

EAST TEXAS PINEY WOODS



Foreword

This report presents the principal findings of the latest Forest Survey of the pine-hardwood region of east Texas, completed in 1965 by the Southern Forest Experiment Station. As used here, "east Texas" refers to the 37 counties delineated in the map on page 2.

The survey, which was undertaken as one phase of the continuing nationwide inventory being conducted by the U. S. Forest Service, provides up-to-date information on the kind, amount, and condition of forest resources; the industries they support; and the possibilities for improving wood production. Comparison with the previous survey of 1955 helps to clarify timber trends.

The field work, compilation of data, and preparation of this report represent the combined efforts of many people. Generous assistance from public and private organizations made it possible to keep the field work ahead of the schedule that could have been maintained with regularly allotted funds. The very material aid of the organizations listed below, and of the individuals in them, is gratefully acknowledged:

Texas Forest Service

Texas Forestry Association

Champion Papers, Inc.

W. T. Carter & Brother

International Paper Company

Kirby Lumber Corporation

Southland Paper Mills, Inc.

Southwestern Timber Company

Temple Industries

EAST TEXAS PINEYWOODS

Herbert S. Sternitzke

**U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE**



SOUTHERN FOREST EXPERIMENT STATION
New Orleans, Louisiana

1967

Contents

	<i>Page</i>
Highlights	1
Resource trends	3
Forest area	3
Little change in forest area	3
Industrial holdings important	3
Pine types extensive	5
Stocking is better	5
Timber volume	5
Pine has increased	5
Hardwood has decreased	6
Productivity varies by ownership	7
Pine growth exceeds cut	7
Timber products output	9
Saw logs lead all products	9
Pulpwood sets record	10
Veneer logs mainly hardwood	10
Miscellaneous products	10
The future	11
Timber supply outlook	11
Management opportunities	11
Appendix	14
Accuracy of the survey	14
Definitions of terms	14
Forest land class	14
Tree species	15
Forest type	15
Class of timber	15
Stand-size class	15
Stocking	15
Volume	15
Log grades	16
Area-condition class	16
Miscellaneous definitions	16
Standard tables	17
County tables	26

Highlights

Pine timber volume in east Texas has risen sharply since the middle 1950's. The forests now support 6.3 billion cubic feet in softwood growing stock trees at least 5 inches in diameter. This volume—nearly all southern yellow pine but including a little cypress and eastern redcedar—is some 40 percent greater than that recorded in the previous survey of 1955. The volume in softwoods large enough to contain at least one saw log is 25.8 billion board feet, an increase of 46 percent.

Although public and industrial holdings make up only 37 percent of the commercial forest land in east Texas, they encompass two-thirds of the softwood sawtimber. The remaining one-third is on the 63 percent of the area, 7.2 million acres, that is in private nonindustrial ownership.

The gain in softwood sawtimber volume was matched by an improvement in timber quality. On both the 1955 and 1965 surveys, softwood trees were rated by the standard log grades for southern pine. During the intervening decade the volume in upper grade logs—that is, grades 1 and 2—rose some 58 percent. This volume now makes up about one-sixth of the softwood sawtimber inventory. The gain in quality is partly due to the general improvement in tree diameter.

Trends in hardwood contrast greatly with those for pine. The volume of hardwood growing stock now stands at 2.9 billion cubic feet, or 11 percent less than in 1955. Hardwood sawtimber volume totals 7.2 billion board feet—down 17 percent. The decline was especially severe in the large diameters that are generally preferred for factory lumber and veneer.

The total acreage of commercial forest land has changed little in the past decade. Forests still occupy 61 percent of the land area in east Texas. But the distribution of forest land has shifted noticeably. In the northeastern coun-

ties, for example, restocking of open land has increased wooded acreage some 6 percent. In the southeastern counties, forest area has declined about 6 percent. The net result of the shifts in land use is that commercial forest acreage now totals 11.5 million acres, or 1 percent less than in 1955 (fig. 1).

Forests of pine, either pure or in mixture with hardwoods, predominate in east Texas. All together, they occupy 2 of every 3 forest acres. The most widespread of all types is loblolly-shortleaf pine, which is found on 4.9 million acres.

The significance of trends in timber volume is further stressed by present growth-cut relationships. Primary wood-using industries in east Texas depend largely on trees of sawtimber size. For the region as a whole, sawtimber growth exceeded the harvest in 1964, when the latest cutting statistics were compiled.

This comparison, however, conceals marked differences between softwood and hardwood. Whereas the growth of softwood sawtimber was more than double the softwood harvest, the cut of hardwood sawtimber exceeded the growth. Moreover, much of the hardwood growth is taking place on trees that are still too small in diameter to yield high-quality lumber or veneer logs in the immediate future.

The 1964 timber cut in east Texas totaled nearly 300 million cubic feet, of which two-thirds was pine. This timber provided the bulk of the raw material for more than 240 primary wood-using plants in the area. Lumber is still pre-eminent in industrial wood usage. Recent gains in softwood timber inventories, however, have fostered the emergence of a multimillion dollar pine plywood industry in Texas and the current expansion of pulping capacity. These developments are indicative of the industrial expansion that is possible through improving timber productivity.

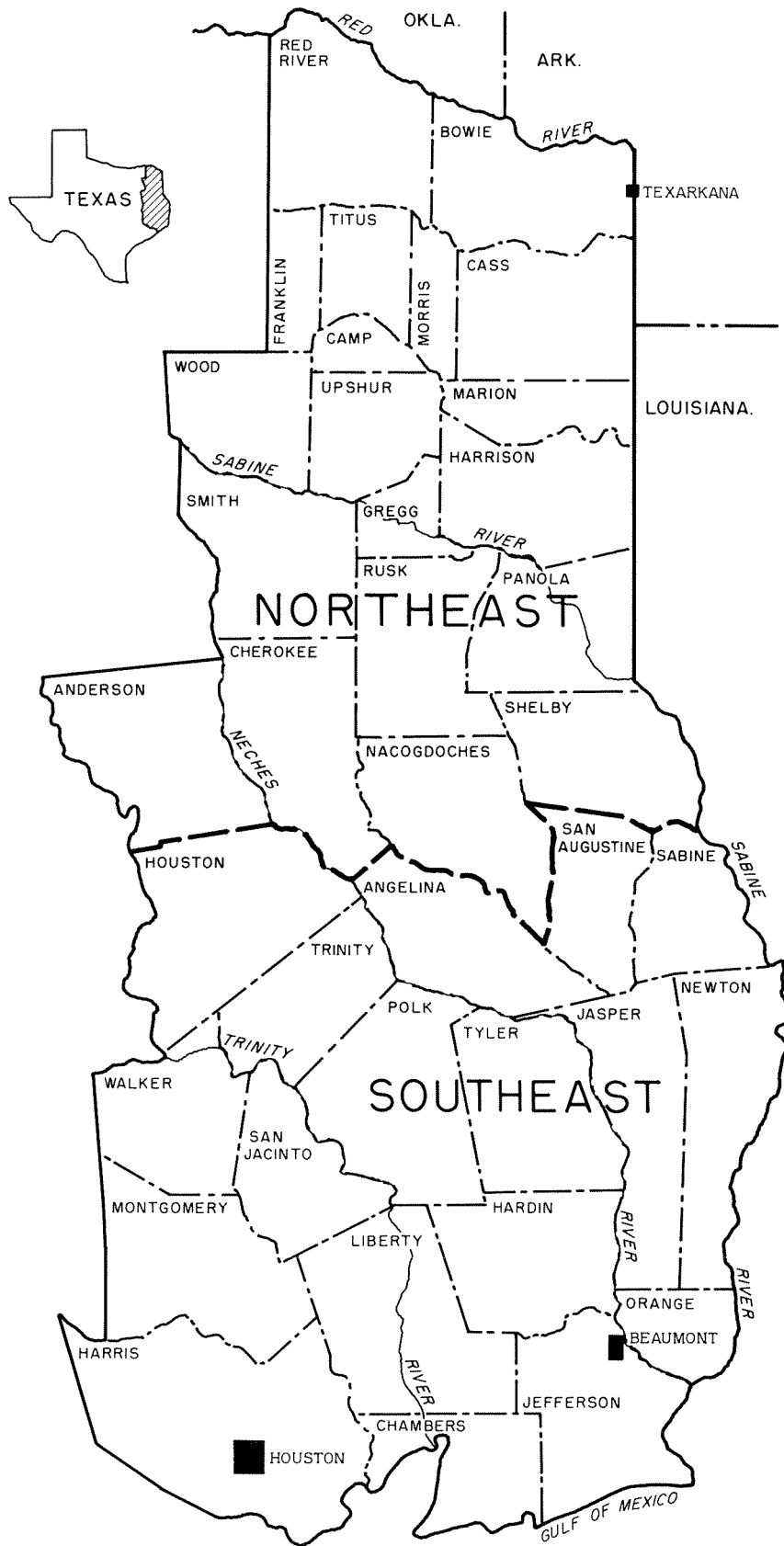


Figure 1. Forest Survey regions of east Texas pineywoods.

Resource Trends

FOREST AREA

Little Change In Forest Area

East Texas is heavily wooded. Its forests are part of a much larger pine-hardwood region that extends into Louisiana, Arkansas, and Oklahoma. Forests cover 61 percent, 11.5 million acres, of the land in east Texas. Except for some 7,000 acres in public holdings that are reserved from timber cutting, the entire forest area is available for timber production. Although the commercial acreage varies widely in quality, all of it is considered suitable for growing timber crops if managed and protected.

The total acreage of commercial forest land is about the same today as it was a decade ago, when the previous forest survey was made. Encroachments on woodlands have been nearly balanced by conversion of open land to forest through planting and natural reversion. The distribution of forest acreage within east Texas, however, has shifted noticeably (table I).

Table I. Commercial forest land in 1965 and change since 1955

Region	Commercial forest	Change
	Thousand acres	Percent
Southeast	6,590.8	- 6
Northeast	4,865.0	+ 6
Total	11,455.8	- 1

In the northeast, changes in rural land-use continue to increase forest acreage. Between 1935 and 1955, for example, the acreage of commercial forest land increased 14 percent. It has since risen another 6 percent or almost 300,000 acres. The recent acreage gains were widespread; 12 of the 19 northeastern counties have more forest today than they did in 1955. Given essential fire protection, this new acreage provides additional opportunities for augmenting the local timber supply. Overall, the northeastern counties are now 56 percent forested.

Much of the southeast is of minor importance for agriculture. Forests cover 65 percent of the land. Recent land-use shifts in the southeast contrast sharply with changes in the northeastern counties. Forest acreage in the southeast has declined 6 percent, or more than 400,000 acres, since 1955. This is a reversal of earlier trends. Water impoundments, expansion of urban areas, and development of land for other nonforest uses have all contributed to the drop.

Industrial Holdings Important

The development of the timber resource depends to a great extent upon the decisions of thousands of landowners. Privately owned lands make up 93 percent of the commercial forest area in east Texas. Public lands include Federal, State, and county holdings, but most of the public ownership is in national forests.

Southwide, forest industries own about 19 percent of the commercial forest land. In east Texas the proportion is 30 percent; pulp and paper companies are the biggest group of industrial owners. The relatively large share of acreage held by wood-using firms provides a strong base for industrial expansion in east Texas. In turn the activities on these ownerships provide an example for the other private owners whose management programs are generally less developed.

