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# Forest Statistics for the Northern Mountains of Virginia, 1992

Tony G. Johnson



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Asheville, North Carolina 28802

**Forest Statistics for  
the Northern Mountains  
of Virginia, 1992**

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## Foreword

This report highlights the principal findings of the sixth forest survey of the Northern Mountains of Virginia. Field work began in September 1991 and was completed in November 1991. Five previous surveys, completed in 1940, 1957, 1966, 1977, and 1986, provide statistics for measuring changes and trends over the past 52 years. The primary emphasis in this report is on the changes and trends since 1986. Previously reported figures have been adjusted to provide the best estimate of change.

Periodic surveys of the forest resource are authorized by the Forest and Range-land Renewable Resources Research Act of 1978. These surveys are a continuing, nationwide undertaking by the Regional Experiment Stations of the USDA Forest Service. In Florida, Georgia, North Carolina, South Carolina, and Virginia, these surveys are administered by the Forest Inventory and Analysis (Forest Survey) Research Unit at the Southeastern Forest Experiment Station, with headquarters in Asheville, NC. The primary objective of the survey is to periodically inventory and evaluate all forest and related resources. These multiresource data help provide a basis for formulating forest policies and programs and for the orderly development and use of the resources. This report

deals only with the extent and condition of forest land, associated timber volumes, and rates of timber growth and removals.

The 14-county area covered by this report is one of five survey units in Virginia. Similar reports, USDA Forest Service Resource Bulletins SE-122, SE-124, and SE-127, have been issued for the Coastal Plain, Southern Piedmont, and Northern Piedmont of Virginia. A comparable report for the Southern Mountain unit will be issued as the statewide inventory progresses. When completed, the inventory will provide updated statistics on the timber resource for all of Virginia.

The Southeastern Station gratefully acknowledges the cooperation and assistance provided by the Virginia Division of Forestry in collecting field data. Appreciation is also expressed for the excellent cooperation of other public agencies, forest industry, and other private landowners in providing information and access to the sample locations.



Noel D. Cost  
Project Leader



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Trends in timberland area since 1986, as shown in this report, reflect a 1.1-percent upward adjustment in the acreage of timberland for 1986. These revisions were necessary due to the incomplete and poor-quality aerial photography and to the associated difficulties in photo interpretation of land use in 1986. For those desiring more information about these changes, please contact the FIA staff at:

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Since 1986 in the Northern Mountains of Virginia--

e area of timberland declined by 18,000 acres, or less than 1 percent. Timberland currently accounts for 2.5 million acres, or 59 percent of the total land area in this 14-county region of Virginia. Land use changes occurred on nearly 73,000 acres. More than 45,000 acres of timberland were diverted to other land uses, while 27,500 acres were added to the timberland base. Of the acreage diverted, more than 43,000 acres, or 95 percent, were reclassified as reserved timberland.

• area of timberland owned by nonindustrial private forest (NIPF) landowners increased more than 27,000 acres, or by 2 percent. Within the NIPF category, farmer-owned timberland declined nearly 8 percent to 376,000 acres. In contrast to farm ownership, timberland held by other individuals increased 5 percent to 848,000 acres, and timberland held by corporations that do not manufacture forest products increased 10 percent to 191,000 acres. NIPF owners currently control 1.4 million acres, or 56 percent of the timberland in the region. Timber-

land owned or leased by forest industry dropped 19 percent to 71,000 acres. The area of timberland in public ownership declined nearly 3 percent and currently totals 1.1 million acres. Forty-one percent of the region's timberland is publicly owned. Ninety-two percent of the publicly owned timberland is in the George Washington and Jefferson National Forests. The proportion of timberland in public ownership is larger than for any other survey unit in the Southeast.

. area of timberland classified as a hardwood forest type declined 102,000 acres, or by 5 percent. However, at 1.9 million acres, hardwood forest types make up three-fourths of the timberland in this mountainous region. Area of oak-hickory--the predominant forest type in the region--fell 20 percent to 1.4 million acres. In contrast, acreage in oak-pine increased 35 percent to 386,000 acres. Area in softwood forest types declined 7 percent to 231,000 acres.

. nearly 10,000 acres were harvested annually and retained in timberland. This average represents a 3-percent increase over that for 1977 to 1986. Of the harvested acres, 62 percent were on NIPF land and the remaining 38 percent on public land. Hardwood stands accounted for 69 percent of the total annual harvest. Pine stands make up the remaining 31 percent of annually harvested acreage. In addition to final harvest, some form of partial harvest or intermediate cutting occurred on 10,000 acres annually. Natural disturbances such as insects, disease, weather, and fire damaged 63,000 acres annually.

. the annual rate of stand regeneration by both natural and artificial means increased 11 percent from 9,000 to 10,000 acres per year. Natural regeneration accounted for 92 percent of the newly regenerated stands, or 9,500 acres per year. NIPF land accounted for 64 percent of the regenerated acreage, and public land accounted for the remaining

36 percent. More than 86 percent of the regenerated stands are currently classified as hardwood or oak-pine stands.

. average basal area of live trees 5.0 inches d.b.h. and larger increased 2 percent from 83 to 85 square feet per acre. Merchantable net volume per acre of softwoods and hardwoods combined currently averages 1,875 cubic feet per acre and includes nearly 5,100 board feet of sawtimber. Stands greater than 51 years of age account for 64 percent, or 1.6 million acres, of the timberland in the region. Stands dominated by sawtimber size trees increased 3 percent to 1.5 million acres, or 58 percent of the region's total timberland area. Acreage in stands classed as fully stocked increased 8 percent to 0.7 million acres, while acreage in medium-stocked stands increased 4 percent to 1.3 million acres. Together, fully stocked and medium-stocked stands make up 79 percent of the total timberland area. Acreage in poorly stocked stands fell 19 percent to 0.5 million acres, approximately 21 percent of the timberland area.

• volume of hardwood growing stock increased more than 7 percent from 3.3 to 3.6 billion cubic feet. With the exception of the 6- and 16-inch diameter classes, hardwood growing-stock volume increased across all diameter classes. Volume in trees 17.0 inches d.b.h. and larger increased nearly 18 percent to 1.0 billion cubic feet. These size classes account for 29 percent of the hardwood growing stock. Most of the major hardwood species registered significant gains in the region. Collectively, the oaks, which account for 71 percent of the hardwood volume, increased 7 percent to 2.5 billion cubic feet. Yellow-poplar volume increased 16 percent to 273 million cubic feet. Hardwood volume on NIPF land was up 6 percent to 1.9 billion cubic feet, and it accounts for 54 percent of the hardwood volume in the region. Hardwood

volume on publicly owned timberland increased more than 10 percent to 1.6 billion cubic feet, making up 44 percent of the hardwood volume in the region. In contrast, hardwood volume on forest industry land fell 12 percent to 87 million cubic feet. Volume of hardwood sawtimber was up 11 percent to 10.5 billion board feet.

• volume of softwood growing stock increased nearly 8 percent from 658 to 710 million cubic feet. With the exception of the 6-inch diameter class, softwood volume increased across all diameter classes. Collectively, the 8-, 10-, and 12-inch diameter classes increased 4 percent and accounted for more than 53 percent of the total softwood volume. Volume of eastern white pine, which accounts for 29 percent of the softwood volume, rose 26 percent to 203 million cubic feet. Volume of Virginia pine declined 3 percent to 164 million cubic feet, whereas that of pitch pine increased nearly 6 percent to 163 million cubic feet. Softwood volume on NIPF land was up almost 6 percent to 396 million cubic feet. On public land, softwood volume increased 13 percent to 301 million cubic feet. Volume of softwood sawtimber rose 16 percent to 2.4 billion board feet.

• net annual growth of hardwood growing stock declined more than 6 percent from 76 to 71 million cubic feet. Hardwood net growth declined nearly 15 percent on public timberland and by almost 1 percent on NIPF land. As in other mountainous regions, this drop in hardwood growth can be attributed to an aging resource and a reduction in overall growth due to rising mortality. Despite the decline, across all ownerships, hardwood net growth still exceeds removals by 136 percent. In contrast to hardwoods, softwood net annual growth increased 15 percent to 14 million cubic feet. Almost three-fourths of this increase occurred on NIPF land, where softwood net growth rose 19

percent to 8 million cubic feet. Across all ownerships, softwood net growth exceeds removals by 162 percent. Net annual growth for both hardwoods and softwoods combined included 355 million board feet of sawtimber, up 3 percent since 1985.

