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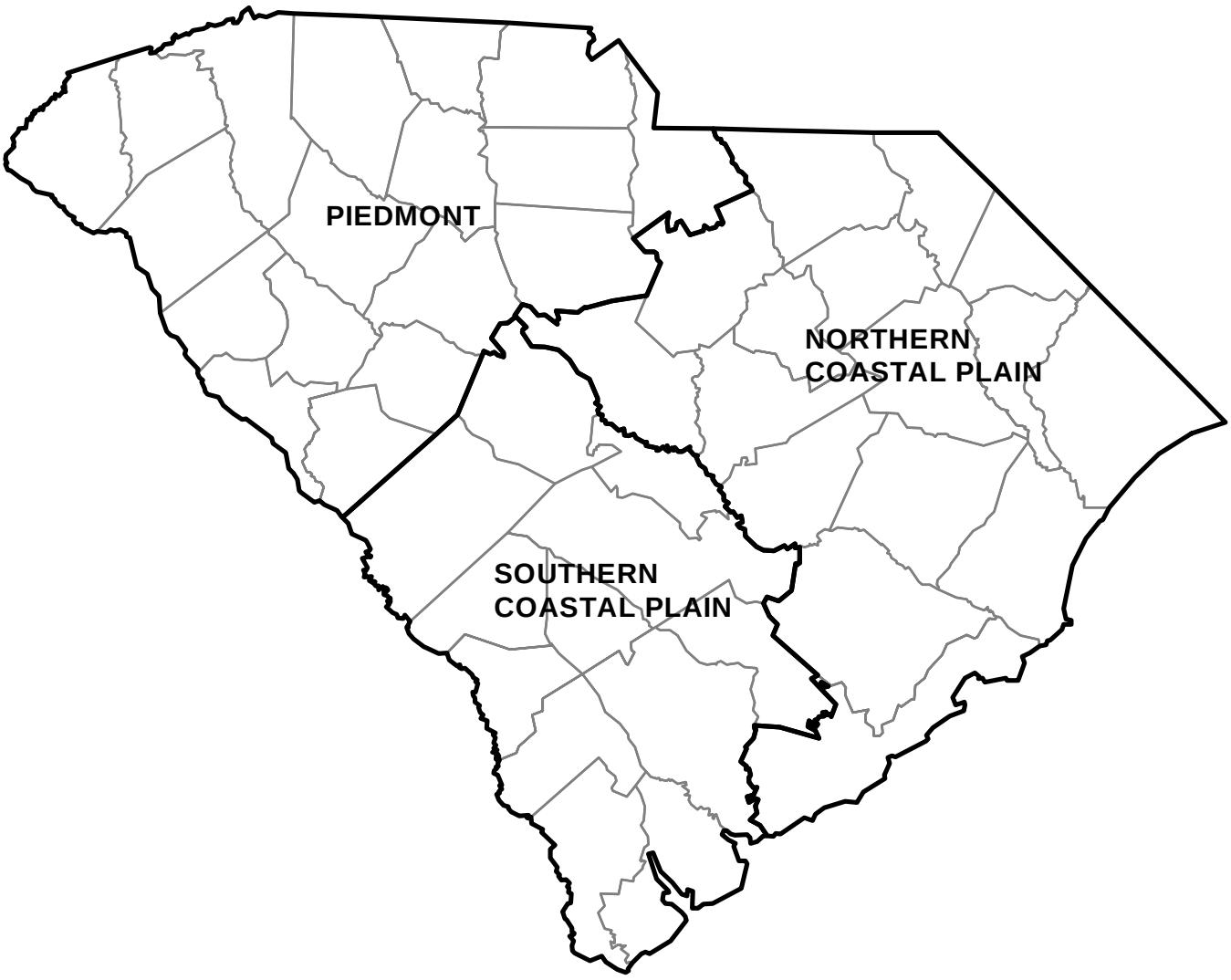
South Carolina's Forest Resources—2000 Update

Roger C. Conner and Raymond M. Sheffield



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Foreword

This bulletin highlights the initial results of an annual inventory of South Carolina's forest resources. Annual inventories of the Nation's forests are mandated by the Agricultural Research Extension and Education Reform Act of 1998 (1998 Farm Bill). The current annual forest inventory program has several new features: (1) a nationally consistent, fixed-radius, four-point plot configuration; (2) a systematic national sampling design featuring a base grid derived by subdividing the Environmental Monitoring and Assessment Program grid into approximately 6,000-acre hexagons; (3) integration of the Forest Inventory and Analysis (FIA) and Forest Health Monitoring (FHM) sampling designs; (4) annual measurement of a fixed proportion of permanent FIA/FHM plots in each State; (5) reporting of data or data summaries within 6 months of completion of a year's sampling; (6) a default 5-year moving average estimator, with provisions for optional estimators based on techniques for updating information; and (7) State inventory reports every 5 years. For additional information, you may access the national FIA Web site at http://fia.fs.fed.us/.

The Southern Research Station's FIA Research Work Unit and the South Carolina Forestry Commission began the new annual inventory of South Carolina in 1998. The new inventory system measures a systematic sample comprising approximately 20 percent of all plots in the State each year. The 20-percent systematic sample is referred to as one panel of inventory data. A panel may take more than or less than 1 year to complete. This bulletin highlights the principal findings of 3 years/panels of plot measurements, or those inventory statistics from about 60 percent of all plots. Fieldwork began in August 1998 and was completed in November 2000. Forest land estimates and inventory volume, growth, removals, and mortality statistics are summarized from the data collected for these three panels. Seven previous periodic inventories completed in 1936, 1947, 1958, 1968, 1978, 1986, and 1993 provide statistics for measuring changes and trends. This bulletin primarily emphasizes changes since 1993.

The Forest and Rangeland Renewable Resources Research Act of 1978 authorized surveys of our Nation's forest resources. These surveys are part of a continuing, nationwide undertaking by the regional experiment stations of the U.S. Department of Agriculture, Forest Service. Inventories of the 13 Southern States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia) and the Commonwealth of Puerto Rico are conducted by the Southern Research Station, FIA Research Work Unit, operating from its headquarters in Knoxville, TN, and offices in Asheville, NC, and Starkville, MS. The primary objective of these appraisals is to develop and maintain the resource information needed to formulate sound forest policies and programs.

Additional information about any aspect of this survey may be obtained from:

Forest Inventory and Analysis
Southern Research Station
4700 Old Kingston Pike
Knoxville, TN 37919
Telephone: 865–862–2000

Acknowledgments

The Southern Research Station gratefully acknowledges the South Carolina Forestry Commission for its role in collecting the field data. We also appreciate the cooperation of other public agencies and private landowners in providing access to measurement plots.

Table of Contents

[a] All tables in this report are available in Microsoft® Excel workbook files. Upon request, these files will be supplied on 3½-inch diskettes.

The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

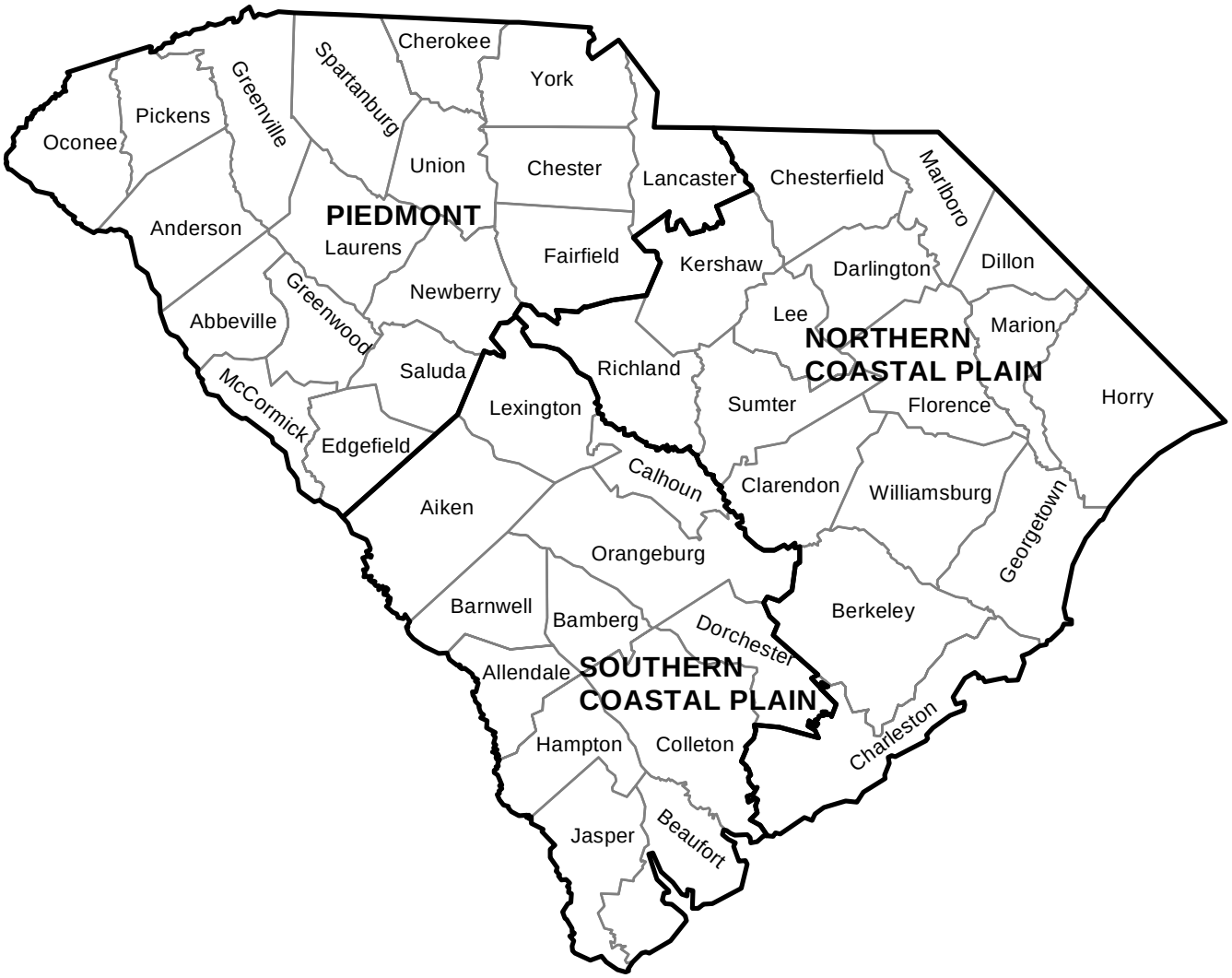

Figure 1—Forest survey regions in South Carolina.

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Highlights

This bulletin summarizes results from the first three annual panels of data measured across the forests of South Carolina (fig. 1). Current estimates are dated 2000 and were derived from 60 percent of all sample plots in the State. Twenty percent of the sample plots are scheduled to be completed annually hereafter. A detailed analytical bulletin will be published when all sample plots have been completed and compiled.

Current estimates of forest area, timberland area, related classifications such as ownership and forest type, and timber volumes are presented and compared with previous values. Average annual rates of growth, removals, and mortality are summarized since the previous inventory in 1993.

