



# Forest Inventory & Analysis Factsheet

## South Carolina

### Forestland Area

Area of forestland totaled 12.4 million acres in 2001, a decline of more than 230,000 acres (2%) since 1993. Forests now occupy 64% of the land area of South Carolina.

Timberland, forestland considered available for timber production, amounted to 12.2 million acres. Reserved and other forestland totaled < 195,000 acres.

#### Area by land class (million acres)

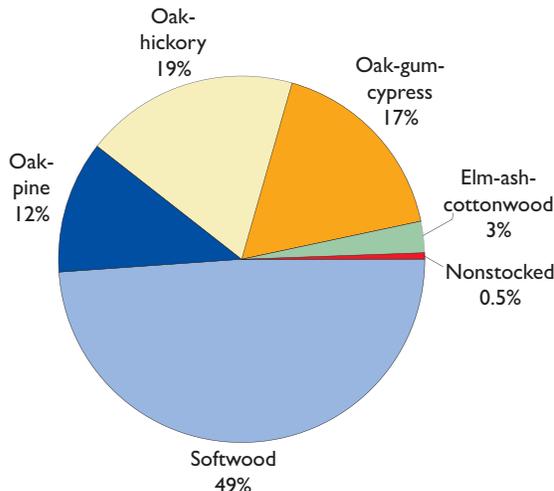
Land class	1968	1978	1986	1993	2001
Timberland	12.4	12.5	12.2	12.5	12.2
Other/reserved	0.1	0.1	0.1	0.2	0.2
Total forestland	12.5	12.6	12.3	12.6	12.4
Nonforestland	6.9	6.8	7.1	6.6	6.8
Total land area	19.4	19.3	19.3	19.3	19.3
Percent forested	65%	65%	63%	66%	64%

### Forest-Type Composition

Softwood forest types account for 49% (6.0 million acres) of South Carolina's timberland area. The majority of the softwood acreage is loblolly-shortleaf forest types which occupy 5.4 million acres.

Oak-hickory is the predominant hardwood forest-type group (19%), followed by oak-gum-cypress types (17%), and oak-pine (12%).

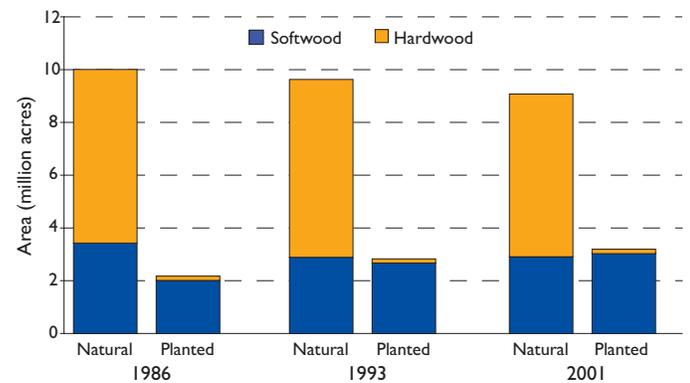
#### Area of timberland by forest-type group



Planted pine stands amounted to 3.1 million acres in 2001, outnumbering stands of natural pine by 150,000 acres. Total area of planted stands has increased by nearly 1.0 million acres since 1986.

As of 2001, natural stands occupied 9.1 million acres including 6.2 million acres of hardwoods.