• annual removals of hardwood growing stock increased 50 percent from 20 to 30 million cubic feet. Fifty-five percent of the hardwood removals came from NIPF timberland, 40 percent from publicly owned timberland, and the remaining 5 percent from forest industry land. Increases in hardwood removals were recorded on all ownership categories; however, most of the increase, nearly 96 percent, was recorded on publicly owned land. Hardwood removals were up substantially on public land due to the reclassification of 43,000 acres of timberland to a reserved status. Inventory volume on these acres is treated as removals from timberland and accounted for 38 percent of the annual hardwood removals in this ownership category. Hardwoods accounted for 85 percent of the total growing-stock

removals. Softwood growing-stock removals increased 62 percent to 5 million cubic feet. Declines in removals from timberland owned by public and forest industry were more than offset by a **136-percent** increase on NIPF timberland. The NIPF category accounted for 94 percent of the softwood removals in the region. Annual removals for hardwoods and softwoods combined included 127 million board feet of sawtimber, up 56 percent since 1985.

. annual mortality of hardwood growing stock increased almost 25 percent from 20 to 25 million cubic feet. Hardwood mortality was evenly split between NIPF and public land; it was up 39 percent on NIPF land and 24 percent on public land. Hardwood mortality reduced gross growth by 26 percent and included 74 million board feet of sawtimber. Annual mortality of softwood growing stock was up almost 4 percent to 6 million cubic feet. About 68 percent of the softwood mortality occurred on NIPF land. Softwood mortality reduced gross growth 32 percent and included 14 million board feet of sawtimber.

## How the Inventory is Made

The method of the inventory is a sampling procedure designed to provide reliable statistics primarily at the State and Survey Unit levels. Individual county statistics are presented so that any combination of counties may be added together until a total is large enough to meet the desired degree of reliability. Procedures were as follows:

1. Initial estimates of forest and nonforest areas were based on the classification of 10,656 sample clusters systematically spaced on the latest aerial photographs available. A subsample of 946 of the 16-point clusters was ground checked, and a linear regression was fitted to the data to develop the relationship between the photo and ground classification of the subsample. This procedure provides a means for adjusting the initial estimates of area for change in land use since date of photography and for photo misclassification.

2. Estimates of timber volume and forest classification were based on measurements recorded at 575 ground sample locations systematically distributed on timberland. The plot design at each location was based on a cluster of 10 points. In most cases, variable plots, established by using a basal-area factor of 37.5 square feet per acre, were systematically spaced within a single forest condition at 5 of the 10 cluster points. Trees less than 5 inches d.b.h. were tallied on a fixed-radius plot around each point center.

3. Equations prepared from detailed measurements collected on standing trees in this Survey Unit, and similar measurements taken throughout the Southeast, were used to compute the volume of individual tally trees. A mirror caliper and sectional aluminum poles were used to obtain the additional measurements required to construct volume equations.

4. Felled trees were measured at six active cutting operations. These data will supplement the standing-tree volume data and be used to generate utilization factors for product and species groups. Forest biomass estimates were made from equations developed by the Utilization of Southern Timber Research Work Unit of the Southeastern Forest Experiment Station in Athens, GA.

5. Estimates of growth, removals, and mortality were determined from the remeasurement of 583 permanent sample plots established in the fifth survey.

6. Ownership information was collected from correspondence, public records, and local contacts. In those counties where the sample missed a particular ownership class, temporary sample plots were added.

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

## Reliability of the Data

Statistical analysis of these data indicates the following sampling errors in terms of one standard error (two times out of three):

	<u>Percent</u>
Per million acres of timberland . . . . .	1.01
Per billion cubic feet of growing stock. . . . .	5.23
Per billion cubic feet of net annual growth. . . . .	0.84
Per billion cubic feet of annual removals. . . . .	3.32

Sampling errors for county and unit **totals,<sup>a</sup>** in terms of one standard error, Northern Mountains of Virginia, **1992**

County	Timberland area	Cubic-foot volume of growing stock		
		Inventory	Growth	Removals
		<u>Sampling error<sup>b</sup></u>		
Alleghany	<b>1.05</b>	<b>6.85</b>	<b>7.49</b>	<b>79.66</b>
Augusta	<b>2.16</b>	<b>8.61</b>	<b>8.61</b>	<b>42.67</b>
Bath	<b>1.13</b>	<b>6.46</b>	<b>6.68</b>	<b>47.25</b>
Botetourt	<b>1.74</b>	<b>10.45</b>	<b>10.27</b>	<b>44.11</b>
Clarke	<b>6.42</b>	<b>16.22</b>	<b>12.94</b>	--
Craig	<b>1.64</b>	<b>9.04</b>	<b>9.14</b>	<b>84.99</b>
Frederick	<b>3.32</b>	<b>9.26</b>	<b>10.85</b>	<b>73.90</b>
Highland	<b>2.02</b>	<b>8.73</b>	<b>10.29</b>	<b>81.20</b>
Page	<b>3.73</b>	<b>11.76</b>	<b>12.78</b>	--
Roanoke	<b>2.89</b>	<b>14.09</b>	<b>16.29</b>	<b>77.43</b>
Rockbridge	<b>1.92</b>	<b>7.81</b>	<b>9.69</b>	<b>45.50</b>
Rockingham	<b>2.38</b>	<b>8.08</b>	<b>8.45</b>	<b>53.20</b>
Shenandoah	<b>2.47</b>	<b>8.88</b>	<b>13.96</b>	<b>100.03</b>
Warren	<b>5.52</b>	<b>19.30</b>	<b>23.42</b>	<b>63.44</b>
Total	<b>.60</b>	<b>2.52</b>	<b>2.87</b>	<b>17.65</b>

<sup>a</sup>Sampling error of breakdowns of county and unit totals may be computed with the following formula:

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

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

SE = Specified sampling error in table.

<sup>b</sup>By random-sampling formula (in percent).

## Definitions of Terms

**Allowable cut.** The volume of timber that could be cut on timberland during a given period under specified management plans aimed at sustained production of timber products.

**Basal area.** The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed as square feet of basal area per acre.

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

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

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

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

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

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

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

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

**Bureau of Land Management lands.** Federal lands administered by the Bureau of Land Management.

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

**Commercial forest land.**(see: Timberland).

**Commercial species.** Tree species conventionally regarded as being able to develop into trees suitable for the manufacture of industrial timber products. Species that typically exhibit small size, poor form, or inferior quality are excluded.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Oak-pine. Forests in which hardwoods (usually upland oaks) constitute a plurality of the stocking but in which pines account for 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar.)

Oak-hickory. Forests in which upland oaks or hickory, singly or in combination, constitute a plurality of the stocking, except where pines account for 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include yellow-poplar, elm, maple, and black walnut.)

Oak-gum-cypress. Bottom-land forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, constitute a plurality of the stocking, except where pines account for 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Elm-ash-cottonwood. Forests in which elm, ash, or cottonwood, singly or in combination, constitute a plurality of the stocking. (Common associates include willow, sycamore, beech, and maple.)

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

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

Gross growth. Annual increase in merchantable volume of trees in the absence of cutting and mortality. (Gross growth includes survivor growth, ingrowth,

growth on ingrowth, growth on removals prior to removal, and growth on mortality prior to death.)

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

Desirable tree. A tree that qualifies as growing stock and has no serious defects in quality limiting present or prospective use; is of relatively high vigor (30 percent or more live crown ratio); is compatible with the site and physiographic class; has a total board-foot loss not to exceed 15 percent in softwoods or 25 percent in hardwoods as a result of severe sweep, crook, or lean; and has a relatively clear bole.

Acceptable tree. A tree that qualifies as growing stock but does not meet the minimum requirements to qualify as a desirable tree. Included are sawtimber-size trees that do not contain a 12-foot saw log because of excessive, natural taper in the butt log but have the potential to produce a 12-foot saw log as diameter increases.

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

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

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

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

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

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

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

Industrial wood. All roundwood products except fuelwood.

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

Inhibiting vegetation. Cover sufficiently dense to prevent the establishment of tree seedlings.