Although this inventory is similar in scope to previous inventories, it differs in sampling design and intensity, standards and definitions, and in methods used to determine key attributes such as stocking, forest type, and stand class. A major change was the shift to annual inventories, in which a portion of the samples is measured each year. By contrast, previous inventories were periodic; all samples were measured prior to publication of inventory estimates. Many of the changes in methods, plot design, and sampling intensity have been designed to provide national consistency among FIA Research Work Units. While these changes initially will complicate data comparison among surveys, over the long term such comparisons will be easier and resource trends more readily identifiable. In this bulletin we make general comparisons where differences between inventories can be reconciled or are considered minimal.

Resource data are presented in 30 tables and 9 graphs. A summary of major findings follows.

Timberland area—The area of timberland declined by 142,000 acres to 12.3 million acres (see table 1). Sixty-five percent of South Carolina was forested. Land use changes involving forests occurred on 1.2 million acres, including 649,000 acres diverted to other land uses. A total of 205,000 acres were cleared for agriculture, 392,000 acres of timberland diverted to urban and other uses, and 51,000 acres converted to ponds, lakes, or other impoundments. Offsetting some of these losses were the 506,000 acres added to the timber base, primarily due to natural regeneration and planting or seeding on nonforest land.

Ownership—Nonindustrial private forest (NIPF) landowners accounted for 74 percent of the timberland area (see table 2). The NIPF owner group is composed of individual and corporate timberland owners. Individual ownership decreased 3 percent, from 7.3 million acres to 7.1 million acres. Timberland under corporate ownership increased 19 percent, from 1.7 million acres to 2.0 million acres. As of 2000, almost 1 out of every 6 acres of timberland in South Carolina was under corporate ownership. Timberland owned by forest industry decreased 14 percent, from 2.3 million acres to 2.0 million acres. Public ownership increased by 122,000 acres to 1.2 million acres.

Forest type—Area of timberland classed as a softwood forest type increased by 408,000 acres to 6.0 million acres (see table 5). Softwood forest types accounted for 48 percent of the timberland in South Carolina, an increase of 3 percent. Loblolly-shortleaf pine forest types, which rose by 465,000 acres to 5.4 million acres, accounted for the majority of the increase. Area of longleaf-slash pine fell 62,000 acres to 547,000 acres. Stands classified as planted rose from 2.8 million acres to 3.1 million acres. Planted stands made up 25 percent of the area of timberland. Among hardwood forest types, oak-pine dropped from 1.9 million acres to 1.4 million acres. Area in the oak-hickory forest-type group declined 4 percent to 2.4 million acres. Bottomland hardwoods (oak-gum-cypress and elm-ash-cottonwood forest-type groups) were relatively unchanged at 2.5 million acres.

Stand-size—Stand-size distributions showed evidence of recovery from Hurricane Hugo, with many of the sapling-seedling stands created by the storm growing into the poletimber class. Area of timberland classified as poletimber increased 36 percent to 4.3 million acres, whereas area of sapling-seedling stands dropped 632,000 acres to 3.8 million acres (see table 4). The area of timberland classified as sawtimber declined 12 percent to 4.2 million acres.

Stand treatment—Since 1993 final harvest occurred on 209,000 acres annually; and 72 percent of the annual harvest was on NIPF land (see table 30). Partial harvests, seed tree cutting, and commercial thinning occurred annually on 157,000 acres of timberland. New stands were established on approximately 300,000 acres each year through reforestation and afforestation. Forty-six percent of the regeneration was due to planting or seeding and the remainder was the result of natural regeneration. Weather-related damage occurred on 31,000 acres annually, while insects, disease, and fire damaged another 56,000 acres per year.

Softwood volume—Merchantable volume of softwood live trees increased from 8.1 billion cubic feet to 9.2 billion cubic feet, a rise of 14 percent (see table 14). Loblolly pine volume increased 24 percent to 6.7 billion cubic feet, accounting for most of the increase in softwood volume. Since 1993, softwood volume on forest industry timberland increased in spite of losses of forest area under this ownership. Softwood volume on forest industry timberland rose 6 percent to 1.8 billion cubic feet. Softwood volume on NIPF timberland increased from 5.2 billion cubic feet to 6.1 billion cubic feet. Significant reductions in the volume of slash and shortleaf pine occurred during the period, whereas the volume of longleaf pine remained relatively stable, dropping only 3 percent. Softwood volume on planted stands—3.4 billion cubic feet—accounted for 37 percent of the softwood live-tree inventory in 2000, compared with 28 percent in 1993.

Hardwood volume—There was also an increase in hardwood live-tree volume, from 9.8 billion cubic feet to 10.2 billion cubic feet. The increase was greatest on NIPF land in cubic-foot terms, as hardwood inventory rose 482.4 million cubic feet to 8.0 billion cubic feet. Forest industry timberland experienced a 19-percent reduction in volume of hardwood live trees and was the only ownership to show a loss. Oak species combined accounted for 53 percent of the increase in hardwood volume on all ownerships, rising from 3.2 billion cubic feet to 3.5 billion cubic feet. Volume of tupelo and blackgum live trees fell 7 percent to 1.5 billion cubic feet. Sweetgum live-tree volume increased to nearly 2.0 billion cubic feet, an increase of 14 percent.

Growth—Net annual growth of softwood live trees almost doubled, from 346 million cubic feet to 681 million cubic feet per year (see table 25). Softwood growth was up on all ownerships, reflecting the recovery from Hurricane Hugo. Net growth on forest industry timberland increased 64 percent and averaged 211 million cubic feet per year. Net annual growth of softwoods on NIPF land rose from an annual rate of 208 million cubic feet to 428 million cubic feet. Planted pine and oak-pine stands accounted for 58 percent of the softwood net growth and 40 percent of the net growth for all species. Net annual growth of hardwood live trees increased 67 percent to 313 million cubic feet. As with softwoods, hardwood net growth increased on all ownerships, including a 63-percent increase to 262 million cubic feet per year on NIPF land.

Mortality—Much of the reason for the increased net growth since the previous survey was due to declines in average annual mortality rates, which had been driven to abnormally high levels by Hurricane Hugo. Annual mortality of softwood live trees decreased 72 percent, from 257 million cubic feet to 73 million cubic feet (see table 24). Softwood mortality was down on all ownerships, declining 76 percent on NIPF land, from 165 million cubic feet to 39 million cubic feet per year. Mortality of softwoods on forest industry timberland fell 67 percent to 13 million cubic feet per year, and was down 61 percent on public timberland. Hardwood annual mortality in South Carolina was also down substantially, falling 38 percent to 119 million cubic feet per year. Hardwood live-tree mortality on NIPF land declined 31 percent to 93 million cubic feet, and fell from 36 million cubic feet to 15 million cubic feet annually on forest industry timberland.

Removals—Annual removals of softwood live-tree volume decreased 5 percent to 475 million cubic feet (see table 25). Sixty-three percent, or 297 million cubic feet, of the softwood removals came from NIPF land. Softwood removals were down 9 percent on NIPF timberland. Forest industry timberland was the only ownership to show an increase in annual softwood removals, rising from 134 million cubic feet to 150 million cubic feet per year. Forest industry timberland accounted for 32 percent of total softwood removals. Removals of hardwood live trees decreased 8 percent to 239 million cubic feet per year, and was down on all ownerships except NIPF land. NIPF owners provided 82 percent—196 million cubic feet—of the hardwoods removals volume, an increase of 4 percent. Hardwood removals from forest industry timberland dropped 16 percent to 40 million cubic feet per year. Hardwood removals declined 88 percent on public timberland. Hardwood volume removed from public lands—3 million cubic feet—accounted for just 1 percent of the hardwood removals. More than one-fourth—27 percent—of the total removals came from planted stands during the latest inventory period, compared with 18 percent for the previous inventory period.

Inventory Methods

The Southern Research Station's FIA Research Work Unit and the South Carolina Forestry Commission began the new annual inventory in 1998. The overall sampling scheme for annual inventories is a significant change from that of previous periodic inventories. In the annual inventory system for the South, the objective is to measure approximately 20 percent (one-fifth) of the periodic inventory plot total across an entire State each year. This annual subsample is referred to as a panel. The plots that are measured in a single panel are selected to ensure systematic coverage of individual counties. This systematic coverage includes forest and nonforest land. Estimates of forest characteristics can be derived using measurements from a single panel; however, the relatively small sample yields estimates with low precision. To achieve reliable statistics at the survey unit and State levels, panel data sets were combined using a moving average methodology. In South Carolina, there were 759 plots measured in panel 1, 797 plots were measured in panel 2, and 763 plots were measured in panel 3. Estimates from plots that sampled forest land in these three panels were combined using the moving average procedure to produce the statistics in this bulletin. The reliability of estimates will improve using the moving average as all five panels are completed. The goal is to complete measurements of all five panels in 5 years and produce a comprehensive report using the full data set.

The Southern Research Station, FIA Research Work Unit, uses a three-phase sample of aerial photo points and permanent ground plots. Phase 1 (remote sensing) entails the use of aerial photography to determine the area of forest land in each county. Phase 2 (traditional FIA estimates) is based on a network of ground sample locations where field crews visit physical locations of plots and collect measurements of a variety of traditional mensurational FIA variables. Phase 3 (forest health estimates) comprises approximately a $1/16^{th}$ sample of the Phase 2 plots. Phase 3 measurements include the full complement of traditional FIA variables measured on Phase 2 plots, plus additional measurements taken on tree crowns, soils, lichens, downed woody debris, and understory vegetation.

In Phase 1, a forest-nonforest classification was derived by interpreting 93,369 points on aerial photographs. These photo classifications were adjusted based on ground observations at 4,142 sample locations. The plot installed at each ground sample location (Phase 2) was a cluster of four points spaced 120 feet apart. Each point served as the center of a 1/24-acre circular subplot used to sample trees 5.0 inches in diameter at breast height (d.b.h.) and larger. A 1/300-acre microplot, located at the subplot center, was used to sample trees 1.0 to 4.9 inches d.b.h. and seedlings (trees less than 1.0 inch d.b.h.). These fixed-radius sample plots were established without regard to land use or land cover. Forest and nonforest condition classes were delineated and recorded on each plot. Condition classes were defined by six attributes: land use, forest type, stand origin, stand size, forest density, and major ownership class. The process of delineating a fixed-radius plot into numerous sections based on forest and land use conditions is called mapping. All trees tallied were assigned to their respective condition class.

The cluster of four fixed plots sampled timberland at 1,647 ground sample locations in South Carolina. Estimates of timber volume and forest classifications were derived from tree measurements and classifications made at these locations. Volumes for individual tally trees were computed using equations for each of the major species in South Carolina. Estimates of growth, removals, and mortality were determined from the remeasurement of 1,531 permanent sample plots established in the previous inventory. The plot design for the previous inventory was based on a cluster of 10 points. Variable plots were systematically spaced within a single forest condition at three to five points. At each point, trees 5.0 inches d.b.h and larger were selected for measurement on a variable-radius plot defined by a 37.5-factor prism. Trees less than 5.0 inches d.b.h. were tallied on a fixed-radius plot around points 1 through 3.

