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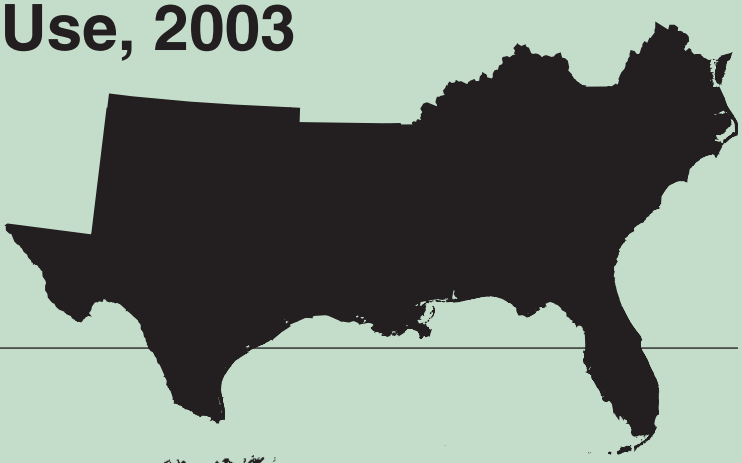
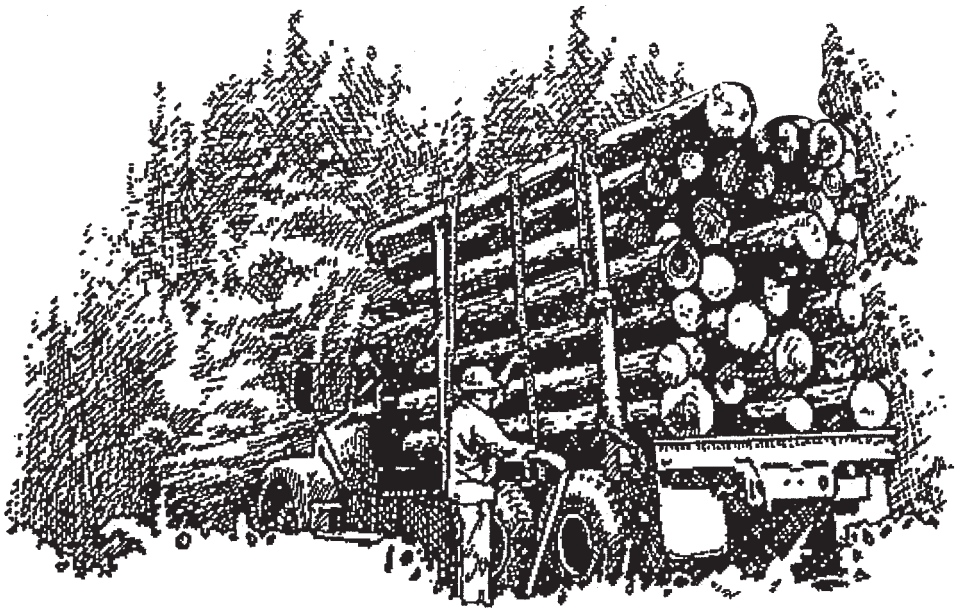
The South's Timber Industry—An Assessment of Timber Product Output and Use, 2003

**Tony G. Johnson,
James W. Bentley,
and Michael Howell**



The Authors:

Tony G. Johnson, Resource Analyst, **James W. Bentley,** Resource Forester, and **Michael Howell,** Resource Forester, USDA Forest Service, Southern Research Station, Knoxville, TN 37919.



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Southern Research Station
200 WT Weaver Blvd.
Asheville, NC 28804

Foreword

This report contains the findings of a 2002 and 2003 canvass of primary wood-using plants in the South, and presents changes in product output and residue use since 1999. It complements the Forest Inventory and Analysis periodic inventory of volume and removals from southern timberland. The canvass was conducted to determine the amount and source of wood receipts and annual timber product drain, by county, in 2002 and 2003 and to determine interstate and cross-regional movement of industrial roundwood. Only primary wood-using mills were canvassed. Primary mills are those that process roundwood in log or bolt form or as chipped roundwood. Examples of industrial roundwood products are saw logs, pulpwood, veneer logs, poles, and logs used for composite board products. Mills producing products from residues generated at primary and secondary processors were not canvassed. Trees chipped in the woods were included in the estimate of timber drain only if they were delivered to a primary domestic manufacturer.

A canvass of wood processors in the South was conducted in 2003 and 2004 to obtain information for 2002 and 2003. In addition, information about roundwood from out-of-region mills known to be using logs or bolts harvested from southern timberland was incorporated into southern production estimates. Each mill was canvassed by mail or through personal contact at plant locations. Telephone contacts followed mailed questionnaire responses when additional information or clarification of a response was necessary. In the event of a nonresponse, data collected in previous surveys were updated using current data collected for mills of similar size, product type, and location.

Pulpwood production data were taken from an annual canvass of all southeastern pulpmills. Medium density fiberboard, insulating board, and hardboard plants were included in this survey.

Acknowledgments

The authors thank Richard A. Harper and Bob G. Flynn for review and comments; Sonja Oswalt and Joe McCollum for the maps; Helen Beresford for TPO database maintenance and support; Anne Jenkins and Charlene Walker for tables, graphs, and statistical checking; and Louise Wilde for editorial review, styling, and publication of this report.

The Southern Research Station gratefully acknowledges the cooperation and assistance provided by the State Forestry Commissions in collecting mill data. Appreciation is also extended to forest industry and mill managers for providing timber products information.

Timber Product Output Database Retrieval System

The Forest Inventory and Analysis (FIA) Research Work Unit of the USDA Forest Service developed the Timber Product Output (TPO) Database Retrieval System to help customers answer questions about timber harvesting and use in the Southern Region. This system acts as an interface to a standard set of consistently coded TPO data for each State and county in the region and nation. This regional and national set of TPO data consists of 11 variables that describe for each county the roundwood products harvested, logging residues left in the woods, other timber removals (i.e. land clearing and reserved timber removals), and wood and bark residues generated by the county's primary wood-using mills. The system is available through the FIA Web site: http://srsfia2.fs.fed.us/php/tpo2/tpo.php.

The database is well documented and easy to use. The retrieval system allows the user to select the TPO variables of interest and generate a standard set of timber products, removals, and mill residue tables for the specified resource area, State, or region. The system has been logically divided into two sections to assist the user in making specific data requests. In section 1, the user will be asked to define the resource area, and section 2 generates tables for the specified area. In each section, the user is asked to supply specific options that will serve to customize the database retrieval.

There are four options available for defining the geographic area of interest. Each option provides an increasing level of detail. The region, subregion, State, or county defines an area. The user selects the option that best suits the level of detail required. Users who select county as an option should be aware that some counties have been combined due to data sensitivity. These combined counties are identified with asterisks in the output tables.

The TPO contacts are listed for each region to provide additional explanation or clarification.

Tony Johnson
Southern Research Station
USDA Forest Service
4700 Old Kingston Pike
Knoxville, TN 37919
tjohnson09@fs.fed.us
865-862-2042

Helen Beresford
Southern Research Station
USDA Forest Service
4700 Old Kingston Pike
Knoxville, TN 37919
hberesford@fs.fed.us
865-862-2091

James Bentley
Southern Research Station
USDA Forest Service
4700 Old Kingston Pike
Knoxville, TN 37919
jbentley@fs.fed.us
865-862-2056

Carolyn Steppleton
Southern Research Station
USDA Forest Service
200 WT Weaver Blvd.
Asheville, NC 28804
csteppleton@fs.fed.us
828-257-4848

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[a] All tables in this report are available in Microsoft® Excel workbook files. Upon request, these files will be supplied in the format the customer requests.

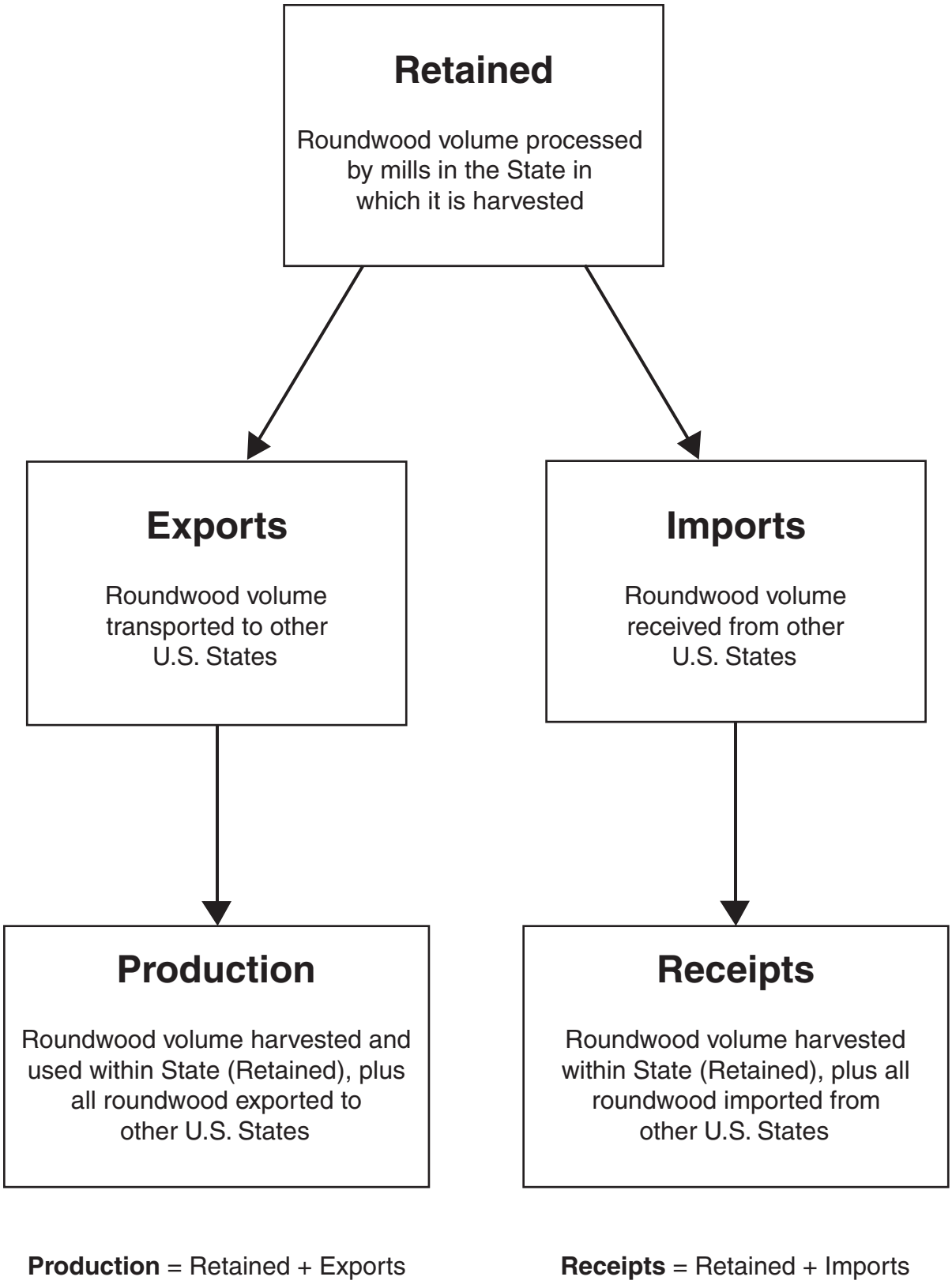

Figure 1—Movement of roundwood exports and imports within the United States.

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Output of Industrial Timber Products

Note: Certain terms used in this report—retained, export, import, production, and receipts—have specialized meanings and relationships unique to the Forest Inventory and Analysis Units across the country that deal with timber product output (TPO) (fig. 1).

All Products

- Between 1999 and 2003, the South's combined industrial TPO from roundwood and plant byproducts declined 4 percent from 11.9 to 11.4 billion cubic feet.
- TPO from roundwood was down 518 million cubic feet, or 6 percent, to 8.2 billion cubic feet, while output of plant byproducts increased 28 million cubic feet to 3.2 billion cubic feet.
- Output of softwood roundwood products declined 3 percent, totaling 6.0 billion cubic feet, while output of hardwood roundwood products was down 13 percent to 2.2 billion cubic feet (fig. 2).
- Figures 3 and 4 display softwood and hardwood county-level intensity of roundwood production for all industrial products across the South. The data are depicted in cubic feet produced per acre of timberland area. Counties with the highest production intensity are depicted in the darker shades. For softwoods the darkest shade represents >45 cubic feet of production per acre, while for hardwoods the darkest shade represents >20 cubic feet per acre.

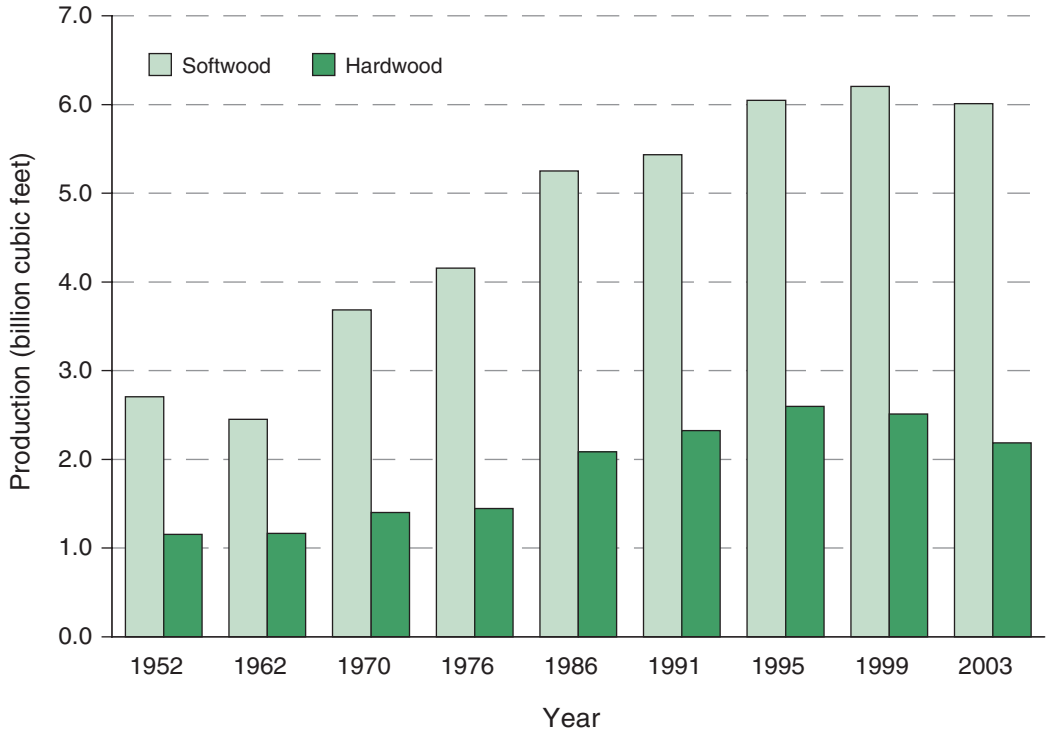

Figure 2—Roundwood production for all products by species group and year (see page 12 for references for individual years).

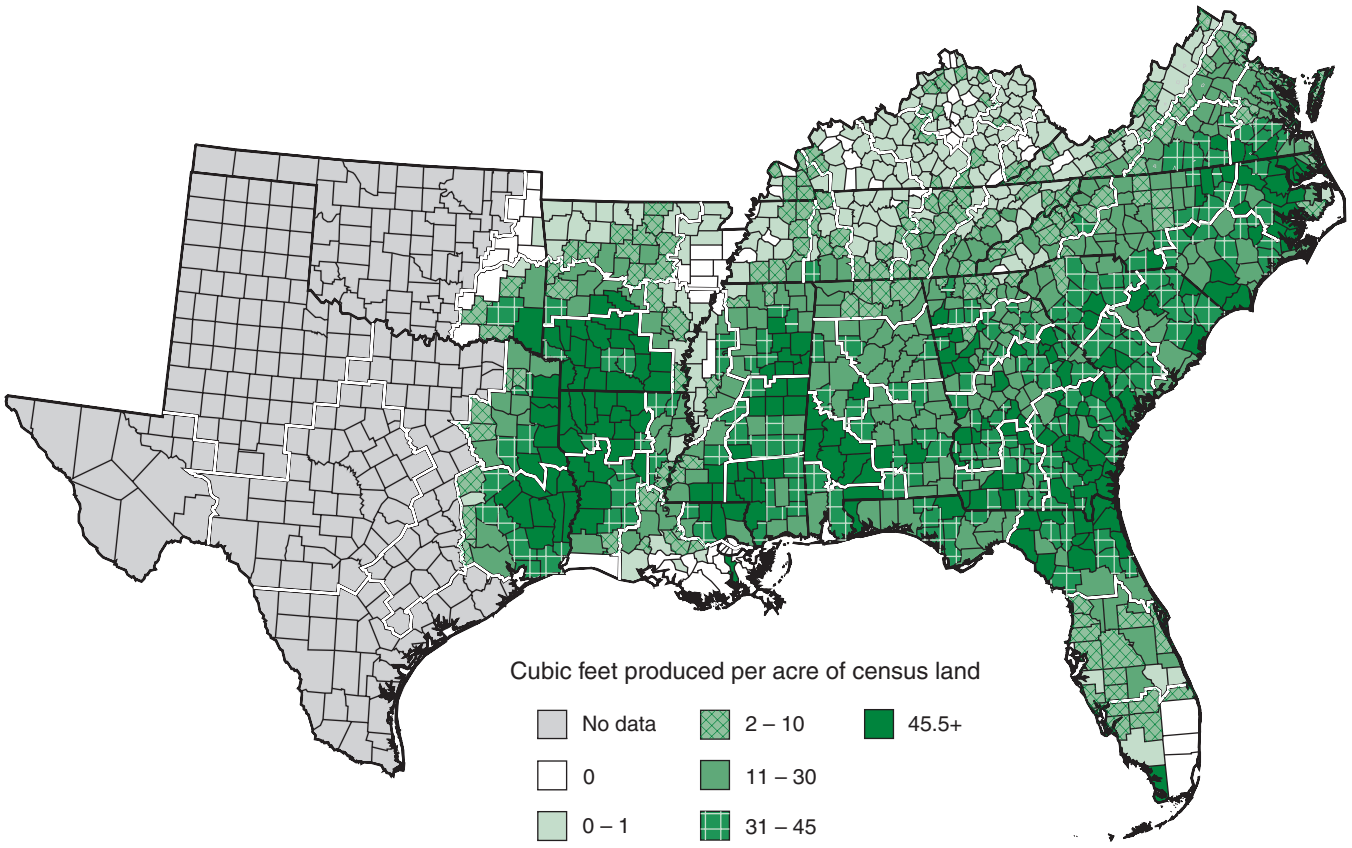

Figure 3—Intensity of roundwood softwood output for all industrial products in the South by county, 2003.

