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EAST TEXAS FORESTS: STATUS AND TRENDS

Southern Forest Experiment Station

SUMMARY

The softwood inventory in east Texas has grown 24 percent during the 1965-1975 time period; hardwood volume has gained 13 percent. The softwood volume, nearly all southern pine, increased throughout the range of size classes. This trend bodes well for southern pine forest industries, especially plywood manufacturers who depend upon larger diameter logs. Much of the hardwood gain took place upon upland sites, where the prospect of hardwood trees developing into quality sawtimber is not good. Forest area declined slightly, a trend that is expected to continue into the future. Opportunities for augmenting the region's timber supply lie in converting uplands now growing low-grade hardwoods to more productive pine and by concentrating hardwood improvements, like cull tree removal, in the more productive bottomland hardwood forests.

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Figure 1. *Forest resource regions of east Texas*

Resource Trends

FOREST AREA

The three forest resource regions of east Texas (fig. 1) lie entirely within the Coastal Plain. The southern pine forests of the Southeast and Northeast regions, collectively known as the Pineywoods, are a continuation of the forests of adjacent states. Further west these forest types blend into oak-pine and oak-hickory forests in the Post Oak region, which contains the westernmost growth of southern pines in Texas. The Post Oak is a transition zone between the Pineywoods forest to the east and the Black Prairie region to the west.

Some Decline Since 1965

East Texas contains 14.2 million acres of forest land, of which some 12.5 million are capable of producing commercial crops of wood. Most of the unproductive land is contained in the Post Oak region.

The 1975 acreage is 4 percent less than that reported 10 years before (table 1). In 1965, diversions of forest land to other uses in the Southeast were nearly balanced by reversion to forest in the Northeast. These regions have all suffered declines since, and the net gains in forest have apparently peaked. This trend is in keeping with that of other recently inventoried Midsouth states.

Table I. *Commercial forest land in 1975 and change since 1965*

Resource region	Commercial forest	Change
	Thousand acres	Percent
Southeast	6,345.2	−4
Northeast	4,556.3	−6
Post Oak	1,611.0	−1
All regions	12,512.5	−4

Most diversions in the Northeast and Post Oak regions were to agriculture, mainly pasture (table II). But the loss in the Southeast region was primarily to nonagricultural uses such as urban expansion and water impoundments. Urban expansion probably will continue to impinge on forests in this region because of growing metropolitan areas like Houston and its environs.

Most Land is Owned by Individuals

Only about 6 percent of the commercial forest land is publicly owned, and the bulk of this is in National Forests.

Private ownership is found in a variety of categories. Forest industry owns outright about 30 percent of the commercial forest — 9 percent more than 10 years ago — and it controls additional acreage

Table II. *Changes in commercial forest land, 1965 - 1975*

Region	Net change	Additions from:			Diversions to:		
		Total	Nonforest	Noncommercial forest[1]	Total	Agriculture	Other
		Thousand acres					
Southeast	−245.6	163.0	162.9	0.1	408.6	218.3	190.3
Northeast	−308.7	316.9	316.3	.6	625.6	487.9	137.7
Pineywoods	−554.3	479.9	479.2	.7	1,034.2	706.2	328.0
Post Oak[2]	− 9.3	304.6	304.6	. . .	313.9	255.6	58.3
East Texas	−563.6	784.5	783.8	.7	1,348.1	961.8	386.3

[1]Productive - reserved.
[2]Excludes Falls, Fannin and Navarro counties.

through long-term leases. Industry ownership is concentrated in the Southeast region. Corporations not in the forest industry own less than 3 percent.

Most forest land in east Texas is owned by individuals. Approximately three-fifths of the commercial forest land is owned by farmers, housewives, professionals, and others. To these people, timber growing is often a minor interest.

Forest Types

East Texas has about 4.8 million acres of southern pine types. This accounts for about two-fifths of the total commercial forest land, and it is concentrated in the Southeast region.

Oak-pine and oak-hickory forest types comprise 5.5 million acres. In the Pineywoods area, they often are the residual left after pine forests have been logged for pine, and these hardwoods are often poor in quality. The acres supporting these low-quality hardwoods are better suited to pine production. Hardwood types in the Post Oak area also are low in productivity. This region is the western fringe of land in east Texas that is capable of producing commercial crops of timber.

Bottomland forests cover 2.2 million acres, or 17 percent of the commercial forest acreage. Construction of water impoundments has reduced the land base in these forest types considerably.

TIMBER VOLUME

East Texas forests contained 14.6 billion cubic feet of wood in 1975. Volume in growing stock — that is, trees presently or prospectively suitable for sawtimber — was 12.7 billion cubic feet or 87 percent of the total. Since different methods of computing timber volume have evolved since the last survey, 1965 volumes were adjusted to conform to current standards.

Pine Volume Has Increased

Almost all softwood volume is composed of the four major southern pines. Loblolly alone makes up almost two-thirds of the softwood growing stock (fig. 2).

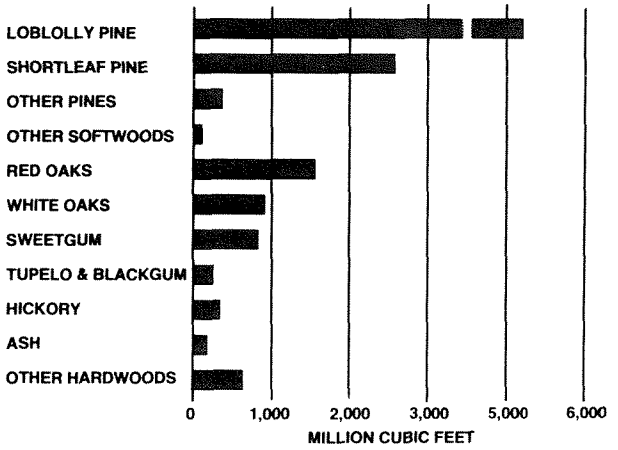

Figure 2. *Growing stock by species*

The present volume of 8.2 billion cubic feet represents a 24-percent increase over the 1965 softwood inventory (table III). All regions shared in the gain, but the large percentage gain in the Post Oak region is somewhat deceptive. This region, as a whole, cannot support many timber-based industries because of low productivity and low volumes per acre. The lower percentage gain in the Southeast is the result of high removal rates. Although the timber resources in that region are being highly utilized, the inventory continues to build. Despite encroachments of agriculture on forest land in the Northeast, that region also gained volume.

All diameter classes shared in the inventory gains (fig. 3). Especially noteworthy are the relatively large increases in diameter classes 10 inches and greater. At the end of 1974, nine plywood plants were operating in Texas, which ranked second only to Louisiana in the Midsouth in pine plywood produc-

Table III. *Growing-stock volume in 1975 and change since 1965*

Resource region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million ft³	*Percent*	*Million ft³*	*Percent*
Southeast	5,590.5	+ 14	2,140.2	+ 8
Northeast	2,334.6	+ 49	1,743.0	+16
Post Oak	236.5	+113	685.5	+20
All regions	8,161.6	+ 24	4,568.7	+13

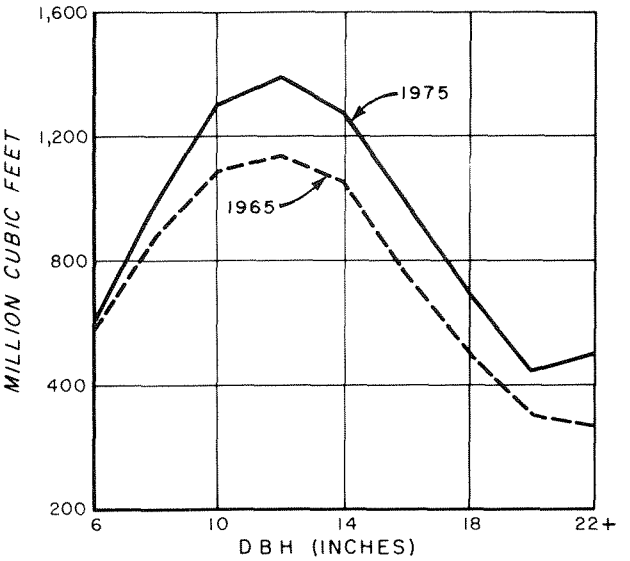

Figure 3. *Softwood growing stock by tree diameter, 1965 and 1975*

tion. Therefore, gain in the upper diameters of the softwood inventory is encouraging. It not only indicates that inventory growth has taken place during this industry expansion, but also that further expansion is possible.

The softwood sawtimber inventory is now 34.9 billion board feet, which is a 29-percent increase over 1965. Regional softwood sawtimber trends followed those for growing stock (table IV).

Much of Hardwood Volume on Pine Sites

The hardwood growing stock inventory presently stands at 4.6 billion cubic feet. The species with the greatest volumes are the oaks, sweetgum, hickory, and tupelo and blackgum (fig. 2).