#### Area by forest-type group and stand origin

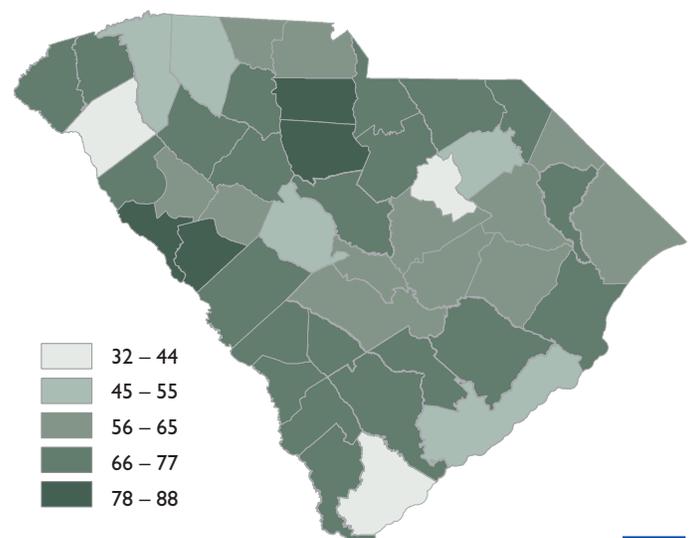


### Forest Distribution

Thirty-two of South Carolina's 46 counties are at least 60% forested, including 10 counties that are 75% or more forested.

Beaufort is the least forested county with less than one-third (32%) of its land area in forest.

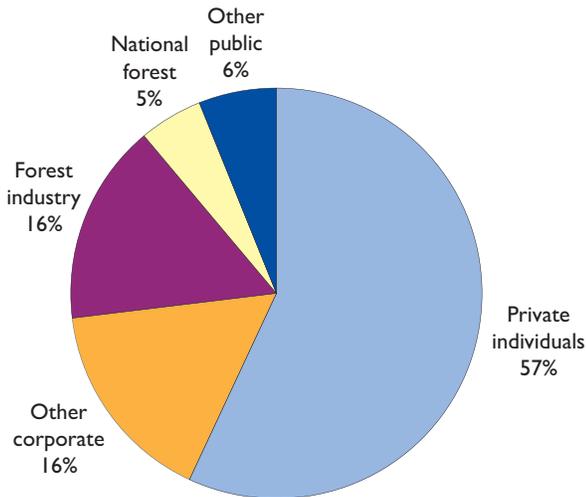
#### Percentage of land in forest by county



## Ownership of the Forest

More than one-half (57%) of South Carolina's timberland is owned by private individuals. Forest industry and corporate owner groups each hold 16% of the State's timberland area. Public timberland is split between national forest (5%) and other public (6%) ownerships.

Ownership of timberland

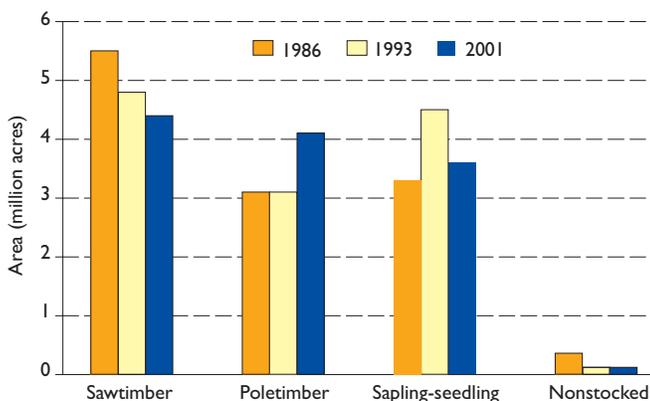


## Stand-Size Distribution

Sawtimber acres were significantly reduced between 1986 and 1993 by Hurricane Hugo-related mortality of large-diameter trees. The downward trend of sawtimber stands continued with the reduction of another 400,000 acres to 4.4 million acres as of 2001.

Poletimber stands increased by 1.0 million acres to 4.1 million since 1993, while the area of sapling-seedling stands dropped to 3.6 million acres.