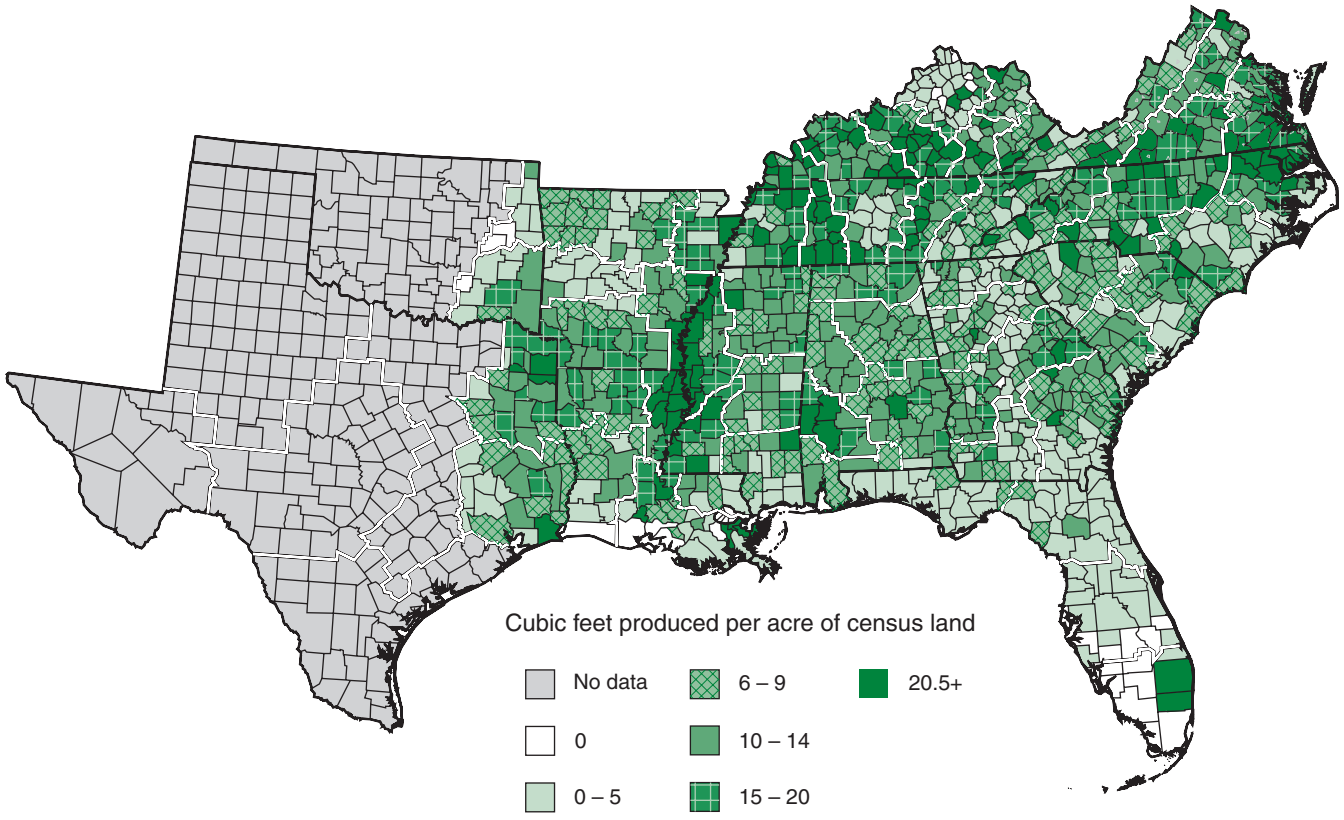

Figure 4—Intensity of roundwood hardwood output for all industrial products in the South by county, 2003.

- Saw logs and pulpwood were the principal roundwood products in 2003. Combined output of these two products totaled 6.9 billion cubic feet and accounted for 85 percent of the South's total industrial roundwood output (fig. 5).
- Total receipts at southern mills, which included roundwood harvested and retained in the South and roundwood imported from other regions, declined 5 percent to 8.3 billion cubic feet. The number of primary roundwood-using plants in the South decreased from 2,551 in 1999 to 2,281 in 2003 (fig. 6: see foldout map, page 5).
- Georgia led the 13 Southern States in total roundwood output (which includes domestic fuelwood) with 1.20 billion cubic feet, while Alabama was a close second with 1.10 billion cubic feet. These two States accounted for 27 percent of the South's total production. Mississippi, North Carolina, and Louisiana followed with 937, 859, and 741 million cubic feet, respectively (fig. 7).

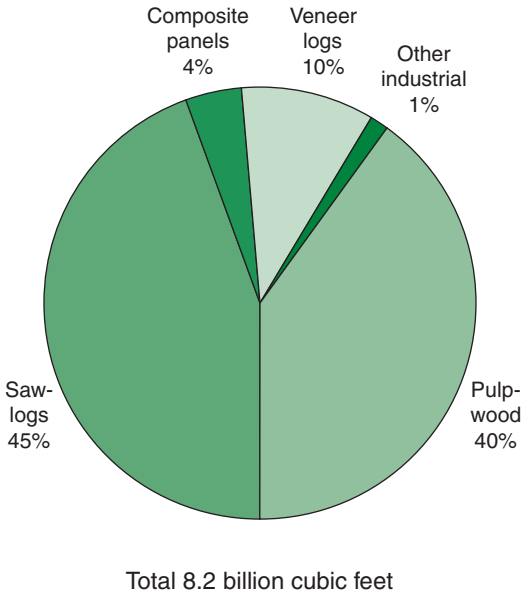

Figure 5—Roundwood production by type of product, 2003.

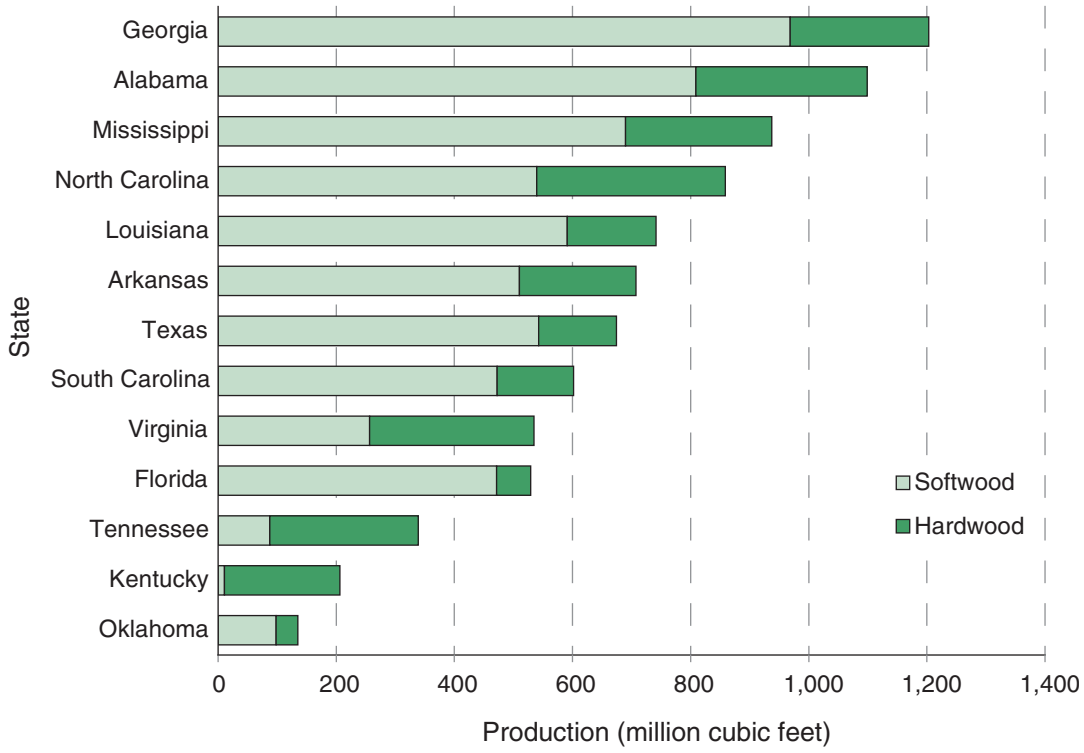

Figure 7—Roundwood production for all products by State and species group, 2003.

Saw Logs

- Saw logs accounted for 45 percent of the South's total roundwood products. Output of softwood saw logs declined 2 percent to 2.67 billion cubic feet (14.7 billion board feet, International ¼-inch rule), while output of hardwood saw logs declined 2 percent to 985 million cubic feet (5.9 billion board feet, International ¼-inch rule) (fig. 8).
- In 2003, the South had 1,896 sawmills, a net loss of 269 mills since 1999. The total number of sawmills does not include the several one-man sawmills in the Southern region. Total saw-log receipts were down 74 million cubic feet to 3.7 billion cubic feet. Softwood saw-log receipts declined 2 percent to 2.69 billion cubic feet; hardwood saw-log receipts declined nearly 2 percent, as well, to 992 million cubic feet. Of the operating mills in 2003, 649, or 34 percent, had receipts of < 1 million board feet, while 397, or 21 percent, had receipts > 10 million board feet and accounted for 83 percent of total saw-log receipts.
- Mississippi led the 13 Southern States in total saw-log production with 526 million cubic feet, while Georgia was second with 441 million cubic feet. Alabama and North Carolina followed with 405 and 399 million cubic feet, respectively (fig. 9). These four States accounted for 48 percent of the South's saw-log production.

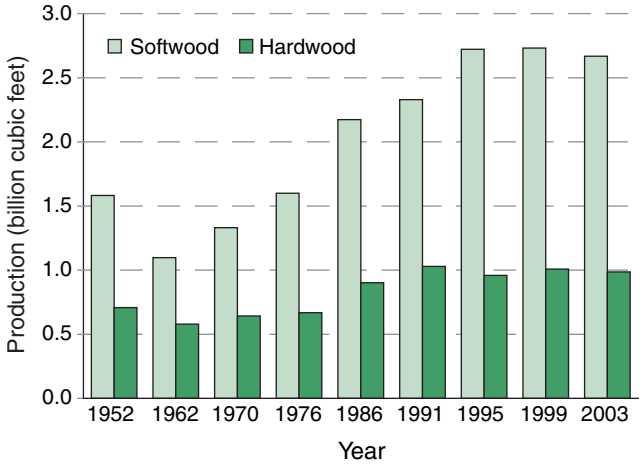

Figure 8—Roundwood saw-log production by species group and year (see page 12 for references for individual years).

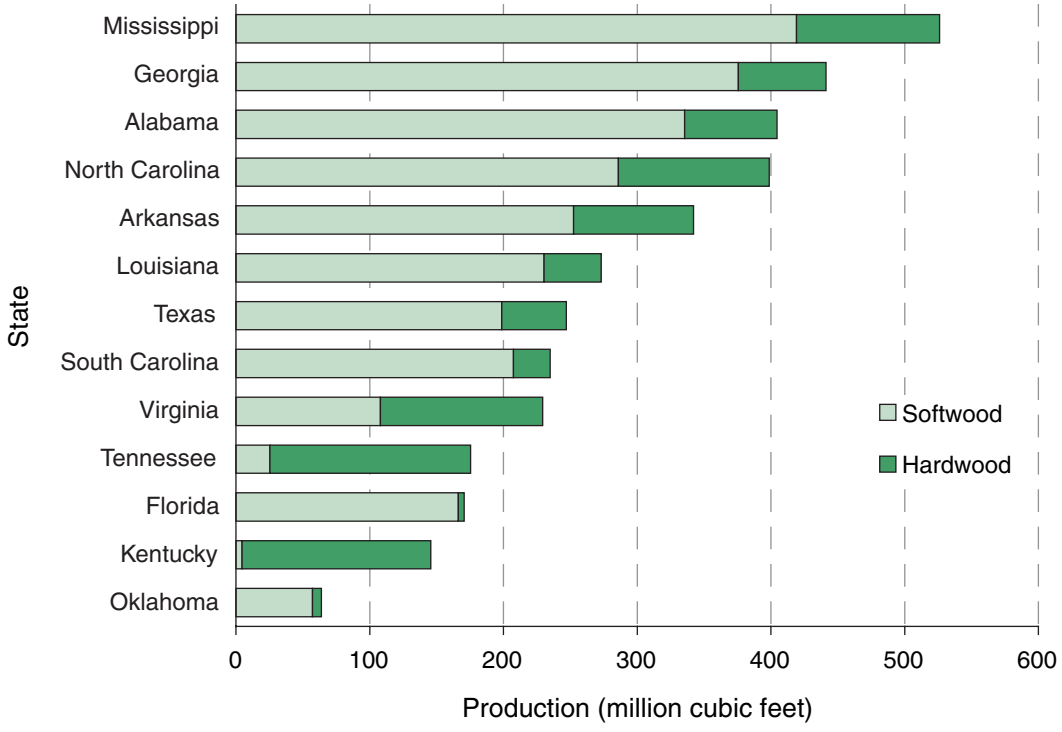

Figure 9—Roundwood saw-log production by State and species group, 2003.