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

Live trees. All trees 1.9 inch d.b.h. and larger which are not dead at the time of inventory.

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

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

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

Logging slash. The unmerchantable portion of growing-stock trees (including saplings) plus all cull trees 1.0 inch d.b.h. and larger cut or destroyed during logging operations and not used.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Quality class. A classification of saw-timber volume by log or tree grades.

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

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

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

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

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

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

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

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

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

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

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

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

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

Seedlings. Live trees of commercial species less than 1.0 inch d.b.h. that are expected to survive and develop.

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

Class 1. 165 or more cubic feet per acre.

Class 2. 120 to 164 cubic feet per acre.

Class 3. 85 to 119 cubic feet per acre.

Class 4. 50 to 84 cubic feet per acre.

Class 5. 20 to 49 cubic feet per acre.

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

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

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

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

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

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

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

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

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

Fully stocked. 100 percent or more stocking.

Medium stocked. 60 to 99 percent stocking.

Poorly stocked. Less than 60 percent stocking.

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

Timberland. Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, not currently developed for nonforest use, capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization by legislative action.

Timber products. Roundwood products and byproducts.

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

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

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

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

Unproductive forest land. (see: Woodland).

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

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

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

## Stocking Standard

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

### Conversion factors

Cubic feet of wood per average cord  
(excluding bark)

D.b.h. class	All species	Pine	Other softwood	Hardwood
6	60.6	61.0	68.2	60.0
8	68.8	68.1	76.0	68.4
10	73.7	73.1	81.4	73.4
12	76.8	76.7	85.2	76.4
14	79.0	79.4	88.2	78.4
16	80.6	81.6	90.4	79.8
18	81.5	83.3	92.3	80.8
20	82.3	84.8	93.8	81.5
22	82.8	86.0	95.1	82.1
<b>24+</b>	83.9	87.9	97.4	83.0
Average	75.6	73.0	84.5	75.3

### Metric equivalents of units used in this report

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

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County Tables

The county tables are intended for use in compiling forest resource estimates for groups of counties. Because the sampling procedure used by the Forest Survey was intended primarily to furnish inventory data for the survey unit as a whole, individual county estimates have limited and variable accuracy. As county totals are broken down by various subdivisions, the possibility of error increases and is greatest for the smallest items. The order of this increase can be computed with the formula on page 5.

Table 1--Area, by county and land class, Northern Mountains of Virginia, 1992

County	All land <sup>a</sup>	Forest land			Nonforest land <sup>b</sup>	
		Total	Timberland	Woodland		Reserved timberland
				<u>Acres</u>		
Alleghany	290,317	254,026	249,199	1,010	3,817	36,291
Augusta	643,097	346,217	291,118	13,736	41,363	296,880
Bath	343,651	306,266	287,742	4,874	13,650	37,385
Botetourt	348,550	253,975	250,882	58	3,035	94,575
Clarke	114,138	39,987	37,876	--	2,111	74,151
Craig	211,085	179,276	162,684	13	16,579	31,809
Frederick	271,532	129,262	128,921	341	--	142,270
Highland	266,112	196,294	196,003	291	--	69,818
Page	200,346	121,531	81,722	2,644	37,165	78,815
Roanoke	197,472	110,833	107,085	--	3,748	86,639
Rockbridge	389,382	253,650	241,345	2,211	10,094	135,732
Rockingham	557,376	306,177	253,579	11,210	41,388	251,199
Shenandoah	327,833	191,246	184,362	6,884	--	136,587
Warren	139,053	78,281	64,311	108	13,862	60,772
<b>Total</b>	<b>4,299,944</b>	<b>2,767,021</b>	<b>2,536,829</b>	43,380	186,812	<b>1,532,923</b>

<sup>a</sup>From U.S. Bureau of the Census, 1980.

<sup>b</sup>Includes 15,414 acres of water according to Forest Survey standards of area classification, but defined by the Bureau of Census as land.

Table 2--Area of timberland, by county and ownership class, Northern Mountains of Virginia, 1992

county	All ownerships	Ownership class							
		National forest	Miscellaneous Federal	State	County and municipal	Forest industry <sup>a</sup>	Other private		
							Farmer	Corporate	Individual
Acres									
Al leghany	249,199	140,535	2,000	125	215	13,427	13,271	17,695	61,931
Augusta	291,118	148,670	--	11,969	420	--	35,016	20,009	75,034
Bath	287,742	156,860	--	9,735	94	440	38,907	31,126	50,580
Botetourt	250,882	76,065	--	10	6,899	39,216	39,939	22,188	66,565
Clarke	37,876	--	--	86	198	--	4,699	--	32,893
Craig	162,684	97,617	--	33	8	397	32,315	--	32,314
Frederick	128,921	4,297	--	43	227	337	44,006	16,002	64,009
Highland	196,003	57,432	--	13,994	20	7,249	31,583	4,512	81,213
Page	81,722	26,803	--	90	246	348	23,728	--	30,507
Roanoke	107,085	3,069	53	7,628	5,882	1,892	24,600	9,840	54,121
Rockbridge	241,345	54,576	--	23,086	1,732	6,804	31,942	13,689	109,516
Rockingham	253,579	124,722	--	212	223	509	18,950	28,425	80,538
Shenandoah	184,362	67,209	--	53	273	167	17,948	17,948	80,764
Warren	64,311	5,117	1,738	285	677	550	18,648	9,324	27,972
<b>Total</b>	<b>2,536,829</b>	<b>962,972</b>	<b>3,791</b>	<b>67,349</b>	<b>17,114</b>	<b>71,336</b>	<b>375,552</b>	<b>190,758</b>	<b>847,957</b>

<sup>a</sup>Includes 0 acres of other private land under long-term lease.

Table 3--Area of timberland, by county and forest-type group, Northern Mountains of Virginia, 1992

County	All type groups	Forest-type group								
		White pine- hemlock	Spruce- fir	Longleaf- slash	Loblolly- shortleaf	Oak- pine	Oak- hickory	Oak-gum- cypress	Elm-ash- cottonwood	Maple-beech- birch
Acres										
Al leghany	249,199	4,846	--	--	17,049	40,435	178,021	--	--	8,848
Augusta	291,118	--	--	--	14,504	46,375	230,239	--	--	--
Bath	287,742	7,782	--	--	12,263	49,642	218,055	--	--	--
Botetourt	250,882	8,911	--	--	26,736	27,593	183,204	--	4,438	--
Clarke	37,876	--	--	--	--	--	37,876	--	--	--
Craig	162,684	9,498	--	--	23,875	37,990	91,321	--	--	--
Frederick	128,921	4,000	--	--	4,001	24,004	96,916	--	--	--
Highland	196,003	13,536	--	--	4,418	35,718	124,379	--	--	17,952
Page	81,722	--	--	--	10,170	3,390	68,162	--	--	--
Roanoke	107,085	--	--	--	19,681	25,603	61,801	--	--	--
Rockbridge	241,345	--	--	--	18,222	36,531	177,466	--	4,563	4,563
Rockingham	253,579	4,157	--	--	14,212	32,002	189,576	--	9,475	4,157
Shenandoah	184,362	8,440	--	--	4,487	22,434	144,514	--	4,487	--
Warren	64,311	--	--	--	--	4,662	50,325	--	9,324	--
<b>Total</b>	<b>2,536,829</b>	<b>61,170</b>	<b>--</b>	<b>--</b>	<b>169,618</b>	<b>386,379</b>	<b>1,851,855</b>	<b>--</b>	<b>32,287</b>	<b>35,520</b>

**Table 4--Area of timberland, by county and stand-size class, Northern Mountains of Virginia, 1992**

county	All stands	Stand-size class			Nonstocked areas
		Sawtimber	Poletimber	Sapling-seedling	
		<u>Acres</u>			
Alleghany	249,199	138,726	90,274	20,199	--
Augusta	291,118	131,763	100,788	58,567	--
Bath	287,742	170,791	92,331	24,620	--
Botetourt	250,882	130,356	62,226	58,300	--
Clarke	37,876	32,979	4,699	198	--
Craig	162,684	85,507	67,680	9,497	--
Frederick	128,921	76,351	40,342	12,228	--
Highland	196,003	120,732	61,809	8,950	4,512
Page	81,722	50,417	31,059	246	--
Roanoke	107,085	60,932	43,084	3,069	--
Rockbridge	241,345	132,371	79,879	29,095	--
Rockingham	253,579	187,519	48,627	17,433	--
Shenandoah	184,362	106,525	69,124	8,713	--
Warren	64,311	42,698	16,274	5,339	--
<b>Total</b>	<b>2,536,829</b>	<b>1,467,667</b>	<b>808,196</b>	<b>256,454</b>	<b>4,512</b>

