

United States
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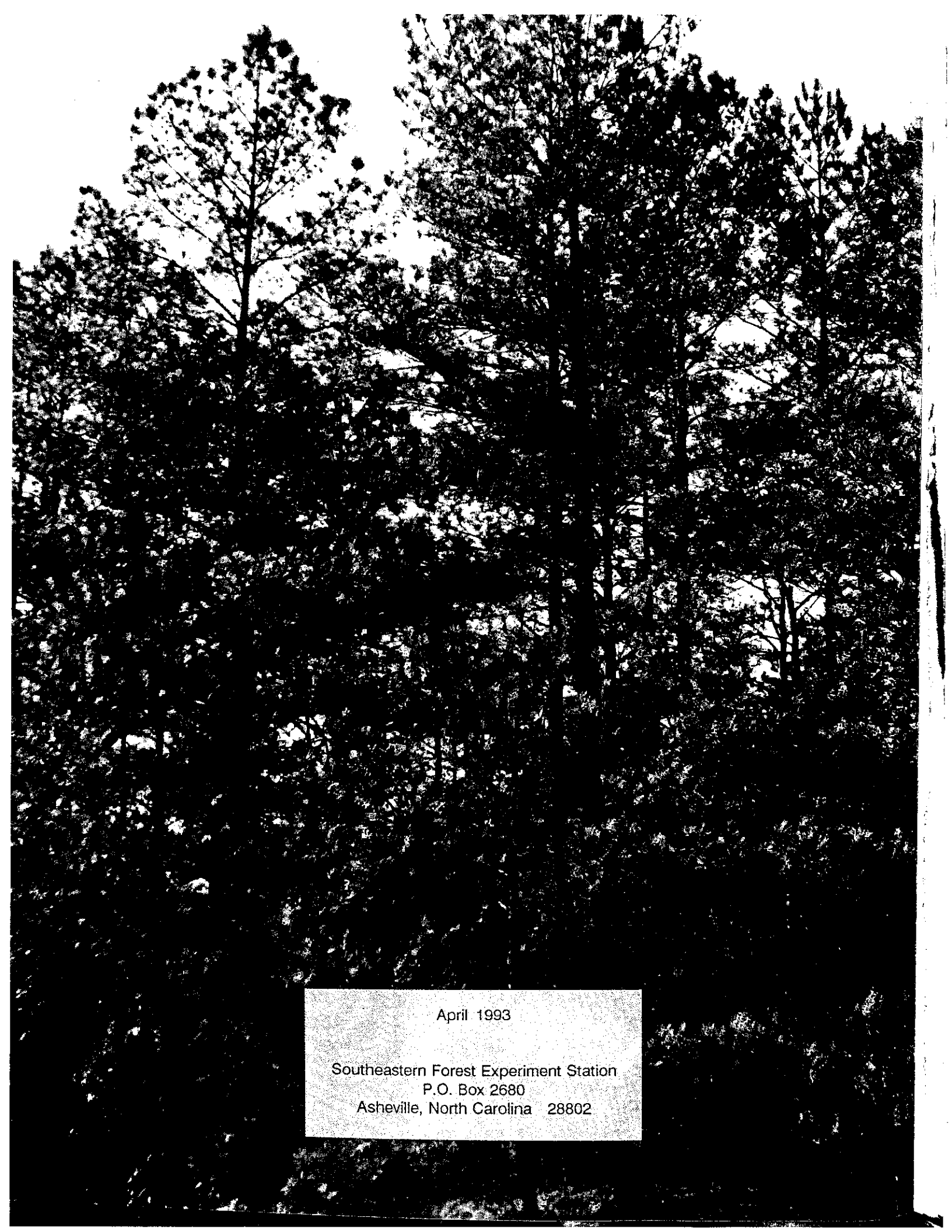
Southeastern Forest
Experiment Station

Resource Bulletin
SE-133

Georgia's Forests, 1989

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Southeastern Forest Experiment Station
P.O. Box 2680
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Forest Inventory and Analysis
Asheville, North Carolina

Foreword

This Resource Bulletin presents the principal findings of the sixth inventory of Georgia's forest resources. Data on the extent, condition, and classification of forest land and associated timber volumes, growth, removals, and mortality are described and interpreted. Whereas data on nontimber commodities associated with forests were also collected, evaluations of these data are not included in this report.

The inventory of Georgia's forests, authorized by the Forest and Rangeland Renewable Resources Research Act of 1978, is part of a continuing nationwide undertaking by the USDA Forest Service. In the five Southeastern States (Florida, Georgia, North Carolina, South Carolina, and Virginia), these surveys are conducted by the Forest Inventory and Analysis (FIA) Work Unit of the Southeastern Forest Experiment Station, one of six FIA research units in the United States. The primary objective of these periodic appraisals is to develop and maintain the resource information needed to formulate sound forest policies and programs. More information is available about Forest Service resource inventories (U.S. Department of Agriculture, Forest Service 1992).

Field work for the sixth survey of Georgia began in October 1987 and was completed in April 1989. Five previous surveys, completed in 1936, 1953, 1961, 1972, and 1982, provide statistics for measuring changes and trends over a 53-year span. This analysis focuses mainly on changes and trends in recent years and their implications for the future. Previously reported figures have been adjusted in some cases to provide the best estimates of change. Normally, such adjustments are necessary to compensate for improvements in volume equations, but a review of processing procedures uncovered a computer programming error involving resource statistics reported for 1982. This error inflated the fifth survey estimates of three resource items: annual timber removals, net annual growth, and annual mortality. Other resource items such as timberland acreage and inventory volumes were unaffected. The inflated values have since been adjusted, and all comparisons in this report involving fifth survey growth, removal, or mortality statistics utilize the corrected estimates.

The combined efforts of many people have gone into this evaluation of Georgia's forest resources. Appreciation is expressed to all Work Unit and Station personnel who participated in the field and office work. The Southeastern Station gratefully acknowledges the cooperation and assistance provided by the Georgia Forestry Commission in collecting field data. Karen J. Lee of the Economics of Forest Protection and Management Research Work Unit provided the projections of timberland area by ownership and stand type. Appreciation is also expressed for the excellent cooperation of other public agencies, forest industries, and private landowners in providing information and allowing access to the sample locations.

Tabular data included in FIA reports are designed to provide a comprehensive array of forest resource statistics, but additional data can be obtained for those who require more specialized information. A Forest Information Retrieval service is available for custom compilation of forest resource data for any area within the Southeastern States. Data in a format common to the four FIA units in the Eastern United States (Eastwide Data Base) are also available (Hansen and others 1992). Custom compilations of tabular data and datasets require processing fees; costs may range from less than \$100 for a relatively simple retrieval to several thousand dollars for a complex request that involves special programming. Although such requests are usually serviced promptly, attention to special requests is sometimes delayed by our regular duties.

Information concerning any aspect of this survey may be obtained from:

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Noel D. Cost
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Highlights

This Bulletin describes Georgia's timber resources in 1989 and the changes in those resources that have occurred since the last inventory of the State's forests in 1982. One of the purposes of the Bulletin is to help planners and policymakers make informed long-term decisions about forests.

Since the interval between statewide inventories in the Southeastern United States is about 7 years, the changes that are reported are often small. Changes in forest policies and forest-industry utilization policies usually have subtle effects on forests. In at least two ways, therefore, this State report is atypical. It documents very large increases in pine planting and in the utilization of hardwood timber.

Since the last statewide inventory in Georgia, the acreage of pine planting increased from 163,000 acres per year to 342,000 acres per year. Georgia has led the Nation in tree planting since 1982. The 1982 report documented declines in pine acreage that did not bode well for forest industries in the State. Through mechanisms that we do not document here, the State's forestry community responded with major increases in southern pine planting.

The 1982 report also spoke of underutilization of plentiful hardwoods. Again, by mechanisms that we did not measure, use of hardwoods increased by 50 percent. Faced with increasing demand for pine, forest industry responded by increasing its use of hardwoods in certain products, particularly pulp and paper.

In reporting these accomplishments, we do not mean to suggest that all of Georgia's timber supply problems have been solved. Problems remain, and new ones will appear as the resource changes, the land base for timber production shrinks, and the demand for forest products and forest benefits of all kinds increase. We are confident that Georgia's forest resources can rebound from current and future problems if they are handled with the same energy and dedication as the 1982 problems.

Since the fifth inventory of Georgia's forest resources was completed in 1982--

- *timberland area has been relatively stable, dropping by only 0.1 million acres.* More than 23.6 million acres are classed as timberland. The small loss of timberland is in stark contrast to the large losses sustained during the 1960's and 1970's. Increasing amounts of tree planting and natural reversion of agricultural land to forest are responsible for the recent stability in timberland acreage.

- *ownership of timberland by farmers continued to drop, with a 19-percent reduction to 4.9 million acres during the 7-year period.* In contrast, timberland ownership by other individuals and other corporations rose during the period. Other individuals control 9.2 million acres of Georgia timberland, up by 6 percent, whereas other corporate ownership increased by 38 percent to 2.0 million acres. Forest industries control one-fourth (5.9 million acres) of the State's timberland through fee simple ownership or long-term lease arrangements. Public agencies control 1.6 million acres of timberland.

- *timberland classified as a pine plantation increased by 40 percent to 5.0 million acres in response to increased tree planting on cutover forest land and on agricultural land.* Area in natural pine stands continued a long-term reduction, falling from 7.8 to 6.0 million acres. Timberland classed as oak-pine and hardwood forest types increased by modest amounts--4 percent for oak-pine and 2 percent for hardwood forest types.

- *volume of softwood growing stock on timberland declined from 16.5 to 15.6 billion cubic feet, a 6-percent drop.* Most of the loss occurred on NIPF timberland, where softwood volume fell by 9 percent. Softwood growing-stock volume was stable on forest industry timberland and increased by 5 percent on public forests. Softwood volumes fell in every region of the State, but losses were concentrated in the Piedmont. Statewide, softwood volume reductions occurred in the 6-inch through the 16-inch d.b.h. classes.

- *volume of hardwood growing stock on timberland increased from 14.4 to 15.1 billion cubic feet, a rate of increase well under those recorded for several previous decades.* Modest increases in hardwood inventory occurred on public and NIPF properties, but a drop of 15 percent was measured on forest industry land. Hardwood growing stock increased in each region, for most tree sizes, and for all major species or species groups. The inventory of hardwood growing stock includes 42.4 billion board feet of sawtimber. More than two-fifths of all hardwood sawtimber is in tree grade 1 or 2 trees.

- *average net annual growth of softwoods declined by 15 percent to 818 million cubic feet per year.* Annual softwood removals now exceed softwood net growth by 17 percent. Almost all the decline in softwood net growth occurred on NIPF land, where a drop of 26 percent was measured. Softwood growth is rising on forest industry land as extensive acreages of pine plantations reach merchantable size.



- *average net annual growth of hardwoods declined by 11 percent to 457 million cubic feet per year.* Hardwood growth still exceeds removals (by 33 percent), but the margin of excess growth has narrowed considerably. Reductions in hardwood net growth were evident for each major ownership group and throughout the State.

- *annual removals of softwood growing stock increased by 16 percent to 960 million cubic feet.* Softwood removals declined on public land and increased on all other ownership categories. Sixty-three percent of the softwood removals came from NIPF land, 33 percent from forest industry land, and 4 percent from public land. Pine plantations supplied 24 percent of total softwood removals. Hardwood removals increased nearly 50 percent to 343 million cubic feet annually. Removals of hardwood growing stock increased across all ownership categories. NIPF land accounted for two-thirds of hardwood removals.

- *total annual output of timber products increased 38 percent, averaging 1.5 billion cubic feet annually.* About 85 percent of the output was from roundwood, with the remaining 15 percent from mill byproducts. The production of pulpwood accounted for nearly half of total production. Saw logs accounted for 33 percent, veneer logs 5 percent, other miscellaneous products 4 percent, and domestic fuelwood the remaining 8 percent of total output.

- *rates of artificial regeneration more than doubled compared with the previous inventory period.* Together with improved natural regeneration, increased planting helped to improve the overall balance between pine acreage harvested annually and acreage regenerated back to pine. Planting on retired agricultural land accounted for more than one-fifth of the acreage planted.

- *reductions in softwood inventory are forecast for Georgia until recently established plantations reach merchantable size.* By the year 2000, volumes in these plantations should help boost softwood growth and balance growth:cut ratios. The long upward trend in hardwood inventory is likely to peak in the 1990's.

GEORGIA

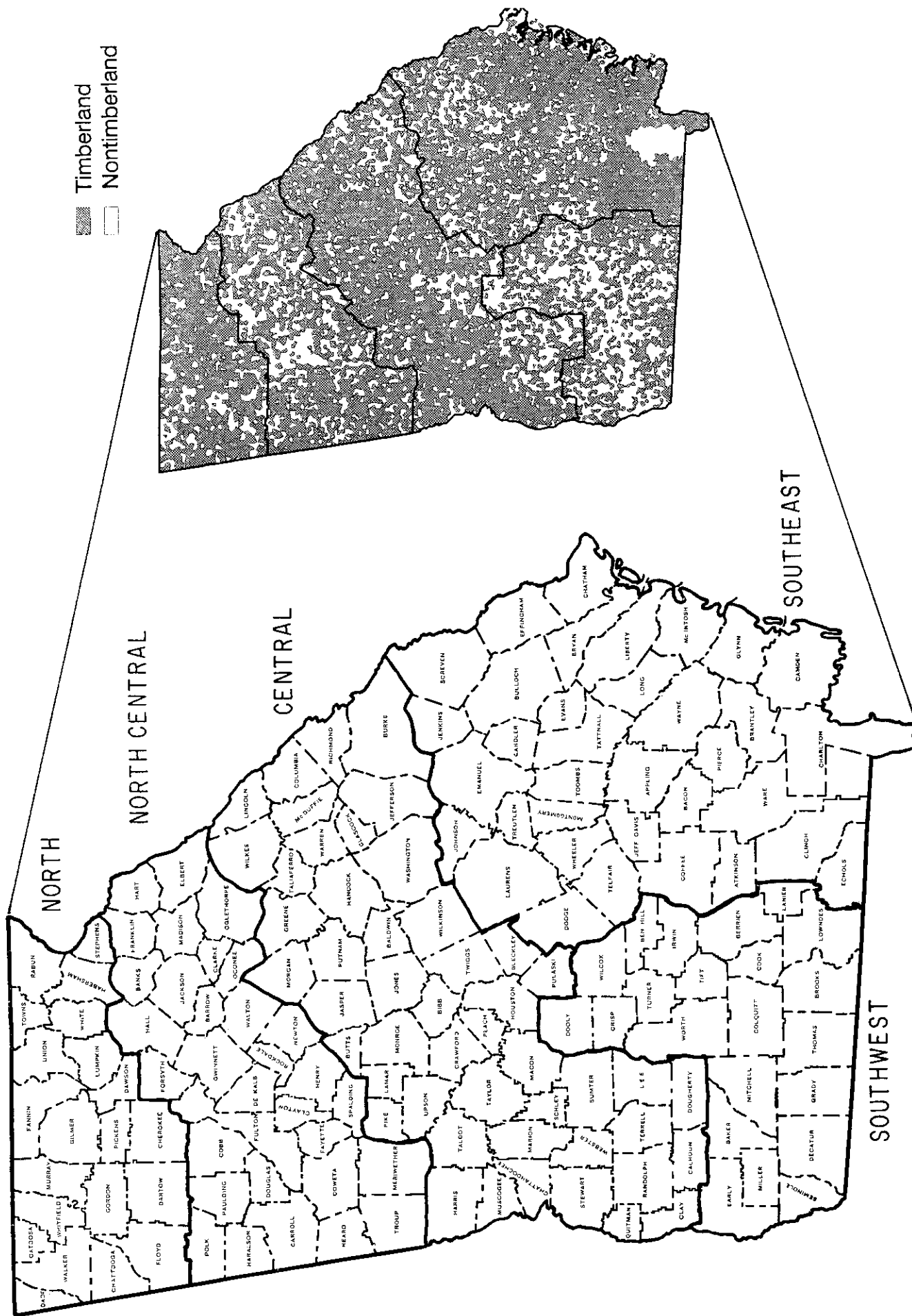


Figure 1.--Forest Survey Units in Georgia with a generalized distribution of timberland.

Forest Trends

Georgia's boundaries encompass 37.1 million acres of land plus nearly 0.6 million acres of inland water. Forests occupy 24.1 million acres or about 65 percent of the land area. A variety of other land uses accounts for the remaining 13 million acres of land. Nearly 9.2 million acres are used for agricultural purposes and 3.2 million acres for numerous urban land uses. About 0.6 million acres are classified as marsh or noncensus water.

The vast majority (23.6 million acres) of the forest land is classed as timberland. Nearly 0.5 million acres are classed as reserved timberland, where management for timber utilization is not practiced because of statutes or administrative regulations. Only 18,000 acres of Georgia's forests are classed as woodland--forests incapable of producing 20 cubic feet of industrial wood per acre per year because of adverse site conditions.

Basic differences in geography and land use require the division of the State into basic resource areas or Survey Units (fig. 1). Southeast and Southwest Georgia coincide with the Coastal Plain physiographic province, Central and North Central Georgia with the Piedmont province, and North Georgia with the Mountains. Forests are the dominant land use throughout much of the State. Only Southwest Georgia has more land in nonforest land uses than in forest.

Rate of Reduction in Timberland Slows

Between 1982 and 1989, timberland area in Georgia dropped only 0.1 million acres to 23.6 million acres (table I). This small reduction represents a striking change from the net loss of 2.1 million acres that occurred between 1961 and 1982. In the 1940's and

1950's, substantial increases in area of timberland occurred as natural reversion and planting of marginal farmland boosted forest area. The primary driving force behind the recent stabilization of timberland acreage was an increased rate of planting and natural reversion of agricultural lands to forest (fig. 2). Between 1972 and 1982, only 36,000 acres each year moved from nontimberland into a timberland category. Between 1982 and 1989, about 125,000 acres were added to the timberland base annually. Increased planting and natural reversion are responsible for this increase. Annual diversions of timberland to nontimberland uses were essentially stable across the last two survey periods. The annual rate of timberland clearing for agricultural uses dropped by 30 percent (26,000 acres) but was offset by a commensurate increase in the rate of clearing for urban land uses. Residential uses accounted for more than one-half of the timberland acreage cleared for urban development. Industrial, recreational, institutional, transportation, utilities, and an assortment of other urban uses accounted for roughly equal proportions of the remainder.

Changes in timberland acreage did not occur uniformly across the State. Acreage dropped by 4 and 5 percent in North Central and North Georgia, respectively, but was stable or increased slightly in the other three Survey Units. About three-fifths of the clearing for urban land uses occurred in the two most northern Survey Units. In mountainous North Georgia, almost 50,000 acres of timberland were reclassified to a reserved status where timber cutting is precluded by law or administrative regulations.

Table I--Changes in area of Georgia's timberland between 1982 and 1989, by Survey Unit

Survey Unit	Area of timberland in --		Changes								
			Additions from --					Diversions to --			
	Net change	Total gain	Nonforest	Other forest land	Total loss	Other forest land	Agri- culture	Urban and other	Water		
Thousand acres											
Southeast	7,164.9	7,194.3	+29.4	262.5	246.9	15.6	233.1	0.1	105.2	105.2	22.6
Southwest	2,636.3	2,633.1	-3.2	191.8	184.9	6.9	195.0	--	146.3	41.8	6.9
Central	7,020.7	7,198.0	+177.3	238.2	219.8	18.4	60.8	--	33.3	25.5	2.0
North Central	3,815.0	3,652.8	-162.2	90.9	85.0	5.9	253.2	0.4	73.2	169.6	10.0
North	3,096.8	2,953.0	-143.8	63.8	57.3	6.5	207.6	49.6	59.3	79.0	19.7
State	23,733.7	23,631.2	-102.5	847.2	793.9	53.3	949.7	50.1	417.3	421.1	61.2

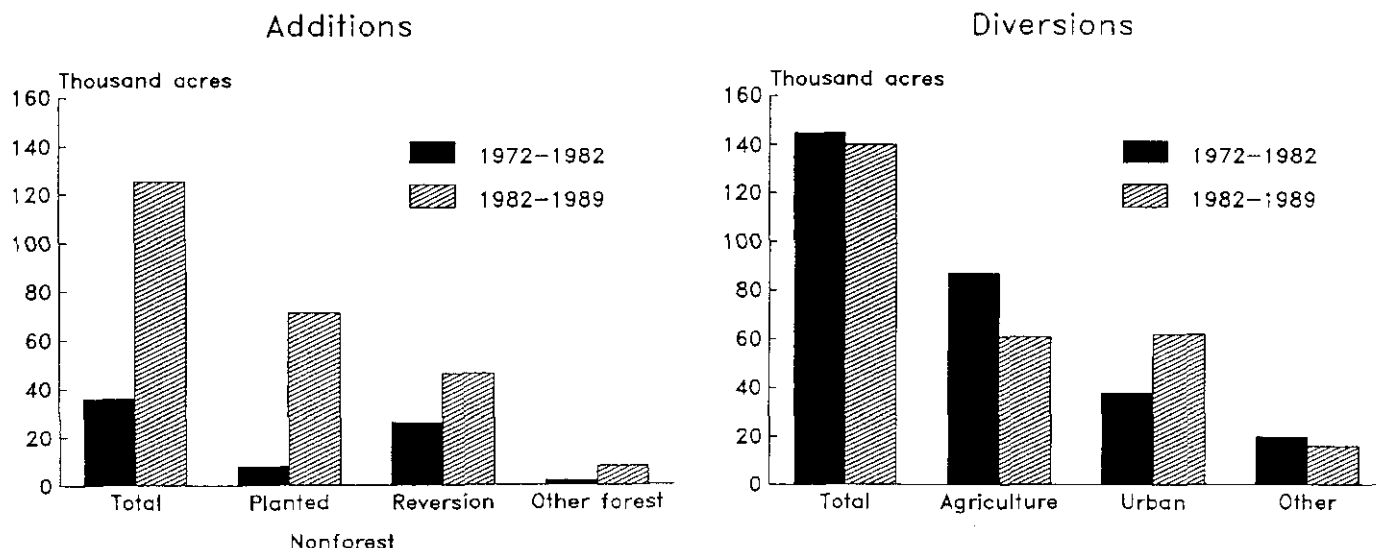


Figure 2.--Annual additions to timberland and diversions of timberland in Georgia, from 1972 to 1982 and 1982 to 1989.

While agricultural clearing decreased since the previous survey period, substantial areas of timberland continued to be cleared for agriculture in southern Georgia. About three-fifths of the 0.4 million acres of timberland clearing for agriculture occurred in Southwest and Southeast Georgia. In those areas, however, diversions were more than offset by additions of new timberland spurred by the Conservation Reserve Program (CRP). CRP enrollments substantially boosted the acreage moving into timberland in the three southernmost Survey Units.

Timberland trends are driven by changes in rates of additions and diversions and by the relationship between the two (fig. 2). Because of a growing population and associated demands for space, future reductions in timberland diversion to other land uses are not very likely. Historically, levels of timberland diversion to other land uses have consistently risen. The rate at which new forests are added to the timberland base is much more volatile, as illustrated by figure 2 and a review of land use trends in Georgia back to the first survey in the 1930's. The high rate of conversion from agricultural land to timberland experienced during the mid to late 1980's cannot be expected to continue. In summary, all evidence points to a probable return to baseline levels of timberland additions with resultant steeper drops in acreage of timberland in coming years compared with that experienced between 1982 and 1989.

Farmer-Owned Timberland Continues Slide

Consistent with long-term trends detailed in a previous analysis of Georgia's forest resources (Sheffield and Knight 1984), the area of timberland owned by farmers dropped throughout the State between 1982 and 1989.

Farmers owned 4.9 million acres of timberland in 1989, 19 percent less than in 1982. Reasons for the decline in farm forestland include changes in owner occupations, actual land transactions, and timberland clearing on farm properties. We do not know how many acres are associated with each reason. Some farmers may have ceased all farming activities when their land was enrolled in the CRP program and planted to trees. Farmers are the major owner group in only one region--agricultural Southwest Georgia--where they control 42 percent of the timberland. In the other regions, farm ownership of timberland ranges from only 12 percent in North Georgia to 21 percent in Southeast Georgia.

Timberland acreages controlled by individuals other than farmers and corporations that do not manufacture forest products increased from 1982 to 1989. Timberland acreage owned by other individuals increased from 8.7 to 9.2 million acres. This group is the largest single owner category in Georgia, with 39 percent of the timberland. Among the diverse types of individual owners in this group are retired persons, professional people such as teachers, doctors, and lawyers, and a host of blue- and white-collar workers. The proportion of other individual ownership of timberland was highest in the northern half of the State. Timberland held by other corporations (not forest industry) increased the most of any single owner group, rising from 1.5 to more than 2.0 million acres. Across the State, corporate owners control 9 percent of the timberland, with slightly higher concentrations in the northern half of the State.

Land held by the three owner groups listed above is called "nonindustrial private forest" (NIPF), or "other private forest." NIPF acreage dropped slightly--from 16.2 to 16.1 million acres--between 1982 and 1989. Still, NIPF owners control 68 percent of Georgia's timberland base.

Forest industry ownership of timberland changed little between 1982 and 1989. Forest industry holds almost 5.0 million acres in fee simple ownership. In addition, nearly 0.9 million acres are under long-term lease arrangements from NIPF owners. Acreage under lease was down by 10 percent. Nevertheless, forest industries control about one-fourth of the State's timberland. Industry ownership is concentrated in the southern half of Georgia, especially in the Southeast (38 percent of the timberland) and Central (27 percent) Survey Units.

Since 1982, timberland under the control of public agencies increased by 4 percent to more than 1.6 million acres. Across the State, public ownership of timberland ranges from a low of 1 percent in Southwest Georgia to 25 percent in North Georgia. Major public holdings of timberland include the Chattahoochee and Oconee National Forests; Fort Benning, Fort Gordon, and Fort Stewart military reservations; Dixon Memorial Forest; Piedmont National Wildlife Refuge; and numerous Corps of Engineers properties around water impoundments.

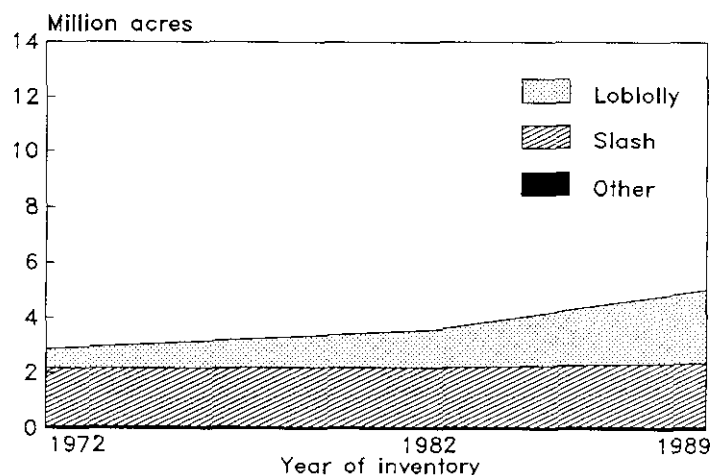
Pine Plantations Up 40 Percent

Since 1982, the acreage of timberland classed as pine plantation in Georgia has increased by 40 percent, rising from 3.6 to 5.0 million acres. Between 1972 and 1982 pine plantation acreage rose from 2.8 to 3.6 million acres (fig. 3a) in response to increased planting rates. Planted slash pine acreage has increased by modest amounts (less than 10 percent) in each survey period since 1972. Major increases have occurred in area of planted loblolly pine stands. In 1972 slash pine plantations outnumbered loblolly plantations by 3 to 1. Area of loblolly pine plantations now exceeds that of slash pine. Many forest managers have turned to loblolly as the species of choice, even in many areas formerly the domain of slash pine.

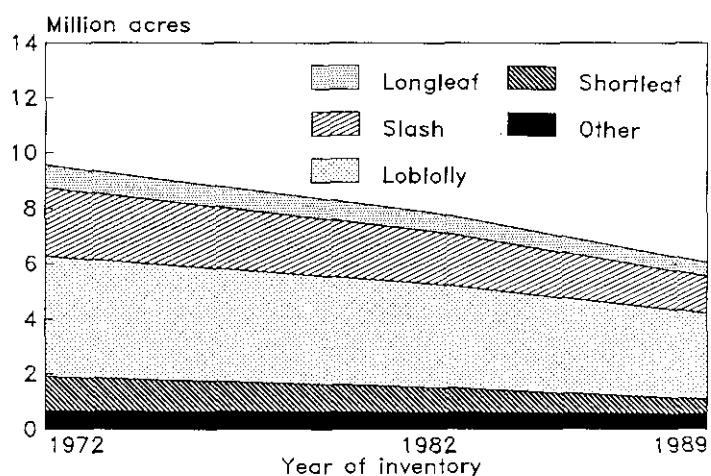
The escalating rate of pine plantation establishment is attributed to the promotional activities of the Georgia Forestry Commission and other forestry interests in the State and to the CRP. Between 1982 and 1989, one-fifth of the planted acreage was nonforest land. On cutover and other poorly stocked timberland, the rate of planting was up by 77 percent in the latest remeasurement period compared with the previous period.

Area in natural pine stands fell from 7.8 to 6.0 million acres between 1982 and 1989 (fig. 3b). The acreage in natural pine stands still exceeds that in pine plantations, but the rates of change exhibited for these two categories suggest that the acreage of pine plantations will exceed that of natural pine before 1995.

(a) Pine plantations



(b) Natural pine



(c) Oak-pine/hardwood

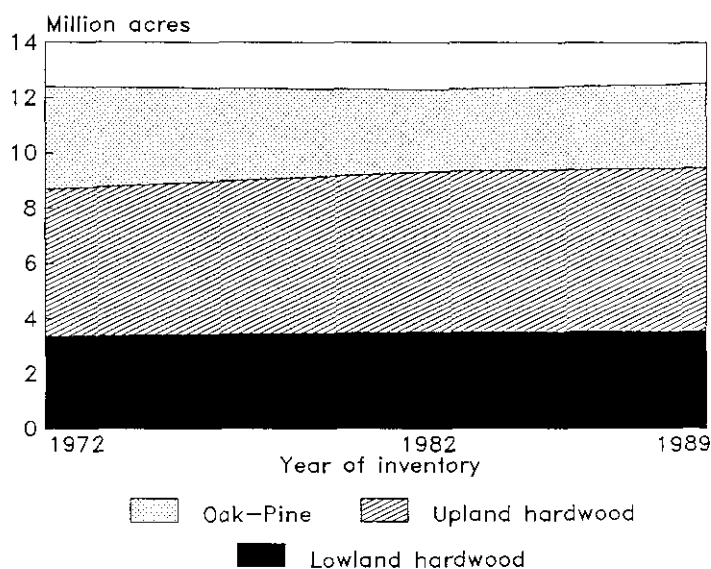


Figure 3.--Area of timberland in pine plantation, natural pine, and oak-pine/hardwood stand types, by forest type component, 1972, 1982, and 1989.

Acreages of all major natural pine forest types declined. Natural loblolly and slash pine stands accounted for two-thirds of the reduction in natural pine stands. However, shortleaf and longleaf pine acreage continued to dwindle, dropping by 41 and 26 percent, respectively. Only one-half million acres of each of these types remain.

Pine forest types, natural and planted combined, make up 47 percent of Georgia's timberland, down slightly from 48 percent in 1982. The total acreage of pine stands dropped from 11.4 to 11.1 million acres between 1982 and 1989. About 45 percent of the acreage moving from a pine to a nonpine type occurred on timberland that was harvested and not subsequently replanted.

Timberland acreage in an oak-pine forest type (between 25 and 50 percent pine stocking) increased by nearly 4 percent (fig. 3c). These mixed stands make up 13 percent of Georgia's timberland. Both upland and lowland hardwood stands increased in area by small amounts between 1982 and 1989. Upland hardwood stands, mostly in oak-hickory forest types, cover some 5.9 million acres. Lowland hardwoods, made up of diverse oak-gum-cypress and elm-ash-cottonwood forest types, account for another 3.6 million acres. The lowland hardwood stands are concentrated in the Coastal Plain, whereas upland hardwoods are concentrated in the Piedmont and Mountains.

Net changes in forest cover types are driven by a host of human-caused and natural factors. Numerous treatments and disturbances, singly or in combination, cause losses and gains much larger than the net change in any one type may suggest. Major factors influencing the interchange of acreage among the forest types include timber harvesting, land clearing, natural and artificial regeneration, and stand structural changes that occur with normal stand development.

Softwood Timber Volume Drops 6 Percent

Volume of softwood growing stock in Georgia declined by 6 percent between 1982 and 1989 (fig. 4). This drop came on the heels of a 6-percent increase in softwood volume between 1972 and 1982 and larger increases for the period prior to that (Sheffield and Knight 1984). These changes are attributable primarily to increases in softwood removals throughout the period with concurrent decreases in net growth. On NIPF land, continuing loss of timberland to other land uses is also a factor. Almost all the recent decline occurred on NIPF land, where softwood growing stock dropped from 11.2 to 10.3 billion cubic feet. Softwood volume on timberland controlled by forest industry was essentially stable, dropping by less than 1 percent to 3.9 billion cubic feet.

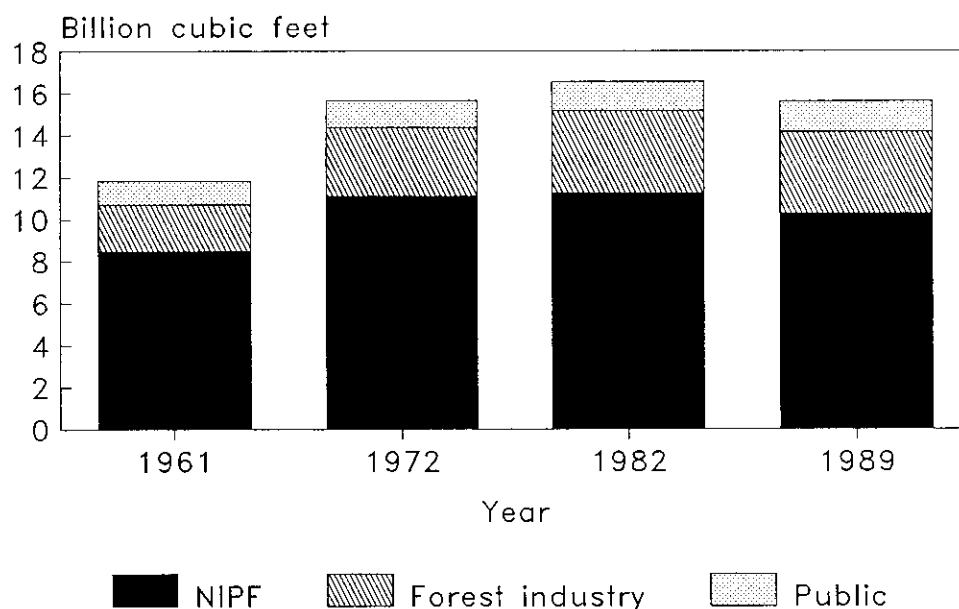


Figure 4.--Volume of softwood growing stock by ownership class, 1961, 1972, 1982, and 1989.

On timberland held by public agencies, volume of softwood growing stock increased by 5 percent to more than 1.4 billion cubic feet. In 1989, NIPF owners controlled two-thirds of Georgia's softwood inventory, forest industry controlled one-fourth, and public agencies held the remainder (9 percent).

Softwood volume declined in each of the five Survey Units in the State, but almost three-fourths of the loss occurred in the Piedmont. Here, softwood growing-stock volume fell by 9 percent between 1982 and 1989. In mountainous North Georgia, softwood volume decreased by 7 percent. Reductions in southern Georgia were more modest--softwood growing stock dropped by 4 percent in Southwest Georgia and by 1 percent in Southeast Georgia. Developing pine plantations boosted the inventory of softwood growing stock on forest industry in Southeast Georgia by 13 percent, just about offsetting an 11-percent reduction on NIPF timberland. This region has more of its timberland in plantations (35 percent) than any other section of the State, and many plantations are old enough to contribute to a buildup in volume. Statewide, 19 percent of the softwood growing stock is contained in pine plantations and 58 percent is in natural pine stands. The remaining 23 percent is in stands classed as an oak-pine or hardwood forest type. Since 1982, softwood volume in plantations has increased by 18 percent, while that in natural pine stands

dropped by 15 percent. The percentage of softwood inventory in pine plantations ranges from a low of 6 percent in North Georgia to 32 percent in Southeast Georgia.

Loblolly pine is the most abundant softwood species. With 7.0 billion cubic feet of growing stock, loblolly pine makes up 45 percent of the 1989 softwood inventory (fig. 5). Slash pine, with 3.9 billion cubic feet, accounts for one-fourth of the total. In spite of their extensive use in pine plantations, volume of loblolly and slash pines declined by 5 and 6 percent between 1982 and 1989. Slash pine plantations have already begun to provide substantial timber removals--almost one-half of the slash pine volume cut in Georgia between 1982 and 1989 was from planted stands. Loblolly plantations have yet to supply a large proportion of annual cut; natural stands provided 86 percent of the loblolly pine cut during the period. The full impact of recent plantings on volume accumulation will not be realized for another 10 years or longer; more than three-fifths of the loblolly plantations and two-fifths of the slash pine plantations are 10 years of age or less. These stands contain little growing-stock volume.

The largest volume reductions were recorded for shortleaf pine (down 18 percent) and longleaf pine (down 13 percent). Virginia pine was the only major yellow pine

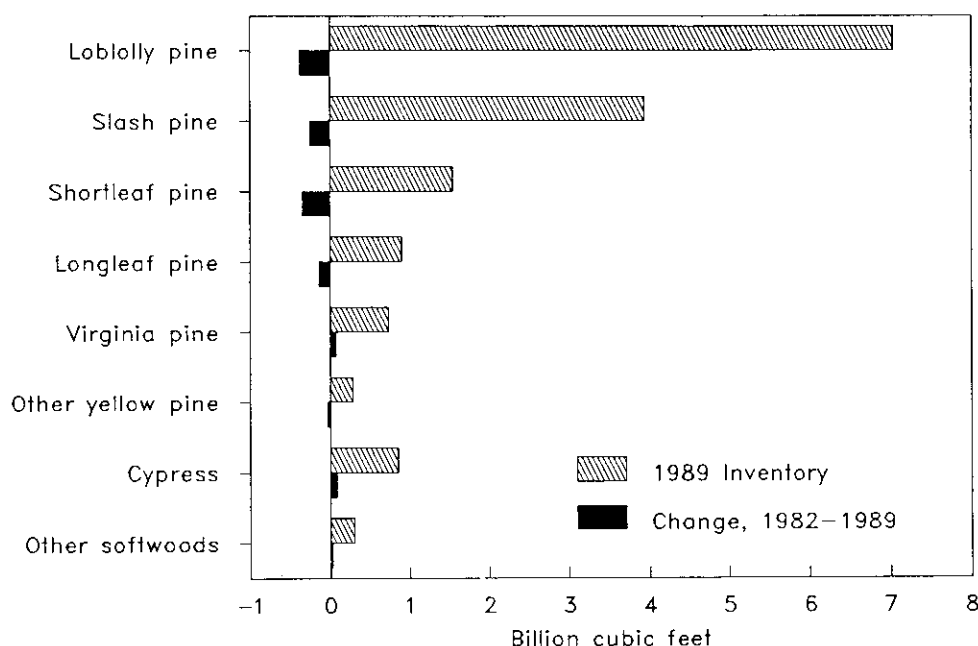


Figure 5.--Volume of softwood growing stock by species, 1989, and change since 1982.

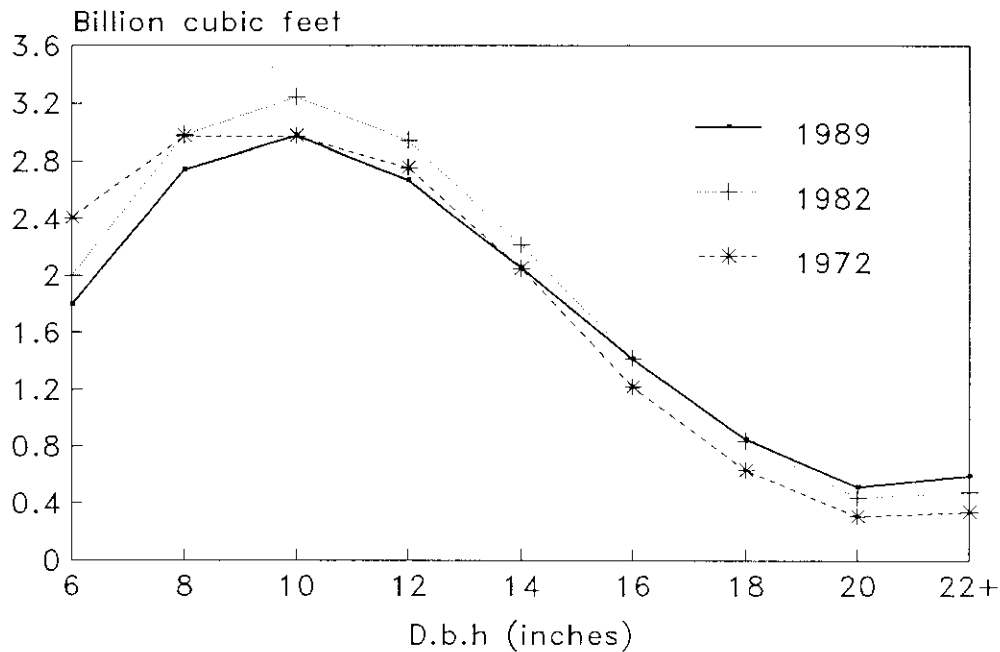


Figure 6.--Volume of softwood growing stock by tree d.b.h. class, 1972, 1982, and 1989.

species to gain volume during the 7-year period, increasing by 11 percent to 0.7 billion cubic feet. Volume of cypress rose by 10 percent.

Softwood volume reductions between 1982 and 1989 were recorded for all 2-inch diameter classes from 6 through 16 inches (fig. 6). Softwood volume in the 18-inch and larger classes increased by 12 percent. Changes shown in figure 6 illustrate that the current softwood inventory is more heavily dominated by large trees than in 1972 or 1982. Reductions that were confined to the 6-inch class in 1982 have advanced upward through consecutively larger size classes in the latest period. These changes have resulted primarily from two developments. First, cutting pressure on small pines has increased. Collectively, softwood removals from the 6-through the 12-inch diameter classes have increased by 30 percent since the 1972-82 period while remaining static or dropping somewhat for larger d.b.h. classes. About two-thirds of softwood removals are taken from trees 6 to 12 inches d.b.h. Escalating removals of small trees instead of larger ones is probably related to increased thinning and final harvesting of pine plantations, and to possible differences in availability of older stands compared with younger ones.

Reduced volumes of small- to medium-diameter softwoods is also attributable to inadequate pine stand establishment during the 1960's and 1970's. Reduced regeneration in that era resulted in fewer softwoods entering merchantable sizes as early as in the last survey (Sheffield and Knight 1984). The deficiency has moved upward through the stand table to affect volumes in progressively larger size classes.

Number of softwood saplings (1.0-4.9 inches d.b.h.) continued to drop between 1982 and 1989 but at a rate far below that experienced between 1972 and 1982. The number of 2-inch softwoods declined by only 1 percent compared with 41 percent in the previous period, whereas 4-inch softwoods dropped by 13 percent contrasted with 28 percent in the previous period. Increased planting on forest and nonforest land and more successful natural regeneration have abated the slide in number of small softwoods. The trend toward fewer small softwoods should reverse in the next 5 to 10 years as recently established plantations and naturally regenerated stands develop. About 1.1 million acres of planted stands were 3 years of age or less in 1989. At this age, most stems in these stands are still in the seedling stage (less than 1.0 inch d.b.h.).

The inventory of softwood growing stock includes 53.4 billion board feet (International 1/4-inch log rule) of sawtimber. That total is essentially the same as in 1982. The saw-log portion of softwood sawtimber trees makes up 64 percent of all softwood growing stock, whereas the upper-stem portion of sawtimber trees accounts for another 7 percent. Poletimber trees make up 29 percent of softwood growing stock (app. table 22). Expressed in cubic volume, softwood sawtimber totals nearly 10.0 billion cubic feet.