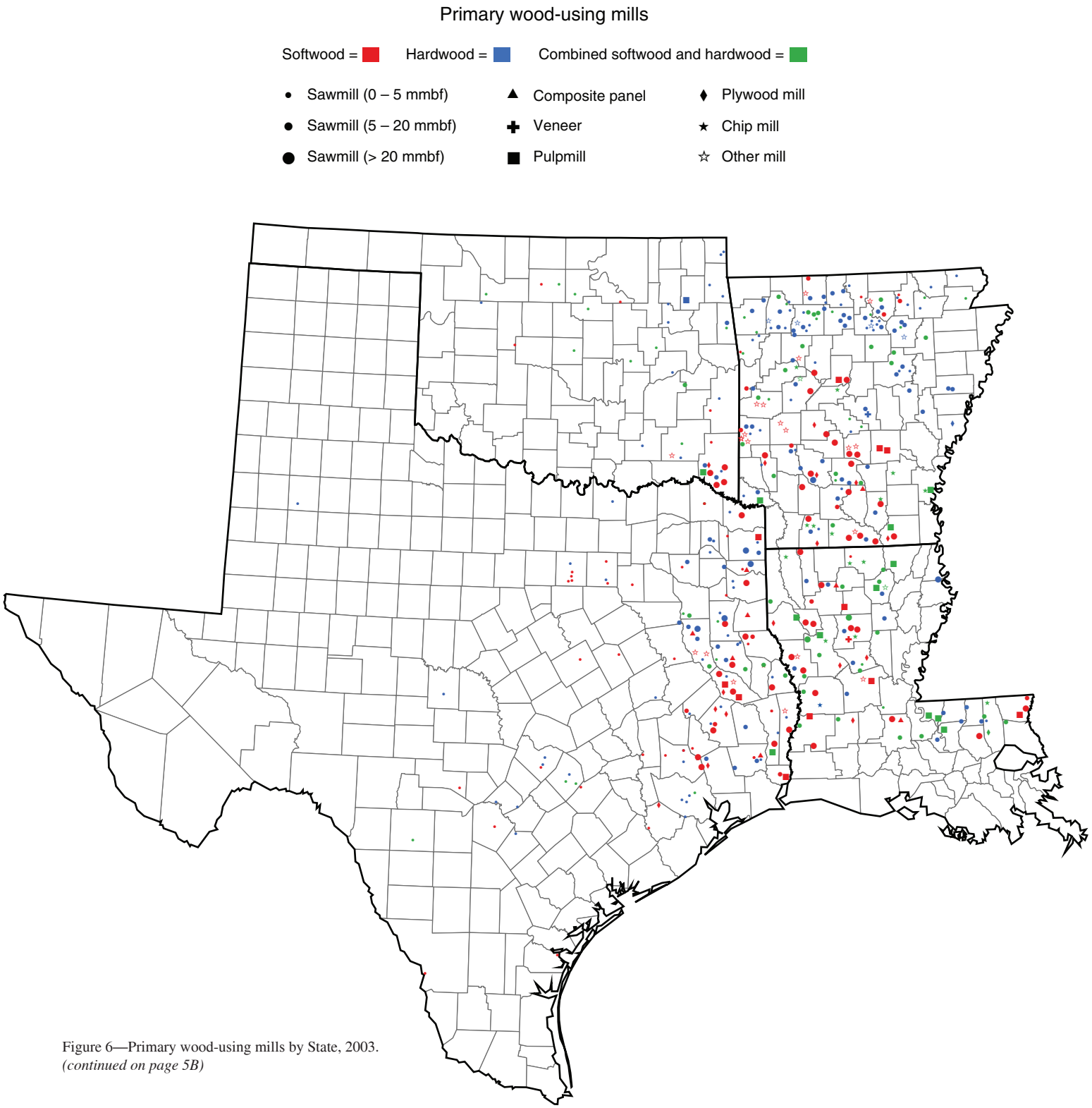

Figure 6—Primary wood-using mills by State, 2003.
(continued on page 5B)

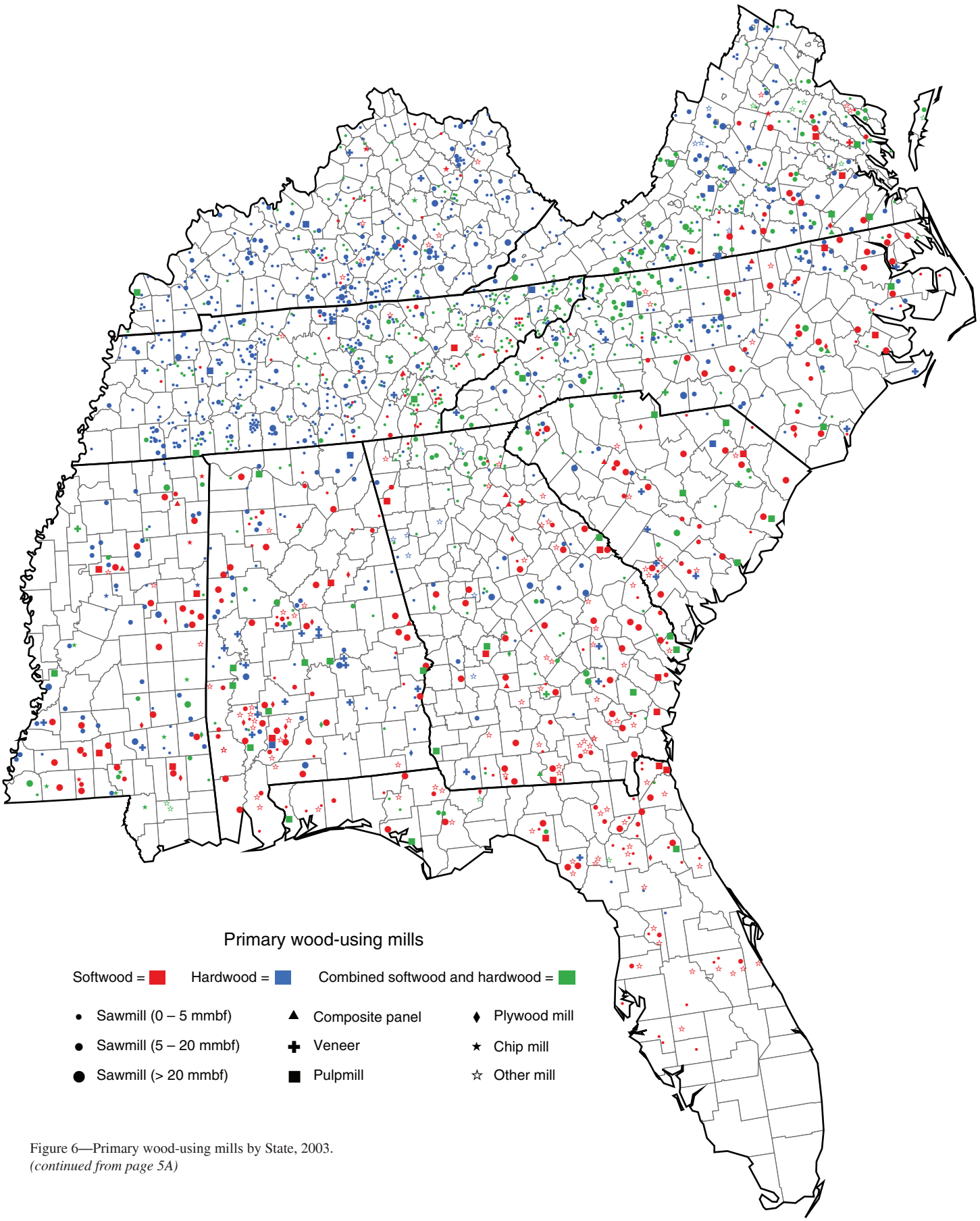

Figure 6—Primary wood-using mills by State, 2003.
(continued from page 5A)

Pulpwood

- Total pulpwood production, including chipped roundwood, declined 12 percent to 3.3 billion cubic feet (44.8 million cords) and accounted for 40 percent of the South's total roundwood TPO. Softwood output was down 8 percent to 2.2 billion cubic feet; hardwood output declined 20 percent to 1.1 billion cubic feet (fig. 10).

- Ninety-one pulpmill facilities were operating and receiving roundwood in the South in 2003, six less than in 1999. Total pulpwood receipts for these mills declined 396 million cubic feet to 3.3 billion cubic feet, accounting for 40 percent of total receipts for all mills.

- Georgia led the 13 Southern States in total pulpwood production with 569 million cubic feet. Alabama followed closely with 521 million cubic feet (fig. 11). These two States accounted for nearly one-third of the southern pulpwood production.

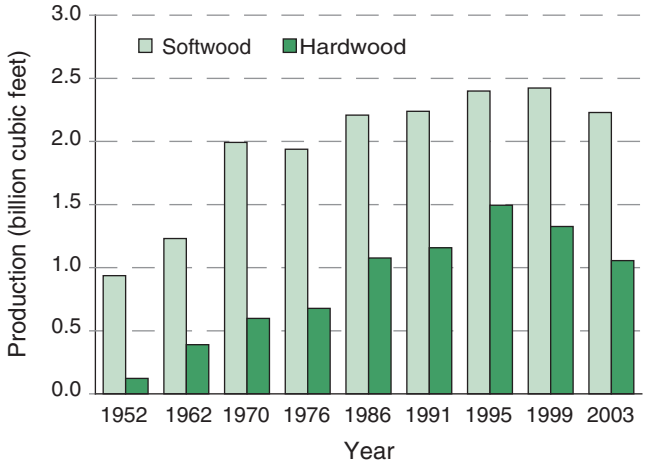

Figure 10—Roundwood pulpwood production by species group and year (see page 12 for references for individual years).

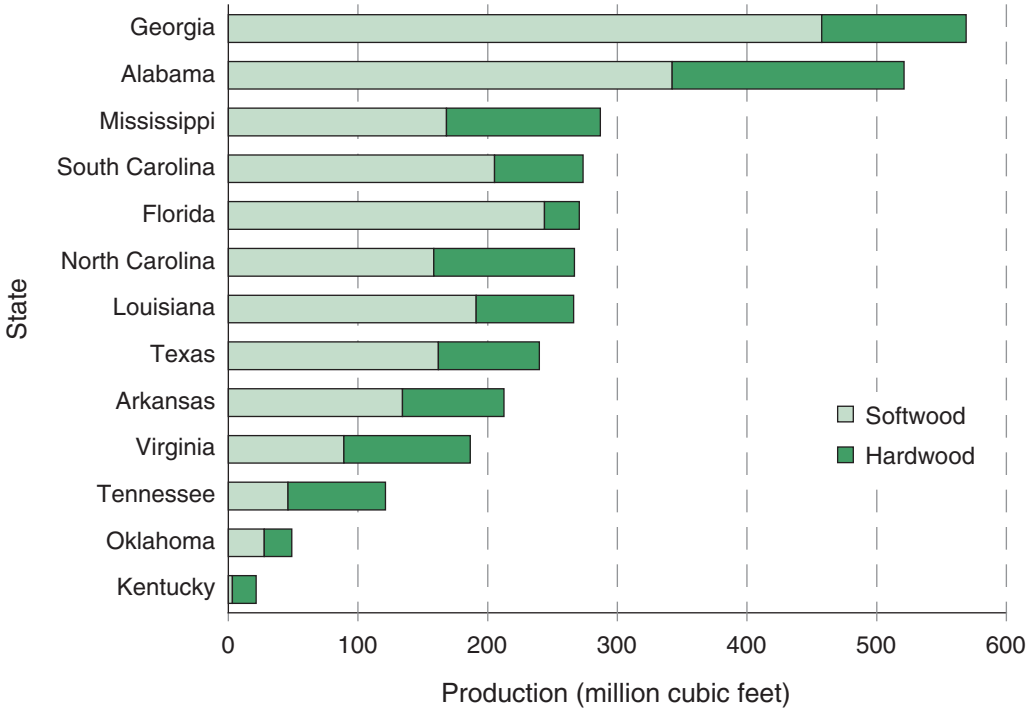

Figure 11—Roundwood pulpwood production by State and species group, 2003.

Veneer Logs

- Output of veneer logs in 2003 totaled 830 million cubic feet and accounted for 10 percent of the South's total roundwood TPO volume. Softwood veneer production declined 7 percent to 744 million cubic feet (4.4 billion board feet, International ¼-inch rule); output of hardwood veneer logs was down 12 percent to 86 million cubic feet (532 million board feet, International ¼-inch rule) (fig. 12).
- The number of veneer mills operating in the South declined from 124 to 107 since 1999. Receipts of veneer logs declined 6 percent to 837 million cubic feet. Softwood veneer receipts were down 43 million cubic feet to 748 million cubic feet.
- Texas led the 13 Southern States in total veneer-log production with 179 million cubic feet. Louisiana and Alabama followed with 137 and 107 million cubic feet, respectively (fig. 13). These three States accounted for 51 percent of the South's veneer-log production.

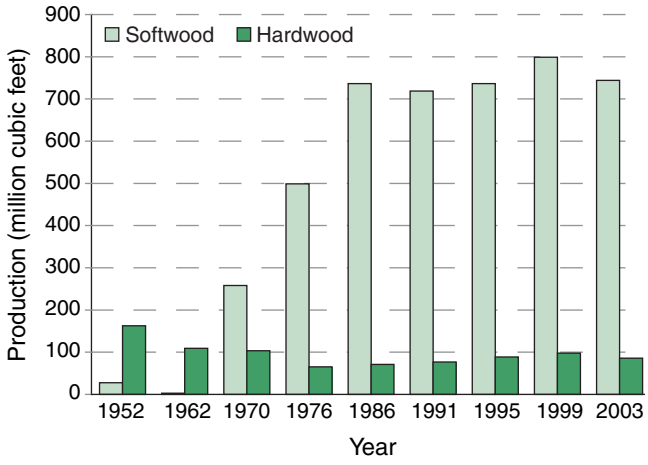

Figure 12—Roundwood veneer-log production by species group and year (see page 12 for references for individual years).

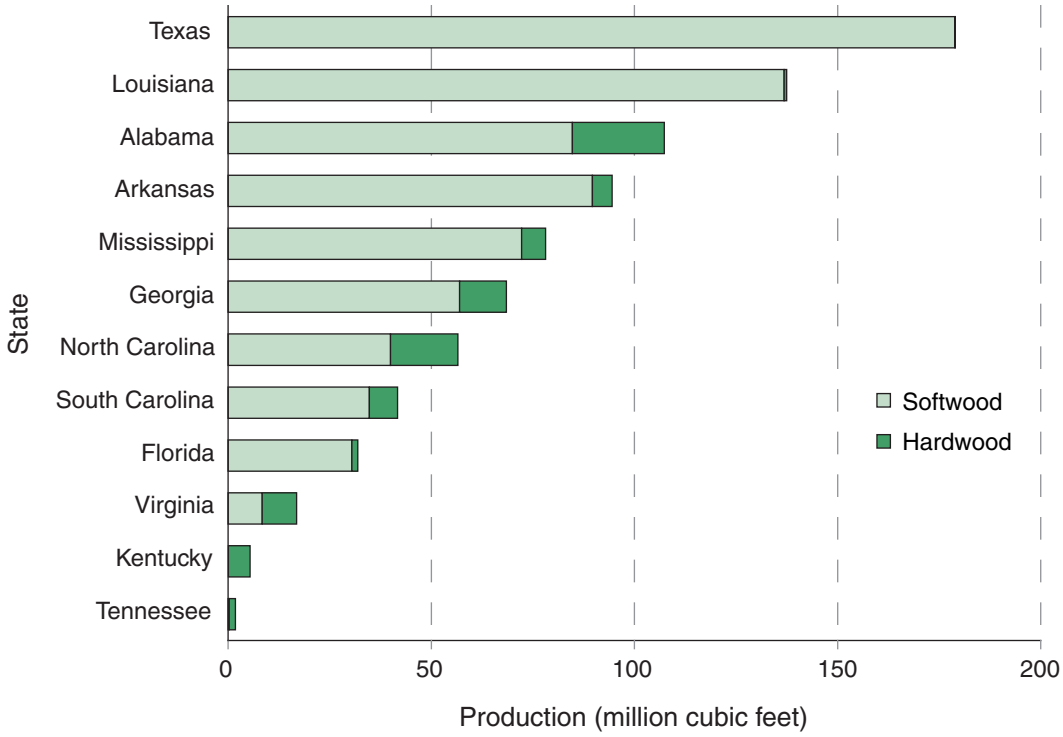

Figure 13—Roundwood veneer-log production by State and species group, 2003.

Composite Panels

- Roundwood harvested from the South's forests for composite panels increased 40 percent and totaled 327 million cubic feet. Softwood output was up 68 percent to 269 million cubic feet (3.7 million cords); hardwood production declined 20 percent to 58 million cubic feet (772 thousand cords) (fig. 14).
- Twenty-nine oriented strand board mills were operating in the South in 2003, five more than in 1999. Total receipts for these mills increased 38 percent to 322 million cubic feet, and accounted for 4 percent of the South's total receipts.

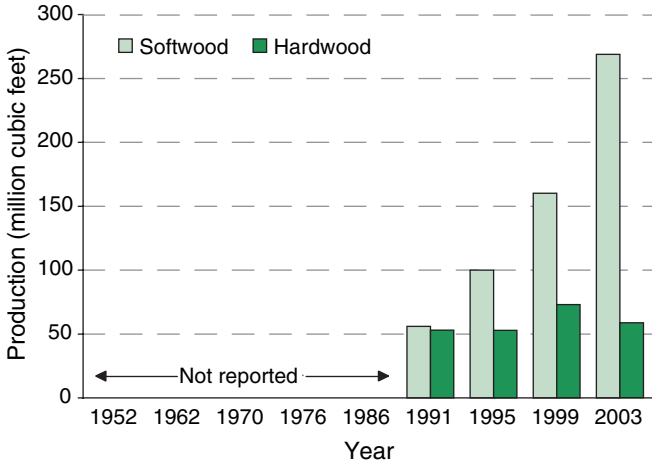

Figure 14—Roundwood production for composite panels by species group and year (see page 12 for references for individual years).

Other Industrial Products

- Roundwood harvested for other industrial uses such as poles, posts, mulch, firewood, logs for log homes, and all other industrial products totaled 101 million cubic feet, a 6-percent increase from 1999. Softwood made up 98 percent of the other industrial products volume (fig. 15).
- The number of plants producing other industrial products increased from 141 in 1999 to 158 in 2003. Combined receipts of other industrial products from softwood and hardwood decreased 4 percent to 94 million cubic feet.

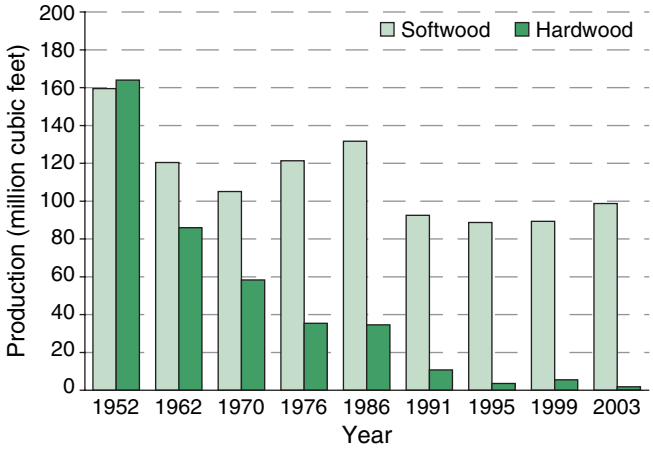

Figure 15—Roundwood production for other industrial products by species group and year (see page 12 for references for individual years).