Among the major classes of private forest owners, farmers are the smallest. They hold only 16 percent of the forest area. Even in the northeastern counties, where most of the acreage in this ownership class is located, they own less than one-fourth of the forest. The small proportion of such holdings may be partly associated with a shift in occupation of many landowners who were formerly farm operators but are now classed as wage earners.

Nearly half of the forest land—47 percent of the total—is made up of miscellaneous private holdings. The owners include a wide variety of business and professional people.



housewives, wage earners, oil companies, and other owner groups. They are largely engaged in occupations or enterprises not directly connected with timber growing. Most of the acreage held by these owners is in the northeast region, where it accounts for 3 in every 5 forest acres.

Pine Types Extensive

Stands of pine, either pure or in mixture with hardwood, dominate the forest landscape of east Texas.¹ The most widespread of all forest types is loblolly-shortleaf pine, which is found on some 4.9 million acres. Nearly 0.4 million acres are occupied by the longleaf-slash pine type, largely in the southeastern counties. Oak-pine forests predominate on another 2.3 million acres. Lands on which this latter type occurs are generally better adapted to growing pine than industrial hardwood.

The oak-hickory type, most common in the northeast region, extends across 2.0 million acres of uplands. Bottom-land forests of oak-gum-cypress and elm-ash-cottonwood prevail on almost 1.9 million acres. Reservoir construction may eventually flood a significant proportion of prime hardwood lands in river bottoms. Fragmentation of bottom-land forests is likely to make operations difficult for timber growers and hardwood industries.

Stocking Is Better

Stocking of forest lands has improved during the past decade. The basal area of the average stand is now 71 square feet per acre, up about 10 percent since 1955.

Despite indications of increasing stand density, there is still considerable room for improvement. About 39 percent of the forest land is occupied by desirable trees—the kind of well-formed, sound, vigorous trees that forest managers aim to grow. Another 28 percent is stocked with trees classed as acceptable. That is, they qualify as growing stock but, because of low vigor, rot, excessive forking or limbiness, or other limitations, their yields will not be high in volume and in quality. The remaining forest land is about equally divided between acreage that is encumbered with rough and rotten trees—of little or no com-

¹A map detailing the major forest types in the South is available upon request from the Southern Forest Experiment Station. The scale is 40 miles to the inch.

mercial value—and areas that are nonstocked with trees. Removal of the poor stems would free considerable growing space for better trees.

TIMBER VOLUME

Pine Has Increased

East Texas has more and better pine timber than it did a decade ago. Softwood volume, nearly all southern pine, has risen 40 percent (table II). It now totals 6.3 billion cubic feet and makes up more than two-thirds of the total growing stock (fig. 2). Most of the inventory is young timber that can be counted on to be markedly responsive to management. Trees 6 to 12 inches in diameter, for example, account for 55 percent of the softwood growing stock.

Table II. *Growing stock volume in 1965 and change since 1955*

Region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million cu. ft.	Per-cent	Million cu. ft.	Per-cent
Southeast	4,821.1	+ 31	1,677.9	- 18
Northeast	1,505.7	+ 73	1,201.8	+ 1
Total	6,326.8	+ 40	2,879.7	- 11

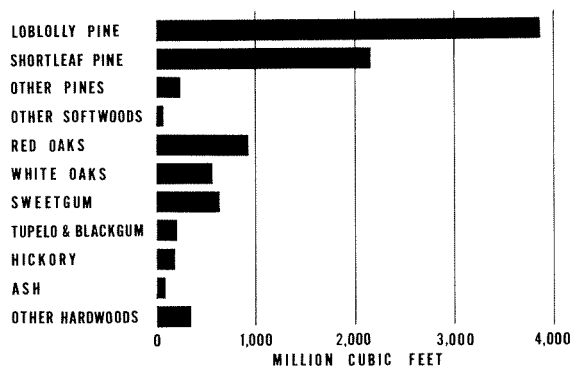


Figure 2. *Growing stock by species.*

As shown in figure 3, numbers of trees have increased in all size classes charted. Moreover, the distribution of volume has also improved measurably. In 1955, trees above 15 inches in diameter totaled about 1.1 billion cubic feet or 24 percent of the softwood inventory. Today trees of these sizes make up 29 percent 1.8 billion cubic feet, of the softwood. This latter volume is largely concentrated in the southeastern counties, but gains in these diameters have taken place in the northeast also.

The buildup in large trees is especially encouraging to the new southern pine plywood

industry. Trees above 15 inches in diameter are expected to provide most of the volume used by plywood plants.

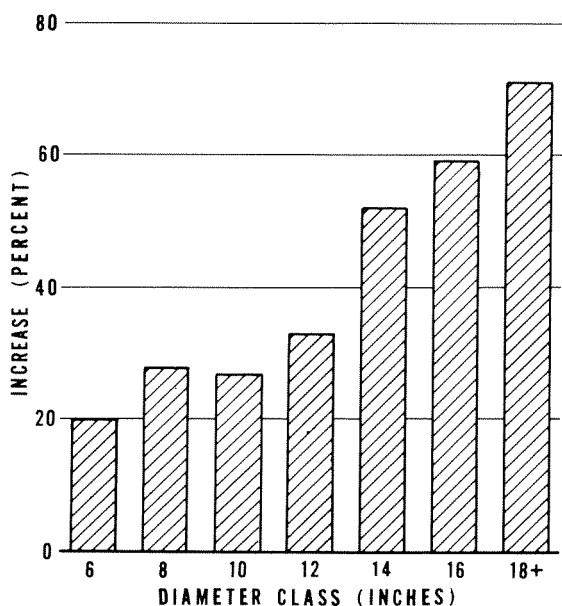


Figure 3. Percentage change in number of softwood growing-stock trees between surveys.

Board-foot volume in softwoods totals 25.8 billion. The gain since 1955 is 46 percent. Half of the present saw log volume is in trees 14 to 18 inches in diameter.

Although public and industrial holdings make up only 37 percent of the commercial forest land in east Texas, they encompass two-thirds of the softwood sawtimber. The remaining one-third is found on the 7.2 million acres that are in private, nonindustrial ownership.

The increase in softwood sawtimber volume was paralleled by a noteworthy improvement in quality. On both the 1955 and 1965 surveys, softwood trees were rated by the standard log grades for southern pine. During the past decade the volume in upper-grade logs—that is, grades 1 and 2—rose some 58 percent. This volume now makes up about one-sixth of the softwood sawtimber inventory. The gain in quality is partly due to the general improvement in tree diameter between surveys. Grade 1 logs, for example, must have a minimum scaling diameter of 17 inches; grade 2 logs, 10 inches. At the same time, the quality enhancement also reflects the efforts of forest managers who have been keeping progressively better stems as growing stock.

Hardwood Has Decreased

Hardwood growing stock now stands at 1.1 billion cubic feet. This is about 11 percent less than in 1955.

There is an additional 1.3 billion cubic feet of sound volume in rough and rotten hardwoods. Although these trees do not meet the standards for growing stock, and hence are unmarketable for sawn products, many of them contain usable amounts of wood fiber. With demand for hardwood pulps rising, it should be increasingly feasible for forest managers to market some of this material as boiler wood.

Declines in hardwood growing-stock trees have been greatest in the larger diameters that are generally preferred by the lumber and veneer industries (fig. 4). Volume in trees 14 inches and larger now makes up 26 percent of the hardwood growing stock. In 1955, the sizes made up 30 percent.

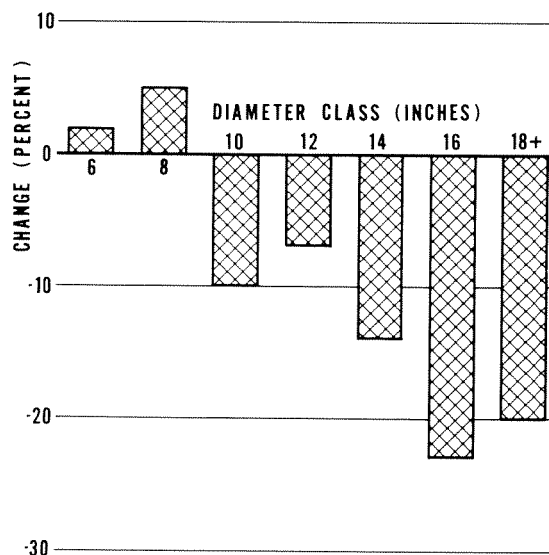


Figure 4. Percentage change in number of hardwood growing-stock trees between surveys.

The sawtimber portion of the current hardwood inventory is 7.2 billion board feet (table III), or some 17 percent less than in 1955. Only one-fifth of the sawtimber is in logs (grades 1 and 2, those normally most in demand for products requiring clear material (table IV).

Improving the timber inventory on areas suitable for growing industrial hardwood will require large-scale efforts to insure prompt

regeneration of favored species after cutting and the reserving of potentially high-quality trees for future growing stock. Moreover, extensive stand improvement work will be needed to reduce excessive numbers of rough and rotten trees. If such reconditioning is instituted reasonably soon, it would alleviate the threat to supplies of quality material.

Table III. Sawtimber volume in 1965 and change since 1955

Region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million bd. ft.	Per- cent	Million bd. ft.	Per- cent
Southeast	20,607.0	+ 37	4,326.6	- 24
Northeast	5,207.7	+ 97	2,911.1	- 5
Total	25,814.7	+ 46	7,237.7	- 17

Table IV. Sawtimber volume by log grade and tree diameter, 1965

Species group and d.b.h. class (inches)	All grades	Grade 1'	Grade 2	Grade 3	Lower grades
----- Million board feet -----					
Softwood:					
10 to 12	9,563.6	5.1	239.7	6,167.0	3,151.8
14 to 18	12,752.6	37.3	2,800.5	5,203.3	4,711.5
20 and up	3,498.5	549.9	728.4	999.8	1,220.4
Total	25,814.7	592.3	3,768.6	12,370.1	9,083.7
Hardwood:					
12	1,825.5	...	36.8	1,116.9	671.8
14 to 18	3,834.7	105.1	701.4	2,070.6	957.6
20 and up	1,577.5	313.3	358.1	719.5	186.6
Total	7,237.7	418.4	1,096.3	3,907.0	1,816.0

¹ All cedar saw logs were graded as No. 1.

Productivity Varies By Ownership

Public and industrial forest lands typically support heavier stands than do private, non-industrial holdings. On public lands, for example, growing stock now averages some 1,360 cubic feet per acre. Forest industry holdings also support a heavy concentration of timber—about 1,070 cubic feet per acre. By contrast, the sizable acreage in private, nonindustrial ownership averages about 610 cubic feet.

The differences between private ownerships may result from variations both in the intensity of sustained management efforts and in the inherent capacity of these forest lands to grow crops of industrial wood. To illustrate, according to available estimates, about two-thirds of the forest industry acreage has the capacity to produce more than 85 cubic feet per acre annually. On private, nonindustrial holdings, however, it is estimated that approximately two-fifths of the acreage has this capability.

Pine Growth Exceeds Cut

Timber mortality ascribed to forest fires, insects, disease, and other natural causes totals about 64 million cubic feet annually, chiefly hardwood. It is equivalent to 13 percent of the net growth of growing stock. The annual growth after allowing for mortality is 406 million cubic feet of softwood and 95 million of hardwood. This volume equals 44 cubic feet per acre, or about 0.6 cord. At this rate, the forests are growing wood at about half of their capacity.