Reductions in volume of softwood sawtimber of about 4 percent occurred in the Piedmont Units of the State. Increases ranging from 1 to 4 percent were recorded in the other sections of the State. On public timberland, softwood sawtimber volume rose by 12 percent between 1982 and 1989. In contrast, it dropped by 2 percent on NIPF timberland and by 3 percent on forest industry land.

Buildup in Hardwood Inventory Slows

The inventory of hardwood growing stock continued a long-term rise, but the rate of increase was well below that of several previous decades (fig. 7). Hardwood volume increased from 14.4 billion cubic feet in 1982 to 15.1 billion cubic feet in 1989, a 5-percent increase. In contrast, hardwood volume rose by 17 percent between 1972 and 1982 and by 26 percent between 1961 and 1972. Rising levels of hardwood removals coupled with declining hardwood growth in the latest remeasurement period slowed the hardwood inventory buildup.

Since 1982, volume of hardwood growing stock rose by 12 percent on public timberland and by 9 percent on NIPF. In contrast, hardwood inventories fell by 15 percent on timberland controlled by forest industry. In 1989, NIPF owners controlled 75 percent of Georgia's hardwood inventory, forest industry controlled 15 percent, and public agencies controlled the remaining 10 percent. Regionally, hardwood growing stock increased in each of the five Survey Units in Georgia; the increases ranged from 3 percent in Central Georgia to 9 percent in North Central Georgia.

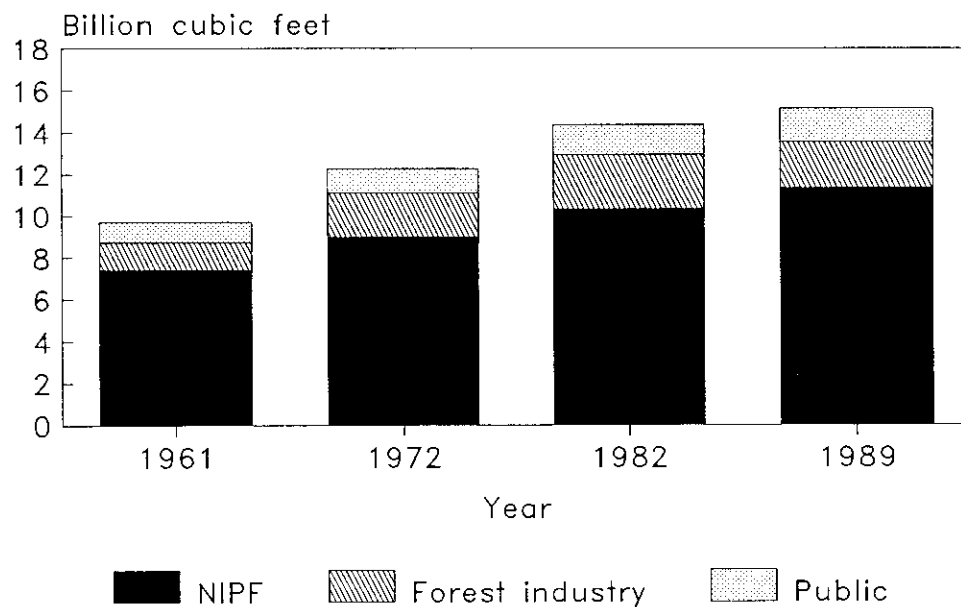


Figure 7.--Volume of hardwood growing stock by ownership class, 1961, 1972, 1982, and 1989.

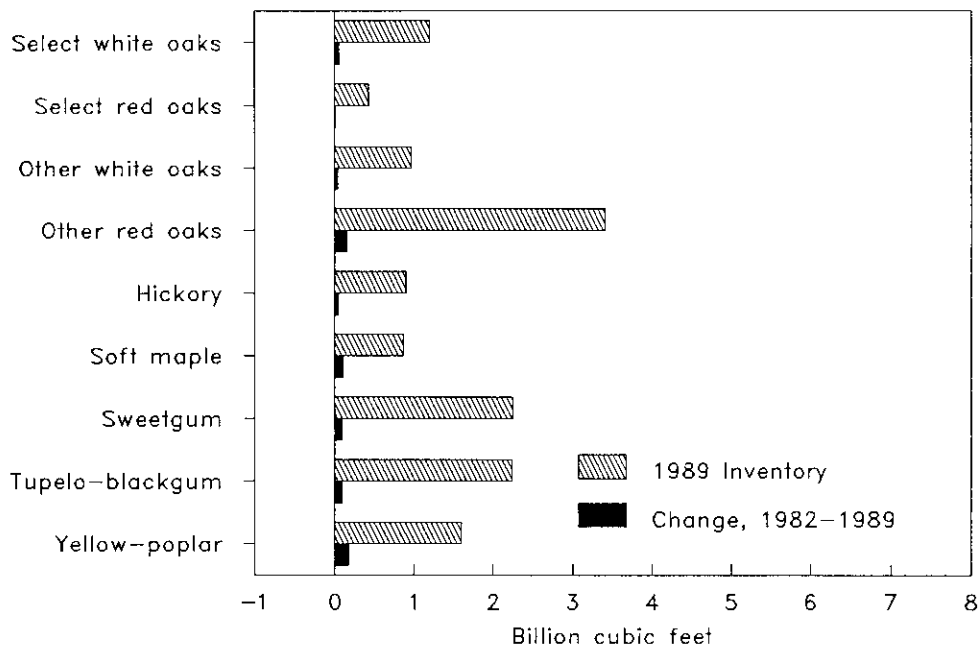


Figure 8.--Volume of hardwood growing stock by species, 1989, and change since 1982.

All the major hardwood species and species groups have increased in volume since 1982 (fig. 8). Most of the increases were modest: 2 percent for select red oaks; 5 percent for select white oaks, other red oaks, other white oaks, tupelo and blackgum; 4 percent for sweetgum, and 6 percent for hickories. Thirteen-percent increases were recorded for yellow-poplar and soft maples. Collectively, a wide variety of oak species accounts for 6.0 billion cubic feet of growing-stock inventory, 40 percent of Georgia's hardwoods. Tupelo/blackgum and sweetgum each account for 2.2 billion cubic feet, or 15 percent of the total.

The slowing of hardwood inventory accumulation was evident across the range of hardwood tree sizes (fig. 9). The only d.b.h. class with a reduction in hardwood growing stock was the 6-inch class, but gains across the range of tree sizes were modest in comparison with those of the previous inventory period. Hardwood volume increases that did occur were concentrated in the upper end of the diameter class groups. Almost 80 percent of the hardwood inventory increase was in trees larger than 13 inches d.b.h. Hardwood removals were up by substantial amounts for all tree sizes, but the largest jump in hardwood removals occurred in the 8- to

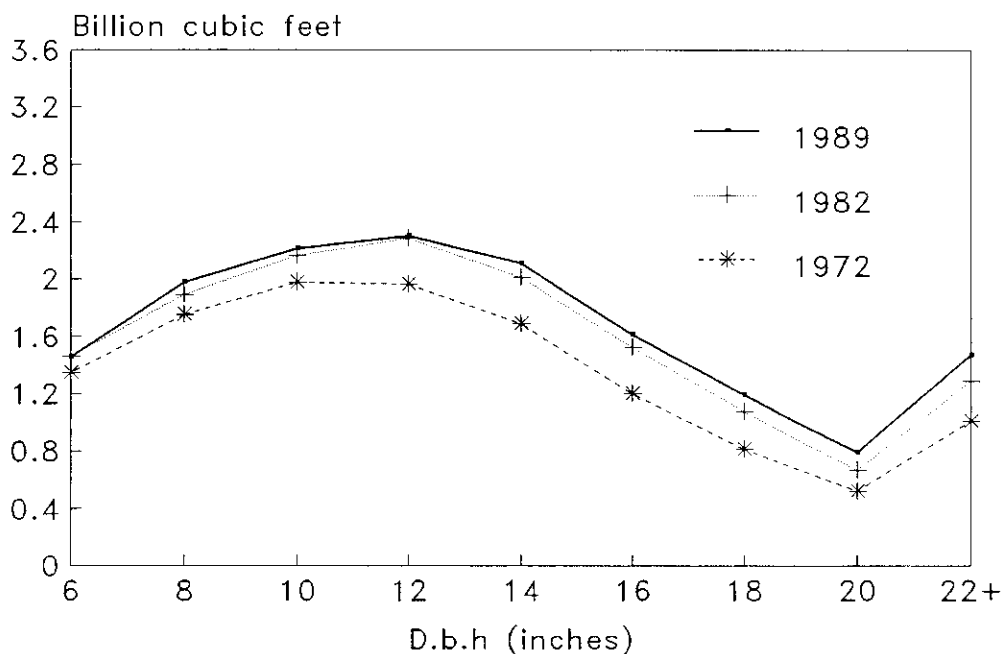
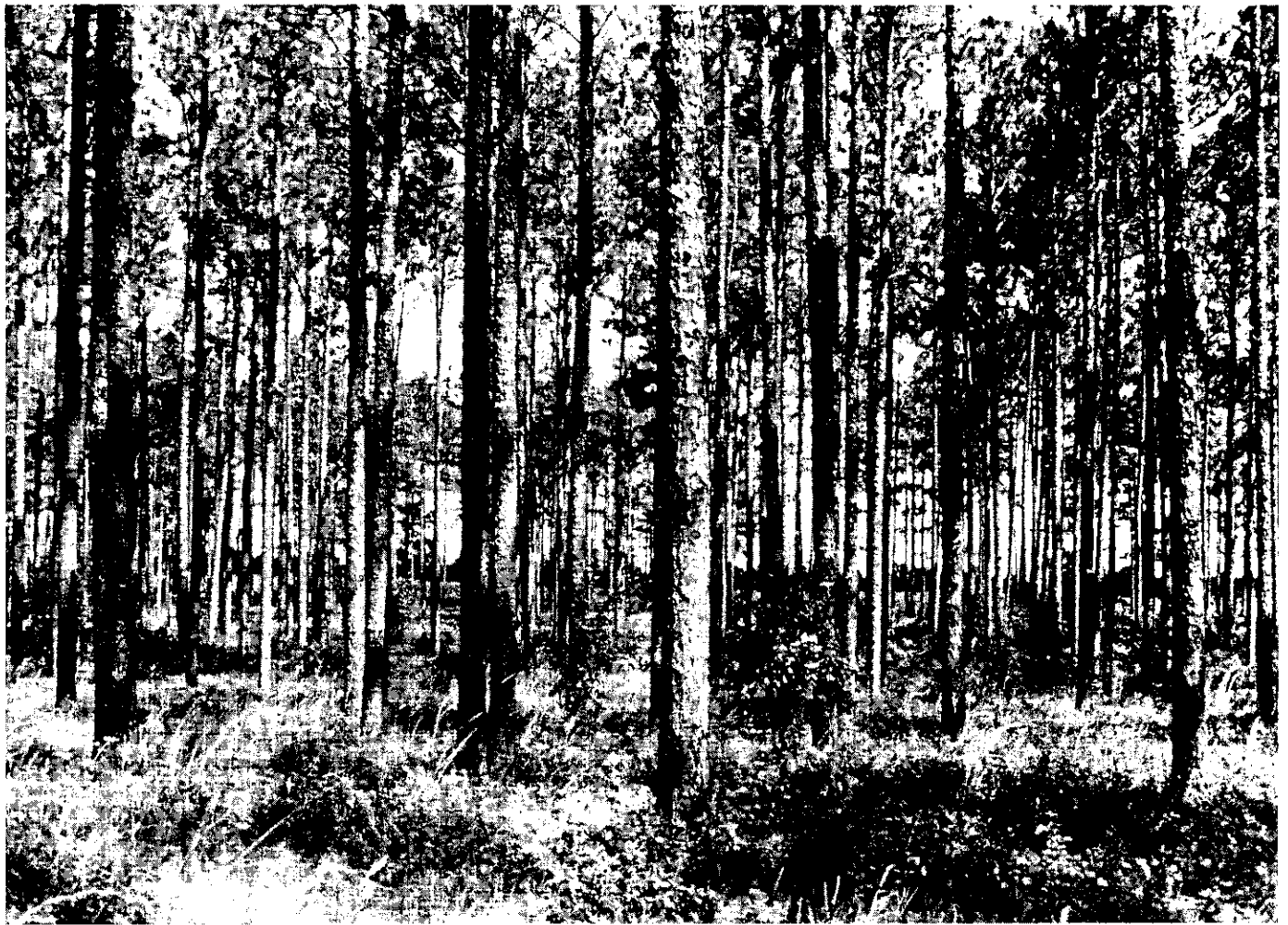


Figure 9.--Volume of hardwood growing stock by tree d.b.h. class, 1972, 1982, and 1989.



14-inch classes. In these sizes, hardwood removals jumped by 70 percent since the previous survey period. These removal increases, combined with reduced levels of hardwood growth, resulted in the modest volume changes.

The inventory of hardwood growing stock includes 42.4 billion board feet (International 1/4-inch log rule) of sawtimber, an increase of 11 percent since 1982. The saw-log portions of hardwood sawtimber trees make up 53 percent of all hardwood growing stock, the upper-stem portion of sawtimber trees accounts for 10 percent, and poletimber trees make up 37 percent (app. table 22). The cubic volume equivalent in hardwood sawtimber trees is nearly 8.0 billion cubic feet.

Hardwood sawtimber volume was up in each region of the State. By ownership, the patterns of change followed those for hardwood growing stock, with a 14-percent reduction in hardwood sawtimber inventory on forest industry and increases of 16 percent on NIPF and 18 percent on public timberland.

The quality of hardwood sawtimber is a concern of hardwood lumber and veneer manufacturers. In Georgia, each sawtimber tree was assigned a tree grade (see

references cited in appendix table 21 for detailed procedures). The entire board-foot volume of each tree is assigned to a single grade, generally the log grade of the butt log in the tree. Hence, tree grades portray a brighter picture than an actual log-grade distribution would. In previous inventories, log grade distributions were estimated for the State from subsamples of the full complement of plots.

About 44 percent of Georgia's hardwood volume is in grade 1 or 2 trees, 43 percent is in grade 3 trees, and 13 percent is in grade 4 trees (butt log qualifies as tie and timber grade only). The larger trees have better overall quality. Sixty-two percent of the hardwood sawtimber trees 15.0 inches and larger at d.b.h. are classed as grade 1 or 2. Distributions of sawtimber volume by grade are presented for various species groups in appendix table 21.

Forest Biomass Totals 45.4 Billion Cubic Feet

Non-growing-stock volumes have continued to grow in importance as a utilizable source of fiber. Escalating use of wood for pulp, panel products, and fuel has increased the need for quantifying all possible sources of wood fiber. In 1989, total-tree volume in Georgia amounted to

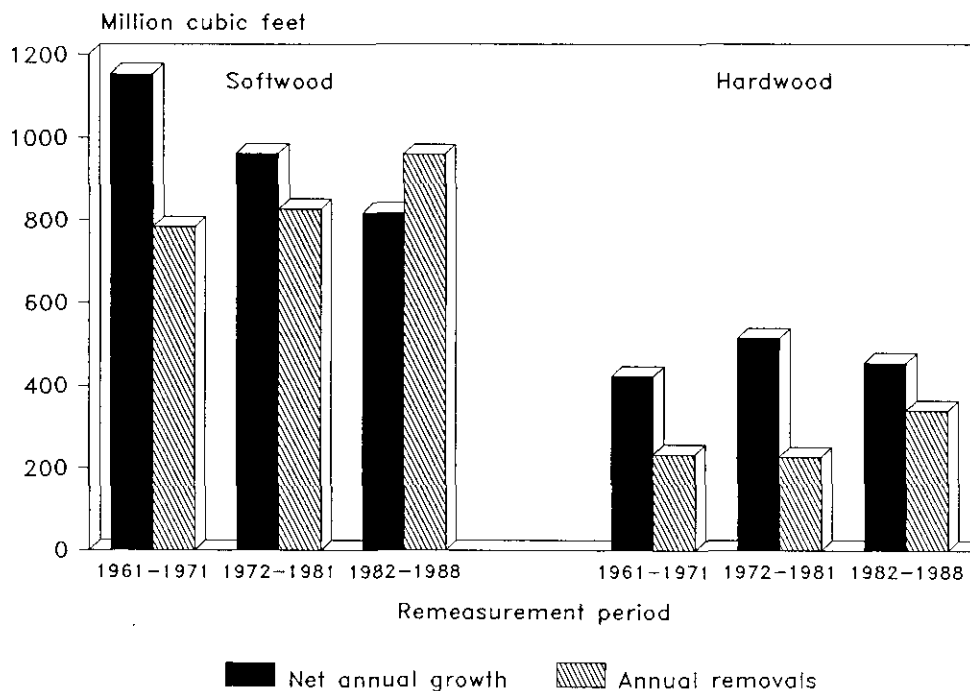


Figure 10.--Average net annual growth and annual timber removals of growing stock by softwood and hardwood, 1961-1971, 1972-1981, and 1982-1988.

45.4 billion cubic feet, 48-percent more than the conventional growing-stock volume of 30.7 billion cubic feet (app. table 22). Rough and rotten trees contain 1.9 billion cubic feet of merchantable volume; stumps, tops, and limbs contain 7.3 billion cubic feet; and saplings contain 5.5 billion cubic feet. Hardwood species make up more than two-thirds of the additional volume. The total inventory has an equivalent green weight of 1.7 billion tons, or 71 tons per acre of timberland.

Net Annual Growth Is Down 14 Percent

Average net annual growth of growing stock in Georgia declined by 14 percent during the latest remeasurement period (1982-88) compared with the previous period (1972-81). Net annual growth of all species averaged nearly 1.3 billion cubic feet during the latest period, or 54 cubic feet per acre of timberland. Net growth of softwood species dropped by 15 percent to 818 million cubic feet annually; net growth of hardwood species dropped by 11 percent to 457 million cubic feet annually (fig. 10). For softwoods, the recent growth reduction came on the heels of a 17-percent drop in the previous remeasurement period. The drop in hardwood growth was the first observed since the initial inventory of the State conducted in 1936.

In contrast to the downward trend in softwood growth, removals have escalated during the last three decades. During the latest period, they rose by 16 percent, overtaking and exceeding softwood growth by 17 percent. After several decades of little change, hardwood removals jumped by 50 percent during the 1982-88 period.

This increase, combined with the reduction in hardwood growth, narrowed the gap between hardwood growth and removals considerably. Ratios of hardwood growth to removals have gone from 1.8 to 1 in 1972, to 2.3 to 1 in 1982, to 1.3 to 1 in the latest inventory.

The latest drop in softwood net growth occurred in all Survey Units except Southeast Georgia, where growth was essentially unchanged. In the other regions, softwood growth reductions ranged from 16 percent in Central Georgia to 35 percent in the North Central Unit. Geographically, softwood growth trends have been consistent since 1972. Softwood growth has been stable and relatively high in Southeast Georgia, where many of the maturing pine plantations, primarily on forest industry holdings, are concentrated. Since 1972, softwood growth reductions of 38, 55, and 39 percent have been measured in Central, North Central, and North Georgia. In the northern half of the State, the softwood resource has been dominated by natural stands on NIPF land. During the last three remeasurement periods, these stands have progressively moved into older age classes characterized by higher density and slower rates of volume accumulation. Major planting activity was apparent during the latest period in much of the State, but these relatively young stands will not contribute positively to softwood growth levels until the late 1990's and beyond.

Almost all the decline in softwood growth occurred on NIPF timberland, where softwood net growth dropped from 613 to 455 million cubic feet, a reduction of 26 percent. Softwood growth on NIPF land has plummeted

by 45 percent since 1972. Softwood growth on public forests has also dropped during this period, by 20 percent in each of the last two remeasurement periods. In contrast, softwood growth is rising on forest industry ownerships, where extensive acreages of pine plantations have boosted growth in each of the last two surveys. Softwood net growth on forest industry land now totals 315 million cubic feet, 9 percent more than in 1982 and 26 percent more than in 1972. These divergent trends in softwood growth by ownership have resulted in a major shift in the distribution of growth. In 1972, NIPF owners accounted for 72 percent of the softwood growth and forest industry for 22 percent. In 1989, NIPF owners account for 56 percent, and forest industry's share has risen to 39 percent.

Different trends in softwood growth by ownership are also apparent in comparisons of per acre growth (fig. 11). Although the hardwood component of growth per

acre was down for each of the three owner groups in the latest period, softwood growth changes have been the driving force behind productivity changes during the past three decades. Softwood growth averaged across all public timberland has dropped from 45 to 28 cubic feet per acre, while total growth per acre dropped from 66 to 51 cubic feet. On NIPF land, softwood growth during the three periods has dropped from 47 to 28 cubic feet per acre while total per acre growth dropped from 65 to 50 cubic feet. In contrast, softwood growth on forest industry land has risen from 46 to 54 cubic feet per acre, with most of the increase occurring in the 1982-88 period. These positive softwood growth changes on forest industry are attributable to increasing acreage of pine plantations moving into and through stages of highest growth, generally from stand ages 10 through 25 years.

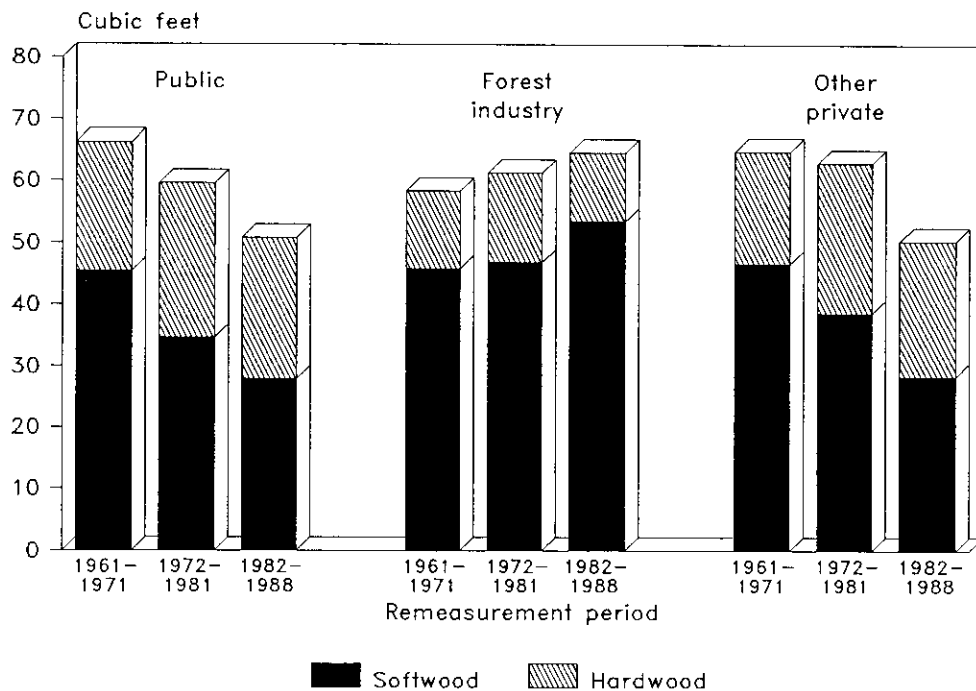


Figure 11.--Net annual growth per acre of timberland, by ownership class and species group, 1961-1971, 1972-1981, and 1982-1988.

Changes in the components of gross and net growth provide insights into recent changes (fig. 12). In the latest remeasurement period, survivor growth, the volume increment on growing-stock trees 5.0 inches d.b.h. and larger in the inventory at the beginning of the year and surviving to its end, made up more than 84 percent of gross growth (table II). Ingrowth, the net volume of growing-stock trees reaching 5.0 inches d.b.h. during the year, and subsequent growth on these trees, accounted for more than 12 percent of gross growth. Growth on removals before removal, and growth on mortality before death, made up 3 percent of gross growth. Since the 1961-71 growth period, the contribution of ingrowth and survivor growth has diminished. In the 1960's, ingrowth was unusually high, accounting for 256 million cubic feet of the gross growth of 1,237 million cubic feet. Between 1972 and 1981, ingrowth returned to more typical levels and has remained there. Ingrowth added only 120 million cubic feet of softwood growing stock to the inventory annually between 1982 and 1988. The volume of softwood survivor growth dropped by a small amount during the 1972-81 period; most of the reduction in survivor growth was recorded since 1981. Softwood net growth was reduced further

by increased softwood mortality in the 1970's. Softwood mortality during the latest remeasurement period was down slightly.

Large acreages of abandoned farmland reverted naturally to pine or were planted during the 1950's and 1960's; many of these stands developed to merchantable size between 1961 and 1972, boosting the level of ingrowth. Declines in acreage of pine establishment in the 1970's led to subsequent reductions in ingrowth and current relatively low levels of survivor growth. Reduced numbers of small softwoods observed between 1972 and 1982 are now showing up in larger diameter classes. These reductions, combined with increased harvesting of small- to medium-diameter pines, translate into less survivor growth. Another factor in reduced survivor growth is that softwoods in natural stands grew less rapidly in diameter in the 1980's than they did in the 1960's and 1970's (Sheffield and others 1985). This change in natural stands has been partially offset by the higher growth rates for pines in planted stands, and by the increasing proportion of plantations relative to natural stands. The recent increase in planting since 1982 should improve ingrowth and survivor growth in the next two decades.

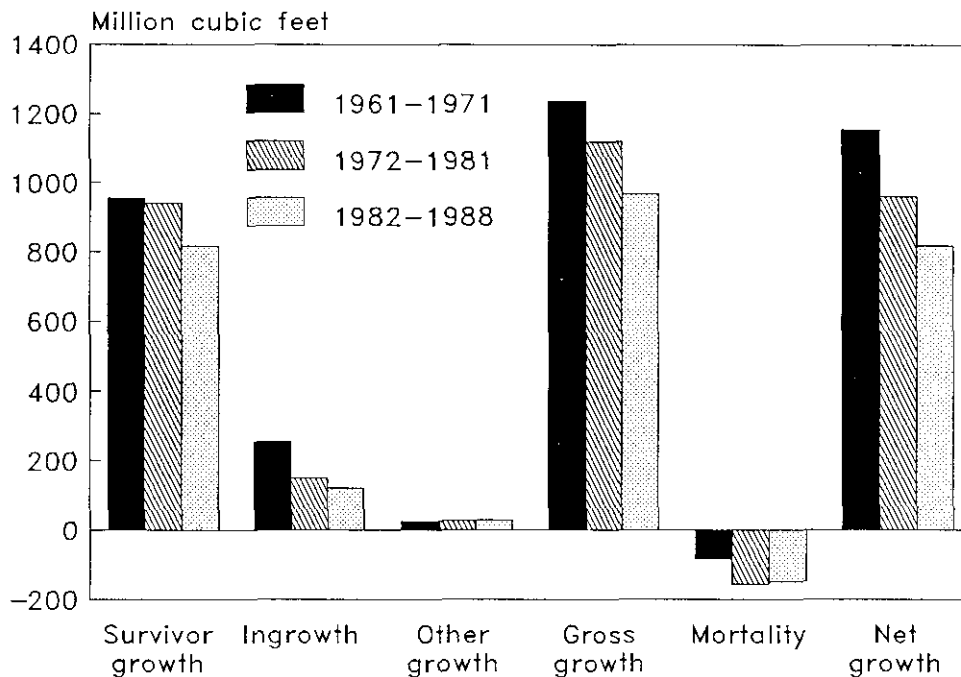


Figure 12.--Average annual growth components for softwood growing stock, 1961-1971, 1972-1981, and 1982-1988.

Table II—Average annual components of change in the volume of growing stock on Georgia's timberland, by Survey Unit and species group, 1982–1988

Survey Unit and species group	Gross growth	Components of growth					Mortality	Net growth	Removals	Net change
		Survivor growth	Ingrowth	Growth on ingrowth	Growth on removals	Growth on mortality				
Million cubic feet										
Southeast										
Softwood	357.6	293.5	46.4	6.3	10.5	0.9	26.1	331.5	336.8	-5.3
Hardwood	118.2	100.5	15.0	1.1	1.2	0.4	26.4	91.8	73.8	+18.0
Total	475.8	394.0	61.4	7.4	11.7	1.3	52.5	423.3	410.6	+12.7
Southwest										
Softwood	115.2	101.5	9.1	1.1	3.1	0.4	12.8	102.4	113.3	-10.9
Hardwood	58.1	48.7	7.9	0.6	0.5	0.4	17.4	40.7	30.1	+10.6
Total	173.3	150.2	17.0	1.7	3.6	0.8	30.2	143.1	143.4	-.3
Central										
Softwood	268.9	227.2	28.8	3.9	7.4	1.6	51.5	217.4	270.2	-52.8
Hardwood	195.9	171.1	19.7	1.7	2.6	0.8	38.5	157.4	139.4	+18.0
Total	464.8	398.3	48.5	5.6	10.0	2.4	90.0	374.8	409.6	-34.8
North Central										
Softwood	141.7	120.8	14.7	1.6	3.5	1.1	40.3	101.4	153.0	-51.6
Hardwood	111.5	99.1	10.3	0.8	0.9	0.4	21.3	90.2	53.9	+36.3
Total	253.2	219.9	25.0	2.4	4.4	1.5	61.6	191.6	206.9	-15.3
North										
Softwood	83.8	73.8	8.0	0.5	1.2	0.3	18.6	65.2	86.2	-21.0
Hardwood	94.2	83.5	9.6	0.4	0.5	0.2	17.6	76.6	45.4	+31.2
Total	178.0	157.3	17.6	0.9	1.7	0.5	36.2	141.8	131.6	+10.2
State										
Softwood	967.2	816.8	107.0	13.4	25.7	4.3	149.3	817.9	959.5	-141.6
Hardwood	577.9	502.9	62.5	4.6	5.7	2.2	121.2	456.7	342.6	+114.1
Total	1,545.1	1,319.7	169.5	18.0	31.4	6.5	270.5	1,274.6	1,302.1	-27.5

The recent drop in average net annual growth of hardwoods occurred on land in all three major owner groups. It was most pronounced on timberland controlled by forest industry, in part because of the growing proportion of pine plantations and the resulting decline in hardwood inventory on industry land. Hardwood growth fell by 8 percent on NIPF and on public timberland. There, hardwood net growth still exceeds removals by substantial margins, but removals exceed hardwood growth by 35 percent on forest industry land.

Hardwood growth per acre increased during the 1960's and 1970's, but it declined modestly during the 1980's.

This trend was evident for all three owner categories. However, forest industry was the only owner group where hardwood growth per acre dropped below the level recorded for 1961-72.

The recent reduction in hardwood growth occurred throughout the State, but hardwood net growth still exceeds hardwood removals in every Survey Unit in Georgia. The margin of growth over removals is highest (1.7 to 1) in the North Central and North Survey Units. Hardwood growth:removal ratios are 1.1, 1.2, and 1.3 to 1 in Central, Southeast, and Southwest Georgia, respectively.

Recent declines in hardwood net growth have resulted from a combination of small reductions in survivor growth and ingrowth volume, and from a 40-percent increase in annual hardwood mortality (fig. 13). Modest reductions in number of hardwood trees during the past remeasurement period precipitated the drop in survivor growth and ingrowth. Diameter growth rates for hardwoods also dropped during the latest period relative to earlier ones. Increased mortality is discussed in more detail in the following section. The peaking and drop in hardwood net growth were predictable. Georgia's hardwood stands are maturing, and growth slowdowns are to be expected (see age profiles in Timber Supply Outlook chapter). Although increased cutting has begun to create more young hardwood stands, these stands will take many years to reach merchantable size and begin to influence hardwood volume growth. Until then, little increase in hardwood growth can be expected.

Hardwood Mortality Up

Mortality of hardwood growing stock claimed an average of 121 million cubic feet of timber per year since 1982, 40 percent more than during the previous period. Weather and disease were the leading identifiable causes of death. Hardwood mortality reduced potential net growth by 21 percent.

The average volume of hardwood mortality has increased in each of the last two survey periods (fig. 13). Inventory volumes have also risen, so climbing rates of mortality might be expected. Mortality volume expressed as a percentage of the midpoint inventory (the average of the 1982 and 1989 inventories) also reveals an increasing rate of hardwood mortality. During the 1961-71 period, mortality claimed 0.65 percent of the hardwood inventory; this rate remained at 0.65 percent for 1972-81 but rose to 0.82 percent of the inventory for 1982-88.

Softwood mortality volume dropped by 5 percent from the average for the previous survey period, but still claimed 149 million cubic feet annually. For softwoods, the leading identifiable causes of death were insects, disease, weather, and suppression. Mortality reduced potential softwood net growth by 15 percent. In the latest period, softwood mortality was equivalent to 0.93 percent of the midpoint softwood inventory. Softwood mortality rates averaged 0.98 percent for 1972-81 and 0.61 percent for 1961-71.

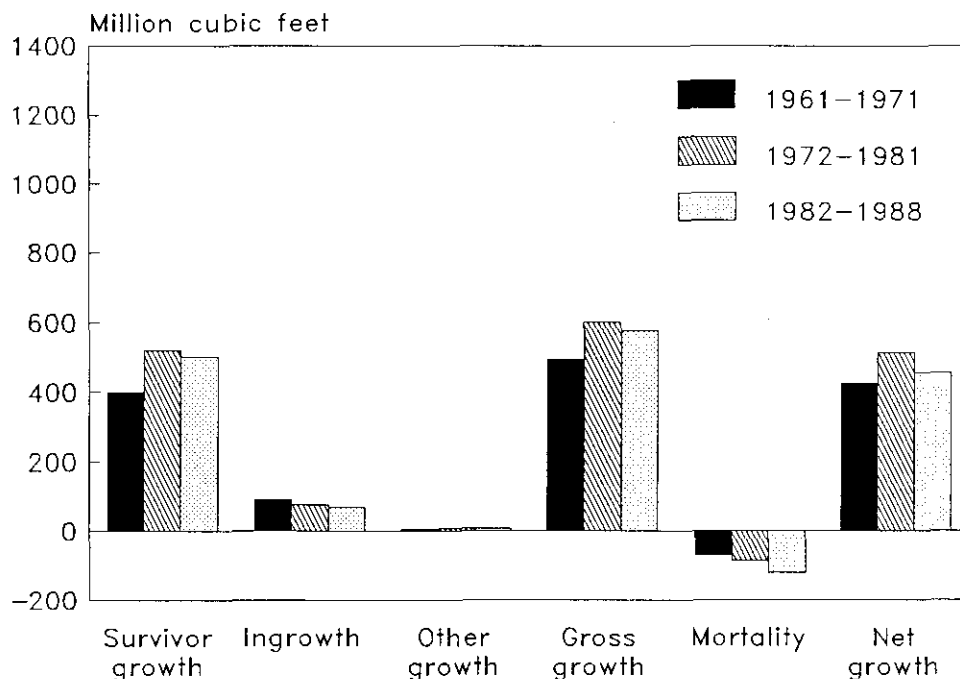


Figure 13.--Average annual growth components for hardwood growing stock, 1961-1971, 1972-1981, and 1982-1988.

Timber Removals and Forest Products Output



The manufacture of forest products in Georgia is a multi-billion dollar annual industry, comprised of more than 230 primary processors in addition to 1,500 loggers and secondary manufacturers of wood products. The industry employs more than 65,000 people--1 of every 9 persons involved in manufacturing in the State. An annual payroll of \$1.4 billion is generated through the processing of wood products (U.S. Department of Commerce 1990). The processing and manufacture of wood products contributes more than \$4 billion of value added to the State's economy, 12 percent of the total value added by manufacture for all products statewide. Timber production and the wood products industry rank third in the State in terms of economic importance. Georgia is the largest timber-producing State in the Southeast and ranks third nationwide behind only Oregon and Washington in the output of timber for lumber and plywood production. Georgia's production of pulpwood is second only to Alabama's. While Georgia's forests provide many other important benefits, such as scenic beauty, wildlife habitat, and other nontimber amenities, this chapter considers only timber-related values. We describe the output and utilization of roundwood timber products harvested from Georgia's timberland.

Sources of Timber Removals and Product Output Data

This section and appendix tables 36-40 contain estimates of average annual timber removals and product output for the period 1982 through 1988. These data were developed from several sources. The volume of trees removed from timberland annually for timber products, the volume of woods residue associated with this harvest, and the volume removed through diversion of timberland to nonforest land uses were calculated from the remeasurement of permanent FIA ground samples. Overutilization and underutilization of these removals (based on FIA merchantability standards) were determined by applying utilization factors obtained from a sample of 100 active logging operations randomly selected throughout the State. Estimates of roundwood receipts at mills, industrial products from timber cut in Georgia, mill residues generated during processing, and the utilization of these residues were calculated from data obtained from canvasses of all primary wood-using mills in the State (fig. 14). These canvasses were conducted jointly by the Georgia Forestry Commission and the Southeastern Forest Experiment Station. Pulpmills

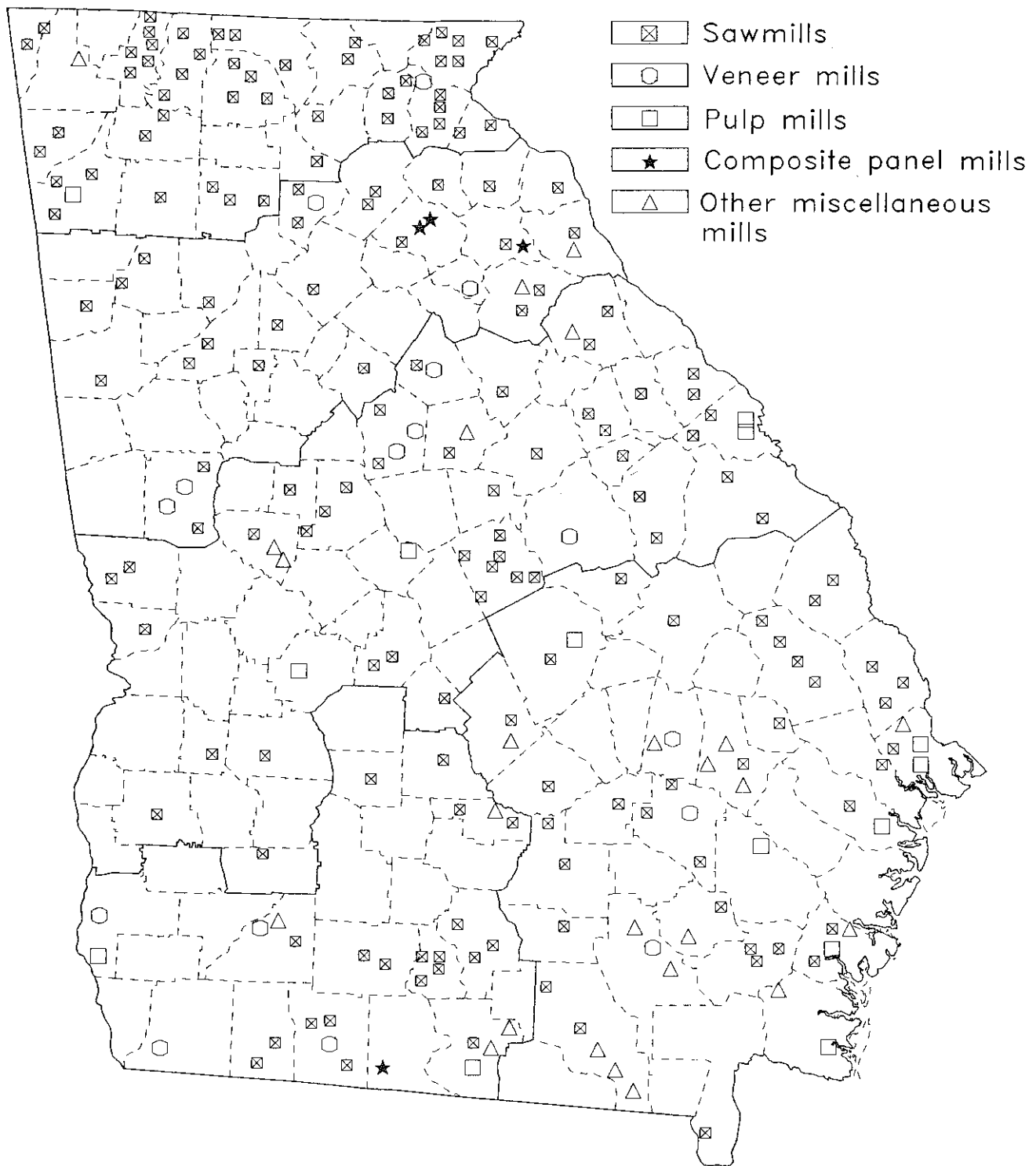


Figure 14.--Location of primary wood-using industries in Georgia, 1989.

were surveyed each year during the remeasurement period; other primary wood-using mills were canvassed in 1983, 1986, and 1989. Data from all three canvass years were averaged to provide the best comparison to total removals data. In some instances, data for individual years are referred to in order to establish trends within the period. Most product output trends were established by comparing average output from the latest period with

values for the previous survey period. The previous data were based upon product output data collected for 1974, 1977, and 1980. Fuelwood production and consumption data are derived from plot remeasurements, industry canvasses, and estimates provided by the Georgia Forestry Commission. The proportion of the fuelwood harvest that was taken from timberland was determined from permanent plot remeasurements.

Softwood and Hardwood Annual Removals Increase

Growing-stock volume of all species cut from Georgia timberland each year averaged 1.3 billion cubic feet, up 23 percent since the previous survey period. Although the hardwood cut increased by a larger amount proportionately, increases in softwood removals accounted for more than half the overall increase. Annual removals of softwood growing stock averaged 960 million cubic feet between 1982 and 1988, up 16 percent from the 827 million cubic feet removed annually between 1972 and 1981. Softwood removals increased 19 percent on forest industry land, 17 percent on NIPF land, and declined 16 percent on public land. About 63 percent of softwood growing stock removed each year was from NIPF timberland, another 33 percent came from forest industry land, and the remaining 4 percent was from public land.

Between 1972 and 1981, pine plantations supplied about 17 percent of all softwood removals. From 1982 to 1988, the proportion rose to 24 percent. The increased use of plantation wood helped drive down the average diameter of trees harvested for a product. Shifts in product mix and better recovery and utilization by primary processors have also contributed to a smaller average-size tree being harvested. The average d.b.h. of softwood trees harvested for all products dropped from 12.3 to 11.8 inches.

Annual removals of hardwood growing stock averaged 343 million cubic feet, 50 percent more than during the last survey. Hardwood removals increased on all ownerships, doubling on public timberland and increasing 42 and 60 percent, respectively, on NIPF and forest industry. Two-thirds of the hardwood removals come from NIPF owners, 26 percent from forest industry timberland, and the remaining 8 percent from public land. These findings reflect the increased demand for hardwood in many primary products over the past 10 years. Hardwoods have contributed an increasing share of pulpwood receipts at mills in the Southeast and have been used in new product applications, such as laminated veneer lumber and oriented strand board.

Timber Utilization Continues to Improve

Of the 1.3 billion cubic feet of growing stock removed annually from Georgia timberland between 1982 and 1988, 1.1 billion cubic feet were used for timber products (app. table 38). In conjunction with the 23-percent increase in growing-stock removals, average output of industrial timber products also increased—by 27 percent. A greater increase in product output relative to changes in total removals is due to better utilization of harvested

growing-stock trees and to increased use of non-growing-stock volume for products. Between 1972 and 1981, 80 percent of all growing-stock removals were used for roundwood products (including owner-cut firewood). Roundwood products accounted for a slightly greater proportion of all growing-stock harvested between 1982 and 1988—83 percent. An additional 121 million cubic feet, or 9 percent of growing-stock removals, were classified as "other removals." These are removals of timber during silvicultural operations and during land use changes in which the trees are not utilized for a product. Some of this timber, such as trees left standing for esthetics in urban development, are not actually removed, but are no longer considered part of the timber base. Also included in these removals is the associated volume of timber on land reclassified from timberland to reserved timberland status.

During the same period, 106 million cubic feet of logging residues were left in the woods. Logging residues are the unused merchantable portions of growing-stock trees harvested for products. This unutilized material accounted for 8 percent of the total growing-stock removals and for about 10 percent of the roundwood product output. Last survey, woods residue amounted to 10 percent of the total growing-stock removals and 13 percent of roundwood product output. Although roundwood product output for this period was 27 percent more than in 1981, volume of logging residues associated with roundwood product output declined by 1 percent. Substantially less wood is being left in the forest after harvests.