Plant Byproducts

- In 2003, processing of primary products in southern mills generated 3.2 billion cubic feet of wood and bark residues. Coarse residues from all primary products amounted to 1.26 billion cubic feet, while bark volume totaled 962 million cubic feet. Collectively, sawdust and shavings made up 31 percent of total residues, or 974 million cubic feet (fig. 16).

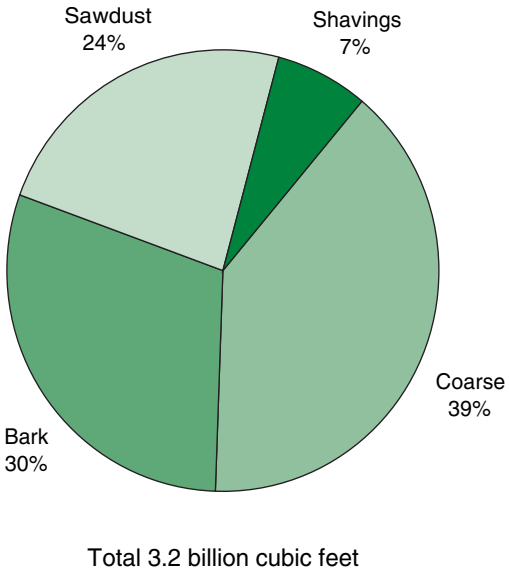

Figure 16—Primary mill residues by residue type, 2003.

- More than 3.1 billion cubic feet, or 99 percent, of the wood and bark residues were used for a product. While 1 percent of the residues were not used for a product, 48 percent of the residues were used for industrial fuel, and 34 percent were used for fiber products (fig. 17). In the South, 1.0 billion cubic feet, or 83 percent, of the coarse residues were used for fiber products. Most of the bark was used for industrial fuel or other miscellaneous products, while 68 percent of the sawdust and shavings were used for industrial fuel. The processing of saw logs generated 2.2 billion cubic feet of mill residues, accounting for 68 percent of the total residues produced (fig. 18).

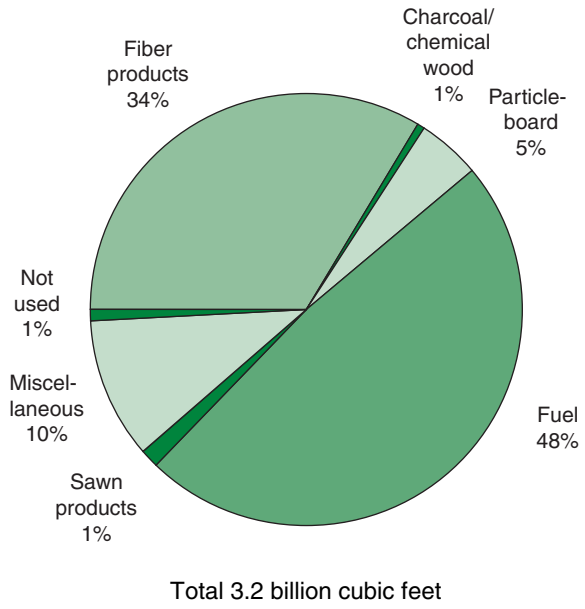

Figure 17—Disposal of residue by product, 2003.

Total Roundwood Output

Using the most recent inventory data for the South, product output by source, ownership, and detailed species group was estimated.

Source

- In addition to the 8.2 billion cubic feet of roundwood output for industrial roundwood, an estimated 372 million cubic feet were harvested for domestic fuelwood, bringing the South's total roundwood output to 8.6 billion cubic feet.

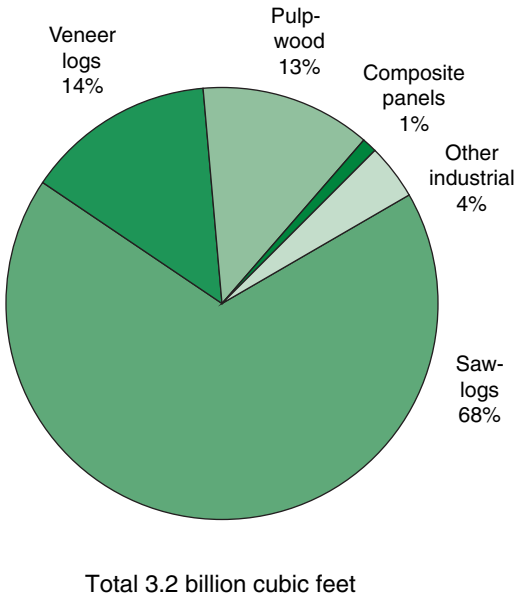

Figure 18—Primary mill residue produced by roundwood type, 2003.

- Ninety-three percent of total roundwood output was considered growing-stock volume (sawtimber and poletimber) from timberland sources. Other sources (such as saplings; stumps, tops, and limbs of trees on timberland; and trees on nonforest land) contributed an estimated 642 million cubic feet, or 7 percent of total roundwood output (fig. 19).

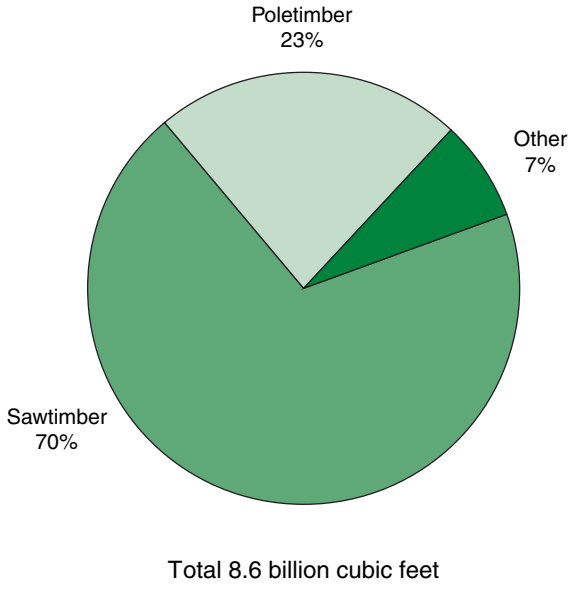

Figure 19—Roundwood output by source, 2003.

Ownership

- An estimated 5.8 billion cubic feet, or 68 percent, of the total roundwood output came from nonindustrial private forest lands. Forest industry lands contributed 2.5 billion cubic feet, or 29 percent of the output. Public lands made up the remaining 3 percent, or 247 million cubic feet (fig. 20).

Species

- The loblolly and shortleaf pine group provided more volume than any other softwood species group, accounting for 73 percent of the total softwood output (fig. 21). The longleaf-slash pine type accounted for 19 percent of the softwood output. In hardwoods, the red oak and white oak groups combined accounted for 1.2 billion cubic feet, or 47 percent of total hardwood output (fig. 22).

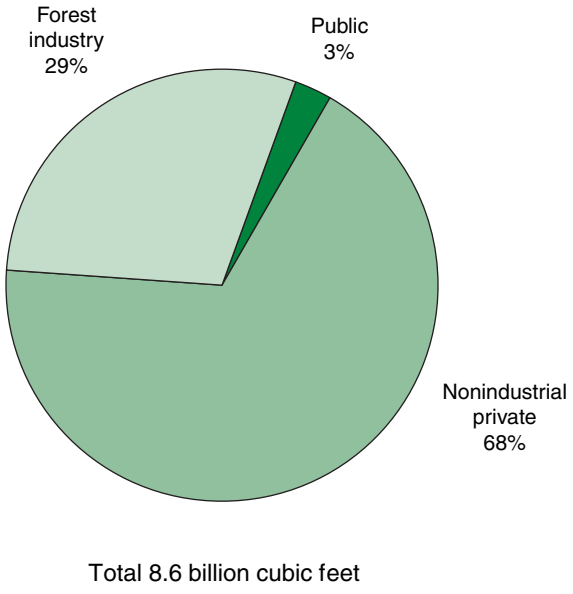

Figure 20—Roundwood output by ownership, 2003.

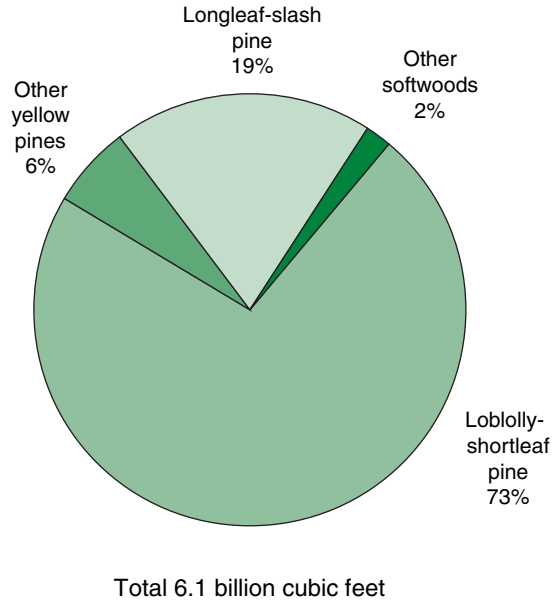

Figure 21—Roundwood output by softwood species group, 2003.

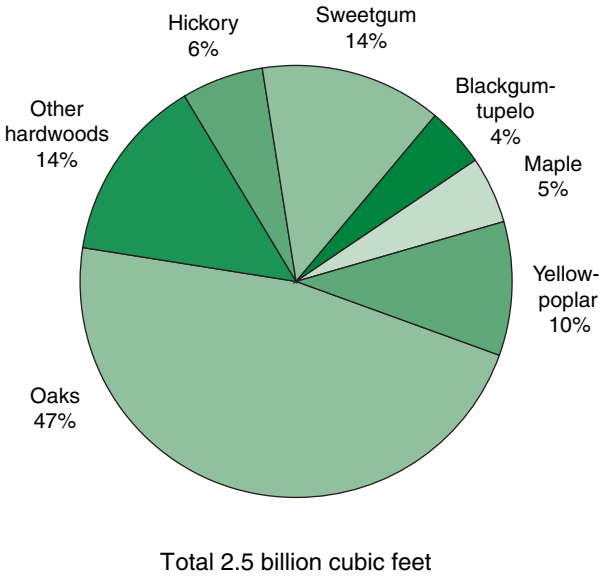

Figure 22—Roundwood output by hardwood species group, 2003.

Regional Trends

- Figure 23 displays the three major physiographic regions in the South. These are the Mountain, Piedmont, and Coastal Plain regions.
- Output of industrial roundwood products declined in all the major physiographic regions of the South. The Mountain region had the smallest decline at 2 percent. The Coastal Plain produced 52 percent of the South's total industrial roundwood production, while the Piedmont and Mountain produced 42 and 6 percent of the South's total output, respectively (fig. 24).

Mountain Region

- Roundwood output from the Mountain region totaled 483 million cubic feet, down 2 percent since 1999. Plant byproducts contributed an additional 208 million cubic feet of product output.

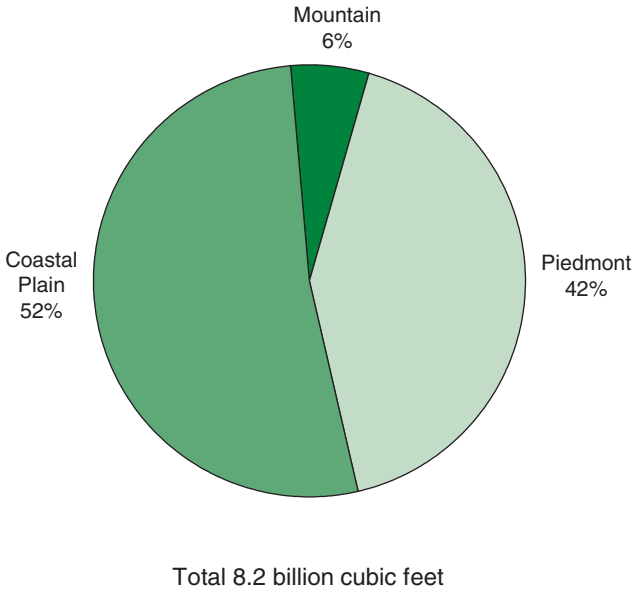

Figure 24—Roundwood production for all products by region, 2003.

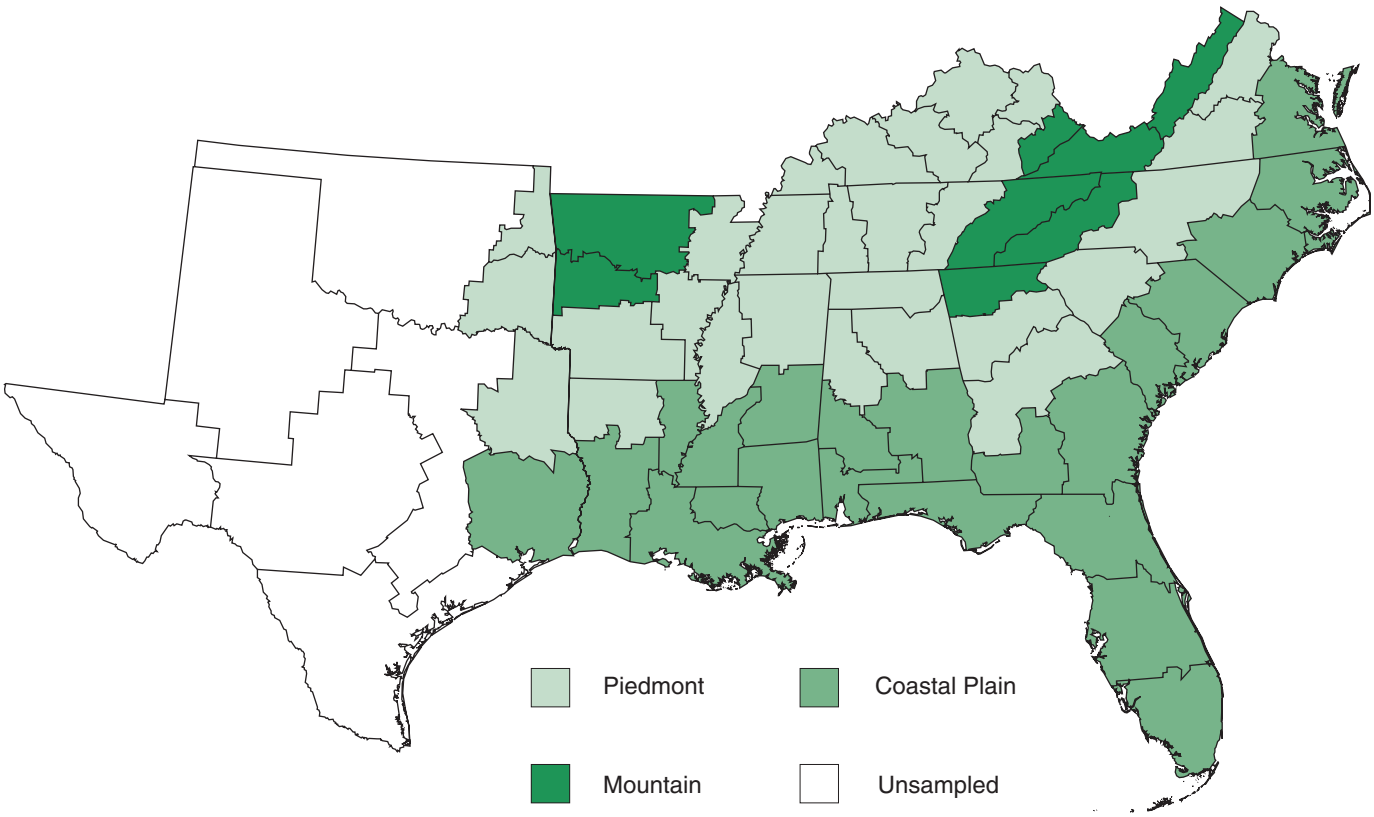

Figure 23—Physiographic regions of the South, 2003.

- Saw logs accounted for 59 percent of the region's TPO and 8 percent of the South's roundwood saw-log output. The 146 million cubic feet of pulpwood accounted for 30 percent of the total roundwood output for the region and about 4½ percent of the South's total pulpwood output. The 23 million cubic feet of veneer logs accounted for 3 percent of the South's total veneer-log output.

Piedmont Region

- Roundwood output from the Piedmont region totaled 3.4 billion cubic feet, a decline of nearly 8 percent since 1999. Plant byproducts contributed an additional 1.37 billion cubic feet towards total product output.

- Saw-log production of 1.6 billion cubic feet accounted for 47 percent of the region's TPO and 44 percent of the South's total saw-log output. Production of pulpwood declined 19 percent to 1.2 billion cubic feet accounting for 36 percent of the region's total roundwood output and 37 percent of the South's total pulpwood output. The 348 million cubic feet of veneer logs accounted for 10 percent of the region's total output and 42 percent of the South's total veneer-log output.

Coastal Plain Region

- Roundwood output from the Coastal Plain region totaled 4.3 billion cubic feet, down 5 percent since 1999. Plant byproducts from the region's mills contributed an additional 1.6 billion cubic feet towards total product output.