It should be noted that growth and mortality estimates for the latest forest survey are more reliable than those formerly made. On the previous survey, growth was determined from measurements of tree rings and mortality was derived from estimates of trees that died within the past 4 years at sample locations. The new survey utilized direct remeasurements of trees on plots established at the time of the earlier inventory.

The significance of recent trends in timber inventory is further indicated by present growth-cut relationships. Primary wood-using industries in east Texas largely depend upon trees of sawtimber size. For the region as a whole, sawtimber growth exceeded the harvest in 1964, when the latest statistics were compiled.

This comparison, however, conceals critical differences between softwood and hardwood. Whereas the growth of softwood sawtimber was more than double the softwood harvest, the cut of hardwood sawtimber exceeded the growth (fig. 5). Moreover, much of the hardwood growth is taking place on trees that are still too small in diameter to yield high-quality logs in the immediate future. It appears, therefore, that current prospects are most encouraging to pine-oriented industries.

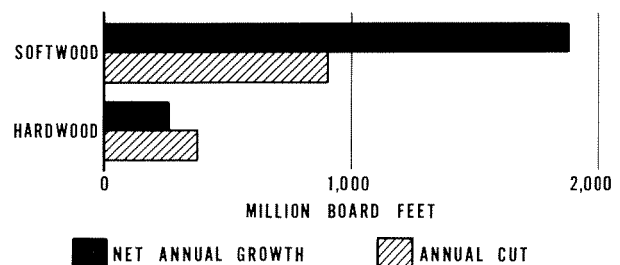
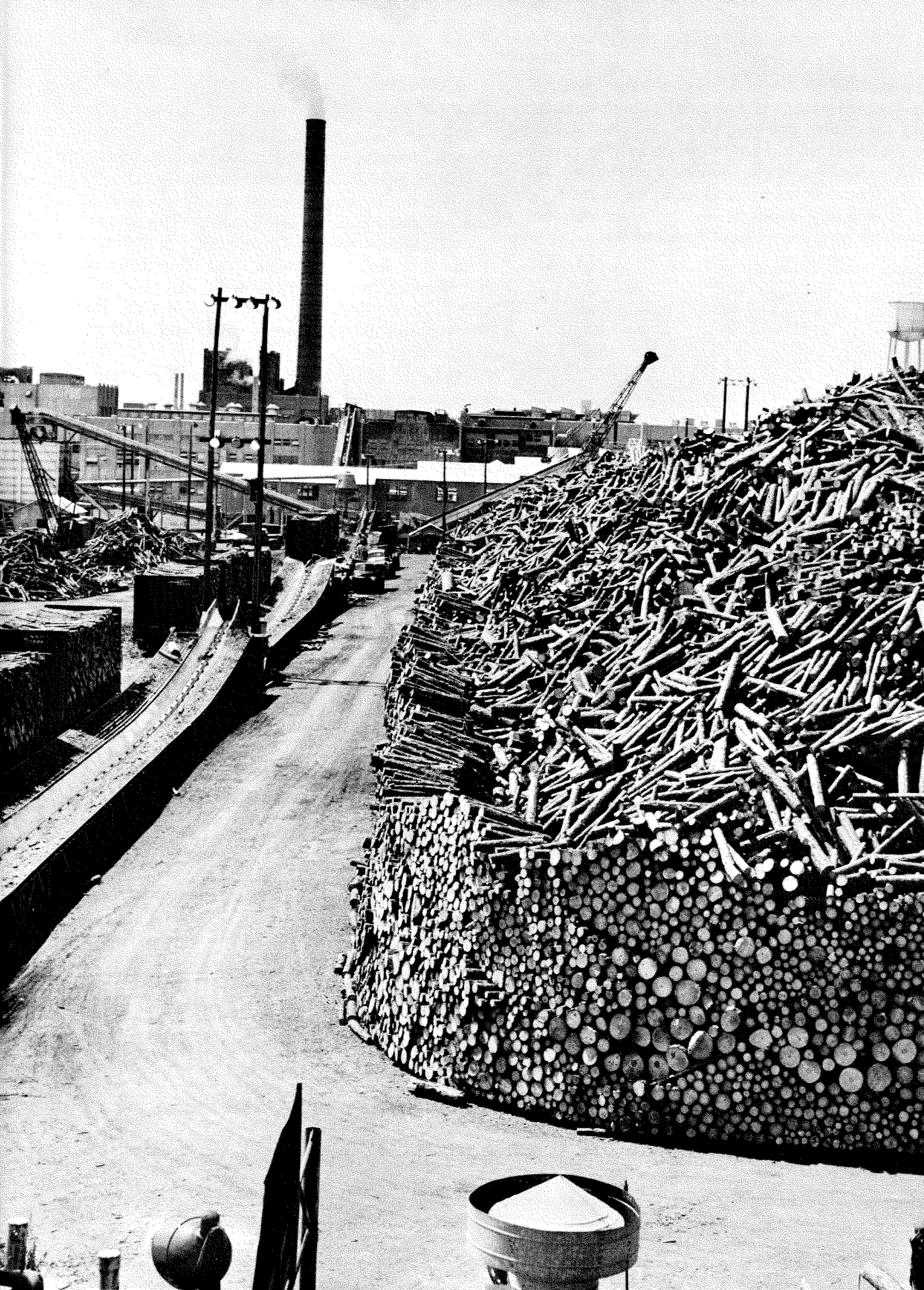


Figure 5. Growth and cut of sawtimber, 1964.



Timber Products Output

In 1964, roundwood products taken from east Texas forests totaled 264 million cubic feet, as compared to about 280 million in 1954. Increases in pulpwood and veneer logs were offset by losses in other items.

Saw logs and pulpwood remain the mainstay of the timber economy. Together, these two items make up about 90 percent of the roundwood. The balance is largely veneer logs, poles, fence posts, and fuelwood.

SAW LOGS LEAD ALL PRODUCTS

Saw logs alone make up more than half of the timber output in east Texas. In 1964 the production of logs for lumber totaled 928 million board feet. Three-fourths of the logs were softwood, mostly pine with some cypress. Oak made up most of the hardwood; the remainder was largely gum. Virtually all of the logs went to sawmills in east Texas.

Saw logs harvested in 1964, nearly equal in total to those produced in 1954, went to fewer mills. Approximately one mill was active for every three that were operating a decade ago. The total number in 1964 was 177 (fig. 6), of which 73 cut more than 3 million board feet apiece. Eight of the mills are very large; together they sawed about two-fifths of all logs harvested in the region.

Mills sawing mainly pine are larger than those sawing mainly hardwood. In 1964, the average pine mill consumed more than 8 million board feet of logs while the average hardwood mill used less than 3 million. Nearly two-thirds of the small sawmills are cutting primarily hardwood. They frequently specialize in making crossties or pallet lumber from low-grade logs.

Use of sawmill residues for pulp chips has risen sharply since the middle 1950's. In 1954, east Texas pulpmills did not report any use

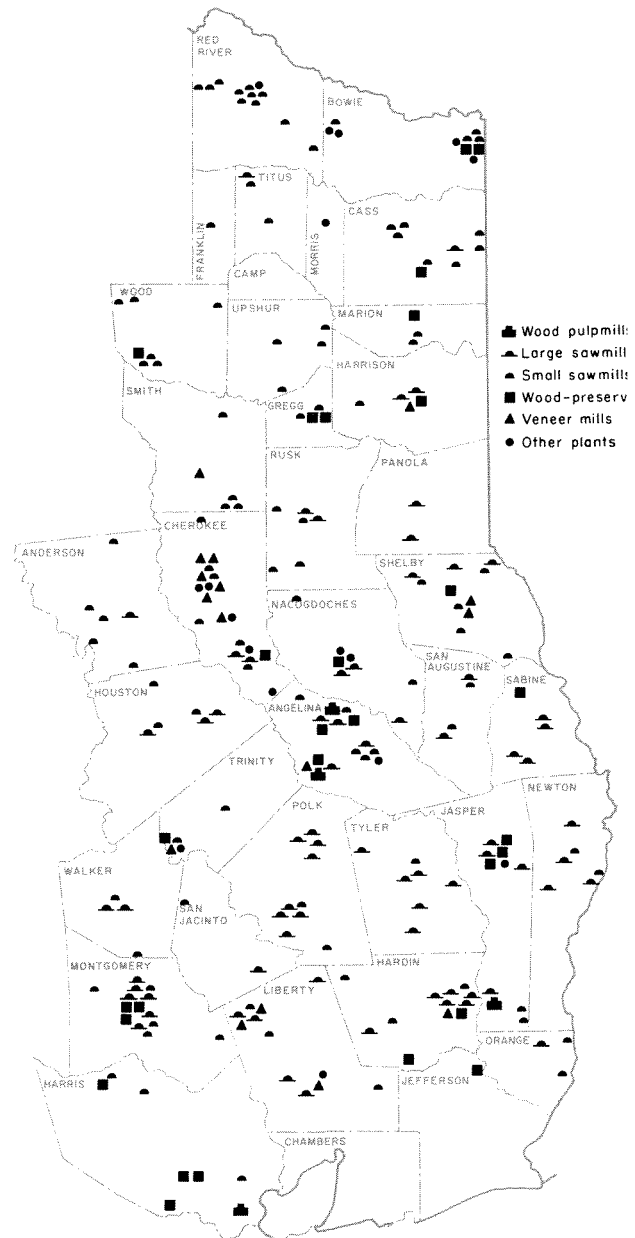


Figure 6. Location of primary wood-using plants

of such residues. In 1964, 41 sawmills with chipping equipment supplied about one-fourth of the region's pulpwood requirements.

PULPWOOD SETS RECORD

Pulpwood production rose to 1.6 million cords in 1964, of which 446,000 were chips derived largely from sawmill residues. Pulpwood bolts, mainly pine, accounted for a third of the 1964 roundwood output. As in much of the South, the use of hardwood has risen steadily. In 1954, for example, hardwood supplied 5 percent of the round pulpwood cut; in 1964, 25 percent. Soft-textured species, mainly gum, make up some two-thirds of the hardwood bolts.

Expansion of existing facilities and the establishment of a new mill have greatly increased pulping capacity since 1954. In that year, the daily pulping capacity of east Texas mills totaled 1,300 tons. Today their capability totals almost 3,300 tons. The average mill can now manufacture nearly 820 tons of pulp every day, as compared to less than 440 tons in 1954.

Two new pulpmills are now under construction—at Orange and Sheldon. They are expected to have a combined capacity of some 1,400 tons daily, and the added tonnage will boost the industry's daily capability by about 40 percent. The harvest of round pulpwood and the use of chipped residues promise to trend upward in the decade ahead.

VENEER LOGS MAINLY HARDWOOD

Veneer logs made in east Texas totaled nearly 44 million board feet in 1964. Hardwood logs accounted for more than three-fourths of the output. They were about equally divided between firm-textured species, such as oak, and the soft-textured species, such as sweetgum, blackgum, and cottonwood. By contrast, soft hardwoods made up about 90 percent of the production in 1954.