Statistical Reliability

A measure of reliability of inventory statistics is provided by sampling errors. Because the inventory statistics presented in this bulletin are based upon approximately 60 percent of all plots in the State, users should be cognizant of the sampling errors presented in this section and utilize the inventory statistics accordingly. FIA inventories supported by the full complement of sample plots are designed to achieve reliable statistics at the survey unit and State levels. For most uses of these data, the statistics generated from 60 percent of the samples will also provide reliable statistics for key totals at the State and survey unit levels. However, users should note that sampling error increases as the area or volume considered decreases in magnitude. Sampling errors and associated confidence intervals are often unacceptably high for small components of the total resource.

Sampling errors mean that the chances are two out of three that the true population value is within the limits indicated

by a confidence interval. Sampling errors (in percent) and associated confidence intervals around the sample estimates for timberland area, inventory volumes, and components of change are presented in the following table.

Item	Sample estimate and confidence interval	Sampling error
		Percent
Timberland (*1,000 acres*)	12,312.5 ± 57.9	0.47
All live ($M\ ft^3$)		
Inventory	19,410.3 ± 457.9	2.36
Net annual growth	993.8 ± 31.6	3.18
Annual removals	713.3 ± 43.9	6.16
Annual mortality	192.1 ± 10.6	5.52
Growing stock ($M\ ft^3$)		
Inventory	17,701.8 ± 435.0	2.46
Net annual growth	953.9 ± 30.4	3.18
Annual removals	679.7 ± 42.4	6.23
Annual mortality	152.3 ± 9.5	6.22
Sawtimber (*M fbm*)		
Inventory	59,523.5 ± 2,008.2	3.37
Net annual growth	3,204.1 ± 113.0	3.53
Annual removals	2,407.0 ± 169.2	7.03
Annual mortality	489.8 ± 37.9	7.73

Sampling errors for key resource items for each survey unit are also provided in the following table. Statistical confidence may be computed for any subdivision of survey unit or State total using the following formula. Sampling errors obtained from this method are only approximations of reliability because this process assumes constant variance across all subdivisions of totals.

$$SE_s = SE_t \frac{\sqrt{X_t}}{\sqrt{X_s}},$$

where

SE_s = sampling error for subdivision of survey unit or State total,

SE_t = sampling error for survey unit or State total,

X_s = sum of values for the variable of interest (area or volume) for subdivision of survey unit or State,

X_t = total area or volume for survey unit or State.

For example, the estimate of sampling error for softwood live-tree volume on forest industry land is computed as:

$$SE_s = 2.36 \frac{\sqrt{19{,}410.3}}{\sqrt{1{,}791.2}} = 7.77.$$

Thus, the sampling error is 7.77 percent, and the resulting confidence interval (two times out of three) for softwood live-tree inventory on forest industry land is 1,791.2 ± 139.2 million cubic feet.

Sampling errors[a] for timberland, live trees, growing stock, sawtimber, and mortality, by survey unit, South Carolina, 2000

Resource item	All survey units	Survey unit: Southern Coastal Plain	Survey unit: Northern Coastal Plain	Survey unit: Piedmont
		Percent		
Timberland	0.47	0.97	0.74	0.79
All live				
Inventory	2.36	4.74	3.90	3.59
Net annual growth	3.18	5.86	5.85	4.95
Annual removals	6.16	13.05	10.32	9.36
Annual mortality	5.52	11.43	8.54	9.62
Growing stock				
Inventory	2.46	4.93	4.09	3.72
Net annual growth	3.18	5.83	5.64	5.12
Annual removals	6.23	13.34	10.40	9.46
Annual mortality	6.22	13.96	9.42	10.37
Sawtimber				
Inventory	3.37	6.77	5.42	5.18
Net annual growth	3.53	6.42	6.40	5.11
Annual removals	7.03	14.46	11.94	10.81
Annual mortality	7.73	16.74	11.28	14.00

[a] By random-sampling formula.

Definitions

Afforestation. Area of land previously classified as nonforest that is converted to forest by planting trees or by natural reversion to forest.

Average annual mortality. Average annual volume of trees 5.0 inches d.b.h. and larger that died from natural causes during the intersurvey period.

Average annual removals. Average annual volume of trees 5.0 inches d.b.h. and larger removed from the inventory by harvesting, cultural operations (such as timber-stand improvement), land clearing, or changes in land use during the intersurvey period.

Average net annual growth. Average annual net change in volume of trees 5.0 inches d.b.h. and larger in the absence of cutting (gross growth minus mortality) during the intersurvey period.

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 fresh 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 d.o.b. in trees 5.0 inches d.b.h. and larger.

Census water. Streams, sloughs, estuaries, canals, and other moving bodies of water 200 feet wide and greater, and lakes, reservoirs, ponds, and other permanent bodies of water 4.5 acres in area and greater.

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

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

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.

D.o.b. (diameter outside bark). Stem diameter including bark.

Forest land. Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. The minimum area considered for classification is 1 acre. Forested strips must be at least 120 feet wide.

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

Pine plantation. Stands that (a) have been artificially regenerated by planting or direct seeding, (b) are classed as a pine or other softwood forest type, and (c) have at least 10 percent stocking.

Natural pine. Stands that (a) have not been artificially regenerated, (b) are classed as a pine or other softwood forest type, and (c) have at least 10 percent stocking.

Oak-pine. Stands that have at least 10 percent stocking and classed as a forest type of oak-pine.

Upland hardwood. Stands that have at least 10 percent stocking and classed as an oak-hickory or maple-beech-birch forest type.

Lowland hardwood. Stands that have at least 10 percent stocking with a forest type of oak-gum-cypress, elm-ash-cottonwood, palm, or other tropical.

Nonstocked stands. Stands less than 10 percent stocked with live trees.

Forest type. A classification of forest land based on the species forming a plurality of live-tree stocking. Major eastern forest-type groups are:

White-red-jack pine. 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. Bottomland 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).

Nonstocked stands. Stands less than 10 percent stocked with live trees.

Forested tract size. The area of forest within the contiguous tract containing each Forest Inventory and Analysis sample plot.

Fresh weight. Mass of tree component at time of cutting.

Gross growth. Annual increase in volume of trees 5.0 inches d.b.h. and larger in the absence of cutting and mortality. (Gross growth includes survivor growth, ingrowth, growth on ingrowth, growth on removals before removal, and growth on mortality before death).

Growing-stock trees. Living trees of commercial species classified as sawtimber, poletimber, saplings, and seedlings. Trees must contain at least one 12-foot or two 8-foot logs in the saw-log portion, currently or potentially (if too small to qualify), to be classed as growing stock. The log(s) must meet dimension and merchantability standards to qualify. Trees must also have, currently or potentially, one-third of the gross board-foot volume in sound wood.

Growing-stock volume. The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches d.b.h. from a 1-foot stump to a minimum 4.0-inch top d.o.b. of the central stem.

Hardwoods. Dicotyledonous trees, usually broadleaf and deciduous.

Soft hardwoods. Hardwood species with an average specific gravity of 0.50 or less, such as gums, yellow-poplar, cottonwoods, red maple, basswoods, and willows.

Hard hardwoods. Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maples, hickories, and beech.

Industrial wood. All roundwood products except fuelwood.

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 200 feet wide, and lakes, reservoirs, and ponds less than 4.5 acres in area.

Live trees. All living trees. All size classes, all tree classes, and both commercial and noncommercial species are included.

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

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

Net annual change. Increase or decrease in volume of live trees at least 5.0 inches d.b.h. Net annual change is equal to net annual growth minus average annual removals.

Noncommercial species. Tree species of typically small size, poor form, or inferior quality that 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.

Nonstocked stands. Stands less than 10 percent stocked with live trees.

Other forest land. Forest land other than timberland and productive reserved forest land. It includes available and reserved forest land which is incapable of producing annually 20 cubic feet per acre of industrial wood under natural conditions, because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

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, resulting in the removal of the trees from timberland.

Ownership. The property owned by one ownership unit, including all parcels of land in the United States.

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.

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

Nonindustrial private forest (NIPF) land. Privately owned land excluding forest industry land or forest industry-leased land.

Corporate. Owned by corporations, including incorporated farm ownerships.

Individual. All lands owned by individuals, including farm operators.

Other public. An ownership class that includes all public lands except national forests.

Miscellaneous Federal land. Federal land other than national forests.

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.

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, suitable for chipping.

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

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

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

Poletimber-size trees. Softwoods 5.0 to 8.9 inches d.b.h. and hardwoods 5.0 to 10.9 inches d.b.h.

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

Productive-reserved forest land. Forest land sufficiently productive to qualify as timberland but withdrawn from timber utilization through statute or administrative regulation.

Reforestation. Area of land previously classified as forest that is regenerated by planting trees or natural regeneration.

Rotten trees. Live trees of commercial species not containing at least one 12-foot saw log, or two noncontiguous 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 not containing at least one 12-foot saw log, or two noncontiguous 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 nonpulpmills, 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, that is produced from roundwood.

Salvable dead trees. Standing or downed dead trees that were formerly growing stock and considered merchantable. Trees must be at least 5.0 inches d.b.h. to qualify.

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, with a minimum diameter inside bark for softwoods of 6 inches (8 inches for hardwoods).

Saw-log portion. The part of the bole of sawtimber trees between a 1-foot stump and the saw-log top.

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 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 d.b.h. and greater than 1 foot tall for hardwoods, greater than 6 inches tall for softwood, and greater than 0.5 inch in diameter at ground level for longleaf pine.

Select red oaks. A group of several red oak species composed of cherrybark, Shumard, and northern red oaks. Other red oak species are included in the "other red oaks" group.

Select white oaks. A group of several white oak species composed of white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks. Other white oak species are included in the "other white oaks" group.

Site class. A classification of forest land in terms of potential capacity to grow crops of industrial wood based on fully stocked natural stands.

Softwoods. Coniferous trees, usually evergreen, having leaves that are needles or scalelike.

Yellow pines. Loblolly, longleaf, slash, pond, shortleaf, pitch, Virginia, sand, spruce, and Table Mountain pines.

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

Stand age. The average age of dominant and codominant trees in the stand.

Stand origin. A classification of forest stands describing their means of origin.

Planted. Planted or artificially seeded.

Natural. No evidence of artificial regeneration.

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 10 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 10 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 10 percent stocked with live trees of which more than half of total stocking is saplings and seedlings.

Nonstocked stands. Stands less than 10 percent stocked with live trees.

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.

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

Timberland. Forest land 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.

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 (at maturity).

Tree grade. A classification of the saw-log portion of sawtimber trees based on: (1) the grade of the butt log or (2) the ability to produce at least one 12-foot or two 8-foot logs in the upper section of the saw-log portion. Tree grade is an indicator of quality; grade 1 is the best quality.

Upper-stem portion. The 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.

Volume of live trees. The cubic-foot volume of sound wood in live trees at least 5.0 inches d.b.h. from a 1-foot stump to a minimum 4.0-inch top d.o.b. of the central stem.