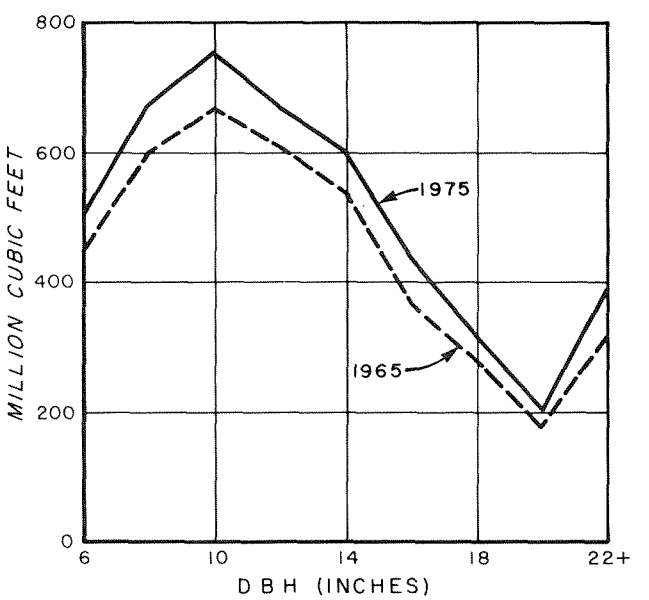

Figure 4. *Hardwood growing stock by tree diameter, 1965 and 1975*

An additional 1.7 billion cubic feet of wood is in culls and dead, salvable trees. This portion represents 28 percent of the total hardwood volume in east Texas. The only real potential market for this part of the hardwood resource is pulpwood.

The 1975 hardwood timber volume represents a 13-percent increase over that of 1965. Regional changes paralleled those that occurred for softwoods (table III), and the increases by diameter class were relatively uniform (fig. 4). However, both the size and increase in the hardwood volume is somewhat misleading. An estimated 60 percent of the hardwood inventory in the Pineywoods is found on upland sites that are better suited for pine. About 14 percent of the hardwood volume is found in the Post Oak region with its attendant low productivity. Only 36 percent of the Pineywoods volume is found in bottomlands, which are the most productive hardwood sites.

Table IV. *Sawtimber volume in 1975 and change since 1965*

Resource region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million fbm	*Percent*	*Million fbm*	*Percent*
Southeast	25,127.0	+ 18	6,168.5	+ 9
Northeast	8,825.1	+ 60	4,710.2	+18
Post Oak	939.9	+151	2,116.8	+27
All regions	34,892.0	+ 29	12,995.5	+14

GROWTH AND REMOVALS

Net growth (gross growth minus mortality) was 721.8 million cubic feet in 1974. Over half of this growth occurred in the Southeast region, about two-fifths in the Northeast, and the remaining 6 percent in Post Oak. The relative contribution of each region reflected the distribution of growing stock and productivity.

Almost all the softwood growth in east Texas is in the southern pines; the oak species and sweetgum comprise almost 75 percent of the hardwood increment. The growth per acre for east Texas averages 58 cubic feet, but this figure is diluted by the Post Oak region. The net annual growth for the Pineywoods alone is 62 cubic feet per acre, and it could be boosted even higher.

Timber mortality resulting from fire, insects, disease, and other agents claimed about 50.7 million cubic feet of the inventory in 1974.

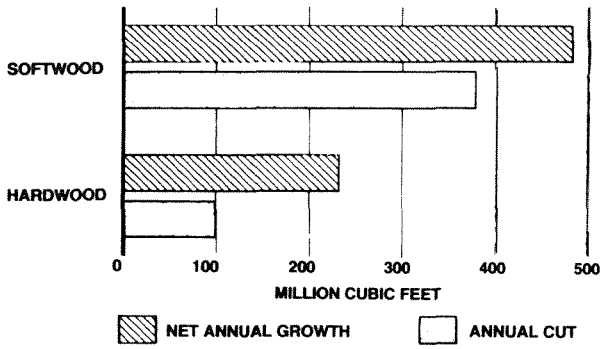

Figure 5. *Growth and cut of growing stock, 1974*

Growing stock (net growth minus removals) increased about 241 million cubic feet in 1974. Growth exceeded removals for both softwood and hardwood (fig. 5), with all major species experiencing an increase in growing stock.

Of the 480.8 million cubic feet of removals, 93 percent was converted to roundwood products, 5 percent was left in the woods as logging residue, and the remaining 2 percent was removed in other land operations such as land clearing and timber stand improvement.

Timber Supply Outlook

Demand for timber almost certainly will increase in the future. But will the region be able to supply these needs?

Timber supply is hard to predict, but projections can be made to see how much timber the region could supply, given a set of hypothetical conditions. Two such projections were made for the Pineywoods, which encompasses nearly all of the east Texas timber suitable for industrial use. In the prospective cut projection, present trends in forest management were assumed to continue, and the cut was gradually increased during the projection period until it equalled growth. In the potential cut projection, more intensive management was assumed so that a better distribution of tree sizes and forest types would be achieved. Other assumptions for both projections were a stable land base and no changes in growth and mortality rates.

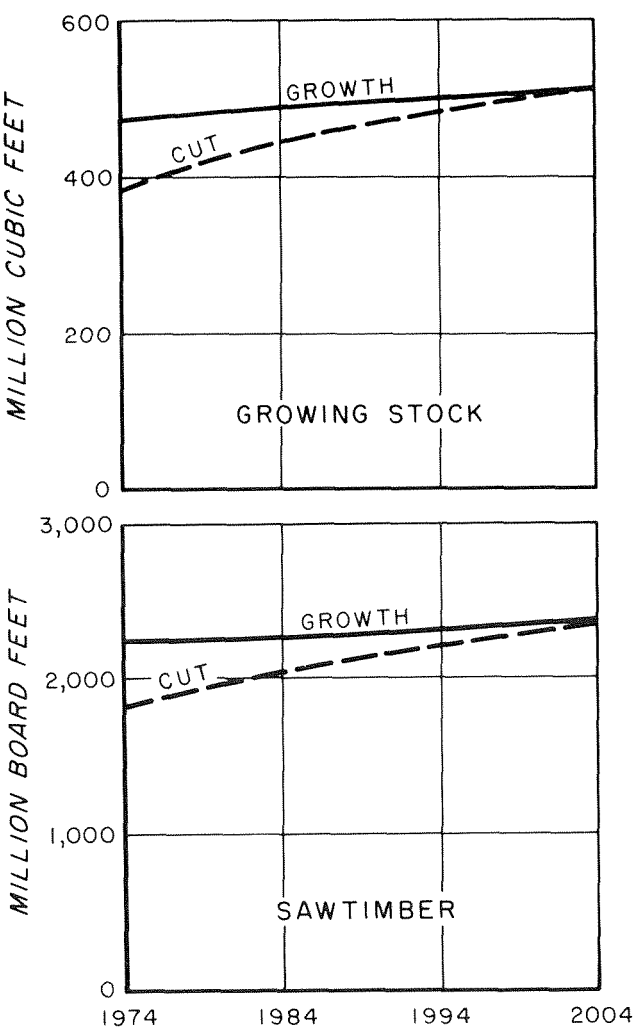

Figure 6. *Prospective growth and cut of softwood, 1974-2004*

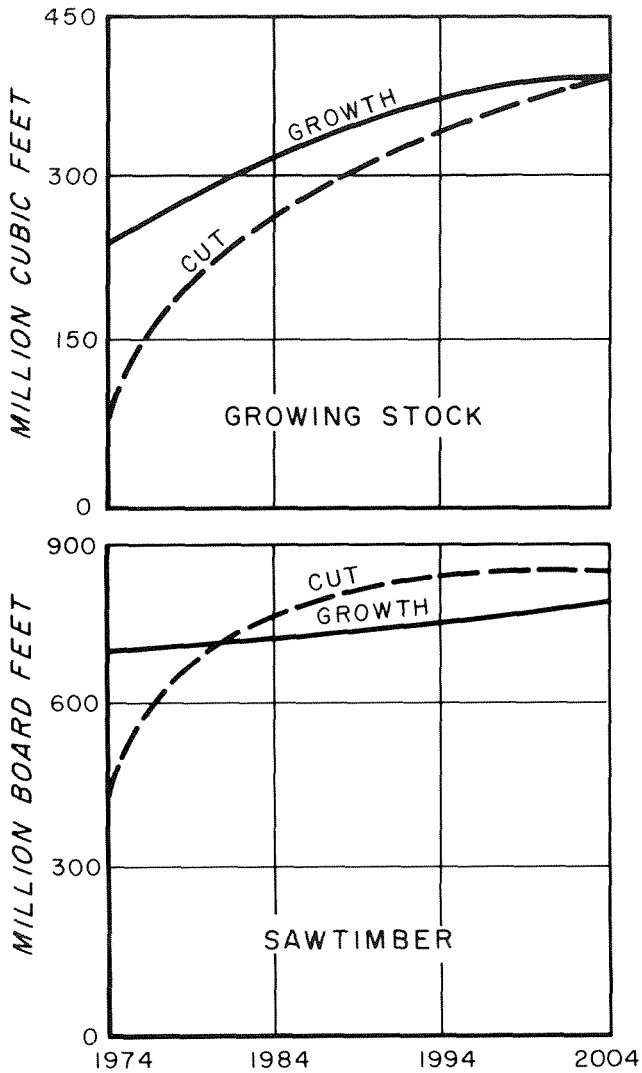

Figure 7. *Prospective growth and cut of hardwood, 1974-2004*

PROSPECTIVE CUT

Growth exceeds cut by 24 percent for softwood growing stock at the start of the 30-year projection period. This margin is gradually reduced, and cut equals growth at the end (fig. 6). The annual growth increases from 469.6 million to 510.1 million cubic feet during the projection. The softwood sawtimber cut also increases and closely matches growth at the end. In 2004, softwood sawtimber growth is 2.3 billion board feet. Softwood growing stock at the end is 8.9 billion cubic feet, an increase of 12 percent.