Statewide, for all products combined and including both poletimber- and sawtimber-size trees, about 94 percent of the merchantable portion of softwoods was utilized in an average harvest. For hardwoods, an average 84 percent of the merchantable portion was utilized. This utilization is slightly better than for the former survey period. In addition to the merchantable volume, total volume utilized in harvesting operations includes some volume not considered merchantable by FIA standards. This material includes tops smaller than 4.0 inches d.b.h., stumps below 1.0 foot, and large limbs of merchantable trees. For softwoods, about 4 percent of the total volume utilized was from such material, and for hardwoods, about 2 percent.

Coinciding with the increase in growing-stock utilization, non-growing-stock material provided a larger portion of the product output in this survey than in the last. In 1981, growing-stock removals accounted for 92 percent of the total roundwood product output. Between 1982 and 1988, an average of 87 percent of the total roundwood product output was from growing stock. For softwoods and hardwoods combined, the proportion of

product output from cull trees has remained at about 1 percent. However, product output from "other sources"--saplings; stumps, tops, and limbs of trees on timberland; and trees on nonforest land such as in fencerows and wooded pastures--increased from 6 percent in the last survey to 11 percent in the most recent survey.

Pulpwood Production

Pulpwood remains the leading timber product harvested from Georgia's timberland, accounting for 50 percent of total product output and 45 percent of the total roundwood output. Georgia ranks second nationwide behind Alabama in the production of roundwood pulpwood. During the latest remeasurement period, average annual roundwood production increased 27 percent to 554 million cubic feet (app. table 36). Softwood output increased 18 percent to 453 million cubic feet and continues to make up the largest share of total roundwood pulpwood production, at 82 percent. However, hardwood production increased 93 percent to 101 million cubic feet, continuing an upward trend in hardwood output. Hardwoods accounted for 18 percent of roundwood pulpwood production compared with 12 percent during the last remeasurement period. This trend will most likely continue as several mills in Georgia have increased capacity and shifted to greater utilization of hardwood.

In addition to roundwood, sawmills and other wood-using plants provided another 169 million cubic feet of plant byproducts for fiber production. Between 1982 and 1988, annual production from all sources averaged 723 million cubic feet (9.9 million cords), a 31-percent increase over last survey. This gain was accomplished with only a 20-percent increase in growing-stock removals designated for pulp products. Of the total volume of pulpwood produced, 66 percent originated from growing stock compared with 72 percent in the previous survey. Improved utilization is attributable to increased use of non-growing-stock roundwood and plant residues. These two sources provided 10 and 24 percent, respectively, of the pulpwood produced during the latest remeasurement period. This compares to 7 and 21 percent prior to 1981.

Figure 15 shows the annual pulpwood production data for individual years between 1960 and 1989. Fiber produced from both roundwood and plant byproducts is included. Thirty years of reported annual pulpwood production figures show some fluctuations, but mostly a consistent upward trend. Since 1960, total annual pulpwood production has more than doubled. In 1989, annual production totaled 9.0 million cords after reaching a

high of nearly 10.7 million cords in 1987. Hardwood output has risen from only 9 percent of total production in 1960 to nearly 17 percent of total production in 1989.

Timber product output data for 1989 shows that Georgia remains a net importer of roundwood pulpwood (Tansey and Steppleton 1991). Imports for softwood and hardwood combined totaled 108 million cubic feet (1.4 million cords), exceeding exports by 21 percent. Alabama, Florida, and South Carolina are the major sources of imported pulpwood. Exports, exclusive of chips for overseas shipment, totaled 89 million cubic feet (1.2 million cords). Florida, Alabama, Tennessee, and North Carolina were the primary recipients of wood shipped from Georgia. Nearly 83 percent of the roundwood cut in 1989 for pulp production was retained for processing in the State. Since 1982, the number of pulp mills in operation and receiving roundwood has dropped from 17 to 14. One facility converted from the use of roundwood to recycled material. However, for the 14 remaining mills, 24-hour pulping capacity has increased from 17,341 to 19,965 tons.

Saw-Log Production

Saw logs are the second leading timber product harvested from Georgia's timberland. They account for nearly a third of total output and 38 percent of total roundwood production (app. table 36). For softwoods and hardwoods combined, average annual output of saw logs from roundwood increased 24 percent to nearly 463 million cubic feet. Softwoods made up more than 84 percent of total saw-log output. Annual softwood saw-log production increased 28 percent from 305 to 390 million cubic feet. About 97 percent of the softwood saw-log output from roundwood came from growing-stock trees, with 98 percent of these of sawtimber size. The remaining 3 percent came from cull trees harvested on timberland or trees cut from nontimberland sources. Plant byproducts, such as veneer cores, contributed another 8 million cubic feet to bring total softwood saw-log output from all sources to 398 million cubic feet. During the same period, softwood lumber production exceeded levels reached in the early 1950's (Knight and McClure 1974). Surveys of lumber production for Georgia sawmills conducted by the Georgia Forestry Commission show that softwood lumber production increased 28 percent between 1980 and 1989 (fig. 16) (Georgia Forestry Commission 1990). In 1986 and 1989, Georgia sawmills produced more than 2.2 billion board feet of lumber.

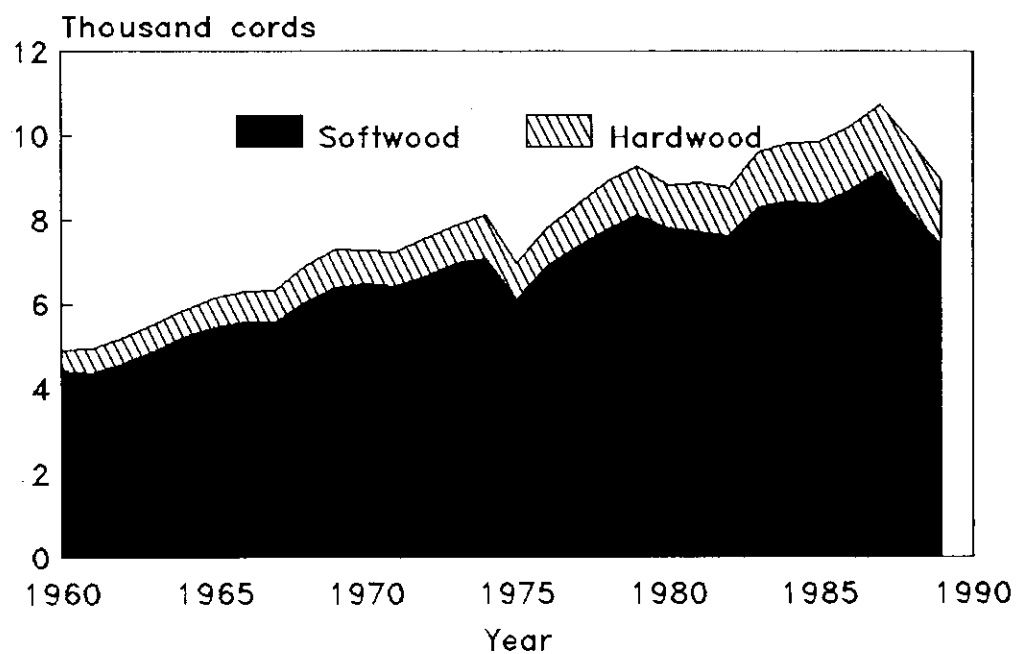


Figure 15.--Pulpwood production in Georgia, 1960-1989.

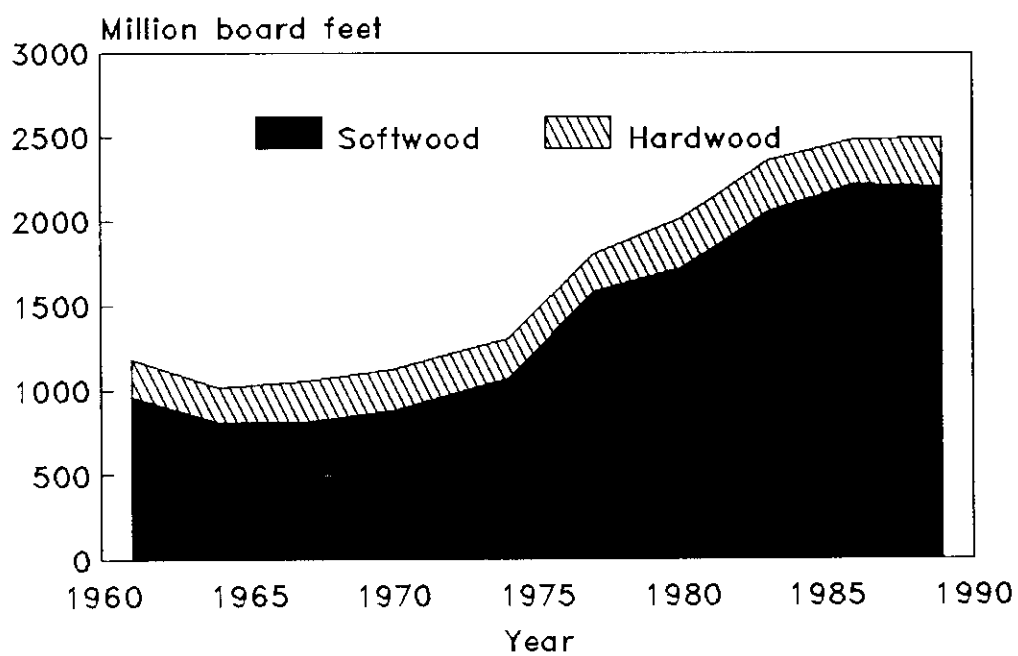


Figure 16.--Lumber production in Georgia, 1961-1989.

Total annual hardwood saw-log production increased nearly 10 percent from an average of 67 to 74 million cubic feet. About 89 percent of the hardwood saw logs came from sawtimber-size growing-stock trees, 6 percent from poletimber growing stock, 4 percent from non-growing-stock sources, and the remaining 1 percent from mill byproducts. Hardwood lumber production peaked in 1983 at 300 million board feet. Records for 1986 and 1989 show a return to levels seen throughout the 1960's and 1970's.

The 1989 industry canvass for Georgia shows the State as a net importer of softwood saw logs. Imports surpassed exports by 34 percent, or nearly 6 million cubic feet. Total receipts of 414 million cubic feet of softwood saw logs in 1989 included more than 22 million cubic feet of wood imported from other States. Almost 96 percent of the softwood saw logs cut in 1989 were retained for processing in the State, while only 4 percent, or 17 million cubic feet, were exported out of State. For hardwood saw logs, imports and exports were nearly in balance at 2 million cubic feet. This volume is nearly 3 percent of production and receipts. Alabama, Florida, North Carolina, South Carolina, and Tennessee continue to be the principal States in the interchange of wood.

The trend toward fewer and larger sawmills has continued. Since 1982, the number of sawmills operating in Georgia dropped from 265 to 172. Nearly 55 percent of the current mills had receipts totaling less than 5 million board feet, compared with 66 percent in 1982. Another 17 percent had receipts averaging between 5.0 and 9.9 million board feet, compared with only 11 percent in the last survey. The remaining 28 percent of the sawmills had receipts averaging more than 10 million board feet and accounted for 88 percent of the lumber output in 1989 (Georgia Forestry Commission 1990). Less than a third of the sawmills were located in the two Coastal Plain Units, but more than half of the mills with receipts greater than 10 million board feet are in this area.

Veneer-Log Production

Production of veneer logs in Georgia ranked third behind pulpwood and saw logs. Between 1982 and 1988, annual production of veneer logs averaged 73 million cubic feet--about 5 percent of total product output and 6 percent of roundwood production (app. table 36). Average annual output increased nearly 27 million cubic feet, or 59 percent, since the previous survey. Essentially all of Georgia's veneer-log production was from roundwood and sawtimber size growing stock.

Most of the gain in veneer output was softwood. Softwood veneer-log production increased 76 percent to 59 million cubic feet and accounted for 81 percent of veneer production during the latest survey cycle. Hardwood veneer output increased by a modest 13 percent to more than 14 million cubic feet, reversing a downward trend seen since 1972.

In 1989, Georgia was a net exporter of softwood veneer logs and a net importer of hardwood veneer logs. Almost 92 percent of the softwood veneer logs and 95 percent of hardwood veneer logs produced in Georgia were retained for processing within the State. Imports of mainly hardwood logs were from Alabama and Florida. Exports were to South Carolina, Florida, and North Carolina.

Since 1982, the number of veneer mills in Georgia has dropped from 23 to 16. Expansion of the veneer industry during the 1970's has abated somewhat, and there is an industry-wide trend toward fewer mills; however, the large-capacity mills remain. Five pine plywood plants now operate in Georgia, compared with six in the previous survey. These five mills accounted for 89 percent of the veneer and plywood produced in 1989 (Georgia Forestry Commission 1990). The remaining 11 plants were involved in the production of hardwood veneer, hardwood plywood, or containers.

Output of Other Industrial Timber Products

Other industrial timber products include poles and pilings, posts, logs for log homes, wood composition board, and miscellaneous products. Between 1982 and 1988, combined output for these products averaged 62 million cubic feet--about 4 percent of total product output and 2 percent of roundwood product output. Annual average output increased by 33 million cubic feet, more than doubling since the previous survey. About 34 percent of these products originated from roundwood growing stock, 2 percent from non-growing-stock roundwood, and 64 percent from plant byproducts. Mill residues have provided an increasing share of the output, especially in the "other" category, as the manufacture of particleboard, oriented strand board, and waferboard has increased. Plant byproducts accounted for 60 percent of other industrial products in 1981, and about 49 percent in 1972. Softwoods continue to account for the greatest proportion of other industrial products, about 91 percent of total output. During the previous survey, however, softwoods accounted for 98 percent of all other industrial products.

Pole and piling production has increased 78 percent from 8.5 to 15.0 million cubic feet since 1982. Output of fenceposts nearly tripled from 2.5 to 6.2 million cubic feet. All of the poles and 79 percent of the posts were manufactured from growing-stock roundwood. All poles and pilings, and 52 percent of the posts were from softwood species.

Since 1982, the number of mills manufacturing other industrial timber products has remained at 29. However, the composition of these mills has changed somewhat. Eight post or pole operations have closed, while three oriented strand-board mills, one parallel strand lumber, two pole and two post facilities have begun operation. Also included in this count are 11 pole and 5 post facilities, 1 log home manufacturer, and 4 other mills designated as other specialty product mills.

Domestic Fuelwood Production

Current annual production of domestic fuelwood is estimated at 122 million cubic feet, or about 8 percent of the total product output. As in other States, trends in production are difficult to track because firewood producers and users are so numerous. Production of firewood has likely increased, but past output may have been underestimated, so the magnitude of increase is difficult to gauge.

Of the fuelwood production estimated for the 1982-88 period, 43 percent came from growing-stock roundwood, 55 percent from non-growing-stock roundwood, and the remaining 2 percent from mill byproducts. Hardwoods accounted for 86 percent of the total fuelwood cut during the latest remeasurement period, about the same as in the previous survey. Fuelwood made up a third of total hardwood output.

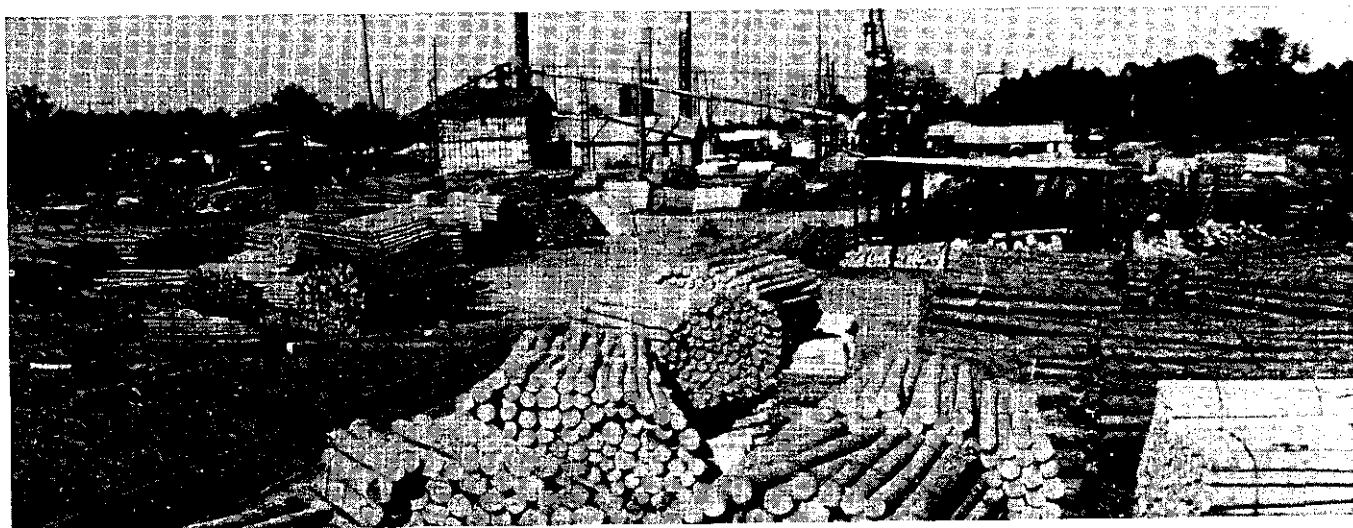
Utilization of Plant Byproducts

Between 1982 and 1988, primary wood-using plants in Georgia generated an estimated 445 million cubic feet of mill residues annually. This volume included an average of 189 million cubic feet of coarse residues (chips, veneer cores, slabs, and edgings), 137 million cubic feet of fine residues (sawdust and shavings), and 120 million cubic feet of bark (app. table 40). About 70 percent of the mill residues were generated from the processing of saw logs.

Whereas the output of plant byproducts increased by 28 percent, volume of unused plant residues dropped by 78 percent. On average, more than 99 percent of the plant residues generated were used. Only about 2.0 million cubic feet of softwood residues and 1.4 million cubic feet of hardwood residues were unused.

Of the mill residue volume generated, 50 percent was used for industrial fuel, 38 percent for the manufacture of fiber products, and 4 percent for composition-board products. The remaining 8 percent was used for miscellaneous products such as litter, mulch, and charcoal.

Plant byproducts provided raw material for 15 percent of the total industrial products output each year and accounted for 21 percent of the increase in product output between 1982 and 1988. Byproducts provided 13 percent of total industrial products and 13 percent of the increase in product output measured in the previous survey.





Timber Supply Outlook

Timber supplies potentially available today and in the next 20 years were determined by actions in earlier decades that established forests and affected their structure. In this chapter, we examine the actions that molded the present forest resources in Georgia and we evaluate prospective changes in timber supply given past and current trends.

Pine Harvest-Regeneration Balance Improves

Over an extended period, the balance between rates of stand establishment (regeneration) and harvest controls the future structure and makeup of forests. Thus, this balance is a key to evaluating future timber supplies. It also is our best indicator of how well society is anticipating tomorrow's timber needs.

Between 1982 and 1989, about 363,000 acres of pine stands underwent a final harvest each year in Georgia (table III). During the same period, an average of 374,000 acres of new pine stands were established on cutover forest land and on nonforest land (table IV). Thus, the overall balance between pine harvest and regeneration was positive during the survey period. In contrast, between 1972 and 1982, pine harvest exceeded regeneration to pine by nearly 66 percent.

The effective promotion of planting following harvest and major increases in planting on marginal agricultural land were key elements behind the rapid improvement in pine regeneration. Planting accounted for 82 percent of the new pine stands established from 1982 to 1989. Planting on harvested and poorly stocked timberland averaged 240,000 acres annually, a 69-percent increase from 1972 to 1982, whereas planting on nonforest averaged 68,000 acres annually, an eightfold increase. New pine stands were established through natural regeneration and natural reversion of agricultural land on an average of 66,000 acres annually.

Positive pine harvest-regeneration balances were evident for all major ownership groups. On public timberland, more than 8,000 acres of pine stands were harvested while nearly 12,000 acres of new pine stands were established each year. More than 137,000 acres of pine timberland owned by forest industry were harvested each year during the period. Almost 150,000 acres of pine stands were established; 95 percent of this area was planted. On NIPF holdings, 217,000 acres of pine were harvested while 212,000 acres of new pine stands were established.

Despite the overall positive harvest-regeneration statistics for pine, an examination of the detailed statistics in tables III and IV reveals deficiencies that should continue

to be addressed through aggressive regeneration programs. For instance, the high rate of planting on agricultural land probably cannot be sustained for very long. If the pine regeneration total is discounted back to that which occurred on forest land only, pine harvests (362,000 acres) outpaced the pine regeneration on existing forest land (290,000 acres) by 25 percent. Another factor that points to the need for continued vigilance is that those acres removed through land clearing are not accounted for in the above comparisons. Each year, approximately 50,000 acres of adequately stocked pine stands were removed from the timberland base through conversion to other land uses. The gap between liquidation and creation of pine-dominated stands is greatest on NIPF land, where most clearing occurs. If land clearing is added to the pine harvest totals and compared to pine regeneration on forest land, the rate of pine liquidation is almost double regeneration that takes place solely on NIPF forest land.

Harvest-regeneration balances for oak-pine forests were favorable. Across all owners, the rate of creation for oak-pine stands (88,000 acres annually) exceeded final harvest (73,000 acres annually). Regeneration equaled or exceeded harvest for all three owner groups. Natural regeneration following harvests accounted for two-thirds of the new oak-pine stands created; nearly one-third resulted from planting efforts.

Annual regeneration to an upland hardwood forest type (122,000 acres annually) exceeded the acreage of such stands harvested each year (94,000 acres) by 30 percent. The bulk of the excess regeneration was on NIPF land where regeneration (100,000 acres) exceeded harvest (70,000 acres) by 43 percent. The acreage regenerated to upland hardwood was boosted substantially by the tendency of harvested pine stands to regenerate to hardwoods; about 29 percent of the upland hardwood regeneration occurred after a harvest of a pine stand in the 1982-89 period. Additional upland hardwood regeneration became established on timberland that sustained a harvest of pine late in the 1972-82 period.

For lowland hardwood stands, final harvests (52,000 acres annually) exceeded regeneration (33,000 acres annually). This deficit in lowland hardwood regeneration effectively offsets the regeneration surplus evident for the upland hardwood and oak-pine types. All the deficit in regeneration of lowland hardwood compared with harvest was on forest industry. Many of the harvested lowland stands were cut within 2 years of the field survey. Regeneration had not become established within this timeframe on many of these areas. Still other harvested lowland hardwood stands on forest industry land were planted and converted to pine plantations.

Table III—Area of Georgia's timberland treated or disturbed annually, by broad management and ownership classes, 1982 to 1989

Broad management ^a and ownership classes ^b	Major stand treatments				Natural disturbance
	Final harvest	Partial harvest ^c	Commercial thinning	Other cutting	
Acres					
Pine plantation					
Public	687	--	369	765	692
Forest industry	61,088	1,420	9,837	--	36,799
Other private	36,078	1,629	23,394	3,097	26,666
Total	97,853	3,049	33,600	3,862	64,157
Natural pine					
Public	7,731	5,590	2,456	1,189	7,446
Forest industry	76,114	4,331	4,864	2,631	8,503
Other private	180,711	50,280	23,603	16,559	58,826
Total	264,556	60,201	30,923	20,379	74,775
Oak--pine					
Public	1,245	649	--	719	3,529
Forest industry	19,552	1,176	--	2,081	1,922
Other private	52,046	19,883	3,101	8,490	15,016
Total	72,843	21,708	3,101	11,290	20,467
Upland hardwood					
Public	4,558	516	146	2,728	2,160
Forest industry	19,990	3,167	--	2,297	2,956
Other private	69,916	27,639	1,274	21,541	28,373
Total	94,464	31,322	1,420	26,566	33,489
Lowland hardwood					
Public	836	603	--	--	1,218
Forest industry	22,849	3,853	--	709	8,573
Other private	28,607	18,549	1,141	3,134	37,425
Total	52,292	23,005	1,141	3,843	47,216
All classes					
Public	15,057	7,358	2,971	5,401	15,045
Forest industry	199,593	13,947	14,701	7,718	58,753
Other private	367,358	117,980	52,513	52,821	166,306
Total	582,008	139,285	70,185	65,940	240,104

^a Broad management class before treatment or disturbance.

^b Ownership class in 1989. Forest industry includes lands under long-term lease.

^c Includes high-grading and some selective cutting.

Table IV--Area of timberland regenerated annually, by broad management and ownership classes, Georgia, 1982 to 1989

Broad management ^a and ownership classes ^b	Total regeneration	Type of regeneration					
		Artificial regeneration after a harvest	Natural regeneration after a harvest	Other artificial regeneration on forest land	Other natural regeneration on forest land	Artificial regeneration on nonforest land	Natural reversion on nonforest land
Acres							
Pine plantation							
Public	6,193	3,170	--	2,097	--	926	--
Forest industry	142,168	106,191	--	32,463	--	3,514	--
Other private	159,306	64,630	--	31,277	--	63,399	--
Total	307,667	173,991	--	65,837	--	67,839	--
Natural pine							
Public	5,496	--	809	--	3,635	--	1,052
Forest industry	7,481	--	4,186	--	2,738	--	557
Other private	52,908	--	15,547	--	22,961	--	14,400
Total	65,885	--	20,542	--	29,334	--	16,009
Oak-pine							
Public	7,408	1,651	2,045	357	3,248	--	107
Forest industry	19,587	7,580	4,384	3,715	3,908	--	--
Other private	61,357	9,856	29,747	2,787	16,202	356	2,409
Total	88,352	19,087	36,176	6,859	23,358	356	2,516
Upland hardwood							
Public	4,440	--	2,512	719	1,209	--	--
Forest industry	17,227	4,631	8,846	582	3,168	--	--
Other private	100,312	1,359	57,346	--	35,393	--	6,214
Total	121,979	5,990	68,704	1,301	39,770	--	6,214
Lowland hardwood							
Public	1,262	--	406	--	856	--	--
Forest industry	4,813	387	4,024	--	402	--	--
Other private	26,440	384	17,380	--	5,236	--	3,440
Total	32,515	771	21,810	--	6,494	--	3,440
All classes							
Public	24,799	4,821	5,772	3,173	8,948	926	1,159
Forest industry	191,276	118,789	21,440	36,760	10,216	3,514	557
Other private	400,323	76,229	120,020	34,064	79,792	63,755	26,463
Total	616,398	199,839	147,232	73,997	98,956	68,195	28,179

^a Broad management class after regeneration.

^b Ownership class in 1989. Forest industry includes lands under long-term lease.

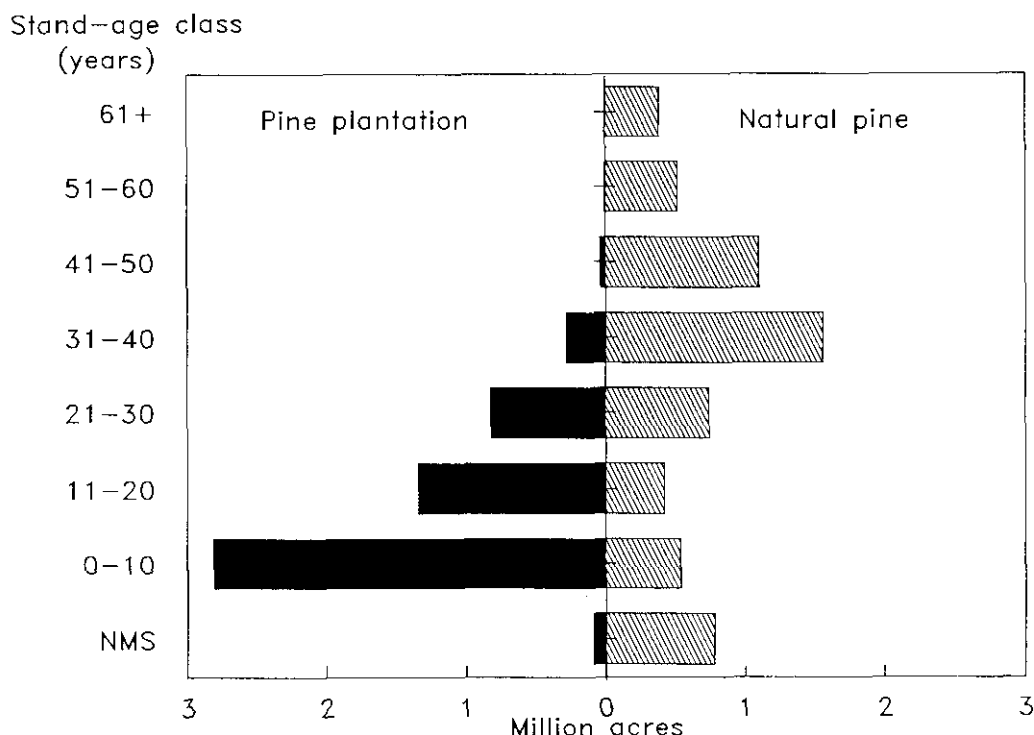


Figure 17.--Profile of timberland classified as pine forest types, by stand-age class and stand origin, 1989. "NMS" includes those areas that lack a manageable stand.

The overall balance of harvest:regeneration for hardwood dominated stands is favorable, but the establishment of vigorous stands of high-quality species should be given high priority. Many of the recently regenerated hardwood stands became established after a pine harvest. These stands are often marginal for production of high-quality hardwood timber of preferred species. Additional opportunities for improving the hardwood resource are reviewed in the following chapter.

Additional Cutting on 275,000 Acres Annually

In addition to the timber removed in final harvests, significant volumes were removed from 275,000 acres of timberland each year in partial harvests, commercial thinnings, and other miscellaneous cuttings. Partial harvests occurred on 139,000 acres each year. This category of cutting is defined as the removal of selected trees from a stand, leaving sufficient stocking of residual trees for a manageable stand. In hardwood and oak-pine stands, which account for 55 percent of all partial harvests, most of the cutting could best be characterized as either high-grading or pine selection with no intent to improve the quality of the residual stand. Natural pine stands accounted for almost all the remaining cutting classed as partial harvest. In these stands, partial harvests typically are diameter limit cuts. Across all stand types, partial harvests contributed only 9 percent of the volume removed annually in Georgia in contrast with 76 percent for final harvests.

Commercial thinning occurred on 70,000 acres annually between 1982 and 1989. Collectively, pine plantations and natural pine stands accounted for 92 percent of this total. Only 4 percent of the total volume removed annually came from commercial thinning during this period. Stand improvement cuttings and other miscellaneous cuttings occurred on 66,000 acres annually.

Prospective Softwood Timber Supply

The acreages of timber stands of various ages in a region provide insight into prospective changes in timber volumes through time. At each sample location, stand age was estimated. FIA field crews assigned an average age to those trees that, collectively, could be featured together assuming an even-aged management objective. In the absence of a manageable stand (generally, less than 60 percent stocking with trees of the same size) an average age of all dominant trees present was assigned. In this section, we examine the current age structure of the softwood resource in Georgia and shifts in age structure since 1982 to forecast probable changes in softwood timber volume in the next 10 to 15 years. It is important to note, however, that forecasts are limited by uncertainties about physical factors (such as drought) and economic factors (such as future demand for timber).

Some important shifts in pine age structure (fig. 17) have occurred since 1982. In 1982, Georgia's pine

resource was dominated by an accumulation of natural pine stands 21 to 40 years old, but pine plantation acreage in the youngest age classes was mounting (Sheffield and Knight 1984). The 1989 age structure reveals that the prominence of the 21- to 40-year category has dwindled. Almost 1.4 million acres of pine stands that were in this age group in 1982 were harvested between 1982 and 1989, accounting for more than three-fifths of the harvest of well-stocked pine stands. By far the most prominent feature of the current age structure in Georgia is the accumulating acreage of pine plantations 10 years of age or less. Pine plantations exceed the area of natural pine in the three youngest 10-year age groups. Compared with 1982 acreage, the 1989 pine acreage was down in age classes 11-20, 21-30, and 31-40. In contrast, acreages in the youngest and oldest age classes increased. All age classes more than 40 years old increased in area; the largest increase occurred in the 61 and older age group, where a 89-percent increase was recorded.

The changes described provide the basis for observations about softwood timber supplies in Georgia. First, short- and long-term softwood supplies are not in danger of depletion. Current demand and growth levels do suggest that further reductions in pine inventory volume are highly probable. These reductions should not be viewed negatively if the recent emphasis on stand renewal is maintained. Previous sections of this analysis have documented recent increases in planting of open land and in both planting and natural regeneration of softwood stands after harvests. These efforts should minimize the extent and duration of softwood inventory reductions. They have stabilized the total acreage of pine forest types in Georgia. Projections of acreage by stand type (app. table 41) show continuing increases in pine plantations during the next two decades, but at a slower pace than that from 1982 to 1989. Natural pine stands are projected to continue to drop as more timberland is put into pine plantations.

A reasonably stable supply of softwood inventory volume should flow into the potential supply pool during the next two decades. Roughly equal pine acreages exist in the 11-20, 21-30, and 31-40 age classes. These stands will provide the bulk of the softwood timber used in Georgia during the next 20 years. Recently established plantations should help stabilize pine inventory reductions once these plantations develop to merchantable size after the year 2000. These young plantations will not provide substantial volumes of wood for harvest until age 20 and beyond unless commercial thinning is practiced in many of these stands.

A higher proportion of the softwood inventory in the next 10 to 20 years will be concentrated in pole timber and small sawtimber trees because of the shift toward

younger stands and plantations. At the same time, reductions in the inventory of medium to large pine sawtimber are likely to continue as natural pine stands from 21 to 50 years of age are harvested. Between 1982 and 1989, nearly 1.2 million acres of natural pine stands in this age range were harvested. These shifts toward a younger age structure will have adverse effects on manufacturers that rely on medium to large pine sawtimber (Saucier and Cabbage 1990). Earlier projections (U.S. Department of Agriculture, Forest Service 1988) that one-half or more of the South's softwood removals would be supplied by pine plantations by the year 2000 appear to be reasonable for Georgia. A stable supply of raw material for solid wood products will depend on the ability to utilize trees from pine plantations. If most plantations are managed on short rotations primarily for fiber production, a shortage of pine sawtimber is probable as more of the available older pine stands are harvested. The increased use of thinning in pine plantations combined with longer rotations will be necessary to bridge this gap in pine sawtimber supply.

In the next 10 to 20 years, softwood timber inventories will continue to grow on forest industry land and decline on NIPF land. The extent to which softwood removals are shifted to forest industry will determine the magnitude and timing of this trend. If current rates of removal continue, softwood inventory volume on NIPF land will continue to decline for the next 10 to 20 years. Ultimately, more of the softwood supply will have to come from forest industry land because of the dominance of this ownership in the younger age classes. For example, NIPF owners control more than 70 percent of the pine stands between 31 and 60 years of age. They control less than half of the collective acreage of pine stands 30 years old or less; forest industry controls 48 percent of the pine stands in this age group. If the recent upturn in regeneration on NIPF land is sustained, these owners should account for an increased proportion of young pine stands in the future.

Some regional projections are possible. Generally, reductions in softwood inventory have been measured in those regions where natural pine stands predominate and where plantation establishment has not compensated for the loss of natural pine after harvest (fig. 18). During the next 10 years, further reductions in softwood volume are probable in Southwest, North Central, and North Georgia. In these regions, little increase in growth can be anticipated until the recently established pine plantations develop to merchantable size. Most of the recent planting has occurred in Southeast and Central Georgia, and most of the older plantations in the State are in these two regions. Softwood inventories in these regions should rise as young pine plantations reach merchantable size after the year 2000.

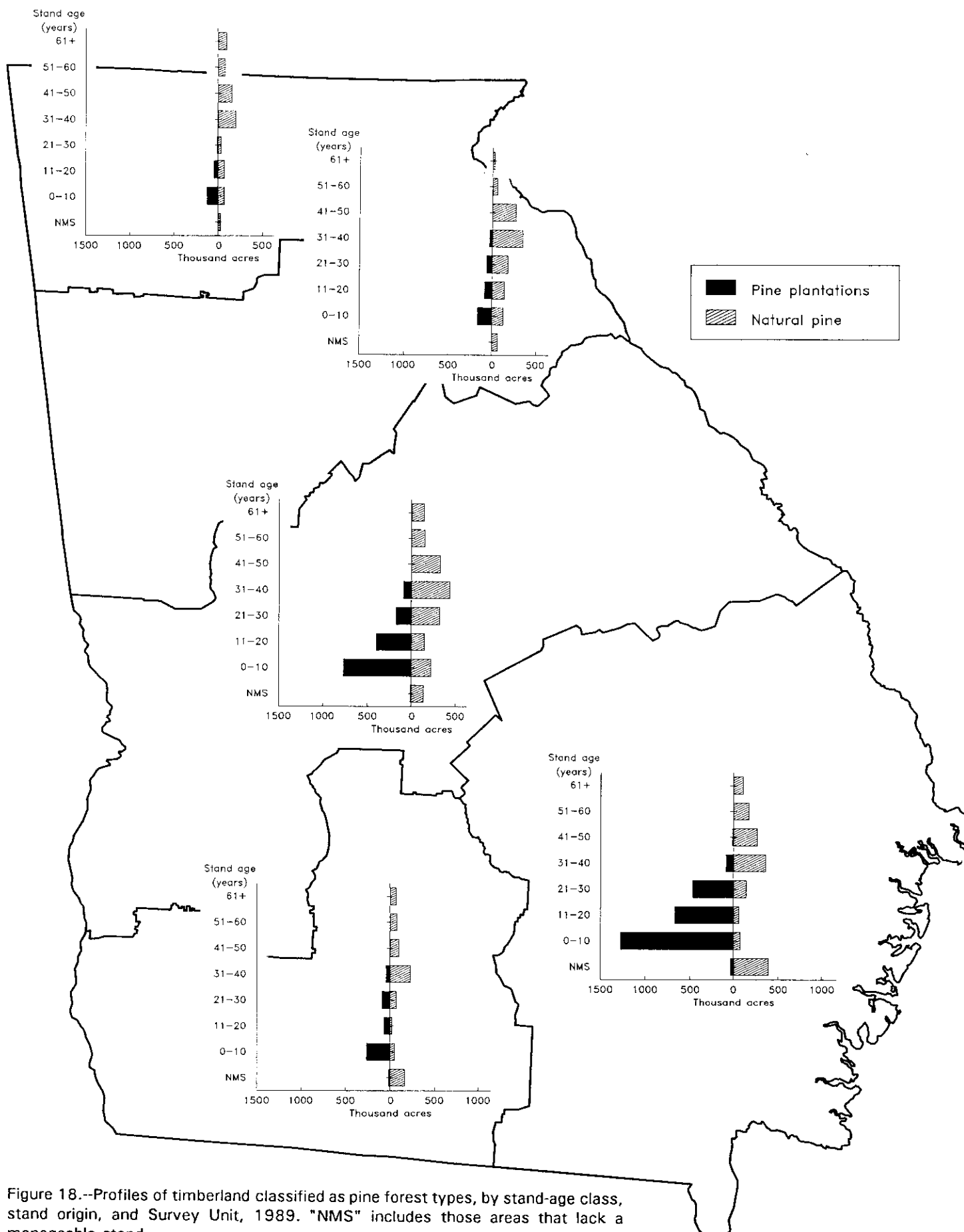


Figure 18.--Profiles of timberland classified as pine forest types, by stand-age class, stand origin, and Survey Unit, 1989. "NMS" includes those areas that lack a manageable stand.

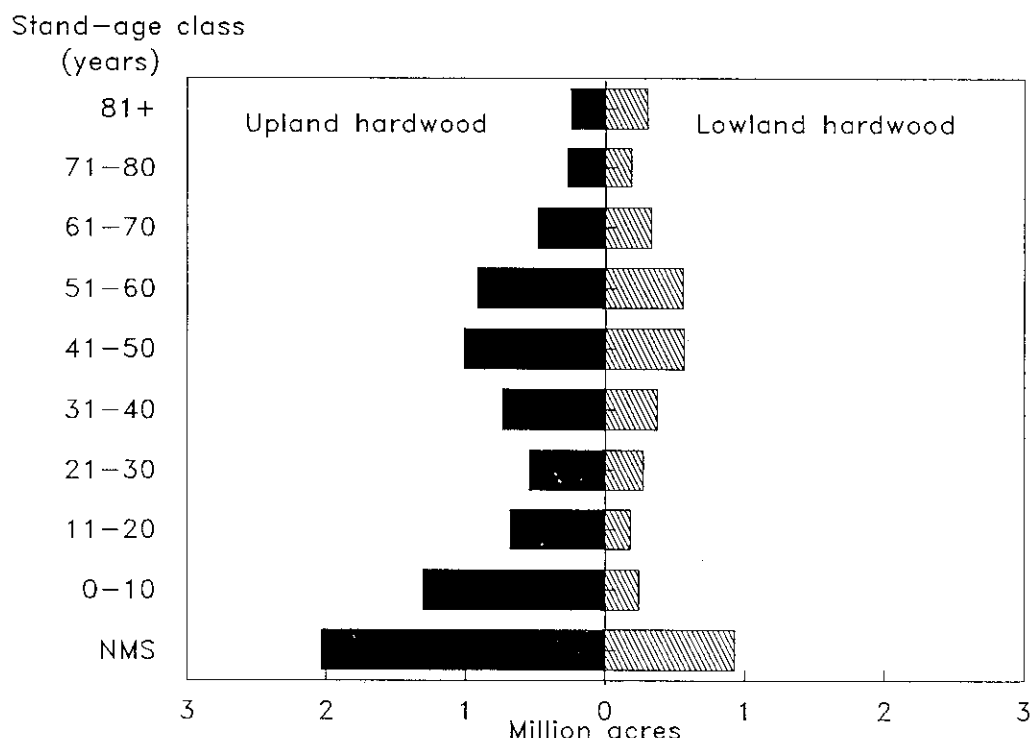


Figure 19.--Stand-age profile of timberland classified as a hardwood or oak-pine forest type, by upland and lowland type groups, 1989. "NMS" includes those areas that lack a manageable stand.

Prospective Hardwood Timber Supply

Like that for softwoods, the age structure of the hardwood resource shows an accumulation of stands in middle to older ages (fig. 19). The age classes from 31 to 70 years are especially prominent for hardwood-dominated forests. Lowland hardwood forests have an especially high proportion of their total area in the oldest age class (71 years and older). Between 1982 and 1989, hardwood acreage in stands 51 years old or more increased by 29 percent, whereas the acreage between 11 and 50 years of age declined by 21 percent. This trend was evident for both upland and lowland hardwood stands. The shift to older hardwood forests is driven by two major factors--aging of undisturbed stands and disproportionately heavy harvesting in relatively young stands. Only 27 percent of the well-stocked hardwood stands harvested between 1982 and 1989 were more than 50 years old. Only 37 percent of the volume of hardwoods harvested from Georgia's forests came from well-stocked stands greater than 50 years old; in comparison, 54 percent of the hardwood inventory is currently in this age group.

Especially in uplands, young hardwood stands (0-10 years old) are a prominent feature of the current age structure. Hardwood stands 10 years old and less increased by nearly 54 percent between 1982 and 1989 because of increased harvesting of pine and hardwood stands in recent years. A continuation of this trend

would move the hardwood resource toward a more balanced age structure in the long term. Optimism about the potentially positive effects this buildup in young hardwood stands might have on the future hardwood resource must be constrained because of the diversity of conditions in young stands. The species composition of many of these stands is dominated by low-quality hardwoods that often occupy sites formerly in pine. More than 45 percent of young hardwood stands developed after the harvest of pine stands. Unfortunately, we do not have sufficient data on the species composition of the seedling component of these stands for a more complete analysis of their current condition and probable development. Some poorly stocked young stands are on areas that were surveyed after harvests but before site preparation and planting could be completed. Many young hardwood stands have a substantial number of large old trees left during harvesting operations. The older trees limit the development of younger trees beneath. Nearly one-half million acres of young hardwood stands were classified by field crews as needing intermediate treatments such as cleaning or release cuttings. More information on treatment opportunities is provided in the following chapter.

Another prominent feature of the hardwood age profile is the prevalence (3.0 million acres) of poorly stocked stands with insufficient desirable trees for management.

Two-thirds of these stands are upland hardwoods, but almost a fourth of the acres in both upland and lowland hardwoods are in this category. Timber harvests between 1982 and 1989 contributed to poor stocking on 1.2 million of the acres currently classed as lacking a manageable stand. Timber harvests between 1972 and 1982 created another 1.1 million acres of poorly stocked stands that are still so classified. Thus, timber harvests since 1972 contributed to the poor stocking in three-fourths of the hardwood stands classed as lacking a manageable stand in 1989. About 45 percent of these were pine harvests.