**Table S--Area of timberland, by county and site class, Northern Mountains of Virginia, 1992**

County	All classes	Site class (cubic feet per acre per year)				
		>164	120-164	85-119	50-84	20-49
		<u>Acres</u>				
Alleghany	249,199	--	4,846	9,270	112,509	122,574
Augusta	291,118	--	--	3,626	150,334	137,158
Bath	287,742	--	--	21,021	145,026	121,695
Botetourt	250,882	4,474	8,875	44,451	109,471	83,611
Clarke	37,876	--	4,699	9,398	18,994	4,785
Craig	162,684	--	--	14,115	91,147	57,422
Frederick	128,921	--	4,001	8,000	68,873	48,047
Highland	196,003	--	4,418	17,859	108,140	65,586
Page	81,722	--	--	3,390	43,241	35,091
Roanoke	107,085	4,920	4,920	6,812	58,950	31,483
Rockbridge	241,345	4,548	--	41,053	136,391	59,353
Rockingham	253,579	--	4,157	18,369	91,057	139,996
Shenandoah	184,362	--	4,487	8,440	94,884	76,551
Warren	64,311	--	--	9,324	45,378	9,609
<b>Total</b>	<b>2,536,829</b>	<b>13,942</b>	<b>40,403</b>	<b>215,128</b>	<b>1,274,395</b>	<b>992,961</b>

**Table 6--Area of timberland, by county and stocking class of growing-stock trees, Northern Mountains of Virginia, 1992**

County	All classes	Stocking class (percent) <sup>a</sup>				
		>130	100-130	60-99	16.7-59	<16.7
		<u>Acres</u>				
Alleghany	249,199	--	54,551	158,842	32,449	3,357
Augusta	291,118	3,626	59,896	133,640	78,949	15,007
Bath	287,742	8,372	63,325	179,754	36,291	--
Botetourt	250,882	8,911	63,742	120,954	57,275	
Clarke	37,876	--	14,183	18,796	4,897	
Craig	162,684	24,139	43,300	71,369	23,876	--
Frederick	128,921	4,001	20,381	76,307	28,232	--
Highland	196,003	17,860	80,894	79,275	13,462	4,512
Page	81,722	--	32,568	21,237	27,917	--
Roanoke	107,085	--	19,681	70,752	16,652	
Rockbridge	241,345	4,548	38,769	150,557	47,471	--
Rockingham	253,579	4,157	39,737	138,886	66,062	4,737
Shenandoah	184,362	12,927	41,723	90,123	39,589	--
Warren	64,311	--	15,276	25,048	19,325	4,662
<b>Total</b>	<b>2,536,829</b>	<b>88,541</b>	<b>588,026</b>	<b>1,335,540</b>	<b>492,447</b>	<b>32,275</b>

<sup>a</sup>See stocking standards on page 13.

Table 7--Volume of growing stock and sawtimber on timberland, by county and species group, Northern Mountains of Virginia, 1992

County	Growing stock					Sawtimber				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand cubic feet<sup>a</sup></u>					<u>Thousand board feet</u>				
Alleghany	382,121	42,842	18,557	35,098	285,624	<b>1,080,683</b>	93,235	72,359	104,267	810,822
Augusta	421,685	65,632	21,886	31,454	302,713	<b>1,160,740</b>	241,292	66,899	71,547	781,002
Bath	521,754	44,360	25,338	54,351	397,705	<b>1,534,105</b>	130,710	81,569	119,147	<b>1,202,679</b>
Botetourt	403,423	38,207	27,066	99,977	238,173	<b>1,347,672</b>	110,502	136,214	408,919	692,037
Clarke	93,396	--	--	40,809	52,587	364,188	--	--	175,182	189,006
Craig	297,107	64,064	18,625	9,641	204,777	763,452	219,250	73,797	12,835	457,570
Frederick	213,952	13,068	12,635	36,925	151,324	660,288	35,681	46,616	83,836	494,155
Highland	389,841	15,291	44,036	63,981	266,533	<b>1,212,280</b>	25,698	188,471	184,520	813,591
Page	140,902	16,180	5,567	15,430	103,725	440,413	55,289	26,923	59,209	298,992
Roanoke	172,440	32,338	20,020	19,484	100,598	474,955	78,670	83,887	46,080	266,318
Rockbridge	391,142	35,777	24,721	61,725	268,919	<b>1,184,042</b>	117,944	90,264	179,085	796,749
Rockingham	433,406	21,860	42,143	54,324	315,079	<b>1,452,968</b>	70,848	138,547	146,172	<b>1,097,401</b>
Shenandoah	321,049	36,575	16,030	40,992	227,452	932,952	126,226	74,246	90,123	642,357
Warren	95,974	5,711	1,509	19,864	68,890	298,465	11,618	5,599	91,052	190,196
Total	<b>4,278,192</b>	431,905	278,133	584,055	<b>2,984,099</b>	<b>12,907,203</b>	<b>1,316,963</b>	<b>1,085,391</b>	<b>1,771,974</b>	<b>8,732,875</b>

<sup>a</sup>Factors for converting to cords are shown on page 13.

Table 8--Average net annual growth of growing stock and sawtimber on timberland, by county and species group, Northern Mountains of Virginia, 1986-1991

County	Growing stock					Sawtimber				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand cubic feet</u>					<u>Thousand board feet</u>				
Alleghany	7,563	887	581	961	5,134	25,779	3,724	2,429	2,500	17,126
Augusta	7,948	651	805	826	5,666	33,630	3,892	3,544	2,210	23,984
Bath	9,596	544	596	1,528	6,928	37,229	2,718	4,420	3,568	26,523
Botetourt	8,655	534	485	2,836	4,800	41,372	3,730	3,511	12,411	21,720
Clarke	1,990	--	--	1,087	903	9,272	--	--	5,477	3,795
Craig	5,604	702	447	314	4,141	22,594	5,409	3,523	432	13,230
Frederick	4,196	190	226	1,218	2,562	20,229	996	1,347	3,446	14,440
Highland	7,630	189	1,588	1,207	4,646	31,168	966	4,363	4,144	21,695
Page	2,491	239	207	290	1,755	12,242	1,496	598	1,787	8,361
Roanoke	4,988	747	456	966	2,819	19,214	5,100	2,777	1,326	10,011
Rockbridge	9,000	534	832	2,230	5,404	42,290	3,341	3,720	10,452	24,777
Rockingham	7,442	135	1,485	1,296	4,526	28,616	1,060	4,477	3,800	19,279
Shenandoah	5,422	341	205	1,347	3,529	22,631	3,334	1,348	2,751	15,198
Warren	2,137	37	31	688	1,381	8,624	346	421	2,179	5,678
Total	84,662	5,730	7,944	16,794	54,194	354,890	36,112	36,478	56,483	225,817

Table 9--Average annual removals of growing stock and sawtimber on timberland, by county and species group, Northern Mountains of Virginia, 1986-1991

County	Growing stock					Sawtimber				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand cubic feet</u>					<u>Thousand board feet</u>				
Alleghany	965	226	--	260	479	2,236	504	--	--	1,732
Augusta	3,934	179	--	24a	3,507	9,754	326	--	329	9,099
Bath	3,764	--	--	787	2,977	11,956	--	--	2,527	9,429
Botetourt	7,118	770	207	2,530	3,611	26,615	1,648	869	11,612	12,486
Clarke	--	--	--	--	--	--	--	--	--	--
Craig	1,206	1,012	--	--	194	6,453	5,434	--	--	1,019
Frederick	1,890	--	--	--	1,890	10,248	--	--	--	10,248
Highland	2,252	--	201	638	1,413	10,917	--	1,217	2,988	6,712
Page	--	--	--	--	--	--	--	--	--	--
Roanoke	2,017	--	--	310	1,707	4,997	--	--	1,406	3,591
Rockbridge	5,625	1,563	--	710	3,352	21,083	3,849	--	2,695	14,539
Rockingham	3,216	--	539	272	2,405	13,572	--	3,084	1,208	9,280
Shenandoah	101	--	--	--	101	305	--	--	--	305
Warren	3,178	527	--	387	2,264	9,206	1,498	--	1,838	5,870
<b>Total</b>	<b>35,266</b>	<b>4,277</b>	<b>947</b>	<b>6,142</b>	<b>23,900</b>	<b>127,342</b>	<b>13,259</b>	<b>5,170</b>	<b>24,603</b>	<b>84,310</b>