For hardwood growing stock, growth exceeds cut by 121 percent at the start of the projection period. Growing stock growth and cut both grow during the projection until the end, when they balance at 390 million cubic feet (fig. 7). Hardwood sawtimber

growth exceeded cut by 55 percent in 1974. Sawtimber growth and cut then increased. However, sawtimber cut exceeded growth before the end of the decade, and it persisted until the end when growth was but 93 percent of the cut.

The persistent imbalance of growth and cut in hardwood sawtimber reduced the inventory in 2004 from its 1974 level. The cause of this drain was overcutting in the higher diameter classes. The ingrowth of trees from lower diameters could not sustain the heavy removals; consequently, the inventory declined.

In the prospective cut, no attention was paid to either building or maintaining a desirable stand structure. However, size distribution and other factors were considered in the second projection.

Potential Cut

The Pineywoods currently has 4.6 million acres of southern pine forest types, which is only about 42 percent of the commercial forest area. It was assumed in the potential cut projection that the oak-pine forest type would be converted to pure pine, which would bring the pine type acreage up to 7 million acres or about 65 percent of the total.

Goals for the pine forest types are a density of 90 square feet of basal area per acre for all live trees — rough and rotten as well as growing stock — and a reduction of the cull tree percentage to 2 percent. For hardwoods, the targets are 90 square feet of basal area and a reduction of the cull tree proportion from 31 to 16 percent.

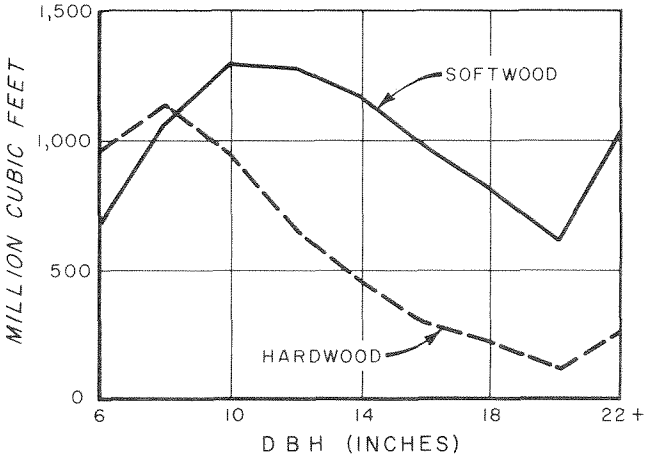

Figure 8. *Prospective inventories of softwood and hardwood, 2004*

A goal for both is a better tree size distribution. With the 1975 stand structure and the desired one for

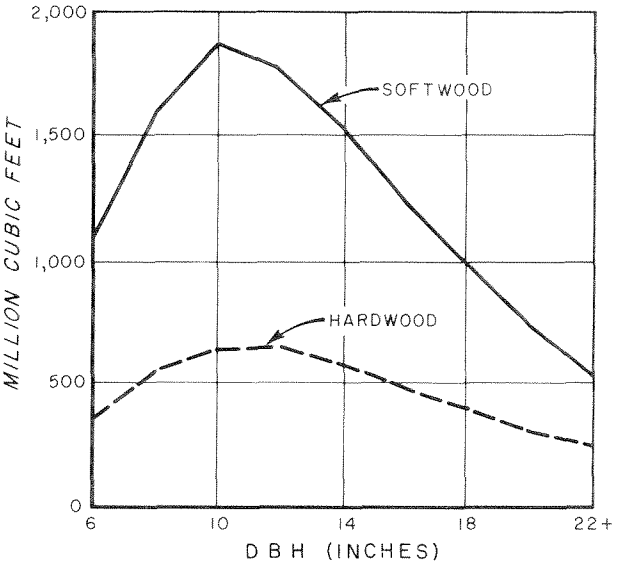

Figure 9. *Potential inventories of softwood and hardwood, 2004*

2004 as the starting and ending inventories, tree distributions for each year of the projection period were found by interpolation. The timber cut for each year was adjusted by diameter class so that the desired stand structure was left.

Attainment of goals for the potential cut would result in a growing stock inventory of 15.6 billion cubic feet (figs. 8 and 9), versus a prospective inventory of 13.9 billion and a current one of 11.8 billion. Softwoods would comprise almost three-quarters of the total.

The growth in 2004 would be 935.9 million cubic feet, which translates into about 86 cubic feet per acre. The growth for sawtimber would be 355 board feet per acre, compared to 271 board feet of current growth and 285 board feet for the prospective cut.

According to the projections, the Pineywoods softwood supply can be expanded by increasing the acreage in pine types and improving stand structure. The hardwood supply can be improved by changing the stand structure and reducing cull trees. A hardwood gain in the large diameters, in fact, can take place despite the shifting of some sites now growing hardwoods to pine types, as evidenced by the potential cut projection.

Management Opportunities

PINE RESOURCE

The Pineywoods contains 8.8 million acres of commercial forest land that is suitable for growing southern pine. However, 4.3 million acres or 49 percent are now dominated by hardwood forest types. In the past the pine forest acreage has been expanded by planting or seeding open areas, but that era has passed. The amount of unstocked forest land in the Pineywoods is minuscule today. Conversion of these hardwood stands to pine is one of the best ways to increase the pine timber supply for tomorrow's needs.

Some of these acres, even though dominated by hardwoods, have a pine seed source that is adequate for natural regeneration. A recent study[1] of type conversion in west Louisiana found that about one-half the total area qualifying for type conversion could be regenerated naturally to pine. Even though these areas can be seeded artificially, the use of natural regeneration systems can lower cost, and every acre restocked this way frees planting stock or seeds for areas that must be regenerated artificially.

Whether these acres are to be converted to pine types by natural regeneration or by seeding or planting, site preparation costs probably will be high because of the substantial hardwood overburden. The degree of success of any regeneration method relies on how well competing vegetation is controlled. If the cost of conversion is the same, areas with high site quality should be converted first to attain maximum cost effectiveness.

The most widely prevalent species for type conversion in the Pineywoods is loblolly pine. Shortleaf assumes importance only in the Northeast, and longleaf is confined to the Southeast. Slash pine, of course, is not indigenous to the region.

Pine sites already supporting southern pine forests also need varying degrees of treatment. About 2.8 million acres of pine types on pine sites are poorly stocked with desirable trees. Enough growing stock is present on a portion of these acres, so that improvement of the existing stand is possible by favoring the desirable or preferred trees in thinnings. However, 351,200 acres are so poorly stocked that they may have to be regenerated. Another 1.6 million acres are medium stocked with desirable trees, and treatment would consist mainly of increasing the proportion of desirables by favoring them in intermediate cuts. Finally, some 170,400 acres are well stocked with desirable trees and need little or no treatment.

[1]Murphy, P.A. Effective allocation of cost-sharing funds for forestry: an example. U.S. Dep. Agric. For. Serv. Res. Pap. SO-128, 14 p. South. For. Exp. Stn., New Orleans, La. 1976.

HARDWOOD RESOURCE

The hardwood resource in the Pineywoods is in two components. Some hardwoods reside on upland sites that are better suited to growing pine. As a rule these sites don't produce good hardwoods. The other — the quality hardwoods — grow in bottom lands, principally along the major river systems. These hardwood forests in past years have been fragmented by reservoir construction and other shifts in land use.

To improve the hardwood resource, efforts should be concentrated on the bottom-land sites for two reasons: these are the more productive hardwood areas, and upland sites now growing hardwood will probably be reclaimed to some extent for pine production. Bottom-land forest sites in the east Texas Pineywoods cover 1.8 million acres. The condition of these forests vary.

Only about 46,100 acres of these bottom lands are at least medium stocked with desirable trees. On these, the desirable tree portion of the stand would be increased by freeing growing space through cull tree removal and improvement cuts. Most of the sites — over 1 million acres — are poorly stocked with desirable trees, but most of this acreage contains enough growing stock so that management of the existing stand is feasible. Cull trees can be reduced and desirable trees can be favored whenever possible in improvement cuts. The remaining 721,000 acres, however, are poorly stocked, and the only alternative may be to regenerate a new stand.

OUTLOOK

The outlook for east Texas forests is mixed. The rise in the softwood inventory, coupled with the current excess of growth over cut, indicates that a moderate increase in removals would not diminish the resource. The hardwood situation is different. Only by concentrating treatments on the bottom-land hardwood sites will the hardwood resource be improved for the future.

