount of hardwood and softwood biomass track one another closely.

Biomass per acre of timberland is displayed in Figure 10. Values range between 26 (Chambers County) and 51 tons per acre (Montgomery County). 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
- More than 45

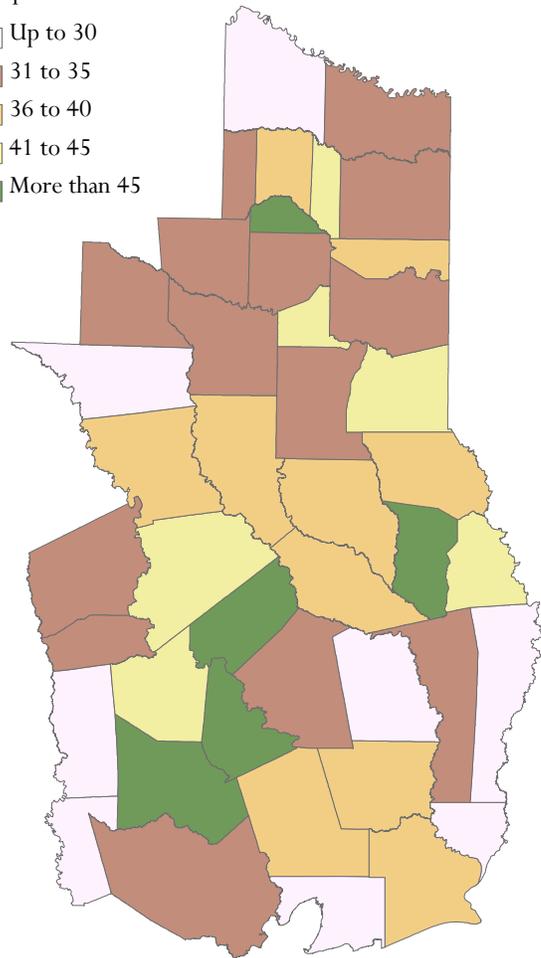


Figure 10. Biomass per acre of timberland by county.

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.

GROWTH AND REMOVALS

Average annual net growth (see sidebar for an explanation) of live trees on timberland is estimated at 779.3 million cubic feet throughout East Texas. Softwoods account for 77 percent of net growth and hardwoods 23 percent. Average annual removals of live trees on timberland is estimated at 717.0 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 is greater than 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 62.3 million cubic feet per year and inventory levels are expected to increase if this condition persists. Net growth and removals by species group are displayed in Figure 11. Net

growth exceeds removals for softwoods, suggesting inventory levels will increase. Net growth is indistinguishable from removals for hardwoods, suggesting inventory levels will hold steady as long as conditions persist. Inventory foresters have observed increased mortality due to weather events (e.g. hurricanes) that have contributed, especially for hardwoods, to lower observed net growth than observed just a few years ago.

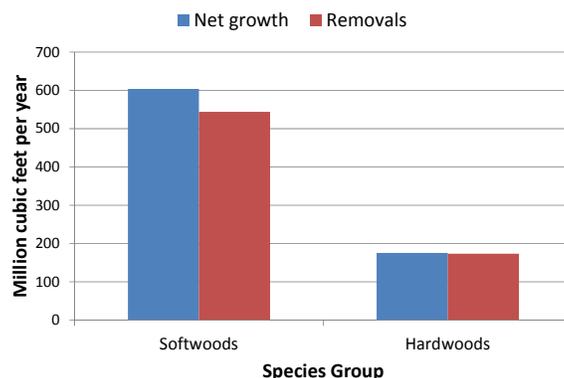


Figure 11. Net growth and removals of all live on timberland by species group.

NOTES

- **Family forest owners** are families, individuals, trusts, estates, family partnerships, and other unincorporated groups of individuals.
- **Diameter** is the most common measurement foresters make. Diameter is measured at breast height, d.b.h., or at root collar, d.r.c., depending on species.
- Inventory estimates are from custom queries of FIADB Version 4.0 Microsoft Access 2007 database that was loaded to the FIA DataMart (<http://199.128.173.17/fiadb4-downloads/datamart.html>) on 01-31-2011.
- Estimates are based on a sample and are therefore subject to sampling error.

MORE INFORMATION

Texas Forest Service staff can assist with questions about information in this report or about Forest Inventory and Analysis. Contact Chris Edgar, Forest Resource Analyst, by phone at 979/458-6630 or by e-mail at cedgar@tfs.tamu.edu.