Unit Tables

Table 10--Area of timberland, by forest type and ownership class, Northern Mountains of Virginia, 1992

Forest type	All ownerships	Ownership class				
		National forest	Other public	Forest industry	Forest <b>industry-</b> leased	Other private
		<u>Acres</u>				
Softwood types						
White pine-hemlock	61,170	22,311	--	--	--	38,859
Spruce-fir	--	--	--	--	--	--
<b>Longleaf</b> pine	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--
Loblolly pine	--	--	--	--	--	--
Shortleaf pine	--	--	--	--	--	--
Virginia pine	60,149	8,966	--	3,357	--	47,826
Sand pine	--	--	--	--	--	--
Eastern <b>redcedar</b>	13,438	--	--	--	--	13,438
Pond pine	--	--	--	--	--	--
Spruce pine	--	--	--	--	--	--
Pitch pine	48,190	26,818	--	--	--	21,372
Table Mountain pine	47,841	29,627	--	--	--	18,214
<b>Total</b>	<b>230,788</b>	<b>87,722</b>	--	<b>3,357</b>	--	<b>139,709</b>
Hardwood types						
Oak-pine	386,379	129,323	16,485	15,053	--	225,518
Oak-hickory	<b>1,376,639</b>	470,538	50,563	48,024	--	807,514
Chestnut oak	470,214	266,814	21,206	4,902	--	177,292
Southern scrub oak	5,002	--	--	--	--	5,002
Oak-gum-cypress	--	--	--	--	--	--
Elm-ash-cottonwood	32,287	--	--	--	--	32,287
Maple-beech-birch	35,520	8,575	--	--	--	26,945
<b>Total</b>	<b>2,306,041</b>	<b>875,250</b>	<b>88,254</b>	<b>67,979</b>	--	<b>1,274,558</b>
<b>All types</b>	<b>2,536,829</b>	<b>962,972</b>	<b>88,254</b>	<b>71,336</b>	--	<b>1,414,267</b>

Table 11--Area of timberland, by ownership and stocking classes of growing-stock trees, Northern Mountains of Virginia, 1992

Ownership class	All classes	Stocking class (percent) <sup>a</sup>				
		>130	100-130	60-99	16.7-59	<16.7
		Acres				
National forest	962,972	53,598	233,277	520,554	155,543	--
Other public	88,254	--	14,739	56,505	17,010	--
Forest industry	71,336	--	26,591	34,594	6,794	3,357
Forest industry-leased	—	--	--	--	--	--
Other private	<b>1,414,267</b>	34,943	313,419	723,887	313,100	28,918
All ownerships	<b>2,536,829</b>	88,541	588,026	<b>1,335,540</b>	492,447	32,275

<sup>a</sup>See stocking standards on page 13.

Table 12--Area of timberland, by forest type and stand-size class, Northern Mountains of Virginia, 1992

Forest type	All stands	Stand-size class			Nonstocked areas
		Sawtimber	Poletimber	Sapling-seedling	
		Acres			
<b>Softwood types</b>					
White pine-hemlock	61,170	40,232	8,644	7,782	4,512
Spruce-fir	--	--	--	--	--
<b>Longleaf</b> pine	--	--	--	--	--
Slash pine	--	--	--	--	--
Loblolly pine	--	--	--	--	--
Shortleaf pine	--	--	--	--	--
Virginia pine	60,149	17,793	34,998	7,358	--
Sand pine	--	--	--	--	--
Eastern <b>redcedar</b>	13,438	--	--	13,438	--
Pond pine	--	--	--	--	--
Spruce pine	--	--	--	--	--
Pitch pine	48,190	30,869	12,847	4,474	--
Table Mountain pine	47,841	25,576	22,265	--	--
<b>Total</b>	<b>230,788</b>	<b>114,470</b>	<b>78,754</b>	<b>33,052</b>	<b>4,512</b>
<b>Hardwood types</b>					
Oak-pine	<b>386,379</b>	<b>176,559</b>	163,406	46,414	--
Oak-hickory	<b>1,376,639</b>	796,007	412,803	167,829	--
Chestnut oak	470,214	331,198	134,859	4,157	--
Southern scrub oak	5,002	--	--	5,002	--
Oak-gum-cypress	--	--	--	--	--
Elm-ash-cottonwood	32,287	13,913	18,374	--	--
Maple-beech-birch	35,520	35,520	--	--	--
<b>Total</b>	<b>2,306,041</b>	<b>1,353,197</b>	729,442	223,402	--
<b>All types</b>	<b>2,536,829</b>	<b>1,467,667</b>	808,196	256,454	4,512

Table 13--Area of timberland, by stand-age and broad management classes, all ownerships, Northern Mountains of Virginia, 1992

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
		<u>Acres</u>				
0-10	81,354	--	8,454	16,947	55,953	--
11-20	95,042	3,891	13,395	20,496	57,260	--
21-30	85,881	--	8,278	26,842	50,761	--
31-40	64,637	4,548	20,348	9,466	30,275	--
41-50	94,421	--	4,881	--	89,540	--
51-60	269,714	--	41,080	46,486	177,585	4,563
61-70	327,119	--	34,273	36,323	256,523	--
71-80	387,164	--	25,518	76,338	285,308	--
<b>81+</b>	651,173	--	44,425	61,484	540,826	4,438
No manageable stand	480,324	4,512	17,185	91,997	343,344	23,286
<b>All classes</b>	<b>2,536,829</b>	12,951	217,837	386,379	<b>1,887,375</b>	32,287

Table 14--Area of timberland, by stand-age and broad management classes, public ownerships, Northern Mountains of Virginia, 1992

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
		<u>Acres</u>				
0-10	27,260	--	--	3,069	24,191	--
11-20	23,780	--	4,474	7,252	12,054	--
21-30	31,277	--	--	22,841	8,436	--
31-40	17,044	4,548	4,157	--	8,339	--
41-50	32,127	--	4,881	--	27,246	--
51-60	84,123	--	23,094	24,542	36,487	--
61-70	134,981	--	16,607	4,881	113,493	--
71-80	175,706	--	12,953	43,729	119,024	--
<b>81+</b>	361,688	--	17,008	18,303	326,377	--
No manageable stand	163,240	--	--	21,191	142,049	--
<b>All classes</b>	<b>1,051,226</b>	4,548	83,174	145,808	817,696	--

Table 15--Area of timberland, by stand-age and broad management classes, forest industry,<sup>a</sup> Northern Mountains of Virginia, 1992

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
		<u>Acres</u>				
0-10	--	--	--	--	--	--
11-20	--	--	--	--	--	--
21-30	11,488	--	3,357	--	8,131	--
31-40	4,902	--	--	4,902	--	--
41-50	--	--	--	--	--	--
51-60	5,299	--	--	--	5,299	--
61-70	4,902	--	^	--	4,902	--
71-80	1,892	--	--	1,892	--	--
81+	19,087	--	--	--	19,087	--
No manageable stand	23,766	--	--	8,259	15,507	--
All classes	71,336	--	3,357	15,053	52,926	--

<sup>a</sup>Includes 0 acres of other private land under long-term lease.

Table 16--Area of timberland, by stand-age and broad management classes, other private ownerships,<sup>a</sup> Northern Mountains of Virginia, 1992

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
		<u>Acres</u>				
0-10	54,094	--	8,454	13,878	31,762	--
11-20	71,262	3,891	8,921	13,244	45,206	--
21-30	43,116	--	4,921	4,001	34,194	--
31-40	42,691	--	16,191	4,564	21,936	--
41-50	62,294	--	--	--	62,294	--
51-60	180,292	--	17,986	21,944	135,799	4,563
61-70	187,236	--	17,666	31,442	138,128	--
71-80	209,566	--	12,565	30,717	166,284	--
81+	270,398	--	27,417	43,181	195,362	4,438
No manageable stand	293,318	4,512	17,185	62,547	185,788	23,286
All classes	1,414,267	8,403	131,306	225,518	1,016,753	32,287

<sup>a</sup>Excludes 0 acres of other private land under long-term lease to forest industry.