Veneers were produced at 16 east Texas plants in 1964, 8 of which made contain veneers. Container plants used one-third the hardwood veneer logs, almost entirely soft textured species. The remainder went to plants manufacturing veneers used chiefly for furniture panels and flooring.

In 1964 two plants, at Diboll and Silsbee began limited production of sheathing-grade plywood from pine veneer. A third mill opened at Keltys in 1965. Together, the capacity of these plants is reported to be about 180 million square feet of $\frac{3}{8}$ -inch plywood. This is equivalent to more than 70 million board feet of logs.

MISCELLANEOUS PRODUCTS

More than 6 million cubic feet of pine were harvested for poles and piling in 1964. Most of this material is pressure-treated with preservatives. Some of the short construction poles are soaked in preservative not under pressure. Small numbers of untreated piling are used in the coastal areas. Of the 29 east Texas plants that treat roundwood, all but one are of the pressure type.

In 1954, when the previous canvass was made, the volume of roundwood used for fuel was nearly 153,000 cords. By 1964 it had declined to 103,000 cords. Not only had the number of homes using wood for heating and cooking declined, but there were indications that most of the fuelwood users had other sources of fuel. Two-thirds of those contacted had facilities for gas cooking, and more than half were equipped to heat with gas, usually propane or butane.

The combined output of all other products in 1964 was 3.7 million cubic feet. This volume mainly fence posts, made up about 1 percent of the total roundwood harvest.

The Future

TIMBER SUPPLY OUTLOOK

The timber inventory in east Texas has risen noticeably since the middle 1950's. Though hardwood volume has declined, this loss was overshadowed by the sizable gain in softwood. But what of the future? Any long-term resource projection is subject to many uncertainties, since the future forest situation depends upon numerous man-directed factors. Thus resource projections are not forecasts, for as they reveal potential problems and opportunities they also tend to stimulate needed changes.

Two 30-year projections of timber growth were developed for east Texas. For the first it was assumed that the difference in cut and growth will gradually diminish until growth equals cut in 30 years, and that the current trend in management will continue. The projection is based upon present diameter distributions and recent studies of diameter growth, tree mortality, and timber cut.

Results from this projection indicate that by 1994 growing-stock volume will have increased about 30 percent and net growth about 23 percent; and that the timber harvest will be twice as large as in 1964. The gain in sawtimber will match the gain in growing stock. Although the cubic volume of hardwood will remain about constant, softwood should increase some 46 percent.

In the second projection it was assumed that the timber cut in east Texas during the projection period will follow the trends shown for the South in *Timber Trends in the United States*.²

² U. S. Forest Service. *Timber Trends in the United States*. U. S. Forest Serv. Forest Resource Rep. 17, 235 pp., illus. 1965.

Results from the latter projection show that net annual growth may increase about 40 percent over the next 30 years and that timber cut may rise more than twofold. During the same period, growing stock will increase 52 percent; sawtimber, about 70 percent. While softwood cubic-foot volume will nearly double hardwood will drop about one-third.

Both projections reinforce the conclusion suggested by current resource trends: the pine resource can apparently sustain heavier cutting and at the same time increase in volume. Further, east Texas forests have the capability of growing far more timber than is envisaged by either of these projections. As noted earlier, it is estimated that they are presently growing wood at about half of their capacity.

MANAGEMENT OPPORTUNITIES

Opportunities to increase timber growth through better management are numerous. Only 1.8 million forest acres are 70 percent or more stocked with desirable trees. Such stands generally do not require any special treatments to insure a high level of growth. Nearly half of these productive acres are among forest industry holdings.

Another 4 million acres are 40 to 70 percent stocked with desirable trees. About one-third of this acreage is expected to attain full stocking without treatment. But 2.5 million acres of the total will require special measures such as cull tree control.

About one-half of the forest acreage, 5.7 million acres, is less than 40 percent stocked with desirable trees. Some 4.6 million of these acres, however, are 40 percent or better stocked with trees that are still acceptable as growing stock. Many of these stands probably



afford opportunities for improvement, especially the 1.5 million that are at least 70 percent stocked. Moreover, planting may be needed on some pine sites.

In their present condition, more than 1 million forest acres are contributing very little timber, since they are less than 40 percent stocked with growing stock. In fact, fully two-fifths of the area is not occupied by any kind of tree cover. Most of the nonproductive forest land is in private, nonindustrial ownership. At least 416,000 of these 1 million acres are pine sites that could be restored to full productivity through site preparation and planting or seedling.

Private, nonindustrial owners hold nearly two-thirds of the forest land in east Texas, as well as half of the present timber inventory. Their land in particular offers many possibilities for improving the timber resource through intensified management. Such effort would attract new wood-using industries and encourage expansion of existing ones. Establishment of a new multimillion dollar pine plywood industry in east Texas and the current expansion of the pulp industry, for example, are largely related to recent gains in inventory. The importance of the forest resource to industrial development in east Texas provides a strong incentive for further improving timber productivity.

Appendix

ACCURACY OF THE SURVEY

The data on forest acreage and timber volume in this report were secured by a systematic 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. At each location, 10 small plots were systematically distributed on an area of about 1 acre.

Accuracy of the estimates may be affected by two types of errors. The first stems from the use of a sample to estimate the whole and from variability of the items being sampled. This type is termed sampling error; it is susceptible to a mathematical evaluation of the probability of error. The second type—often referred to as reporting or estimating error—derives from mistakes in measurement, judgment, arithmetic, or recording, and from limitations of method or equipment. Its effects cannot be appraised mathematically, but the Forest Survey constantly 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 0.4 percent for the estimate of total forest area, 1.8 percent for total cubic volume, and 2.4 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 estimates are liable, two chances out of three.

Forest area	Sampling error	Cubic volume	Sampling error	Board-foot volume	Sampling error
<i>Thousand acres</i>	<i>Percent</i>	<i>Million cu. ft.</i>	<i>Percent</i>	<i>Million bd. ft.</i>	<i>Percent</i>
11,462.8	0.4	...	...	...	...
1,834.1	1.0	9,206.5	1.8	...	...
458.5	2.0	7,457.3	2.0	33,052.4	2.4
203.8	3.0	3,314.3	3.0	21,153.5	3.0
114.6	4.0	1,864.3	4.0	11,898.9	4.0
73.4	5.0	1,193.2	5.0	7,615.3	5.0
18.3	10.0	298.3	10.0	1,903.8	10.0
8.2	15.0	132.6	15.0	846.1	15.0
4.6	20.0	74.6	20.0	476.0	20.0
2.9	25.0	47.7	25.0	304.6	25.0
.7	50.0	11.9	50.0	76.2	50.0

Growth estimates were derived from diameter growth measurements and mortality data taken at sample locations. No attempt was made to calculate sampling error in these estimates.

Estimates of annual timber cut are based on studies conducted during the period of forest inventory. The sampling error to which the estimates are liable, on a probability of two chances out of three, are:

Cubic volume	Sampling error	Board-foot volume	Sampling error
<i>Million cu. ft.</i>	<i>Percent</i>	<i>Million bd. ft.</i>	<i>Percent</i>
299.2	2.0	1,282.2	2.5
48.0	5.0	321.8	5.0
12.0	10.0	80.4	10.0
5.3	15.0	35.8	15.0
3.0	20.0	20.1	20.0
1.9	25.0	12.9	25.0
.5	50.0	3.2	50.0

In computing changes in timber volumes since 1955, data from the earlier survey were adjusted to make them closely comparable to those from the latest survey. This was necessary because of certain basic differences between the two sets of data. In every case, the data from the earlier survey were adjusted to conform to the standards of the latest survey before the change was computed.

DEFINITIONS OF TERMS

Forest Land Class

Forest land.—Land at least 10 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for non-forest use.

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

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 presently or prospectively suitable for industrial wood products; excludes so-called weed species, such as blackjack oak and blue beech.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous.

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

Forest Type

Longleaf-slash pine.—Forests in which 50 percent or more of the stand is southern yellow pine, and longleaf or slash pine, singly or in combination, predominates. Common associates include oak and gum.

Loblolly-shortleaf pine.—Forests in which 50 percent or more of the stand is southern yellow pine, and loblolly or shortleaf pine, singly or in combination, predominates. Common associates include oak, hickory, and gum.

Oak-pine.—Forests in which 50 percent or more of the stand is hardwoods, usually upland oaks, but in which southern pines make up 25-49 percent of the stand. Common associates include gum, hickory, and yellow-poplar.

Oak-hickory.—Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination, except where pines comprise 25-49 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 50 percent or more of the stand is tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, except where pines comprise 25-49 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 50 percent or more of the stand is elm, ash, or cottonwood, singly or in combination. 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 left in silvicultural cutting or favored in cultural 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 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 10 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 pole timber stocking.

Poletimber stands.—Stands at least 10 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 10 percent stocked with growing-stock trees, with more than half of this stocking in saplings or seedlings.

Nonstocked areas.—Commercial forest lands less than 10 percent stocked with growing-stock trees.

Stocking

A measure of area occupancy by trees of specified classes. Three categories of stocking are considered in the Survey: (1) all live trees, (2) growing-stock trees, and (3) desirable trees. Stocking, in terms of all trees is used in the delineation of forest land and forest types. Stocking in terms of growing-stock trees is used in stand-size and age classifications. Stocking in terms of desirable tree is used in delineating area-condition classes.

Volume

Volume of sawtimber.—Net volume of the saw log portion of live sawtimber trees, in board feet of the International rule, $\frac{1}{4}$ -inch kerf.

Volume of growing stock.—Volume of sound wood in the bole of sawtimber and poletimber tree from stump to a minimum 4.0-inch top outside bar.

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.

Log Grades

Log grades are based on the standards presented by the U. S. Forest Service in "Interim Log Grades for Southern Pines," issued by the Southern Forest Experiment Station in 1953, and "Hardwood Log Grades for Standard Lumber," issued by the Forest Products Laboratory under the designation D1737 in 1949.

Hardwood log grades include, in addition to the hardwood log grades for standard lumber, a grade-4 tie and timber log. Specifications for tie and timber logs are based chiefly on knot size and log soundness; clear cuttings are not required.

Area-Condition Class

Class 1.—Areas 70% or more stocked with desirable trees.

Class 2.—Areas 40 to 70% stocked with desirable trees, and with 30% or less of the area controlled by acceptable growing-stock trees, rough and rotten trees, inhibiting vegetation, slash, or nonstockable conditions.

Class 3.—Areas 40 to 70% stocked with desirable trees and with more than 30% of the area controlled by other trees or conditions that ordinarily prevent occupancy by desirable trees.

Class 4.—Areas less than 40% stocked with desirable trees, but with 70% or more stocking with growing-stock trees.

Class 5.—Areas less than 40% stocked with desirable trees, but with 40 to 70% stocking with growing-stock trees.

Class 6.—Areas less than 40% stocked with desirable trees and with less than 40% stocking with growing-stock trees.

Miscellaneous Definitions

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 to and including 12.9 inches d.b.h.

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

Net annual growth of sawtimber.—The annual change, resulting from natural causes, in net board-foot volume of live sawtimber trees.

Net annual growth of growing stock.—The annual change, resulting from natural causes, in volume of sound wood in live sawtimber and pole timber trees.

Mortality of sawtimber.—The net board-foot volume of sawtimber trees dying annually from natural causes.

Mortality of growing stock.—The volume of sound wood in live sawtimber and pole timber trees dying annually from natural causes.