Area of timberland by stand size

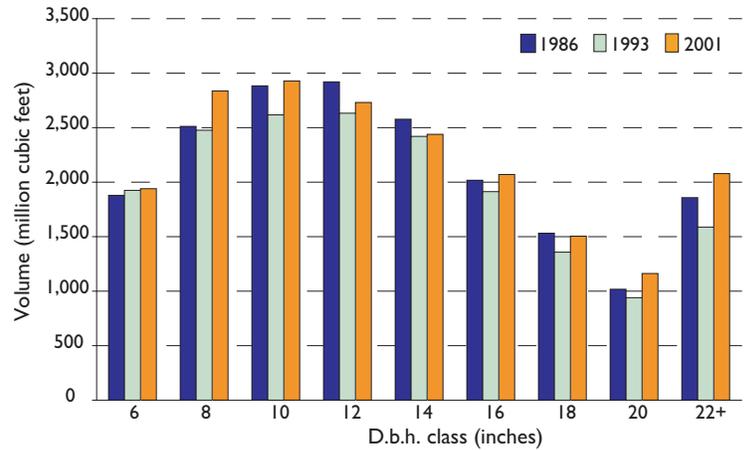


## Tree Volume

Volume of all live trees increased in every diameter class since 1993 and amounted to 19.7 billion cubic feet in 2001, surpassing all previous inventory estimates.

Softwood forests account for 9.4 billion cubic feet, and hardwood totals 10.3 billion cubic feet. Loblolly pine volume increased 30% since 1993, and totals 7.1 billion cubic feet in 2001.

All live volume on timberland by diameter class



## Annual Growth and Removals

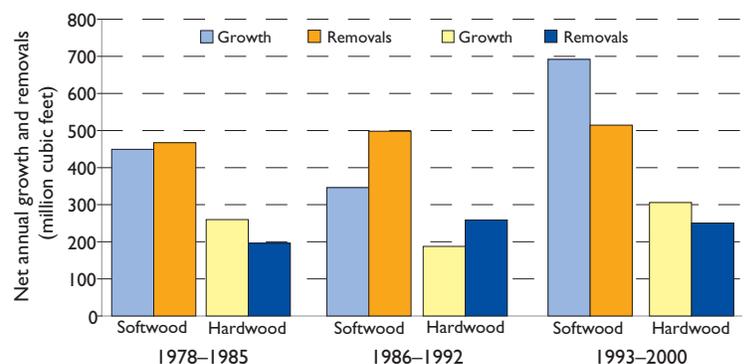
Net annual growth of all live softwoods doubled since 1992, rising to 692 million cubic feet per year. Based on Forest Inventory and Analysis surveys since 1936, softwood timberlands are producing more wood now than at any other time.

Hardwood growth rose 63% and averaged 306 million cubic feet annually since the previous survey.

Total removals of all live trees averaged 765 million cubic feet per year between 1993 and 2000. Softwoods accounted for two-thirds of the current removals.

As of 2000, net annual growth exceeds removals for both hardwoods and softwoods, reversing the negative relationship driven by Hurricane Hugo's impact on net growth and removals.

Growth and removals of live trees, by survey



## Statistical Reliability

A measure of reliability of inventory statistics is provided by sampling errors. These 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 and inventory volumes are presented in the following table.

### Statistical Reliability for South Carolina

Item	Sample estimate and confidence interval		Sampling error percent
<b>Land area</b> (1,000 acres)	12,221.0 ±	50.1	0.41
<b>All live</b> (million ft <sup>3</sup> )			
Inventory	19,720.6 ±	356.9	1.81
Net annual growth	997.7 ±	24.1	2.42
Annual removals	765.0 ±	34.4	4.49
Annual mortality	197.6 ±	8.2	4.14
<b>Growing stock</b> (million ft <sup>3</sup> )			
Inventory	18,013.5 ±	339.3	1.88
Net annual growth	960.6 ±	23.4	2.43
Annual removals	731.9 ±	33.2	4.54
Annual mortality	158.9 ±	7.4	4.64
<b>Sawtimber</b> (million fbm)			
Inventory	61,038.2 ±	1,585.7	2.60
Net annual growth	3,271.9 ±	87.4	2.67
Annual removals	2,570.2 ±	133.6	5.20
Annual mortality	493.5 ±	29.9	6.06

FIA inventories supported by the full complement of sample plots are designed to achieve reliable statistics at the survey unit and State levels. 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. Statistical confidence may be computed for any subdivision of State totals using the following formula.