Appendix

SURVEY METHODS

The data on forest acreage and timber volume were secured by a sampling method involving a forest-nonforest classification on aerial photographs and on-the-ground measurements of trees at sample locations. The sample locations were at the intersections of a grid of lines spaced 3 miles apart. In east Texas, 153,918 photographic classifications were made and 7,640 ground sample locations were visited.

The initial estimates of forest area that were obtained with the aerial photographs were adjusted on the basis of the ground check.

A cluster of 10 variable-radius plots were installed at each ground sample location. Each sample tree on the variable-radius plots represented 3.75 square feet of basal area per acre. Trees less than 5.0 inches in diameter were tallied on fixed-radius plots around the plot centers. Together, these samples provided most of the information for the new inventory.

The plots established by the prior survey were remeasured to determine the elements of change and were the basis for estimating growth, mortality, removals, and changes in land use.

A special study was made to determine product output. It consisted of a canvass of all primary wood-using plants active in east Texas during 1974. Out-of-state firms known to use east Texas roundwood were also contacted. Additionally, fuelwood and other domestic uses were determined from an area sample.

RELIABILITY OF THE DATA

Reliability of the estimates may be affected by two types of errors. The first stems from use of a sample to estimate the whole and from variability of the items being sampled. This is termed sampling error; it is susceptible to a mathematical evaluation of the probability of errror. The second type — often referred to as reporting or estimating error — derives from mistakes in measurement, judgment, or recording, and from limitations of method or equipment. Its effects cannot be appraised mathematically, but the Forest Service attempts to hold it to a minimum by proper training and good supervision, and by emphasis on careful work.

Statistical analysis of the data indicates a sampling error of plus or minus 0.3 percent for the estimate of total commercial forest area, 1.6 percent for total cubic volume, and 2.1 percent for total board-foot volume. As these totals are broken down by forest type, species, tree diameter, and other subdivisions, the possibility of error increases and is greatest for the smallest items. The order of this increase is suggested in the following tabulation, which shows the sampling error to which the timber volume and area estimates are liable, two chances out of three.

The sampling error to which the estimates of growth, mortality, and removals are liable, on a probability of two chances out of three are:

Sampling errors for commercial forest area, growing-stock and sawtimber volumes, east Texas, 1975

Commercial forest area	Sampling error[1]	Cubic volume[2]	Sampling error[1]	Board-foot volume[3]	Sampling error[1]
Thousand acres	*Percent*	*Million cubic feet*	*Percent*	*Million board feet*	*Percent*
12,512.5	0.3				
1,126.1	1.0	12,730.3	1.6		
281.5	2.0	8,147.4	2.0	47,887.5	2.1
125.1	3.0	3,621.1	3.0	23,464.9	3.0
70.4	4.0	2,036.8	4.0	13,199.0	4.0
45.0	5.0	1,303.6	5.0	8,447.4	5.0
11.3	10.0	325.9	10.0	2,111.8	10.0
5.0	15.0	144.8	15.0	938.6	15.0
2.8	20.0	81.5	20.0	528.0	20.0
1.8	25.0	52.1	25.0	337.9	25.0

[1]By random-sampling formula.
[2]Growing-stock volume on commercial forest land.
[3]Sawtimber volume on commercial forest land.

Net annual growth and timber removals sampling error, East Texas, 1974

Net annual growth				Annual removals			
Cubic volume	Sampling error	Board-foot volume	Sampling error[1]	Cubic volume	Sampling error	Board-foot volume	Sampling error[1]
Million cubic feet	*Percent*	*Million board feet*	*Percent*	*Million cubic feet*	*Percent*	*Million board feet*	*Percent*
721.8	1.5			480.8	1.4		
406.0	2.0	3,128.4	2.1	235.6	2.0	2,307.6	2.9
180.4	3.0	1,532.9	3.0	104.7	3.0	2,156.3	3.0
101.5	4.0	862.3	4.0	58.9	4.0	1,212.9	4.0
65.0	5.0	551.8	5.0	37.7	5.0	776.3	5.0
16.2	10.0	138.0	10.0	9.4	10.0	194.1	10.0
7.2	15.0	61.3	15.0	4.2	15.0	86.3	15.0
4.1	20.0	34.5	20.0	2.4	20.0	48.5	20.0
2.6	25.0	22.1	25.0	1.5	25.0	31.1	25.0

[1]By random-sampling formula.

DEFINITIONS OF TERMS

Forest Land Class

Forest land. — Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover and not currently developed for nonforest use.

Commercial forest land. — Forest land that is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization.

Nonstocked land. — Commercial forest land less than 16.7 percent stocked with growing-stock trees.

Productive-reserved forest land. — Productive public forest land withdrawn from timber utilization through statute or administrative regulation.

Unproductive forest land. — Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Tree Species

Commercial species. — Tree species currently or prospectively suitable for industrial wood products; excludes so-called weed species such as blackjack oak and blue beech.

Hardwoods. — Dicotyledonous trees, usually broadleaved and deciduous.

Softwoods. — Coniferous trees, usually evergreen, having needle or scale-like leaves.

Forest Type

Longleaf-slash pine. — Forests in which longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include other southern pines, oak, and gum.

Loblolly-shortleaf pine. — Forests in which southern pine and eastern redcedar except longleaf or slash pine, singly or in combination, comprise a plurality of the stocking. Common associates include oak, hickory, and gum.

Oak-pine. — Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking but in which softwoods, except cypress, comprise 25-50 percent of the stocking. Common associates include gum, hickory, and yellow-poplar.

Oak-hickory. — Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elm, maple, and black walnut.

Oak-gum-cypress. — Bottom land forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25-50 percent, in which case the stand would be classified oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-ash-cottonwood. — Forests in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

Class of Timber

Growing stock trees. — Sawtimber trees, poletimber trees, saplings, and seedlings; that is, all live trees except rough and rotten trees.

Desirable trees. — Growing-stock trees that have no serious defects to limit present or prospective use, are of relatively high vigor, and contain no pathogens that may result in death or serious deterioration before rotation age. They comprise the type of trees that forest managers aim to grow; that is, the trees favored in silvicultural operations.

Acceptable trees. — Trees meeting the specifications for growing stock but not qualifying as desirable trees.

Sawtimber trees. — Live trees of commercial species, 9.0 inches and larger in diameter at breast height for softwoods and 11.0 inches and larger for hardwoods, and containing at least one 12-foot saw log.

Poletimber trees. — Live trees of commercial species 5.0 to 9.0 inches in d.b.h. for softwoods and 5.0 to 11.0 inches for hardwoods, and of good form and vigor.

Saplings. — Live trees of commercial species, 1.0 inch to 5.0 inches in d.b.h. and of good form and vigor.

Rough and rotten trees. — Live trees that are unmerchantable for saw logs now or prospectively because of defect, rot, or species.

Salvable dead trees. — Standing or down dead trees that are considered currently or potentially merchantable.

Stand-Size Class

Sawtimber stands. — Stands at least 16.7 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands. — Stands at least 16.7 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-seedling stands. — Stands at least 16.7 percent stocked with growing-stock trees, with more than half of this stocking in saplings or seedlings.

Nonstocked areas. — Commercial forest lands less than 16.7 percent stocked with growing-stock trees.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or preempted by vegetative cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Full stocking is assumed to range from 100 to 133 percent of the stocking standard.

The tabulation below shows the density standard in terms of trees per acre, by size class, required for full stocking:

D.b.h. (inches)	Number of trees	D.b.h. (inches)	Number of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

Volume

Volume of sawtimber. — Net volume of the saw-log portion of live sawtimber trees in board feet of the International rule, ¼-inch kerf.

Volume of growing stock. — Volume of sound wood in the bole of sawtimber and poletimber trees from stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs.

Volume of timber. — The volume of sound wood in the bole of growing stock, rough, rotten, and salvable dead trees 5.0 inches and larger in d.b.h. from stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs.

Area Condition Class

A classification of commercial forest land based upon stocking by desirable trees and other conditions affecting current and prospective timber growth.

Class 10. — Areas 100 percent or more stocked with desirable trees and not overstocked.

Class 20. — Areas 100 percent or more stocked with desirable trees and overstocked with all live trees.

Class 30. — Areas 60 to 100 percent stocked with desirable trees and with less than 30 percent of the area controlled by other trees, inhibiting vegetation, slash, or nonstockable conditions.

Class 40. — Areas 60 to 100 percent stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees.

Class 50. — Areas less than 60 percent stocked with desirable trees, but with 100 percent or more stocking of growing-stock trees.

Class 60. — Areas less than 60 percent stocked with desirable trees, but with 60 to 100 percent stocking of growing-stock trees.

Class 70. — Areas less than 60 percent stocked with desirable trees and with less than 60 percent stocking of growing-stock trees.

Miscellaneous Definitions

Basal area. — The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed as square feet per acre.

D.b.h. — (Diameter breast high) — Tree diameter in inches, outside bark, measured at 4½ feet above ground.

Diameter classes. — The 2-inch diameter classes extend from 1.0 inch below to 0.9 inch above the stated midpoint. Thus, the 12-inch class includes trees 11.0 inches through 12.9 inches d.b.h.