- Saw-log production of 1.8 billion cubic feet accounted for 41 percent of the region's total TPO and 48 percent of the South's total saw-log output. Pulpwood production of 1.9 billion cubic feet accounted for another 45 percent of the region's total roundwood output and 58 percent of the South's total pulpwood production. The 459 million cubic feet of veneer logs accounted for 55 percent of the South's total veneer-log output.

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Glossary

Board foot. A unit of measure applied to lumber that is 1-foot long, 1-foot wide, and 1-inch thick (or its equivalent) and also associated with roundwood as to its potential yield of such products.

Byproducts. Primary wood products, e.g., pulp chips, animal bedding, and fuelwood, recycled from mill residues.

Composite panels. Roundwood products manufactured into chips, wafers, strands, flakes, shavings, or sawdust and then reconstituted into a variety of panel and engineered lumber products.

Consumption. The quantity of a commodity, such as pulpwood, utilized by a particular mill or group of mills.

Drain. The volume of roundwood removed from any geographic area where timber is grown.

Exports. The volume of domestic roundwood utilized by mills outside the State where timber was cut.

Fiber products. Byproducts used in the manufacture of pulp, paper, paperboard, and composite products, such as chipboard.

Fuelwood production. The volume of roundwood harvested to produce some form of energy, e.g., heat and steam, in residential, industrial or institutional settings.

Growing-stock removals. The growing-stock volume removed from poletimber and sawtimber trees in the timberland inventory. (Note: Includes volume removed for roundwood products, logging residues, and other removals.)

Growing-stock trees. Living trees of commercial species classified as sawtimber, poletimber, saplings, and seedlings. Growing-stock 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). The log(s) must meet dimension and merchantability standards and 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 > 0.50, such as oaks, hard maples, hickories, and beech.

Imports. The volume of domestic roundwood delivered to a mill or group of mills in a specific State but harvested outside that State.

Industrial fuelwood. A roundwood product, with or without bark, used to generate energy at a manufacturing facility such as a wood-using mill.

Industrial roundwood products. Any primary use of the main stem of a tree, such as saw logs, pulpwood, veneer logs, intended to be processed into primary wood products such as lumber, wood pulp, sheathing, at primary wood-using mills.

International ¼-inch rule. A log rule or formula for estimating the board-foot volume of logs, allowing ½-inch of taper for each 4-foot length. The rule appears in a number of forms that allow for kerf. In the form used by FIA, a ¼-inch of kerf is assumed. This rule is used as the USDA Forest Service standard log rule in the Eastern United States.

Log. A primary forest product harvested in long, primarily 8-, 12-, and 16-foot lengths.

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

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 d.o.b. on the central stem. That portion of primary forks from the point of occurrence to a minimum 4.0-inch top d.o.b. is included.

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

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.

Nongrowing-stock sources. The net volume removed from the nongrowing-stock portions of poletimber and sawtimber trees (stumps, tops, limbs, cull sections of central stem) and from any portion of a rough, rotten, sapling, dead, or nonforest tree.

Other forest land. Forest land other than timberland and productive reserved forest land. It includes available and reserved forest land that 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 products. A miscellaneous category of roundwood products, e.g., cooperage, excelsior, shingles, and mill residue byproducts (charcoal, bedding, mulch, etc.).

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.

Other sources. (See: Nongrowing-stock sources.)

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.

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, which is suitable for chipping.

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

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

Unused plant residues. Residues (coarse or fine) that are 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.

Posts, poles, and pilings. Roundwood products milled (cut or peeled) into standard sizes (lengths and circumferences) to be put in the ground to provide vertical and lateral support in buildings, foundations, utility lines, and fences. May also include nonindustrial (unmilled) products.

Primary wood-using plants. Industries that convert round-wood products (saw logs, veneer logs, pulpwood, etc.) into primary wood products, such as lumber, veneer or sheathing, wood pulp.

Production. The total volume of known roundwood harvested from land within a State, regardless of where it is consumed. Production is the sum of timber harvested and used within a State, and all roundwood exported to other States.

Pulpwood. A roundwood product that will be reduced to individual wood fibers by chemical or mechanical means. The fibers are used to make a broad generic group of pulp products that includes paper products, as well as fiberboard, insulating board, and paperboard.

Receipts. The quantity or volume of industrial roundwood received at a mill or by a group of mills in a State, regardless of the geographic source. Volume of roundwood receipts is equal to the volume of roundwood retained in a State plus roundwood imported from other States.

Retained. Roundwood volume harvested from and processed by mills within the same State.

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 manufacture or consumer uses.

Roundwood chipped. Any timber cut primarily for industrial manufacture, delivered to nonpulpmills, chipped, and then sold to pulpmills for use as fiber. Includes tops, jump sections, whole trees, and pulpwood sticks.

Roundwood product drain. That portion of total drain used for a product.

Roundwood products. Any primary product, such as lumber, veneer, composite panels, 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 roundwood product, usually 8 feet in length or longer, processed into a variety of sawn products such as lumber, cants, pallets, railroad ties, and timbers.

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 for FIA standards.

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-sized trees in board feet (International ¼-inch rule).

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

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

Standard cord. A unit of measure applied to roundwood, usually bolts or split wood. It is a stack of wood 4 feet high, 4 feet wide, and 8 feet long encompassing 128 cubic feet of wood, bark, and air space. This usually translates to approximately 75.0 to 81.0 cubic feet of solid wood for pulpwood, because pulpwood is more uniform.

Standard unit. A unit measure applied to roundwood timber products. Board feet (International ¼-inch rule) is the standard unit used for saw logs and veneer; cords are used for pulpwood, composite panel, and fuelwood; hundred pieces for poles; thousand pieces for posts; and thousand cubic feet for all other miscellaneous forest products.

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

Timber product output. The total volume of roundwood products from all sources plus the volume of byproducts recovered from mill residues (equals roundwood product drain).

Timber products. Roundwood products and byproducts.

Timber removals. The total volume of trees removed from the timberland inventory by harvesting, cultural operations such as stand improvement, land clearing, or changes in land use. (Note: Includes roundwood products, logging residues, and other removals.)

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).

Upper-stem portion. The part of the main stem of saw-timber trees above the saw-log top and the minimum top diameter of 4.0 inches outside bark, or to the point where the main stem breaks into limbs.

Utilization studies. Studies conducted on active logging operations to develop factors for merchantable portions of trees left in the woods (logging residues), logging damage, and utilization of the unmerchantable portion of growing-stock trees and nongrowing-stock trees.

Veneer log. A roundwood product either rotary cut, sliced, stamped, or sawn into a variety of veneer products such as plywood, finished panels, veneer sheets, or sheathing.

Weight. A unit of measure for mill residues, expressed as oven-dry tons (2,000 oven-dry pounds).

Metric Equivalents

1 acre = 4,046.86 m^2 or 0.404686 ha
1 cubic foot = 0.028317 m^3
1 inch = 2.54 cm or 0.0254 m
Breast height = 1.4 m above the ground
1 square foot = 929.03 cm^2 or 0.0929 m^2
1 square foot per basal area = 0.229568 m^2/ha
1 pound = 0.454 kg
1 ton = 0.907 mt

Conversion Factors

Alabama Conversion Factors[a]

Saw logs	
Softwood	0.18393 cubic foot = 1 board foot 5.44 board feet = 1 cubic foot
Hardwood	0.17597 cubic foot = 1 board foot 5.68 board feet = 1 cubic foot
Veneer logs	
Softwood	0.16260 cubic foot = 1 board foot 6.15 board feet = 1 cubic foot
Hardwood	0.16394 cubic foot = 1 board foot 6.10 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.6 cubic feet per cord
Hardwood	76.4 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species.
[b] Cubic feet of solid wood per cord.

Arkansas Conversion Factors[a]

Saw logs	
Softwood	0.18018 cubic foot = 1 board foot 5.55 board feet = 1 cubic foot
Hardwood	0.16556 cubic foot = 1 board foot 6.04 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17391 cubic foot = 1 board foot 5.75 board feet = 1 cubic foot
Hardwood	0.15873 cubic foot = 1 board foot 6.30 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.5 cubic feet per cord
Hardwood	76.6 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species.
[b] Cubic feet of solid wood per cord.

Florida Conversion Factors[a]

Saw logs	
Softwood	0.19121 cubic foot = 1 board foot 5.23 board feet = 1 cubic foot
Hardwood	0.16807 cubic foot = 1 board foot 5.95 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17241 cubic foot = 1 board foot 5.80 board feet = 1 cubic foot
Hardwood	0.16129 cubic foot = 1 board foot 6.20 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	71.00 cubic feet per cord
Hardwood	75.00 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Florida during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Kentucky Conversion Factors[a]

Saw logs	
Softwood	0.18282 cubic foot = 1 board foot 5.47 board feet = 1 cubic foot
Hardwood	0.16393 cubic foot = 1 board foot 6.10 board feet = 1 cubic foot
Veneer logs	
Softwood	0.16129 cubic foot = 1 board foot 6.20 board feet = 1 cubic foot
Hardwood	0.16000 cubic foot = 1 board foot 6.25 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	73.3 cubic feet per cord
Hardwood	76.1 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Kentucky during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Georgia Conversion Factors[a]

Saw logs	
Softwood	0.18349 cubic foot = 1 board foot 5.45 board feet = 1 cubic foot
Hardwood	0.16807 cubic foot = 1 board foot 5.95 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17094 cubic foot = 1 board foot 5.85 board feet = 1 cubic foot
Hardwood	0.16260 cubic foot = 1 board foot 6.15 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.6 cubic feet per cord
Hardwood	75.0 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Georgia during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Louisiana Conversion Factors[a]

Saw logs	
Softwood	0.18349 cubic foot = 1 board foot 5.45 board feet = 1 cubic foot
Hardwood	0.16807 cubic foot = 1 board foot 5.95 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17094 cubic foot = 1 board foot 5.85 board feet = 1 cubic foot
Hardwood	0.16260 cubic foot = 1 board foot 6.15 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.6 cubic feet per cord
Hardwood	75.0 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Louisiana during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Mississippi Conversion Factors[a]

Saw logs	
Softwood	0.18349 cubic foot = 1 board foot 5.45 board feet = 1 cubic foot
Hardwood	0.16807 cubic foot = 1 board foot 5.95 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17094 cubic foot = 1 board foot 5.85 board feet = 1 cubic foot
Hardwood	0.16260 cubic foot = 1 board foot 6.15 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.6 cubic feet per cord
Hardwood	75.0 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Mississippi during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Oklahoma Conversion Factors[a]

Saw logs	
Softwood	0.18018 cubic foot = 1 board foot 5.55 board feet = 1 cubic foot
Hardwood	0.16556 cubic foot = 1 board foot 6.04 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17391 cubic foot = 1 board foot 5.75 board feet = 1 cubic foot
Hardwood	0.15873 cubic foot = 1 board foot 6.30 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.5 cubic feet per cord
Hardwood	76.6 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species.
[b] Cubic feet of solid wood per cord.

North Carolina Conversion Factors[a]

Saw logs	
Softwood	0.18018 cubic foot = 1 board foot 5.55 board feet = 1 cubic foot
Hardwood	0.16556 cubic foot = 1 board foot 6.04 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17391 cubic foot = 1 board foot 5.75 board feet = 1 cubic foot
Hardwood	0.15873 cubic foot = 1 board foot 6.30 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.5 cubic feet per cord
Hardwood	76.6 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in North Carolina during the most recent survey period.
[b] Cubic feet of solid wood per cord.

South Carolina Conversion Factors[a]

Saw logs	
Softwood	0.18018 cubic foot = 1 board foot 5.55 board feet = 1 cubic foot
Hardwood	0.16750 cubic foot = 1 board foot 5.97 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17601 cubic foot = 1 board foot 5.68 board feet = 1 cubic foot
Hardwood	0.16340 cubic foot = 1 board foot 6.12 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	68.6 cubic feet per cord
Hardwood	70.5 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in South Carolina during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Tennessee Conversion Factors[a]

Saw logs	
Softwood	0.18018 cubic foot = 1 board foot 5.55 board feet = 1 cubic foot
Hardwood	0.16556 cubic foot = 1 board foot 6.04 board feet = 1 cubic foot
Veneer logs	
Softwood	0.17391 cubic foot = 1 board foot 5.75 board feet = 1 cubic foot
Hardwood	0.15873 cubic foot = 1 board foot 6.30 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	72.5 cubic feet per cord
Hardwood	76.6 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Tennessee during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Virginia Conversion Factors[a]

Saw logs	
Softwood	0.18282 cubic foot = 1 board foot 5.47 board feet = 1 cubic foot
Hardwood	0.16393 cubic foot = 1 board foot 6.10 board feet = 1 cubic foot
Veneer logs	
Softwood	0.16129 cubic foot = 1 board foot 6.20 board feet = 1 cubic foot
Hardwood	0.16000 cubic foot = 1 board foot 6.25 board feet = 1 cubic foot
Pulpwood[b]	
Softwood	73.3 cubic feet per cord
Hardwood	76.1 cubic feet per cord

[a] Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in Virginia during the most recent survey period.
[b] Cubic feet of solid wood per cord.

Species List[a]

Common name	Scientific name[b]
Softwoods	
Atlantic white-cedar	*Chamaecyparis thyoides* (L.) B.S.P.
Southern redcedar	*Juniperus silicicola* (Small) Bailey
Eastern redcedar	*J. virginiana* L.
Shortleaf pine	*Pinus echinata* Mill.
Slash pine	*P. elliottii* Engelm.
Spruce pine	*P. glabra* Walt.
Longleaf pine	*P. palustris* Mill.
Pond pine	*P. serotina* Michx.
Eastern white pine	*P. strobus* L.
Loblolly pine	*P. taeda* L.
Virginia pine	*P. virginiana* Mill.
Baldcypress	*Taxodium distichum* (L.) Rich.
Pondcypress	*T. distichum* var. *nutans*
Eastern hemlock	*Tsuga canadensis* (L.) Carr.
Hardwoods	
Florida maple	*Acer barbatum* Michx.
Boxelder	*A. negundo* L.
Red maple	*A. rubrum* L.
Silver maple	*A. saccharinum* L.
Sugar maple	*A. saccharum* Marsh.
Buckeye	*Aesculus* spp. L.
Ohio buckeye	*A. glabra* Willd.
Ailanthus	*Ailanthus altissima* (Mill.) Swingle
Tung-oil tree	*Aleurites fordii* Hemsl.
Serviceberry	*Amelanchier* spp. Med.
River birch	*Betula nigra* L.
American hornbeam	*Carpinus caroliniana* Walt.
Hickory	*Carya* spp. Nutt.
Water hickory	*C. aquatica* (Michx. f.) Nutt.
Bitternut hickory	*C. cordiformis* (Wangenh.) K. Koch
Pignut hickory	*C. glabra* (Mill.) Sweet
Pecan	*C. illinoensis* (Wangenh.) K. Koch
Shellbark hickory	*C. laciniosa* (Michx. f.) Loud.
Nutmeg hickory	*C. myristiciformis* (Michx. f.) Nutt.
Shagbark hickory	*C. ovata* (Mill.) K. Koch
Black hickory	*C. texana* Buckl.
Mockernut hickory	*C. tomentosa* (Poir.) Nutt.
Allegheny chinkapin	*Castanea pumila* Mill.
Chinkapin	*Castanopsis* (D. Don) Spach
Catalpa	*Catalpa* spp. Scop.
Sugarberry	*Celtis laevigata* Willd.
Hackberry	*C. occidentalis* L.
Eastern redbud	*Cercis canadensis* L.
Flowering dogwood	*Cornus florida* L.
Hawthorn	*Crataegus* spp. L.
Common persimmon	*Diospyros virginiana* L.
American beech	*Fagus grandifolia* Ehrh.
White ash	*Fraxinus americana* L.
Pumpkin ash	*F. profunda* (Bush) Bush
Blue ash	*F. quadrangulata* Michx.
Waterlocust	*Gleditsia aquatica* Marsh.
Honeylocust	*G. triacanthos* L.
Kentucky coffeetree	*Gymnocladus dioicus* (L.) K. Koch
Hardwoods (continued)	
American holly	*Ilex opaca* Ait.
Black walnut	*Juglans nigra* L.
Sweetgum	*Liquidambar styraciflua* L.
Yellow-poplar	*Liriodendron tulipifera* L.
Osage-orange	*Maclura pomifera* (Raf.) Schneid.
Cucumbertree	*Magnolia acuminata* L.
Southern magnolia	*M. grandiflora* L.
Bigleaf magnolia	*M. macrophylla* Michx.
Sweetbay	*M. virginiana* L.
Apple	*Malus* spp. Mill.
Chinaberry	*Melia azedarach* L.
White mulberry	*Morus alba* L.
Red mulberry	*M. rubra* L.
Water tupelo	*Nyssa aquatica* L.
Blackgum	*N. sylvatica* Marsh.
Swamp tupelo	*N. sylvatica* var. *biflora* (Walt.) Sarg.
Eastern hophornbeam	*Ostrya virginiana* (Mill.) K. Koch
Sourwood	*Oxydendrum arboreum* (L.) DC.
Redbay	*Persea borbonia* (L.) Spreng.
American sycamore	*Platanus occidentalis* L.
Cottonwood	*Populus* spp. L.
Black cherry	*Prunus serotina* Ehrh.
White oak	*Quercus* alba L.
Scarlet oak	*Q. coccinea* Muenchh.
Durand oak	*Q. durandii* Buckl.
Southern red oak	*Q. falcata* Michx.
Cherrybark oak	*Q. falcata* var. *pagodifolia* Ell.
Bluejack oak	*Q. incana* Bartr.
Turkey oak	*Q. laevis* Walt.
Laurel oak	*Q. laurifolia* Michx.
Overcup oak	*Q. lyrata* Walt.
Swamp chestnut oak	*Q. michauxii* Nutt.
Chinkapin oak	*Q. muehlenbergii* Engelm.
Water oak	*Q. nigra* L.
Nuttall oak	*Q. nuttallii* Palmer
Pin oak	*Q. palustris* Muenchh.
Willow oak	*Q. phellos* L.
Chestnut oak	*Q. prinus* L.
Northern red oak	*Q. rubra* L.
Shumard oak	*Q. shumardii* Buckl.
Post oak	*Q. stellata* Wangenh.
Black oak	*Q. velutina* Lam.
Live oak	*Q. virginiana* Mill.
Black locust	*Robinia pseudoacacia* L.
Willow	*Salix* spp. L.
Sassafras	*Sassafras albidum* (Nutt.) Nees
American basswood	*Tilia americana* L.
White basswood	*T. heterophylla* Vent.
Winged elm	*Ulmus alata* Michx.
American elm	*U. americana* L.
Cedar elm	*U. crassifolia* Nutt.
Slippery elm	*U. rubra* Muhl.
September elm	*U. serotina* Sarg.
Rock elm	*U. thomasii* Sarg.