Volume of saw-log portion of sawtimber trees. The cubic-foot volume of sound wood in the saw-log portion of sawtimber trees. Volume is the net result after deductions for rot, sweep, and other defects that affect use for lumber.

Metric Equivalents

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 = 1.4 meters above the ground
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

Graphs

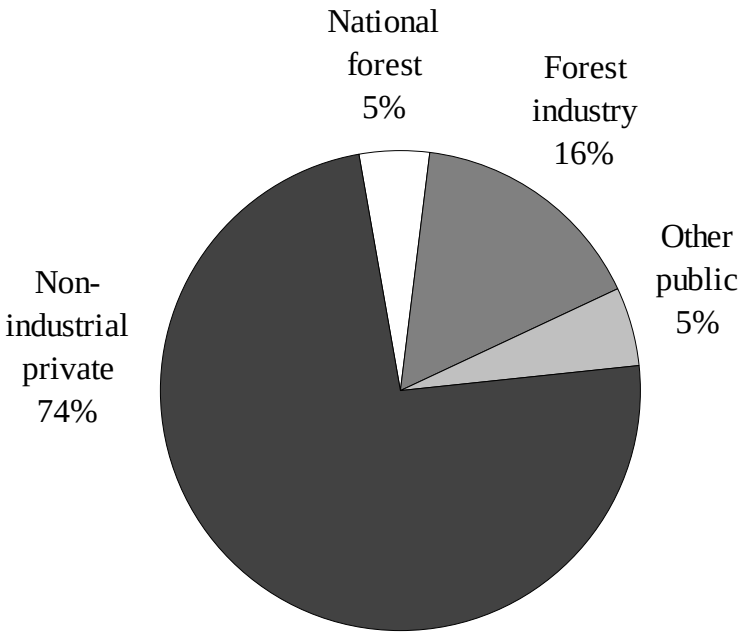

Figure 2—Distribution of timberland by ownership class, South Carolina, 2000.

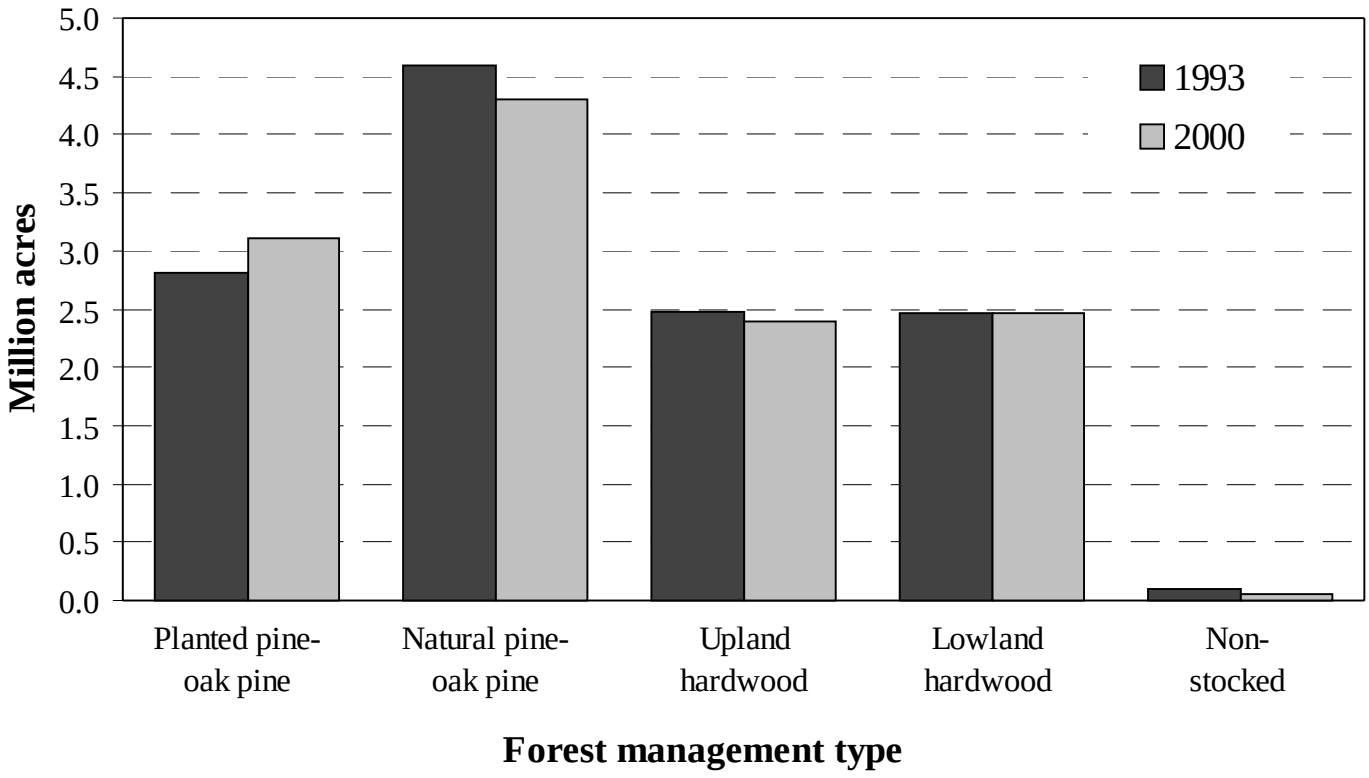

Figure 3—Area of timberland by forest management type, South Carolina, 1993 and 2000.

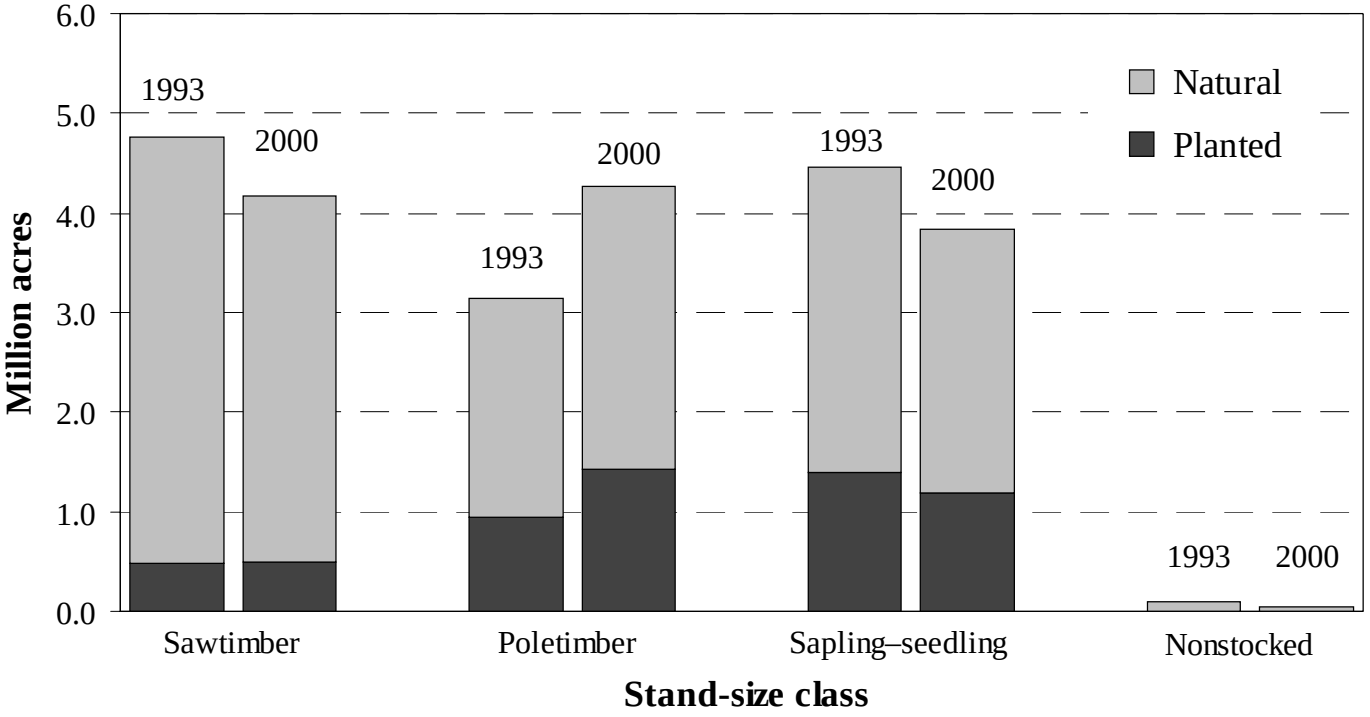

Figure 4—Area of timberland by stand-size class and stand origin, South Carolina, 1993 and 2000.

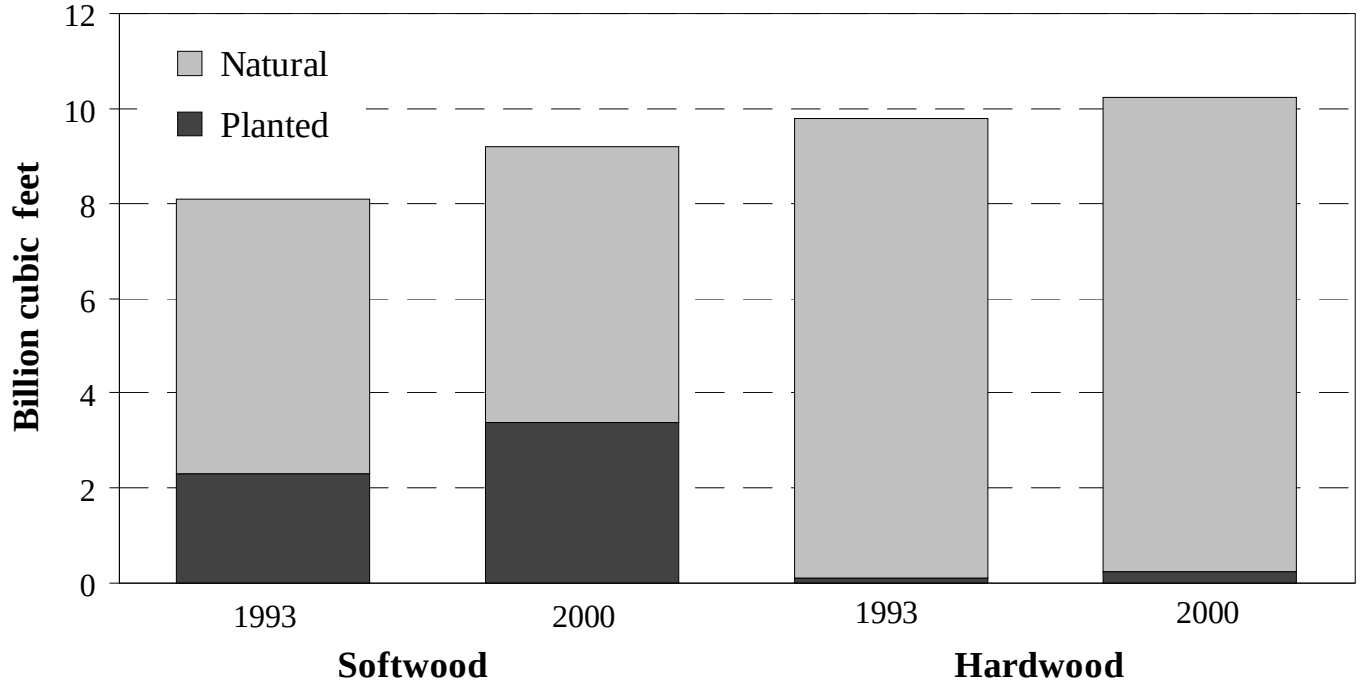

Figure 5—Volume of live trees on timberland by species group and stand origin, South Carolina, 1993 and 2000.