Timber cut from sawtimber.—The net board-foot volume of live sawtimber trees cut for forest products during a specified period, including both roundwood products and logging residues.

Timber cut from growing stock.—The volume of sound wood in live sawtimber and pole timber trees cut for forest products during a specified period including both roundwood products and logging residues.

Timber products.—Roundwood products and by-products of wood manufacturing plants.

STANDARD TABLES

Table 1. Area by land classes, east Texas, 1965

Land class	Area
	Thousand acres
Forest:	
Commercial	11,455.8
Unproductive	...
Productive-reserved	7.0
Total forest	11,462.8
Nonforest ¹	7,393.1
All land ²	18,855.9

¹ Includes some acreage of water according to survey standards of area classification but defined by Bureau of the Census as land.

² From U. S. Bureau of the Census, Land and Water Area of the United States, 1960.

Table 3. Area of commercial forest land by stand-size and ownership class, east Texas, 1965

Stand-size class	All ownerships	National forest	Other public	Forest industry	Farm and mi- privat
	Thousand acres				
Sawtimber	6,495.4	515.5	102.5	2,484.1	3,393.
Poletimber	1,777.3	37.5	15.9	314.9	1,409.
Sapling and seedling	3,108.3	69.3	72.9	647.8	2,318.
Nonstocked areas	74.8	...	...	17.4	57.
All classes	11,455.8	622.3	191.3	3,464.2	7,178.

Table 4. Area of commercial forest land by stand-volume classes for saw timber and other stand-size classes, east Texas, 1965

Stand volume per acre	All stands	Sawtimber stands	Other stands
	Thousand acres		
Less than 1,500 board feet	5,143.6	854.2	4,289.4
1,500 to 5,000 board feet	4,080.7	3,409.7	671.0
More than 5,000 board feet	2,231.5	2,231.5	...
All classes	11,455.8	6,495.4	4,960.4

Table 2. Area of commercial forest land by ownership classes, east Texas, 1965

Ownership class	Area
	Thousand acres
Public:	
National forest	622.3
Miscellaneous federal	148.6
State	36.6
County and municipal	6.1
Total public	813.6
Private:	
Forest industry	3,464.2
Farmer	1,770.0
Miscellaneous private	5,408.0
Total private	10,642.2
All ownerships	11,455.8

Table 5. Area of commercial forest land by stocking classes based on all native stand components, east Texas, 1965

Stocking percentage	Stocking classified in terms of		
	All trees	Growing stock trees	Desirable trees
	Thousand acres		
90 to 100	5,370.1	1,699.4	254.2
80 to 90	3,024.5	2,305.4	520.4
70 to 80	1,522.8	2,181.6	1,002.9
60 to 70	748.5	1,883.4	1,080.4
50 to 60	392.3	1,404.0	1,375.1
40 to 50	202.6	929.5	1,524.1
30 to 40	104.6	564.0	1,458.8
20 to 30	34.9	260.5	1,624.8
10 to 20	43.1	153.2	1,431.2
Less than 10	12.4	74.8	1,183.9
All areas	11,455.8	11,455.8	11,455.8

Table 6. Area of commercial forest land by stocking classes of growing stock trees and by stand-size classes, east Texas, 1965

Stocking class	All stands	Saw- timber	Pole- timber	Sapling and seedling	Non- stocked
	Thousand acres				
70 percent or more	6,186.4	3,809.2	895.9	1,481.3	...
40 to 70 percent	4,216.9	2,280.5	722.3	1,214.1	...
10 to 40 percent	977.7	405.7	159.1	412.9	...
Less than 10 percent	74.8	...	...	...	74.8
All classes	11,455.8	6,495.4	1,777.3	3,108.3	74.8

Table 7. Area of commercial forest land by area-condition and ownership classes, east Texas, 1965

Area-condition class	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
----- Thousand acres -----					
1	1,777.5	262.8	24.3	841.3	649.1
2	1,441.4	134.6	16.1	492.4	798.3
3	2,538.2	140.1	32.9	984.1	1,381.1
4	1,527.5	32.0	55.3	328.0	1,112.2
5	3,118.7	48.0	55.0	649.8	2,365.9
6	1,052.5	4.8	7.7	168.6	871.4
All classes	11,455.8	622.3	191.3	3,464.2	7,178.0

Table 8. Area of commercial forest land by area-condition and stocking classes, east Texas, 1965

Area-condition class	All classes		Stocking class									
			Growing stock				Rough and rotten trees		Shrubs		Other	
			Desirable		Acceptable							
Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	
1	1,777.5	100.0	1,390.7	78.3	179.5	10.1	82.2	4.6	5.9	0.3	119.2	6.7
2	1,441.4	100.0	796.1	55.2	209.3	14.5	114.6	8.0	11.2	.8	310.2	21.5
3	2,538.2	100.0	1,244.4	49.1	709.0	27.9	351.0	13.8	24.9	1.0	208.9	8.2
4	1,527.5	100.0	343.2	22.5	837.2	54.8	200.7	13.1	9.6	.6	136.8	9.0
5	3,118.7	100.0	615.7	19.7	1,052.1	33.8	770.3	24.7	57.6	1.8	623.0	20.0
6	1,052.5	100.0	101.4	9.6	169.0	16.1	349.3	33.2	43.7	4.2	389.1	36.9
All classes	11,455.8	100.0	4,491.5	39.2	3,156.1	27.6	1,868.1	16.3	152.9	1.3	1,787.2	15.6

Table 9. Area of commercial forest land by site and ownership classes, east Texas, 1965

Site class	All ownerships	National forest	Other public	Forest industry	Farmer and misc. private
----- Thousand acres -----					
120 cu. ft. or more	616.8	62.9	8.3	350.3	195.3
85 to 120 cu. ft.	5,384.1	341.3	80.2	1,987.8	2,974.8
50 to 85 cu. ft.	4,904.0	213.2	102.8	1,049.6	3,538.4
Less than 50 cu. ft.	550.9	4.9	...	76.5	469.5
All classes	11,455.8	622.3	191.3	3,464.2	7,178.0

Table 10. Area of commercial forest land by forest types and ownership classes, east Texas, 1965

Type	All ownerships	Public	Private
----- Thousand acres -----			
Longleaf-slash pine	358.5	10.6	347.9
Loblolly-shortleaf pine	4,908.7	593.7	4,315.0
Oak-pine	2,306.1	64.2	2,241.9
Oak-hickory	2,020.6	89.0	1,931.6
Oak-gum-cypress	1,808.2	50.9	1,757.3
Elm-ash-cottonwood	53.7	5.2	48.5
All types	11,455.8	813.6	10,642.2

Table 11. Area of noncommercial forest land by forest types, east Texas, 1965

Type	All areas	Productive-reserved areas	Un-productive areas
----- Thousand acres -----			
Longleaf-slash pine	0.1	0.1	...
Loblolly-shortleaf pine	3.1	3.1	...
Oak-pine	2.6	2.6	...
Oak-hickory	1.2	1.2	...
All types	7.0	7.0	...

Table 12. Number of growing-stock trees on commercial forest land by diameter classes and by softwoods and hardwoods, east Texas, 1965

D.b.h. class (inches)	All species	Softwood	Hardwood
----- Thousand trees -----			
1.0- 2.9	2,718,660	797,233	1,921,427
3.0- 4.9	955,052	443,056	511,996
5.0- 6.9	422,633	236,244	186,389
7.0- 8.9	245,813	147,852	97,961
9.0-10.9	150,211	89,582	60,629
11.0-12.9	91,705	59,065	32,640
13.0-14.9	56,739	37,011	19,728
15.0-16.9	30,179	19,525	10,654
17.0-18.9	15,578	9,595	5,983
19.0 and larger	13,716	7,603	6,113
All classes	4,700,286	1,846,766	2,853,520

Table 13. Number of rough, rotten, and salvable dead trees on commercial forest land by diameter groups and by softwoods and hardwoods, east Texas, 1965

D.b.h. class (inches)	Rough and rotten trees	Salvable dead trees
----- Thousand trees -----		
Softwood:		
5.0- 8.9	5,684	101
9.0-18.9	2,858	13
19.0 and larger	190	10
Total	8,732	124
Hardwood:		
5.0-10.9	185,691	72
11.0-18.9	53,355	54
19.0 and larger	7,946	...
Total	246,992	126
All species	255,724	250

Table 14. Volume of timber on commercial forest land by class of timber and by softwoods and hardwoods, east Texas, 1965

Class of timber	All species	Softwood	Hardwood
----- Million cubic feet -----			
Sawtimber trees:			
Saw-log portion	5,509.5	4,275.8	1,233.7
Upper-stem portion	1,040.9	679.0	361.9
Total	6,550.4	4,954.8	1,595.6
Poletimber trees	2,656.1	1,372.0	1,284.1
All growing stock	9,206.5	6,326.8	2,879.7
Rough trees:			
Sawtimber-size	568.1	24.0	544.1
Poletimber-size	333.3	9.3	324.0
Total	901.4	33.3	868.1
Rotten trees:			
Sawtimber-size	392.1	8.4	383.7
Poletimber-size	91.1	.3	90.8
Total	483.2	8.7	474.5
Salvable dead trees:			
Sawtimber-size	2.1	1.3	.8
Poletimber-size	.6	.3	.3
Total	2.7	1.6	1.1
All timber	10,593.8	6,370.4	4,223.4

Table 15. Volume of growing stock and sawtimber on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1965

Ownership class	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
----- Million cubic feet ----- ----- Million board feet -----						
Public:						
National forest	942.0	829.2	112.8	4,274.9	3,977.5	297.4
Other public	162.3	108.5	53.8	591.2	440.9	150.3
Total	1,104.3	937.7	166.6	4,866.1	4,418.4	447.7
Private:						
Forest industry	3,698.9	2,802.2	896.7	14,881.8	12,456.1	2,425.7
Farmer and misc. private	4,403.3	2,586.9	1,816.4	13,304.5	8,940.2	4,364.3
Total	8,102.2	5,389.1	2,713.1	28,186.3	21,396.3	6,790.0
All ownerships	9,206.5	6,326.8	2,879.7	33,052.4	25,814.7	7,237.7

Table 16. Volume of growing stock and sawtimber on commercial forest land by stand-size classes and by softwoods and hardwoods, east Texas, 1965

Stand-size class	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
----- Million cubic feet ----- ----- Million board feet -----						
Sawtimber	7,435.8	5,333.8	2,102.0	29,711.4	23,596.1	6,115.3
Poletimber	1,159.8	619.1	540.7	1,780.2	1,121.4	658.8
Sapling and seedling	609.0	373.3	235.7	1,554.9	1,094.2	460.7
Nonstocked areas	1.9	.6	1.3	5.9	3.0	2.9
All classes	9,206.5	6,326.8	2,879.7	33,052.4	25,814.7	7,237.7

Table 17. Volume of growing stock on commercial forest land by species and diameter classes, east Texas, 1965