Table 17--Area of timberland, by broad management and stand-volume classes, Northern Mountains of Virginia, 1992

Broad management class	All classes	Stand-volume class (cubic feet of growing stock per acre>				
		0-499	500-999	1000-1499	1500-1999	2000+
				<u>Acres</u>		
Pine plantation	12,951	8,403	--	4,548	--	--
Natural pine	217,837	30,724	28,077	45,657	29,627	83,752
Oak-pine	386,379	69,938	72,641	89,928	52,934	100,938
Upland hardwood	<b>1,887,375</b>	183,015	227,179	362,861	361,324	752,996
Lowland hardwood	32,287	9,324	4,487	14,038	--	4,438
All classes	<b>2,536,829</b>	301,404	332,384	517,032	443,885	942,124

Table 18--Volume of growing stock on timberland, by broad management class, species group, and stand-age class, Northern Mountains of Virginia, 1992

Broad management class and species group	All classes	NO manageable stand	Stand-age class (years)								
			0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81+
<u>Thousand cubic feet</u>											
<b>Pine plantation</b>											
<b>Softwood</b>	<b>6,409</b>	--	--	--	--	<b>6,409</b>	--	<b>-0</b>	--	--	--
<b>Hardwood</b>	--	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>6,409</b>	--	--	--	--	<b>6,409</b>	--	--	--	--	--
<b>Natural pine</b>											
<b>softwood</b>	<b>299,953</b>	<b>3,210</b>	<b>1,034</b>	<b>3,692</b>	<b>9,364</b>	<b>34,319</b>	<b>9,137</b>	<b>66,199</b>	<b>74,112</b>	<b>32,132</b>	<b>66,754</b>
<b>Hardwood</b>	<b>75,182</b>	<b>1,086</b>	--	<b>1,407</b>	<b>334</b>	<b>4,295</b>	<b>349</b>	<b>19,968</b>	<b>14,035</b>	<b>6,560</b>	<b>27,148</b>
<b>Total</b>	<b>375,135</b>	<b>4,296</b>	<b>1,034</b>	<b>5,099</b>	<b>9,698</b>	<b>38,614</b>	<b>9,486</b>	<b>86,167</b>	<b>88,147</b>	<b>38,692</b>	<b>93,902</b>
<b>Oak-pine</b>											
<b>Softwood</b>	<b>228,405</b>	<b>33,109</b>	<b>1,780</b>	<b>4,958</b>	<b>16,243</b>	<b>7,371</b>	--	<b>27,306</b>	<b>40,336</b>	<b>49,702</b>	<b>47,600</b>
<b>Hardwood</b>	<b>302,442</b>	<b>24,951</b>	--	<b>2,724</b>	<b>11,725</b>	<b>7,617</b>	--	<b>40,665</b>	<b>47,229</b>	<b>84,186</b>	<b>83,345</b>
<b>Total</b>	<b>530,847</b>	<b>58,060</b>	<b>1,780</b>	<b>7,682</b>	<b>27,968</b>	<b>14,988</b>	--	<b>67,971</b>	<b>87,565</b>	<b>133,888</b>	<b>130,945</b>
<b>Upland hardwood</b>											
<b>softwood</b>	<b>174,655</b>	<b>14,984</b>	<b>1,061</b>	<b>8,645</b>	<b>4,368</b>	<b>1,175</b>	<b>8,120</b>	<b>17,358</b>	<b>25,392</b>	<b>34,941</b>	<b>58,611</b>
<b>Hardwood</b>	<b>3,159,304</b>	<b>226,810</b>	<b>15,925</b>	<b>32,970</b>	<b>46,052</b>	<b>39,822</b>	<b>145,348</b>	<b>323,156</b>	<b>554,908</b>	<b>576,744</b>	<b>1,197,569</b>
<b>Total</b>	<b>3,333,959</b>	<b>241,794</b>	<b>16,986</b>	<b>41,615</b>	<b>50,420</b>	<b>40,997</b>	<b>153,468</b>	<b>340,514</b>	<b>580,300</b>	<b>611,685</b>	<b>1,256,180</b>
<b>Lowland hardwood</b>											
<b>Softwood</b>	<b>616</b>	<b>616</b>	--	--	--	--	--	--	--	--	--
<b>Hardwood</b>	<b>31,226</b>	<b>15,709</b>	--	--	--	--	--	<b>6,189</b>	--	--	<b>9,328</b>
<b>Total</b>	<b>31,842</b>	<b>16,325</b>	--	--	--	--	--	<b>6,189</b>	--	--	<b>9,328</b>
<b>All types</b>											
<b>Softwood</b>	<b>710,038</b>	<b>51,919</b>	<b>3,875</b>	<b>17,295</b>	<b>29,975</b>	<b>49,274</b>	<b>17,257</b>	<b>110,863</b>	<b>139,840</b>	<b>116,775</b>	<b>172,965</b>
<b>Hardwood</b>	<b>3,568,154</b>	<b>268,556</b>	<b>15,925</b>	<b>37,101</b>	<b>58,111</b>	<b>51,734</b>	<b>145,697</b>	<b>389,978</b>	<b>616,172</b>	<b>667,490</b>	<b>1,317,390</b>
<b>Total</b>	<b>4,278,192</b>	<b>320,475</b>	<b>19,800</b>	<b>54,396</b>	<b>88,086</b>	<b>101,008</b>	<b>162,954</b>	<b>500,841</b>	<b>756,012</b>	<b>784,265</b>	<b>1,490,355</b>

Table 19--Average net annual growth of growing stock on timberland, by broad management class, species group, and stand-age class, Northern Mountains of Virginia, 1986-1991

Broad management class <sup>a</sup> and species group	All classes	No manageable stand	Stand-age class <sup>a</sup> (years)									
			0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81+	
<u>Thousand cubic feet</u>												
Pine plantation												
Softwood	319	--	--	10	--	309	--	--	--	--	--	--
Hardwood	--	--	--	--	--	--	--	--	--	--	--	--
Total	319	--	--	10	--	309	--	--	--	--	--	--
Natural pine												
Softwood	4,937	26	31	107	311	1,013	172	1,101	1,012	380	784	
Hardwood	2,183	15	--	73	7	177	9	1,018	297	135	452	
Total	7,120	41	31	180	318	1,190	181	2,119	1,309	515	1,236	
Oak-pine												
Softwood	4,734	580	46	599	451	176	--	639	478	776	989	
Hardwood	6,336	486	--	157	867	318	--	909	990	1,321	1,288	
Total	11,070	1,066	46	756	1,318	494	--	1,548	1,468	2,097	2,277	
Upland hardwood												
Softwood	3,676	157	35	854	201	49	142	242	336	734	926	
Hardwood	61,679	4,295	537	1,241	2,340	1,600	4,233	7,843	10,880	10,591	18,119	
Total	65,355	4,452	572	2,095	2,541	1,649	4,375	8,085	11,216	11,325	19,045	
Lovland hardwood												
Softwood	8	8	--	--	--	--	--	--	--	--	--	
Hardwood	790	365	--	--	--	--	--	210	--	--	215	
Total	798	373	--	--	--	--	--	210	--	--	215	
All types												
Softwood	13,674	771	112	1,570	963	1,547	314	1,982	1,826	1,890	2,699	
Hardwood	70,988	5,161	537	1,471	3,214	2,095	4,242	9,980	12,167	12,047	20,074	
Total	84,662	5,932	649	3,041	4,177	3,642	4,556	11,962	13,993	13,937	22,773	

<sup>a</sup>Classifications at the end of the remeasurement period.