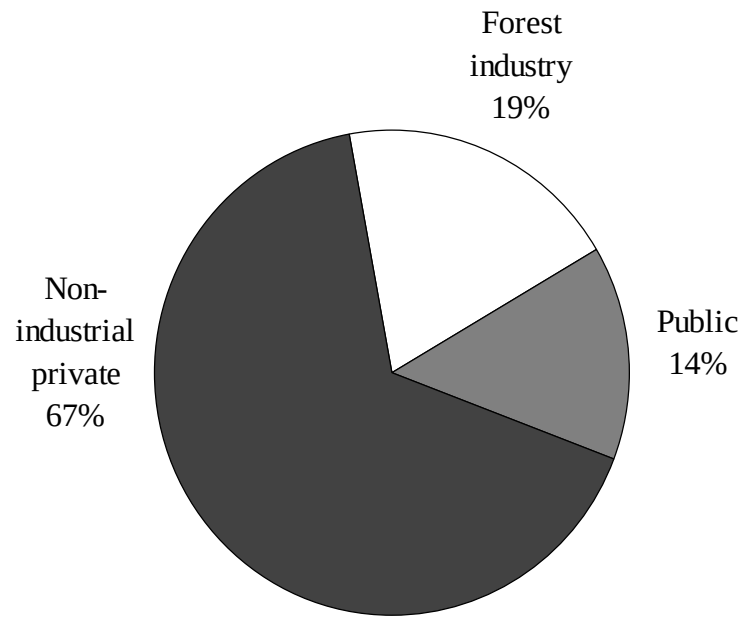

Figure 6—Distribution of softwood live tree volume by ownership class, South Carolina, 2000.

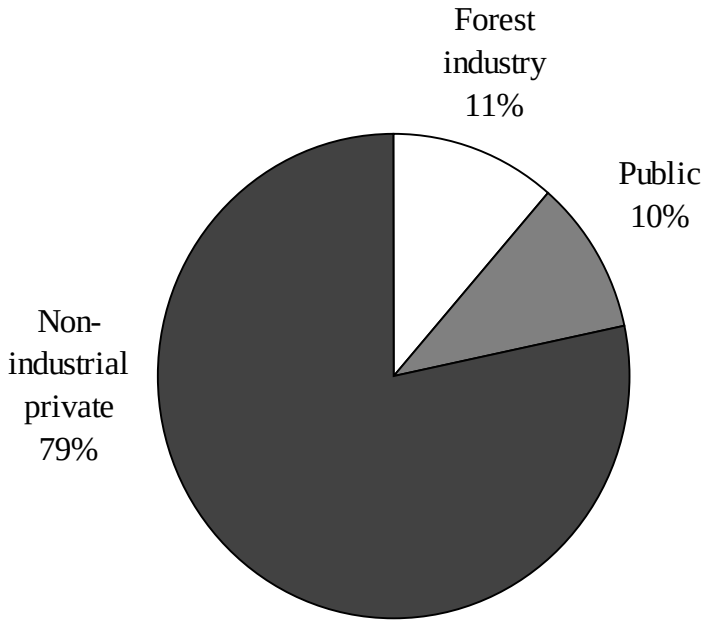

Figure 7—Distribution of hardwood live tree volume by ownership class, South Carolina, 2000.

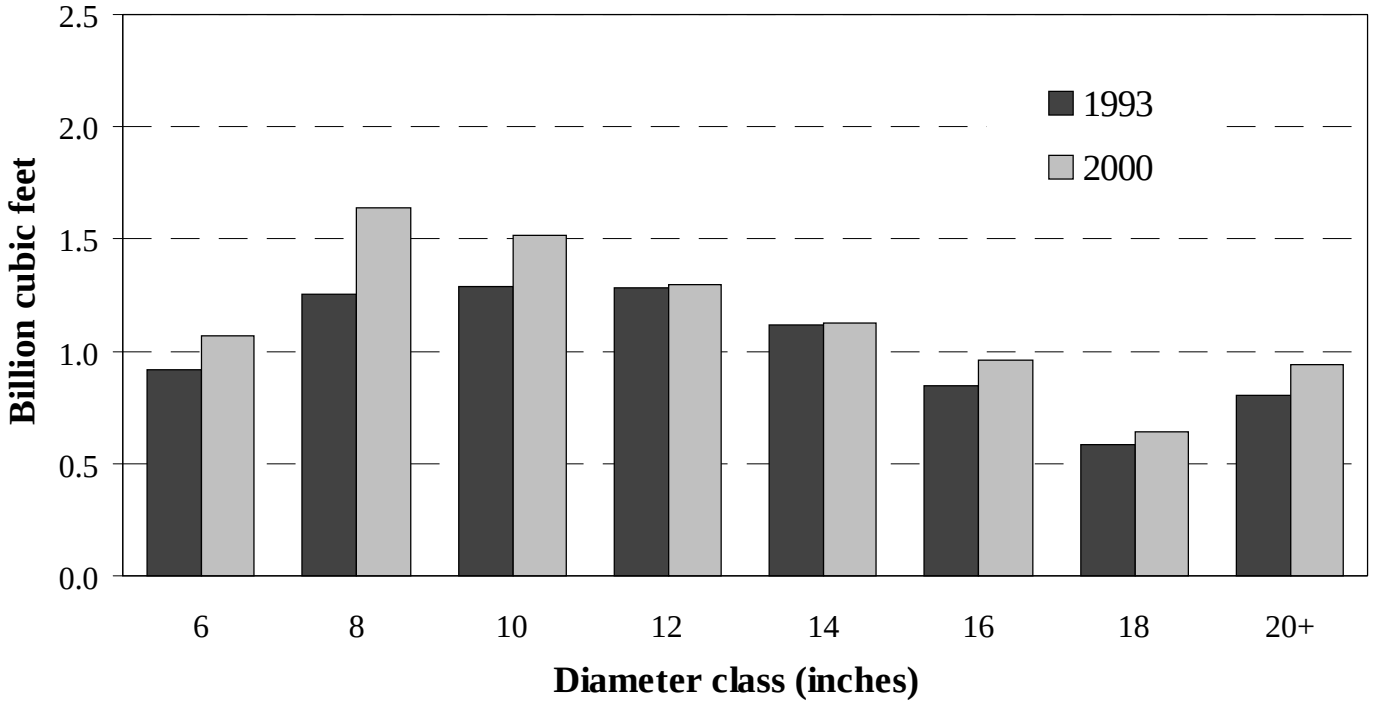

Figure 8—Volume of softwood live trees on timberland by diameter class, South Carolina, 1993 and 2000.

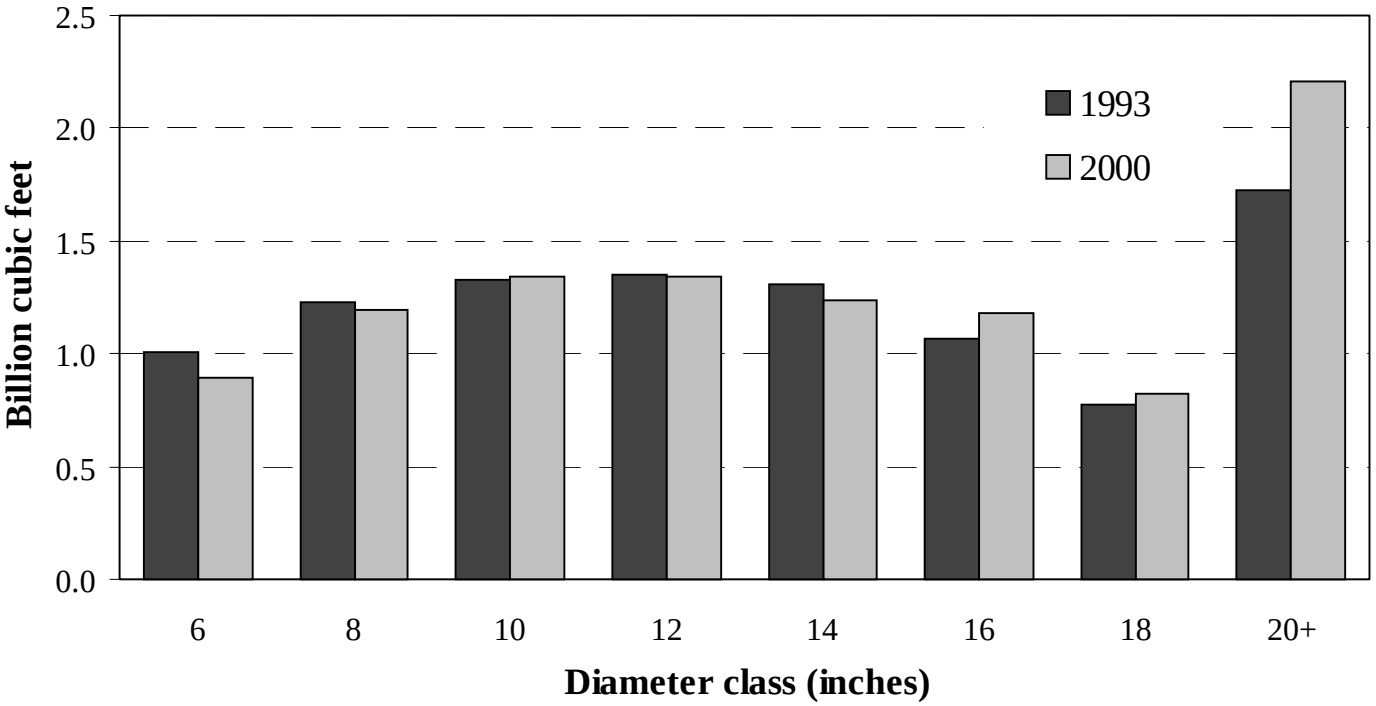

Figure 9—Volume of hardwood live trees on timberland by diameter class, South Carolina, 1993 and 2000.