Site classes. — A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Log grades. — A classification of logs based on external characteristics as indicators of quality or value.

Gross growth. — Annual increase in net volume of trees in the absence of cutting and mortality.

Net annual growth. — The increase in volume of a specified size class for a specific year. Components of net annual growth include the increment in net volume of trees at the beginning of the specified year surviving to its end plus volume of trees reaching the size class during the year minus the volume of trees that died during the year minus the net volume of trees that become rough or rotten during the year.

Mortality. — Number or sound-wood volume of live trees dying from natural causes during a specified period.

Timber removals. — The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations such as timberstand improvement, land clearing, or changes in land use.

Timber products. — Roundwood products and plant by-products. Timber products output includes roundwood products cut from growing stock on commercial forest land; from other sources, such as cull trees, salvable dead trees, limbs, and saplings; from trees on noncommercial and nonforest lands; and from plant byproducts.

Roundwood products. — Logs, bolts, and other round sections cut from trees for industrial or consumer uses. Included are saw logs, veneer logs and bolts, cooperage logs and bolts, pulpwood, fuelwood, piling, poles and posts, hewn ties, mine timbers, and various other round, split, or hewn products.

Logging residues. — The unused portions of trees cut or killed by logging.

Plant byproducts. — Wood products, such as pulp chips, obtained incidental to manufacture of other products.

Plant residues. — Wood materials from manufacturing plants not utilized for some product. Included are slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and pulp screening.

STANDARD TABLES

NOTE: Regional tables identical in format to standard State tables 1-22, are available for each of the three forest resource regions in East Texas. They are free on request to the Southern Forest Experiment Station.

Table 1. *Area by land classes, east Texas, 1975*

Land class	Area
	Thousand acres
Forest:	
Commercial	12,512.5
Productive-reserved	37.2
Unproductive	1,604.3
Total forest	14,154.0
Nonforest:	
Cropland[1]	7,856.7
Other[2]	11,045.7
Total nonforest	18,902.4
All land[3]	33,056.4

[1]Census of Agriculture.

[2]Includes pasture and range, industrial and urban areas, other nonforest land, and 113,800 acres, classed as water by Forest Survey standards, but defined by the Bureau of the Census as land.

[3]United States Bureau of the Census.

Table 2. *Area of commercial forest land by ownership classes, east Texas, 1975*

Ownership class	Area
	Thousand acres
Public:	
National forest	576.6
Indian	3.0
Other federal	141.8
State	48.5
County and municipal	7.4
Total public	777.3
Private:	
Forest industry[1]	3,771.1
Farmer	1,186.6
Miscellaneous private:	
Individual	6,404.0
Corporate	373.5
Total private	11,735.2
All ownerships	12,512.5

[1]Not including 24.0 thousand acres of farmer-owned and miscellaneous private lands leased to forest industry.

Table 3. *Area of commercial forest land by stand-size and ownership classes, east Texas, 1975*

Stand-size class	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
			Thousand acres		
Sawtimber	6,456.9	474.6	91.3	2,189.6	3,701.4
Poletimber	3,202.3	33.1	81.3	761.1	2,326.8
Sapling and seedling	2,687.6	68.5	28.1	808.3	1,782.7
Nonstocked areas	165.7	.4	...	12.1	153.2
All classes	12,512.5	576.6	200.7	3,771.1	7,964.1

Table 4. *Area of commercial forest land by stand-volume and ownership classes, east Texas, 1975*

Stand-volume per acre[1]	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
			Thousand acres		
Less than 1,500 fbm	4,193.7	53.2	76.9	848.9	3,214.7
1,500 to 5,000 fbm	4,759.5	59.4	59.7	1,476.1	3,164.3
More than 5,000 fbm	3,559.3	464.0	64.1	1,446.1	1,585.1
All classes	12,512.5	576.6	200.7	3,771.1	7,964.1

[1]International ¼-inch rule.

Table 5. *Area of commercial forest land by stocking classes based on selected stand components, east Texas, 1975*

Stocking percentage	Stocking classified in terms of					
	All trees	Growing-stock trees			Rough and rotten trees	Inhibiting vegetation
		Total	Desirable	Acceptable		
	Thousand acres					
160 or more	...	...	...	...	...	...
150 to 160	18.1	12.2	...	...	...	...
140 to 150	207.5	35.4	...	...	...	...
130 to 140	591.7	195.1	6.5	6.3	...	...
120 to 130	1,336.8	442.1	19.0	23.7	...	...
110 to 120	2,236.0	799.1	40.2	56.3	4.7	...
100 to 110	2,333.0	1,077.0	123.8	91.9	13.7	...
90 to 100	2,108.6	1,761.6	186.0	225.2	5.5	...
80 to 90	1,672.3	1,651.7	275.9	616.2	67.8	...
70 to 80	908.6	1,639.6	511.1	1,030.3	123.5	...
60 to 70	500.2	1,646.6	661.1	1,519.7	254.0	...
50 to 60	281.3	1,183.9	923.5	2,027.0	512.9	...
40 to 50	168.8	823.0	1,124.8	2,131.6	1,003.2	5.7
30 to 40	111.1	559.0	1,380.1	2,015.4	1,504.1	5.6
20 to 30	20.9	449.9	1,607.1	1,468.2	2,657.4	18.0
10 to 20	11.0	168.0	1,708.4	868.1	3,285.3	79.9
Less than 10	6.6	68.3	3,945.0	432.6	3,080.4	12,403.3
All areas	12,512.5	12,512.5	12,512.5	12,512.5	12,512.5	12,512.5

Table 6. *Area of commercial forest land by area-condition and ownership classes, east Texas, 1975*

Area-condition class	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
	Thousand acres				
10	135.8	...	5.3	53.4	77.1
20	53.7	15.7	...	17.8	20.2
30	369.7	47.4	6.3	198.4	117.6
40	1,264.4	184.7	11.6	446.6	621.5
50	1,270.4	129.5	29.1	384.2	727.6
60	6,166.4	156.0	107.5	2,008.0	3,894.9
70	3,252.1	43.3	40.9	662.7	2,505.2
All classes	12,512.5	576.6	200.7	3,771.1	7,964.1

Table 7. *Area of commercial forest land by site and ownership classes, east Texas, 1975*

Site class	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
	Thousand acres				
165 ft^3 or more	133.3	5.8	5.0	29.1	93.4
120 to 165 ft^3	1,071.4	60.0	13.8	522.1	475.5
85 to 120 ft^3	4,679.9	302.2	38.2	1,782.3	2,557.2
50 to 85 ft^3	5,639.9	201.4	131.2	1,391.8	3,915.5
Less than 50 ft^3	988.0	7.2	12.5	45.8	922.5
All classes	12,512.5	576.6	200.7	3,771.1	7,964.1

Table 8. *Area of commercial forest land by forest types and ownership classes, east Texas, 1975*

Type	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
			Thousand acres		
Longleaf-slash pine	258.8	16.2	...	175.6	67.0
Loblolly-shortleaf pine	4,502.9	443.0	66.1	1,641.6	2,352.2
Oak-pine	2,550.5	72.5	21.4	931.5	1,525.1
Oak-hickory	3,018.7	21.9	55.5	496.5	2,444.8
Oak-gum-cypress	1,952.7	17.2	46.6	514.9	1,374.0
Elm-ash-cottonwood	228.9	5.8	11.1	11.0	201.0
All types	12,512.5	576.6	200.7	3,771.1	7,964.1

Table 9. *Area of noncommercial forest land by forest types, east Texas, 1975*

Type	All areas	Productive-reserved areas	Unproductive areas
		Thousand acres	
Longleaf-slash pine	1.0	1.0	...
Loblolly-shortleaf pine	44.2	24.2	20.0
Oak-pine	28.3	8.1	20.2
Oak-hickory	1,523.8	3.9	1,519.9
Oak-gum-cypress	44.2	...	44.2
All types	1,641.5	37.2	1,604.3

Table 10. *Number of growing-stock trees on commercial forest land by species and diameter classes, east Texas, 1975*