The accumulation of older, high-volume hardwood stands could signal that ample supplies of hardwood timber will be available for the foreseeable future. Growth:removal relationships are still positive throughout the State. This positive scenario may or may not be realistic. Many owners prefer not to harvest their mature timber. Ownership objectives and restrictions, physical terrain characteristics, and a host of other factors related to the heterogeneous resource limit the availability of hardwood timber at any point in time. This report does not estimate the individual or collective impact these restrictions have on availability, but we acknowledge that they potentially limit hardwood timber supplies. For instance, some 14 percent of the hardwood stands more than 50 years old are on public land. Steep slopes or year-round water problems on private timberland limit the availability of another 12 percent of these older hardwood stands. An unknown amount of hardwood timberland in Georgia is in wetlands or streamside management zones that may be subject to regulations. Most of the wetlands support lowland hardwood types depicted in the age profiles, but streamside zones often support upland types as well.

Demand for hardwood timber will probably continue to increase during the next 10 to 20 years with the substitution of hardwood for pine in a growing number of products (U.S. Department of Agriculture, Forest Service 1989). The demand for hardwood chips for both domestic and foreign markets has been especially strong. The impact of this growing use has not been fully measured in forest inventories because the markets developed in the late 1980's. On the resource side, hardwood net growth probably will not rise above current levels in the next 10 years or more because of accumulating acreage in stands over 50 years old and shrinking acreage in stands 11 to 50 years old. Diameter and height growth

rates drop considerably in older stands and mortality increases. This reduction with age is especially prominent for the upland hardwood types. Increased acreage in the age category 0-10, if sustained, should provide some boost in hardwood growth in the long term. However, compared with pine stands, hardwood stands grow slower and require longer rotations. Thus, more time is needed to reverse negative trends in growth levels or growth-removal relationships.

Geographic differences in age structure and broad categories of stand type are depicted in figure 20. Lowland hardwoods dominate in southern Georgia and upland hardwoods in the northern half of the State. While the characteristics of the hardwood age structure described earlier for the entire State generally apply for each geographic region, a somewhat more uniform age structure is apparent for hardwood stands in the southern sections. This age structure suggests more stable hardwood growth levels in southern than northern Georgia in the next 10 to 20 years. Throughout the State, relatively large acreages of hardwood that lack a manageable stand demonstrate a need for greater attention to adequate regeneration and rehabilitation. Large areas of well-stocked hardwood stands also are present in every Survey Unit. Young stands are especially common in Central Georgia, where two-fifths of the hardwood removals occurred during the latest remeasurement period. Overall, the regional age profiles suggest that hardwood supplies will be relatively stable in southern Georgia in the next one to two decades. In northern Georgia, additional reductions in hardwood growth levels are probable during the next 10 years. Increased hardwood removals in this section of the State could also lead to reductions in inventory, especially in Central Georgia where the hardwood growth:removal relationship is already tight. Sometime beyond the year 2000, the large acreage of very young hardwood stands should help reverse the downward trend in hardwood growth.

Converging levels of hardwood removals and growth suggest that the long upward trend in hardwood inventory volume will end in the 1990's. This event need not be viewed negatively as long as high-quality regeneration is obtained when hardwood stands are harvested. The hardwood timber inventory is vast and has historically been underutilized. Area of hardwood forest types is projected to remain near current levels for the next three decades (app. table 41). With sound management, this stable hardwood acreage can provide huge benefits of many kinds.

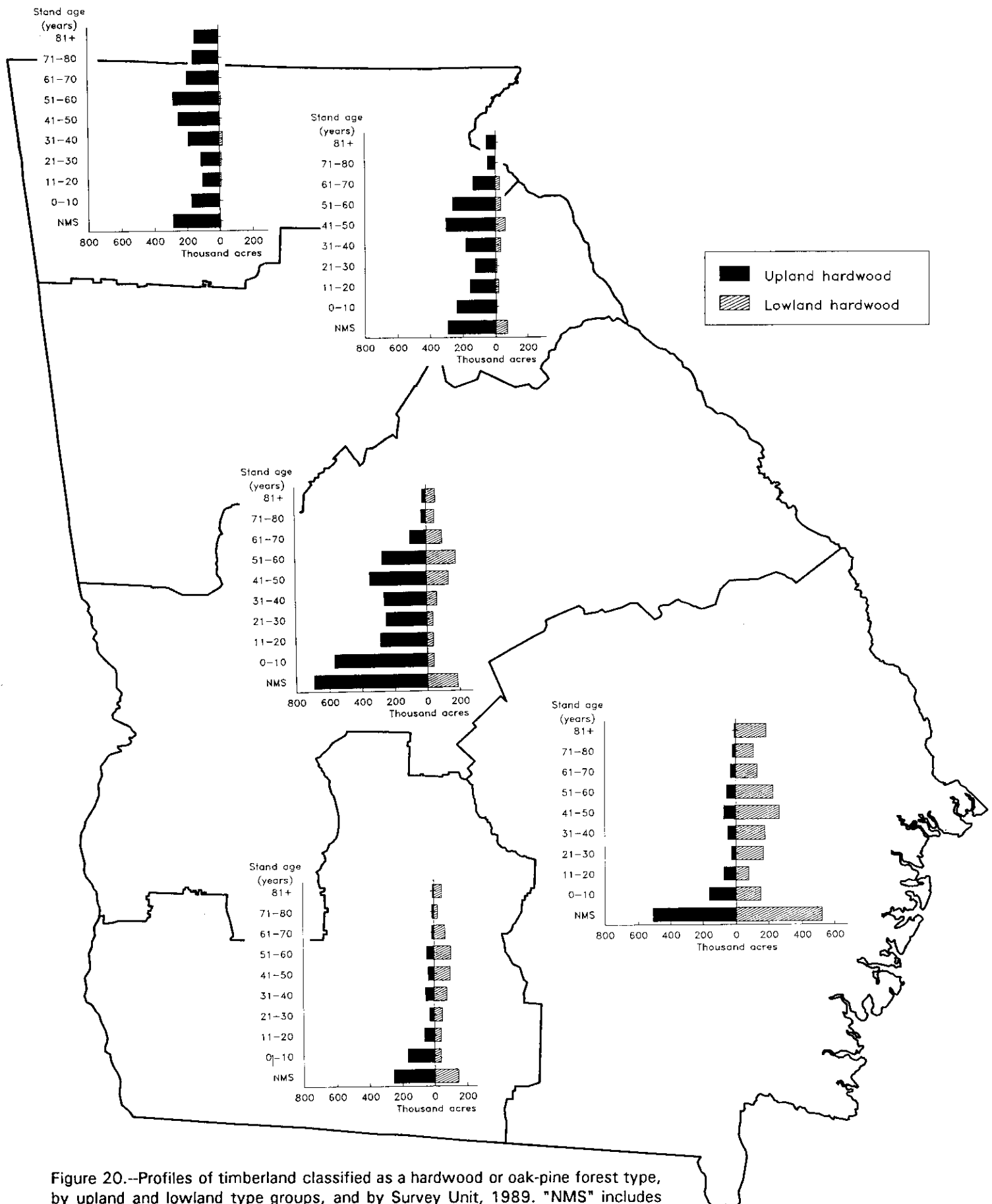


Figure 20.--Profiles of timberland classified as a hardwood or oak-pine forest type, by upland and lowland type groups, and by Survey Unit, 1989. "NMS" includes those areas that lack a manageable stand.



Management Opportunities

This chapter highlights treatment opportunities for improving Georgia's timberland. A shrinking timberland base and growing demands for timber and timber products make it imperative to maximize timber growth and improve the quality and quantity of the resource on as many timberland acres as possible. High costs of intensive forest management, environmental constraints and regulations, and the diversity of timberland ownership complicate or retard efforts to manage timberland. Treatments that enhance timber growth also can increase nontimber benefits by promoting healthier forest conditions. Where intensive management is practical, therefore, treatment opportunities should be seriously considered.

Field crews assigned treatment opportunities at each sample location based on the stand conditions they encountered. The treatment opportunity assigned describes the single most important action that could be taken to improve the growth and quality of the existing stand. Since stand conditions vary greatly by broad management class and ownership group, the treatment opportunities discussed here are very broad and general in nature (table V).

Adverse Sites Limit Management Opportunities on 1.1 Million Acres

Excessively steep slopes and year-round water problems led to designation of "adverse sites." These conditions limit management opportunities on 1.1 million acres, or nearly 5 percent, of Georgia's timberland. Steep slopes--slopes of 40 percent or greater--account for nearly two-thirds of the acreage classified as adverse. Most of the stands on steep slopes are in northern Georgia, while areas with water problems--the remaining 34 percent of adverse sites--are located in the southern half of the State. Only 10 percent of the adverse sites were classed as pine types. The remaining 90 percent was classed as hardwood or oak-pine. More than half of all adverse sites are on NIPF land, about a third are on public land, and the remainder are on forest industry land. Proportionately, adverse sites make up nearly 23 percent of the public timberland, while accounting for less than 4 percent of NIPF land and 3 percent of forest industry land.

During the latest remeasurement cycle, only 4 percent of the acres classed as adverse experienced some form of timber cutting. As a result, timber growth there was nearly twice the rate of removals. Volume of growing stock per acre averaged 2,057 cubic feet per acre, nearly 63 percent more than the average volume on operable sites.

Adverse stands have been excluded from the management opportunities presented in this chapter (table V) because applying any of the treatments described would be difficult. However, these stands should not be excluded from the productive timberland base. New and more advanced logging techniques are making most adverse sites more accessible to logging. Although these sites restrict the intensity of management, they provide many nontimber benefits such as recreational opportunities, wildlife habitat, and areas for watershed management.

Almost 14.6 Million Acres Support Stands in Good Condition

Manageable stands in good condition and on operable sites occupy nearly 14.6 million acres, or 62 percent, of Georgia's timberland. These stands are generally 60 percent or better stocked with immature trees of acceptable quality and free from significant damage or excessive competition. Two-thirds of the timberland controlled by forest industry is in good condition and needs no immediate treatment, as is 61 percent of NIPF timberland and 51 percent of public land. Pine stands accounted for 57 percent of the acres in good condition. About 85 percent of the pine plantations and 66 percent of natural pine stands are in good condition. In comparison, 58 percent of the oak-pine stands, 49 percent of the upland hardwood stands, and 46 percent of the lowland hardwood stands are in good condition. Volume of growing stock on areas that are in good condition averages 1,328 cubic feet per acre, and net annual growth of growing stock averaged 59 cubic feet per acre. Performing intermediate stand treatments as needed, protection from catastrophic fire, and prompt regeneration after harvest will ensure a high rate of growth and continued productivity on these timberland acres.

Treatment Opportunities for 7.9 Million Acres

One-third of Georgia's timberland offers opportunities to improve the State's future timber supply. Conditions range from overmaturity and overstocking to low stocking and the need for regeneration. Without treatment, these stands will remain far less productive than they could be. Six management opportunities were identified that would improve both quantity and quality of timber on these acres:

1. *Salvage and regenerate seriously damaged stands on 87,000 acres.* These stands have been heavily damaged by disease (primarily fusiform rust), insects, weather, or fire. Without treatment, they will experience excessive mortality. These stands averaged 41 years of age and contained 2,075 cubic feet of growing stock per acre.

Table V--Area of Georgia's idle cropland and timberland, by broad management, ownership and treatment opportunity classes, 1989

Broad management ^a and ownership classes ^b	Broad treatment opportunity class							Stands in relatively good condition	Adverse sites or conditions ^d
	Total area	Salvage	Harvest	Commercial thinning	Other stand improvement	Stand conversion ^b	Regeneration ^c		
	Thousand acres								
Idle cropland									
Public	--	--	--	--	--	--	--	--	--
Forest industry	--	--	--	--	--	--	--	--	--
Other private	879.3	--	--	--	--	--	879.3	--	--
Total	879.3	--	--	--	--	--	879.3	--	--
Pine plantation									
Public	98.9	2.4	--	--	7.3	--	3.1	86.1	--
Forest industry	2,890.2	22.0	--	374.3	77.0	6.1	4.7	2,403.6	2.5
Other private	2,047.5	16.0	3.1	99.2	60.3	12.1	66.1	1,790.7	--
Total	5,036.6	40.4	3.1	473.5	144.6	18.2	73.9	4,280.4	2.5
Natural pine stands									
Public	593.7	2.4	48.0	13.6	35.6	2.5	53.5	380.1	58.0
Forest industry	851.7	3.4	17.3	84.4	62.4	--	119.1	554.9	10.2
Other private	4,604.1	31.1	153.4	352.1	378.3	7.3	596.2	3,038.0	47.7
Total	6,049.5	36.9	218.7	450.1	476.3	9.8	768.8	3,973.0	115.9
Oak-pine stands									
Public	258.0	--	35.5	--	33.5	1.9	30.2	98.0	58.9
Forest industry	494.4	--	15.4	5.2	97.9	5.0	61.1	293.7	16.1
Other private	2,311.5	--	42.7	4.1	362.2	4.1	425.6	1,399.6	73.2
Total	3,063.9	--	93.6	9.3	493.6	11.0	516.9	1,791.3	148.2
Upland hardwood stands									
Public	554.7	--	27.1	--	25.5	--	62.8	202.1	237.2
Forest industry	693.3	--	16.8	--	104.0	14.5	240.2	292.7	25.1
Other private	4,669.6	7.0	176.3	10.4	526.5	76.8	1,212.1	2,411.2	249.3
Total	5,917.6	7.0	220.2	10.4	656.0	91.3	1,515.1	2,906.0	511.6
Lowland hardwood stands									
Public	140.1	--	28.0	2.7	0.9	1.9	16.1	69.2	21.3
Forest industry	940.5	--	121.4	4.7	126.1	9.2	209.9	346.9	122.5
Other private	2,483.0	2.7	242.6	26.0	224.8	19.2	538.0	1,208.0	221.7
Total	3,563.6	2.7	392.0	33.4	351.8	30.3	763.8	1,624.1	365.5
All classes									
Public	1,645.4	4.8	138.6	16.3	102.8	6.3	165.7	835.5	375.4
Forest industry	5,870.1	25.4	170.9	468.6	467.4	34.8	634.8	3,891.8	176.4
Other private	16,995.0	56.8	618.1	491.8	1,552.1	119.5	3,717.3	9,847.5	591.9
Total	24,510.5	87.0	927.6	976.7	2,122.3	160.6	4,517.8	14,574.8	1,143.7

^a Forest industry includes lands under long-term lease.

^b Areas occupied with species unsuitable for the site from the standpoint of timber production.

^c Includes 193.7 thousand acres where high-quality hardwood regeneration could be accomplished by felling residual trees to release advance understory hardwood reproduction and promote stump sprouting.

^d Areas where management opportunities are severely limited because of steep slopes or poor drainage.

Pine plantations and natural pine stands accounted for nearly 89 percent of the stands in need of salvage. High pine representation reflects the incidence of fusiform rust in these stands. Salvageable damaged stands account for less than 1 percent of Georgia's timberland; however, stands in which mortality has reduced stocking below 60 percent are included under the regeneration rather than the salvage opportunity.

2. Harvest and regenerate mature stands on 928,000 acres. Nearly 4 percent of Georgia's timberland falls in this category. Included are stands characterized by advanced age, high volumes, low growth rates, and significant mortality. These stands averaged 77 years of age and support 3,112 cubic feet of growing stock per acre. Net annual growth per acre averages 61 cubic feet. Hardwood stands account for two-thirds of all stands in need of harvest. Pine stands account for nearly a fourth of stands in need of harvest and oak-pine stands make up the remainder. Two-thirds of the harvestable acreage occurs on NIPF land.

3. Thin young stands that are too densely stocked with merchantable trees on 977,000 acres. Four percent of the State's timberland is in stands heavily overstocked with immature trees that are competing intensely with each other. Without treatment these stands will stagnate and much of the growth potential will be lost to suppression mortality. These stands average 29 years of age and contained 2,605 cubic feet of growing stock per acre. Net annual growth per acre averages 156 cubic feet. Pine stands account for nearly 95 percent of the commercial thinning opportunity. The acreage is almost equally split between pine plantations and natural pine stands. By ownership, 50 percent of stands that need thinning are on NIPF land, 48 percent are on land controlled by forest industry, and the remaining 2 percent are on public land.

4. Remove undesirable trees and competing vegetation from immature stands on 2.1 million acres. Nearly 9 percent of the State's timberland supports immature stands receiving intense competition from rough trees or other inhibiting vegetation. This category also includes stands heavily stocked with immature trees and requiring a precommercial thinning. A need for timber stand improvement (TSI) often originates with cutting practices, such as partial harvests and high-grading, that leave undesirable trees to impede regeneration and inhibit growth of existing reproduction. These stands average

16 years of age and contain 765 cubic feet of growing stock per acre. Net annual growth of growing stock averages 40 cubic feet per acre. By broad forest type, hardwood stands account for 48 percent of the acres in need of TSI, and oak-pine stands account for another 23 percent. Natural pine stands and pine plantations account for 22 and 7 percent, respectively. About 73 percent of the acres in need of timber stand improvement are on NIPF land, 22 percent are on forest industry land and 5 percent are on public land.

5. Convert stands with species obviously unsuitable for the site to more productive species from the standpoint of timber production on 161,000 acres. Nearly 1 percent of the State's timberland is dominated by off-site species that make up a manageable stand but produce well below the site's potential. These stands average 25 years of age and contain 740 cubic feet of growing stock per acre. Net annual growth of growing stock averages 44 cubic feet per acre. Hardwood stands account for three-fourths of the area needing conversion. By ownership, 74 percent of the acres in need of stand conversion are on NIPF land, 22 percent are on forest industry land, and 4 percent are on public land.

6. Regenerate 3.6 million acres so poorly stocked with acceptable trees that a manageable stand does not exist. About 15 percent of Georgia's timberland does not support a manageable stand. Volume of growing stock in these poorly stocked stands averages only 467 cubic feet per acre, and net annual growth of growing stock averages 20 cubic feet per acre. As with areas needing TSI, these stands result from poor harvesting practices. Nearly 41 percent of the acres in need of regeneration experienced a final harvest between 1982 and 1989. Amounts of growing stock on these areas may increase without treatment, but decades may pass before manageable stands emerge. More than half of the stands in this category have been there since the previous survey period. Average age of stands in need of regeneration is 29 years. The trees in the existing stands are scattered, and many are undesirable, but they prevent the development of a manageable stand. Of the timberland acres with a regeneration opportunity, 63 percent are classed as hardwood, 14 percent as oak-pine, and 23 percent as pine forest types. Note, however, that species currently growing on these areas are not necessarily well suited to the sites.

In addition to the 3.6 million acres of poorly stocked timberland, 879,000 acres of idle cropland represent a regeneration opportunity. In the past, these acres have been a major source of new stands and represent a relatively inexpensive way to maintain Georgia's pine resource. Including both poorly stocked timberland and idle cropland, regeneration opportunities exist on 4.5 million acres. Since NIPF owners control 82 percent of the acres in need of regeneration, efforts to correct and improve the situation would best be directed toward this group of landowners.

Several sources of financial and professional assistance are available to aid Georgia's NIPF owners in timberland management. The Stewardship Incentives Program, the Forestry Incentives Program, the Agriculture Conservation Program, and the Conservation Reserve Program are Federal cost-sharing programs designed to aid forest landowners. At present, the Georgia Forestry Commission supplies pine seedlings free for tracts up to 50 acres. In addition, professional advice and services are available through the Georgia Forestry Commission, the University of Georgia Cooperative Extension Service, and private forestry consultants. Many forest products companies also offer lease arrangements, cooperative agreements, and technical assistance to private landowners.

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Appendix

Procedure

The procedures used in the sixth statewide inventory and evaluation of Georgia's forest resources included several basic steps.

1. Initial estimates of forest and nonforest areas were based on the classification of 120,333 sample clusters systematically spaced on the latest available aerial photographs. A subsample of 11,615 of the 16-point clusters was ground checked, and a linear regression was fitted to the data to develop the relationship between the photo and ground classification of the subsample. This procedure provides a means for adjusting the initial estimates of area for changes in land use since date of photography and for photo misclassification.

2. Estimates of timber volume and forest classification were based on measurements recorded at 7,175 ground sample locations systematically distributed on timberland. The plot design at each location was based on a cluster of 10 points. In most cases, variable plots, established by using a basal-area factor of 37.5 square feet per acre, were systematically spaced within a single forest condition at 5 of the 10 cluster points. Trees less than 5 inches d.b.h. were tallied on a fixed-radius plot around each point center.

3. Seedlings, shrubs, vines, grasses, forbs, and other lesser vegetation occurring within a 35-foot radius of selected point centers were identified and recorded at each forest sample location. Each distinctive zone of lesser vegetation was classified based on its height, density, and species composition. When merged with the tree tally, this information provided a vegetative profile of each condition sampled. Additional nontimber attributes measured or classified included land use, terrain features, soils, erosion, litter, water, snags, tree cavities, livestock grazing, and recreational use.

4. Equations prepared from detailed measurements collected on standing trees in Georgia, and similar measurements taken throughout the Southeast, were used to compute the volume of individual tally trees. A mirror caliper and sectional aluminum poles were used to obtain the additional measurements required to construct volume equations (Cost 1978). Forest biomass estimates were made with equations developed by the Utilization of Southern Timber Research Work Unit of the Southeastern Forest Experiment Station in Athens, GA. In addition, felled trees were measured at 100 active cutting operations to provide utilization factors for the different timber products and species groups and to supplement the standing tree volume study.

5. Growth, removals, and mortality were estimated from the remeasurement of 7,329 permanent sample plots established at the time of the 1982 inventory. Periodic surveys of timber products output, conducted in cooperation with the Georgia Forestry Commission,

along with the annual pulpwood production study for the South, provided additional information for breakdowns of removals by product.

6. Ownership information was collected from correspondence, public records, and local contacts. In counties where the sample missed a particular ownership class, temporary samples were added and measured to describe forest conditions within the ownership class.

7. All field data were sent to Asheville for editing and were entered into disk and magnetic-tape storage for processing. Final estimates were based on statistical summaries of the data.

Reliability of the Data

Statistical analysis of these data indicates a sampling error of ± 0.20 percent for the estimate of timberland, 1.16 percent for total growing-stock volume, 1.17 percent for growing-stock growth, and 2.58 percent for growing-stock removals. As the totals are broken down by forest type, species, tree diameter, or other subdivisions, the sampling error increases. If homogeneity of variances is assumed, the order of this increase may be approximated by using the following tabulation showing the sampling errors in terms of one standard error, or two chances out of three. For example, a subset of the State totals with an estimate of 4.6 billion cubic feet would have an estimated sampling error of 3 percent, or 0.14 billion cubic feet. This means that, two times out of three, the true growing-stock volume for this subset would be within the range defined by 4.6 ± 0.14 , or from 4.46 to 4.74 billion cubic feet.

Sampling error for selected areas and volumes^a

Sampling error ^b (percent)	Volume of growing stock			
	Timberland	Inventory	Net growth	Removals
	<i>Macres</i>		<i>Million cubic feet</i>	
1	945.2	--	--	--
2	236.3	10,338.9	436.2	--
3	105.0	4,595.1	193.9	963.1
4	59.1	2,584.7	109.1	541.8
5	37.8	1,654.2	69.8	346.7
10	9.5	413.6	17.4	86.7
15	4.2	183.8	7.8	38.5
20	2.4	103.4	4.4	21.7
25	1.5	66.2	2.8	13.9

^a Sampling error of volume or area totals in question may be computed with the following formula:

$$E = \frac{(SE) \sqrt{\text{Specified volume or area}}}{\sqrt{(\text{Volume or area total in question})}}$$

where: E = Sampling error of the volume or area total in question.

SE = Specified sampling error in table.

^b By random-sampling formula.

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 in square feet per acre.

Biomass. The aboveground green weight of solid wood and bark in live trees 1.0 inch d.b.h. and larger from the ground to the tip of the tree. All foliage is excluded. The weight of wood and bark in lateral limbs, secondary limbs, and twigs under 0.5 inch in diameter at the point of occurrence on sapling-size trees is included but is excluded on poletimber and sawtimber-size trees.

Bole. That portion of a tree between a 1-foot stump and a 4-inch top diameter outside bark (d.o.b.) in trees 5.0 inches d.b.h. and larger.

Broad management class. A classification of timberland based on forest type and stand origin.

Pine plantation. Stands that have been artificially regenerated by planting or direct seeding and with a southern yellow pine, white pine-hemlock, or other softwood forest type.

Natural pine. Stands that have not been artificially regenerated and with a southern yellow pine, white pine-hemlock, or other softwood forest type.

Oak-pine. Stands with a forest type of oak-pine.

Upland hardwood. Stands with a forest type of oak-hickory, chestnut oak, southern scrub oak, or maple-beech-birch.

Lowland hardwood. Stands with a forest type of oak-gum-cypress, elm-ash-cottonwood, palm, or other tropical.

Census water. Streams, sloughs, estuaries, canals, and other moving bodies of water one-eighth of a statute mile in width and greater, and lakes, reservoirs, ponds, and other permanent bodies of water 40 acres in area and greater.

Commercial forest land. (see: Timberland).

Commercial species. Tree species currently or potentially suitable for industrial wood products. Noncommercial species are excluded.

Cropland. Land under cultivation within the past 24 months, including orchards and land in soil-improving crops but excluding land cultivated in developing improved pasture. Also includes idle farmland.

D.b.h. Tree diameter in inches (outside bark) at breast height (4.5 feet above the ground).

Diameter class. A classification of trees based on tree d.b.h. Two-inch diameter classes are commonly used by Forest Inventory and Analysis, with the even inch as the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h.

Farm. Land on which agricultural operations are being conducted and sale of agricultural products totaled \$1,000 or more during the year.

Farm operator. A person who operates a farm, either doing the work or directly supervising the work.

Farmer-owned land. (see: Other private land).

Forest industry land. Land owned by companies or individuals operating primary wood-using plants.

Forest industry-leased land. Land leased or under management contracts to forest industry from other owners for periods of one forest rotation or longer. Land under cutting contracts is not included.

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

Forest type. A classification of forest land based on the species forming a plurality of live-tree stocking.

White pine-hemlock. Forests in which eastern white pine, red pine, or jack pine, singly or in combination, constitute a plurality of the stocking. (Common associates include hemlock, birch, and maple.)

Spruce-fir. Forests in which spruce or true firs, singly or in combination, constitute a plurality of the stocking. (Common associates include maple, birch, and hemlock.)

Longleaf-slash pine. Forests in which longleaf or slash pine, singly or in combination, constitute a plurality of the stocking. (Common associates include oak, hickory, and gum.)

Loblolly-shortleaf pine. Forests in which loblolly pine, shortleaf pine, or other southern yellow pines, except longleaf or slash pine, singly or in combination, constitute a plurality of the stocking. (Common associates include oak, hickory, and gum.)

Oak-pine. Forests in which hardwoods (usually upland oaks) constitute a plurality of the stocking but in which pines account for 25 to 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, constitute a plurality of the stocking, except where pines account for 25 to 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, constitute a plurality of the stocking, except where pines account for 25 to 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, constitute a plurality of the stocking. (Common associates include willow, sycamore, beech, and maple.)

Maple-beech-birch. Forests in which maple, beech, or yellow birch, singly or in combination, constitute a plurality of the stocking. (Common associates include hemlock, elm, basswood, and white pine.)

Palm, other tropicals. Forests in which palms and other tropicals constitute a plurality of the stocking.

Gross growth. Annual increase in merchantable volume of trees in the absence of cutting and mortality. (Gross growth includes survivor growth, ingrowth, growth on ingrowth, growth on removals prior to removal, and growth on mortality prior to death.)

Growing-stock trees. Live sawtimber-size trees of commercial species containing at least a 12-foot log, or two noncontiguous saw logs each 8 feet or longer, meeting minimum grade requirements (hardwoods must qualify as a log grade of either 3 or 4; softwoods must qualify as a log grade 3) with at least one-third of the gross board-foot volume (International 1/4-inch rule) between a 1-foot stump and the minimum saw-log top being sound, or a live tree below sawtimber size that will prospectively qualify under the above standards.

Growing-stock volume. Volume (cubic feet) of solid wood in growing-stock trees 5.0 inches d.b.h. and larger, from a 1-foot stump to a minimum 4.0-inch top diameter, outside bark, on the central stem. Volume of solid wood in primary forks from the point of occurrence to a minimum 4.0-inch top diameter outside bark is included.

Hardwoods. Angiosperms; dicotyledonous trees (including all palm species which are monocotyledonous), usually broadleaf and deciduous.

Soft hardwoods. Soft-textured hardwoods such as boxelder, red and silver maples, hackberry, loblolly-bay, sweetgum, yellow-poplar, magnolia, sweetbay, water tupelo, blackgum, sycamore, cottonwood, black cherry, willow, basswood, and elm.

Hard hardwoods. Hard-textured hardwoods such as sugar maple, birch, hickory, dogwood, persimmon (forest grown), black locust, beech, ash, honeylocust, holly, black walnut, mulberry, and all commercial oaks.

Idle farmland. Cropland, orchard, improved pasture, and farm sites not tended within the past 2 years, and currently less than 16.7 percent stocked with live trees.

Improved pasture. Land currently improved for grazing by cultivation, seeding, irrigation, or clearing of trees or brush.

Indian land. All lands held in trust by the United States for individual Indians or tribes, or all lands, titles to which are held by individual Indians or tribes, subject to Federal restrictions against alienation.

Industrial wood. All roundwood products except fuelwood.

Ingrowth. The number or net volume of trees that grow large enough during a specified year to qualify as saplings, poletimber, or sawtimber.

Land area. The area of dry land and land temporarily or partly covered by water such as marshes, swamps, and river floodplains (omitting tidal flats below mean high tide), streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width and greater, lakes, reservoirs, and ponds less than 40 acres in area.

Live trees. All trees 1.0 inch d.b.h. and larger which are not dead at the time of inventory.

Live-tree volume. Volume (cubic feet) of wood above the ground line in live trees 1.0 inch d.b.h. and larger. The volume in twigs and lateral limbs smaller than 0.5 inch in diameter at the point of occurrence on sapling-size trees is included but is excluded on poletimber and sawtimber-size trees.

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

Logging residues. The unused merchantable portion of growing-stock trees cut or destroyed during logging operations.

Manageable stand. Timberland at least 60 percent stocked with growing-stock trees that can be featured together under a management scheme.

Merchantable portion. That portion of live trees 5.0 inches d.b.h. and larger between a 1-foot stump and a minimum 4.0-inch top diameter outside bark on the central stem. That portion of primary forks from the point of occurrence to a minimum 4.0-inch top diameter outside bark is included.

Merchantable volume. Solid-wood volume in merchantable portion of live trees.

Miscellaneous Federal land. Federal land other than National forests, land administered by the Bureau of Land Management, and land administered by the Bureau of Indian Affairs.

Miscellaneous private land. (see: Other private land).

Mortality. The merchantable volume in trees that have died from natural causes during a specified period.

National forest land. Federal land that has been legally designated as national forests or purchase units, and other land under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III land.

Net annual growth. The net change in merchantable volume for a specific year in the absence of cutting (gross growth minus mortality for that specified year).

Net volume. Gross volume of wood less deductions for rot, sweep, or other defect affecting use for timber products.

Noncommercial species. Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

Nonforest land. Land that has never supported forests and land formerly forested where timber production is precluded by development for other uses.

Nonindustrial private forest (NIPF) land. (see: Other private land).

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

Other private land. Privately owned land excluding forest industry land or forest industry-leased land. Also referred to as nonindustrial private forest (NIPF) land.

Farmer-owned land. Owned by farm operators, excluding incorporated farm ownerships.

Other individual land. Owned by individuals other than farm operators.

Other corporate land. Owned by corporations, including incorporated farm ownerships.

Other removals. The growing-stock volume of trees removed from the inventory by cultural operations such as timber stand improvement, land clearing, and other changes in land use that result in the removal of the trees from timberland.

Plant residues. Wood material generated in the production of timber products at primary manufacturing plants.

Coarse residues. Material, such as slabs, edgings, trim, veneer cores and ends, which is suitable for chipping.

Fine residues. Material, such as sawdust, shavings, and veneer chippings, which is not suitable for chipping.

Plant byproducts. Residues (coarse or fine) utilized in the further manufacture of industrial products or for consumer use, or utilized as fuel.

Unused plant residues. Residues (coarse or fine) that are not used for any product, including fuel.

Poletimber-size trees. Live trees at least 5.0 inches d.b.h. but smaller than sawtimber size.

Primary wood-using plants. Industries that receive roundwood or chips from roundwood for the manufacture of products such as veneer, pulp, and lumber.

Productive-reserved forest land. (see: Reserved timberland).

Rangeland. Land on which the natural vegetation is predominantly native grasses, grasslike plants, forbs, or shrubs valuable for forage, not qualifying as timberland and not developed for another land use. Rangeland includes natural grassland and savannah.

Reserved timberland. Forest land sufficiently productive to qualify as timberland, but withdrawn from timber utilization through statute or administrative designation.

Rotten trees. Live trees of commercial species that do not contain at least one 12-foot saw log, or two non-contiguous saw logs, each 8 feet or longer, now or prospectively, primarily because of rot or missing sections, and with less than one-third of the gross board-foot tree volume in sound material.

Rough trees. Live trees of commercial species that do not contain at least one 12-foot saw log, or two non-contiguous saw logs, each 8 feet or longer, now or prospectively, primarily because of roughness, poor form, splits, and cracks, and with less than one-third of the gross board-foot tree volume in sound material; and live trees of noncommercial species.

Roundwood (roundwood logs). Logs, bolts, or other round sections cut from trees for industrial or consumer uses.

Roundwood chipped. Any timber cut primarily for pulpwood, delivered to non-pulpmills, chipped, and then sold to pulpmills as residues, including chipped tops, jump sections, whole trees, and pulpwood sticks.

Roundwood products. Any primary product such as lumber, poles, pilings, pulp, or fuelwood which is produced from roundwood.

Salvable dead trees. Standing or down dead trees considered utilizable by Forest Inventory and Analysis standards.

Saplings. Live trees 1.0 to 5.0 inches d.b.h.

Saw log. A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, and with a minimum diameter inside bark for softwoods of 6 inches (8 inches for hardwoods).

Saw-log portion. That part of the bole of sawtimber trees between a 1-foot stump and the saw-log top, including the portion of forks large enough to contain a saw log.

Saw-log top. The point on the bole of sawtimber trees above which a conventional saw log cannot be produced. The minimum saw-log top is 7.0 inches in diameter outside bark (d.o.b.) for softwoods and 9.0 inches (d.o.b.) for hardwoods.

Sawtimber-size trees. Softwoods 9.0 inches d.b.h. and larger and hardwoods 11.0 inches d.b.h. and larger.

Sawtimber volume. Growing-stock volume in the saw-log portion of sawtimber-size trees in board feet (International 1/4-inch rule).

Seedlings. Trees less than 1.0 inch in d.b.h. Only seedlings of a commercial species that are not over topped and are more than 6 inches tall for softwoods and 1 foot tall for hardwoods are counted.

Site class. A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands, by annual production capacity.

Softwoods. Gymnosperms; in the order Coniferales, usually evergreen (includes the genus *Taxodium* which is deciduous), having needles or scalelike leaves.

Pines. Yellow pine species which include loblolly, longleaf, slash, pond, shortleaf, pitch, Virginia, sand, spruce, and Table Mountain pines.

Other softwoods. Cypress, eastern red-cedar, white cedar, eastern white pine, eastern hemlock, spruce, and fir.

Stand-size class. A classification of forest land based on the diameter class distribution of live trees in the stand.

Sawtimber stands. Stands at least 16.7 percent stocked with live trees, with half or more of total stocking in sawtimber and poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands. Stands at least 16.7 percent stocked with live trees, of which half or more of total stocking is in poletimber and sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands. Stands at least 16.7 percent stocked with live trees of which more than half of total stocking is saplings and seedlings.

State, county, and municipal land. Land owned by States, counties, and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

Stocking. The degree of occupancy of land by trees, measured by basal area or the number of trees in a stand and spacing in the stand, compared with a minimum standard, depending on tree size, required to fully utilize the growth potential of the land.

Fully stocked. 100 percent or more stocking.

Medium stocked. 60 to 99 percent stocking.

Poorly stocked. Less than 60 percent stocking.

Survivor growth. The merchantable volume increment on trees 5.0 inches d.b.h. and larger in the inventory at the beginning of the year and surviving to its end.

Timberland. Timberland that is capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization.

Timber products. Roundwood products and byproducts.

Timber removals. The merchantable volume of trees removed from the inventory by harvesting, cultural operations such as stand improvement, land clearing, or changes in land use.

Top. The portion of the main stem and forks from a 4.0-inch diameter outside bark to the tips of the main stem and forks, plus all other limbs above the 4.0-inch top at least 0.5 inch in diameter at their point of occurrence.

Treatment opportunity. A classification of the management or treatment that would most improve for timber production the existing condition of the stand being sampled.

Tree. Woody plants having one erect perennial stem or trunk at least 3 inches d.b.h., a more or less definitely formed crown of foliage, and a height of at least 13 feet.

Tree grade. A classification of sawtimber trees based on the log grade of the butt log in the tree.

Unproductive forest land. (see: Woodland).

Upper-stem portion. That part of the main stem or fork of sawtimber trees above the saw-log top to minimum top diameter 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.

Urban and other areas. Areas developed for residential, industrial, or recreational purposes, school yards, cemeteries, roads, railroads, airports, beaches, powerlines and other rights-of-way, or other nonforest land not included in any other specified land use class.

Woodland. Forest land incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions, because of adverse site conditions.

**STOCKING
STANDARD**

**Density of trees and basal area per acre
required for full stocking**

D.b.h. class	Trees per acre for full stocking	Basal area per acre
Seedlings	600	—
2	560	—
4	460	—
6	340	67
8	240	84
10	155	85
12	115	90
14	90	96
16	72	101
18	60	106
20	51	111

**CONVERSION
FACTORS**

**Cubic feet of wood per average cord
(excluding bark)**

D.b.h. class	All species	Pine	Other softwood	Hardwood
6	60.6	61.0	68.2	60.0
8	68.5	68.1	76.0	68.4
10	73.4	73.1	81.4	73.4
12	76.8	76.7	85.2	76.4
14	79.1	79.4	88.2	78.4
16	80.9	81.6	90.4	79.8
18	82.1	83.3	92.3	80.8
20	83.1	84.8	93.8	81.5
22	83.9	86.0	95.1	82.1
24+	84.9	87.7	97.8	83.1
Average	74.3	72.3	84.1	74.2

Rough cord per M cubic feet (without bark) =

$$a + b \left(\frac{1}{d.b.h.} \right) + c \left(\frac{1}{d.b.h.} \right)^2$$

Where	<i>Pine</i>	<i>Other softwoods</i>	<i>Hardwoods</i>
a =	10.01850	9.15960	11.68410
b =	34.42135	28.75973	3.74431
c =	22.73994	25.54418	157.39417

Metric equivalents of units used in this report

1 acre = 4,046.86 square meters or 0.404686 hectare
1 cubic foot = 0.028317 cubic meter
1 inch = 2.54 centimeters or 0.0254 meter
Breast height (4.5 feet) = 1.4 meters above ground level
1 square foot = 929.03 square centimeters or 0.0929 square meter
1 square foot per acre basal area = 0.229568 square meter per hectare
1 pound = 0.454 kilogram
1 ton = 0.907 metric ton

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Tables

**Table 1--Area, by land class,
Georgia, 1989**

Land class	Area
	<u>Acres</u>
Forest land	
Timberland	23,631,214
Reserved timberland	487,362
Woodland	18,161
Total	<u>24,136,737</u>
Nonforest land	
Cropland	6,293,638
Pasture and range	2,579,873
Other ^a	4,130,266
Total	<u>13,003,777</u>
All land^b	<u>37,140,514</u>

^aIncludes swampland, industrial, and urban areas, other nonforest land, and 197,155 acres classed as water by Forest Inventory and Analysis standards but defined by Bureau of Census as land.

^bFrom the U.S. Bureau of Census, 1980.

**Table 2--Area of timberland, by
ownership class, Georgia, 1989**

Ownership class	Area
	<u>Acres</u>
National forest	<u>751,791</u>
Other Federal	
Bureau of Land Management	--
Indian	--
Miscellaneous Federal	619,567
Total	<u>619,567</u>
State	<u>185,925</u>
County and municipal	<u>88,132</u>
Forest industry	<u>4,990,347</u>
Forest industry-leased	<u>879,793</u>
Other private	
Farmer	4,877,643
Other individual	9,190,007
Other corporate	2,048,009
Total	<u>16,115,659</u>
All ownerships	<u>23,631,214</u>

Table 3--Area of timberland, by stand-size and ownership classes, Georgia, 1989

Stand-size class	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
	<u>Acres</u>					
Sawtimber	9,285,417	508,706	539,671	1,193,488	174,433	6,869,119
Poletimber	6,294,348	89,102	192,435	1,568,571	385,891	4,058,349
Sapling and seedling	7,388,492	153,983	150,440	2,058,433	290,819	4,734,817
Nonstocked	662,957	--	11,078	169,855	28,650	453,374
All classes	23,631,214	751,791	893,624	4,990,347	879,793	16,115,659

Table 4--Area of timberland, by stand-volume and ownership classes, Georgia, 1989

Stand volume class (board feet/acre ^a)	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
	<u>Acres</u>					
Less than 2,000	11,399,667	172,560	233,859	3,326,194	558,074	7,108,980
2,000-3,999	3,270,024	73,792	152,408	454,323	128,697	2,460,804
4,000-5,999	2,712,390	123,931	126,998	358,315	78,341	2,024,805
6,000-7,999	1,973,078	133,871	80,026	252,512	53,802	1,452,867
8,000-9,999	1,400,503	70,982	70,513	170,524	35,611	1,052,873
10,000 or more	2,875,552	176,655	229,820	428,479	25,268	2,015,330
All classes	23,631,214	751,791	893,624	4,990,347	879,793	16,115,659

^aInternational 1/4-inch rule.