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 and larger
----- Million cubic feet -----									
Softwood:									
Longleaf and slash pines	232.6	20.6	32.9	29.3	34.3	56.8	36.3	16.3	6.1
Shortleaf and loblolly pines	6,029.7	519.6	785.3	950.9	1,056.7	968.7	716.6	470.6	561.3
Cypress	57.1	4.1	5.3	6.7	5.7	7.6	7.0	7.9	12.8
Other softwoods	7.4	2.1	2.1	1.3	.2	1.1	.6	...	...
Total	6,326.8	546.4	825.6	988.2	1,096.9	1,034.2	760.5	494.8	580.2
Hardwood:									
Select white oaks ¹	184.3	15.2	19.9	25.8	30.7	31.1	23.3	13.4	24.9
Select red oaks ²	117.7	7.5	14.9	12.9	18.5	14.5	10.7	8.3	30.4
Other white oaks	377.1	51.1	71.8	70.0	55.6	39.5	30.8	25.1	33.2
Other red oaks	795.2	106.9	113.5	131.3	115.7	94.4	79.4	60.2	93.8
Hickory	174.7	18.2	29.4	30.2	28.7	15.9	16.6	11.2	24.5
Hard maple	1.4	.6	.2	.2	...	...	.4	...	...
Soft maple	27.1	5.6	6.0	3.6	3.4	3.4	2.7	1.4	1.0
Beech	21.7	1.0	2.5	3.1	3.7	2.8	2.7	2.3	3.6
Sweetgum	633.3	101.6	101.8	104.4	113.5	88.7	47.0	36.3	40.0
Tupelo and blackgum	190.8	18.0	17.7	25.6	33.1	36.7	23.1	12.7	23.9
Ash	72.8	7.7	11.2	13.0	12.2	9.5	9.3	6.2	3.7
Cottonwood	1.3	1.0	...	...	...	...	...	...	.3
Basswood	4.5	.3	.4	1.5	.7	1.1	.5	...	...
Black walnut	.8	.2	.6	...	...	...	...	...	...
Other hardwoods	277.0	41.6	45.8	50.3	43.2	36.0	22.7	13.5	23.9
Total	2,879.7	376.5	435.7	471.9	459.0	373.6	269.2	190.6	303.2
All species	9,206.5	922.9	1,261.3	1,460.1	1,555.9	1,407.8	1,029.7	685.4	883.4

¹ Includes white, swamp chestnut, swamp white, and chinkapin oaks.

² Includes cherrybark and Shumard oaks.

Table 18. Volume of sawtimber on commercial forest land by species and diameter classes, east Texas, 1965

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 and larger
----- Million board feet -----							
Softwood:							
Longleaf and slash pines	905.6	117.8	171.1	301.7	194.3	86.2	34.5
Shortleaf and loblolly pines	24,635.2	3,931.3	5,287.7	5,245.3	4,056.3	2,732.3	3,382.3
Cypress	260.3	24.4	26.2	40.7	39.6	47.7	81.7
Other softwoods	13.6	4.4	.7	5.8	2.7	...	...
Total	25,814.7	4,077.9	5,485.7	5,593.5	4,292.9	2,866.2	3,498.5
Hardwood:							
Select white oaks ¹	568.8	...	125.3	138.2	111.8	62.6	130.9
Select red oaks ²	378.1	...	69.9	65.5	46.9	41.6	154.2
Other white oaks	862.2	...	223.2	177.8	152.6	128.9	179.7
Other red oaks	2,024.0	...	450.2	413.2	368.0	297.9	494.7
Hickory	456.9	...	118.3	71.3	78.9	57.7	130.7
Hard maple	2.5	...	...	...	2.5	...	...
Soft maple	51.3	...	14.1	14.0	11.8	6.5	4.9
Beech	66.3	...	13.2	14.0	12.5	12.0	14.6
Sweetgum	1,400.4	...	448.6	372.2	208.1	169.7	201.8
Tupelo and blackgum	572.0	...	127.4	163.7	108.0	56.4	116.5
Ash	191.0	...	54.5	43.5	45.4	28.8	18.8
Cottonwood	2.0	...	...	...	...	...	2.0
Basswood	9.2	...	2.3	4.8	2.1	...	...
Other hardwoods	653.0	...	178.5	168.4	109.4	68.0	128.7
Total	7,237.7	...	1,825.5	1,646.6	1,258.0	930.1	1,577.5
All species	33,052.4	4,077.9	7,311.2	7,240.1	5,550.9	3,796.3	5,076.0

¹ Includes white, swamp white, and chinkapin oaks.

² Includes cherrybark and Shumard oaks.

Table 19. Volume of sawtimber on commercial forest land by species and log grade, east Texas, 1965

Species	All grades	Grade 1	Grade 2	Grade 3	Lower grades
----- Million board feet -----					
Softwood:					
Yellow pines	25,540.8	553.7	3,717.7	12,251.3	9,018.1
Cypress	260.3	25.0	50.9	118.8	65.6
Other softwoods	13.6	13.6	...	...	...
Total	25,814.7	592.3	3,768.6	12,370.1	9,083.7
Hardwood:					
Select white and red oaks	946.9	86.9	144.5	487.2	228.3
Other white and red oaks	2,886.2	107.5	382.7	1,536.5	859.5
Hickory	456.9	33.2	63.2	254.1	106.4
Hard maple	2.5	...	...	2.2	.3
Sweetgum	1,400.4	92.0	232.0	745.8	330.6
Ash	191.0	13.0	49.7	103.0	25.3
Other hardwoods	1,353.8	85.8	224.2	778.2	265.6
Total	7,237.7	418.4	1,096.3	3,907.0	1,816.0
All species	33,052.4	1,010.7	4,864.9	16,277.1	10,899.7

Table 20. Volume of salvable dead sawtimber-size trees on commercial forest land by softwoods and hardwoods, east Texas, 1965

Species group	Volume
----- Million board feet -----	
Softwood	8.4
Hardwood	3.1
All species	11.5

Table 21. Net annual growth and cut of growing stock on commercial forest land by species, east Texas, 1964

Species	Net annual growth	Annual timber cut
----- Million cubic feet -----		
Softwood:		
Yellow pines	402.1	198.7
Other softwoods	4.1	.6
Total	406.2	199.3
Hardwood:		
Select white and red oaks	10.0	15.3
Other white and red oaks	38.8	35.6
Hickory	5.8	6.5
Sweetgum	21.0	18.4
Other hardwoods	19.7	24.1
Total	95.3	99.9
All species	501.5	299.2

Table 22. Net annual growth and cut of growing stock on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1964

Ownership class	Net annual growth			Annual timber cut		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- Million cubic feet -----						
Public	65.7	60.2	5.5	29.6	23.5	6.1
Forest industry	209.6	179.9	29.7	81.1	56.2	24.9
Farmer and misc. private	226.2	166.1	60.1	188.5	119.6	68.9
All ownerships	501.5	406.2	95.3	299.2	199.3	99.9

Table 23. *Net annual growth and cut of sawtimber on commercial forest land by species, east Texas, 1964*

Species	Net annual growth	Annual timber cut
- Million board feet -		
Softwood:		
Yellow pines	1,868.8	908.8
Other softwoods	20.8	2.7
Total	<u>1,889.6</u>	<u>911.5</u>
Hardwood:		
Select white and red oaks	33.9	59.7
Other white and red oaks	103.4	139.0
Hickory	16.3	25.2
Sweetgum	50.3	53.8
Other hardwoods	55.2	93.0
Total	<u>259.1</u>	<u>370.7</u>
All species	<u>2,148.7</u>	<u>1,282.2</u>

Table 24. *Net annual growth and cut of sawtimber on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1964*

Ownership class	Net annual growth			Annual timber cut		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
- - - - - Million board feet - - - - -						
Public	339.4	323.4	16.0	124.2	105.7	18.5
Forest industry	998.6	911.8	86.8	380.0	276.2	103.8
Farmer and misc. private	<u>810.7</u>	<u>654.4</u>	<u>156.3</u>	<u>778.0</u>	<u>529.6</u>	<u>248.4</u>
All ownerships	<u>2,148.7</u>	<u>1,889.6</u>	<u>259.1</u>	<u>1,282.2</u>	<u>911.5</u>	<u>370.7</u>

Table 25. *Annual mortality of growing stock and sawtimber on commercial forest land by species, east Texas, 1964*

Species	Growing stock	Sawtimber
	Million cubic feet	Million board feet
Softwood:		
Yellow pines	29.4	130.3
Other softwoods	.3	1.4
Total	<u>29.7</u>	<u>131.7</u>
Hardwood:		
Select white and red oaks	3.6	12.7
Other white and red oaks	13.8	38.7
Hickory	2.1	6.1
Sweetgum	7.5	18.8
Other hardwoods	7.0	20.7
Total	<u>34.0</u>	<u>97.0</u>
All species	<u>63.7</u>	<u>228.7</u>

Table 26. *Annual mortality of growing stock and sawtimber on commercial forest land by ownership classes and by softwoods and hardwoods, east Texas, 1964*

Ownership class	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
- Million cubic feet - - Million board feet -						
Public	6.4	4.4	2.0	28.5	22.5	6.0
Forest industry	23.8	13.2	10.6	96.1	63.6	32.5
Farmer and misc. private	<u>33.5</u>	<u>12.1</u>	<u>21.4</u>	<u>104.1</u>	<u>45.6</u>	<u>58.5</u>
All ownerships	<u>63.7</u>	<u>29.7</u>	<u>34.0</u>	<u>228.7</u>	<u>131.7</u>	<u>97.0</u>

Table 27. Annual mortality of growing stock and sawtimber on commercial forest land by causes and by softwoods and hardwoods, east Texas, 1964

Cause of death	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
	- Million cubic feet -			- Million board feet -		
Fire	6.0	3.2	2.8	26.3	17.8	8.5
Insects	3.5	1.9	1.6	16.8	9.6	7.2
Disease	8.4	5.4	3.0	43.5	34.9	8.6
Other	5.3	2.0	3.3	7.7	2.2	5.5
Unknown	40.5	17.2	23.3	134.4	67.2	67.2
All causes	63.7	29.7	34.0	228.7	131.7	97.0

Table 28. Total output of timber products by product, by type of material used, and by softwoods and hardwoods, east Texas, 1964

Product and species group	Total output in standard units		Output from roundwood		Output from plant by-products (standard units)
	Unit	Number	Standard units	M cubic feet	
Saw logs:					
Softwood	M bd. ft. ¹	676,982	676,982	111,364	...
Hardwood	M bd. ft. ¹	251,286	251,286	41,889	...
Total	M bd. ft. ¹	928,268	928,268	153,253	...
Veneer logs and bolts:					
Softwood	M bd. ft.	9,734	9,734	1,601	...
Hardwood	M bd. ft.	34,016	34,016	5,709	...
Total	M bd. ft.	43,750	43,750	7,310	...
Pulpwood:					
Softwood	Std. cords ²	1,252,602	848,595	63,984	404,007
Hardwood	Std. cords ²	323,439	281,345	21,889	42,094
Total	Std. cords ²	1,576,041	1,129,940	85,873	446,101
Piling:					
Softwood	M linear ft.	766	766	633	...
Hardwood	M linear ft.	...	...	...	...
Total	M linear ft.	766	766	633	...
Poles:					
Softwood	M pieces	505	505	5,504	...
Hardwood	M pieces	...	...	...	...
Total	M pieces	505	505	5,504	...
Misc. industrial wood: ³					
Softwood	M cu. ft.	4,423	859	859	3,564
Hardwood	M cu. ft.	1,954	646	646	1,308
Total	M cu. ft.	6,377	1,505	1,505	4,872
Posts (round and split):					
Softwood	M pieces	3,695	3,695	1,679	...
Hardwood	M pieces	806	806	516	...
Total	M pieces	4,501	4,501	2,195	...
Fuelwood:					
Softwood	Std. cords	190,281	12,191	919	⁴ 178,090
Hardwood	Std. cords	120,662	91,235	6,843	⁴ 29,427
Total	Std. cords	310,943	103,426	7,762	⁴ 207,517
All products:					
Softwood	M cu. ft.	...	...	186,543	...
Hardwood	M cu. ft.	...	...	77,492	...
Total	M cu. ft.	...	...	264,035	...