[a] Scientific and common names of tree species > 1.0 inch in d.b.h. occurring in the FIA sample.

[b] Little (1979).

Appendix

Index of Tables

Table A.1—Output of industrial products by product and species group, Southern Region, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	2,731,094	2,667,325	-63,769	-2.3
Hardwood	1,008,035	985,455	-22,580	-2.2
Total	3,739,129	3,652,780	-86,349	-2.3
Veneer logs				
Softwood	798,960	744,141	-54,819	-6.9
Hardwood	97,771	85,693	-12,078	-12.4
Total	896,731	829,834	-66,897	-7.5
Pulpwood[a]				
Softwood	2,423,108	2,229,030	-194,078	-8.0
Hardwood	1,325,752	1,055,814	-269,938	-20.4
Total	3,748,860	3,284,844	-464,016	-12.4
Composite panels				
Softwood	160,193	268,858	108,665	67.8
Hardwood	73,040	58,284	-14,756	-20.2
Total	233,233	327,142	93,909	40.3
Other industrial				
Softwood	89,297	98,717	9,420	10.5
Hardwood	5,474	1,800	-3,674	-67.1
Total	94,771	100,517	5,746	6.1
All industrial				
Softwood	6,202,652	6,008,071	-194,581	-3.1
Hardwood	2,510,072	2,187,046	-323,026	-12.9
Total	8,712,724	8,195,117	-517,607	-5.9
Byproduct output				
Softwood	2,311,686	2,329,943	18,257	0.8
Hardwood	825,877	835,517	9,640	1.2
Total	3,137,563	3,165,460	27,897	0.9
Total output				
Softwood	8,514,338	8,338,014	-176,324	-2.1
Hardwood	3,335,949	3,022,563	-313,386	-9.4
Total	11,850,287	11,360,577	-489,710	-4.1

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (76,328,000 cubic feet in 1999 and 60,731,000 cubic feet in 2003).

Table A.2—Roundwood receipts by product and species group, Southern Region, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	2,748,099	2,689,494	-58,605	-2.1
Hardwood	1,007,043	992,060	-14,983	-1.5
Total	3,755,142	3,681,554	-73,588	-2.0
Veneer logs				
Softwood	791,039	747,850	-43,189	-5.5
Hardwood	99,111	89,262	-9,849	-9.9
Total	890,150	837,112	-53,038	-6.0
Pulpwood[a]				
Softwood	2,411,132	2,284,655	-126,477	-5.2
Hardwood	1,333,678	1,063,763	-269,915	-20.2
Total	3,744,810	3,348,418	-396,392	-10.6
Composite panels				
Softwood	160,891	268,281	107,390	66.7
Hardwood	73,140	53,622	-19,518	-26.7
Total	234,031	321,903	87,872	37.5
Other industrial				
Softwood	93,160	92,580	-580	-0.6
Hardwood	5,442	1,759	-3,683	-67.7
Total	98,602	94,339	-4,263	-4.3
Total receipts				
Softwood	6,204,321	6,082,860	-121,461	-2.0
Hardwood	2,518,414	2,200,466	-317,948	-12.6
Total	8,722,735	8,283,326	-439,409	-5.0

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (84,291,000 cubic feet in 1999 and 72,845,000 cubic feet in 2003).

Table A.3—Number of primary wood-using plants by industry, Southern Region, 1970 to 2003

Industry	Year							
	1970	1975	1980	1985	1990	1995	1999	2003
	number							
Sawmills	4,289	3,591	3,482	3,086	2,683	2,386	2,165	1,896
Veneer mills	239	200	192	168	155	139	124	107
Pulpmills	109	115	116	107	105	105	97	91
Composite panel mills	0	0	0	6	11	21	24	29
Other mills	452	358	313	295	235	161	141	158
All plants	5,089	4,264	4,103	3,662	3,189	2,812	2,551	2,281

Table A.4—Roundwood receipts by sawmill size, Southern Region, 1999 and 2003

Sawmill size class[a]	1999			2003		
	Mills	Volume		Mills	Volume	
mmbf	*number*	*mbf*	*percent*	*number*	*mbf*	*percent*
< 1.0	820	174,727	1	649	162,410	1
1.0 – 4.99	643	1,750,122	8	587	1,611,924	7
5.0 – 9.99	280	1,934,141	9	263	1,852,635	9
10.0 – 49.99	306	6,873,324	32	273	5,822,641	28
> 50	116	10,641,140	50	124	11,542,541	55
Total	2,165	21,373,454	100	1,896	20,992,151	100

[a] Based on volume received as opposed to actual capacity.

Table A.5—Roundwood receipts by species and type of mill, Southern Region, 2003

Species	All mills	Type of mill					
			Veneer mills				
		Sawmills	Pine plywood	Other veneer	OSB and panels	Pulpmills[a]	Other mills
		thousand cubic feet					
Softwood							
Yellow pine	3,712,388	2,628,323	725,661	21,446	266,865	NA	70,093
White pine	37,658	35,513	114	22	1,241	NA	768
Cedar	5,489	3,894	129	4	175	NA	1,287
Cypress	40,906	20,435	43	50	0	NA	20,378
Other softwood	1,764	1,329	360	21	0	NA	54
Unclassified	2,284,655	0	0	0	0	2,284,655	0
Total softwoods	6,082,860	2,689,494	726,307	21,543	268,281	2,284,655	92,580
Hardwood							
Blackgum and tupelo	26,182	15,098	3,108	2,821	5,155	NA	0
Soft maple	22,882	18,651	601	398	3,232	NA	0
Sweetgum	90,731	59,027	10,664	9,982	11,058	NA	0
Yellow-poplar	242,980	184,949	26,101	14,533	17,397	NA	0
Other soft hardwood	43,617	31,865	2,272	1,506	7,792	NA	182
Hickory	42,695	40,593	484	1,096	326	NA	196
Red oak	346,050	332,053	601	9,300	3,807	NA	289
White oak	208,703	202,786	483	2,014	3,263	NA	157
Other hard hardwood	112,863	107,038	699	2,599	1,592	NA	935
Unclassified	1,063,763	0	0	0	0	1,063,763	0
Total hardwoods	2,200,466	992,060	45,013	44,249	53,622	1,063,763	1,759
All species	8,283,326	3,681,554	771,320	65,792	321,903	3,348,418	94,339

OSB = oriented strand board; NA = not applicable.

[a] Collected only by softwood and hardwood and includes roundwood chipped.

Table A.6—Primary mill residue volume by roundwood type, species group, and residue type, Southern Region, 2003

Roundwood type and species group	All types	Residue type			
		Bark	Coarse	Sawdust	Shavings
		thousand cubic feet			
Saw logs					
Softwood	1,560,482	229,545	725,398	395,129	210,410
Hardwood	603,741	119,575	271,374	204,332	8,460
Total	2,164,223	349,120	996,772	599,461	218,870
Veneer logs					
Softwood	379,757	64,924	185,321	129,512	0
Hardwood	76,528	16,421	37,680	22,427	0
Total	456,285	81,345	223,001	151,939	0
Pulpwood					
Softwood	244,676	244,676	0	0	0
Hardwood	159,675	159,675	0	0	0
Total	404,351	404,351	0	0	0
Composite panels					
Softwood	32,605	32,605	0	0	0
Hardwood	7,025	7,025	0	0	0
Total	39,630	39,630	0	0	0
Other industrial [a]					
Softwood	123,943	80,843	39,638	3,462	0
Hardwood	6,990	6,213	571	206	0
Total	130,933	87,056	40,209	3,668	0
Total					
Softwood	2,341,463	652,593	950,357	528,103	210,410
Hardwood	853,959	308,909	309,625	226,965	8,460
Total	3,195,422	961,502	1,259,982	755,068	218,870

[a] Includes poles, pilings, posts, and other industrial products.

Table A.7—Disposal of residue at primary wood-using plants by product, species group, and type of residue, Southern Region, 1999 and 2003

Product and species group	All types		Bark		Coarse		Sawdust		Shavings	
	1999	2003	1999	2003	1999	2003	1999	2003	1999	2003
	thousand cubic feet									
Fiber products										
Softwood	876,990	848,704	0	0	845,555	823,285	9,309	12,103	22,126	13,316
Hardwood	237,584	222,557	57	194	233,051	220,023	4,163	2,340	313	0
Total	1,114,574	1,071,261	57	194	1,078,606	1,043,308	13,472	14,443	22,439	13,316
Particleboard										
Softwood	162,318	137,254	168	3	20,754	9,494	55,742	59,298	85,654	68,459
Hardwood	16,082	15,334	119	166	12,006	12,164	3,439	2,803	518	201
Total	178,400	152,588	287	169	32,760	21,658	59,181	62,101	86,172	68,660
Charcoal/ chemical wood										
Softwood	5,774	3,340	454	1	2,449	13	2,871	3,322	0	4
Hardwood	12,629	14,396	295	1,056	3,662	3,796	8,672	9,455	0	89
Total	18,403	17,736	749	1,057	6,111	3,809	11,543	12,777	0	93
Sawn products										
Softwood	31,637	31,521	0	1	31,637	31,520	0	0	0	0
Hardwood	3,192	11,241	0	4	3,192	11,237	0	0	0	0
Total	34,829	42,762	0	5	34,829	42,757	0	0	0	0
Fuel										
Softwood	1,018,670	1,078,138	493,511	540,945	56,963	60,605	408,524	398,063	59,672	78,525
Hardwood	458,488	469,943	230,432	243,641	40,328	41,029	180,895	179,857	6,833	5,416
Total	1,477,158	1,548,081	723,943	784,586	97,291	101,634	589,419	577,920	66,505	83,941
Miscellaneous										
Softwood	216,297	230,986	99,964	108,021	18,633	22,086	48,714	51,022	48,986	49,857
Hardwood	97,902	102,046	58,455	60,204	13,962	13,007	23,046	26,154	2,439	2,681
Total	314,199	333,032	158,419	168,225	32,595	35,093	71,760	77,176	51,425	52,538
Not used										
Softwood	20,889	11,520	6,914	3,622	3,958	3,354	9,767	4,295	250	249
Hardwood	22,938	18,442	6,031	3,644	8,975	8,369	7,870	6,356	62	73
Total	43,827	29,962	12,945	7,266	12,933	11,723	17,637	10,651	312	322
All products										
Softwood	2,332,575	2,341,463	601,011	652,593	979,949	950,357	534,927	528,103	216,688	210,410
Hardwood	848,815	853,959	295,389	308,909	315,176	309,625	228,085	226,965	10,165	8,460
Total	3,181,390	3,195,422	896,400	961,502	1,295,125	1,259,982	763,012	755,068	226,853	218,870

Table A.8—Total roundwood output by product, species group, and source of material, Southern Region, 2003

Product and species group	All sources	Growing-stock trees			Other sources
		Total	Sawtimber	Poletimber	
	thousand cubic feet				
Saw logs					
Softwood	2,667,325	2,568,597	2,437,052	131,545	98,728
Hardwood	985,455	938,862	889,737	49,125	46,593
Total	3,652,780	3,507,459	3,326,789	180,670	145,321
Veneer logs and bolts					
Softwood	744,141	704,095	672,966	31,129	40,046
Hardwood	85,693	84,462	83,863	599	1,231
Total	829,834	788,557	756,829	31,728	41,277
Pulpwood					
Softwood	2,229,030	1,995,472	947,871	1,047,601	233,558
Hardwood	1,055,814	950,961	495,614	455,347	104,853
Total	3,284,844	2,946,433	1,443,485	1,502,948	338,411
Composite panels					
Softwood	232,662	206,884	84,783	122,101	25,778
Hardwood	45,230	39,653	22,567	17,086	5,577
Total	277,892	246,537	107,350	139,187	31,355
Other miscellaneous					
Softwood	134,913	121,399	95,017	26,382	13,514
Hardwood	14,854	14,052	7,635	6,417	802
Total	149,767	135,451	102,652	32,799	14,316
Total industrial products					
Softwood	6,008,071	5,596,447	4,237,689	1,358,758	411,624
Hardwood	2,187,046	2,027,990	1,499,416	528,574	159,056
Total	8,195,117	7,624,437	5,737,105	1,887,332	570,680
Fuelwood					
Softwood	39,703	29,914	20,212	9,702	9,789
Hardwood	331,974	270,351	203,385	66,966	61,623
Total	371,677	300,265	223,597	76,668	71,412
All products					
Softwood	6,047,774	5,626,361	4,257,901	1,368,460	421,413
Hardwood	2,519,020	2,298,341	1,702,801	595,540	220,679
Total	8,566,794	7,924,702	5,960,702	1,964,000	642,092

Numbers in rows and columns may not add due to rounding.

Table A.9—Total roundwood output by species group, State, and ownership class, Southern Region, 2003

Species group and State	Total	Ownership class		
		Public	Forest industry	Nonindustrial private
		thousand cubic feet		
Softwoods				
Alabama	808,931	12,300	243,485	553,146
Arkansas	510,110	21,060	274,741	214,309
Florida	471,601	33,532	226,246	211,823
Georgia	968,614	25,605	297,383	645,626
Kentucky	10,511	54	9	10,448
Louisiana	591,256	11,225	274,323	305,708
Mississippi	689,947	21,263	153,667	515,017
North Carolina	539,406	14,712	128,206	396,488
Oklahoma	98,075	592	62,870	34,613
South Carolina	472,628	21,300	146,269	305,059
Tennessee	87,585	3,815	11,164	72,606
Texas	542,704	11,559	237,695	293,450
Virginia	256,406	5,448	40,473	210,485
Total softwoods	6,047,774	182,465	2,096,531	3,768,778
Hardwoods				
Alabama	289,762	4,473	55,418	229,871
Arkansas	197,166	11,908	49,350	135,908
Florida	57,665	5,515	19,179	32,971
Georgia	234,642	8,189	37,123	189,330
Kentucky	195,595	3,613	6,883	185,099
Louisiana	149,947	3,537	46,420	99,990
Mississippi	247,400	6,298	49,328	191,774
North Carolina	319,106	2,733	19,541	296,832
Oklahoma	37,009	679	9,304	27,026
South Carolina	129,161	994	34,625	93,542
Tennessee	251,356	10,068	30,352	210,936
Texas	131,700	1,719	38,622	91,359
Virginia	278,511	4,821	28,471	245,219
Total hardwoods	2,519,020	64,547	424,616	2,029,857
All species	8,566,794	247,012	2,521,147	5,798,635

Numbers in rows and columns may not add due to rounding.