Table 5--Area of timberland, by stocking class of growing-stock trees and ownership class, Georgia, 1989

Stocking class	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
<u>Acres</u>						
Overstocked	1,039,754	41,013	28,944	304,512	65,245	600,040
Fully stocked	8,273,702	243,014	306,446	2,106,112	411,277	5,206,853
Moderately stocked	10,302,090	413,086	414,507	1,869,840	289,142	7,315,515
Poorly stocked	3,352,711	54,678	132,649	540,028	85,479	2,539,877
Nonstocked	662,957	--	11,078	169,855	28,650	453,374
All classes	23,631,214	751,791	893,624	4,990,347	879,793	16,115,659

Table 6--Area of timberland, by site and ownership classes, Georgia, 1989

Site class (ft ³ /acre/year)	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
<u>Acres</u>						
>164	156,735	68,902	2,355	2,364	--	83,114
120-164	716,239	36,565	67,954	102,251	19,515	489,954
85-119	6,650,912	163,840	280,860	1,409,649	193,528	4,603,035
50-84	14,629,995	415,794	450,912	3,148,865	612,973	10,001,451
20-49	1,477,333	66,690	91,543	327,218	53,777	938,105
All classes	23,631,214	751,791	893,624	4,990,347	879,793	16,115,659

Table 7--Area of timberland, by forest type and site index class, Georgia, 1989

Forest type	All classes	Site index class (50-year base)								
		<50	50-59	60-69	70-79	80-89	90-99	100-109	110-119	>119
Acres										
Softwood types										
White pine-hemlock	74,444	--	--	6,463	10,755	20,160	24,286	6,891	5,889	--
Spruce-fir	--	--	--	--	--	--	--	--	--	--
Longleaf pine	519,862	5,625	48,751	155,475	217,500	75,682	16,829	--	--	--
Slash pine	3,658,173	8,754	77,397	652,316	1,676,837	1,030,058	184,065	28,746	--	--
Loblolly pine	5,753,273	8,525	83,733	852,762	2,711,656	1,566,256	415,077	97,114	18,150	--
Shortleaf pine	544,235	20,435	43,299	140,863	204,703	126,400	8,535	--	--	--
Virginia pine	375,433	--	18,361	117,330	153,382	65,615	20,745	--	--	--
Sand pine	36,076	3,260	2,727	21,773	8,316	--	--	--	--	--
Eastern redcedar	9,072	--	--	9,072	--	--	--	--	--	--
Pond pine	99,635	--	21,769	34,063	35,320	8,483	--	--	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--
Pitch pine	11,778	--	5,889	5,889	--	--	--	--	--	--
Table Mountain pine	4,167	--	--	--	4,167	--	--	--	--	--
Total	11,086,148	46,599	301,926	1,996,006	5,022,636	2,892,654	669,537	132,751	24,039	--
Hardwood types										
Oak-pine	3,063,856	16,317	193,980	629,464	1,310,945	636,000	204,965	68,246	--	3,939
Oak-hickory	5,606,612	18,901	204,070	952,502	2,517,611	1,334,486	402,532	116,343	48,280	11,887
Chestnut oak	48,536	8,762	18,226	7,372	14,176	--	--	--	--	--
Southern scrub oak	262,500	9,780	105,920	76,027	64,456	6,317	--	--	--	--
Oak-gum-cypress	3,245,126	7,099	198,178	631,345	1,405,404	588,177	305,293	81,183	22,927	5,520
Elm-ash-cottonwood	318,436	--	7,692	13,722	108,384	110,983	55,616	16,114	3,174	2,751
Maple-beech-birch	--	--	--	--	--	--	--	--	--	--
Total	12,545,066	60,859	728,066	2,310,432	5,420,976	2,675,963	968,406	281,886	74,381	24,097
All types	23,631,214	107,458	1,029,992	4,306,438	10,443,612	5,568,617	1,637,943	414,637	98,420	24,097

Table 8--Area of timberland, by forest type and ownership class, Georgia, 1989

Forest type	All ownerships	Ownership class				
		National forest	Other public	Forest industry	Forest industry- leased	Other private
<u>Acres</u>						
Softwood types						
White pine-hemlock	74,444	54,565	--	--	--	19,879
Spruce-fir	--	--	--	--	--	--
Longleaf pine	519,862	--	58,668	39,095	5,715	416,384
Slash pine	3,658,173	4,106	124,508	1,294,765	240,370	1,994,424
Loblolly pine	5,753,273	79,764	225,677	1,748,108	244,806	3,454,918
Shortleaf pine	544,235	19,512	33,224	63,807	33,014	394,678
Virginia pine	375,433	38,302	23,608	23,371	--	290,152
Sand pine	36,076	--	--	17,559	--	18,517
Eastern redcedar	9,072	--	--	--	--	9,072
Pond pine	99,635	--	18,877	18,377	12,996	49,385
Spruce pine	--	--	--	--	--	--
Pitch pine	11,778	11,778	--	--	--	--
Table Mountain pine	4,167	--	--	--	--	4,167
Total	11,086,148	208,027	484,562	3,205,082	536,901	6,651,576
Hardwood types						
Oak-pine	3,063,856	150,024	108,013	419,330	75,029	2,311,460
Oak-hickory	5,606,612	381,747	144,847	580,658	64,765	4,434,595
Chestnut oak	48,536	8,101	--	--	--	40,435
Southern scrub oak	262,500	--	20,029	36,066	11,850	194,555
Oak-gum-cypress	3,245,126	--	126,791	677,001	180,831	2,260,503
Elm-ash-cottonwood	318,436	3,892	9,382	72,210	10,417	222,535
Maple-beech-birch	--	--	--	--	--	--
Total	12,545,066	543,764	409,062	1,785,265	342,892	9,464,083
All types	23,631,214	751,791	893,624	4,990,347	879,793	16,115,659

Table 9--Area of timberland, by forest type and stand-size class, Georgia, 1989

Forest type	All stands	Stand-size class			Nonstocked areas
		Sawtimber	Poletimber	Sapling- seedling	
<u>Acres</u>					
Softwood types					
White pine-hemlock	74,444	65,936	--	8,508	--
Spruce-fir	--	--	--	--	--
Longleaf pine	519,862	361,190	58,367	65,400	34,905
Slash pine	3,658,173	955,475	1,325,674	1,282,045	94,979
Loblolly pine	5,753,273	1,991,792	1,320,115	2,407,446	33,920
Shortleaf pine	544,235	297,460	177,843	68,932	--
Virginia pine	375,433	206,823	109,018	59,592	--
Sand pine	36,076	--	11,043	25,033	--
Eastern redcedar	9,072	--	3,111	5,961	--
Pond pine	99,635	55,039	28,161	10,633	5,802
Spruce pine	--	--	--	--	--
Pitch pine	11,778	11,778	--	--	--
Table Mountain pine	4,167	--	4,167	--	--
Total	11,086,148	3,945,493	3,037,499	3,933,550	169,606
Hardwood types					
Oak-pine	3,063,856	1,161,788	735,049	1,151,025	15,994
Oak-hickory	5,606,612	2,337,150	1,537,040	1,562,241	170,181
Chestnut oak	48,536	26,301	14,123	8,112	--
Southern scrub oak	262,500	25,076	15,745	56,375	165,304
Oak-gum-cypress	3,245,126	1,582,414	878,816	648,175	135,721
Elm-ash-cottonwood	318,436	207,195	76,076	29,014	6,151
Maple-beech-birch	--	--	--	--	--
Total	12,545,066	5,339,924	3,256,849	3,454,942	493,351
All types	23,631,214	9,285,417	6,294,348	7,388,492	662,957

Table 10--Area of timberland, by stand-age and broad management classes, all
ownerships, Georgia, 1989

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
<u>Acres</u>						
0-10	4,902,448	2,588,930	536,745	663,208	875,359	238,206
11-20	2,633,183	1,268,514	422,613	379,157	397,173	165,726
21-30	2,390,204	805,078	740,911	223,621	373,013	247,581
31-40	2,949,171	274,457	1,556,753	377,687	443,125	297,149
41-50	2,717,504	22,850	1,103,721	343,729	745,980	501,224
51-60	2,001,738	2,850	520,526	308,911	688,400	481,051
61-70	1,110,292	--	294,134	115,917	383,748	316,493
71-80	532,533	--	73,135	63,104	226,582	169,712
81+	570,210	--	23,469	44,581	207,728	294,432
No manageable stand	3,823,931	73,947	777,515	543,941	1,576,540	851,988
All classes	23,631,214	5,036,626	6,049,522	3,063,856	5,917,648	3,563,562

Table 11--Area of timberland, by stand-age and broad management classes, public
ownerships, Georgia, 1989

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
<u>Acres</u>						
0-10	190,711	59,279	43,571	44,280	34,155	9,426
11-20	96,166	18,221	22,774	33,880	21,291	--
21-30	99,716	7,926	51,040	6,750	22,021	11,979
31-40	173,090	10,366	106,696	10,899	22,743	22,386
41-50	201,497	--	97,127	30,927	55,850	17,593
51-60	234,029	--	83,353	39,744	97,866	13,066
61-70	198,355	--	88,294	14,528	80,608	14,925
71-80	140,250	--	35,394	20,773	65,543	18,540
81+	120,189	--	11,917	21,179	71,252	15,841
No manageable stand	191,412	3,129	53,502	35,077	83,395	16,309
All classes	1,645,415	98,921	593,668	258,037	554,724	140,065

Table 12--Area of timberland, by stand-age and broad management classes, forest industry,^a Georgia, 1989

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
Acres						
0-10	1,658,048	1,280,681	67,387	152,873	118,153	38,954
11-20	1,172,405	925,215	43,564	93,814	82,036	27,776
21-30	873,297	583,690	113,614	41,833	50,130	84,030
31-40	512,031	88,637	280,891	18,488	41,413	82,602
41-50	367,483	7,343	133,940	69,471	64,595	92,134
51-60	262,054	--	50,082	27,556	56,037	128,379
61-70	146,019	--	27,745	7,398	16,762	94,114
71-80	65,421	--	3,755	7,442	8,335	45,889
81+	133,466	--	6,558	5,642	15,628	105,638
No manageable stand	679,916	4,693	124,188	69,842	240,250	240,943
All classes	5,870,140	2,890,259	851,724	494,359	693,339	940,459

^aIncludes 879,793 acres of other private land under long-term lease.

Table 13--Area of timberland, by stand-age and broad management classes, other private ownerships,^a Georgia, 1989

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
Acres						
0-10	3,053,689	1,248,970	425,787	466,055	723,051	189,826
11-20	1,364,612	325,078	356,275	251,463	293,846	137,950
21-30	1,417,191	213,462	576,257	175,038	300,862	151,572
31-40	2,264,050	175,454	1,169,166	348,300	378,969	192,161
41-50	2,148,524	15,507	872,654	243,331	625,535	391,497
51-60	1,505,655	2,850	387,091	241,611	534,497	339,606
61-70	765,918	--	178,095	93,991	286,378	207,454
71-80	326,862	--	33,986	34,889	152,704	105,283
81+	316,555	--	4,994	17,760	120,848	172,953
No manageable stand	2,952,603	66,125	599,825	439,022	1,252,895	594,736
All classes	16,115,659	2,047,446	4,604,130	2,311,460	4,669,585	2,483,038

^aExcludes 879,793 acres of other private land under long-term lease to forest industry.

Table 14--Basal area per acre of live trees 5.0 inches d.b.h. and larger, by broad management class, species group, and ownership class, Georgia, 1989

Broad management class and species group	All ownerships	National forest	Other public	Forest industry	Forest industry- leased	Other private
<u>Square feet</u>						
Pine plantation						
Softwood	32.5	25.0	27.5	38.1	47.8	23.0
Hardwood	1.1	1.2	2.5	1.0	.7	1.3
Total	33.6	26.2	30.0	39.1	48.5	24.3
Natural pine						
Softwood	61.8	71.1	64.1	63.6	57.3	61.1
Hardwood	12.1	27.3	11.1	10.6	5.7	12.3
Total	73.9	98.4	75.2	74.2	63.0	73.4
Oak-pine						
Softwood	25.5	29.0	28.9	27.4	22.8	24.9
Hardwood	31.0	44.5	32.7	21.4	11.8	32.5
Total	56.5	73.5	61.6	48.8	34.6	57.4
Upland hardwood						
Softwood	4.5	3.8	7.0	3.4	1.7	4.7
Hardwood	52.1	85.3	54.9	40.5	29.1	51.9
Total	56.6	89.1	61.9	43.9	30.8	56.6
Lowland hardwood						
Softwood	13.1	--	9.7	17.1	18.2	11.7
Hardwood	76.6	150.0	92.0	73.4	66.5	77.3
Total	89.7	150.0	101.7	90.5	84.7	89.0
All classes						
Softwood	29.4	24.6	38.2	33.5	37.1	27.2
Hardwood	31.8	59.0	34.4	20.1	19.9	35.3
Total	61.2	83.6	72.6	53.6	57.0	62.5

Table 15--Area of reserved timberland and woodland, by forest-type group, Georgia, 1989

Forest-type group	All areas	Reserved timberland	Woodland
<u>Acres</u>			
White pine-hemlock	3,642	3,642	--
Spruce-fir	--	--	--
Longleaf-slash pine	75,262	75,262	--
Loblolly-shortleaf pine	33,140	33,140	--
Oak-pine	9	9	--
Oak-hickory	175,276	157,115	18,161
Oak-gum-cypress	218,043	218,043	--
Elm-ash-cottonwood	151	151	--
Maple-beech-birch	--	--	--
All types	505,523	487,362	18,161

Table 16—Number of live trees on timberland, by species and diameter class, Georgia, 1989

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	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	100,411	26,853	15,992	11,644	12,118	13,077	9,802	6,078	3,159	1,017	477	194	--
Slash pine	1,158,077	313,610	323,054	258,898	145,237	64,081	28,926	14,462	5,895	2,368	955	579	12
Shortleaf pine	367,144	121,689	86,779	62,408	45,027	26,343	15,109	6,202	2,522	713	297	55	--
Loblolly pine	2,143,599	999,774	473,529	275,981	161,006	101,320	61,759	34,929	18,470	9,161	4,588	2,999	83
Pond pine	28,634	6,650	4,907	5,962	3,973	3,015	2,148	965	606	178	148	82	--
Virginia pine	183,144	66,818	42,115	26,145	22,767	15,896	6,471	2,035	735	119	33	10	--
Pitch pine	3,758	313	1,052	547	380	558	246	310	207	97	--	48	--
Table Mountain pine	2,015	837	243	386	266	110	97	60	--	16	--	--	--
Spruce pine	4,426	2,493	149	527	176	394	153	127	175	152	--	74	6
Sand pine	12,073	5,297	4,228	2,548	--	--	--	--	--	--	--	--	--
Eastern white pine	51,983	31,080	11,328	1,432	2,385	1,334	1,278	808	638	646	344	662	48
Eastern hemlock	14,735	10,161	2,076	1,286	339	273	318	205	29	--	17	25	6
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	19,688	5,955	3,300	1,807	2,477	1,520	995	1,024	756	588	439	721	106
Pondcypress	232,423	125,142	45,424	23,446	13,841	10,783	6,541	3,581	2,151	797	376	295	46
Cedars	57,660	41,234	11,006	3,493	1,061	411	200	88	111	50	--	6	--
Total softwoods	4,379,770	1,757,906	1,025,182	676,510	411,053	239,115	134,043	70,874	35,454	15,902	7,674	5,750	307
Hardwood													
Select white oaks ^a	272,230	122,671	58,856	31,861	20,814	13,403	9,651	6,649	3,559	2,310	1,195	1,127	134
Select red oaks ^b	55,480	24,694	7,307	7,842	4,505	2,372	3,007	1,805	1,449	859	716	870	54
Chestnut oak	106,630	34,771	24,915	17,863	9,003	6,896	4,805	3,851	1,941	1,194	563	771	57
Other white oaks	204,443	120,212	38,601	15,855	11,351	6,983	4,121	2,324	1,755	1,272	511	1,120	338
Other red oaks	1,616,594	1,067,258	252,414	110,062	71,684	41,849	29,686	18,081	10,689	6,260	3,517	4,413	681
Hickory	472,768	301,809	83,437	37,559	19,788	12,605	6,952	5,117	2,932	1,322	548	650	49
Yellow birch	314	314	--	--	--	--	--	--	--	--	--	--	--
Hard maple	41,290	31,672	6,374	1,340	1,042	649	118	52	--	31	--	12	--
Soft maple	1,119,799	822,789	168,670	60,630	30,390	15,883	9,474	5,126	3,225	1,645	880	1,004	83
Beech	26,888	19,263	3,298	1,684	775	400	203	338	175	176	243	308	25
Sweetgum	1,642,076	1,102,355	286,298	120,251	59,260	32,768	19,862	10,387	5,560	2,825	1,346	1,054	110
Tupelo and blackgum	1,433,244	892,108	267,928	115,160	64,046	38,020	26,088	14,290	7,380	4,341	1,729	1,891	263
Ash	162,264	108,522	26,768	9,201	6,506	4,246	2,916	1,981	1,065	455	248	336	20
Cottonwood	1,323	205	211	500	--	112	193	46	--	15	13	28	--
Basswood	4,530	1,881	1,564	191	106	267	332	149	25	--	--	9	6
Yellow-poplar	307,953	160,227	51,705	29,162	19,010	15,860	10,425	9,102	5,433	3,193	1,967	1,732	137
Bay and magnolia	304,651	207,945	54,281	19,352	10,323	5,482	3,333	1,902	894	592	284	228	35
Black cherry	283,803	218,757	44,826	12,353	5,117	1,832	643	192	34	17	--	32	--
Black walnut	3,571	1,721	759	320	382	181	63	91	19	--	24	11	--
Sycamore	6,124	1,561	1,392	756	808	712	122	250	179	50	128	159	7
Black locust	7,352	4,626	820	814	405	410	106	--	108	20	32	11	--
Elm	245,776	170,823	43,921	14,730	9,798	2,841	1,340	1,271	516	262	128	146	--
Other eastern hardwoods	2,169,351	1,624,488	381,753	107,032	33,131	12,648	5,257	2,677	1,095	609	379	253	29
Total hardwoods	10,488,454	7,040,672	1,806,098	714,518	378,244	216,419	138,697	85,681	48,033	27,448	14,451	16,165	2,028
All species	14,868,224	8,798,578	2,831,280	1,391,028	789,297	455,534	272,740	156,555	83,487	43,350	22,125	21,915	2,335

^aIncludes white, swamp white, swamp chestnut, and chinquapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 17--Number of growing-stock trees on timberland, by species and diameter class, Georgia, 1989

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	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	97,559	25,459	14,805	11,519	12,050	13,045	9,772	6,078	3,143	1,017	477	194	--
Slash pine	1,135,546	297,199	318,066	258,245	144,865	64,034	28,898	14,442	5,895	2,356	955	579	12
Shortleaf pine	345,389	104,285	83,514	61,483	44,927	26,282	15,109	6,202	2,522	713	297	55	--
Loblolly pine	2,050,150	926,248	460,381	271,533	159,668	100,794	61,441	34,890	18,430	9,147	4,563	2,972	83
Pond pine	26,043	4,683	4,751	5,588	3,912	2,982	2,148	965	606	178	148	82	--
Virginia pine	173,969	59,913	40,689	25,833	22,496	15,679	6,471	2,035	701	119	33	--	--
Pitch pine	3,758	313	1,052	547	380	558	246	310	207	97	--	48	--
Table Mountain pine	1,772	837	--	386	266	110	97	60	--	16	--	--	--
Spruce pine	4,074	2,141	149	527	176	394	153	127	175	152	--	74	6
Sand pine	11,704	5,297	4,025	2,382	--	--	--	--	--	--	--	--	--
Eastern white pine	49,634	29,287	10,772	1,432	2,385	1,334	1,278	808	638	646	344	662	48
Eastern hemlock	13,893	9,587	1,808	1,286	339	273	318	205	29	--	17	25	6
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	17,921	4,715	3,144	1,564	2,477	1,520	965	1,003	756	588	431	686	72
Pondcypress	218,057	114,829	43,429	22,744	13,387	10,232	6,433	3,447	2,121	785	367	253	30
Cedars	50,648	35,384	10,542	3,063	911	377	200	62	93	16	--	--	--
Total softwoods	4,200,117	1,620,177	997,127	668,132	408,239	237,614	133,529	70,634	35,316	15,830	7,632	5,630	257
Hardwood													
Select white oaks ^a	225,379	86,458	51,820	29,778	20,450	13,090	9,384	6,473	3,450	2,231	1,092	1,053	100
Select red oaks ^b	48,206	18,661	6,768	7,627	4,352	2,324	2,968	1,706	1,420	813	699	814	54
Chestnut oak	87,923	24,195	20,580	16,827	7,990	6,315	4,366	3,608	1,783	1,035	506	675	43
Other white oaks	129,594	68,332	25,188	12,277	9,578	6,271	3,133	1,575	1,245	837	390	598	170
Other red oaks	1,282,615	790,385	217,074	101,560	66,559	39,037	27,898	16,936	10,007	5,718	3,060	3,888	493
Hickory	358,410	202,974	70,952	36,185	18,866	12,308	6,811	5,068	2,825	1,288	497	594	42
Yellow birch	314	314	--	--	--	--	--	--	--	--	--	--	--
Hard maple	18,436	11,860	4,325	958	565	596	65	52	--	15	--	--	--
Soft maple	582,395	385,511	106,391	41,107	21,761	12,166	6,581	4,005	2,542	1,054	619	625	33
Beech	17,147	10,787	2,791	1,471	690	400	175	246	95	123	147	216	6
Sweetgum	1,259,464	784,781	237,961	109,702	56,012	31,509	19,139	10,113	5,320	2,661	1,265	941	60
Tupelo and blackgum	863,295	438,553	196,894	93,352	54,411	32,664	22,488	12,225	6,261	3,590	1,378	1,360	119
Ash	80,498	43,819	14,403	7,303	4,814	3,853	2,537	1,909	947	393	220	284	16
Cottonwood	1,077	205	--	500	--	77	193	46	--	15	13	28	--
Basswood	2,113	222	980	191	--	267	332	90	25	--	--	--	6
Yellow-poplar	283,029	140,799	48,905	28,055	18,335	15,621	10,400	8,934	5,263	3,123	1,897	1,601	96
Bay and magnolia	201,035	129,097	38,567	15,132	7,996	4,410	2,798	1,414	723	507	223	153	15
Black cherry	150,736	111,938	25,202	7,720	3,530	1,609	501	192	--	17	--	27	--
Black walnut	2,818	1,106	759	320	271	181	63	64	19	--	24	11	--
Sycamore	5,368	933	1,392	756	808	654	122	211	157	50	128	150	7
Black locust	5,331	3,787	566	419	274	203	53	--	29	--	--	--	--
Elm	142,933	83,966	33,453	11,765	8,100	2,389	1,212	1,138	462	214	105	129	--
Other eastern hardwoods	89,980	58,615	16,163	6,071	4,134	1,903	1,190	902	467	199	185	134	17
Total hardwoods	5,838,096	3,397,298	1,121,134	529,076	309,496	187,847	122,409	76,907	43,040	23,883	12,448	13,281	1,277
All species	10,038,213	5,017,475	2,118,261	1,197,208	717,735	425,461	255,938	147,541	78,356	39,713	20,080	18,911	1,534

^aIncludes white, swamp white, swamp chestnut, and chinkapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 18--Merchantable volume of live trees on timberland, by species and diameter class, Georgia, 1989

Species	All classes	Diameter class (inches at breast height)									
		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 cubic feet											
Softwood											
Longleaf pine	904,983	34,948	89,131	176,020	201,685	180,831	124,309	50,929	29,940	17,190	--
Slash pine	3,943,960	686,896	956,518	809,802	582,653	426,090	236,493	128,611	63,875	51,309	1,713
Shortleaf pine	1,547,318	184,432	326,851	350,501	322,883	190,033	107,097	39,594	20,814	5,113	--
Loblolly pine	7,064,010	685,383	1,025,910	1,224,688	1,216,173	1,015,561	756,205	502,484	317,071	304,653	15,882
Pond pine	186,554	13,943	24,944	34,314	39,541	25,711	22,521	8,543	9,762	7,275	--
Virginia pine	746,207	101,441	195,643	220,284	132,780	59,786	27,284	5,919	1,869	1,201	--
Pitch pine	42,521	1,343	2,421	6,332	5,371	9,667	7,963	5,195	--	4,229	--
Table Mountain pine	10,023	2,127	2,655	1,436	1,644	1,592	--	569	--	--	--
Spruce pine	39,432	1,599	901	5,147	3,322	4,307	7,106	7,725	--	7,617	1,708
Sand pine	6,256	6,256	--	--	--	--	--	--	--	--	--
Eastern white pine	251,556	4,368	15,932	14,486	25,336	23,111	25,843	37,209	24,521	71,054	9,696
Eastern hemlock	26,099	3,183	2,246	2,759	6,350	5,427	1,210	--	1,192	2,435	1,297
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	238,918	5,545	17,027	18,014	18,431	26,743	26,153	26,370	24,063	58,206	18,366
Pondcypress	644,948	74,518	91,876	124,431	112,287	87,128	74,122	33,534	19,804	20,576	6,672
Cedars	27,162	8,680	4,844	3,594	3,143	2,050	3,050	1,727	--	74	--
Total softwoods	15,679,947	1,814,662	2,756,899	2,991,808	2,671,599	2,058,037	1,419,356	848,409	512,911	550,932	55,334
Hardwood											
Select white oaks ^a	1,233,388	88,426	136,972	162,461	185,417	188,448	141,117	120,464	78,314	108,612	23,157
Select red oaks ^b	443,927	25,873	31,690	30,862	56,316	49,192	55,576	45,245	48,070	87,814	13,289
Chestnut oak	573,851	49,105	55,060	75,940	81,327	98,285	63,833	52,284	29,916	61,672	6,429
Other white oaks	559,757	40,370	62,296	71,299	63,646	51,767	51,310	50,917	27,697	86,113	54,342
Other red oaks	3,615,357	308,595	452,998	472,161	533,011	465,625	377,398	293,064	203,239	388,918	120,348
Hickory	927,788	91,463	120,969	147,750	130,214	143,146	113,908	70,355	36,953	64,188	8,842
Yellow birch	--	--	--	--	--	--	--	--	--	--	--
Hard maple	20,698	3,689	5,329	6,646	2,120	1,185	--	1,022	--	707	--
Soft maple	1,115,610	178,593	182,595	167,629	153,335	127,373	106,660	64,931	48,329	75,734	10,431
Beech	86,012	4,813	4,607	4,962	3,653	8,313	6,134	7,969	12,617	28,673	4,271
Sweetgum	2,331,912	294,047	369,535	393,892	394,174	308,791	222,137	149,604	89,751	94,628	15,353
Tupelo and blackgum	2,532,520	305,827	377,448	409,731	444,978	342,424	237,067	179,223	82,284	125,122	28,416
Ash	334,277	23,445	40,781	52,604	53,440	54,459	39,961	21,593	15,124	29,270	3,600
Cottonwood	13,193	1,816	--	1,474	3,807	1,367	--	987	1,008	2,734	--
Basswood	16,358	440	466	3,041	6,247	3,274	1,214	--	--	462	1,214
Yellow-poplar	1,630,083	90,275	131,795	206,111	218,277	269,720	221,216	170,569	133,236	167,437	21,447
Bay and magnolia	373,217	56,494	65,197	57,246	58,762	45,159	30,146	25,481	13,429	16,654	4,649
Black cherry	99,992	33,526	27,626	19,171	10,646	4,813	784	565	--	2,861	--
Black walnut	11,503	708	2,207	1,844	1,445	1,756	884	--	1,832	827	--
Sycamore	59,809	3,671	7,021	8,135	2,347	6,816	6,266	2,521	8,220	13,835	977
Black locust	12,867	1,707	2,261	3,865	1,316	--	2,352	307	443	616	--
Elm	234,709	30,470	58,665	33,184	25,994	33,165	18,774	12,536	8,183	13,738	--
Other eastern hardwoods	695,638	218,231	154,487	103,871	74,036	55,503	29,321	20,689	18,224	17,448	3,828
Total hardwoods	16,922,466	1,851,584	2,290,005	2,433,879	2,504,508	2,260,581	1,726,058	1,290,326	856,869	1,388,063	320,593
All species	32,602,413	3,666,246	5,046,904	5,425,687	5,176,107	4,318,618	3,145,414	2,138,735	1,369,780	1,938,995	375,927

^aIncludes white, swamp white, swamp chestnut, and chinkapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 19--Volume of growing stock on timberland, by species and diameter class, Georgia, 1989

Species	All classes	Diameter class (inches at breast height)									
		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 cubic feet											
Softwood											
Longleaf pine	903,495	34,703	88,905	175,738	201,283	180,831	123,976	50,929	29,940	17,190	--
Slash pine	3,938,976	685,422	954,582	809,344	582,415	425,609	236,493	128,214	63,875	51,309	1,713
Shortleaf pine	1,543,740	182,057	326,165	349,984	322,883	190,033	107,097	39,594	20,814	5,113	--
Loblolly pine	7,031,301	675,318	1,019,359	1,219,878	1,210,994	1,014,514	754,570	502,164	315,868	302,754	15,882
Pond pine	184,962	13,015	24,745	33,849	39,541	25,711	22,521	8,543	9,762	7,275	--
Virginia pine	736,989	100,556	192,517	217,308	132,780	59,786	26,254	5,919	1,869	--	--
Pitch pine	42,521	1,343	2,421	6,332	5,371	9,667	7,963	5,195	--	4,229	--
Table Mountain pine	10,023	2,127	2,655	1,436	1,644	1,592	--	569	--	--	--
Spruce pine	39,432	1,599	901	5,147	3,322	4,307	7,106	7,725	--	7,617	1,708
Sand pine	6,055	6,055	--	--	--	--	--	--	--	--	--
Eastern white pine	251,556	4,368	15,932	14,486	25,336	23,111	25,843	37,209	24,521	71,054	9,696
Eastern hemlock	26,099	3,183	2,246	2,759	6,350	5,427	1,210	--	1,192	2,435	1,297
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	230,831	5,080	17,027	18,014	17,955	26,465	26,153	26,370	23,763	56,301	13,703
Pondcypress	629,570	72,709	90,224	120,444	111,079	85,388	73,437	33,313	19,464	19,161	4,351
Cedars	23,562	8,005	4,277	3,330	3,143	1,531	2,598	678	--	--	--
Total softwoods	15,599,112	1,795,540	2,741,956	2,978,049	2,664,096	2,053,972	1,415,221	846,422	511,068	544,438	48,350
Hardwood											
Select white oaks ^a	1,199,438	83,100	134,953	159,661	182,689	184,641	138,590	117,896	74,341	104,982	18,585
Select red oaks ^b	433,165	25,321	30,858	30,139	55,689	47,382	55,226	43,429	47,505	84,327	13,289
Chestnut oak	541,662	47,311	51,274	71,690	76,360	93,836	60,319	48,509	28,562	58,050	5,751
Other white oaks	427,238	32,710	54,999	65,414	51,759	38,223	39,015	37,784	22,746	52,898	31,690
Other red oaks	3,415,535	289,713	431,153	450,999	512,355	447,383	362,009	277,159	187,495	359,595	97,674
Hickory	905,588	88,913	116,852	144,656	128,088	142,276	111,179	69,343	34,820	61,564	7,897
Yellow birch	--	--	--	--	--	--	--	--	--	--	--
Hard maple	15,090	2,827	2,858	6,071	1,315	1,185	--	834	--	--	--
Soft maple	872,513	129,133	140,184	140,318	118,239	106,324	91,521	49,047	38,294	54,222	5,231
Beech	65,781	4,155	4,315	4,962	3,073	6,119	3,802	6,368	8,842	23,120	1,025
Sweetgum	2,252,180	273,177	357,058	385,188	383,769	303,771	216,339	144,600	87,447	89,465	11,366
Tupelo and blackgum	2,243,069	259,014	334,877	368,580	401,076	311,478	213,600	161,700	74,615	101,764	16,365
Ash	305,552	19,479	32,990	49,505	49,777	52,944	37,645	19,497	14,083	26,250	3,382
Cottonwood	12,691	1,816	--	972	3,807	1,367	--	987	1,008	2,734	--
Basswood	14,637	440	--	3,041	6,247	2,481	1,214	--	--	--	1,214
Yellow-poplar	1,597,528	87,093	129,056	203,942	217,739	267,338	216,540	168,381	129,552	159,554	18,333
Bay and magnolia	310,775	46,573	53,130	49,091	51,268	35,574	25,277	23,284	11,527	13,014	2,037
Black cherry	76,957	22,567	20,371	17,291	8,906	4,813	--	565	--	2,444	--
Black walnut	10,539	708	1,471	1,844	1,445	1,528	884	--	1,832	827	--
Sycamore	57,998	3,671	7,021	8,084	2,347	5,947	5,966	2,521	8,220	13,244	977
Black locust	7,348	1,116	1,885	2,520	817	--	1,010	--	--	--	--
Elm	208,537	25,848	49,316	29,234	24,003	31,058	17,908	10,668	7,459	13,043	--
Other eastern hardwoods	160,997	16,469	24,125	22,444	23,014	23,761	16,577	8,843	10,937	12,236	2,591
Total hardwoods	15,134,818	1,461,154	1,978,746	2,215,646	2,303,782	2,109,429	1,614,621	1,191,415	789,285	1,233,333	237,407
All species	30,733,930	3,256,694	4,720,702	5,193,695	4,967,878	4,163,401	3,029,842	2,037,837	1,300,353	1,777,771	285,757

^aIncludes white, swamp white, swamp chestnut, and chinkapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 20--Volume of sawtimber on timberland, by species and diameter class, Georgia, 1989

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- 29.0 and larger	
Thousand board feet								
Softwood								
Longleaf pine	3,989,256	718,240	969,154	971,409	716,204	309,624	189,883	114,742
Slash pine	10,789,285	2,987,418	2,670,456	2,229,399	1,352,313	782,367	408,512	346,281
Shortleaf pine	4,750,029	1,301,080	1,476,083	977,416	598,049	234,817	129,269	33,315
Loblolly pine	26,477,375	4,373,145	5,446,347	5,227,669	4,255,390	3,023,243	1,998,290	2,036,830
Pond pine	723,758	181,102	132,344	132,446	50,209	60,397	47,273	116,461
Virginia pine	1,803,333	784,865	563,867	281,166	131,832	31,388	10,215	--
Pitch pine	193,517	19,791	23,722	48,530	43,391	30,363	27,720	--
Table Mountain pine	24,531	5,584	7,319	8,219	--	3,409	--	--
Spruce pine	203,249	21,329	15,712	22,387	39,442	44,615	--	11,659
Sand pine	--	--	--	--	--	--	--	--
Eastern white pine	1,292,522	51,828	112,071	114,140	139,209	212,549	146,494	450,459
Eastern hemlock	97,793	9,410	26,960	25,849	6,016	--	6,626	8,456
Spruce and fir	--	--	--	--	--	--	--	--
Baldcypress	1,040,001	54,364	68,650	116,066	124,930	134,723	128,225	325,308
Pondcypress	1,964,482	378,559	433,656	378,723	357,070	172,228	105,565	111,022
Cedars	55,272	13,901	14,967	7,913	14,471	4,020	--	--
Hardwood								
Select white oaks ^a	3,595,374	621,473	735,355	614,466	562,288	376,653	572,189	112,950
Select red oaks ^b	1,548,404	185,331	180,651	235,773	199,989	228,747	436,377	81,536
Chestnut oak	1,555,256	250,556	360,563	255,902	220,707	137,031	298,218	32,279
Other white oaks	1,297,131	185,820	159,677	177,118	184,733	115,982	290,060	183,741
Other red oaks	10,460,360	1,879,375	1,886,168	1,679,064	1,378,356	983,616	2,039,368	614,453
Hickory	2,432,407	441,009	579,307	501,990	337,468	180,124	344,056	48,453
Yellow birch	--	--	--	--	--	--	--	--
Hard maple	13,283	4,783	4,636	387,431	3,864	--	--	--
Soft maple	1,897,022	386,286	409,984	387,431	222,215	184,379	277,355	29,372
Beech	210,588	11,267	23,212	14,791	25,297	35,714	95,967	4,340
Sweetgum	5,571,912	1,371,921	1,303,947	1,039,175	757,916	487,030	535,864	76,665
Tupelo and blackgum	5,281,419	1,316,091	1,216,572	938,125	769,967	375,601	561,243	103,820
Ash	851,406	161,135	203,393	163,559	91,364	70,367	141,309	20,279
Cottonwood	44,704	13,270	5,581	--	5,068	5,339	15,446	--
Basswood	42,769	20,706	9,507	5,372	--	--	--	--
Yellow-poplar	5,781,279	788,206	1,163,182	1,066,440	901,825	741,082	992,311	128,133
Bay and magnolia	656,563	170,239	137,009	107,262	107,026	54,688	68,023	12,316
Black cherry	67,697	31,116	20,104	--	2,737	--	13,740	--
Black walnut	25,113	5,067	5,593	3,418	--	7,578	3,457	--
Sycamore	184,907	7,139	23,044	25,378	11,675	40,518	71,472	5,681
Black locust	6,690	2,871	--	3,819	--	--	--	--
Elm	432,086	83,280	121,900	76,454	48,364	35,660	66,428	--
Other eastern hardwoods	410,072	80,307	93,855	69,759	40,280	52,081	60,969	12,821
Total hardwoods	42,366,442	8,017,248	8,643,234	7,365,396	5,870,539	4,112,190	6,883,852	1,473,983
All species								
	95,770,845	10,846,301	20,027,314	19,184,464	15,269,359	10,904,094	7,295,666	10,439,383
	10,846,301	20,027,314	19,184,464	15,269,359	10,904,094	7,295,666	10,439,383	1,804,264
	--	--	--	--	--	--	--	--
	1,804,264	--	--	--	--	--	--	--

^aIncludes white, swamp white, swamp chestnut, and chinquapin oaks.

^bIncludes cherrybark, northern red, and Shumard oaks.

Table 21--Volume of sawtimber on timberland, by species, size class, and tree grade, Georgia, 1989

Species	All size classes					Trees 15.0 inches d.b.h. and larger				
	All grades	Tree grade				All grades	Tree grade			
		1	2	3	4		1	2	3	4
Thousand board feet										
Softwood										
Yellow pines ^a	48,954,333	10,449,344	10,788,441	27,716,548	--	17,363,793	5,734,409	4,261,461	7,367,923	--
Eastern white pine ^b	1,292,522	149,820	337,013	795,510	10,179	1,014,483	130,781	298,665	577,791	7,246
Spruce and fir ^b	--	--	--	--	--	--	--	--	--	--
Cypress ^c	3,004,483	673,181	989,404	1,305,802	36,096	1,574,465	673,181	669,882	219,632	11,770
Other eastern softwoods ^b	153,065	7,822	23,717	90,165	31,361	54,065	7,822	21,126	9,393	15,724
Total	53,404,403	11,280,167	12,138,575	29,908,025	77,636	20,006,806	6,546,193	5,251,134	8,174,739	34,740
Hardwood ^c										
Select white and red oaks	5,143,778	1,096,147	1,458,487	1,957,818	631,326	3,420,968	1,096,147	1,201,361	871,865	251,595
Other white and red oaks	13,312,747	1,941,636	3,337,263	5,739,758	2,294,090	8,590,588	1,941,636	2,821,005	2,735,222	1,092,725
Hickory	2,432,407	286,524	765,926	1,031,701	348,256	1,412,091	286,524	603,059	372,361	150,147
Yellow birch	--	--	--	--	--	--	--	--	--	--
Hard maple	13,283	--	--	4,783	8,500	3,864	--	--	--	3,864
Sweetgum	5,571,912	808,853	1,619,882	2,605,159	538,018	2,896,050	808,853	1,113,763	798,605	174,829
Ash, walnut, and black cherry	944,216	135,660	303,987	441,755	62,814	517,808	135,660	216,975	128,508	36,665
Yellow-poplar	5,781,279	1,261,990	1,942,774	2,119,970	456,545	3,829,891	1,261,990	1,440,919	854,541	272,441
Other eastern hardwoods	9,166,820	1,075,253	2,525,933	4,532,282	1,033,352	5,034,700	1,075,253	1,864,299	1,643,071	452,077
Total	42,366,442	6,606,063	11,954,252	18,433,226	5,372,901	25,705,960	6,606,063	9,261,381	7,404,173	2,434,343
All species	95,770,845	17,886,230	24,092,827	48,341,251	5,450,537	45,712,766	13,152,256	14,512,515	15,578,912	2,469,083

^aFor yellow pines, tree grade is based on "Southern Pine Tree Grades for Yard and Structural Lumber," Research Paper SE-40, published by the Southeastern Forest Experiment Station, Asheville, NC, 1968. Tree grade 4 does not apply to yellow pine.

^bFor other softwoods (excluding cypress), tree grade is based on "Tree Grades for Eastern White Pine," Research Paper NE-214, published by the Northeastern Forest Experiment Station, Broomall, PA, 1971.

^cFor hardwoods and cypress, tree grades 1, 2, and 3 are based on "Hardwood Tree Grades for Factory Lumber," Research Paper NE-333, published by the Northeastern Forest Experiment Station, Broomall, PA, 1976. Grade 4 trees are sawtimber trees not qualifying as tree grades 1, 2, or 3. The butt log of these trees qualify as construction (tie and timber) logs based on "A Guide to Hardwood Log Grading (revised)," General Technical Report NE-1, published by the Northeastern Forest Experiment Station, Broomall, PA, 1971.

Table 22--Volume of live timber and associated green weight of forest biomass on timberland, by class of material, softwood, and hardwood, Georgia, 1989

Class of material	Volume ^a			Associated green weight ^b		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Thousand cubic feet			Hundred thousand pounds		
Sawtimber trees						
Saw-log portion	17,948,158	9,977,855	7,970,303	13,520,862	7,357,970	6,162,892
Upper stem	2,592,730	1,083,761	1,508,969	1,944,748	796,727	1,148,021
Total ^c	20,540,888	11,061,616	9,479,272	15,465,610	8,154,697	7,310,913
Poletimber trees ^c	10,193,042	4,537,496	5,655,546	7,230,284	3,244,907	3,985,377
All growing stock ^c	30,733,930	15,599,112	15,134,818	22,695,894	11,399,604	11,296,290
Rough trees ^c	1,558,635	65,931	1,492,704	1,191,074	47,816	1,143,258
Rotten trees ^c	309,848	14,904	294,944	245,850	11,783	234,067
Saplings ^d	5,529,622	1,556,423	3,973,199	4,013,439	1,059,643	2,953,796
Stumps, tops, and limbs ^e	7,290,017	2,995,260	4,294,757	5,331,474	2,152,432	3,179,042
Total, all classes	45,422,052	20,231,630	25,190,422	33,477,731	14,671,278	18,806,453

^aExcludes bark.

^bIncludes bark.

^cBole portion only.

^dIncludes entire tree above ground.

^eOf live trees 5.0 inches d.b.h. and larger.