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0- and larger
	Thousand trees										
Softwood:											
Longleaf pine	11,186	2,338	3,002	2,001	1,545	1,147	686	360	83	24	...
Slash pine	36,889	18,419	12,709	4,468	1,075	153	32	24	9	...	...
Shortleaf pine	234,982	83,589	54,899	40,908	27,631	16,156	7,537	2,939	1,016	307	...
Loblolly pine	411,160	145,814	93,443	62,131	43,620	28,402	17,267	10,041	5,567	4,713	162
Cypress	4,423	2,012	899	225	289	315	242	178	100	140	23
Redcedar	4,688	2,044	1,651	429	303	173	56	32	...	...	...
Total	703,328	254,216	166,603	110,162	74,463	46,346	25,820	13,574	6,775	5,184	185
Hardwood:											
Select white oaks[1]	30,082	13,476	5,563	3,644	3,020	2,018	995	682	332	342	10
Select red oaks[2]	14,250	3,368	3,941	1,841	1,756	1,216	713	547	263	510	95
Other white oaks	100,832	42,858	24,064	16,178	8,102	4,674	2,235	1,314	764	604	39
Other red oaks	145,717	51,738	37,485	22,660	13,268	8,841	5,170	2,765	1,694	1,921	175
Pecan	10,418	3,528	2,841	1,469	908	723	240	190	61	223	235
Other hickories	29,328	11,071	6,913	6,420	2,188	1,585	537	401	116	87	10
Sweetgum	125,088	61,736	30,307	15,663	8,492	4,314	2,306	1,310	441	486	33
Tupelo and blackgum	29,351	13,914	5,519	4,236	1,989	1,675	1,016	429	259	293	21
Hard maple	814	363	247	143	36	...	17	...	...	8	...
Soft maple	9,436	6,528	1,898	633	75	150	100	43	...	9	...
Beech	1,855	222	244	485	325	235	196	77	39	28	4
Ash	20,011	8,367	4,265	3,108	1,869	1,034	789	365	102	112	...
Cottonwood	2,052	188	545	221	229	322	218	165	96	38	30
Basswood	271	132	...	34	28	63	...	14	...	...	...
Black walnut	521	136	185	110	78	...	...	...	12	...	...
Black cherry	483	294	148	...	25	...	16	...	...	...	...
Willow	1,392	244	309	189	113	188	59	110	68	90	22
Magnolia (*Magnolia*, spp.)	5,007	1,913	1,452	785	366	259	153	27	29	23	...
American elm	8,271	3,797	1,290	1,192	694	755	244	163	77	56	3
Other elms	31,969	14,680	7,294	4,695	2,708	1,539	674	261	63	55	...
Hackberry	11,830	4,463	3,135	2,204	830	599	401	93	56	49	...
Sycamore	1,487	407	585	237	27	34	64	25	19	89	...
Other hardwoods	12,774	7,088	3,048	1,452	531	371	161	59	20	44	...
Total	593,239	250,511	141,278	87,599	47,657	30,595	16,304	9,040	4,511	5,067	677
All species	1,296,567	504,727	307,881	197,761	122,120	76,941	42,124	22,614	11,286	10,251	862

[1]Includes white, swamp chestnut, swamp white, and chinkapin oaks.
[2]Includes northern red, Shumard, and cherrybark oaks.

Table 11. *Volume of timber on commercial forest land by class of timber and by softwoods and hardwoods, east Texas, 1975*

Class of timber	All species	Softwood	Hardwood
	Million cubic feet		
Sawtimber trees:			
Saw-log portion	8,178.5	5,980.6	2,197.9
Upper-stem portion	1,048.2	606.5	441.7
Total	9,226.7	6,587.1	2,639.6
Poletimber trees	3,503.6	1,574.5	1,929.1
All growing stock	12,730.3	8,161.6	4,568.7
Rough trees	1,417.3	103.0	1,314.3
Rotten trees	350.7	14.2	336.5
Salvable dead trees	89.8	2.2	87.6
All timber	14,588.1	8,281.0	6,307.1

Table 12. *Volume of growing stock and sawtimber on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1975*

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Million board feet					
National forest	1,172.6	1,033.8	138.8	5,622.0	5,247.9	374.1
Other public	226.9	140.3	86.6	951.8	732.7	219.1
Forest industry	4,442.0	3,142.8	1,299.2	17,776.0	14,036.3	3,739.7
Farmer and misc. private	6,888.8	3,844.7	3,044.1	23,537.7	14,875.1	8,662.6
All ownerships	12,730.3	8,161.6	4,568.7	47,887.5	34,892.0	12,995.5

Table 13. *Volume of growing stock on commercial forest land by species and diameter classes, east Texas, 1975*

Species	Diameter class (inches at breast height)										
	All classes	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0- and larger
	Million cubic feet										
Softwood:											
Longleaf pine	163.6	6.2	19.1	25.2	28.7	32.0	26.3	19.0	5.3	1.8	...
Slash pine	185.7	44.4	70.4	46.8	17.7	3.6	1.2	1.1	.5	...	...
Shortleaf pine	2,539.1	194.4	333.3	498.5	529.0	456.5	290.3	150.0	62.4	24.7	...
Loblolly pine	5,186.8	339.9	545.2	721.8	808.0	779.9	655.1	513.3	367.2	429.9	26.5
Cypress	63.7	3.9	6.5	2.6	4.5	6.9	8.7	7.5	6.3	13.2	3.6
Redcedar	22.7	4.0	7.2	3.5	3.6	2.1	1.1	1.2	...	...	...
Total	8,161.6	592.8	981.7	1,298.4	1,391.5	1,281.0	982.7	692.1	441.7	469.6	30.1
Hardwood:											
Select white oaks	269.1	28.9	27.8	32.3	43.9	44.3	28.8	24.0	15.2	22.6	1.3
Select red oaks	200.2	7.2	19.2	17.1	26.5	24.0	20.6	20.3	12.0	39.9	13.4
Other white oaks	630.2	81.1	101.8	120.6	98.1	81.3	49.8	38.2	28.0	27.8	3.5
Other red oaks	1,327.7	114.8	187.5	207.5	187.1	179.8	139.3	97.3	73.3	118.9	22.2
Pecan	115.3	7.4	14.6	11.9	10.8	14.7	5.6	6.9	2.5	14.0	26.9
Other hickories	196.5	18.4	28.3	51.0	29.0	28.5	14.4	13.9	5.2	6.4	1.4
Sweetgum	829.7	114.6	149.2	146.4	135.3	99.2	71.6	52.4	22.4	34.6	4.0
Tupelo and blackgum	232.5	28.6	27.1	37.9	30.9	33.8	27.4	15.4	12.3	17.3	1.8
Hard maple	5.1	.9	1.3	1.3	.9	...	.4	...	...	.3	...
Soft maple	38.6	14.3	9.8	5.7	1.3	2.8	2.9	1.5	...	.3	...
Beech	29.7	.5	1.4	4.8	5.5	4.7	5.5	2.6	1.6	2.5	.6
Ash	158.1	18.4	21.5	30.0	25.1	20.5	19.8	10.9	4.2	7.7	...
Cottonwood	45.3	.5	2.6	2.0	4.2	6.9	7.0	8.2	8.0	2.2	3.7
Basswood	2.5	.3	...	.2	.3	1.3	...	.4	...	...	...
Black walnut	3.5	.2	.9	.9	1.0	...	...	...	.5	...	...
Black cherry	2.3	.6	.9	...	.3	...	.5	...	...	...	...
Willow	23.5	.5	1.4	1.4	1.8	2.7	1.3	3.4	3.3	5.6	2.1
Magnolia (*Magnolia* spp.)	40.6	6.2	8.0	6.7	5.3	5.6	4.9	1.5	1.1	1.3	...
American elm	64.9	7.4	6.5	10.8	8.9	13.0	5.2	5.3	3.2	3.4	1.2
Other elms	196.2	27.9	32.4	39.2	38.2	25.7	17.0	9.0	3.0	3.8	...
Hackberry	81.0	8.6	12.3	17.6	12.2	11.7	10.6	3.4	2.3	2.3	...
Sycamore	18.6	.8	2.7	2.7	.4	1.0	1.6	.7	.9	7.8	...
Other hardwoods	57.6	13.2	13.2	9.4	6.8	6.5	3.7	1.8	.9	2.1	...
Total	4,568.7	501.3	670.4	757.4	673.8	608.0	437.9	317.1	199.9	320.8	82.1
All species	12,730.3	1,094.1	1,652.1	2,055.8	2,065.3	1,889.0	1,420.6	1,009.2	641.6	790.4	112.2

Table 14. *Volume of sawtimber on commercial forest land by species and diameter classes, east Texas, 1975*