Table A.10—Total roundwood output by species group, detailed species group, and product, Southern Region, 2003

Species group and detailed species group	Total	Product						
		Saw logs	Veneer logs	Pulpwood	Composite panels	Poles and posts	Other miscellaneous	Fuel-wood
		thousand cubic feet						
Softwood								
Cedars	23,471	12,158	1,824	6,758	2,017	202	271	241
Cypress	58,627	25,431	3,731	23,045	1,109	781	4,107	423
Hemlock	2,899	2,311	9	272	63	25	164	55
Loblolly-shortleaf pines	4,383,702	1,978,737	628,991	1,500,654	182,808	37,745	28,127	26,640
Longleaf-slash pines	1,175,955	461,818	94,231	553,325	14,929	25,860	18,934	6,858
White pine	30,597	20,924	92	6,283	2,122	181	438	557
Other pines	372,523	165,946	15,263	138,693	29,614	3,710	14,368	4,929
Total softwoods	6,047,774	2,667,325	744,141	2,229,030	232,662	68,504	66,409	39,703
Hardwood								
Ash	50,064	21,634	2,124	18,570	1,149	3	106	6,478
Basswood	6,919	3,081	327	2,171	13	0	357	970
Beech	27,189	14,132	642	8,105	405	0	580	3,325
Yellow birch	738	266	13	278	10	0	0	171
Other birch	10,171	5,000	371	3,087	234	1	161	1,317
Black cherry	14,350	5,515	448	6,248	272	0	33	1,834
Cottonwood	14,870	6,379	695	6,241	249	0	0	1,306
Elm	40,233	16,473	1,440	16,819	686	0	41	4,774
Hickory	153,679	66,635	4,896	60,217	1,531	8	1,390	19,002
Hard maples	17,098	9,836	203	4,551	188	0	382	1,938
Soft maples	110,082	39,697	4,551	44,832	2,300	5	138	18,559
Select red oaks	119,767	54,499	3,287	44,040	2,790	3	748	14,400
Other red oaks	604,662	222,604	20,311	271,092	10,508	28	3,238	76,881
Select white oaks	270,437	119,411	7,186	103,899	3,690	18	1,367	34,866
Other white oaks	184,448	77,974	3,289	76,544	2,446	11	1,368	22,816
Sweetgum	345,550	106,816	13,370	175,268	5,907	10	261	43,918
Sycamore	19,959	9,997	773	6,620	452	1	50	2,066
Tupelo-blackgum	108,157	26,915	4,182	56,413	3,640	1	250	16,756
Black walnut	7,836	4,995	183	1,568	32	0	67	991
Yellow-poplar	253,995	111,871	10,217	86,146	4,015	23	3,392	38,331
Other hardwoods	158,816	61,725	7,185	63,105	4,713	1	812	21,275
Total hardwoods	2,519,020	985,455	85,693	1,055,814	45,230	113	14,741	331,974
All species	8,566,794	3,652,780	829,834	3,284,844	277,892	68,617	81,150	371,677

Numbers in rows and columns may not add due to rounding.

Table A.11—Total roundwood output by species group, detailed species group, and ownership class, Southern Region, 2003

Species group and detailed species group	Total	Ownership class		
		Public	Forest industry	Nonindustrial private
		thousand cubic feet		
Softwood				
Cedars	23,471	952	4,225	18,294
Cypress	58,627	2,336	20,567	35,724
Hemlock	2,899	140	140	2,619
Loblolly-shortleaf pines	4,383,702	114,161	1,524,505	2,745,036
Longleaf-slash pines	1,175,955	49,396	486,650	639,909
White pine	30,597	2,754	2,154	25,689
Other pines	372,523	12,726	58,290	301,507
Total softwoods	6,047,774	182,465	2,096,531	3,768,778
Hardwood				
Ash	50,064	1,958	9,519	38,587
Basswood	6,918	183	599	6,136
Beech	27,190	609	3,764	22,817
Yellow birch	739	6	8	725
Other birch	10,169	634	615	8,920
Black cherry	14,352	353	2,045	11,954
Cottonwood	14,870	1,489	2,758	10,623
Elm	40,234	900	8,011	31,323
Hickory	153,678	3,969	23,829	125,880
Hard maples	17,098	501	1,795	14,802
Soft maples	110,081	2,769	14,841	92,471
Select red oaks	119,768	4,318	18,451	96,999
Other red oaks	604,662	16,168	108,088	480,406
Select white oaks	270,438	6,790	38,763	224,885
Other white oaks	184,449	6,567	32,987	144,895
Sweetgum	345,549	6,747	71,316	267,486
Sycamore	19,960	332	4,072	15,556
Tupelo-blackgum	108,157	2,466	28,691	77,000
Black walnut	7,835	99	186	7,550
Yellow-poplar	253,993	3,578	25,266	225,149
Other hardwoods	158,816	4,112	29,013	125,691
Total hardwoods	2,519,020	64,548	424,617	2,029,855
All species	8,566,794	247,013	2,521,148	5,798,633

Numbers in rows and columns may not add due to rounding.

Table A.12—Output of industrial products by product and species group, Southern Mountain, 1999 and 2003

Product and species group	Year			
	1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	127,323	124,317	-3,006	-2.4
Hardwood	160,361	160,522	161	0.1
Total	287,684	284,839	-2,845	-1.0
Veneer logs				
Softwood	20,112	14,481	-5,631	-28.0
Hardwood	13,443	8,839	-4,604	-34.2
Total	33,555	23,320	-10,235	-30.5
Pulpwood				
Softwood	90,585	87,228	-3,357	-3.7
Hardwood	56,827	58,854	2,027	3.6
Total	147,412	146,082	-1,330	-0.9
Composite panels				
Softwood	10,072	9,019	-1,053	-10.5
Hardwood	13,745	3,170	-10,575	-76.9
Total	23,817	12,189	-11,628	-48.8
Other industrial				
Softwood	1,295	9,180	7,885	608.9
Hardwood	235	7,496	7,261	3,089.8
Total	1,530	16,676	15,146	989.9
All industrial				
Softwood	249,387	244,225	-5,162	-2.1
Hardwood	244,611	238,881	-5,730	-2.3
Total	493,998	483,106	-10,892	-2.2
Byproduct output				
Softwood	99,982	101,834	1,852	1.9
Hardwood	107,602	106,554	-1,048	-1.0
Total	207,584	208,388	804	0.4
Total output				
Softwood	349,369	346,059	-3,310	-0.9
Hardwood	352,213	345,435	-6,778	-1.9
Total	701,582	691,494	-10,088	-1.4

Table A.13—Output of industrial products by product and species group, Southern Piedmont, 1999 and 2003

Product and species group	Year			
	1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	1,069,270	1,024,748	-44,522	-4.2
Hardwood	608,291	587,039	-21,252	-3.5
Total	1,677,561	1,611,787	-65,774	-3.9
Veneer logs				
Softwood	324,265	312,862	-11,403	-3.5
Hardwood	42,981	34,820	-8,161	-19.0
Total	367,246	347,682	-19,564	-5.3
Pulpwood				
Softwood	852,686	706,419	-146,267	-17.2
Hardwood	658,522	520,923	-137,599	-20.9
Total	1,511,208	1,227,342	-283,866	-18.8
Composite panels				
Softwood	118,838	180,691	61,853	52.0
Hardwood	26,084	16,706	-9,378	-36.0
Total	144,922	197,397	52,475	36.2
Other industrial				
Softwood	23,268	49,537	26,269	112.9
Hardwood	3,873	6,415	2,542	65.6
Total	27,141	55,952	28,811	106.2
All industrial				
Softwood	2,388,327	2,274,257	-114,070	-4.8
Hardwood	1,339,751	1,165,903	-173,848	-13.0
Total	3,728,078	3,440,160	-287,918	-7.7
Byproduct output				
Softwood	879,045	897,045	18,000	2.0
Hardwood	448,702	471,975	23,273	5.2
Total	1,327,747	1,369,020	41,273	3.1
Total output				
Softwood	3,267,372	3,171,302	-96,070	-2.9
Hardwood	1,788,453	1,637,878	-150,575	-8.4
Total	5,055,825	4,809,180	-246,645	-4.9

Table A.14—Output of industrial products by product and species group, Southern Coastal Plain, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	- - - - - - - thousand cubic feet - - - - - - -			*percent*
Saw logs				
Softwood	1,534,501	1,518,260	-16,241	-1.1
Hardwood	239,383	237,894	-1,489	-0.6
Total	1,773,884	1,756,154	-17,730	-1.0
Veneer logs				
Softwood	454,583	416,798	-37,785	-8.3
Hardwood	41,347	42,034	687	1.7
Total	495,930	458,832	-37,098	-7.5
Pulpwood				
Softwood	1,479,837	1,435,383	-44,454	-3.0
Hardwood	610,403	476,037	-134,366	-22.0
Total	2,090,240	1,911,420	-178,820	-8.6
Composite panels				
Softwood	31,283	42,952	11,669	37.3
Hardwood	33,211	25,354	-7,857	-23.7
Total	64,494	68,306	3,812	5.9
Other industrial				
Softwood	64,734	76,196	11,462	17.7
Hardwood	1,366	943	-423	-31.0
Total	66,100	77,139	11,039	16.7
All industrial				
Softwood	3,564,938	3,489,589	-75,349	-2.1
Hardwood	925,710	782,262	-143,448	-15.5
Total	4,490,648	4,271,851	-218,797	-4.9
Byproduct output				
Softwood	1,332,762	1,331,065	-1,697	-0.1
Hardwood	269,575	256,988	-12,587	-4.7
Total	1,602,337	1,588,053	-14,284	-0.9
All industrial				
Softwood	4,897,700	4,820,654	-77,046	-1.6
Hardwood	1,195,285	1,039,250	-156,035	-13.1
Total	6,092,985	5,859,904	-233,081	-3.8

Table A.15—Volume of roundwood products by State, year, species group, and type of product, Southern Region

State, year, and species group	All products	Product						
		Saw logs	Veneer logs	Pulpwood	Composite panels	Poles and posts	Other miscellaneous	Fuel-wood
		thousand cubic feet						
Alabama 2003								
Softwood	808,931	335,571	84,767	342,360	0	20,501	22,885	2,847
Hardwood	289,763	69,046	22,595	178,737	0	0	1,138	18,247
Total	1,098,694	404,617	107,362	521,097	0	20,501	24,023	21,094
Arkansas 2002								
Softwood	510,110	252,493	89,633	134,317	27,141	2,878	167	3,481
Hardwood	197,166	89,622	4,859	78,276	187	0	41	24,181
Total	707,276	342,115	94,492	212,593	27,328	2,878	208	27,662
Florida 2003								
Softwood	471,601	166,217	30,492	243,796	1,326	11,857	14,889	3,024
Hardwood	57,665	4,454	1,437	26,939	6,400	0	879	17,556
Total	529,266	170,671	31,929	270,735	7,726	11,857	15,768	20,580
Georgia 2003								
Softwood	968,614	375,705	56,986	457,619	45,373	12,520	13,744	6,667
Hardwood	234,641	65,442	11,488	111,277	2,365	0	335	43,734
Total	1,203,255	441,147	68,474	568,896	47,738	12,520	14,079	50,401
Kentucky 2003								
Softwood	10,511	4,642	88	3,143	0	387	2,184	67
Hardwood	195,595	141,027	5,310	18,240	0	44	11,519	19,455
Total	206,106	145,669	5,398	21,383	0	431	13,703	19,522
Louisiana 2002								
Softwood	591,256	230,394	136,832	191,096	23,863	7,506	0	1,565
Hardwood	149,947	42,609	641	75,219	12,176	0	0	19,302
Total	741,203	273,003	137,473	266,315	36,039	7,506	0	20,867
Mississippi 2002								
Softwood	689,947	419,174	72,261	168,144	27,061	1,595	0	1,712
Hardwood	247,400	107,028	5,865	118,759	7,402	0	0	8,346
Total	937,347	526,202	78,126	286,903	34,463	1,595	0	10,058
North Carolina 2003								
Softwood	539,406	285,904	39,980	158,359	45,444	929	0	8,790
Hardwood	319,106	112,758	16,574	108,554	7,519	0	22	73,679
Total	858,512	398,662	56,554	266,913	52,963	929	22	82,469
Oklahoma 2002								
Softwood	98,075	57,304	10,691	27,706	0	2,215	0	159
Hardwood	37,009	6,653	0	21,212	0	0	0	9,144
Total	135,084	63,957	10,691	48,918	0	2,215	0	9,303

continued

Table A.15—Volume of roundwood products by State, year, species group, and type of product, Southern Region (continued)

State, year, and species group	All products	Product						
		Saw logs	Veneer logs	Pulpwood	Composite panels	Poles and posts	Other miscellaneous	Fuel-wood
		thousand cubic feet						
South Carolina 2003								
Softwood	472,628	207,536	34,781	205,321	17,870	3,723	30	3,367
Hardwood	129,161	27,381	6,958	68,303	56	0	0	26,463
Total	601,789	234,917	41,739	273,624	17,926	3,723	30	29,830
Tennessee 2003								
Softwood	87,585	25,468	294	46,031	0	548	12,471	2,773
Hardwood	251,356	149,992	1,498	75,198	0	0	447	24,221
Total	338,941	175,460	1,792	121,229	0	548	12,918	26,994
Texas 2003								
Softwood	542,704	198,832	178,935	161,940	0	2,441	0	556
Hardwood	131,700	48,263	20	77,836	0	0	0	5,581
Total	674,404	247,095	178,955	239,776	0	2,441	0	6,137
Virginia 2003								
Softwood	256,406	108,085	8,401	89,198	44,584	1,404	39	4,695
Hardwood	278,511	121,180	8,448	97,264	9,125	69	360	42,065
Total	534,917	229,265	16,849	186,462	53,709	1,473	399	46,760
Total States								
Softwood	6,047,774	2,667,325	744,141	2,229,030	232,662	68,504	66,409	39,703
Hardwood	2,519,020	985,455	85,693	1,055,814	45,230	113	14,741	331,974
Total	8,566,794	3,652,780	829,834	3,284,844	277,892	68,617	81,150	371,677

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

Table A.16—Output of industrial products by product and species group, Alabama, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	353,832	335,571	-18,261	-5.2
Hardwood	71,945	69,046	-2,899	-4.0
Total	425,777	404,617	-21,160	-5.0
Veneer logs				
Softwood	85,120	84,767	-353	-0.4
Hardwood	23,903	22,595	-1,308	-5.5
Total	109,023	107,362	-1,661	-1.5
Pulpwood[a]				
Softwood	417,631	342,360	-75,271	-18.0
Hardwood	223,048	178,737	-44,311	-19.9
Total	640,679	521,097	-119,582	-18.7
Other industrial				
Softwood	34,348	43,386	9,038	26.3
Hardwood	315	1,138	823	261.3
Total	34,663	44,524	9,861	28.4
All industrial				
Softwood	890,931	806,084	-84,847	-9.5
Hardwood	319,211	271,516	-47,695	-14.9
Total	1,210,142	1,077,600	-132,542	-11.0
Byproduct output				
Softwood	371,896	330,945	-40,951	-11.0
Hardwood	96,095	78,598	-17,497	-18.2
Total	467,991	409,543	-58,448	-12.5
Total output				
Softwood	1,262,827	1,137,029	-125,798	-10.0
Hardwood	415,306	350,114	-65,192	-15.7
Total	1,678,133	1,487,143	-190,990	-11.4

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (13,815,000 cubic feet in 1999 and 12,395,000 cubic feet in 2003).

Table A.17—Output of industrial products by product and species group, Arkansas, 1999 and 2002

Product and species group	Year 1999	2002	Change	Change
	- - - - - - *thousand cubic feet* - - - - - -			*percent*
Saw logs				
Softwood	231,530	252,493	20,963	9.1
Hardwood	88,325	89,622	1,297	1.5
Total	319,855	342,115	22,260	7.0
Veneer logs				
Softwood	77,621	89,633	12,012	15.5
Hardwood	5,927	4,859	-1,068	-18.0
Total	83,548	94,492	10,944	13.1
Pulpwood[a]				
Softwood	182,819	134,317	-48,502	-26.5
Hardwood	102,146	78,276	-23,870	-23.4
Total	284,965	212,593	-72,372	-25.4
Composite panels				
Softwood	437	27,141	26,704	6,110.8
Hardwood	188	187	-1	-0.5
Total	625	27,328	26,703	4,272.5
Other industrial				
Softwood	2,725	3,045	320	11.7
Hardwood	28	41	13	46.4
Total	2,753	3,086	333	12.1
All industrial				
Softwood	495,132	506,629	11,497	2.3
Hardwood	196,614	172,985	-23,629	-12.0
Total	691,746	679,614	-12,132	-1.8
Byproduct output				
Softwood	220,430	251,034	30,604	13.9
Hardwood	69,230	75,317	6,087	8.8
Total	289,660	326,351	36,691	12.7
Total output				
Softwood	715,562	757,663	42,101	5.9
Hardwood	265,844	248,302	-17,542	-6.6
Total	981,406	1,005,965	24,559	2.5

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (4,636,000 cubic feet in 1999 and 3,709,000 cubic feet in 2002).

Table A.18—Output of industrial products by product and species group, Florida, 1999 and 2003

Product and species group	Year			
	1999	2003	Change	Change
	- - - - - thousand cubic feet - - - - -			*percent*
Saw logs				
Softwood	162,959	166,217	3,258	2.0
Hardwood	4,382	4,454	72	1.6
Total	167,341	170,671	3,330	2.0
Veneer logs				
Softwood	32,770	30,492	-2,278	-7.0
Hardwood	1,211	1,437	226	18.7
Total	33,981	31,929	-2,052	-6.0
Pulpwood[a]				
Softwood	222,119	243,796	21,677	9.8
Hardwood	39,202	26,939	-12,263	-31.3
Total	261,321	270,735	9,414	3.6
Composite panels				
Softwood	0	1,326	1,326	—
Hardwood	7,380	6,400	-980	-13.3
Total	7,380	7,726	346	4.7
Other industrial				
Softwood	27,901	26,746	-1,155	-4.1
Hardwood	638	879	241	37.8
Total	28,539	27,625	-914	-3.2
All industrial				
Softwood	445,749	468,577	22,828	5.1
Hardwood	52,813	40,109	-12,704	-24.1
Total	498,562	508,686	10,124	2.0
Byproduct output				
Softwood	141,047	141,578	531	0.4
Hardwood	10,757	8,968	-1,789	-16.6
Total	151,804	150,546	-1,258	-0.8
Total output				
Softwood	586,796	610,155	23,359	4.0
Hardwood	63,570	49,077	-14,493	-22.8
Total	650,366	659,232	8,866	1.4

— = negligible.