Table 20--Average annual removals of growing stock on timberland, by broad management class, species group, and stand-age class, Northern Mountains of Virginia, 1986-1991

Broad management class <sup>a</sup> and species group	All classes	No manageable stand	Stand-age class <sup>a</sup> (years)									
			0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81+	
Thousand cubic feet												
Pine plantation												
Softwood	--	--	--	--	--	--	--	--	--	--	--	--
Hardwood	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
Natural pine												
Softwood	2,682	183	--	357	--	348	782	--	1,012	--	--	--
Hardwood	519	--	--	--	--	--	519	--	--	--	--	--
Total	3,201	183	--	357	--	348	1,301	--	1,012	--	--	--
Oak-pine												
Softwood	813	--	--	--	274	--	--	--	--	--	--	539
Hardwood	225	--	--	--	--	--	--	--	--	--	--	225
Total	1,038	--	--	--	274	--	--	--	--	--	--	764
Upland hardwood												
Softwood	1,729	--	--	--	--	226	207	--	945	150	201	--
Hardwood	27,853	2,713	--	108	--	194	151	4,026	7,574	5,688	7,399	--
Total	29,582	2,713	--	108	--	420	358	4,026	8,519	5,838	7,600	--
Lowland hardwood												
Softwood	--	--	--	--	--	--	--	--	--	--	--	--
Hardwood	1,445	787	--	--	--	--	--	--	658	--	--	--
Total	1,445	787	--	--	--	--	--	--	658	--	--	--
All types												
Softwood	5,224	183	--	357	274	574	989	--	1,957	150	740	--
Hardwood	30,042	3,500	--	108	--	194	670	4,026	8,232	5,688	7,624	--
Total	35,266	3,683	--	465	274	768	1,659	4,026	10,189	5,838	8,364	--

<sup>a</sup>Classifications before timber removals.

Table 21--Merchantable volume of live trees and growing stock on timberland, by forest-type and species groups, Northern Mountains of Virginia, 1992

Forest-type group	Live trees						GROWING STOCK								
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
White pine-hemlock	124,158	5,244	77,445	7,184	34,285	114,472	5,244	76,107	6,354	26,767					
Spruce-fir	--	--	--	--	--	--	--	--	--	--					
Longleaf-slash pine	--	--	--	--	--	--	--	--	--	--					
Loblolly-shortleaf pine	282,140	214,457	17,147	9,889	40,647	267,072	208,364	16,647	8,917	33,144					
Oak-pine	585,568	125,728	107,280	30,164	322,396	530,847	122,207	106,198	25,092	277,350					
Oak-hickory	3,636,234	98,699	79,838	562,111	2,895,586	3,257,902	96,090	78,565	503,009	2,580,238					
Oak-gum-cypress	--	--	--	--	--	--	--	--	--	--					
Elm-ash-cottonwood	43,922	--	892	30,748	12,282	31,842	--	616	23,482	7,744					
Maple-beech-birch	84,992	--	--	17,971	67,021	76,057	--	--	17,201	58,856					
All types	4,757,014	444,128	282,602	658,067	3,372,217	4,278,192	431,905	278,133	584,055	2,984,099					

Table 22--Area of timberland treated or disturbed annually and retained in timberland, by treatment or disturbance and ownership class, Northern Mountains of Virginia, 1986 to 1992

Treatment or disturbance	All ownerships	Ownership class				
		Public	Forest industry	Forest industry-leased	Other private	
			<u>Acres<sup>a</sup></u>			
Final harvest	9,719	3,668	--	--	6,051	
Partial harvest <sup>b</sup>	7,973	1,451	--	--	6,522	
Commercial thinning	--	--	--	--	--	
Other stand improvement	2,011	1,373	--	--	638	
Site preparation	1,668	--	--	--	1,668	
Artificial regeneration <sup>c</sup>	834	--	--	--	834	
Natural regeneration <sup>c</sup>	9,495	3,689	--	--	5,806	
Other treatment	10,099	1,470	--	--	8,629	
Natural disturbance	62,972	35,880	2,283	--	24,809	

<sup>a</sup>Since some acres experience more than one treatment or disturbance, there are no column totals.

<sup>b</sup>Includes high grading and some selective cutting.

<sup>c</sup>Includes establishment of trees for timber production on forest and nonforest land.

Table 23--Area of timberland treated or disturbed annually and retained in timberland, by treatment or disturbance and broad management class, Northern Mountains of Virginia, 1986 to 1992

Treatment or disturbance	All classes	Broad management class <sup>a</sup>					
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood	
			<u>Acres<sup>b</sup></u>				
Final harvest	9,719	--	2,976	--	6,743	--	
Partial harvest <sup>c</sup>	7,973	--	--	777	6,448	748	
Commercial thinning	--	--	--	--	--	--	
Other stand improvement	2,011	638	--	--	1,373	--	
Site preparation	1,668	--	--	--	1,668	--	
Other treatment	10,099	638	745	--	7,964	752	
Natural disturbance	62,972	--	5,276	5,680	52,016	--	

<sup>a</sup>Classification before treatment or disturbance.

<sup>b</sup>Since some acres experience more than one treatment or disturbance, there are no column totals.

<sup>c</sup>Includes high grading and some selective cutting.

Table 24--Area of timberland regenerated annually, by type of regeneration and broad management class, Northern Mountains of Virginia, 1986 to 1992

Type of regeneration	All classes	Broad management class <sup>a</sup>				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
<u>Acres</u>						
Artificial regeneration following harvest	834	--	--	834	--	--
Natural regeneration following harvest	6,262	--	748	1,480	4,034	--
Other artificial regeneration on forest land	--	--	--	--	--	--
Other natural regeneration on forest land	2,595	--	--	520	2,075	--
Artificial regeneration on nonforest land	--	--	--	--	--	--
Natural reversion of nonforest land	638	--	638	--	--	--
<b>Total</b>	<b>10,329</b>	<b>--</b>	<b>1,386</b>	<b>2,834</b>	<b>6,109</b>	<b>--</b>

<sup>a</sup>Classification after regeneration.

Table 25--Area of timberland, by treatment opportunity and broad management classes, Northern Mountains of Virginia, 1992

Treatment opportunity class	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
<u>Acres</u>						
Salvage	27,036	--	3,390	4,001	19,645	--
Harvest	414,550	--	22,214	43,901	343,997	4,438
Commercial thinning	16,916	--	12,429	--	4,487	--
Other stand improvement	84,159	--	8,961	16,628	58,570	--
Stand conversion	--	--	--	--	--	--
Regeneration	241,831	4,512	8,875	26,127	179,031	23,286
Stands in relatively good condition	927,410	8,439	102,927	158,843	652,638	4,563
Adverse sites <sup>a</sup>	824,927	--	59,041	136,879	629,007	--
<b>All classes</b>	<b>2,536,829</b>	<b>12,951</b>	<b>217,837</b>	<b>386,379</b>	<b>1,887,375</b>	<b>32,287</b>

<sup>a</sup>Areas where management opportunities are severely limited because of steep slopes or poor drainage.

Table 26--Area of timberland, by treatment opportunity and ownership classes, Northern Mountains of Virginia, 1992

Treatment opportunity class	All ownerships	Ownership class			
		Public	Forest industry	Forest industry-leased	Other private
			<u>Acres</u>		
Salvage	27,036	7,253	—	—	19,783
Harvest	414,550	203,576	10,828	—	200,146
Commercial thinning	16,916	—	—	—	16,916
Other stand improvement	84,159	36,679	8,131	—	39,349
Stand conversion	—	—	—	—	—
Regeneration	241,831	47,268	8,526	—	186,037
Stands in relatively good condition	927,410	295,072	15,103	—	617,235
Adverse sites <sup>a</sup>	824,927	461,378	28,748	—	334,801
All classes	<b>2,536,829</b>	<b>1,051,226</b>	71,336	—	<b>1,414,267</b>

<sup>a</sup>Areas where management opportunities are severely limited because of steep slopes or poor drainage.