Species	Diameter class (inches at breast height)								
	All classes	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Million board feet								
Softwood:									
Longleaf pine	748.0	115.5	145.8	175.5	150.9	117.6	32.9	9.8	...
Slash pine	305.7	189.2	82.8	18.5	5.6	6.8	2.8	...	...
Shortleaf pine	10,573.8	2,207.0	2,733.7	2,548.7	1,670.7	887.4	378.3	148.0	...
Loblolly pine	22,940.0	2,993.1	4,030.9	4,227.0	3,712.2	3,008.0	2,199.2	2,610.2	159.4
Cypress	273.4	7.9	19.4	29.6	44.6	38.5	35.7	75.0	22.7
Redcedar	51.1	13.9	15.8	10.0	5.4	6.0	...	...	...
Total	34,892.0	5,526.6	7,028.4	7,009.3	5,589.4	4,064.3	2,648.9	2,843.0	182.1
Hardwood									
Select white oaks	889.7	...	184.2	216.6	149.0	130.6	76.3	123.8	9.2
Select red oaks	813.5	...	105.2	112.1	102.6	111.6	71.1	236.8	74.1
Other white oaks	1,659.7	...	434.2	402.3	267.1	210.3	161.9	162.4	21.5
Other red oaks	4,028.7	...	758.8	839.4	697.7	520.4	406.1	671.5	134.8
Pecan	430.2	...	45.9	68.2	30.8	33.7	14.3	80.5	156.8
Other hickories	492.5	...	127.9	142.9	74.8	75.0	31.2	35.7	5.0
Sweetgum	1,963.6	...	526.9	463.2	361.2	271.7	117.2	198.0	25.4
Tupelo and blackgum	646.8	...	115.6	149.2	134.8	76.0	64.4	93.8	13.0
Hard maple	7.1	...	4.0	...	1.8	...	...	1.3	...
Soft maple	41.7	...	6.5	10.7	14.8	7.5	...	2.2	...
Beech	115.6	...	24.3	19.2	30.2	16.0	7.8	15.2	2.9
Ash	414.9	...	102.1	94.0	88.9	58.7	22.0	49.2	...
Cottonwood	227.1	...	18.7	36.1	40.4	48.1	50.2	10.9	22.7
Basswood	8.9	...	1.1	5.7	...	2.1	...	...	...
Black walnut	8.1	...	5.1	...	...	...	3.0	...	...
Black cherry	4.3	...	1.4	...	2.9	...	...	...	...
Willow	107.3	...	6.9	15.4	6.4	16.2	19.4	29.4	13.6
Magnolia (*Magnolia* spp.)	88.0	...	21.3	24.8	21.8	7.5	6.5	6.1	...
American elm	204.6	...	43.7	65.7	26.3	27.0	14.2	17.8	9.9
Other elms	472.3	...	160.5	128.6	94.4	50.3	18.4	20.1	...
Hackberry	201.1	...	52.1	54.4	51.1	16.9	12.6	14.0	...
Sycamore	65.7	...	1.7	3.7	7.3	3.4	5.8	43.8	...
Other hardwoods	104.1	...	29.7	29.8	17.9	10.1	4.7	11.9	...
Total	12,995.5	...	2,777.8	2,882.0	2,222.2	1,693.1	1,107.1	1,824.4	488.9
All species	47,887.5	5,526.6	9,806.2	9,891.3	7,811.6	5,757.4	3,756.0	4,667.4	671.0

Table 15. *Volume of sawtimber on commercial forest land by species and log grade, east Texas, 1975*

Species	All grades	Grade 1	Grade 2	Grade 3	Grade 4
	Million board feet				
Softwood:					
Yellow pines	34,567.5	1,894.2	4,042.9	28,630.4	...
Cypress	273.4	43.1	55.1	175.2	...
Redcedar	51.1	51.1	...	...	...
Total	34,892.0	1,988.4	4,098.0	28,805.6	...
Hardwood					
Select white and red oaks	1,703.2	155.1	261.8	809.5	476.8
Other white and red oaks	5,688.4	246.5	621.7	2,682.1	2,138.1
Hickory	922.7	133.0	158.9	340.8	290.0
Hard maple	7.1	...	...	3.2	3.9
Sweetgum	1,963.6	119.9	268.2	952.7	622.8
Tupelo and blackgum	646.8	47.3	148.8	334.2	116.5
Ash, walnut, and black cherry	427.3	57.4	105.1	220.4	44.4
Other hardwoods	1,636.4	94.5	230.0	786.9	525.0
Total	12,995.5	853.7	1,794.5	6,129.8	4,217.5
All species	47,887.5	2,842.1	5,892.5	34,935.4	4,217.5

Table 16. *Annual growth and removals of growing stock on commercial land by species, east Texas, 1974*

Species	Net annual growth	Annual removals
	Million cubic feet	
Softwood:		
Yellow pines	481.4	380.4
Cypress	2.0	.8
Redcedar	1.8	.3
Total	485.2	381.5
Hardwood:		
Select white and red oaks	24.1	11.8
Other white and red oaks	104.5	44.7
Hickory	13.5	4.4
Hard maple	.3	...
Sweetgum	47.0	21.1
Tupelo and blackgum	8.4	4.1
Ash, walnut, and black cherry	7.0	2.6
Other hardwoods	31.8	10.6
Total	236.6	99.3
All species	721.8	480.8

Table 17. *Annual growth and removals of growing stock on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1974*

Ownership class	Net annual growth			Annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Million cubic feet					
National forest	43.6	37.8	5.8	17.1	15.6	1.5
Other public	13.0	6.8	6.2	5.5	2.6	2.9
Forest industry	231.6	170.4	61.2	202.5	171.2	31.3
Farmer and misc. private	433.6	270.2	163.4	255.7	192.1	63.6
All ownerships	721.8	485.2	236.6	480.8	381.5	99.3

Table 18. *Annual growth and removals of sawtimber on commercial forest land by species, east Texas, 1974*

Species	Net annual growth	Annual removals
	Million board feet	
Softwood:		
Yellow pines	2,310.8	1,827.3
Cypress	8.0	3.9
Redcedar	4.6	.4
Total	2,323.4	1,831.6
Hardwood:		
Select white and red oaks	116.5	68.7
Other white and red oaks	404.9	222.5
Hickory	38.9	21.0
Hard maple	.3	...
Sweetgum	118.2	84.9
Tupelo and blackgum	23.9	24.0
Ash, walnut, and black cherry	21.0	12.6
Other hardwoods	81.3	42.3
Total	805.0	476.0
All species	3,128.4	2,307.6

Table 19. *Annual growth and removals of sawtimber on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1974*

Ownership class	Net annual growth			Annual removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Million board feet					
National forest	215.0	200.5	14.5	86.4	79.4	7.0
Other public	47.5	32.4	15.1	23.9	11.9	12.0
Forest industry	1,069.9	870.1	199.8	1,043.0	883.2	159.8
Farmer and misc. private	1,796.0	1,220.4	575.6	1,154.3	857.1	297.2
All ownerships	3,128.4	2,323.4	805.0	2,307.6	1,831.6	476.0

Table 20. *Mortality of growing stock and sawtimber on commercial forest land by species, east Texas, 1974*

Species	Growing stock	Sawtimber
	- - Million cubic feet - -	*- - Million board feet - -*
Softwood:		
Yellow pines	27.3	100.0
Cypress	.6	2.9
Redcedar	.2	.7
Total	28.1	103.6
Hardwood:		
Select white and red oaks	.9	3.9
Other white and red oaks	6.1	19.8
Hickory	1.7	4.5
Hard maple	.1	.3
Sweetgum	5.6	13.0
Tupelo and blackgum	.7	2.5
Ash, walnut, and black cherry	.7	1.6
Other hardwoods	6.8	22.2
Total	22.6	67.8
All species	50.7	171.4

Table 21. *Mortality of growing stock and sawtimber on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1974*

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	- - - - - - Million cubic feet - - - - - -			*- - - - - - Million board feet - - - - - -*		
National forest	2.7	2.3	0.4	10.1	9.4	0.7
Other public	1.1	.1	1.0	4.6	.9	3.7
Forest industry	19.9	15.2	4.7	78.8	64.1	14.7
Farmer and misc. private	27.0	10.5	16.5	77.9	29.2	48.7
All ownerships	50.7	28.1	22.6	171.4	103.6	67.8

Table 22. *Mortality of growing stock and sawtimber on commercial forest land by causes and by softwoods and hardwoods, east Texas, 1974*

Cause of death	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	- - - - - - - Million cubic feet - - - - - - -			*- - - - - - - Million board feet - - - - - - -*		
Fire	1.2	0.8	0.4	3.8	3.0	0.8
Insects	14.1	13.6	.5	64.5	62.4	2.1
Disease	5.4	1.9	3.5	15.8	6.9	8.9
Other	18.5	7.0	11.5	57.4	16.8	40.6
Unknown	11.5	4.8	6.7	29.9	14.5	15.4
All causes	50.7	28.1	22.6	171.4	103.6	67.8

Table 23. *Total output of timber products by product, by type of material used, and by softwoods and hardwoods, east Texas, 1974*

Product and species group	Standard units	Total output		Roundwood products		Plant byproducts	
		Number	M ft³	Number	M ft³	Number	M ft³
Saw logs:							
Softwood	M fbm[1]	840,132	131,162	776,352	125,847	63,780	5,315
Hardwood	M fbm[1]	253,746	42,553	253,746	42,553	...	...
Total	M fbm[1]	1,093,878	173,715	1,030,098	168,400	63,780	5,315
Veneer logs and bolts:							
Softwood	M fbm	439,331	67,481	439,331	67,481	...	...
Hardwood	M fbm	21,484	3,605	21,484	3,605	...	...
Total	M fbm	460,815	71,086	460,815	71,086	...	...
Pulpwood:							
Softwood	Std cd[2]	3,294,235	266,834	2,168,435	175,644	1,125,800	91,190
Hardwood	Std cd[2]	552,825	44,226	432,625	34,610	120,200	9,616
Total	Std cd[2]	3,847,060	311,060	2,601,060	210,254	1,246,000	100,806
Piling:							
Softwood	M lin ft	244	202	244	202	...	...
Hardwood	M lin ft	...	...	...	...	...	...
Total	M lin ft	244	202	244	202	...	...
Poles:							
Softwood	M pieces	378	4,120	378	4,120	...	...
Hardwood	M pieces	...	...	...	...	...	...
Total	M pieces	378	4,120	378	4,120	...	...
Commercial posts (round and split):							
Softwood	M pieces	2,089	1,417	2,089	1,417	...	...
Hardwood	M pieces	...	...	...	...	...	...
Total	M pieces	2,089	1,417	2,089	1,417	...	...
Other[3]:							
Softwood	M ft³	1,243	1,243	199	199	1,044	1,044
Hardwood	M ft³	6,469	6,469	783	783	5,686	5,686
Total	M ft³	7,712	7,712	982	982	6,730	6,730
Total industrial products:							
Softwood	---	...	...	...	374,910	...	97,549
Hardwood	---	...	...	...	81,551	...	15,302
Total	---	...	...	...	456,461	...	112,851
Fuelwood:							
Softwood	Std cd	131,033	9,827	11,286	846	[4]119,747	[4] 8,981
Hardwood	Std cd	199,166	14,937	162,139	12,160	[4] 37,027	[4] 2,777
Total	Std cd	330,199	24,764	173,425	13,006	[4]156,774	[4]11,758
All products:							
Softwood	---	...	...	...	375,756	...	106,530
Hardwood	---	...	...	...	93,711	...	18,079
Total	---	...	...	...	469,467	...	124,609

[1]International ¼-inch rule.