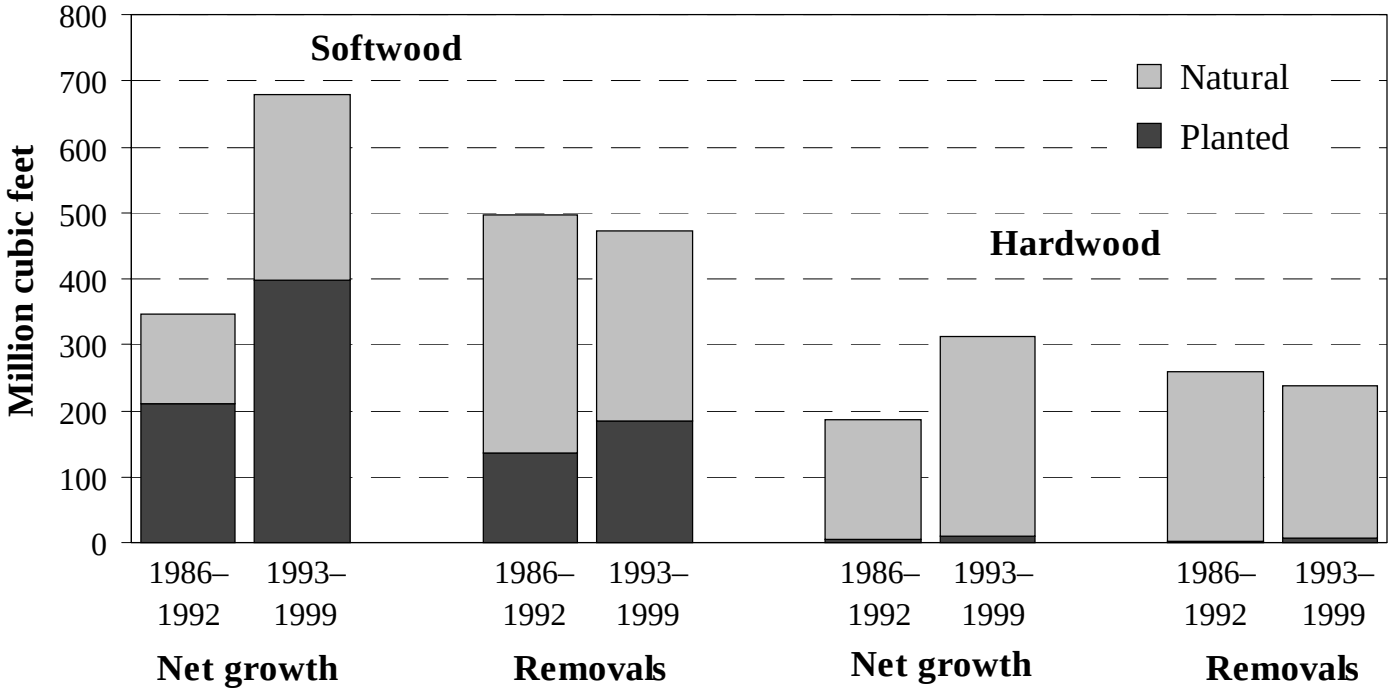

Figure 10—Average net annual growth and removals of live trees on timberland by species group and stand origin, South Carolina, 1986–1992 and 1993–1999.

Index of Tables

Table 1—Land area by survey unit and land class, South Carolina, 2000

Survey unit	Total land area[a]	Forest land				Other land[b]
		Total forest	Timberland	Productive reserved	Other	
	Thousand acres					
Southern Coastal Plain	5,144.6	3,364.3	3,342.2	22.1	—	1,780.4
Northern Coastal Plain	7,426.2	4,622.3	4,541.6	80.7	—	2,803.9
Piedmont	6,691.5	4,520.0	4,428.7	91.3	—	2,171.6
All units	19,262.4	12,506.6	12,312.5	194.1	—	6,755.8

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

[a] From the U.S. Bureau of the Census, 1990.

[b] Includes 60.4 thousand acres of water according to Forest Inventory and Analysis standards of area classification, but defined by the Bureau of the Census as land.

Table 2—Area of timberland by survey unit and ownership class, South Carolina, 2000

Survey unit	All classes	Ownership class			
		National forest	Other public	Forest industry	Nonindustrial private
	Thousand acres				
Southern Coastal Plain	3,342.2	—	207.5	572.6	2,562.0
Northern Coastal Plain	4,541.6	247.0	328.2	858.3	3,108.1
Piedmont	4,428.7	329.1	124.2	563.1	3,412.4
All units	12,312.5	576.1	659.9	1,994.0	9,082.4

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 3—Area of timberland by survey unit and forest-type group, South Carolina, 2000

Survey unit	All groups	Forest-type group								
		White-red-jack pine	Longleaf-slash	Loblolly-shortleaf	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood	Tropical hardwood	Nonstocked
	Thousand acres									
Southern Coastal Plain	3,342.2	—	267.5	1,435.2	357.0	407.2	813.1	59.7	1.7	0.6
Northern Coastal Plain	4,541.6	—	279.3	1,903.4	402.1	519.3	1,204.0	183.2	—	50.3
Piedmont	4,428.7	9.8	—	2,074.0	668.0	1,466.5	63.2	145.2	—	2.0
All units	12,312.5	9.8	546.8	5,412.6	1,427.1	2,393.0	2,080.3	388.2	1.7	52.9

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 4—Area of timberland by survey unit and stand-size class, South Carolina, 2000

Survey unit	All classes	Stand-size class			
		Sawtimber	Poletimber	Sapling-seedling	Nonstocked
		Thousand acres			
Southern Coastal Plain	3,342.2	1,263.4	1,060.1	1,018.1	0.6
Northern Coastal Plain	4,541.6	1,304.3	1,643.0	1,544.1	50.3
Piedmont	4,428.7	1,601.9	1,559.1	1,265.7	2.0
All units	12,312.5	4,169.6	4,262.1	3,827.9	52.9

Numbers in rows and columns may not sum to totals due to rounding.

Table 5—Area of timberland by forest-type group, stand origin, and ownership class, South Carolina, 2000

Forest-type group and stand origin	All classes	Ownership class			
		National forest	Other public	Forest industry	Nonindustrial private
		Thousand acres			
Softwood types					
White–red–jack pine					
Planted	1.6	—	1.6	—	—
Natural	8.2	—	6.6	—	1.6
Total	9.8	—	8.2	—	1.6
Longleaf-slash pine					
Planted	176.0	—	57.8	12.3	105.9
Natural	370.8	14.4	110.6	15.7	230.1
Total	546.8	14.4	168.4	28.0	336.0
Loblolly-shortleaf pine					
Planted	2,872.0	89.8	58.0	1,134.5	1,589.7
Natural	2,540.6	255.6	154.0	131.0	2,000.1
Total	5,412.6	345.5	211.9	1,265.4	3,589.7
Total softwoods	5,969.2	359.9	388.5	1,293.4	3,927.4
Hardwood types					
Oak-pine					
Planted	53.2	—	—	7.3	45.9
Natural	1,373.9	24.4	50.9	86.8	1,211.8
Total	1,427.1	24.4	50.9	94.0	1,257.7
Oak-hickory	2,393.0	112.2	92.2	149.6	2,039.0
Oak-gum-cypress	2,080.3	59.3	118.6	346.3	1,556.0
Elm-ash-cottonwood	388.2	20.3	7.8	87.1	272.9
Tropical hardwood	1.7	—	1.7	—	—
Total hardwoods	6,290.3	216.3	271.4	677.0	5,125.7
Nonstocked	52.9	—	—	23.6	29.4
All groups	12,312.5	576.1	659.9	1,994.0	9,082.4

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 6—Number of live trees on timberland by species group and diameter class, South Carolina, 2000

Species group	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													
Yellow pine	2,719,336	1,145,606	619,506	433,844	265,288	120,885	61,016	33,882	20,222	10,273	5,318	3,381	114
Other softwoods	211,607	116,212	38,499	20,739	13,637	8,298	5,233	3,932	2,658	1,225	583	337	254
All softwoods	2,930,943	1,261,818	658,005	454,583	278,925	129,183	66,249	37,814	22,880	11,498	5,901	3,718	368
Hardwood													
Soft hardwood	3,109,828	2,165,253	461,458	197,386	108,767	66,834	42,939	25,742	19,211	9,806	6,050	5,518	866
Hard hardwood	2,680,762	1,869,024	417,591	159,303	91,384	54,610	31,887	21,593	13,570	7,630	5,418	7,321	1,432
All hardwoods	5,790,590	4,034,277	879,049	356,689	200,151	121,444	74,826	47,335	32,781	17,436	11,468	12,839	2,298
All species	8,721,533	5,296,095	1,537,054	811,272	479,075	250,627	141,075	85,149	55,661	28,934	17,369	16,556	2,666

Numbers in rows and columns may not sum to totals due to rounding.

Table 7—Number of growing-stock trees on timberland by species group and diameter class, South Carolina, 2000

Species group	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													
Yellow pine	2,365,455	890,568	562,767	410,913	255,616	114,367	59,628	33,089	19,747	10,089	5,220	3,339	114
Other softwoods	148,455	67,901	31,122	17,229	11,580	7,406	4,865	3,540	2,559	1,178	583	238	254
All softwoods	2,513,910	958,469	593,889	428,142	267,196	121,773	64,493	36,629	22,306	11,267	5,803	3,577	368
Hardwood													
Soft hardwood	1,478,846	827,385	274,377	142,659	87,567	55,210	35,416	21,746	16,585	7,992	5,148	4,283	477
Hard hardwood	866,228	396,234	185,050	100,756	66,811	44,520	25,688	18,231	11,389	5,912	4,600	6,066	972
All hardwoods	2,345,074	1,223,619	459,427	243,415	154,378	99,730	61,104	39,977	27,974	13,904	9,748	10,349	1,449
All species	4,858,984	2,182,089	1,053,315	671,557	421,574	221,503	125,596	76,606	50,280	25,171	15,550	13,926	1,817

Numbers in rows and columns may not sum to totals due to rounding.

Table 8—Volume of live trees on timberland by species group and diameter class, South Carolina, 2000

Species group	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
					Million cubic feet						
Softwood											
Yellow pine	8,466.0	1,012.6	1,550.1	1,417.2	1,202.0	1,023.8	863.5	584.3	388.9	392.3	31.1
Other softwoods	728.0	58.5	87.5	98.0	97.6	103.8	95.5	58.6	36.0	27.3	65.1
All softwoods	9,194.0	1,071.1	1,637.6	1,515.2	1,299.6	1,127.6	959.1	642.9	424.9	419.6	96.3
Hardwood											
Soft hardwood	5,541.7	502.7	670.0	754.2	789.3	666.6	692.0	472.0	365.7	484.7	144.7
Hard hardwood	4,674.6	390.3	519.7	587.7	553.9	567.8	489.0	350.2	320.8	663.6	231.6
All hardwoods	10,216.3	892.9	1,189.7	1,341.8	1,343.2	1,234.5	1,181.0	822.2	686.4	1,148.2	376.3
All species	19,410.3	1,964.0	2,827.3	2,857.1	2,642.8	2,362.1	2,140.1	1,465.1	1,111.3	1,567.8	472.6

Numbers in rows and columns may not sum to totals due to rounding.