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

where

$SE_s$  = sampling error for subdivision of State total

$SE_t$  = sampling error for State total

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

$X_t$  = total area or volume for State

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

$$SE_s = 1.81 \frac{\sqrt{19,720.6}}{\sqrt{1,781.2}} = 6.02$$

Thus, the sampling error is 6.02 percent, and the resulting confidence interval of one standard error (two times out of three) for softwood live-tree inventory on forest industry land is 1,781.2 ± 107.2 million cubic feet. .

Sampling errors obtained from this method are only approximations of reliability because this process assumes constant variance across all subdivisions of totals.

### Precautions

Traditional users of FIA data are accustomed to the highly variable accuracy of small subsets of population totals. All FIA published reports devote a chapter that explains sampling errors and provide cautions about the reliability of subpopulations such as county-level statistics. Therefore, when summarizing statistics, it is strongly recommended that users beware of any subdivision below the survey unit level. Users should familiarize themselves with the procedures to compute sampling error as outlined above.

### Definition of Terms

**Average annual gross growth.** Average 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.

**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 net growth.** Average annual net change in volume of trees 5.0 inches d.b.h. and larger in the absence of removals during the intersurvey period. Average annual net growth is equal to average annual gross growth minus average annual mortality.

**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.

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

**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.

**Forestland.** 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 industry.** Companies or individuals operating primary wood-using plants.

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

**Growing-stock trees.** Live trees that contain at least one 12-foot or two 8-foot logs in the saw-log portion, either currently or potentially if too small to qualify as a saw log. The log(s) must meet dimension and merchantability standards to qualify. Trees must have one-third of the gross board foot volume in sound wood, either currently or potentially.

**Hardwoods.** Dicotyledonous trees, usually broadleaf and deciduous.

**Nonforestland.** Land that either has never supported forests or land formerly forested that has been developed for other uses, including cultural, agricultural, etc.

**Other forestland.** Forestland that is incapable of producing 20 cubic feet of wood volume per acre annually under natural conditions due to adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

**Other private.** Land owned by individuals and corporations, including individual and corporate farms, where the owner does not own a primary wood-using plant. This land is often referred to as nonindustrial private forestland (NIPF).

**Poletimber.** Softwood species 5.0 to 8.9 inches d.b.h. and hardwoods 5.0 to 10.9 inches d.b.h.

**Reserved forestland.** Public forestland capable of producing 20 cubic feet of wood volume per acre annually, but is withdrawn from timber utilization through statute or administrative regulation.

**Saplings.** Trees 1.0 to 4.9 inches d.b.h.

**Sawtimber.** Softwood species 9.0 inches d.b.h. and larger and hardwoods 11.0 inches d.b.h. and larger.

**Seedlings.** Trees < 1.0 inch d.b.h. and > 1 foot tall for hardwoods, > 6 inches tall for softwoods.

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

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

**Timberland.** Forestland capable of producing 20 cubic feet of wood volume per acre annually and not withdrawn from timber utilization.

**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.

**Volume.** The amount 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 diameter outside bark of the central stem.

For more information contact:

**Roger Conner, Research Forester**  
Forest Inventory and Analysis  
Southern Research Station, USDA Forest Service  
4700 Old Kingston Pike, Knoxville, TN 37919  
Phone: (865) 862-2000 Fax: (865) 862-0262  
Email: rconner01@fs.fed.us  
Southern FIA: <http://srsfia2.fs.fed.us>  
National FIA: <http://fia.fs.fed.us>

**Byron Rominger, FIA Coordinator**  
South Carolina Forestry Commission  
5500 Broad River Road  
Columbia, SC 29212  
Phone: (803) 896-8804 Fax: (803) 798-8097  
Email: brominger@forestry.state.sc.us  
<http://www.state.sc.us/forest/index.htm>