¹ International 1/4-inch rule.

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

³ Includes cooperage (logs and bolts), chemical wood, handle stock, mine timbers, miscellaneous dimension 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 29. Total output of roundwood products by source and by softwoods and hardwoods, east Texas, 1964

Source	All species	Softwood	Hardwood
-- Thousand cubic feet --			
Growing stock trees: ¹			
Sawtimber	217,294	159,982	57,312
Poletimber	34,110	22,234	11,876
Total	251,404	182,216	69,188
Rough and rotten trees ¹	4,954	615	4,339
Salvable dead trees ¹	1,647	72	1,575
Other sources ²	6,030	3,640	2,390
All sources	264,035	186,543	77,492

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 30. Annual timber cut from growing stock on commercial forest land by product and logging residues and by softwoods and hardwoods, east Texas, 1964

Product and residues	All species	Softwood	Hardwood
-- Thousand cubic feet --			
Roundwood products:			
Saw logs	150,950	110,619	40,331
Veneer logs and bolts	7,200	1,591	5,609
Pulpwood	78,513	60,929	17,584
Piling	630	630	...
Poles	5,463	5,463	...
Miscellaneous industrial wood	1,495	859	636
Posts	1,994	1,528	466
Fuelwood	5,159	597	4,562
All products	251,404	182,216	69,188
Logging residues	47,833	17,117	30,716
Timber cut	299,237	199,333	99,904

Table 31. Annual timber cut from live sawtimber on commercial forest land by product and logging residues and by softwoods and hardwoods, east Texas, 1964

Product and residues	All species	Softwood	Hardwood
-- Thousand board feet --			
Roundwood products:			
Saw logs	904,824	668,791	236,033
Veneer logs and bolts	42,618	9,616	33,002
Pulpwood	205,266	167,003	38,263
Piling	3,738	3,738	...
Poles	27,924	27,924	...
Miscellaneous industrial wood	6,383	3,067	3,316
Posts	741	216	525
Fuelwood	4,502	488	4,014
All products	1,195,996	880,843	315,153
Logging residues	86,226	30,687	55,539
Timber cut	1,282,222	911,530	370,692

Table 32. Volume of plant residues by industrial source and type of residue and by softwoods and hardwoods, east Texas, 1964

Industrial source	All species			Softwood			Hardwood		
	Total	Coarse ¹	Fine ²	Total	Coarse ¹	Fine ²	Total	Coarse ¹	Fine ²
----- Thousand cubic feet -----									
Lumber industry	22,480	9,790	12,690	9,555	3,605	5,950	12,925	6,185	6,740
Veneer industry	1,024	952	72	41	24	17	983	928	55
Other primary industries	2,247	874	1,373	1,875	699	1,176	372	175	197
All industries	25,751	11,616	14,135	11,471	4,328	7,143	14,280	7,288	6,992

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 33. *Timber growth projections, east Texas, 1964 to 1994*¹

Year	Assumed cut			Projected growth		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
GROWING STOCK						
----- Thousand cubic feet -----						
1964	299,200	199,300	99,900	501,500	406,200	95,300
1974	413,300	307,000	106,300	548,100	444,900	103,200
1984	531,500	421,700	109,800	599,000	490,700	108,300
1994	616,000	504,200	111,800	616,000	504,200	111,800
SAWTIMBER						
----- Thousand board feet -----						
1964	1,282,200	911,500	370,700	2,148,700	1,889,600	259,100
1974	1,691,000	1,391,000	300,000	2,191,000	1,990,000	201,000
1984	2,199,000	1,924,000	275,000	2,444,000	2,251,000	193,000
1994	2,563,000	2,315,000	248,000	2,524,000	2,333,000	191,000

¹ Based on the assumption that cut starting at the 1964 level will be in balance with growth by the year 1994, and that forestry progress will continue at the rate indicated by recent trends.

Table 34. *Basal area per acre by diameter classes and forest types, east Texas, 1965*

Forest type	All trees	Growing stock trees		Rough and rotten trees	
		1.0-4.9 inches	5.0 inches and up	1.0-4.9 inches	5.0 inches and up
----- Square feet -----					
Longleaf-slash pine	40.0	9.9	25.1	1.8	3.2
Loblolly-shortleaf pine	79.6	14.8	54.3	3.4	7.1
Oak-pine	69.2	12.1	39.4	4.8	12.9
Oak-hickory	56.4	10.8	25.5	4.4	15.7
Oak-gum-cypress	75.4	8.7	38.4	5.8	22.5
Elm-ash-cottonwood	60.1	15.3	30.4	2.8	11.6
All types	71.4	12.5	42.6	4.2	12.1

COUNTY TABLES

The tables that follow are intended for use in compiling forest resource estimates for groups of counties. Because the sampling procedure used by the Forest Survey in east Texas was intended primarily to furnish inventory data for the region as a whole, estimates for individual counties have limited and variable accuracy. As county totals are broken down by various subdivisions, the possibility of error increases and is greatest for the smallest items. The order of this increase is suggested in the tabulations on page 14.

Table 35. *Land area and commercial forest by county, east Texas, 1965*

County	All land			County	Commercial forest		
	Thousand acres	Thousand acres	Percent		Thousand acres	Thousand acres	Percent
Anderson	682.9	396.9	58.1	Nacogdoches	597.1	400.4	67.1
Angelina	511.4	359.9	70.4	Newton	602.2	560.0	93.0
Bowie	577.9	300.9	52.1	Orange	227.8	145.0	63.7
Camp	121.6	53.2	43.8	Panola	563.2	353.8	62.8
Cass	608.0	383.4	63.1	Polk	700.2	592.8	84.7
Chambers	394.9	35.4	9.0	Red River	660.5	338.0	51.2
Cherokee	670.7	386.4	57.6	Rusk	601.3	303.8	50.5
Franklin	187.5	74.4	39.7	Sabine	354.6	295.8	83.4
Gregg	180.8	84.0	46.5	San Augustine	352.6	285.2	80.9
Hardin	572.8	501.6	87.6	San Jacinto	396.2	313.5	79.1
Harris	1,105.3	185.0	16.7	Shelby	524.1	363.0	69.3
Harrison	570.9	360.0	63.1	Smith	597.9	237.9	39.8
Houston	788.4	442.4	56.1	Titus	267.2	105.6	39.5
Jasper	600.4	541.8	90.2	Trinity	450.6	347.7	77.2
Jefferson	604.8	54.4	9.0	Tyler	587.5	552.0	94.0
Liberty	750.7	453.6	60.4	Upshur	375.1	220.0	58.7
Marion	240.0	192.0	80.0	Walker	503.0	360.4	71.7
Montgomery	697.6	564.3	80.9	Wood	461.8	226.8	49.1
Morris	166.4	84.5	50.8	All counties	18,855.9	11,455.8	60.8

36. Growing stock volume by species groups and county, east Texas, 1965

County	All species	Softwood			Soft hardwood			Hard hardwood		
		Total	Pine	Other	Total	Gum	Other	Total	Oak	Other
----- Thousand cords -----										
Anderson	2,485	1,191	1,188	3	237	194	43	1,057	715	342
Angelina	6,314	4,881	4,881	...	421	361	60	1,012	811	201
Bowie	2,730	945	942	3	345	249	96	1,440	947	493
Camp	603	273	273	...	131	131	...	199	141	58
Cass	2,915	1,067	1,028	39	739	694	45	1,109	861	248
Chambers	270	255	255	...	...	...	...	15	15	...
Cherokee	3,668	2,203	2,200	3	549	497	52	916	747	169
Franklin	295	77	73	4	75	75	...	143	140	3
Gregg	391	84	84	...	122	73	49	185	79	106
Hardin	6,397	3,884	3,868	16	830	651	179	1,683	1,511	172
Harris	1,460	791	787	4	206	199	7	463	402	61
Harrison	2,408	1,275	1,214	61	527	504	23	606	424	182
Houston	5,276	3,889	3,865	24	439	364	75	948	700	248
Jasper	6,321	4,548	4,456	92	722	655	67	1,051	820	231
Jefferson	717	217	176	41	276	260	16	224	187	37
Liberty	5,277	2,676	2,599	77	887	829	58	1,714	1,117	597
Marion	1,638	1,029	908	121	222	209	13	387	348	39
Montgomery	7,185	5,677	5,677	...	460	439	21	1,048	861	187
Morris	429	108	108	...	67	63	4	254	112	142
Nacogdoches	4,049	2,836	2,836	...	628	588	40	585	445	140
Newton	7,603	5,068	5,040	28	878	718	160	1,657	1,241	416
Orange	2,034	1,240	1,177	63	336	300	36	458	421	37
Panola	3,773	2,457	2,324	133	328	313	15	988	716	272
Polk	9,132	7,541	7,532	9	527	461	66	1,064	819	245
Red River	2,097	483	483	...	51	42	9	1,563	999	564
Rusk	2,467	1,731	1,727	4	161	154	7	575	445	130
Sabine	4,937	3,623	3,622	1	460	433	27	854	620	234
San Augustine	4,130	2,912	2,907	5	472	446	26	746	622	124
San Jacinto	4,402	3,529	3,440	89	394	378	16	479	327	152
Shelby	3,775	2,409	2,396	13	366	352	14	1,000	715	285
Smith	1,528	611	611	...	193	188	5	724	536	188
Titus	492	52	47	5	31	27	4	409	285	124
Trinity	4,507	3,848	3,848	...	210	210	...	449	364	85
Tyler	8,902	6,181	6,166	15	1,102	876	226	1,619	1,279	340
Upshur	1,248	811	811	...	131	124	7	306	267	39
Walker	4,460	3,520	3,517	3	139	139	...	801	595	206
Wood	1,023	435	431	4	104	104	...	484	371	113
All counties	127,338	84,357	83,497	860	13,766	12,300	1,466	29,215	22,005	7,210