Table 9—Volume of growing-stock trees on timberland by species group and diameter class, South Carolina, 2000

Species group	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
					Million cubic feet						
Softwood											
Yellow pine	8,252.7	969.5	1,503.8	1,359.7	1,179.6	1,006.6	850.8	576.5	384.5	390.6	31.1
Other softwoods	678.1	50.0	76.9	89.4	92.9	96.1	93.5	57.5	36.0	20.7	65.1
All softwoods	8,930.8	1,019.5	1,580.7	1,449.1	1,272.5	1,102.7	944.3	634.0	420.4	411.3	96.3
Hardwood											
Soft hardwood	4,781.0	386.2	566.6	654.6	688.0	591.6	633.3	414.4	332.4	419.3	94.6
Hard hardwood	3,990.0	272.7	409.6	507.7	475.9	499.6	435.3	301.4	297.4	604.2	186.3
All hardwoods	8,771.0	658.8	976.2	1,162.3	1,163.9	1,091.2	1,068.7	715.8	629.8	1,023.5	280.8
All species	17,701.8	1,678.3	2,556.9	2,611.4	2,436.4	2,193.9	2,013.0	1,349.8	1,050.2	1,434.9	377.1

Numbers in rows and columns may not sum to totals due to rounding.

Table 10—Volume of sawtimber on timberland by species group and diameter class, South Carolina, 2000

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
				Million board feet					
Softwood									
Yellow pine	29,110.4	4,959.7	5,334.0	5,207.1	4,812.7	3,477.2	2,433.7	2,649.8	236.1
Other softwoods	2,576.2	290.1	365.3	426.0	459.5	294.5	195.4	118.8	426.5
All softwoods	31,686.6	5,249.8	5,699.4	5,633.1	5,272.2	3,771.7	2,629.0	2,768.7	662.7
Hardwood									
Soft hardwood	14,572.5	—	2,342.8	2,381.5	2,901.2	2,093.9	1,771.3	2,467.0	614.8
Hard hardwood	13,264.5	—	1,690.8	2,059.7	1,981.4	1,464.2	1,528.3	3,380.9	1,159.3
All hardwoods	27,837.0	—	4,033.5	4,441.2	4,882.6	3,558.0	3,299.6	5,847.9	1,774.1
All species	59,523.5	5,249.8	9,732.9	10,074.2	10,154.8	7,329.8	5,928.6	8,616.6	2,436.8

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 11—Volume of live trees on timberland by survey unit and species group, South Carolina, 2000

Survey unit	All species	Softwoods: All softwood	Softwoods: Yellow pine	Softwoods: Other softwood	Hardwoods: All hardwood	Hardwoods: Soft hardwood	Hardwoods: Hard hardwood
				Million cubic feet			
Southern Coastal Plain	5,943.2	3,054.7	2,775.3	279.4	2,888.5	1,652.0	1,236.5
Northern Coastal Plain	6,443.7	3,052.9	2,712.3	340.6	3,390.8	2,198.3	1,192.5
Piedmont	7,023.4	3,086.3	2,978.4	107.9	3,937.0	1,691.4	2,245.6
All units	19,410.3	9,194.0	8,466.0	728.0	10,216.3	5,541.7	4,674.6

Numbers in rows and columns may not sum to totals due to rounding.

Table 12—Volume of growing stock on timberland by survey unit and species group, South Carolina, 2000

Survey unit	All species	Softwoods: All softwood	Softwoods: Yellow pine	Softwoods: Other softwood	Hardwoods: All hardwood	Hardwoods: Soft hardwood	Hardwoods: Hard hardwood
				Million cubic feet			
Southern Coastal Plain	5,401.1	2,979.1	2,710.1	269.0	2,422.1	1,403.9	1,018.2
Northern Coastal Plain	5,809.8	2,975.7	2,646.6	329.1	2,834.1	1,860.0	974.1
Piedmont	6,490.8	2,976.0	2,896.0	80.0	3,514.8	1,517.1	1,997.7
All units	17,701.8	8,930.8	8,252.7	678.1	8,771.0	4,781.0	3,990.0

Numbers in rows and columns may not sum to totals due to rounding.

Table 13—Volume of sawtimber on timberland by survey unit and species group, South Carolina, 2000

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million board feet						
Southern Coastal Plain	18,531.0	10,719.2	9,576.0	1,143.1	7,811.8	4,257.3	3,554.5
Northern Coastal Plain	19,134.0	10,850.2	9,582.0	1,268.3	8,283.7	5,093.9	3,189.9
Piedmont	21,858.6	10,117.2	9,952.4	164.8	11,741.4	5,221.3	6,520.1
All units	59,523.5	31,686.6	29,110.4	2,576.2	27,837.0	14,572.5	13,264.5

Numbers in rows and columns may not sum to totals due to rounding.

Table 14—Volume of live and growing-stock trees on timberland by ownership class and species group, South Carolina, 2000

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Live trees (*million cubic feet*)						
National forest	987.0	571.3	518.9	52.4	415.7	239.7	176.0
Other public	1,374.9	737.2	691.5	45.7	637.8	334.1	303.6
Forest industry	2,950.0	1,791.2	1,701.0	90.2	1,158.8	699.3	459.5
Nonindustrial private	14,098.3	6,094.3	5,554.6	539.7	8,004.0	4,268.4	3,735.5
All classes	19,410.3	9,194.0	8,466.0	728.0	10,216.3	5,541.7	4,674.6
	Growing-stock trees (*million cubic feet*)						
National forest	934.6	562.5	512.6	50.0	372.1	221.0	151.1
Other public	1,289.4	728.5	683.0	45.5	560.9	307.8	253.1
Forest industry	2,708.7	1,736.8	1,654.7	82.2	971.9	584.9	386.9
Nonindustrial private	12,769.1	5,902.9	5,402.5	500.5	6,866.1	3,667.2	3,198.9
All classes	17,701.8	8,930.8	8,252.7	678.1	8,771.0	4,781.0	3,990.0

Numbers in rows and columns may not sum to totals due to rounding.

Table 15—Volume of sawtimber on timberland by ownership class, species group, and size class, South Carolina, 2000

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
				All size classes (*million board feet*)			
National forest	3,756.8	2,449.5	2,202.4	247.1	1,307.3	880.9	426.5
Other public	5,226.6	3,308.0	3,226.8	81.2	1,918.6	1,029.5	889.1
Forest industry	7,641.3	4,528.1	4,224.5	303.6	3,113.2	1,682.2	1,431.0
Nonindustrial private	42,898.8	21,401.0	19,456.7	1,944.2	21,497.8	10,979.8	10,518.0
All classes	59,523.5	31,686.6	29,110.4	2,576.2	27,837.0	14,572.5	13,264.5
				Trees ≥ 15.0 inches d.b.h. (*million board feet*)			
National forest	2,553.3	1,528.4	1,312.4	216.0	1,024.9	749.1	275.9
Other public	3,230.4	1,777.6	1,772.7	4.9	1,452.9	707.5	745.4
Forest industry	3,609.4	1,340.0	1,213.4	126.5	2,269.4	1,108.3	1,161.1
Nonindustrial private	25,073.5	10,458.4	9,311.1	1,147.3	14,615.1	7,283.4	7,331.7
All classes	34,466.6	15,104.3	13,609.6	1,494.7	19,362.3	9,848.2	9,514.1

Numbers in rows and columns may not sum to totals due to rounding.

Table 16—Volume of growing stock on timberland by forest-type group, stand origin, and species group, South Carolina, 2000

Forest-type group and stand origin	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
				Million cubic feet			
Softwood types							
White-red-jack pine							
Planted	6.0	4.9	4.9	—	1.0	1.0	—
Natural	21.0	4.8	4.6	0.2	16.2	4.7	11.5
Total	26.9	9.7	9.5	0.2	17.3	5.7	11.5
Longleaf-slash pine							
Planted	145.2	140.9	140.0	0.9	4.3	2.4	2.0
Natural	474.5	446.6	446.6	—	27.9	6.1	21.8
Total	619.7	587.5	586.6	0.9	32.2	8.4	23.8
Loblolly-shortleaf pine							
Planted	3,250.6	3,094.2	3,083.5	10.7	156.3	79.0	77.3
Natural	3,772.0	3,131.8	3,091.8	40.1	640.1	319.0	321.1
Total	7,022.5	6,226.1	6,175.3	50.8	796.4	398.0	398.5
Total softwoods	7,669.2	6,823.3	6,771.4	51.9	845.9	412.1	433.8
Hardwood types							
Oak-pine							
Planted	26.7	6.5	6.5	0.1	20.2	13.7	6.5
Natural	1,598.6	827.9	807.2	20.7	770.7	261.7	509.0
Total	1,625.3	834.4	813.6	20.8	790.9	275.4	515.5
Oak-hickory	3,585.0	452.7	414.7	38.0	3,132.3	1,339.8	1,792.5
Oak-gum-cypress	4,175.6	792.8	240.3	552.5	3,382.8	2,384.7	998.1
Elm-ash-cottonwood	639.6	25.4	11.1	14.3	614.2	364.1	250.1
Tropical hardwood	0.1	0.1	0.1	—	—	—	—
Total hardwoods	10,025.6	2,105.3	1,479.8	625.5	7,920.3	4,364.0	3,556.3
Nonstocked	7.0	2.2	1.5	0.7	4.8	4.8	—
All groups	17,701.8	8,930.8	8,252.7	678.1	8,771.0	4,781.0	3,990.0

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 17—Average net annual growth of live trees on timberland by survey unit and species group, South Carolina, 1993–1999

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million cubic feet						
Southern Coastal Plain	323.0	235.1	229.8	5.3	87.8	42.6	45.2
Northern Coastal Plain	327.4	239.9	234.0	5.8	87.5	54.4	33.1
Piedmont	343.4	205.5	202.9	2.6	137.9	62.2	75.7
All units	993.8	680.5	666.7	13.8	313.3	159.2	154.0

Numbers in rows and columns may not sum to totals due to rounding.

Table 18—Average net annual growth of growing stock on timberland by survey unit and species group, South Carolina, 1993–1999

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million cubic feet						
Southern Coastal Plain	308.9	226.9	222.0	4.9	82.0	39.2	42.8
Northern Coastal Plain	319.9	235.9	230.1	5.8	84.0	52.0	32.0
Piedmont	325.2	198.8	196.7	2.1	126.4	55.0	71.3
All units	953.9	661.6	648.8	12.8	292.4	146.2	146.1

Numbers in rows and columns may not sum to totals due to rounding.

Table 19—Average net annual growth of sawtimber on timberland by survey unit and species group, South Carolina, 1993–1999

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million board feet						
Southern Coastal Plain	1,036.4	720.2	690.5	29.7	316.1	143.3	172.8
Northern Coastal Plain	1,076.3	786.8	762.9	23.9	289.5	159.9	129.6
Piedmont	1,091.5	583.0	575.3	7.7	508.5	209.8	298.7
All units	3,204.1	2,090.0	2,028.7	61.3	1,114.1	513.0	601.1

Numbers in rows and columns may not sum to totals due to rounding.

Table 20—Average annual removals of live trees on timberland by survey unit and species group, South Carolina, 1993–1999

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million cubic feet						
Southern Coastal Plain	191.2	115.1	110.2	4.9	76.1	39.9	36.2
Northern Coastal Plain	259.1	165.1	164.3	0.8	94.1	57.5	36.6
Piedmont	262.9	194.4	192.5	1.9	68.6	27.0	41.6
All units	713.3	474.6	467.0	7.5	238.8	124.4	114.4

Numbers in rows and columns may not sum to totals due to rounding.