Table 23--Total volume of live trees on timberland, by species and diameter class, Georgia, 1989

Species	All classes	Diameter class (inches at breast height)												
		1.0- 2.9	3.0- 4.9	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 cubic feet														
Softwood														
Longleaf pine	1,068,338	6,600	20,700	48,122	107,182	203,467	229,393	203,855	139,455	56,968	33,437	19,159	--	
Slash pine	5,183,584	85,461	368,170	958,374	1,155,544	936,501	661,830	479,462	264,729	143,491	71,101	57,023	1,898	
Shortleaf pine	1,958,523	29,286	97,341	252,785	394,087	406,845	368,607	215,247	120,742	44,512	23,346	5,725	--	
Loblolly pine	9,028,296	216,380	480,534	978,812	1,250,447	1,428,313	1,391,892	1,151,148	852,469	564,545	355,388	340,664	17,704	
Pond pine	225,549	1,304	5,942	18,967	29,954	39,993	45,455	29,348	25,607	9,692	11,064	8,223	--	
Virginia pine	963,933	17,744	58,461	133,184	234,162	257,053	153,251	68,617	31,208	6,755	2,132	1,366	--	
Pitch pine	50,700	111	1,324	1,734	2,886	7,403	6,200	11,129	9,133	5,950	--	4,830	--	
Table Mountain pine	12,002	130	190	2,583	3,109	1,654	1,881	1,811	--	644	--	--	--	
Spruce pine	45,920	712	127	2,169	1,086	5,966	3,799	4,886	8,023	8,700	--	8,542	1,910	
Sand pine	15,092	1,160	4,988	8,944	--	--	--	--	--	--	--	--	--	
Eastern white pine	314,930	8,664	13,978	5,737	19,312	17,098	29,531	26,795	29,851	42,893	28,225	81,707	11,139	
Eastern hemlock	36,014	2,700	2,221	4,471	2,768	3,259	7,363	6,243	1,388	--	1,360	2,770	1,471	
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--	
Baldcypress	299,361	1,725	4,646	8,135	21,968	22,346	22,476	32,397	31,582	31,643	28,942	70,221	23,280	
Pondcypress	971,908	38,812	65,181	125,088	128,056	163,847	144,392	110,866	93,573	42,148	24,861	26,167	8,917	
Cedars	57,480	9,452	12,379	12,911	6,223	4,412	3,801	2,468	3,640	2,053	--	141	--	
Total softwoods	20,231,630	420,241	1,136,182	2,562,016	3,356,784	3,498,157	3,069,871	2,344,272	1,611,400	959,994	579,856	626,538	66,319	
Hardwood														
Select white oaks ^a	1,677,011	30,175	79,144	131,500	179,470	205,921	232,105	234,148	174,718	148,988	96,963	134,561	29,318	
Select red oaks ^b	571,386	5,611	11,287	35,941	40,534	38,636	69,925	60,986	68,651	55,748	59,315	108,385	16,367	
Chestnut oak	759,290	8,062	35,575	69,389	70,320	94,252	99,935	119,944	77,838	63,871	36,622	75,466	8,016	
Other white oaks	789,016	26,431	47,063	62,237	83,483	91,602	80,560	64,800	63,797	62,985	34,061	105,650	66,347	
Other red oaks	5,227,489	220,822	340,327	484,454	605,647	604,557	670,174	580,557	468,573	363,512	252,754	483,991	152,121	
Hickory	1,335,653	58,899	99,042	143,400	159,030	185,307	160,170	174,112	138,225	84,828	44,577	77,254	10,809	
Yellow birch	53	53	--	--	--	--	--	--	--	--	--	--	--	
Hard maple	42,026	7,460	7,465	5,736	6,881	8,219	2,582	1,445	--	1,370	--	868	--	
Soft maple	1,842,710	190,871	252,915	254,089	230,739	206,057	186,209	152,994	128,127	78,509	58,039	91,322	12,839	
Beech	117,747	3,994	3,739	7,365	6,121	6,301	4,582	10,317	7,807	10,080	16,072	36,088	5,281	
Sweetgum	3,406,841	232,170	350,664	436,818	458,691	466,109	456,854	354,212	253,650	170,270	102,051	107,537	17,815	
Tupelo and blackgum	3,846,427	248,996	366,899	459,190	489,315	510,849	546,827	418,412	290,159	219,122	101,892	156,182	38,584	
Ash	460,475	27,752	35,905	33,967	50,074	62,105	62,241	62,749	45,993	24,748	17,286	33,540	4,115	
Cottonwood	16,040	19	309	2,445	--	1,752	4,474	1,593	--	1,139	1,162	3,147	--	
Basswood	21,640	467	2,025	604	576	3,550	7,211	3,803	1,386	--	--	620	1,398	
Yellow-poplar	1,986,473	38,236	74,074	122,048	157,254	237,617	248,309	305,085	249,365	191,805	149,683	188,433	24,564	
Bay and magnolia	599,860	53,379	79,818	82,652	82,330	69,729	70,512	53,966	35,739	30,098	16,067	19,902	5,668	
Black cherry	256,624	71,822	58,440	45,955	34,165	22,977	12,621	5,691	936	662	--	3,355	--	
Black walnut	15,277	339	874	1,008	2,764	2,260	1,723	2,119	1,046	--	2,169	975	--	
Sycamore	73,608	446	2,538	4,735	8,534	9,717	2,751	7,947	7,325	2,919	9,506	16,063	1,127	
Black locust	18,515	1,080	575	2,493	2,877	4,850	1,675	--	3,015	483	647	820	--	
Elm	381,841	34,070	56,256	44,947	73,726	40,162	30,916	39,204	22,142	14,703	9,636	16,079	--	
Other eastern hardwoods	1,744,420	363,192	443,919	331,089	202,728	131,657	92,258	68,695	36,510	25,693	22,372	21,549	4,758	
Total hardwoods	25,190,422	1,624,346	2,348,853	2,762,062	2,945,259	3,004,186	3,044,614	2,722,779	2,075,002	1,551,533	1,030,874	1,681,787	399,127	
All species	45,422,052	2,044,587	3,485,035	5,324,078	6,302,043	6,502,343	6,114,485	5,067,051	3,686,402	2,511,527	1,610,730	2,308,325	465,446	

^aIncludes white, swamp white, swamp chestnut, and chinkapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 24---Green weight of forest biomass on timberland, by species and diameter class, Georgia, 1989

Species	All classes	Diameter class (inches at breast height)												
		1.0- 2.9	3.0- 4.9	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	
Hundred thousand pounds														
Softwood														
Longleaf pine	834,477	5,455	17,520	33,926	80,891	157,196	179,993	161,223	110,862	45,442	26,684	15,285	--	
Slash pine	3,993,291	64,063	340,803	695,339	877,709	718,090	510,524	370,902	204,790	110,559	54,909	44,124	1,479	
Shortleaf pine	1,340,104	16,279	59,147	151,201	268,119	286,934	263,725	154,793	86,854	32,072	16,843	4,137	--	
Loblolly pine	6,455,617	105,887	283,632	692,232	915,555	1,045,829	1,020,014	845,021	619,601	410,155	258,851	246,165	12,675	
Pond pine	159,164	710	3,302	13,242	21,279	28,441	32,445	20,987	18,327	6,848	7,785	5,798	--	
Virginia pine	711,185	15,510	47,639	98,807	169,164	187,393	112,179	50,136	22,923	4,901	1,554	979	--	
Pitch pine	33,730	100	1,199	1,139	1,963	4,885	4,075	7,280	6,037	3,882	--	3,170	--	
Table Mountain pine	7,298	81	177	1,445	1,804	1,023	1,187	1,152	--	429	--	--	--	
Spruce pine	32,117	597	118	1,218	746	4,079	2,633	3,392	5,718	6,231	--	6,047	1,338	
Sand pine	11,133	806	4,102	6,225	--	--	--	--	--	--	--	--	--	
Eastern white pine	188,848	3,651	6,343	3,847	12,699	11,479	19,284	17,142	18,715	25,937	16,851	46,874	6,026	
Eastern hemlock	26,406	1,590	1,417	3,520	2,171	2,677	5,594	4,788	965	--	910	1,850	924	
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--	
Baldcypress	231,448	954	2,930	4,187	13,504	15,332	16,504	24,787	24,794	25,435	23,810	58,950	20,261	
Pondcypress	606,190	20,943	41,049	54,734	69,758	100,508	96,084	77,433	67,706	31,297	18,801	20,453	7,424	
Cedars	40,270	5,761	7,878	9,516	4,958	3,356	2,736	1,739	2,691	1,528	--	107	--	
Total softwoods	14,671,278	242,387	817,256	1,770,578	2,440,320	2,567,222	2,266,977	1,740,775	1,189,983	704,716	426,998	453,939	50,127	
Hardwood														
Select white oaks ^a	1,349,642	23,784	58,638	92,292	140,456	165,105	188,500	192,093	144,369	123,784	81,254	113,648	50,127	
Select red oaks ^b	464,118	4,716	8,451	26,160	32,588	31,269	57,758	50,101	56,685	45,838	48,451	88,262	13,839	
Chestnut oak	594,473	7,354	27,669	48,518	53,117	73,308	78,276	94,588	62,602	51,211	29,727	61,261	6,842	
Other white oaks	664,586	19,163	33,575	42,221	65,348	74,212	67,425	56,027	56,513	56,413	30,661	98,539	64,489	
Other red oaks	4,216,984	186,686	256,098	342,396	479,899	489,281	551,716	483,668	391,700	303,635	210,420	398,414	123,071	
Hickory	1,079,805	50,824	86,758	100,207	122,746	145,680	128,950	142,934	114,938	71,313	38,072	67,549	9,834	
Yellow birch	42	42	--	--	--	--	--	--	--	--	--	--	--	
Hard maple	35,022	6,197	6,307	3,850	5,974	7,030	2,345	1,305	--	1,212	--	802	--	
Soft maple	1,352,272	144,591	180,076	178,496	176,603	153,976	138,677	113,278	93,858	57,604	41,606	64,575	8,932	
Beech	95,340	3,227	3,183	4,443	4,504	4,851	3,790	8,738	6,353	8,242	13,530	29,858	4,621	
Sweetgum	2,434,605	154,398	232,657	283,766	327,947	337,414	335,393	263,762	191,476	130,008	78,701	84,399	14,684	
Tupelo and blackgum	2,529,770	169,737	248,612	234,527	296,516	325,539	361,866	289,671	206,937	159,754	77,425	124,339	34,847	
Ash	286,285	16,878	22,638	25,009	35,436	39,843	38,535	37,635	26,666	14,132	9,675	17,822	2,016	
Cottonwood	11,001	9	206	1,454	--	1,176	3,069	1,107	--	816	839	2,325	--	
Basswood	14,699	315	1,407	325	380	2,368	4,820	2,632	940	--	--	438	1,074	
Yellow-poplar	1,399,835	28,246	49,287	72,386	106,094	164,330	174,797	218,280	180,132	139,383	109,393	138,941	18,566	
Bay and magnolia	372,363	33,030	49,325	43,976	50,206	43,960	44,802	35,418	23,600	19,879	10,857	13,491	3,819	
Black cherry	154,138	34,023	39,046	26,989	22,513	15,273	8,672	3,983	682	492	--	2,465	--	
Black walnut	13,099	277	746	825	2,355	1,862	1,469	1,960	884	--	1,855	866	--	
Sycamore	52,005	301	1,727	2,477	5,043	6,295	1,867	5,802	5,422	2,199	7,237	12,736	899	
Black locust	17,386	901	502	2,012	2,652	4,591	1,636	--	3,067	500	712	813	--	
Elm	251,181	24,669	39,419	27,695	46,704	25,292	19,746	25,875	14,626	9,874	6,391	10,890	--	
Other eastern hardwoods	1,417,802	310,979	387,122	243,899	160,743	105,069	70,488	52,244	29,180	19,886	17,086	17,127	3,979	
Total hardwoods	18,806,453	1,220,347	1,733,449	1,803,923	2,137,824	2,217,724	2,284,597	2,081,101	1,610,630	1,216,175	813,892	1,349,560	337,231	
All species	33,477,731	1,462,734	2,550,705	3,574,501	4,578,144	4,784,946	4,551,574	3,821,876	2,800,613	1,920,891	1,240,890	1,803,499	387,358	

^aIncludes white, swamp white, swamp chestnut, and chinkapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 25--Volume of growing stock on timberland, by species and forest-type group, Georgia, 1989

Species	All types	Forest-type group								
		White pine-hemlock	Spruce-fir	Longleaf-slash	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood	Maple-beech-birch
Thousand cubic feet										
Softwood										
Longleaf pine	903,495	--	--	720,609	57,915	74,714	46,966	3,291	--	--
Slash pine	3,938,976	--	--	3,328,940	106,952	322,779	25,331	154,974	--	--
Shortleaf pine	1,543,740	7,843	--	11,158	1,055,864	308,315	160,560	--	--	--
Loblolly pine	7,031,301	3,933	--	196,848	5,598,655	785,555	323,314	113,781	9,215	--
Pond pine	184,962	--	--	44,923	95,285	21,494	3,647	19,613	--	--
Virginia pine	736,989	9,470	--	--	553,920	128,194	45,405	--	--	--
Pitch pine	42,521	1,296	--	--	17,157	19,404	4,664	--	--	--
Table Mountain pine	10,023	1,232	--	--	7,722	1,069	--	--	--	--
Spruce pine	39,432	--	--	--	3,551	8,717	9,131	17,534	499	--
Sand pine	6,055	--	--	--	6,055	--	--	--	--	--
Eastern white pine	251,556	156,944	--	--	10,791	58,730	25,091	--	--	--
Eastern hemlock	26,099	9,272	--	--	--	11,103	5,724	--	--	--
Spruce and fir	--	--	--	--	--	--	--	--	--	--
Baldcypress	230,831	--	--	2,525	--	442	2,545	222,911	2,408	--
Pondcypress	629,570	--	--	26,536	1,683	94,355	--	506,533	463	--
Cedars	23,562	--	--	--	9,148	6,590	7,512	312	--	--
Total softwoods	15,599,112	189,990	--	4,331,539	7,524,698	1,841,461	659,890	1,038,949	12,585	--
Hardwood										
Select white oaks ^a	1,199,438	7,420	--	--	70,881	183,612	888,252	42,365	6,908	--
Select red oaks ^b	433,165	2,248	--	676	25,111	30,015	349,302	14,582	11,231	--
Chestnut oak	541,662	4,408	--	497	19,384	78,521	438,852	--	--	--
Other white oaks	427,238	820	--	6,330	46,994	62,830	208,650	91,768	9,846	--
Other red oaks	3,415,535	10,601	--	75,870	264,516	499,699	1,770,052	742,609	52,188	--
Hickory	905,588	2,180	--	602	49,073	79,504	726,819	34,115	13,295	--
Yellow birch	--	--	--	--	--	--	--	--	--	--
Hard maple	15,090	--	--	--	727	1,096	9,340	2,023	1,904	--
Soft maple	872,513	10,069	--	20,553	31,230	83,533	201,324	434,989	90,815	--
Beech	65,781	--	--	--	1,936	5,164	48,922	9,759	--	--
Sweetgum	2,252,180	5,017	--	20,895	349,890	300,543	802,156	645,984	127,695	--
Tupelo and blackgum	2,243,069	645	--	53,461	30,122	153,437	149,148	1,843,283	12,973	--
Ash	305,552	--	--	--	10,615	5,128	56,474	108,451	124,884	--
Cottonwood	12,691	--	--	--	1,974	229	1,038	449	9,001	--
Basswood	14,637	--	--	--	--	862	13,775	--	--	--
Yellow-poplar	1,597,528	9,896	--	3,357	160,123	190,252	806,015	374,627	53,258	--
Bay and magnolia	310,775	--	--	4,589	7,196	19,214	20,667	258,653	456	--
Black cherry	76,957	--	--	4,602	15,023	11,419	37,172	7,612	1,129	--
Black walnut	10,539	--	--	--	754	--	5,501	2,012	2,272	--
Sycamore	57,998	--	--	--	2,435	4,025	13,995	12,255	25,288	--
Black locust	7,348	--	--	--	2,073	1,162	4,113	--	--	--
Elm	208,537	--	--	--	21,108	25,190	61,704	59,634	40,901	--
Other eastern hardwoods	160,997	--	--	1,028	2,305	5,793	49,157	52,009	50,705	--
Total hardwoods	15,134,818	53,304	--	192,460	1,113,470	1,741,228	6,662,428	4,737,179	634,749	--
All species	30,733,930	243,294	--	4,523,999	8,638,168	3,582,689	7,322,318	5,776,128	647,334	--

^aIncludes white, swamp white, swamp chestnut, and chinkapin oaks.^bIncludes cherrybark, northern red, and Shumard oaks.

Table 26--Volume of growing stock on timberland, by ownership class, species group, and diameter class, Georgia, 1989

Ownership class and species group	All classes	Diameter class (inches at breast height)										29.0 and larger
		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		
Thousand cubic feet												
National forest												
Softwood	466,316	26,901	49,195	80,827	69,515	62,546	38,253	45,624	27,752	56,078	9,625	
Hardwood	908,041	60,233	90,926	108,755	113,704	132,042	102,487	88,355	59,695	138,967	12,877	
Total	1,374,357	87,134	140,121	189,582	183,219	194,588	140,740	133,979	87,447	195,045	22,502	
Other public												
Softwood	983,163	52,530	95,918	125,935	173,338	161,462	141,080	89,229	70,668	69,551	3,452	
Hardwood	685,112	68,409	90,876	112,599	95,463	112,963	71,841	51,125	29,880	47,508	4,448	
Total	1,668,275	120,939	186,794	238,534	268,801	274,425	212,921	140,354	100,548	117,059	7,900	
Forest industry												
Softwood	3,363,501	653,351	806,024	641,247	451,084	320,191	217,950	117,145	66,546	78,308	11,655	
Hardwood	1,943,733	205,655	248,325	258,703	254,007	237,320	204,903	170,699	125,224	182,398	56,499	
Total	5,307,234	859,006	1,054,349	899,950	705,091	557,511	422,853	287,844	191,770	260,706	68,154	
Forest industry-leased												
Softwood	524,311	139,459	165,675	105,058	56,528	29,146	10,796	4,674	4,799	7,042	1,134	
Hardwood	285,594	37,613	47,385	45,074	44,188	33,959	26,033	19,975	13,661	16,094	1,612	
Total	809,905	177,072	213,060	150,132	100,716	63,105	36,829	24,649	18,460	23,136	2,746	
Other private												
Softwood	10,261,821	923,299	1,625,144	2,024,982	1,913,631	1,480,627	1,007,142	589,750	341,303	333,459	22,484	
Hardwood	11,312,338	1,089,244	1,501,234	1,690,515	1,796,420	1,593,145	1,209,357	861,261	560,825	848,366	161,971	
Total	21,574,159	2,012,543	3,126,378	3,715,497	3,710,051	3,073,772	2,216,499	1,451,011	902,128	1,181,825	184,455	
All ownerships												
Softwood	15,599,112	1,795,540	2,741,956	2,978,049	2,664,096	2,053,972	1,415,221	846,422	511,068	544,438	48,350	
Hardwood	15,134,818	1,461,154	1,978,746	2,215,646	2,303,782	2,109,429	1,614,621	1,191,415	789,285	1,233,333	237,407	
Total	30,733,930	3,256,694	4,720,702	5,193,695	4,967,878	4,163,401	3,029,842	2,037,837	1,300,353	1,777,771	285,757	

Table 27--Volume of sawtimber on timberland, by ownership class, species group, and diameter class, Georgia, 1989

Ownership class and species group	All classes	Diameter class (inches at breast height)							
		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 board feet									
National forest									
Softwood	1,974,988	290,782	306,222	313,536	208,812	264,649	168,672	357,295	65,020
Hardwood	2,892,811	--	384,722	528,762	452,837	418,139	296,730	737,047	74,574
Total	4,867,799	290,782	690,944	842,298	661,649	682,788	465,402	1,094,342	139,594
Other public									
Softwood	4,374,861	471,767	794,468	838,922	795,281	535,556	446,059	467,504	25,304
Hardwood	1,843,726	--	334,759	467,202	330,907	255,708	159,793	267,052	28,305
Total	6,218,587	471,767	1,129,227	1,306,124	1,126,188	791,264	605,852	734,556	53,609
Forest industry									
Softwood	8,818,987	2,305,547	2,014,647	1,620,873	1,204,839	683,914	406,819	504,602	77,746
Hardwood	5,649,421	--	881,486	966,396	935,463	845,302	644,528	1,018,792	357,454
Total	14,468,408	2,305,547	2,896,133	2,587,269	2,140,302	1,529,216	1,051,347	1,523,394	435,200
Forest industry-leased									
Softwood	929,976	369,691	249,568	146,562	57,833	26,616	28,519	43,947	7,240
Hardwood	672,149	--	149,044	137,089	117,032	97,944	70,950	90,474	9,616
Total	1,602,125	369,691	398,612	283,651	174,865	124,560	99,469	134,421	16,856
Other private									
Softwood	37,305,591	7,408,514	8,645,161	7,621,337	5,637,198	3,522,820	2,133,407	2,182,183	154,971
Hardwood	31,308,335	--	6,267,237	6,543,785	5,529,157	4,253,446	2,940,189	4,770,487	1,004,034
Total	68,613,926	7,408,514	14,912,398	14,165,122	11,166,355	7,776,266	5,073,596	6,952,670	1,159,005
All ownerships									
Softwood	53,404,403	10,846,301	12,010,066	10,541,230	7,903,963	5,033,555	3,183,476	3,555,531	330,281
Hardwood	42,366,442	--	8,017,248	8,643,234	7,365,396	5,870,539	4,112,190	6,883,852	1,473,983
Total	95,770,845	10,846,301	20,027,314	19,184,464	15,269,359	10,904,094	7,295,666	10,439,383	1,804,264

Table 28--Volume of growing stock on timberland, by broad management class, species group, and stand-age class, Georgia, 1989

Broad management class and species group	All classes	No manageable stand	Stand-age class (years)								
			0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81+
Thousand cubic feet											
Pine plantation											
Softwood	2,909,483	21,120	58,916	862,644	1,342,037	572,950	47,310	4,506	--	--	--
Hardwood	92,231	1,114	19,891	13,942	35,875	21,095	--	314	--	--	--
Total	3,001,714	22,234	78,807	876,586	1,377,912	594,045	47,310	4,820	--	--	--
Natural pine											
Softwood	9,136,744	311,000	170,990	290,798	1,030,559	2,918,108	2,354,687	1,180,211	651,057	170,245	59,089
Hardwood	1,267,003	34,903	31,753	52,104	100,353	316,767	369,926	199,243	118,749	37,983	5,222
Total	10,403,747	345,903	202,743	342,902	1,130,912	3,234,875	2,724,613	1,379,454	769,806	208,228	64,311
Oak-pine											
Softwood	1,841,461	211,699	86,367	129,596	123,931	323,097	357,992	320,911	132,764	88,609	66,495
Hardwood	1,741,228	107,203	92,680	79,561	111,299	325,748	363,761	374,875	146,914	76,415	62,772
Total	3,582,689	318,902	179,047	209,157	235,230	648,845	721,753	695,786	279,678	165,024	129,267
Upland hardwood											
Softwood	659,890	106,914	44,480	40,972	44,582	71,437	134,551	94,487	64,275	34,936	23,256
Hardwood	6,662,428	608,074	229,056	189,514	326,079	668,914	1,332,700	1,440,066	858,938	500,018	509,069
Total	7,322,318	714,988	273,536	230,486	370,661	740,351	1,467,251	1,534,553	923,213	534,954	532,325
Lowland hardwood											
Softwood	1,051,534	58,546	17,444	17,486	74,199	80,904	139,640	149,391	121,838	113,740	278,346
Hardwood	5,371,928	385,720	45,699	90,052	227,236	477,101	969,329	1,140,025	785,208	500,875	750,683
Total	6,423,462	444,266	63,143	107,538	301,435	558,005	1,108,969	1,289,416	907,046	614,615	1,029,029
All types											
Softwood	15,599,112	709,279	378,197	1,341,496	2,615,308	3,966,496	3,034,180	1,749,506	969,934	407,530	427,186
Hardwood	15,134,818	1,137,014	419,079	425,173	800,842	1,809,625	3,035,716	3,154,523	1,909,809	1,115,291	1,327,746
Total	30,733,930	1,846,293	797,276	1,766,669	3,416,150	5,776,121	6,069,896	4,904,029	2,879,743	1,522,821	1,754,932

Table 29--Average net annual growth and removals of live timber and growing stock on timberland, by species, Georgia, 1982-1988

Species	Live timber ^a		Growing stock	
	Net annual growth	Annual timber removals	Net annual growth	Annual timber removals
Thousand cubic feet				
Softwood				
Yellow pines	793,816	944,756	792,196	941,611
Eastern white pine	7,774	4,151	7,774	4,151
Spruce and fir	--	--	--	--
Cypress	15,502	12,067	15,409	11,923
Other eastern softwoods	2,580	1,943	2,527	1,943
Total softwoods	819,672	962,917	817,906	959,628
Hardwood				
Select white and red oaks	47,868	40,913	47,452	39,994
Other white and red oaks	155,001	116,647	151,730	108,068
Hickory	20,346	17,425	20,154	16,628
Yellow birch	--	--	--	--
Hard maple	723	401	654	401
Sweetgum	73,652	68,615	72,337	65,711
Ash, walnut, and black cherry	14,483	6,980	13,680	6,057
Yellow-poplar	57,055	40,727	56,694	39,843
Tupelo and blackgum	38,589	34,346	37,171	31,009
Bay and magnolia	10,064	6,271	9,430	6,116
Other eastern hardwoods	57,340	43,372	47,450	28,791
Total hardwoods	475,121	375,697	456,752	342,618
All species	1,294,793	1,338,614	1,274,658	1,302,246

^aMerchantable portion only.

Table 30--Average net annual growth and removals of growing stock on timberland, by ownership class, softwood, and hardwood, Georgia, 1982-1988

Ownership class	Net annual growth			Annual timber removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
Thousand cubic feet						
National forest	34,090	14,508	19,582	36,368	12,733	23,635
Other public	52,950	33,311	19,639	29,918	25,350	4,568
Forest industry	324,170	266,242	57,928	372,101	289,121	82,980
Forest industry-leased	56,740	48,854	7,886	31,506	25,636	5,870
Other private	806,708	454,991	351,717	832,353	606,788	225,565
All ownerships	1,274,658	817,906	456,752	1,302,246	959,628	342,618

Table 31--Average net annual growth and removals of sawtimber on timberland, by species, Georgia, 1982-1988

Species	Net annual growth	Annual timber removals
	<u>Thousand board feet</u>	
Softwood		
Yellow pines	3,143,614	3,235,917
Eastern white pine	44,788	24,620
Spruce and fir	--	--
Cypress	62,703	45,286
Other eastern softwoods	7,216	5,978
Total softwoods	<u>3,258,321</u>	<u>3,311,801</u>
Hardwood		
Select white and red oaks	190,769	115,666
Other white and red oaks	573,469	350,032
Hickory	70,943	43,328
Yellow birch	--	--
Hard maple	664	390
Sweetgum	240,714	182,454
Ash, walnut, and black cherry	42,527	11,889
Yellow-poplar	268,538	162,052
Tupelo and blackgum	122,246	85,414
Bay and magnolia	23,644	11,278
Other eastern hardwoods	125,588	74,408
Total hardwoods	<u>1,659,102</u>	<u>1,036,911</u>
All species	<u>4,917,423</u>	<u>4,348,712</u>

Table 32--Average net annual growth and removals of sawtimber on timberland, by ownership class, softwood, and hardwood, Georgia, 1982-1988

Ownership class	Net annual growth			Annual timber removals		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Thousand board feet					
National forest	141,269	66,377	74,892	126,936	58,160	68,776
Other public	243,022	166,190	76,832	118,594	103,921	14,673
Forest industry	958,153	768,868	189,285	1,090,767	843,800	246,967
Forest industry-leased	136,109	112,959	23,150	71,306	56,584	14,722
Other private	3,438,870	2,143,927	1,294,943	2,941,109	2,249,336	691,773
All ownerships	4,917,423	3,258,321	1,659,102	4,348,712	3,311,801	1,036,911

Table 33--Average annual mortality of live timber, growing stock, and sawtimber on timberland, by species, Georgia, 1982-1988

Species	Live timber ^a	Growing stock	Sawtimber
	<u>Thousand cubic feet</u>		<u>Thousand board feet</u>
Softwood			
Yellow pines	149,516	146,803	390,064
Eastern white pine	617	617	1,924
Spruce and fir	--	--	--
Cypress	1,731	1,529	3,297
Other eastern softwoods	324	252	713
Total softwoods	152,188	149,201	395,998
Hardwood			
Select white and red oaks	8,311	7,017	20,629
Other white and red oaks	65,974	53,067	159,262
Hickory	6,839	5,749	16,984
Yellow birch	--	--	--
Hard maple	514	119	221
Sweetgum	16,688	14,841	32,954
Ash, walnut, and black cherry	4,421	3,217	5,380
Yellow-poplar	6,882	6,029	18,060
Tupelo and blackgum	15,443	10,355	23,361
Bay and magnolia	6,250	5,287	9,339
Other eastern hardwoods	33,644	15,560	34,109
Total hardwoods	164,966	121,241	320,299
All species	317,154	270,442	716,297

^aMerchantable portion only.

Table 34--Average annual mortality of growing stock and sawtimber on timberland, by ownership class, softwood, and hardwood, Georgia, 1982-1988

Ownership class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Thousand cubic feet			Thousand board feet		
National forest	10,360	3,850	6,510	33,023	12,781	20,242
Other public	15,425	11,720	3,705	54,143	45,514	8,629
Forest industry	41,769	24,756	17,013	95,054	46,411	48,643
Forest industry-leased	5,176	2,857	2,319	10,113	3,903	6,210
Other private	197,712	106,018	91,694	523,964	287,389	236,575
All ownerships	270,442	149,201	121,241	716,297	395,998	320,299

Table 35--Average annual mortality of growing stock and sawtimber on timberland, by cause of death, softwood, and hardwood, Georgia, 1982-1988

Cause of death	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Thousand cubic feet			Thousand board feet		
Fire	7,190	2,147	5,043	9,012	4,363	4,649
Insects	48,631	46,889	1,742	158,855	154,024	4,831
Disease	48,029	31,251	16,778	105,050	64,515	40,535
Weather	29,252	12,091	17,161	100,306	41,073	59,233
Suppression	21,272	12,785	8,487	8,543	5,629	2,914
Animals	6,754	117	6,637	18,167	571	17,596
Undetermined	109,314	43,921	65,393	316,364	125,823	190,541
All causes	270,442	149,201	121,241	716,297	395,998	320,299

Table 36--Average annual output of timber products, by product, species group, and type of material, Georgia, 1982-1988

Product and species group	Standard units	Total output		Roundwood products		Mill byproducts	
		Number of units	Thousand cubic feet	Number of units	Thousand cubic feet	Number of units	Thousand cubic feet
Saw logs							
Softwood	M fbm ^a	2,160,881	397,455	2,119,246	389,797	41,635	7,658
Hardwood	M fbm ^a	418,004	73,555	414,947	73,017	3,057	538
Total		2,578,885	471,010	2,534,193	462,814	44,692	8,196
Veneer logs & bolts							
Softwood	M fbm ^a	361,686	58,811	361,686	58,811	--	--
Hardwood		86,789	14,228	86,789	14,228	--	--
Total	M fbm ^a	448,475	73,039	448,475	73,039	--	--
Pulpwood^b							
Softwood	Cords ^c	8,316,669	603,402	6,247,919	453,307	2,068,750	150,095
Hardwood	Cords ^c	1,565,848	119,546	1,315,648	100,444	250,200	19,102
Total	Cords ^c	9,882,517	722,948	7,563,567	553,751	2,318,950	169,197
Poles and piling							
Softwood	C pieces	8,759	15,046	8,759	15,046	--	--
Hardwood	C pieces	--	--	--	--	--	--
Total	C pieces	8,759	15,046	8,759	15,046	--	--
Posts (round and split)							
Softwood	M pieces	5,083	3,234	5,083	3,234	--	--
Hardwood	M pieces	4,715	3,000	4,715	3,000	--	--
Total	M pieces	9,798	6,234	9,798	6,234	--	--
Other^d							
Softwood	M ft ³	38,084	38,084	1,168	1,168	36,916	36,916
Hardwood	M ft ³	2,698	2,698	--	--	2,698	2,698
Total	M ft ³	40,782	40,782	1,168	1,168	39,614	39,614
Total industrial products							
Softwood		--	1,116,032	--	921,363	--	194,669
Hardwood		--	213,027	--	190,689	--	22,338
Total		--	1,329,059	--	1,112,052	--	217,007
Fuelwood^e							
Softwood	Cords	238,645	17,314	214,772	15,582	23,873	1,732
Hardwood	Cords	1,375,269	104,995	1,364,437	104,168	10,832	827
Total	Cords	1,613,914	122,309	1,579,209	119,750	34,705	2,559
All products							
Softwood		--	1,133,346	--	936,945	--	196,401
Hardwood		--	318,022	--	294,857	--	23,165
Total		--	1,451,368	--	1,231,802	--	219,566

^aInternational 1/4-inch rule.

^bRoundwood figures include an estimated 60,467 thousand cubic feet of roundwood chipped at other primary wood-using plants.

^cRough-wood basis (includes chips converted to equivalent standard cords).

^dIncludes liter, mulch, particleboard, charcoal, and other specialty products.

^eExcludes approximately 113,488 thousand cubic feet of wood residues and 108,781 thousand cubic feet of bark used for industrial fuel.

Table 37--Average annual output of roundwood products, by product, species group, and source of material, Georgia, 1982-1988

Product and species group	All sources	Growing-stock trees ^a			Cull trees ^a	Salvable dead trees ^a	Other sources ^b
		Total	Sawtimber	Poletimber			
Thousand cubic feet							
Saw logs							
Softwood	389,797	379,849	372,795	7,054	1,042	232	8,674
Hardwood	73,017	69,858	65,700	4,158	2,845	128	186
Total	462,814	449,707	438,495	11,212	3,887	360	8,860
Veneer logs and bolts							
Softwood	58,811	57,629	57,629	--	--	--	1,182
Hardwood	14,228	14,116	14,116	--	95	--	17
Total	73,039	71,745	71,745	--	95	--	1,199
Pulpwood							
Softwood	453,307	387,955	158,273	229,682	1,407	67	63,878
Hardwood	100,444	91,953	40,329	51,624	3,239	--	5,252
Total	553,751	479,908	198,602	281,306	4,646	67	69,130
Poles and piling							
Softwood	15,046	15,046	15,046	--	--	--	--
Hardwood	--	--	--	--	--	--	--
Total	15,046	15,046	15,046	--	--	--	--
Posts (round and split)							
Softwood	3,234	2,537	1,848	689	--	--	697
Hardwood	3,000	2,400	1,589	811	250	--	350
Total	6,234	4,937	3,437	1,500	250	--	1,047
Other							
Softwood	1,168	1,034	604	430	--	--	134
Hardwood	--	--	--	--	--	--	--
Total	1,168	1,034	604	430	--	--	134
Total industrial products							
Softwood	921,363	844,050	606,195	237,855	2,449	299	74,565
Hardwood	190,689	178,327	121,734	56,593	6,429	128	5,805
Total	1,112,052	1,022,377	727,929	294,448	8,878	427	80,370
Fuelwood							
Softwood	15,582	5,845	4,028	1,817	--	--	9,737
Hardwood	104,168	46,876	35,971	10,905	6,000	2,654	48,638
Total	119,750	52,721	39,999	12,722	6,000	2,654	58,375
All products							
Softwood	936,945	849,895	610,223	239,672	2,449	299	84,302
Hardwood	294,857	225,203	157,705	67,498	12,429	2,782	54,443
Total	1,231,802	1,075,098	767,928	307,170	14,878	3,081	138,745

^aOn timberland.

^bIncludes trees less than 5.0 inches in diameter, tree tops and limbs from timberland, or material from other forest land or nonforest land such as fencerows or suburban areas.

Table 38--Average annual timber removals from growing stock on timberland, by item, softwood, and hardwood, Georgia, 1982-1988

Item	All species	Softwood	Hardwood
<u>Thousand cubic feet</u>			
Roundwood products			
Saw logs	449,707	379,849	69,858
Veneer logs and bolts	71,745	57,629	14,116
Pulpwood	479,908	387,955	91,953
Poles and piling	15,046	15,046	--
Posts	3,937	2,537	2,400
Other	1,034	1,034	--
Fuelwood	52,721	5,845	46,876
All products	1,075,098	849,895	225,203
Logging residues	105,831	54,662	51,169
Other removals	121,317	55,071	66,246
Total removals	1,302,246	959,628	342,618

Table 39--Average annual timber removals from live sawtimber on timberland, by item, softwood, and hardwood, Georgia, 1982-1988

Item	All species	Softwood	Hardwood
<u>Thousand board feet</u>			
Roundwood products			
Saw logs	2,209,728	1,875,925	333,803
Veneer logs and bolts	399,248	328,035	71,213
Pulpwood	958,586	774,230	184,356
Poles and piling	85,645	85,645	--
Posts	14,910	8,371	6,539
Other	3,033	3,033	--
Fuelwood	246,484	20,228	226,256
All products	3,917,634	3,095,467	822,167
Logging residues	89,656	37,497	52,159
Other removals	341,422	178,837	162,585
Total removals	4,348,712	3,311,801	1,036,911

Table 40--Disposal of average annual volume of residue at primary wood-using plants, by product, species group, and type of residue, Georgia, 1982-1988

Product and species group	All types	Bark	Coarse ^a	Fine ^b
<u>Thousand cubic feet</u>				
Fiber products				
Softwood	150,095	39	141,716	8,340
Hardwood	19,102	36	18,900	166
Total	169,197	75	160,616	8,506
Particleboard				
Softwood	18,302	7	297	17,998
Hardwood	137	--	55	82
Total	18,439	7	352	18,080
Strand/wafer board				
Softwood	--	--	--	--
Hardwood	--	--	--	--
Total	--	--	--	--
Sawn products				
Softwood	7,658	--	7,658	--
Hardwood	538	--	538	--
Total	8,196	--	8,196	--
Industrial fuel				
Softwood	183,104	89,608	10,488	83,008
Hardwood	39,165	19,173	4,266	15,726
Total	222,269	108,781	14,754	98,734
Domestic fuel				
Softwood	1,732	498	1,234	--
Hardwood	827	336	471	20
Total	2,559	834	1,705	20
Miscellaneous				
Softwood	18,614	7,805	2,257	8,552
Hardwood	2,561	559	104	1,898
Total	21,175	8,364	2,361	10,450
Not used				
Softwood	2,040	907	700	433
Hardwood	1,399	713	209	477
Total	3,439	1,620	909	910
All products				
Softwood	381,545	98,864	164,350	118,331
Hardwood	63,729	20,817	24,543	18,369
Total	445,274	119,681	188,890	136,700

^aMaterial such as slabs and edgings.

^bMaterial such as sawdust and shavings.

Table 41--Area of timberland, by broad management and ownership classes, 1989, with projections^a to 2020, Georgia

Broad management type and ownership class	Inventory year	Projected to--		
	1989	2000	2010	2020
<u>Thousand acres</u>				
Pine plantation				
Public	124	177	212	244
Forest industry	3,075	3,426	3,564	3,663
Other private	2,176	2,892	3,231	3,430
Total	5,375	6,495	7,007	7,337
Natural pine				
Public	594	586	566	552
Forest industry	852	521	372	295
Other private	4,604	3,627	3,167	2,829
Total	6,050	4,734	4,105	3,676
Oak-pine				
Public	233	186	173	166
Forest industry	310	293	271	258
Other private	2,183	2,029	1,940	1,854
Total	2,726	2,508	2,384	2,278
Upland hardwood				
Public	555	550	547	547
Forest industry	693	644	653	680
Other private	4,670	4,491	4,517	4,511
Total	5,918	5,685	5,717	5,738
Lowland hardwood				
Public	140	152	156	158
Forest industry	941	921	889	879
Other private	2,483	2,498	2,506	2,518
Total	3,564	3,571	3,551	3,555
All classes				
Public	1,646	1,651	1,654	1,667
Forest industry	5,871	5,805	5,749	5,775
Other private	16,116	15,537	15,361	15,142
Total	23,633	22,993	22,764	22,584

^aProspective changes in timberland area were simulated using the Southern Acreage Model (Alig 1985). Personnel at the Economics of Forest Protection and Management Research Work Unit, Southeastern Forest Experiment Station, Research Triangle Park, conducted the simulations and provided these data.

Table 42--Land area, by land use class, major forest type, and survey completion date, Georgia

Land use class	Survey completion date			Change 1982-1989
	1972	1982	1989	
<u>Acres</u>				
Forest land				
Timberland:				
Pine and oak-pine types	16,129,955	14,398,469	14,150,004	-248,465
Hardwood types	8,696,471	9,335,215	9,481,210	+145,995
Total	24,826,426	23,733,684	23,631,214	-102,470
Reserved timberland	383,679	490,593	487,362	-3,231
Woodland	30,075	18,161	18,161	--
Total forest land	25,240,180	24,242,438	24,136,737	-105,701
Nonforest land				
Cropland	6,276,534	6,773,563	6,293,638	-479,925
Pasture and range	2,825,525	2,505,404	2,579,873	+74,469
Other	2,668,710	3,315,058	3,933,111	+618,053
Total	11,770,769	12,594,025	12,806,622	+212,597
All land^a	37,010,949	36,836,463	36,943,359	+106,896

^aExcludes all water areas.

Table 43--Volume^a of sawtimber, growing stock, and live timber on timberland, by species group, survey completion date, and diameter class, Georgia

Species group and year	All classes	Diameter class (inches at breast height)								
		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 and larger
SAWTIMBER (in thousand board feet)										
Softwood										
1972	47,186,013	--	--	10,590,500	12,122,997	10,228,970	6,608,870	3,645,451	1,857,645	2,131,580
1982	53,726,669	--	--	11,549,586	12,930,158	11,053,204	7,712,478	4,818,037	2,639,192	3,024,014
1989	53,404,403	--	--	10,846,301	12,010,066	10,541,230	7,903,963	5,033,555	3,183,476	3,885,812
Hardwood										
1972	30,824,010	--	--	--	6,549,870	6,713,922	5,331,454	3,897,950	2,663,283	5,667,531
1982	38,218,806	--	--	--	7,613,403	7,992,856	6,781,555	5,175,961	3,394,103	7,260,928
1989	42,366,442	--	--	--	8,017,248	8,643,234	7,365,396	5,870,539	4,112,190	8,357,835
GROWING STOCK (in thousand cubic feet)										
Softwood										
1972	15,645,197	2,404,631	2,972,705	2,971,769	2,755,172	2,048,553	1,216,543	629,734	308,150	337,940
1982	16,546,128	1,997,932	2,981,904	3,243,259	2,942,239	2,215,309	1,420,339	832,138	437,833	475,175
1989	15,599,112	1,795,540	2,741,956	2,978,049	2,664,096	2,053,972	1,415,221	846,422	511,068	592,788
Hardwood										
1972	12,270,630	1,346,223	1,753,757	1,974,895	1,964,849	1,690,867	1,198,361	811,098	522,423	1,008,157
1982	14,371,979	1,461,888	1,893,898	2,165,483	2,283,556	2,010,659	1,524,309	1,074,968	665,607	1,291,611
1989	15,134,818	1,461,154	1,978,746	2,215,646	2,303,782	2,109,429	1,614,621	1,191,415	789,285	1,470,740
LIVE TIMBER ^b (in thousand cubic feet)										
Softwood										
1972	15,723,294	2,428,454	2,987,854	2,986,981	2,763,641	2,054,040	1,220,313	631,371	308,941	341,699
1982	16,630,703	2,016,671	2,997,628	3,259,727	2,951,486	2,221,613	1,424,958	834,280	439,014	485,326
1989	15,679,947	1,814,662	2,756,899	2,991,808	2,671,599	2,058,037	1,419,356	848,409	512,911	606,266
Hardwood										
1972	13,793,198	1,688,624	2,030,240	2,201,228	2,117,659	1,813,553	1,293,220	880,094	581,308	1,187,272
1982	16,131,539	1,838,654	2,193,647	2,414,910	2,462,767	2,154,834	1,642,000	1,164,242	738,860	1,521,625
1989	16,922,466	1,851,584	2,290,005	2,433,879	2,504,508	2,260,581	1,726,058	1,290,326	856,869	1,708,656

^aTo provide a basis for valid comparisons, adjustments have been made to allow for differences in volume tables and sawtimber specifications used in previous surveys.

^bMerchantable volume.