Table 37. Sawtimber volume by species groups and county, east Texas, 1965

County	All species	Softwood			Soft hardwood			Hard hardwood		
		Total	Pine	Other	Total	Gum	Other	Total	Oak	Other
----- Million board feet -----										
Anderson	551.9	337.4	337.4	.	38.4	32.2	6.2	176.1	117.8	58.3
Angelina	1,938.2	1,723.3	1,723.3	.	61.4	48.8	12.6	153.5	119.9	33.6
Bowie	530.6	241.2	241.2	.	47.1	27.2	19.9	242.3	173.0	69.3
Camp	138.3	61.9	61.9	.	30.7	30.7	...	45.7	33.8	11.9
Cass	522.1	229.3	221.4	7.9	120.9	114.4	6.5	171.9	144.3	27.6
Chambers	54.4	51.0	51.0	.	.	.	...	3.4	3.4	...
Cherokee	833.7	623.8	623.5	.3	57.0	51.7	5.3	152.9	134.8	18.1
Franklin	57.2	16.7	16.7	...	9.0	9.0	...	31.5	31.5	...
Gregg	85.1	24.3	24.3	...	23.6	17.2	6.4	37.2	10.6	26.6
Hardin	1,721.9	1,369.3	1,367.4	1.9	92.1	84.8	7.3	260.5	225.1	35.4
Harris	323.7	201.0	200.0	1.0	35.0	35.0	...	87.7	69.7	18.0
Harrison	419.2	236.7	233.7	3.0	75.1	71.6	3.5	107.4	84.5	22.9
Houston	1,521.9	1,287.5	1,287.0	.5	80.6	73.5	7.1	153.8	120.1	33.7
Jasper	1,762.4	1,407.3	1,368.4	38.9	148.0	137.1	10.9	207.1	158.8	48.3
Jefferson	137.8	53.7	43.1	10.6	38.3	36.4	1.9	45.8	39.5	6.3
Liberty	1,470.4	1,000.2	962.8	37.4	135.3	122.4	12.9	334.9	223.1	111.8
Marion	392.2	288.0	252.5	35.5	39.1	35.2	3.9	65.1	62.4	2.7
Montgomery	1,791.5	1,586.5	1,586.5	...	59.6	54.2	5.4	145.4	121.6	23.8
Morris	93.6	19.8	19.8	...	15.6	15.6	...	58.2	19.8	38.4
Nacogdoches	927.4	781.0	781.0	...	61.4	55.6	5.8	85.0	69.4	15.6
Newton	2,018.4	1,554.1	1,544.6	9.5	190.2	156.3	33.9	274.1	201.1	73.0
Orange	579.4	449.7	429.6	20.1	64.9	61.3	3.6	64.8	56.0	8.8
Panola	826.0	603.8	552.4	51.4	50.0	46.4	3.6	172.2	133.1	39.1
Polk	2,650.3	2,344.8	2,340.2	4.6	93.3	83.1	10.2	212.2	161.7	50.5
Red River	381.3	119.1	119.1	...	8.3	4.4	3.9	253.9	174.6	79.3
Rusk	415.1	337.8	336.8	1.0	14.2	14.2	...	63.1	48.5	14.6
Sabine	1,362.6	1,162.2	1,161.6	.6	59.0	55.4	3.6	141.4	100.2	41.2
San Augustine	1,137.5	927.6	926.7	.9	78.9	74.0	4.9	131.0	100.2	30.8
San Jacinto	1,200.4	1,053.5	1,017.8	35.7	69.9	65.3	4.6	77.0	54.7	22.3
Shelby	967.6	741.1	737.2	3.9	51.9	51.9	...	174.6	133.1	41.5
Smith	356.2	195.4	195.4	...	34.1	34.1	.	126.7	96.1	30.6
Titus	92.8	7.6	7.0	.6	3.8	1.8	2.0	81.4	59.7	21.7
Trinity	1,378.4	1,254.3	1,254.3	.	35.2	35.2	...	88.9	78.2	10.7
Tyler	2,635.0	2,117.5	2,111.3	6.2	200.7	157.4	43.3	316.8	248.8	68.0
Upshur	297.0	217.1	217.1	...	21.9	21.9	...	58.0	50.8	7.2
Walker	1,249.4	1,063.5	1,062.8	.7	29.7	29.7	.	156.2	108.7	47.5
Wood	231.5	125.7	124.0	1.7	27.4	27.4	...	78.4	64.5	13.9
All counties	33,052.4	25,814.7	25,540.8	273.9	2,201.6	1,972.4	229.2	5,036.1	3,833.1	1,203.0

Table 38. Sawtimber volume by diameter classes and county, east Texas, 1965

County	All species	Softwood			Soft hardwood			Hard hardwood		
		Total	9.0-14.9 inches	15.0 inches and up	Total	11.0-14.9 inches	15.0 inches and up	Total	11.0-14.9 inches	15.0 inches and up
----- Million board feet -----										
Anderson	551.9	337.4	180.4	157.0	38.4	26.3	12.1	176.1	67.7	108.4
Angelina	1,938.2	1,723.3	848.3	875.0	61.4	30.0	31.4	153.5	50.5	103.0
Bowie	530.6	241.2	191.3	49.9	47.1	27.5	19.6	242.3	118.6	123.7
Camp	138.3	61.9	54.3	7.6	30.7	6.6	24.1	45.7	16.0	29.7
Cass	522.1	229.3	204.0	25.3	120.9	72.6	48.3	171.9	111.3	60.6
Chambers	54.4	51.0	46.4	4.6	...	...	...	3.4	3.4	...
Cherokee	833.7	623.8	470.0	153.8	57.0	38.6	18.4	152.9	77.3	75.6
Franklin	57.2	16.7	8.2	8.5	9.0	6.8	2.2	31.5	18.3	13.2
Gregg	85.1	24.3	14.3	10.0	23.6	9.1	14.5	37.2	6.6	30.6
Hardin	1,721.9	1,369.3	691.4	677.9	92.1	53.0	39.1	260.5	111.6	148.9
Harris	323.7	201.0	108.0	93.0	35.0	17.8	17.2	87.7	39.3	48.4
Harrison	419.2	236.7	190.8	45.9	75.1	39.4	35.7	107.4	49.3	58.1
Houston	1,521.9	1,287.5	669.0	618.5	80.6	35.3	45.3	153.8	79.3	74.5
Jasper	1,762.4	1,407.3	778.6	628.7	148.0	75.6	72.4	207.1	97.1	110.0
Jefferson	137.8	53.7	46.0	7.7	38.3	29.5	8.8	45.8	17.2	28.6
Liberty	1,470.1	1,000.2	476.4	523.8	135.3	78.9	56.4	334.9	126.5	208.4
Marion	392.2	288.0	176.7	111.3	39.1	35.2	3.9	65.1	40.6	24.5
Montgomery	1,791.5	1,586.5	1,072.6	513.9	59.6	31.4	28.2	145.4	56.0	89.4
Morris	93.6	19.8	12.1	7.7	15.6	2.8	12.8	58.2	22.8	35.4
Nacogdoches	927.4	781.0	501.7	279.3	61.4	43.5	17.9	85.0	45.3	39.7
Newton	2,018.4	1,554.1	971.4	582.7	190.2	115.4	74.8	274.1	129.1	145.0
Orange	579.4	449.7	211.1	238.6	64.9	43.0	21.9	64.8	20.7	44.1
Panola	826.0	603.8	425.0	178.8	50.0	24.7	25.3	172.2	70.9	101.3
Polk	2,650.3	2,344.8	1,445.4	899.4	93.3	54.1	39.2	212.2	108.9	103.3
Red River	381.3	119.1	97.4	21.7	8.3	4.4	3.9	253.9	138.3	115.6
Rusk	415.1	337.8	251.8	86.0	14.2	6.4	7.8	63.1	31.8	31.3
Sabine	1,362.6	1,162.2	720.8	441.4	59.0	35.5	23.5	141.4	57.9	83.5
San Augustine	1,137.5	927.6	482.7	444.9	78.9	46.9	32.0	131.0	48.4	82.6
San Jacinto	1,200.4	1,053.5	486.6	566.9	69.9	38.9	31.0	77.0	43.8	33.2
Shelby	967.6	741.1	398.6	342.5	51.9	30.6	21.3	174.6	77.1	97.5
Smith	356.2	195.4	123.4	72.0	34.1	19.4	14.7	126.7	45.9	80.8
Titus	92.8	7.6	3.4	4.2	3.8	...	3.8	81.4	30.6	50.8
Trinity	1,378.4	1,254.3	637.3	617.0	35.2	17.1	18.1	88.9	29.7	59.2
Tyler	2,635.0	2,117.5	1,316.9	800.6	200.7	114.9	85.8	316.8	116.0	200.8
Upshur	297.0	217.1	186.3	30.8	21.9	11.1	10.8	58.0	42.7	15.3
Walker	1,249.4	1,063.5	546.7	516.8	29.7	10.4	19.3	156.2	44.5	111.7
Wood	231.5	125.7	111.8	13.9	27.4	13.4	14.0	78.4	35.0	43.4
All counties	33,052.4	25,814.7	15,157.1	10,657.6	2,201.6	1,246.1	955.5	5,036.1	2,226.0	2,810.1

Table 39. Annual cut of growing stock and sawtimber by county, east Texas, 1964

County	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
	- Million cubic feet -			- Million board feet -		
Anderson	6.8	3.7	3.1	34.4	20.1	14.3
Angelina	20.0	11.0	9.0	78.7	50.3	28.4
Bowie	3.4	1.9	1.5	8.9	6.6	2.3
Camp	.5	.2	.3	2.0	.9	1.1
Cass	5.5	4.4	1.1	20.1	16.4	3.7
Chambers	.3	.2	.1	1.3	1.1	.2
Cherokee	10.6	7.5	3.1	47.7	34.4	13.3
Franklin	.1	(¹)	.1	.5	(¹)	.5
Gregg	1.1	.7	.4	5.2	3.8	1.4
Hardin	15.5	9.6	5.9	72.5	48.9	23.6
Harris	4.7	3.1	1.6	16.3	12.5	3.8
Harrison	5.0	3.2	1.8	21.4	14.4	7.0
Houston	10.9	9.1	1.8	49.9	44.3	5.6
Jasper	17.5	11.9	5.6	77.9	55.8	22.1
Jefferson	.3	.1	.2	.7	.2	.5
Liberty	14.9	7.4	7.5	63.0	31.4	31.6
Marion	2.5	1.4	1.1	7.0	4.4	2.6
Montgomery	16.1	12.3	3.8	69.2	56.6	12.6
Morris	.9	.3	.6	3.5	1.0	2.5
Nacogdoches	9.2	6.8	2.4	37.9	27.2	10.7
Newton	14.6	11.3	3.3	67.8	55.8	12.0
Orange	6.1	5.2	.9	28.9	26.8	2.1
Panola	6.9	4.1	2.8	22.6	14.7	7.9
Polk	30.4	23.3	7.1	141.9	113.3	28.6
Red River	3.1	1.1	2.0	15.5	5.8	9.7
Rusk	5.0	2.6	2.4	23.2	12.2	11.0
Sabine	11.0	6.0	5.0	45.6	24.7	20.9
San Augustine	8.1	5.3	2.8	30.5	22.2	8.3
San Jacinto	8.9	5.3	3.6	39.4	26.3	13.1
Shelby	11.8	7.9	3.9	51.4	34.9	16.5
Smith	1.6	.4	1.2	6.5	1.9	4.6
Titus	1.2	.1	1.1	5.6	.7	4.9
Trinity	12.4	8.8	3.6	46.2	36.6	9.6
Tyler	20.0	14.3	5.7	91.5	68.6	22.9
Upshur	3.9	2.9	1.0	14.8	10.8	4.0
Walker	7.1	5.4	1.7	28.3	24.0	4.3
Wood	1.3	.5	.8	4.4	1.9	2.5
All counties	299.2	199.3	99.9	1,282.2	911.5	370.7

¹ Negligible.

U. S. Forest Service Resource Bulletin SO-10

SOUTHERN FOREST EXPERIMENT STATION

New Orleans, Louisiana

Forest Service, U.S. Department of Agriculture

1967