Table 21—Average annual removals of growing stock on timberland by survey unit and species group, South Carolina, 1993–1999

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million cubic feet						
Southern Coastal Plain	180.7	114.6	110.1	4.5	66.2	35.1	31.0
Northern Coastal Plain	241.7	163.4	162.8	0.6	78.3	47.5	30.7
Piedmont	257.3	193.3	191.4	1.9	63.9	25.5	38.5
All units	679.7	471.3	464.3	7.0	208.4	108.2	100.2

Numbers in rows and columns may not sum to totals due to rounding.

Table 22—Average annual removals of sawtimber on timberland by survey unit and species group, South Carolina, 1993–1999

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million board feet						
Southern Coastal Plain	657.7	437.9	416.3	21.5	219.8	118.4	101.4
Northern Coastal Plain	899.4	663.4	660.7	2.7	236.0	134.4	101.7
Piedmont	849.9	684.5	683.4	1.1	165.5	69.2	96.2
All units	2,407.0	1,785.7	1,760.4	25.3	621.3	322.0	299.3

Numbers in rows and columns may not sum to totals due to rounding.

Table 23—Average net annual growth and average annual removals of live trees, growing stock, and sawtimber on timberland by species group, South Carolina, 1993–1999

	Live trees		Growing stock		Sawtimber	
Species group	Net annual growth	Annual removals	Net annual growth	Annual removals	Net annual growth	Annual removals
	Million cubic feet				*Million board feet*	
Softwood						
Yellow pine	666.7	467.0	648.8	464.3	2,028.7	1,760.4
Other softwoods	13.8	7.5	12.8	7.0	61.3	25.3
All softwoods	680.5	474.6	661.6	471.3	2,090.0	1,785.7
Hardwood						
Soft hardwood	159.2	124.4	146.2	108.2	513.0	322.0
Hard hardwood	154.0	114.4	146.1	100.2	601.1	299.3
All hardwoods	313.3	238.8	292.4	208.4	1,114.1	621.3
All species	993.8	713.3	953.9	679.7	3,204.1	2,407.0

Numbers in rows and columns may not sum to totals due to rounding.

Table 24—Average annual mortality of live trees, growing stock, and sawtimber on timberland by species group, South Carolina, 1993–1999

Species group	Live trees	Growing stock	Sawtimber
	Million cubic feet		*Million board feet*
Softwood			
Yellow pine	69.3	67.7	230.2
Other softwoods	3.4	3.2	8.7
All softwoods	72.8	70.9	238.9
Hardwood			
Soft hardwood	57.8	37.2	107.8
Hard hardwood	61.6	44.1	143.0
All hardwoods	119.4	81.3	250.9
All species	192.1	152.3	489.8

Numbers in rows and columns may not sum to totals due to rounding.

Table 25—Average net annual growth and average annual removals of live trees on timberland by ownership class and species group, South Carolina, 1993–1999

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
		Average net annual growth (*million cubic feet*)					
National forest	18.0	12.1	12.0	0.1	5.9	2.8	3.1
Other public	46.1	29.5	28.1	1.4	16.6	7.3	9.3
Forest industry	239.7	210.9	209.2	1.7	28.8	16.5	12.3
Nonindustrial private	690.0	428.0	417.4	10.6	262.0	132.6	129.4
All classes	993.8	680.5	666.7	13.8	313.3	159.2	154.0
		Average annual removals (*million cubic feet*)					
National forest	7.4	6.4	6.4	—	1.0	0.4	0.6
Other public	23.3	21.4	21.4	—	1.9	0.5	1.3
Forest industry	190.0	149.5	146.9	2.7	40.4	24.4	16.0
Nonindustrial private	492.7	297.2	292.3	4.9	195.5	99.1	96.4
All classes	713.3	474.6	467.0	7.5	238.8	124.4	114.4

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 26—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, South Carolina, 1993–1999

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
		Average net annual growth (*million cubic feet*)					
National forest	17.3	11.8	11.6	0.2	5.5	2.2	3.3
Other public	44.4	28.9	27.5	1.4	15.6	6.5	9.1
Forest industry	232.9	204.9	203.2	1.7	28.0	16.0	12.0
Nonindustrial private	659.3	416.0	406.4	9.6	243.3	121.6	121.8
All classes	953.9	661.6	648.8	12.8	292.4	146.2	146.1
		Average annual removals (*million cubic feet*)					
National forest	7.2	6.4	6.4	—	0.8	0.4	0.4
Other public	22.2	20.9	20.9	—	1.4	0.5	0.8
Forest industry	182.1	148.6	146.3	2.4	33.5	20.2	13.3
Nonindustrial private	468.2	295.4	290.8	4.6	172.8	87.1	85.7
All classes	679.7	471.3	464.3	7.0	208.4	108.2	100.2

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 27—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species group, South Carolina, 1993–1999

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
		Average net annual growth (*million board feet*)					
National forest	82.7	63.2	61.4	1.8	19.5	7.5	12.0
Other public	202.3	144.4	143.3	1.1	57.9	27.6	30.4
Forest industry	607.7	508.2	498.8	9.5	99.5	40.2	59.3
Nonindustrial private	2,311.4	1,374.1	1,325.2	48.9	937.2	437.8	499.5
All classes	3,204.1	2,090.0	2,028.7	61.3	1,114.1	513.0	601.1
		Average annual removals (*million board feet*)					
National forest	32.9	32.1	32.1	—	0.8	—	0.8
Other public	82.1	81.4	81.4	—	0.7	—	0.7
Forest industry	551.6	457.4	447.9	9.6	94.2	59.2	35.0
Nonindustrial private	1,740.4	1,214.8	1,199.0	15.8	525.6	262.8	262.8
All classes	2,407.0	1,785.7	1,760.4	25.3	621.3	322.0	299.3

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

Table 28—Average net annual growth of growing stock on timberland by forest-type group, stand origin, and species group, South Carolina, 1993–1999

Forest-type group and stand origin[a]	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million cubic feet						
Softwood types							
Longleaf-slash pine							
Planted	17.9	17.4	17.4	0.0	0.4	—	0.4
Natural	21.8	18.8	18.8	0.0	3.0	1.2	1.8
Total	39.7	36.2	36.2	0.0	3.5	1.2	2.2
Loblolly-shortleaf pine							
Planted	367.2	361.5	361.4	0.1	5.7	4.3	1.4
Natural	193.7	168.2	167.0	1.2	25.5	12.6	12.9
Total	560.9	529.7	528.4	1.2	31.2	16.9	14.3
Total softwoods	600.6	565.9	564.6	1.2	34.7	18.1	16.6
Hardwood types							
Oak-pine							
Planted	7.7	6.1	6.1	-0.0	1.6	1.2	0.4
Natural	74.4	42.8	42.9	-0.1	31.6	11.3	20.3
Total	82.1	48.9	49.0	-0.1	33.2	12.5	20.7
Oak-hickory	137.0	22.6	21.9	0.7	114.4	46.6	67.8
Oak-gum-cypress	127.2	23.2	12.4	10.8	104.0	64.8	39.2
Elm-ash-cottonwood	5.5	0.2	—	0.2	5.3	3.9	1.5
Total hardwoods	351.8	94.9	83.3	11.6	256.9	127.7	129.2
Nonstocked	1.0	0.3	0.3	—	0.8	0.4	0.4
All groups	953.4	661.0	648.2	12.8	292.4	146.2	146.1

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

[a] Classifications at the beginning of the remeasurement period.

Table 29—Average annual removals of growing stock on timberland by forest-type group, stand origin, and species group, South Carolina, 1993–1999

Forest-type group and stand origin[a]	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
	Million cubic feet						
Softwood types							
Longleaf-slash pine							
Planted	42.1	42.1	41.8	0.3	—	—	—
Natural	12.4	12.1	11.8	0.2	0.3	0.3	—
Total	54.5	54.1	53.6	0.5	0.3	0.3	—
Loblolly-shortleaf pine							
Planted	141.1	137.5	137.5	—	3.6	2.4	1.3
Natural	224.5	208.0	207.1	0.9	16.4	9.7	6.8
Total	365.6	345.5	344.6	0.9	20.1	12.0	8.0
Total softwoods	420.1	399.7	398.2	1.4	20.4	12.4	8.0
Hardwood types							
Oak-pine							
Planted	5.7	4.5	4.5	—	1.2	1.1	0.1
Natural	67.6	40.0	39.4	0.7	27.6	8.2	19.4
Total	73.3	44.5	43.8	0.7	28.8	9.3	19.5
Oak-hickory	74.1	10.8	10.2	0.5	63.3	19.8	43.5
Oak-gum-cypress	109.7	14.8	10.4	4.4	94.9	65.7	29.2
Elm–ash–cottonwood	1.0	—	—	—	1.0	1.0	—
Total hardwoods	258.0	70.1	64.5	5.6	188.0	95.8	92.2
Nonstocked	0.4	0.4	0.4	—	—	—	—
All groups	678.5	470.1	463.1	7.0	208.4	108.2	100.2

Numbers in rows and columns may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of > 0.0 but < 0.05 for the cell.

[a] Classifications at the beginning of the remeasurement period.

Table 30—Area of timberland treated or disturbed annually and retained in timberland by treatment or disturbance and ownership class, South Carolina, 1993 to 2000

Treatment or disturbance	All classes	Ownership class		
		Public	Forest industry	Nonindustrial private
		Thousand acres		
Final harvest	209.4	5.8	52.8	150.8
Partial harvest[a]	72.1	6.9	2.7	62.5
Seed tree/shelterwood	10.5	2.4	—	8.2
Commercial thinning	74.8	4.9	19.8	50.1
Other stand improvement	8.5	—	3.3	5.2
Site preparation	88.5	1.8	43.3	43.4
Artificial regeneration[b]	136.8	4.4	51.1	81.3
Natural regeneration[b]	163.5	4.1	15.3	144.0
Other cutting	37.3	4.0	1.0	32.2
Natural disturbance				
Disease	5.5	3.4	—	2.1
Insects	19.5	10.1	1.2	8.2
Fire	31.3	6.8	5.2	19.4
Weather	30.8	5.8	4.1	20.9
Animals	15.8	0.7	2.2	12.9
Other disturbances				
Grazing	7.9	—	—	7.9
Other human-caused disturbance	34.2	2.4	2.2	29.7

Since some acres experience more than one treatment or disturbance, there are no column totals. Numbers in rows may not sum to totals due to rounding.

A dash (—) indicates no sample for the cell; 0.0 indicates a value of >0.0 but < 0.05 for the cell.

[a] Includes high-grading and some selective cutting.

[b] Includes establishment of trees for timber production on forest and nonforest land.

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This bulletin highlights the principal findings of an annual inventory of South Carolina's forest resources. Data summaries are based upon 60 percent of the plots in the State. Additional data summaries and bulletins will be published as the full set of plots are completed.

Keywords: Annual inventory, forest ownership, timberland, timber growth, timber removals, timber volume.

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