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (7,104,000 cubic feet in 1999 and 4,787,000 cubic feet in 2003).

Table A.19—Output of industrial products by product and species group, Georgia, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	- - - - - - - *thousand cubic feet* - - - - - - -			*percent*
Saw logs				
Softwood	446,881	375,705	-71,176	-15.9
Hardwood	61,768	65,422	3,654	5.9
Total	508,649	441,127	-67,522	-13.3
Veneer logs				
Softwood	59,547	56,986	-2,561	-4.3
Hardwood	15,858	11,488	-4,370	-27.6
Total	75,405	68,474	-6,931	-9.2
Pulpwood[a]				
Softwood	431,017	457,619	26,602	6.2
Hardwood	162,535	111,277	-51,258	-31.5
Total	593,552	568,896	-24,656	-4.2
Composite panels				
Softwood	39,996	45,373	5,377	13.4
Hardwood	6,176	2,365	-3,811	-61.7
Total	46,172	47,738	1,566	3.4
Other industrial				
Softwood	20,005	26,264	6,259	31.3
Hardwood	758	335	-423	-55.8
Total	20,763	26,599	5,836	28.1
All industrial				
Softwood	997,446	961,947	-35,499	-3.6
Hardwood	247,095	190,907	-56,188	-22.7
Total	1,244,541	1,152,854	-91,687	-7.4
Byproduct output				
Softwood	396,075	348,174	-47,901	-12.1
Hardwood	78,014	68,460	-9,554	-12.2
Total	474,089	416,634	-57,455	-12.1
Total output				
Softwood	1,393,521	1,310,121	-83,400	-6.0
Hardwood	325,109	259,367	-65,742	-20.2
Total	1,718,630	1,569,488	-149,142	-8.7

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (15,947,000 cubic feet in 1999 and 10,473,000 cubic feet in 2003).

Table A.20—Output of industrial products by product and species group, Kentucky, 1999 and 2003

Product and species group	Year			
	1999	2003	Change	Change
	- - - - - - thousand cubic feet - - - - - -			*percent*
Saw logs				
Softwood	5,855	4,642	-1,213	-20.7
Hardwood	173,019	141,027	-31,992	-18.5
Total	178,874	145,669	-33,205	-18.6
Veneer logs				
Softwood	88	88	0	—
Hardwood	7,472	5,310	-2,162	-28.9
Total	7,560	5,398	-2,162	-28.6
Pulpwood[a]				
Softwood	2,162	3,143	981	45.4
Hardwood	17,322	18,240	918	5.3
Total	19,484	21,383	1,899	9.7
Other industrial				
Softwood	2,575	2,571	-4	-0.2
Hardwood	11,425	11,563	138	1.2
Total	14,000	14,134	134	1.0
All industrial				
Softwood	10,680	10,444	-236	-2.2
Hardwood	209,238	176,140	-33,098	-15.8
Total	219,918	186,584	-33,334	-15.2
Byproduct output				
Softwood	3,797	2,698	-1,099	-28.9
Hardwood	104,668	86,944	-17,724	-16.9
Total	108,465	89,642	-18,823	-17.4
Total output				
Softwood	14,477	13,142	-1,335	-9.2
Hardwood	313,906	263,084	-50,822	-16.2
Total	328,383	276,226	-52,157	-15.9

— = negligible.

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (1,156,000 cubic feet in 1999 and 1,980,000 cubic feet in 2003).

Table A.21—Output of industrial products by product and species group, Louisiana, 1999 and 2002

Product and species group	Year		Change	Change
	1999	2002		
	thousand cubic feet			*percent*
Saw logs				
Softwood	229,859	230,394	535	0.2
Hardwood	39,201	42,609	3,408	8.7
Total	269,060	273,003	3,943	1.5
Veneer logs				
Softwood	147,777	136,832	-10,945	-7.4
Hardwood	695	641	-54	-7.8
Total	148,472	137,473	-10,999	-7.4
Pulpwood[a]				
Softwood	246,672	191,096	-55,576	-22.5
Hardwood	102,436	75,219	-27,217	-26.6
Total	349,108	266,315	-82,793	-23.7
Other industrial				
Softwood	24,037	31,369	7,332	30.5
Hardwood	11,557	12,176	619	5.4
Total	35,594	43,545	7,951	22.3
All industrial				
Softwood	648,345	589,691	-58,654	-9.0
Hardwood	153,889	130,645	-23,244	-15.1
Total	802,234	720,336	-81,898	-10.2
Byproduct output				
Softwood	247,175	238,447	-8,728	-3.5
Hardwood	37,899	36,235	-1,664	-4.4
Total	285,074	274,682	-10,392	-3.6
Total output				
Softwood	895,520	828,138	-67,382	-7.5
Hardwood	191,788	166,880	-24,908	-13.0
Total	1,087,308	995,018	-92,290	-8.5

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (3,743,000 cubic feet in 1999 and 3,743,000 cubic feet in 2002).

Table A.22—Output of industrial products by product and species group, group, Mississippi, 1999 and 2002

Product and species group	Year		Change	Change
	1999	2002		
	thousand cubic feet			*percent*
Saw logs				
Softwood	402,071	419,174	17,103	4.3
Hardwood	88,495	107,028	18,533	20.9
Total	490,566	526,202	35,636	7.3
Veneer logs				
Softwood	64,920	72,261	7,341	11.3
Hardwood	5,983	5,865	-118	-2.0
Total	70,903	78,126	7,223	10.2
Pulpwood[a]				
Softwood	227,311	168,144	-59,167	-26.0
Hardwood	176,565	118,759	-57,806	-32.7
Total	403,876	286,903	-116,973	-29.0
Composite panels				
Softwood	12,683	27,061	14,378	113.4
Hardwood	11,611	7,402	-4,209	-36.3
Total	24,294	34,463	10,169	41.9
Other industrial				
Softwood	1,646	1,595	-51	-3.1
Hardwood	0	0	0	—
Total	1,646	1,595	-51	-3.1
All industrial				
Softwood	708,631	688,235	-20,396	-2.9
Hardwood	282,654	239,054	-43,600	-15.4
Total	991,285	927,289	-63,996	-6.5
Byproduct output				
Softwood	288,515	315,985	27,470	9.5
Hardwood	68,967	74,540	5,573	8.1
Total	357,482	390,525	33,043	9.2
Total output				
Softwood	997,146	1,004,220	7,074	0.7
Hardwood	351,621	313,594	-38,027	-10.8
Total	1,348,767	1,317,814	-30,953	-2.3

— = negligible.

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (3,257,000 cubic feet in 1999 and 2,964,000 cubic feet in 2002).

Table A.23—Output of industrial products by product and species group, North Carolina, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	296,290	285,904	-10,386	-3.5
Hardwood	125,778	112,758	-13,020	-10.4
Total	422,068	398,662	-23,406	-5.5
Veneer logs				
Softwood	41,748	39,980	-1,768	-4.2
Hardwood	19,310	16,574	-2,736	-14.2
Total	61,058	56,554	-4,504	-7.4
Pulpwood[a]				
Softwood	164,991	158,359	-6,632	-4.0
Hardwood	106,854	108,554	1,700	1.6
Total	271,845	266,913	-4,932	-1.8
Composite panels				
Softwood	27,450	45,444	17,994	65.6
Hardwood	8,860	7,519	-1,341	-15.1
Total	36,310	52,963	16,653	45.9
Other industrial				
Softwood	1,778	929	-849	-47.8
Hardwood	0	22	22	—
Total	1,778	951	-827	-46.5
All industrial				
Softwood	532,257	530,616	-1,641	-0.3
Hardwood	260,802	245,427	-15,375	-5.9
Total	793,059	776,043	-17,016	-2.1
Byproduct output				
Softwood	207,323	213,304	5,981	2.9
Hardwood	103,597	100,645	-2,952	-2.8
Total	310,920	313,949	3,029	1.0
Total output				
Softwood	739,580	743,920	4,340	0.6
Hardwood	364,399	346,072	-18,327	-5.0
Total	1,103,979	1,089,992	-13,987	-1.3

— = negligible.

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (7,369,000 cubic feet in 1999 and 11,934,000 cubic feet in 2003).

Table A.24—Output of industrial products by product and species group, Oklahoma, 1999 and 2002

Product and species group	Year 1999	2002	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	42,963	57,304	14,341	33.4
Hardwood	8,543	6,653	-1,890	-22.1
Total	51,506	63,957	12,451	24.2
Veneer and other industrial[a]				
Softwood	14,777	12,906	-1,871	-12.7
Hardwood	0	0	0	—
Total	14,777	12,906	-1,871	-12.7
Pulpwood[b]				
Softwood	32,508	27,706	-4,802	-14.8
Hardwood	21,226	21,212	-14	-0.1
Total	53,734	48,918	-4,816	-9.0
All industrial				
Softwood	90,248	97,916	7,668	8.5
Hardwood	29,769	27,865	-1,904	-6.4
Total	120,017	125,781	5,764	4.8
Byproduct output				
Softwood	43,073	43,690	617	1.4
Hardwood	7,594	6,387	-1,207	-15.9
Total	50,667	50,077	-590	-1.2
Total output				
Softwood	133,321	141,606	8,285	6.2
Hardwood	37,363	34,252	-3,111	-8.3
Total	170,684	175,858	5,174	3.0

— = negligible.

[a] Includes poles, posts, mulch, firewood, log homes, charcoal, and all other industrial products.

[b] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (4,553,000 cubic feet in 1999 and 3,707,000 cubic feet in 2002).

Table A.25—Output of industrial products by product and species group, South Carolina, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	- - - - - thousand cubic feet - - - - -			*percent*
Saw logs				
Softwood	209,572	207,536	-2,036	-1.0
Hardwood	32,113	27,381	-4,732	-14.7
Total	241,685	234,917	-6,768	-2.8
Veneer logs				
Softwood	46,938	34,781	-12,157	-25.9
Hardwood	7,536	6,958	-578	-7.7
Total	54,474	41,739	-12,735	-23.4
Pulpwood[a]				
Softwood	219,352	205,321	-14,031	-6.4
Hardwood	104,264	68,303	-35,961	-34.5
Total	323,616	273,624	-49,992	-15.4
Composite panels				
Softwood	1,374	17,870	16,496	1,200.6
Hardwood	74	56	-18	-24.3
Total	1,448	17,926	16,478	1,138.0
Other industrial				
Softwood	3,972	3,753	-219	-5.5
Hardwood	0	0	0	—
Total	3,972	3,753	-219	-5.5
All industrial				
Softwood	481,208	469,261	-11,947	-2.5
Hardwood	143,987	102,698	-41,289	-28.7
Total	625,195	571,959	-53,236	-8.5
Byproduct output				
Softwood	162,523	142,208	-20,315	-12.5
Hardwood	33,893	26,109	-7,784	-23.0
Total	196,416	168,317	-28,099	-14.3
Total output				
Softwood	643,731	611,469	-32,262	-5.0
Hardwood	177,880	128,807	-49,073	-27.6
Total	821,611	740,276	-81,335	-9.9

— = negligible.

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (11,055,000 cubic feet in 1999 and 2,257,000 cubic feet in 2003).

Table A.26—Output of industrial products by product and species group, Tennessee, 1999 and 2003

Product and species group	Year			
	1999	2003	Change	Change
	- - - - - thousand cubic feet - - - - -			*percent*
Saw logs				
Softwood	32,928	25,468	-7,460	-22.7
Hardwood	152,109	149,992	-2,117	-1.4
Total	185,037	175,460	-9,577	-5.2
Veneer logs				
Softwood	4,278	294	-3,984	-93.1
Hardwood	1,563	1,498	-65	-4.2
Total	5,841	1,792	-4,049	-69.3
Pulpwood				
Softwood	52,185	46,031	-6,154	-11.8
Hardwood	68,932	75,198	6,266	9.1
Total	121,117	121,229	112	0.1
Other industrial				
Softwood	10,817	13,019	2,202	20.4
Hardwood	2,431	447	-1,984	-81.6
Total	13,248	13,466	218	1.6
All industrial				
Softwood	100,208	84,812	-15,396	-15.4
Hardwood	225,035	227,135	2,100	0.9
Total	325,243	311,947	-13,296	-4.1
Byproduct output				
Softwood	20,535	20,327	-208	-1.0
Hardwood	91,808	92,657	849	0.9
Total	112,343	112,984	641	0.6
Total output				
Softwood	120,743	105,139	-15,604	-12.9
Hardwood	316,843	319,792	2,949	0.9
Total	437,586	424,931	-12,655	-2.9

Table A.27—Output of industrial products by product and species group, Texas, 1999 and 2003

Product and species group	Year			
	1999	2003	Change	Change
	thousand cubic feet			*percent*
Saw logs				
Softwood	201,055	198,832	-2,223	-1.1
Hardwood	31,779	48,263	16,484	51.9
Total	232,834	247,095	14,261	6.1
Veneer logs				
Softwood	212,737	178,935	-33,802	-15.9
Hardwood	2,366	20	-2,346	-99.2
Total	215,103	178,955	-36,148	-16.8
Pulpwood				
Softwood	126,677	161,940	35,263	27.8
Hardwood	123,686	77,836	-45,850	-37.1
Total	250,363	239,776	-10,587	-4.2
Composite panels				
Softwood	0	0	0	—
Hardwood	0	0	0	—
Total	0	0	0	—
Other industrial				
Softwood	921	2,441	1,520	165.0
Hardwood	0	0	0	—
Total	921	2,441	1,520	165.0
All industrial				
Softwood	541,390	542,148	758	0.1
Hardwood	157,831	126,119	-31,712	-20.1
Total	699,221	668,267	-30,954	-4.4
Byproduct output				
Softwood	126,436	183,775	57,339	45.4
Hardwood	40,329	93,235	52,906	131.2
Total	166,765	277,010	110,245	66.1
Total output				
Softwood	667,826	725,923	58,097	8.7
Hardwood	198,160	219,354	21,194	10.7
Total	865,986	945,277	79,291	9.2

— = negligible.

Table A.28—Output of industrial products by product and species group, Virginia, 1999 and 2003

Product and species group	Year 1999	2003	Change	Change
	- - - - - thousand cubic feet - - - - -			*percent*
Saw logs				
Softwood	115,299	108,085	-7,214	-6.3
Hardwood	130,578	121,180	-9,398	-7.2
Total	245,877	229,265	-16,612	-6.8
Veneer logs				
Softwood	13,947	8,401	-5,546	-39.8
Hardwood	5,947	8,448	2,501	42.1
Total	19,894	16,849	-3,045	-15.3
Pulpwood[a]				
Softwood	97,664	89,198	-8,466	-8.7
Hardwood	77,536	97,264	19,728	25.4
Total	175,200	186,462	11,262	6.4
Composite panels				
Softwood	31,106	44,584	13,478	43.3
Hardwood	14,552	9,125	-5,427	-37.3
Total	45,658	53,709	8,051	17.6
Other industrial				
Softwood	2,411	1,443	-968	-40.1
Hardwood	2,521	429	-2,092	-83.0
Total	4,932	1,872	-3,060	-62.0
All industrial				
Softwood	260,427	251,711	-8,716	-3.3
Hardwood	231,134	236,446	5,312	2.3
Total	491,561	488,157	-3,404	-0.7
Byproduct output				
Softwood	83,392	83,135	-257	-0.3
Hardwood	83,132	88,238	5,106	6.1
Total	166,524	171,373	4,849	2.9
Total output				
Softwood	343,819	334,846	-8,973	-2.6
Hardwood	314,266	324,684	10,418	3.3
Total	658,085	659,530	1,445	0.2

[a] Includes roundwood delivered to nonpulpmills, then chipped and sold to pulpmills (3,693,000 cubic feet in 1999 and 2,782,000 cubic feet in 2003).

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Johnson, Tony G.; Bentley, James W.; Howell, Mike. 2006. The South's timber industry—an assessment of timber product output and use, 2003. Resour. Bull. SRS–114. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 52 p.

In 2003, industrial roundwood output from the South's forests totaled 8.2 billion cubic feet, 6 percent less than in 1999. Mill byproducts generated from primary manufacturers increased 1 percent to 3.2 billion cubic feet. Almost all plant residues were used primarily for fuel and fiber products. Saw logs were the leading roundwood product at 3.7 billion cubic feet; pulpwood ranked second at 3.3 billion cubic feet; veneer logs were third at 830 million cubic feet. The number of primary processing plants declined from 2,551 in 1999 to 2,281 in 2003. Total receipts declined 5 percent to 8.3 billion cubic feet.

Keywords: FIA, pulpwood, residues, roundwood, saw logs, veneer logs, wood movement.

United States
Department of Agriculture

Forest Service

Southern
Research Station
200 WT Weaver Blvd.
Asheville, NC 28804