Table 44--Merchantable volume of live timber, by species group, Survey Unit, and survey completion date, Georgia

Species group and Survey Unit	1972	1982	Change 1972-1982	1989	Change 1982-1989
	<u>Thousand cubic feet</u>	<u>Thousand cubic feet</u>	<u>Percent</u>	<u>Thousand cubic feet</u>	<u>Percent</u>
Softwood					
Southeast	4,502,355	4,938,790	+9.7	4,899,479	-0.8
Southwest	1,828,321	2,100,023	+14.9	2,014,824	-4.1
Central	4,682,638	4,645,190	-.8	4,290,059	-7.6
North Central	2,839,851	2,881,384	+1.5	2,540,433	-11.8
North	1,870,129	2,065,316	+10.4	1,935,152	-6.3
All units	15,723,294	16,630,703	+5.8	15,679,947	-5.7
Hardwood					
Southeast	3,154,222	3,724,250	+18.1	3,837,333	+3.0
Southwest	1,309,305	1,568,627	+19.8	1,648,983	+5.1
Central	4,189,522	4,816,607	+15.0	5,003,382	+3.9
North Central	2,459,456	2,979,776	+21.2	3,213,557	+7.8
North	2,680,693	3,042,279	+13.5	3,219,211	+5.8
All units	13,793,198	16,131,539	+17.0	16,922,466	+4.9

Table 45--Land area and total forest, by county, Georgia, 1989

County	All land ^a		Total forest ^b		County	All land ^a		Total forest ^b	
	Acres	Acres	Percent	Percent		Acres	Acres	Percent	Percent
Appling	326,425	210,404	64.5		Dade	112,429	78,851	70.1	
Atkinson	220,045	150,608	68.4		Dawson	134,419	111,375	82.9	
Bacon	182,816	124,795	68.3		Decatur	374,906	196,893	52.5	
Baker	222,150	107,757	48.5		De Kalb	172,775	62,293	36.1	
Baldwin	164,761	118,849	72.1		Dodge	322,502	206,095	63.9	
Banks	149,613	103,575	69.2		Dooly	253,946	100,970	39.8	
Barrow	104,089	48,792	46.9		Dougherty	210,906	98,606	46.8	
Bartow	291,917	193,361	66.2		Douglas	129,734	86,074	66.3	
Ben Hill	162,400	102,631	63.2		Early	330,291	165,154	50.0	
Berrien	291,648	164,479	56.4		Echols	269,178	252,126	93.7	
Bibb	161,920	91,219	56.3		Effingham	308,429	244,154	79.2	
Bleckley	140,153	73,010	52.1		Elbert	220,048	152,467	69.3	
Brantley	284,480	242,606	85.3		Emanuel	440,525	305,760	69.4	
Brooks	314,329	149,745	47.6		Evans	119,341	70,179	58.8	
Bryan	282,406	233,918	82.8		Fannin	245,888	211,198	85.9	
Bulloch	433,875	218,676	50.4		Fayette	127,386	67,159	52.7	
Burke	533,011	293,529	55.1		Floyd	331,942	204,337	61.6	
Butts	119,616	88,553	74.0		Forsyth	144,794	73,808	51.0	
Calhoun	181,606	94,160	51.8		Franklin	168,832	85,251	50.5	
Camden	415,654	309,104	74.4		Fulton	341,722	138,904	40.6	
Candler	158,822	86,827	54.7		Gilmer	273,530	242,326	88.6	
Carroll	320,857	186,445	58.1		Glascock	92,378	70,108	75.9	
Catoosa	103,930	50,874	49.0		Glynn	263,936	158,236	60.0	
Charlton	498,886	488,109	97.8		Gordon	227,181	126,858	55.8	
Chatham	283,802	95,926	33.8		Grady	293,747	146,824	50.0	
Chattahoochee	160,051	133,313	83.3		Greene	249,248	201,445	80.8	
Chattooga	200,570	143,719	71.7		Gwinnett	278,458	131,229	47.1	
Cherokee	271,341	191,418	70.5		Habersham	178,086	124,281	69.8	
Clarke	78,042	35,726	45.8		Hall	242,688	136,306	56.2	
Clay	125,696	84,161	67.0		Hancock	300,582	270,130	89.9	
Clayton	94,650	39,420	41.6		Haralson	180,857	138,257	76.4	
Clinch	525,677	479,469	91.2		Harris	297,241	242,200	81.5	
Cobb	219,706	87,419	39.8		Hart	146,648	54,239	37.0	
Coffee	385,184	232,957	60.5		Heard	186,771	155,236	83.1	
Colquitt	356,179	137,772	38.7		Henry	205,209	119,870	58.4	
Columbia	185,709	140,506	75.7		Houston	243,040	128,019	52.7	
Cook	148,864	62,769	42.2		Irwin	231,827	101,003	43.6	
Coweta	284,448	202,563	71.2		Jackson	218,957	125,985	57.5	
Crawford	209,779	162,443	77.4		Jasper	237,651	186,845	78.6	
Crisp	176,019	66,557	37.8		Jeff Davis	214,438	137,133	64.0	

Continued

Table 45--Land area and total forest, by county, Georgia, 1989

County	All land ^a		Total forest ^b		County	All land ^a		Total forest ^b	
	Acres	Acres	Percent			Acres	Acres	Percent	
Jefferson	338,656	212,820	62.8		Richmond	208,589	120,769	57.9	
Jenkins	225,664	138,105	61.2		Rockdale	84,448	42,380	50.2	
Johnson	196,103	112,863	57.6		Schley	108,154	74,693	69.1	
Jones	252,371	204,339	81.0		Screven	419,040	253,981	60.6	
Lamar	118,758	77,219	65.0		Seminole	144,211	42,801	29.7	
Lanier	123,968	81,878	66.0		Spalding	127,501	67,964	53.3	
Laurens	522,067	322,453	61.8		Stephens	113,357	77,622	68.5	
Lee	229,402	95,972	41.8		Stewart	289,440	251,846	87.0	
Liberty	330,669	246,273	74.5		Sumter	312,666	128,108	41.0	
Lincoln	125,222	105,268	84.1		Talbot	252,499	215,201	85.2	
Long	257,363	233,951	90.9		Taliaferro	125,344	107,340	85.6	
Lowndes	324,333	201,628	62.2		Tattnell	309,677	195,430	63.1	
Lumpkin	183,750	159,616	86.9		Taylor	244,256	187,991	77.0	
Macon	258,451	137,723	53.3		Telfair	284,096	197,940	69.7	
Madison	182,509	101,191	55.4		Terrell	215,667	89,903	41.7	
Marion	234,362	190,993	81.5		Thomas	352,371	178,749	50.7	
McDuffie	163,808	108,535	66.3		Tift	171,802	53,727	31.3	
McIntosh	272,026	174,204	64.0		Toombs	237,466	133,970	56.4	
Meriwether	323,674	231,503	71.5		Towns	105,517	88,870	84.2	
Miller	181,504	62,493	34.4		Treutlen	129,319	91,894	71.1	
Mitchell	327,910	113,564	34.6		Troup	265,267	196,758	74.2	
Monroe	253,958	209,696	82.6		Turner	184,992	84,410	45.6	
Montgomery	156,262	99,389	63.6		Twiggs	231,462	190,333	82.2	
Morgan	223,303	139,795	62.6		Union	204,736	160,900	78.6	
Murray	220,576	163,072	73.9		Upson	208,442	157,990	75.8	
Muscogee	139,411	89,237	64.0		Walker	285,421	184,508	64.6	
Newton	177,498	104,317	58.8		Walton	211,328	114,990	54.4	
Oconee	119,283	66,561	55.8		Ware	580,557	512,394	88.3	
Oglethorpe	282,643	214,837	76.0		Warren	182,733	122,341	67.0	
Paulding	199,891	155,973	78.0		Washington	437,446	306,617	70.1	
Peach	96,973	36,188	37.3		Wayne	414,010	333,964	80.7	
Pickens	148,551	118,158	79.5		Webster	134,317	89,382	66.5	
Pierce	220,102	142,819	64.9		Wheeler	191,411	144,186	75.3	
Pike	140,339	86,834	61.9		White	154,906	122,982	79.4	
Polk	199,315	134,046	67.3		Whitfield	186,125	99,460	53.4	
Pulaski	159,501	75,771	47.5		Wilcox	244,442	146,141	59.8	
Putnam	219,859	162,955	74.1		Wilkes	300,870	229,062	76.1	
Quitman	93,440	87,973	94.1		Wilkinson	288,947	249,406	86.3	
Rabun	237,050	208,455	87.9		Worth	368,026	165,151	44.9	
Randolph	275,539	179,568	65.2						
					Total	37,140,514	24,136,737	65.0	

^aExcludes inland water.^bIncludes timberland, reserved timberland, and woodland.

Table 46--Area of timberland, by county and ownership class, Georgia, 1989

County	All ownerships	National forest	Other public	Forest industry ^a	Other private	County	All ownerships	National forest	Other public	Forest industry ^a	Other private
Acres						Acres					
Appling	210,404	--	740	72,375	137,289	Dade	77,879	--	1,674	10,634	65,571
Atkinson	150,608	--	--	61,498	89,110	Dawson	111,375	6,921	17,007	8,701	78,746
Bacon	124,795	--	2,440	32,582	89,773	Decatur	196,893	--	7,053	35,050	154,790
Baker	107,757	--	5	16,215	91,537	De Kalb	60,488	--	1,377	--	59,111
Baldwin	118,849	--	4,829	13,650	100,370	Dodge	206,095	--	10	34,525	171,560
Banks	103,575	1,022	516	13,077	88,960	Dooly	100,945	4,106	64	12,335	84,440
Barrow	48,792	--	1,485	57	47,250	Dougherty	98,606	--	1,701	15,326	81,579
Bartow	193,361	--	8,274	39,597	145,490	Douglas	86,074	--	3,450	1,690	80,934
Ben Hill	102,631	--	310	26,475	75,846	Early	165,154	--	1,779	22,475	140,900
Berrien	164,479	--	2,189	20,526	141,764	Echols	251,966	--	--	212,796	39,170
Bibb	90,749	--	7	5,418	85,324	Effingham	244,154	--	7,842	64,150	172,162
Bleckley	73,010	--	126	17,401	55,483	Elbert	152,467	--	13,897	48,334	90,236
Brantley	242,606	--	6,045	160,887	75,674	Emanuel	305,760	--	1,568	75,157	229,035
Brooks	149,745	--	410	25,806	123,529	Evans	70,179	--	14,703	7,153	48,323
Bryan	233,895	--	102,753	51,914	79,228	Fannin	178,004	72,829	386	392	104,397
Bulloch	218,676	--	403	35,157	183,116	Fayette	67,159	--	20	600	66,539
Burke	293,529	--	118	90,272	203,139	Floyd	204,337	6,618	1,067	26,773	169,879
Butts	88,553	--	998	18,374	69,181	Forsyth	73,715	--	5,794	6	67,915
Calhoun	94,160	--	3	9,763	84,394	Franklin	85,251	--	1,765	5,649	77,837
Camden	297,795	--	8,117	134,806	154,872	Fulton	136,974	--	2,355	2,454	132,165
Candler	86,827	--	178	10,960	75,689	Gilmer	231,727	44,168	3,840	13,124	170,595
Carroll	186,445	--	1,062	31,468	153,915	Glascok	70,108	--	--	15,075	55,033
Catoosa	47,729	6	1,663	3,404	42,656	Glynn	158,049	--	7,629	110,350	40,070
Charlton	317,592	--	6,684	175,576	135,332	Gordon	126,858	8,070	226	29,100	89,462
Chatham	92,980	--	16,064	36,712	40,204	Grady	146,824	--	2,966	12,779	131,079
Chattahoochee	133,313	--	73,125	19,206	40,982	Greene	201,445	21,605	790	57,103	121,947
Chattooga	143,719	20,712	214	17,531	105,262	Gwinnett	130,799	--	2,200	--	128,599
Cherokee	191,418	--	9,940	41,061	140,417	Habersham	120,690	36,433	171	2,592	81,494
Clarke	35,726	--	2,408	335	32,983	Hall	136,306	--	11,007	5,914	119,385
Clay	84,161	--	2,652	14,647	66,862	Hancock	270,130	--	273	101,298	168,559
Clayton	39,420	--	3,808	--	35,612	Haralson	138,257	--	380	44,730	93,147
Clinch	459,637	--	2,450	375,830	81,357	Harris	242,200	--	6,897	52,561	182,742
Cobb	83,342	--	3,241	167	79,934	Hart	54,239	--	7,282	2,522	44,435
Coffee	232,957	--	2,286	25,420	205,251	Heard	155,236	--	5,731	57,117	92,388
Colquitt	137,772	--	1,121	4,314	132,337	Henry	119,870	--	311	4,969	114,590
Columbia	140,506	--	14,328	31,563	94,615	Houston	128,019	--	3,151	51,841	73,027
Cook	62,769	--	704	5,752	56,313	Irwin	101,003	--	55	10,277	90,671
Coweta	202,563	--	1,535	24,605	176,423	Jackson	125,985	--	908	6,429	118,648
Crawford	162,443	--	1,184	71,810	89,449	Jasper	186,845	26,787	6,097	34,355	119,606
Crisp	66,554	--	1,759	4,331	60,464	Jeff Davis	137,133	--	42	25,070	112,021

Continued

Table 46--Area of timberland, by county and ownership class, Georgia, 1989--Continued

County	All ownerships	National forest	Other public	Forest industry ^a	Other private	County	All ownerships	National forest	Other public	Forest industry ^a	Other private
Acres						Acres					
Jefferson	212,820	--	4,043	39,709	169,068	Richmond	120,769	--	40,568	19,115	61,086
Jenkins	138,105	--	997	44,297	92,811	Rockdale	41,978	--	396	135	41,447
Johnson	112,863	--	407	18,538	93,918	Schley	74,693	--	21	16,566	58,106
Jones	204,337	16,271	28,778	47,951	111,337	Scriven	253,981	--	1,844	46,521	205,616
Lamar	77,219	--	--	10,063	67,156	Seminole	42,801	--	4,178	3,502	35,121
Lanier	81,878	--	9,245	20,254	52,379	Spalding	67,964	--	518	1,522	65,924
Laurens	322,453	--	6,588	48,014	267,851	Stephens	77,406	21,923	1,658	2,835	50,990
Lee	95,647	--	50	7,970	87,627	Stewart	251,846	--	1,144	178,612	72,090
Liberty	246,273	--	105,282	63,662	77,329	Sumter	128,108	--	333	23,479	104,296
Lincoln	105,268	--	21,123	21,214	62,931	Talbot	215,201	--	3,454	86,351	125,396
Long	233,232	--	24,412	128,558	80,262	Taliaferro	107,340	--	1,202	46,844	59,294
Lowndes	201,628	--	2,450	67,190	131,988	Tattnall	195,430	--	6,421	39,110	149,899
Lumpkin	158,088	55,129	919	7,514	94,526	Taylor	187,991	--	460	50,599	136,932
Macon	137,615	--	1,100	33,992	102,523	Telfair	197,940	--	3,083	64,880	129,977
Madison	101,191	--	142	19,616	81,433	Terrell	89,903	--	20	6,470	83,413
Marion	190,993	--	65	87,697	103,231	Thomas	178,749	--	505	7,114	171,130
McDuffie	108,535	--	14,739	24,224	69,572	Tift	53,727	--	725	--	53,002
McIntosh	163,233	--	14,656	118,157	30,420	Toombs	133,970	--	644	34,612	98,714
Meriwether	231,503	--	4,714	69,818	156,971	Towns	71,965	40,093	379	217	31,276
Miller	62,493	--	30	15,874	46,589	Treutlen	91,894	--	51	10,336	81,507
Mitchell	113,564	--	10	5,356	108,198	Troup	196,758	--	12,376	20,799	163,583
Monroe	209,696	--	897	58,213	150,586	Turner	84,410	--	70	11,203	73,137
Montgomery	99,389	--	167	15,430	83,792	Twiggs	190,333	--	76	59,084	131,173
Morgan	139,795	274	5,836	7,025	126,660	Union	151,196	87,577	1,362	3,060	59,197
Murray	156,942	44,598	11,292	23,504	77,548	Upson	157,990	--	901	55,030	102,059
Muscogee	89,237	--	31,676	994	56,567	Walker	182,759	18,475	13,605	6,084	144,595
Newton	104,317	--	1,185	8,323	94,809	Walton	114,990	--	446	5,117	109,427
Oconee	66,561	160	292	2,979	63,130	Ware	342,959	--	35,275	179,350	128,334
Oglethorpe	214,837	3,732	510	90,582	120,013	Warren	122,341	--	258	43,544	78,539
Paulding	155,973	--	11,014	34,489	110,470	Washington	306,617	--	681	55,982	249,954
Peach	36,188	--	254	3,821	32,113	Wayne	333,485	--	317	189,821	143,347
Pickens	118,158	--	150	20,044	97,964	Webster	89,382	--	--	24,047	65,335
Pierce	142,819	--	8	33,333	109,478	Wheeler	144,186	--	740	29,785	113,661
Pike	86,834	--	297	12,154	74,383	White	113,616	32,773	1,050	624	79,169
Polk	134,046	--	266	33,053	100,727	Whitfield	99,460	11,765	1,256	12,386	74,053
Pulaski	75,771	--	144	11,834	63,793	Wilcox	146,141	--	106	25,846	120,189
Putnam	162,955	34,296	14,466	26,708	87,485	Wilkes	229,062	--	6,975	81,189	140,898
Quitman	87,973	--	781	35,525	51,667	Wilkinson	249,406	--	400	65,375	183,631
Rabun	196,279	135,448	1,388	--	59,443	Worth	165,151	--	111	31,747	133,293
Randolph	179,568	--	--	51,620	127,948	Total	23,631,214	751,791	893,624	5,870,140	16,115,659

^aIncludes 879,793 acres of other private land under long-term lease.

Table 47--Area of timberland, by county and broad management class, Georgia, 1989

County	All classes	Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood	County	All classes	Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
Acres							Acres						
Appling	210,404	75,085	68,401	10,674	16,475	39,769	Dade	77,879	115	13,481	9,506	48,816	5,961
Atkinson	150,608	69,991	32,163	11,881	13,832	22,741	Dawson	111,375	--	21,401	36,893	53,081	--
Bacon	124,795	38,987	36,625	9,471	11,244	28,468	Decatur	196,893	36,579	77,240	22,592	41,912	18,570
Baker	107,757	14,307	24,791	17,162	25,750	25,747	De Kalb	60,488	--	27,427	13,357	16,420	3,284
Baldwin	118,849	25,790	59,503	11,152	11,250	11,154	Dodge	206,095	75,755	53,930	24,509	22,056	29,845
Banks	103,575	--	33,889	17,190	44,023	8,473	Dooley	100,945	9,729	26,013	3,839	38,446	22,918
Barrow	48,792	57	24,970	5,906	14,906	2,953	Dougherty	98,606	11,548	26,591	2,189	25,948	32,330
Bartow	193,361	44,819	41,729	53,885	52,928	--	Douglas	86,074	4,430	21,790	11,432	45,310	3,112
Ben Hill	102,631	46,876	27,105	2,917	14,065	11,668	Early	165,154	35,642	23,004	11,038	49,924	45,546
Berrien	164,479	26,843	51,352	17,720	12,822	55,742	Echols	251,966	113,013	28,476	14,602	19,002	76,873
Bibb	90,749	--	38,798	8,981	25,000	17,970	Effingham	244,154	62,385	82,594	8,399	37,717	53,059
Bleckley	73,010	19,319	4,656	14,900	15,208	18,927	Elbert	152,467	28,193	45,122	20,335	54,145	4,672
Brantley	242,606	110,569	26,277	24,038	11,036	70,686	Emanuel	305,760	107,755	57,747	37,686	44,044	58,528
Brooks	149,745	24,589	20,092	16,471	39,719	48,874	Evans	70,179	11,636	22,571	3,222	8,864	23,886
Bryan	233,895	45,766	93,995	22,432	8,488	63,214	Fannin	178,004	--	37,490	20,701	119,813	--
Bulloch	218,676	28,913	40,486	44,885	24,744	79,648	Fayette	67,159	--	22,179	17,744	22,800	4,436
Burke	293,529	62,283	34,915	38,360	95,745	62,226	Floyd	204,337	20,401	67,131	9,437	97,930	9,438
Butts	88,553	18,302	31,445	9,507	28,359	940	Forsyth	73,715	--	25,761	11,999	35,955	--
Calhoun	94,160	7,283	15,060	--	46,206	25,611	Franklin	85,251	7,187	22,943	10,614	37,431	7,076
Camden	297,795	132,884	30,625	24,909	26,345	83,032	Fulton	136,974	2,812	55,081	20,029	50,616	8,436
Candler	86,827	27,696	7,096	7,096	21,285	23,654	Gilmer	231,727	76	34,958	63,590	128,364	4,739
Carroll	186,445	13,891	48,724	26,867	83,072	13,891	Glascok	70,108	12,941	18,345	8,354	17,527	12,941
Catoosa	47,729	6,218	3,404	--	36,569	1,538	Glynn	158,049	76,880	20,402	18,205	10,520	32,042
Charlton	317,592	168,072	71,467	16,056	17,807	44,190	Gordon	126,858	17,429	27,352	32,184	39,953	9,940
Chatham	92,980	24,119	12,753	14,305	23,810	17,993	Grady	146,824	10,668	35,592	16,361	52,861	31,342
Chattahoochee	133,313	28,310	43,984	9,434	39,779	11,806	Greene	201,445	41,975	97,095	14,173	44,506	3,696
Chattooga	143,719	14,446	26,315	25,606	77,352	--	Gwinnett	130,799	--	39,077	20,954	63,817	6,951
Cherokee	191,418	25,299	51,631	34,896	74,912	4,680	Habersham	120,690	--	25,230	29,920	65,540	--
Clarke	35,726	4,000	10,994	10,995	9,737	--	Hall	136,306	7,549	38,297	23,307	67,153	--
Clay	84,161	20,244	15,115	10,232	27,729	10,841	Hancock	270,130	100,355	88,236	27,876	42,904	10,759
Clayton	39,420	1,679	11,102	12,394	10,684	3,561	Haralson	138,257	34,641	22,115	29,980	37,257	14,264
Clinch	459,637	241,966	61,160	36,353	5,136	115,022	Harris	242,200	26,147	88,456	50,450	67,005	10,142
Cobb	83,342	--	49,874	15,301	14,534	3,633	Hart	54,239	4,964	13,510	3,703	32,062	--
Coffee	232,957	94,368	48,340	22,118	9,485	58,646	Heard	155,236	29,938	34,259	43,229	38,980	8,830
Colquitt	137,772	27,570	57,430	19,299	3,145	30,328	Henry	119,870	5,582	42,976	30,971	34,147	6,194
Columbia	140,506	6,292	73,562	26,281	23,657	10,714	Houston	128,019	16,200	14,285	12,369	50,798	34,367
Cook	62,769	7,233	14,511	11,732	3,050	26,243	Irwin	101,003	8,034	45,124	16,000	10,722	21,123
Coweta	202,563	11,802	66,347	38,004	68,408	18,002	Jackson	125,985	2,143	26,689	43,056	50,005	4,092
Crawford	162,443	63,004	20,451	33,268	40,890	4,830	Jasper	186,845	30,894	58,352	39,242	58,357	--
Crisp	66,554	--	16,367	13,145	5,258	31,784	Jeff Davis	137,133	44,839	37,715	18,195	2,435	33,949

Continued

Table 47--Area of timberland, by county and broad management class, Georgia, 1989--Continued

County	All classes	Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood	County	All classes	Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
Acres							Acres						
Jefferson	212,820	38,323	38,270	16,102	64,463	55,662	Richmond	120,769	12,363	28,850	15,726	33,142	30,688
Jenkins	138,105	47,372	17,478	5,800	20,345	47,110	Rockdale	41,978	--	20,884	5,552	15,542	--
Johnson	112,863	26,342	31,656	13,044	18,302	23,519	Schley	74,693	24,201	12,233	9,175	22,967	6,117
Jones	204,337	25,449	97,962	32,415	31,370	17,141	Screven	253,981	39,208	46,034	36,074	61,675	70,990
Lamar	77,219	6,930	28,783	7,462	14,923	19,121	Seminole	42,801	8,781	8,781	--	9,397	15,842
Lanier	81,878	15,540	21,645	15,897	6,563	22,233	Spalding	67,964	4,120	34,443	12,630	8,489	8,282
Laurens	322,453	86,306	53,216	36,240	80,518	66,173	Stephens	77,406	4,902	24,217	12,471	35,816	--
Lee	95,647	12,483	12,140	3,505	45,616	21,903	Stewart	251,846	86,402	48,716	24,197	83,969	8,562
Liberty	246,273	54,275	109,228	16,099	13,134	53,537	Sumter	128,108	40,204	17,929	16,054	15,099	38,822
Lincoln	105,268	12,365	43,413	28,513	20,977	--	Talbot	215,201	49,391	65,840	30,621	58,161	11,188
Long	233,232	68,632	45,298	31,013	17,180	71,109	Taliaferro	107,340	8,659	38,957	32,601	27,123	--
Lowndes	201,628	55,818	20,309	38,245	36,229	51,027	Tattnall	195,430	43,889	52,082	3,059	23,891	72,509
Lumpkin	158,088	7,696	37,411	40,647	72,334	--	Taylor	187,991	62,932	26,237	19,868	60,445	18,509
Macon	137,615	31,718	8,688	11,392	49,368	36,449	Telfair	197,940	49,026	53,270	13,956	17,018	64,670
Madison	101,191	13,015	29,677	19,388	35,233	3,878	Terrell	89,903	6,673	13,367	10,009	14,776	45,078
Marion	190,993	42,348	26,409	20,545	73,232	28,459	Thomas	178,749	8,703	70,012	26,103	47,314	26,617
McDuffie	108,535	17,785	45,299	6,626	22,966	15,859	Tift	53,727	5,579	17,464	13,946	5,580	11,158
McIntosh	163,233	63,618	29,012	10,331	19,388	40,884	Toombs	133,970	49,398	27,521	7,299	12,148	37,604
Meriwether	231,503	59,611	64,322	9,500	67,160	30,910	Towns	71,965	30	15,653	10,760	45,522	--
Miller	62,493	7,305	10,581	4,659	23,642	16,306	Treutlen	91,894	32,388	27,168	13,585	5,434	13,319
Mitchell	113,564	51,093	30,054	9,017	17,388	6,012	Troup	196,758	11,023	80,769	23,933	68,704	12,329
Monroe	209,696	27,615	76,610	32,221	70,241	3,009	Turner	84,410	16,540	38,310	3,483	7,036	19,041
Montgomery	99,389	29,834	27,676	7,740	17,068	17,071	Twiggs	190,333	45,814	39,817	14,589	64,479	25,634
Morgan	139,795	19,190	48,158	32,357	34,877	5,213	Union	151,196	5,093	40,287	20,553	85,263	--
Murray	156,942	16,576	54,337	21,844	64,185	--	Upson	157,990	20,583	33,121	23,537	72,157	8,592
Muscogee	89,237	4,714	26,139	19,644	29,350	9,390	Walker	182,759	12,100	37,879	22,382	110,398	--
Newton	104,317	7,900	38,094	18,576	31,846	7,901	Walton	114,990	15,336	29,843	16,580	39,967	13,264
Oconee	66,561	2,979	25,266	8,418	25,529	4,369	Ware	342,959	165,215	77,440	20,905	--	79,399
Oglethorpe	214,837	51,328	63,925	3,417	54,766	41,401	Warren	122,341	27,917	38,773	15,104	37,526	3,021
Paulding	155,973	6,927	75,949	22,630	47,119	3,348	Washington	306,617	85,971	65,171	38,454	90,102	26,919
Peach	36,188	1,911	194	4,014	25,995	4,074	Wayne	333,485	157,230	55,082	22,030	11,027	88,116
Pickens	118,158	144	36,092	25,418	56,504	--	Webster	89,382	37,301	13,066	8,619	21,732	8,664
Pierce	142,819	36,668	38,975	18,214	7,834	41,128	Wheeler	144,186	46,265	29,770	18,944	15,084	34,123
Pike	86,834	9,213	12,467	12,397	40,116	12,641	White	113,616	--	32,285	28,187	48,977	4,167
Polk	134,046	19,765	44,700	11,193	58,388	--	Whitfield	99,460	13,634	34,559	5,890	45,377	--
Pulaski	75,771	15,989	6,716	19,446	13,431	20,189	Wilcox	146,141	40,715	30,047	9,013	14,378	51,988
Putnam	162,955	43,751	44,916	38,161	36,127	--	Wilkes	229,062	57,238	64,358	41,628	50,979	14,859
Quitman	87,973	10,634	37,290	20,976	8,906	10,167	Wilkinson	249,406	47,189	41,054	32,280	74,053	54,830
Rabun	196,279	3,373	57,622	48,544	86,740	--	Worth	165,151	39,704	68,722	7,840	17,521	31,364
Randolph	179,568	25,067	19,993	36,504	60,440	37,564	Total	23,631,214	5,036,626	6,049,522	3,063,856	5,917,648	3,563,562

Table 48--Merchutable volume of live timber 5.0 inches d.b.h. and larger on timberland, by county and species group, Georgia, 1989

County	All species	Yellow pine	Other softwood	Other hardwood	Hard hardwood	Thousand cubic feet				
						Hard	Soft	Other	hardwood	Hardwood
Appling	244,665	146,337	11,087	63,923	23,318	Dade	123,039	15,663	2,624	33,908
Atkinson	155,251	108,620	8,931	32,192	5,508	Dawson	202,565	80,284	1,725	30,342
Bacon	127,417	76,650	9,686	32,303	8,778	Decatur	302,965	180,622	10,811	59,419
Baker	145,632	50,111	12,026	10,275	73,220	De Kalb	168,762	87,436	—	23,225
Baldwin	147,099	88,124	—	38,010	20,965	Dodge	252,538	147,058	4,086	70,766
Banks	176,473	59,658	365	39,999	76,451	Dooley	127,715	44,688	18,620	41,892
Barrow	78,868	31,770	—	18,326	28,772	Dougherty	173,729	64,267	41,464	23,796
Barthow	257,981	146,932	—	23,206	87,843	Douglas	176,650	60,222	—	47,393
Ben Hill	102,232	78,469	4,829	14,034	4,900	Early	203,364	55,211	11,122	70,095
Berrien	242,898	128,544	32,001	63,796	18,557	Echols	291,000	160,932	37,624	79,054
Bibb	151,597	75,512	—	25,246	25,246	Effingham	283,577	130,861	9,329	70,669
Blackley	103,921	14,881	—	43,887	43,887	Elbert	188,794	84,054	3,664	37,395
Brantley	196,962	84,705	22,830	63,031	25,496	Emanuel	327,170	170,197	2,369	117,236
Brooks	217,376	66,900	26,573	79,394	44,509	Evans	131,234	34,882	6,458	70,957
Bryan	358,421	200,337	6,527	100,082	51,475	Fannin	346,063	63,845	35,246	38,643
Bulloch	340,545	131,633	4,599	150,082	54,231	Fayette	141,030	41,873	—	63,232
Burke	387,457	109,092	10,270	154,295	113,800	Floyd	299,112	155,025	—	23,146
Butts	134,868	62,338	1,011	35,952	35,567	Forstyth	129,009	51,180	—	27,483
Calhoun	119,895	15,252	22,404	45,546	36,693	Franklin	131,265	41,553	869	23,807
Camden	478,702	235,286	32,955	130,108	80,353	Fullton	351,465	155,384	—	91,430
Candler	110,572	25,300	3,078	60,533	21,661	Gilmer	441,449	70,321	38,681	112,396
Carroll	255,199	87,492	—	65,625	102,022	Glascok	75,960	34,798	19,293	19,293
Catoosa	65,927	9,227	—	17,628	39,099	Glynn	234,178	113,178	24,164	50,929
Charlton	337,586	269,667	20,289	40,828	6,802	Gordon	157,889	93,877	—	10,641
Chatham	178,400	66,123	4,674	60,432	47,171	Grady	202,682	89,023	175	46,938
Chatahoochee	196,550	98,267	—	64,266	34,017	Greene	328,470	205,780	902	75,597
Chattooga	148,052	49,224	—	30,174	68,654	Gwinnet	254,883	103,451	—	84,002
Cherokee	364,474	156,826	—	86,973	120,625	Heberham	236,247	70,904	6,708	40,396
Clarke	61,821	27,701	—	9,154	24,966	Hall	238,059	91,186	433	46,407
Clay	82,262	32,282	—	24,625	25,355	Hancock	328,724	222,186	—	56,531
Clayton	71,366	34,158	—	16,595	20,613	Hartalsan	211,425	83,980	—	53,169
Clinch	417,920	228,848	78,239	97,402	13,431	Harris	244,657	117,642	423	68,250
Cobb	162,929	105,785	—	35,686	21,458	Hart	78,607	10,359	366	16,686
Coffee	222,511	127,290	9,411	72,857	12,953	Heard	138,695	71,137	—	33,929
Colquitt	186,613	111,425	8,940	48,577	17,671	Henry	187,893	93,990	—	39,632
Columbia	291,222	187,196	312	57,478	46,236	Houston	171,212	33,713	2,263	76,312
Cook	104,479	42,649	4,648	34,529	22,653	Irwin	200,966	117,250	19,634	54,765
Coweta	263,485	96,580	—	85,780	81,125	Jackson	194,176	86,655	1,879	54,671
Crawford	106,060	51,925	—	36,872	17,263	Jasper	308,566	157,221	1,533	62,839
Crisp	96,148	38,080	3,369	26,228	28,471	Jeff Davis	116,943	80,924	2,893	15,835

Continued

Table 48--Merchantable volume of live timber 5.0 inches d.b.h. and larger on timberland, by county and species group, Georgia, 1989--Continued

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand cubic feet						Thousand cubic feet					
Jefferson	336,379	84,868	19,174	135,922	96,415	Richmond	144,483	47,557	3,862	64,364	28,700
Jenkins	218,566	57,296	12,712	83,757	64,801	Rockdale	92,395	54,236	--	17,100	21,059
Johnson	134,180	66,112	--	49,727	18,341	Schley	81,694	26,883	599	29,799	24,413
Jones	316,989	213,607	--	57,679	45,703	Screven	519,872	168,132	35,003	212,957	103,780
Lamar	103,446	41,969	--	33,231	28,246	Seminole	53,895	22,576	3,492	13,059	14,768
Lanier	100,809	56,426	15,823	25,058	3,502	Spalding	122,946	80,138	--	34,558	8,250
Laurens	353,727	121,311	8,477	128,485	95,454	Stephens	147,426	68,924	--	16,598	61,904
Lee	142,646	42,973	2,835	35,648	61,190	Stewart	228,073	116,266	--	43,922	67,885
Liberty	424,769	247,255	10,452	96,112	70,950	Sumter	151,099	59,964	2,353	52,475	36,307
Lincoln	158,444	120,274	--	13,811	24,359	Talbot	199,263	82,664	1,209	54,208	61,182
Long	304,846	125,820	30,781	88,388	59,857	Taliaferro	149,150	101,910	--	22,047	25,193
Lowndes	296,536	103,942	17,517	106,951	68,126	Tattnall	235,326	117,691	5,574	70,339	41,722
Lumpkin	308,743	89,667	36,004	39,507	143,565	Taylor	140,419	46,974	364	44,600	48,481
Macon	181,235	40,599	--	70,857	69,779	Telfair	260,516	121,725	8,409	74,290	56,092
Madison	144,161	75,084	721	43,309	25,047	Terrell	97,044	25,163	3,099	54,544	14,238
Marion	147,869	43,817	--	45,180	58,872	Thomas	271,852	160,247	--	44,366	67,239
McDuffie	198,896	118,492	--	46,891	33,513	Tift	100,064	41,444	6,081	44,032	8,507
McIntosh	227,237	94,816	15,560	60,326	56,535	Toombs	122,626	59,244	1,483	48,314	13,585
Meriwether	251,351	129,788	407	60,269	60,887	Towns	144,262	45,531	3,153	26,979	68,599
Miller	69,840	17,742	6,355	20,494	25,249	Treutlen	92,356	60,998	--	20,485	10,873
Mitchell	119,863	73,135	4,831	26,350	15,547	Troup	236,767	104,816	420	74,207	57,324
Monroe	265,852	101,791	--	84,549	79,512	Turner	120,753	65,453	30,221	19,900	5,179
Montgomery	112,316	64,617	334	29,016	18,349	Twiggs	281,305	119,382	--	84,905	77,018
Morgan	206,685	121,300	--	60,662	24,723	Union	319,550	67,383	24,846	42,745	184,576
Murray	254,936	88,087	21,104	30,960	114,785	Upson	208,226	71,390	--	51,193	85,643
Muscogee	133,521	52,198	--	53,665	27,658	Walker	253,850	71,070	463	31,236	151,081
Newton	159,907	76,839	--	29,155	53,913	Walton	199,715	94,701	--	56,238	48,776
Oconee	139,678	60,012	--	33,319	46,347	Ware	276,464	203,689	22,659	44,702	5,414
Oglethorpe	345,217	160,984	2,493	116,075	65,665	Warren	184,803	117,172	--	35,310	32,321
Paulding	231,391	96,436	--	53,490	81,465	Washington	344,844	152,762	742	111,890	79,450
Peach	11,106	1,273	--	3,589	6,244	Wayne	322,051	198,909	36,254	62,278	24,610
Pickens	169,067	57,199	--	32,723	79,145	Webster	68,521	32,002	--	14,888	21,631
Pierce	179,330	76,541	17,685	69,276	15,828	Wheeler	147,524	70,418	1,465	54,906	20,735
Pike	131,818	27,889	--	45,404	58,525	White	296,186	98,229	7,103	70,123	120,731
Polk	169,668	90,178	--	7,996	71,494	Whitfield	146,012	55,976	--	27,185	62,851
Pulaski	102,056	28,229	4,719	31,502	37,606	Wilcox	171,469	66,765	14,193	56,756	33,755
Putnam	201,688	117,080	926	34,506	49,176	Wilkes	381,629	237,383	1,410	64,895	77,941
Quitman	103,876	51,125	--	30,087	22,664	Wilkinson	315,391	92,493	11,054	119,370	92,474
Rabun	471,556	100,859	102,442	67,183	201,072	Worth	225,656	146,160	6,701	46,472	26,323
Randolph	222,742	49,206	--	86,988	86,548						
						Total	32,602,413	14,491,264	1,188,683	8,468,038	8,454,428

Table 49--Volume of growing stock on timberland, by county and species group, Georgia, 1989

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand cubic feet						Thousand cubic feet					
Appling	234,254	146,337	11,087	56,329	20,501	Dade	115,375	15,663	2,624	31,381	65,707
Atkinson	147,896	108,155	8,931	26,837	3,973	Dawson	190,640	79,238	1,725	27,262	82,415
Bacon	120,282	76,650	9,686	27,441	6,505	Decatur	285,867	180,332	10,811	53,699	41,025
Baker	124,121	50,111	11,552	9,478	52,980	De Kalb	163,863	87,436	--	21,946	54,481
Baldwin	143,366	87,790	--	35,143	20,433	Dodge	237,376	146,577	4,086	59,892	26,821
Banks	167,010	59,658	365	37,685	69,302	Dooly	117,703	44,688	18,620	33,289	21,106
Barrow	77,373	31,450	--	18,326	27,597	Dougherty	168,154	64,267	41,005	23,161	39,721
Bartow	249,639	146,487	--	20,687	82,465	Douglas	169,987	60,222	--	44,728	65,037
Ben Hill	98,618	78,469	4,170	11,648	4,331	Early	189,728	55,211	11,122	64,825	58,570
Berrien	227,931	128,544	31,209	51,648	16,530	Echols	277,326	160,932	37,624	70,081	8,689
Bibb	144,911	75,512	--	47,398	22,001	Effingham	266,266	130,861	8,249	62,709	64,447
Bleckley	94,282	14,881	--	40,741	38,660	Elbert	181,268	83,408	3,473	33,857	60,530
Brantley	172,050	84,482	19,778	55,346	12,444	Emanuel	306,020	169,582	2,369	102,028	32,041
Brooks	200,259	66,625	25,875	70,775	36,984	Evans	120,708	34,656	6,187	64,966	14,899
Bryan	329,878	199,971	6,132	83,232	40,543	Fannin	323,869	63,276	35,246	36,352	188,995
Bulloch	318,137	130,789	4,599	136,558	46,191	Fayette	137,443	41,408	--	62,756	33,279
Burke	364,070	108,801	10,270	142,312	102,687	Floyd	284,648	154,131	--	21,602	108,915
Butts	131,975	62,338	1,011	35,164	33,462	Forsyth	124,265	51,180	--	27,053	46,032
Calhoun	111,469	15,252	22,404	42,776	31,037	Franklin	123,431	41,553	869	22,359	58,650
Camden	447,394	235,286	31,994	116,899	63,215	Fulton	337,970	153,934	--	86,682	97,354
Candler	95,013	25,300	3,078	50,046	16,589	Gilmer	405,424	70,321	38,681	103,170	193,252
Carroll	244,220	87,492	--	60,327	96,401	Glascok	66,337	33,400	--	14,083	18,854
Catoosa	63,353	9,227	--	17,120	37,006	Glynn	217,203	112,792	24,164	45,830	34,417
Charlton	329,385	269,087	19,999	35,464	4,835	Gordon	149,846	91,912	--	9,419	48,515
Chatham	159,902	65,316	3,592	55,066	35,928	Grady	181,307	88,566	--	39,288	53,453
Chattahoochee	188,425	98,267	--	63,995	26,163	Greene	320,595	205,780	902	70,958	42,955
Chattooga	141,930	49,224	--	28,893	63,813	Gwinnett	249,313	102,914	--	82,315	64,084
Cherokee	348,572	155,678	--	84,924	107,970	Habersham	220,260	70,904	6,708	38,177	104,471
Clarke	59,898	27,437	--	23,307	9,154	Hall	226,460	91,186	433	42,788	92,053
Clay	78,827	31,880	--	23,997	22,950	Hancock	316,636	221,969	--	50,834	43,833
Clayton	69,106	34,158	--	15,526	19,422	Haralson	199,923	83,980	--	51,355	64,588
Clinch	390,026	228,254	72,811	81,657	7,304	Harris	231,070	117,642	423	65,008	47,997
Cobb	161,672	105,785	--	35,044	20,843	Hart	72,899	10,359	366	13,672	48,502
Coffee	208,338	127,290	9,411	60,633	11,004	Heard	132,782	71,137	--	32,661	28,984
Colquitt	175,485	111,247	8,940	40,400	14,898	Henry	182,050	93,990	--	37,865	50,195
Columbia	283,639	187,196	--	54,739	41,704	Houston	160,908	33,713	2,263	70,013	54,919
Cook	97,075	42,649	4,405	29,613	20,408	Irwin	182,376	116,252	16,063	41,208	8,853
Coweta	248,420	95,607	--	77,551	75,262	Jackson	187,918	86,655	575	52,559	48,129
Crawford	99,065	51,724	--	34,466	12,875	Jasper	298,519	156,840	1,533	61,698	78,448
Crisp	86,251	38,080	3,123	21,778	23,270	Jeff Davis	108,046	80,924	2,893	11,699	12,530

Continued

Table 49--Volume of growing stock on timberland, by county and species group, Georgia, 1989--Continued

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand cubic feet						Thousand cubic feet					
Jefferson	315,282	84,257	19,174	122,183	89,668	Richmond	128,972	47,040	3,862	56,175	21,895
Jenkins	206,552	56,976	12,712	76,884	59,980	Rockdale	87,667	53,828	--	15,920	17,919
Johnson	126,312	65,560	--	45,501	15,251	Schley	77,798	26,883	599	28,690	21,626
Jones	309,416	212,671	--	55,169	41,576	Screven	495,275	167,920	34,527	197,594	95,234
Lamar	96,131	41,365	--	29,357	25,409	Seminole	48,499	22,576	3,492	11,877	10,554
Lanier	97,071	56,426	15,823	23,010	1,812	Spalding	118,944	78,601	--	32,567	7,776
Laurens	328,046	120,534	8,477	112,648	86,387	Stephens	142,838	68,924	--	16,598	57,316
Lee	127,745	42,973	2,835	31,741	50,196	Stewart	218,803	116,060	--	42,249	60,494
Liberty	401,666	246,429	10,057	90,999	54,181	Sumter	143,314	59,964	2,353	47,381	33,616
Lincoln	151,887	119,942	--	10,081	21,864	Talbot	192,020	82,664	1,209	50,979	57,168
Long	283,956	125,820	30,781	77,776	49,579	Taliaferro	143,300	101,910	--	19,963	21,427
Lowndes	262,443	103,942	17,177	88,900	52,424	Tattnall	222,641	117,691	5,574	65,989	33,387
Lumpkin	291,867	89,667	36,004	38,014	128,182	Taylor	122,046	45,690	364	39,606	36,386
Macon	167,626	40,599	--	68,183	58,844	Telfair	239,021	121,725	7,866	59,993	49,437
Madison	141,338	75,084	412	42,120	23,722	Terrell	88,968	25,163	3,099	48,104	12,602
Marion	135,009	43,817	--	44,148	47,044	Thomas	252,439	159,479	--	39,393	53,567
McDuffie	193,193	118,067	--	44,578	30,548	Tift	95,082	41,444	5,820	41,290	6,528
McIntosh	207,794	94,535	14,563	53,173	45,523	Toombs	111,377	59,014	1,483	41,986	8,894
Meriwether	238,878	129,466	407	55,291	53,714	Towns	126,500	45,531	3,153	23,736	54,080
Miller	54,955	17,230	6,355	17,836	13,534	Treutlen	86,480	60,644	--	17,198	8,638
Mitchell	112,589	72,170	4,831	21,347	14,241	Troup	227,874	103,216	420	69,779	54,459
Monroe	250,342	101,791	--	78,154	70,397	Turner	116,023	65,453	30,045	15,603	4,922
Montgomery	105,722	64,617	334	24,513	16,258	Twiggs	272,623	119,382	--	79,815	73,426
Morgan	201,680	121,300	--	56,498	23,882	Union	298,213	67,383	24,846	40,004	165,980
Murray	240,977	86,267	21,104	24,974	108,632	Upson	195,681	71,390	--	48,030	76,261
Muscogee	127,013	52,198	--	50,873	23,942	Walker	241,331	69,869	463	29,750	141,249
Newton	153,575	76,839	--	25,369	51,367	Walton	194,131	94,227	--	53,264	46,640
Oconee	133,530	60,012	--	31,049	42,469	Ware	268,273	203,225	22,659	39,051	3,338
Oglethorpe	328,763	159,039	2,493	107,302	59,929	Warren	177,394	116,448	--	32,942	28,004
Paulding	226,234	96,436	--	52,254	77,544	Washington	325,805	151,103	742	102,589	71,371
Peach	8,749	1,273	--	2,572	4,904	Wayne	305,458	198,909	36,030	55,009	15,510
Pickens	149,270	55,696	--	27,818	65,756	Webster	65,874	32,002	--	14,888	18,984
Pierce	163,481	76,541	17,685	61,738	7,517	Wheeler	131,686	70,418	1,241	43,535	16,492
Pike	125,964	27,889	--	42,587	55,488	White	268,871	97,344	7,103	61,686	102,738
Polk	164,237	90,178	--	7,996	66,063	Whitfield	141,930	55,976	--	27,185	58,769
Pulaski	95,896	27,854	4,719	27,517	35,806	Wilcox	158,294	66,765	13,727	47,311	30,491
Putnam	198,147	116,608	926	32,786	47,827	Wilkes	372,106	236,675	439	61,347	73,645
Quitman	95,183	49,874	--	27,484	17,825	Wilkinson	291,266	91,812	11,054	109,598	78,802
Rabun	433,672	97,949	102,442	64,864	168,417	Worth	218,214	145,772	6,701	41,901	23,840
Randolph	203,412	49,206	--	82,225	71,981						
						Total	30,733,930	14,437,494	1,161,618	7,694,284	7,440,534