[2]Rough wood basis (for example, chips converted to equivalent standard cords).

[3]Includes furniture stock, handlestock, cooperage, and other minor industrial products. Additionally, byproducts include material used for livestock bedding, mulch, etc.

[4]Includes plant byproducts used for industrial and domestic fuel.

Table 24. *Output of roundwood products by source and by softwoods and hardwoods, east Texas, 1974*

Product species group	All sources	Growing-stock trees[1]			Rough and rotten trees[1]	Salvable dead trees[1]	Other sources[2]
		Total	Sawtimber	Poletimber			
	Thousand cubic feet						
Industrial products:							
Saw logs:							
Softwood	125,847	124,961	124,827	134	138	...	748
Hardwood	42,553	41,457	40,726	731	965	...	131
Total	168,400	166,418	165,553	865	1,103	...	879
Veneer logs and bolts:							
Softwood	67,481	66,475	66,475	...	613	...	393
Hardwood	3,605	3,543	3,543	...	47	...	15
Total	71,086	70,018	70,018	...	660	...	408
Pulpwood:							
Softwood	175,644	165,224	136,719	28,505	1,205	...	9,215
Hardwood	34,610	31,357	24,286	7,071	748	102	2,403
Total	210,254	196,581	161,005	35,576	1,953	102	11,618
Misc. industrial products:							
Piling:							
Softwood	202	201	201	...	...	...	1
Hardwood	...	...	...	...	...	...	...
Total	202	201	201	...	...	...	1
Poles:							
Softwood	4,120	4,089	3,617	472	...	...	31
Hardwood	...	...	...	...	...	...	...
Total	4,120	4,089	3,617	472	...	...	31
Commercial posts (round and split):							
Softwood	1,417	1,292	...	1,292	...	...	125
Hardwood	...	...	...	...	...	...	...
Total	1,417	1,292	...	1,292	...	...	125
Other:							
Softwood	199	199	186	13	...	...	...
Hardwood	783	775	737	38	4	...	4
Total	982	974	923	51	4	...	4
All misc. industrial products:							
Softwood	5,938	5,781	4,004	1,777	...	...	157
Hardwood	783	775	737	38	4	...	4
Total	6,721	6,556	4,741	1,815	4	...	161
All industrial products:							
Softwood	374,910	362,441	332,025	30,416	1,956	...	10,513
Hardwood	81,551	77,132	69,292	7,840	1,764	102	2,553
Total	456,461	439,573	401,317	38,256	3,720	102	13,066
Fuelwood:							
Softwood	846	458	241	217	44	61	283
Hardwood	12,160	5,685	2,890	2,795	1,267	866	4,342
Total	13,006	6,143	3,131	3,012	1,311	927	4,625
All products:							
Softwood	375,756	362,899	332,266	30,633	2,000	61	10,796
Hardwood	93,711	82,817	72,182	10,635	3,031	968	6,895
Total	469,467	445,716	404,448	41,268	5,031	1,029	17,691

[1]On commercial forest land.

[2]Includes noncommercial forest land, nonforest land such as fence rows, trees less than 5.0 inches in diameter, and treetops and limbs.

Table 25. *Timber removals from growing stock on commercial forest land by items and by softwoods and hardwoods, east Texas, 1974*

Item	All species	Softwood	Hardwood
		Thousand cubic feet	
Roundwood products:			
Saw logs	166,418	124,961	41,457
Veneer logs and bolts	70,018	66,475	3,543
Pulpwood	196,581	165,224	31,357
Piling	201	201	...
Poles	4,089	4,089	...
Posts	1,292	1,292	...
Other	974	199	775
Fuelwood	6,143	458	5,685
All products	445,716	362,899	82,817
Logging residues	25,551	12,747	12,804
Other removals	9,485	5,834	3,651
Total removals	480,752	381,480	99,272

Table 26. *Timber removals from live sawtimber on commercial forest lands by items and by softwoods and hardwoods, east Texas, 1974*

Item	All species	Softwood	Hardwood
		Thousand board feet	
Roundwood products:			
Saw logs	1,023,994	773,058	250,936
Veneer logs and bolts	453,939	433,095	20,844
Pulpwood	662,091	540,314	121,777
Piling	1,194	1,194	...
Poles	20,901	20,901	...
Other	5,707	1,231	4,476
Fuelwood	15,334	1,203	14,131
All products	2,183,160	1,770,996	412,164
Logging residues	89,939	36,240	53,699
Other removals	34,566	24,326	10,240
Total removals	2,307,665	1,831,562	476,103

Table 27. *Volume of plant residues by industrial source and type of residue and by softwoods and hardwoods, east Texas, 1974*

Species group and type	All industries	Lumber	Veneer and plywood	Other
	Thousand cubic feet			
Softwood:				
Coarse[1]	1,419	1,124	14	281
Fine[2]	4,029	3,445	4	580
Total	5,448	4,569	18	861
Hardwood:				
Coarse	3,168	3,054	52	62
Fine	2,533	2,388	7	138
Total	5,701	5,442	59	200
All species:				
Coarse	4,587	4,178	66	343
Fine	6,562	5,833	11	718
Total	11,149	10,011	77	1,061

[1]Unused material suitable for chipping, such as slabs, edgings, and veneer cores.

[2]Unused material not suitable for chipping, such as sawdust and shavings.

Table 28. *Projections of net annual growth, available cut, and inventory of growing stock and sawtimber on commercial forest land, east Texas Pineywoods, 1974-2004*[1]

Species group	Growing stock				Sawtimber			
	1974	1984	1994	2004	1974	1984	1994	2004
	Million cubic feet				*Million board feet*			
Softwood:								
Cut	379.4	446.2	484.6	510.1	1,821.1	2,039.0	2,222.0	2,340.0
Growth	469.6	489.5	505.8	510.1	2,244.1	2,243.0	2,305.0	2,328.0
Inventory[2]	7,925.1	8,460.0	8,771.2	8,862.5	33,952.1	36,789.0	38,129.0	38,432.0
Hardwood:								
Cut	95.1	269.3	341.0	390.2	460.4	769.0	840.0	844.0
Growth	210.6	322.1	372.5	390.2	712.6	726.0	751.0	782.0
Inventory[2]	3,883.2	4,490.0	4,905.7	5,081.2	10,878.7	11,341.0	10,538.0	9,795.0
Total								
Cut	474.5	715.5	825.6	900.3	2,281.5	2,808.0	3,062.0	3,184.0
Growth	680.2	811.6	878.3	900.3	2,956.7	2,969.0	3,056.0	3,111.0
Inventory[2]	11,808.3	12,950.0	13,676.9	13,943.7	44,830.8	48,130.0	48,667.0	48,227.0

[1]Based on the assumption that the cut of growing stock will be in balance with growth by the year 2004, and that forestry progress will continue at the rate indicated by recent trends.

[2]Inventory as of January 1 of the following year.

Murphy, Paul A.

1976. East Texas Forests — status and trends. South. For. Exp. Stn., New Orleans, La. 25 p. (USDA For. Serv. Resour. Bull. SO-61)

The softwood inventory in east Texas has grown 24 percent during the 1965-1975 time period; hardwood volume has gained 13 percent. Forest area declined slightly, a trend that is expected to continue into the future.

Additional keywords: timber volume, forest area, timber cut, timber growth

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Three other reports dealing with east Texas' timber resource published recently are:

Bertelson, D.F.
1975. East Texas forest industries, 1974. South For. Exp. Stn., New Orleans, La. 20 p. (USDA For. Serv. Resour. Bull. SO-57)

Earles, J.M.
1976. Forest statistics for southeast Texas counties. South. For. Exp. Stn., New Orleans, La. 21 p. (USDA For. Serv. Resour. Bull. SO-58)

Earles, J.M.
1976. Forest statistics for east Texas Pineywoods counties. South. For. Exp. Stn., New Orleans, La. ___ p. (USDA For. Serv. Resour. Bull. SO-60)