Table 50--Volume of sawtimber on timberland, by county and species group, Georgia, 1989

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand board feet						Thousand board feet					
Appling	732,685	500,538	47,870	120,943	63,334	Dade	286,886	40,260	6,367	55,790	184,469
Atkinson	366,677	296,078	26,329	36,605	7,665	Dawson	504,263	193,438	3,204	61,486	246,135
Bacon	270,633	178,779	34,096	39,686	18,072	Decatur	1,066,182	750,002	56,971	139,484	119,725
Baker	502,933	235,102	32,889	32,197	202,745	De Kalb	594,059	323,869	--	67,852	202,338
Baldwin	451,487	286,904	--	92,568	72,015	Dodge	772,430	517,906	20,121	148,503	85,900
Banks	486,404	190,561	--	105,371	190,472	Dooly	418,070	182,545	87,765	88,260	59,500
Barrow	272,369	117,057	--	54,706	100,606	Dougherty	663,424	307,070	165,110	61,547	129,697
Bartow	728,129	440,140	--	64,039	223,950	Douglas	571,430	223,348	--	145,209	202,873
Ben Hill	292,236	244,117	10,302	28,390	9,427	Early	554,984	157,488	27,297	177,029	193,170
Berrien	654,528	465,456	69,716	79,060	40,296	Echols	398,297	183,231	91,747	108,031	15,288
Bibb	546,684	330,011	--	150,762	65,911	Effingham	859,690	492,823	25,938	148,945	191,984
Bleckley	307,335	38,262	--	129,673	139,400	Elbert	500,278	229,312	3,560	116,750	150,656
Brantley	411,708	175,651	52,304	143,029	40,724	Emanuel	966,462	606,144	12,167	229,905	118,246
Brooks	673,082	269,373	78,891	204,148	120,670	Evans	360,346	142,283	21,734	151,844	44,485
Bryan	1,117,046	748,060	14,170	214,806	140,010	Fannin	1,032,744	190,219	170,833	82,361	589,331
Bulloch	1,127,588	552,728	14,482	402,887	157,491	Fayette	448,534	154,186	--	180,048	114,300
Burke	1,217,221	414,783	48,633	458,304	295,501	Floyd	842,135	605,450	--	36,894	199,791
Butts	426,177	228,512	1,873	118,223	77,569	Forsyth	374,158	170,270	--	82,679	121,209
Calhoun	348,028	59,202	79,890	94,846	114,090	Franklin	375,461	134,764	2,379	55,932	182,386
Camden	1,216,369	597,192	150,891	271,493	196,793	Fulton	1,243,093	598,991	--	299,392	344,710
Candler	292,082	107,589	15,007	122,348	47,138	Gilmer	1,259,741	184,283	198,212	304,953	572,293
Carroll	641,443	219,290	--	169,726	252,427	Glascok	190,455	118,029	--	34,993	37,433
Catoosa	198,803	45,165	--	47,656	105,982	Glynn	658,991	305,434	95,087	126,206	132,264
Charlton	668,540	526,920	58,369	73,802	9,449	Gordon	359,127	191,295	--	17,109	150,723
Chatham	588,879	293,458	14,926	153,925	126,570	Grady	678,432	379,695	--	113,943	184,794
Chattahoochee	673,998	472,261	--	137,019	64,718	Greene	926,429	686,418	1,827	139,813	98,371
Chattooga	398,289	156,146	--	82,574	159,569	Gwinnett	899,989	386,710	--	279,533	233,746
Cherokee	1,099,125	560,043	--	223,028	316,054	Habersham	655,759	232,715	33,530	98,536	290,978
Clarke	187,680	76,978	--	82,129	28,573	Hall	671,999	243,197	--	130,592	298,210
Clay	239,025	114,103	--	67,447	57,475	Hancock	1,017,615	808,956	--	110,691	97,968
Clayton	231,060	144,564	--	36,194	50,302	Haralson	626,966	300,518	--	140,542	185,906
Clinch	736,085	369,651	170,945	166,166	29,323	Harris	601,834	359,449	1,805	124,993	115,587
Cobb	604,758	424,191	--	116,306	64,261	Hart	191,309	14,359	--	26,430	150,520
Coffee	643,339	425,361	31,332	158,295	28,351	Heard	351,577	206,064	--	85,918	59,595
Colquitt	560,543	419,467	3,458	79,469	58,149	Henry	574,611	341,939	--	81,593	151,079
Columbia	1,119,705	838,136	--	164,937	116,632	Houston	578,540	142,632	10,595	205,870	219,443
Cook	314,380	179,684	12,222	57,240	65,234	Irwin	628,005	436,924	61,615	109,147	20,319
Coweta	716,040	268,817	--	231,897	215,326	Jackson	595,043	314,164	--	133,082	147,797
Crawford	217,126	102,010	--	83,334	31,782	Jasper	1,028,280	655,588	3,621	150,389	218,682
Crisp	293,879	155,712	12,613	50,190	75,364	Jeff Davis	352,853	307,960	6,176	9,622	29,095

Continued

Table 50--Volume of sawtimber on timberland, by county and species group, Georgia, 1989--Continued

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand board feet						Thousand board feet					
Jefferson	1,005,316	371,339	61,873	313,420	258,684	Richmond	424,932	188,843	21,046	153,955	61,088
Jenkins	674,176	190,050	56,383	217,239	210,504	Rockdale	321,670	233,921	--	53,552	34,197
Johnson	404,269	222,459	--	131,549	50,261	Schley	231,731	107,386	2,100	62,550	59,695
Jones	1,140,441	890,537	--	138,722	111,182	Screven	1,890,636	746,538	157,909	668,923	317,266
Lamar	308,698	148,903	--	100,729	59,066	Seminole	183,831	106,076	17,776	23,708	36,271
Lanier	265,645	173,598	49,946	40,254	1,847	Spalding	395,945	313,044	--	63,741	19,160
Laurens	1,009,538	422,831	34,679	258,244	293,784	Stephens	399,753	190,869	--	39,727	169,157
Lee	457,501	183,155	16,048	105,793	152,505	Stewart	572,834	315,671	--	95,029	162,134
Liberty	1,423,327	914,373	40,732	253,329	214,893	Sumter	416,175	184,406	14,554	107,693	109,522
Lincoln	563,174	524,054	--	8,263	30,857	Talbot	497,072	218,127	2,871	132,365	143,709
Long	953,246	415,235	118,556	197,455	222,000	Taliaferro	443,444	345,157	--	40,681	57,606
Lowndes	781,787	331,446	60,426	209,783	180,132	Tattnall	758,339	417,355	13,727	197,281	129,976
Lumpkin	940,751	251,156	170,552	104,150	414,893	Taylor	349,806	141,794	--	105,970	102,042
Macon	581,658	153,458	--	222,716	205,484	Telfair	816,847	431,784	36,845	159,494	188,724
Madison	393,172	240,804	--	89,267	63,101	Terrell	279,819	99,483	11,648	137,049	31,639
Marion	422,323	157,403	--	127,772	137,148	Thomas	1,134,823	834,989	--	108,989	190,845
McDuffie	704,233	475,613	--	146,137	82,483	Tift	299,469	180,042	19,329	78,787	21,311
McIntosh	629,151	273,752	55,756	121,473	178,170	Toombs	284,888	173,385	5,480	84,512	21,511
Meriwether	626,158	380,126	--	103,919	142,113	Towns	415,510	134,084	16,216	58,802	206,408
Miller	193,730	75,069	13,946	50,384	54,331	Treutlen	250,623	188,258	--	33,150	29,215
Mitchell	406,330	293,677	19,959	56,180	36,514	Troup	640,847	332,893	--	197,653	110,301
Monroe	659,567	306,296	--	145,489	207,782	Turner	409,120	230,893	119,090	47,622	11,515
Montgomery	366,359	233,581	1,957	78,895	51,926	Twiggs	782,950	344,651	--	257,348	180,951
Morgan	637,766	464,106	--	112,611	61,049	Union	1,023,400	208,425	126,345	101,983	586,647
Murray	658,767	233,022	95,259	42,796	287,690	Upson	534,803	198,034	--	117,383	219,386
Muscogee	448,842	234,699	--	151,248	62,895	Walker	682,992	212,338	--	84,957	385,697
Newton	511,721	267,825	--	73,506	170,390	Walton	722,777	417,724	--	150,431	154,622
Oconee	391,429	209,586	--	73,608	108,235	Ware	565,389	434,736	60,449	63,055	7,149
Oglethorpe	1,080,071	544,810	10,668	328,293	196,300	Warren	601,995	479,623	--	51,680	70,692
Paulding	630,211	265,477	--	141,145	223,589	Washington	932,342	494,492	3,373	243,972	190,505
Peach	6,733	5,236	--	--	1,497	Wayne	680,209	365,477	118,907	137,376	58,449
Pickens	428,997	153,033	--	82,750	193,214	Webster	251,988	158,208	--	40,451	53,329
Pierce	474,753	251,480	64,412	141,998	16,863	Wheeler	406,092	215,249	1,991	134,707	54,145
Pike	353,306	99,353	--	113,098	140,855	White	755,311	218,109	36,750	205,425	295,027
Polk	405,355	230,364	--	18,306	156,685	Whitfield	449,334	200,505	--	71,125	177,704
Pulaski	318,756	89,092	25,916	79,638	124,110	Wilcox	524,961	225,722	56,545	127,691	115,003
Putnam	592,244	452,409	2,086	43,447	94,302	Wilkes	1,382,102	984,369	2,511	155,626	239,596
Quitman	281,533	170,786	--	67,389	43,358	Wilkinson	809,656	262,182	55,899	275,286	216,289
Rabun	1,529,623	347,497	535,504	154,417	492,205	Worth	714,648	494,832	25,182	125,976	68,658
Randolph	616,546	188,989	--	234,194	193,363						
						Total	95,770,845	48,954,333	4,450,070	20,082,625	22,283,817

Table 51--Average net annual change^a of growing stock on timberland, by county and species group, Georgia, 1982-1988

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand cubic feet						Thousand cubic feet					
Appling	-1,599	-1,713	-1,104	+824	+394	Dade	+2,417	+652	+188	+1,004	+573
Atkinson	+1,540	+3,525	-13	-1,933	-39	Dawson	+6,154	+2,861	+89	+900	+2,304
Bacon	-691	-873	+209	-117	+90	Decatur	+8,842	+6,334	+344	+1,108	+1,056
Baker	-1,841	-2,313	+239	+271	-38	De Kalb	-1,184	-1,359	--	+462	-287
Baldwin	+617	-373	-58	+844	+204	Dodge	+663	-912	+55	+1,334	+186
Banks	+529	-2,200	+10	+1,111	+1,608	Dooly	-832	+101	+262	-717	-478
Barrow	+706	-446	--	+423	+729	Dougherty	-1,452	-4,192	+361	+891	+1,488
Bartow	-2,124	-3,859	--	+297	+1,438	Douglas	+3,480	+1,582	--	+1,148	+750
Ben Hill	-2,025	-1,405	-125	-282	-213	Early	-162	+77	+71	+200	-510
Berrien	-2,221	-3,358	+530	-114	+721	Echols	+14,077	+12,611	+347	+1,335	-216
Bibb	+1,390	-232	--	+1,008	+614	Effingham	-7,999	-6,486	-171	-1,586	+244
Bleckley	+3,803	+1,597	--	+1,001	+1,205	Elbert	+1,562	+2,104	+202	-15	-729
Brantley	-4,329	-4,518	+137	+297	-245	Emanuel	-187	-295	+46	+164	-102
Brooks	+927	-1,333	+400	+1,033	+827	Evans	+1,175	-529	+70	+1,235	+399
Bryan	+1,232	-450	+86	+539	+1,057	Fannin	+2,553	-738	-172	+544	+2,919
Bulloch	-1,130	-3,577	+34	+1,930	+483	Fayette	+4,226	+1,570	--	+1,709	+947
Burke	-5,861	-3,785	+93	-1,545	-624	Floyd	-2,434	-4,545	--	+471	+1,640
Butts	+895	-1,050	+46	+1,107	+792	Forsyth	-535	-1,951	--	+565	+851
Calhoun	-1,945	-1,981	+573	+797	-1,334	Franklin	+640	+927	-87	-142	-58
Camden	+11,444	+9,072	+912	+1,336	+124	Fulton	-3,261	-5,049	--	+1,539	+249
Candler	-955	-2,478	+41	+896	+586	Gilmer	+3,082	+2,013	+209	-12	+872
Carroll	+850	-1,598	--	+1,169	+1,279	Glascock	-1,170	-839	--	-21	-310
Catoosa	-1,201	-640	--	-23	-538	Glynn	+2,970	+4,957	+307	+235	-2,529
Charlton	+9,019	+8,590	-376	+990	-185	Gordon	+914	+821	--	+295	-202
Chatham	+389	-621	-249	+478	+781	Grady	-4,318	-2,746	--	-513	-1,059
Chattahoochee	+1,144	-102	--	+467	+779	Greene	+7,610	+3,068	+26	+2,904	+1,612
Chattooga	-2,755	-2,896	--	+915	-774	Gwinnett	-2,159	-4,107	--	+1,587	+361
Cherokee	+2,053	-2,205	--	+2,646	+1,612	Habersham	+1,147	-3,003	+225	+1,579	+2,346
Clarke	+1,526	+1,231	--	+328	-33	Hall	+834	-1,405	+26	+680	+1,533
Clay	+838	-468	--	+822	+484	Hancock	-1,414	-900	--	-1,246	+732
Clayton	-1,983	-1,248	--	+58	-793	Haralson	+69	-1,931	--	+1,026	+974
Clinch	+4,447	+3,721	-19	+536	+209	Harris	-4,477	-2,904	+6	-314	-1,265
Cobb	-15,169	-13,708	--	-401	-1,060	Hart	+1,987	+562	+24	+356	+1,045
Coffee	-2,701	-4,484	-64	+2,021	-174	Heard	+518	-1,468	--	+954	+1,032
Colquitt	+234	-1,610	+478	+941	+425	Henry	-992	-2,588	--	+635	+961
Columbia	+5,912	+3,773	--	+1,164	+975	Houston	-1,236	-2,089	+74	+362	+417
Cook	+221	-881	-68	+700	+470	Irwin	+1,251	+473	+269	+102	+407
Coweta	-1,538	-1,254	--	+266	-550	Jackson	-5,542	-6,871	+21	+1,298	+10
Crawford	-95	-638	+43	+169	+331	Jasper	+3,728	-58	+106	+1,209	+2,471
Crisp	-5,276	-6,098	+30	+355	+437	Jeff Davis	-6,718	-5,583	-372	-882	+119

Continued

Table 51--Average net annual change^a of growing stock on timberland, by county and species group, Georgia, 1982-1988--Continued

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand cubic feet						Thousand cubic feet					
Jefferson	+2,439	-552	+516	+292	+2,183	Richmond	-420	-2,229	+148	+1,193	+468
Jenkins	-1,447	-2,257	+190	+296	+324	Rockdale	-1,153	-2,082	-55	+438	+546
Johnson	+2,039	+1,652	--	+199	+188	Schley	-2,124	-1,887	+11	-509	+261
Jones	-4,855	-4,904	--	-445	+494	Screven	+6,815	+3,737	+255	+2,175	+648
Lamar	+1,015	+1,551	--	-105	-431	Seminole	+1,367	+557	+63	+448	+299
Lanier	+3,158	+2,589	+179	+376	+14	Spalding	-3,936	-3,036	--	-968	+68
Laurens	-15,070	-14,443	+99	-425	-301	Stephens	+2,403	+562	--	+459	+1,382
Lee	-75	-1,425	+50	+1,024	+276	Stewart	+476	+54	--	+519	-97
Liberty	+6,267	+5,923	+139	+121	+84	Sumter	-5,825	-5,620	+45	+424	-674
Lincoln	+3,693	+3,682	--	+238	-227	Talbot	-4,219	-3,798	-58	-650	+287
Long	+1,754	-803	+527	+1,236	+794	Taliaferro	-2,518	-1,753	--	+82	-847
Lowndes	+7,311	+4,833	-191	+1,225	+1,444	Tattnall	-2,022	-2,494	-289	-81	+842
Lumpkin	+550	-2,439	+1,240	+622	+1,127	Taylor	-5,398	-5,108	-152	+50	-188
Macon	+3,630	+278	--	+1,977	+1,375	Telfair	-6,274	-7,512	+117	+443	+678
Madison	+2,681	+1,135	+30	+1,349	+167	Terrell	-6,824	-473	+37	-5,050	-1,338
Marion	-2,046	+796	--	-2,060	-782	Thomas	+3,980	+2,014	--	+678	+1,288
McDuffie	+1,692	+523	--	+828	+341	Tift	-3,278	-4,465	+126	+869	+192
McIntosh	-3	-257	-142	+373	+23	Toombs	-926	-645	+43	-377	+53
Meriwether	+176	+1,662	+10	-789	-707	Towns	-5,568	-1,973	+109	-517	-3,187
Miller	-2,023	-1,258	+248	+171	-1,184	Treutlen	+1,092	+713	--	+122	+257
Mitchell	-524	-518	+122	+383	-511	Troup	-4,274	-5,327	+6	+323	+724
Monroe	-4,363	-4,046	--	+614	-931	Turner	-1,842	-1,347	+336	-731	-100
Montgomery	-522	-371	+15	+133	-299	Twiggs	+3,426	+3,439	--	+22	-35
Morgan	+2,254	+1,819	--	+1,207	-772	Union	-2,785	+1,155	-693	-882	-2,365
Murray	+718	-2,766	+797	+597	+2,090	Upson	+1,926	+2,098	--	-1,836	+1,664
Muscogee	+164	-1,955	--	+1,261	+858	Walker	+3,466	-289	-6	+668	+3,093
Newton	-2,048	-3,879	+38	+521	+1,272	Walton	-1,586	-3,006	--	+526	+894
Oconee	+1,822	+352	--	+391	+1,079	Ware	+4,188	+4,157	-425	+441	+15
Oglethorpe	+2,556	+399	-13	+1,676	+494	Warren	+911	+2,085	--	+123	-1,297
Paulding	+5,218	+1,182	--	+1,867	+2,169	Washington	-2,237	-4,587	+21	+2,436	-107
Peach	-4,739	-3,674	--	-854	-211	Wayne	+1,597	+3,812	-539	-2,086	+410
Pickens	-4,828	-3,683	-840	-569	+264	Webster	-1,319	+1,250	--	-1,922	-647
Pierce	-2,659	-3,752	-11	+974	+130	Wheeler	-2,848	-2,623	+24	-469	+220
Pike	+120	-3,250	--	+1,344	+2,026	White	+5,958	+2,068	+145	+1,542	+2,203
Polk	+673	+214	-228	-35	+722	Whitfield	-7,094	-7,278	--	-286	+470
Pulaski	-140	-670	-234	-36	+800	Wilcox	-6,859	-5,533	-285	-843	-198
Putnam	+167	-1,374	+48	+516	+977	Wilkes	-6,194	-2,490	-29	-3,693	+18
Quitman	-1,858	-2,458	--	+254	+346	Wilkinson	-3,447	-1,559	-1,140	-1,760	+1,012
Rabun	+7,512	+1,009	+2,816	+964	+2,723	Worth	+3,749	+1,847	+162	+1,058	+682
Randolph	-6,485	-5,993	--	-816	+324						
						Total	-27,588	-149,415	+7,693	+54,981	+59,153

^a Average net annual growth minus average annual timber removals.

Table 52--Average net annual change^a of sawtimber on timberland, by county and species group, Georgia, 1982-1988

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand board feet						Thousand board feet					
Appling	+8,670	+8,886	-6,260	+4,300	+1,744	Dade	+7,025	+2,134	+403	+3,149	+1,339
Atkinson	+3,625	+8,691	+426	-4,999	-493	Dawson	+31,703	+18,184	+268	+5,519	+7,732
Bacon	-3,670	-4,441	+618	-31	+184	Decatur	+30,782	+23,347	+1,894	+2,739	+2,802
Baker	-1,603	-3,440	+563	+837	+437	De Kalb	-687	-1,428	--	+1,086	-345
Baldwin	+11,082	+5,812	--	+3,407	+1,863	Dodge	+12,098	+9,004	+412	+3,423	-741
Banks	+13,088	-1,033	--	+3,463	+10,658	Dooley	+3,385	+7,997	+1,342	-4,174	-1,780
Barrow	+7,926	+1,321	--	+3,617	+2,988	Dougherty	+1,497	-9,503	+2,104	+3,575	+5,321
Bartow	+2,431	-4,268	--	+66	+6,633	Douglas	+18,680	+9,589	--	+3,901	+5,190
Ben Hill	-6,257	-2,547	-277	-2,438	-995	Early	+2,148	-910	+582	+2,559	-83
Berrien	-6,274	-8,836	+469	+500	+1,593	Echols	+14,252	+11,017	+1,198	+1,468	+569
Bibb	+5,558	+471	--	+4,446	+641	Effingham	-25,360	-19,814	-512	-3,949	-1,085
Bleckley	+11,463	+2,118	--	+3,831	+5,514	Elbert	+9,742	+5,119	+375	-1,267	+5,515
Brantley	-10,085	-13,806	+580	+3,364	-223	Emanuel	-11,296	-14,441	+251	+1,392	+1,502
Brooks	-2,096	-9,839	+1,418	+3,814	+2,511	Evans	+8,362	-360	+337	+6,373	+2,012
Bryan	+25,369	+19,494	+186	+2,464	+3,225	Fannin	+18,415	+5,475	-488	+2,118	+11,310
Bulloch	+8,407	-2,333	+119	+7,686	+2,935	Fayette	+18,394	+6,542	--	+7,104	+4,748
Burke	+1,442	-1,019	+779	+2,724	-1,042	Floyd	+6,190	-665	--	-547	+7,402
Butts	+14,056	+2,836	+8	+4,398	+6,814	Forsyth	+6,344	+996	--	+3,085	+2,263
Calhoun	+221	-3,906	+3,933	+4,108	-3,914	Franklin	+5,369	+5,986	+98	-503	-212
Camden	+57,130	+51,187	+3,021	+4,289	-1,367	Fulton	-2,223	-11,385	--	+8,693	+469
Candler	-5,051	-11,285	+218	+2,584	+3,432	Gilmer	+17,391	+8,608	+1,440	+2,049	+5,294
Carroll	+11,061	+1,813	--	+4,293	+4,955	Glascock	-1,875	+128	--	+504	-2,507
Catoosa	+69	-1,713	--	+2,553	-771	Glynn	+18,862	+24,467	+1,129	+557	-7,291
Charlton	+25,006	+25,018	-692	+755	-75	Gordon	+7,154	+2,074	--	+786	+4,294
Chatham	+12,247	+7,455	+132	+2,915	+1,745	Grady	-27,924	-19,831	--	-2,904	-5,189
Chattahoochee	+8,833	+1,437	--	+3,659	+3,737	Greene	+32,916	+20,791	+268	+7,078	+4,779
Chattooga	-1,272	-4,223	--	+2,479	+472	Gwinnett	-1,375	-8,902	--	+6,471	+1,056
Cherokee	+11,504	-7,223	--	+9,046	+9,681	Habersham	+13,379	-9,872	+1,440	+8,056	+13,755
Clarke	+8,207	+7,207	--	+1,093	-93	Hall	+15,681	+4,803	--	+3,541	+7,337
Clay	+12,479	+4,933	--	+2,989	+4,557	Hancock	-11,553	-8,365	--	-5,943	+2,755
Clayton	-6,967	-3,683	--	+291	-3,575	Haralson	+7,197	-7,074	--	+8,292	+5,979
Clinch	+5,291	+3,041	+876	+445	+929	Harris	-22,554	-16,042	+36	-881	-5,667
Cobb	-51,571	-45,729	--	-2,471	-3,371	Hart	+13,387	+3,634	--	+1,107	+8,646
Coffee	+174	-6,510	+193	+6,000	+491	Heard	+3,537	-6,131	--	+7,130	+2,538
Colquitt	+7,759	+4,767	+159	+2,089	+744	Henry	,163	-5,273	--	+3,120	+4,316
Columbia	+32,802	+24,112	--	+4,401	+4,289	Houston	-7,478	-11,551	+478	+1,457	+2,138
Cook	+8,787	+2,944	-403	+1,834	+4,412	Irwin	+13,435	+11,423	+1,232	-236	+1,016
Coweta	-7,986	-5,091	--	-528	-2,367	Jackson	-16,174	-20,468	--	+2,936	+1,358
Crawford	-1,595	-3,038	--	+296	+1,147	Jasper	+10,163	+516	+203	+3,455	+5,989
Crisp	-12,599	-17,315	+162	+2,014	+2,540	Jeff Davis	-22,222	-15,758	-1,464	-4,814	-186

Continued

Table 52--Average net annual change^a of sawtimber on timberland, by county and species group, Georgia, 1982-1988--Continued

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Thousand board feet						Thousand board feet					
Jefferson	+16,803	+3,486	+1,868	+737	+10,712	Richmond	-1,636	-6,671	+1,007	+3,896	+132
Jenkins	-5,462	-9,397	+1,023	+77	+2,835	Rockdale	+758	-2,418	--	+1,763	+1,413
Johnson	+12,286	+8,755	--	+3,122	+409	Schley	-3,454	-3,870	+106	-1,408	+1,718
Jones	-2,490	-5,608	--	+479	+2,639	Screven	+41,533	+25,002	+1,035	+10,661	+4,835
Lamar	+2,359	+3,676	--	+1,604	-2,921	Seminole	+3,690	+1,214	+331	+915	+1,230
Lanier	+11,073	+8,446	+981	+1,941	-295	Spalding	-16,084	-10,790	--	-5,413	+119
Laurens	-59,614	-63,992	+376	+2,097	+1,905	Stephens	+13,265	+3,446	--	+2,343	+7,476
Lee	+1,540	-1,733	+347	+2,973	-47	Stewart	+5,388	-1,181	--	+4,603	+1,966
Liberty	+28,004	+25,218	+584	+116	+2,086	Sumter	-22,221	-21,380	+313	+542	-1,696
Lincoln	+11,619	+11,675	--	+716	-772	Talbot	-6,102	-8,764	-642	+206	+3,098
Long	+7,163	-3,992	+2,200	+4,025	+4,930	Taliaferro	-1,121	+702	--	-671	-1,152
Lowndes	+26,432	+19,049	-901	+3,274	+5,010	Tattnall	-7,695	-13,310	-459	+2,949	+3,125
Lumpkin	+14,827	+351	+7,414	+772	+6,290	Taylor	-6,500	-12,061	--	+3,981	+1,580
Macon	+20,832	+5,005	--	+8,623	+7,204	Telfair	-10,938	-16,309	+341	+1,021	+4,009
Madison	+7,464	+5,167	--	+3,680	-1,383	Terrell	-15,659	-1,428	+46	-14,850	+573
Marion	-4,635	-2,193	--	-4,139	+1,697	Thomas	+24,747	+13,171	--	+4,165	+7,411
McDuffie	+12,744	+9,165	--	+2,927	+652	Tift	-9,176	-14,544	+610	+3,736	+1,022
McIntosh	+402	-1,545	-32	+1,766	+213	Toombs	+3,159	+3,158	+135	+2,015	-2,149
Meriwether	+12,797	+10,588	+83	+923	+1,203	Towns	-14,182	-5,709	+378	-2,207	-6,644
Miller	-5,246	-1,782	+860	+652	-4,976	Treutlen	+909	-1,490	--	+1,246	+1,153
Mitchell	+15,703	+14,437	+710	+976	-420	Troup	-10,649	-17,260	--	+943	+5,668
Monroe	-2,429	-3,858	--	+4,465	-3,036	Turner	-5,390	-6,367	+1,649	-625	-47
Montgomery	+2,316	+3,120	+87	+1,130	-2,021	Twiggs	+17,721	+17,201	--	-104	+624
Morgan	+21,411	+17,926	--	+5,354	-1,869	Union	-2,786	+6,555	-5,799	-2,690	-852
Murray	+7,539	-8,872	+3,080	+1,873	+11,458	Upson	-2,039	+2,867	--	-9,590	+4,684
Muscogee	-8,415	-14,684	--	+4,401	+1,868	Walker	+17,383	+5,573	-459	+1,950	+10,319
Newton	-10,162	-17,864	--	+1,951	+5,751	Walton	-2,683	-9,723	--	+2,380	+4,660
Oconee	+14,432	+6,228	--	+3,049	+5,155	Ware	+2,316	+1,432	-854	+1,118	+620
Oglethorpe	+12,303	+667	+39	+8,827	+2,770	Warren	+13,190	+13,929	--	+598	-1,337
Paulding	+29,269	+17,673	--	+3,792	+7,804	Washington	+22,702	+5,896	+129	+11,320	+5,357
Peach	-15,267	-10,401	--	-4,016	-850	Wayne	-3,175	+1,108	-1,715	-4,185	+1,617
Pickens	-21,884	-14,425	-5,071	-2,295	-93	Webster	-3,776	+4,964	--	-9,492	+752
Pierce	-5,074	-10,506	+515	+3,113	+1,804	Wheeler	-3,943	-3,075	+130	-3,394	+2,396
Pike	-2,736	-14,825	--	+5,768	+6,321	White	+26,594	+11,163	+928	+7,571	+6,932
Polk	+5,079	+5,597	--	-851	+333	Whitfield	-15,552	-20,014	--	-817	+5,279
Pulaski	+4,612	+2,098	-1,087	-246	+3,847	Wilcox	-4,970	-1,852	-2,009	-1,890	+781
Putnam	-15,164	-17,241	+74	+649	+1,354	Wilkes	-1,979	+6,269	+49	-9,262	+965
Quitman	-12,726	-14,332	--	+33	+1,573	Wilkinson	-20,647	-17,013	-5,977	-4,301	+6,644
Rabun	+36,345	+9,469	+16,544	+1,870	+8,462	Worth	+21,188	+10,811	+602	+5,261	+4,514
Randolph	-14,116	-18,407	--	+1,000	+3,291						
						Total	+568,711	-92,303	+38,823	+265,580	+356,611

^a Average net annual growth minus average annual timber removals.

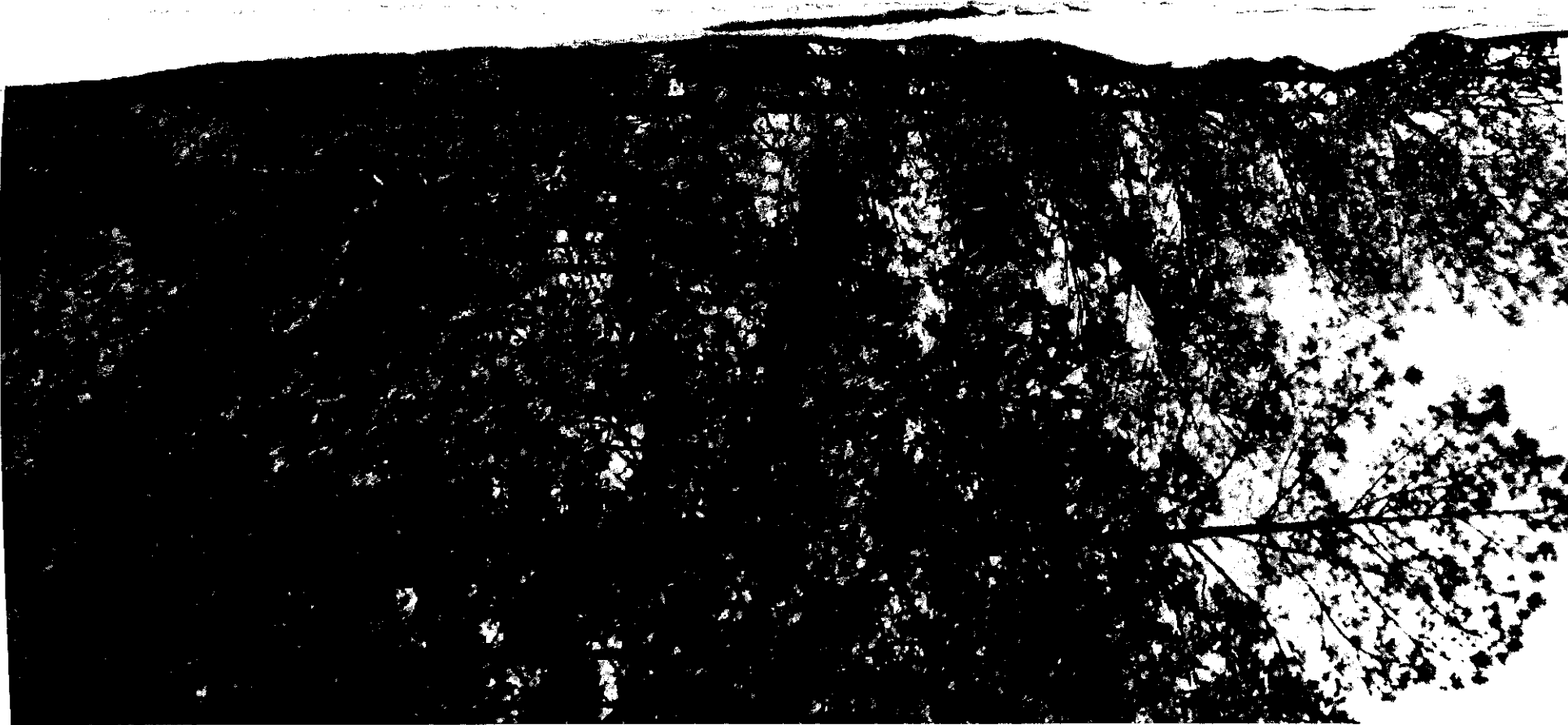
Table 53--Green weight of forest biomass on timberland, by county and species group, Georgia, 1989

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Hundred thousand pounds						Hundred thousand pounds					
Appling	253,180	145,847	10,358	69,261	27,714	Dade	134,653	15,306	4,445	32,544	82,358
Atkinson	167,847	108,065	8,321	39,309	12,152	Dawson	212,221	72,064	1,969	30,528	107,660
Bacon	134,901	78,597	9,578	34,961	11,765	Decatur	306,007	165,783	10,829	60,025	69,370
Baker	150,774	45,006	11,712	10,839	83,217	De Kalb	157,184	74,837	73	21,154	61,120
Baldwin	143,392	82,024	--	37,069	24,299	Dodge	257,273	136,711	3,940	76,903	39,719
Banks	178,891	52,359	523	39,236	86,773	Dooley	131,774	42,317	17,015	42,319	30,123
Barrow	81,248	27,989	32	18,425	34,802	Dougherty	164,666	55,325	36,293	24,834	48,214
Bartow	264,933	130,580	363	27,773	106,217	Douglas	176,795	53,425	--	45,125	78,245
Ben Hill	103,197	74,117	4,388	17,248	7,444	Early	217,193	57,103	9,983	66,340	83,767
Berrien	252,364	118,929	29,931	77,744	25,760	Echols	330,390	172,692	37,859	100,849	18,990
Bibb	157,991	67,072	--	54,154	36,765	Effingham	295,399	123,946	9,240	72,888	89,325
Bleckley	109,337	16,713	--	42,401	50,223	Elbert	206,335	83,203	5,881	39,259	77,992
Brantley	226,881	97,610	21,903	70,217	37,151	Emanuel	335,108	165,233	2,194	117,855	49,826
Brooks	219,375	60,297	24,094	79,879	55,105	Evans	121,123	31,704	5,526	61,503	22,390
Bryan	352,848	184,496	6,805	99,269	62,278	Fannin	365,811	59,675	26,682	44,605	234,849
Bulloch	331,073	119,170	4,916	141,131	65,856	Fayette	142,555	38,782	6	61,851	41,916
Burke	392,190	99,632	9,685	148,636	134,237	Floyd	311,337	132,832	203	27,223	151,079
Butts	135,931	57,670	1,053	35,812	41,396	Forsyth	130,500	43,629	--	25,616	61,255
Calhoun	119,911	13,355	20,418	43,451	42,687	Franklin	137,363	38,531	1,149	22,452	75,231
Camden	499,496	226,779	32,513	137,895	102,309	Fulton	335,120	134,528	15	83,972	116,605
Candler	111,335	25,013	2,810	56,167	27,345	Gilmer	460,305	65,848	30,249	108,464	255,744
Carroll	272,140	84,141	70	65,832	122,097	Glascok	84,107	31,929	--	21,357	30,821
Catoosa	68,399	7,911	93	15,006	45,389	Glynn	228,843	106,099	22,268	47,705	52,771
Charlton	361,843	276,570	19,314	52,511	13,448	Gordon	171,671	93,840	--	13,827	64,004
Chatham	181,460	57,526	4,436	63,743	55,755	Grady	201,416	78,663	266	43,994	78,493
Chattahoochee	190,780	86,809	--	58,218	45,753	Greene	327,733	186,159	936	80,988	59,650
Chattooga	168,999	46,557	116	34,084	88,242	Gwinnett	247,449	89,834	--	77,791	79,824
Cherokee	367,750	138,812	--	82,516	146,422	Habersham	237,862	62,334	5,284	38,057	132,187
Clarke	57,816	25,057	185	21,728	10,846	Hall	235,542	81,420	752	44,609	108,761
Clay	88,151	29,783	--	23,043	35,325	Hancock	337,323	204,406	--	67,496	65,421
Clayton	69,891	29,317	--	16,067	24,507	Haralson	222,793	77,931	--	51,921	92,941
Clinch	468,418	252,735	76,940	117,504	21,239	Harris	269,776	118,112	754	78,051	72,859
Cobb	153,334	89,369	21	36,509	27,435	Hart	84,818	10,811	933	16,981	56,093
Coffee	230,466	124,527	8,557	77,015	20,367	Heard	167,547	72,908	280	40,066	54,293
Colquitt	188,746	106,661	8,293	50,915	22,877	Henry	187,323	82,867	59	40,491	63,906
Columbia	273,215	159,879	599	59,259	53,478	Houston	174,057	31,139	2,110	72,033	68,775
Cook	100,456	36,924	4,077	33,969	25,486	Irwin	191,848	108,135	17,768	53,618	12,327
Coweta	269,086	91,639	--	82,774	94,673	Jackson	189,130	73,206	1,840	53,509	60,575
Crawford	128,432	60,263	341	37,922	29,906	Jasper	314,926	138,834	2,308	66,360	107,424
Crisp	94,687	33,798	3,118	26,745	31,026	Jeff Davis	131,429	81,422	2,923	24,219	22,865

Continued

Table 53--Green weight of forest biomass on timberland, by county and species group, Georgia, 1989--Continued

County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	County	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
Hundred thousand pounds						Hundred thousand pounds					
Jefferson	334,423	77,654	16,859	127,705	112,205	Richmond	149,090	46,040	3,765	61,116	38,169
Jenkins	224,120	56,151	11,598	87,328	69,043	Rockdale	89,541	46,745	12	17,094	25,690
Johnson	138,300	64,820	--	50,406	23,074	Schley	81,621	24,122	719	26,713	30,067
Jones	305,644	187,651	--	59,613	58,380	Screven	506,345	150,152	33,999	209,223	112,971
Lamar	106,348	39,945	--	33,430	32,973	Seminole	56,742	21,054	3,266	13,892	18,530
Lanier	105,189	55,166	14,153	29,086	6,784	Spalding	116,303	68,870	--	37,063	10,370
Laurens	365,099	116,303	7,412	129,289	112,095	Stephens	148,060	58,335	189	18,017	71,519
Lee	143,816	37,572	2,806	33,974	69,464	Stewart	249,048	113,129	23	50,767	85,129
Liberty	421,222	228,623	9,964	96,041	86,594	Sumter	155,339	53,168	2,533	55,772	43,866
Lincoln	159,142	105,842	23	19,447	33,830	Talbot	222,498	84,466	2,048	60,463	75,521
Long	325,926	122,742	30,566	99,678	72,940	Taliaferro	150,967	92,354	278	28,328	30,007
Lowndes	295,537	97,749	16,609	102,909	78,270	Tattall	240,658	112,531	4,656	70,727	52,744
Lumpkin	313,193	78,758	27,731	39,989	166,715	Taylor	164,686	50,532	384	42,561	71,209
Macon	186,952	35,247	--	66,651	85,054	Telfair	265,905	114,479	8,435	73,926	69,065
Madison	152,413	68,147	855	45,374	38,037	Terrell	95,537	22,579	2,795	51,583	18,580
Marion	168,214	44,947	--	45,744	77,523	Thomas	259,709	137,612	--	45,144	76,953
McDuffie	190,277	104,998	--	46,451	38,828	Tift	96,654	36,578	5,314	44,265	10,497
McIntosh	242,909	96,374	15,357	64,882	66,296	Toombs	127,400	59,753	1,602	47,455	18,590
Meriwether	267,106	128,101	569	63,864	74,572	Towns	147,925	39,159	2,365	26,396	80,005
Miller	74,211	16,048	7,179	21,075	29,909	Treutlen	97,818	60,824	--	22,047	14,947
Mitchell	120,105	70,631	4,292	25,260	19,922	Troup	259,507	103,257	458	78,158	77,634
Monroe	276,021	97,003	--	84,024	94,994	Turner	118,706	63,424	26,235	21,755	7,292
Montgomery	114,958	60,356	370	30,813	23,419	Twiggs	285,119	111,168	--	81,751	92,200
Morgan	201,663	106,845	--	63,983	30,835	Union	323,464	58,717	20,573	43,085	201,089
Murray	268,463	85,951	16,974	36,187	129,351	Upson	228,882	70,195	37	52,673	105,977
Muscogee	137,320	49,256	150	51,615	36,299	Walker	289,820	68,279	1,964	37,703	181,874
Newton	162,739	69,914	274	30,986	61,565	Walton	193,022	81,434	--	56,898	54,690
Oconee	138,839	51,207	101	32,946	54,585	Ware	312,300	222,596	24,121	55,646	9,937
Oglethorpe	333,746	148,535	2,213	108,816	74,182	Warren	182,471	105,085	194	37,899	39,293
Paulding	247,754	93,579	--	55,083	99,092	Washington	356,473	142,522	696	112,628	100,627
Peach	17,150	2,136	--	3,906	11,108	Wayne	349,224	205,046	34,085	75,116	34,977
Pickens	185,827	56,391	--	32,498	96,938	Webster	78,528	39,676	--	13,371	25,481
Pierce	178,115	72,304	15,848	67,723	22,240	Wheeler	158,440	69,311	1,356	59,075	28,698
Pike	133,183	26,760	41	42,620	63,762	White	295,416	87,987	6,318	65,022	136,089
Polk	186,588	83,265	302	11,779	91,242	Whitfield	145,384	47,820	--	27,371	70,193
Pulaski	105,709	26,075	4,685	31,568	43,381	Wilcox	170,915	63,992	13,700	58,348	34,875
Putnam	207,702	108,529	931	36,746	61,496	Wilkes	370,396	208,858	1,876	72,972	86,690
Quitman	107,152	47,641	84	29,304	30,123	Wilkinson	334,656	90,024	10,902	114,677	119,053
Rabun	460,199	82,444	76,247	68,285	233,223	Worth	220,867	138,119	6,453	45,459	30,836
Randolph	223,152	43,343	23	79,069	100,717						
Total	33,477,731	13,578,116	1,093,162	8,633,925	10,172,528						



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Since 1982, area of timberland in Georgia declined by less than 1 percent and currently totals 23.6 million acres. Nonindustrial private owners control 68 percent of the State's timberland. Volume of softwood growing stock declined 6 percent, whereas hardwood growing-stock volume increased 5 percent. Softwood net annual growth dropped 15 percent to 818 million cubic feet, and hardwood growth declined 11 percent to 457 million cubic feet. Annual removals of softwood and hardwood growing stock increased 16 and 50 percent, respectively. Annual softwood mortality was down 5 percent, while hardwood mortality increased 40 percent.

KEYWORDS: Timberland, forest ownership, timber volume, timber growth, timber removals, timber mortality.

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