Table 27--Merchantable volume of live trees and growing stock on timberland, by ownership class and species group, Northern Mountains of Virginia, 1992

Ownership class	Live trees					Growing stock				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand cubic feet</u>									
National forest	<b>1,931,479</b>	179,496	114,088	178,728	<b>1,459,167</b>	<b>1,723,577</b>	175,089	112,972	157,745	<b>1,277,771</b>
Other public	158,393	12,083	1,291	24,669	120,350	141,250	11,685	1,291	22,308	105,966
Forest industry	108,268	7,081	5,520	19,338	76,329	99,931	7,081	5,520	18,360	68,970
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	<b>2,558,874</b>	245,468	161,703	435,332	<b>1,716,371</b>	<b>2,313,434</b>	238,050	158,350	385,642	<b>1,531,392</b>
All ownerships	<b>4,757,014</b>	444,128	282,602	658,067	<b>3,372,217</b>	<b>4,278,192</b>	431,905	278,133	584,055	<b>2,984,099</b>

Table 28--Volume of **sawtimber** on timberland, by ownership class and species group, Northern Mountains of Virginia, 1992

Ownership class	Small <b>sawtimber</b> <sup>a</sup>					Large <b>sawtimber</b> <sup>b</sup>				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand board feet</u>									
National forest	<b>1,953,940</b>	429,046	177,845	151,118	<b>1,195,931</b>	<b>3,157,839</b>	137,842	229,529	286,274	<b>2,504,194</b>
Other public	183,573	29,602	1,376	31,293	121,302	200,941	9,736	4,763	32,023	154,419
Forest industry	90,140	8,894	8,619	5,681	66,946	210,393	7,282	19,846	23,776	159,489
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	<b>2,855,395</b>	572,116	246,188	333,979	1,703,112	<b>4,254,982</b>	122,445	397,225	907,830	<b>2,827,482</b>
All ownerships	<b>5,083,048</b>	<b>1,039,658</b>	434,028	522,071	<b>3,087,291</b>	<b>7,824,155</b>	277,305	651,363	<b>1,249,903</b>	<b>5,645,584</b>

<sup>a</sup>Volume of sawtimber trees less than 15.0 inches at d.b.h.

<sup>b</sup>Volume of sawtimber trees 15.0 inches and larger at d.b.h.

Table 29--Average net annual growth and removals of growing stock on timberland, by ownership class and species group, Northern Mountains of Virginia, 1986-1991

Ownership class	Net annual growth					Annual timber removals				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand cubic feet</u>									
National forest	30,252	1,848	3,130	4,051	21,223	10,074	82	--	2,988	7,004
Other public	2,875	132	16	415	2,312	2,053	--	--	--	2,053
Forest industry	2,756	158	141	1,121	1,336	1,720	239	--	185	1,296
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	48,779	3,592	4,657	11,207	29,323	21,419	3,956	947	2,969	13,547
All ownerships	84,662	5,730	7,944	16,794	54,194	35,266	4,277	947	6,142	23,900

Table 30--Average net annual growth and removals of sawtimber on timberland, by ownership class and species group, Northern Mountains of Virginia, 1986-1991

Ownership class	Net annual growth					Annual timber removals				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	<u>Thousand board feet</u>									
National forest	115,006	11,220	14,497	9,202	80,087	34,639	326	--	11,296	23,017
Other public	8,972	728	102	1,092	7,050	4,382	--	--	--	4,382
Forest industry	9,370	748	1,058	2,441	5,123	3,098	499	--	778	1,821
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	221,542	23,416	20,821	43,748	133,557	85,223	12,434	5,170	12,529	55,090
All ownerships	354,890	36,112	36,478	56,483	225,817	127,342	13,259	5,170	24,603	84,310

Table 31--Volume of timber on timberland, by class of timber and species group, Northern Mountains of Virginia, 1992

Class of timber	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
<u>Thousand cubic feet</u>					
Sawtimber trees					
Saw-log portion	<b>2,492,391</b>	264,469	196,273	322,366	<b>1,709,283</b>
Upper-stem portion <sup>a</sup>	418,167	31,817	19,042	53,923	313,385
Total	<b>2,910,558</b>	296,286	215,315	376,289	<b>2,022,668</b>
Poletimber trees	<b>1,367,634</b>	135,619	62,818	207,766	961,431
All growing-stock trees	<b>4,278,192</b>	431,905	278,133	584,055	<b>2,984,099</b>
Rough trees					
Sawtimber size	226,908	7,422	2,534	24,880	192,072
Poletimber size	183,997	4,254	929	36,291	142,523
Total	410,905	11,676	3,463	61,171	334,595
Rotten trees					
Sawtimber size	64,432	547	1,006	12,591	50,288
Poletimber size	3,485	--	--	250	3,235
Total	67,917	547	1,006	12,841	53,523
Salvable dead trees					
Sawtimber size	12,418	678	105	76	11,559
Poletimber size	6,578	627	103	471	5,377
Total	18,996	1,305	208	547	16,936
Total, all timber	<b>4,776,010</b>	445,433	282,810	658,614	<b>3,389,153</b>

<sup>a</sup>Includes cull sections in the saw-log portion.

**Table 32--Number of live trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1992**

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- a.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 and larger
<u>Thousand trees</u>													
Softwood													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	1,619	785	--	--	161	323	128	113	--	80	29	--	--
Loblolly pine	829	254	508	--	--	67	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	59,671	27,236	11,068	8,204	7,466	3,379	1,569	585	130	34	--	--	--
Pitch pine	26,211	9,831	3,439	2,230	3,468	3,122	1,940	1,410	537	172	62	--	--
Table Mountain pine	16,926	3,490	3,302	3,133	3,265	1,888	1,167	477	168	21	15	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	72,350	39,322	16,286	5,927	3,827	2,717	1,562	961	824	402	239	283	--
Eastern hemlock	21,137	8,707	4,824	3,498	1,930	820	652	250	154	134	63	77	28
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	10,222	5,616	2,098	1,592	462	250	80	124	--	--	--	--	--
<b>Total softwoods</b>	<b>208,965</b>	<b>95,241</b>	<b>41,525</b>	<b>24,584</b>	<b>20,579</b>	<b>12,566</b>	<b>7,098</b>	<b>3,920</b>	<b>1,813</b>	<b>843</b>	<b>408</b>	<b>360</b>	<b>28</b>
Hardwood													
Select white oaks	67,735	19,757	11,469	10,897	8,364	5,998	4,269	2,707	1,755	999	655	731	134
Select red oaks	43,985	14,240	9,322	5,211	4,030	3,357	2,169	1,676	1,171	840	727	1,086	156
Chestnut oak	153,498	24,679	32,737	30,379	24,188	15,005	9,858	6,413	3,863	2,748	1,468	1,993	167
Other white oaks	1,440	836	--	179	319	--	44	36	26	--	--	--	--
Other red oaks	96,354	28,072	13,247	16,924	14,764	9,203	5,432	4,717	1,727	1,371	402	488	7
Hickory	105,518	61,026	24,296	8,264	5,603	2,319	1,807	974	619	332	170	94	14
Yellow birch	373	267	--	--	--	106	--	--	--	--	--	--	--
Hard maple	22,931	12,648	4,509	1,844	1,782	752	537	380	197	116	75	79	12
Soft maple	217,646	148,489	39,871	14,762	8,129	2,670	2,048	801	456	165	139	101	15
Beech	1,286	267	267	351	201	--	53	--	50	60	15	22	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	210,627	168,659	33,281	4,763	2,411	446	519	154	193	138	34	29	--
Ash	23,313	14,677	4,286	1,253	1,459	496	473	212	121	235	93	--	8
Cottonwood	12	--	--	--	--	--	--	--	--	--	--	12	--
Basswood	3,841	2,132	278	240	361	172	164	150	146	93	32	56	17
Yellow-poplar	34,954	14,192	6,178	4,729	1,977	2,556	1,406	1,243	997	820	452	382	22
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	13,776	8,650	2,798	824	560	535	121	88	142	58	--	--	--
Black walnut	5,956	807	2,124	988	814	473	345	226	107	37	--	35	--
Sycamore	1,152	254	254	--	181	111	116	32	45	18	55	84	2
Black locust	29,027	15,359	5,079	3,534	1,484	1,380	1,132	622	197	76	96	68	--
Elm	11,844	7,689	1,867	1,508	219	319	132	34	19	34	--	23	--
Other eastern hardwoods	375,276	293,241	60,658	12,906	4,607	2,013	890	446	241	150	78	46	--
<b>Total hardwoods</b>	<b>1,420,544</b>	<b>835,941</b>	<b>252,521</b>	<b>119,556</b>	<b>81,453</b>	<b>47,911</b>	<b>31,515</b>	<b>20,911</b>	<b>12,072</b>	<b>8,290</b>	<b>4,491</b>	<b>5,329</b>	<b>554</b>
<b>All species</b>	<b>1,629,509</b>	<b>931,182</b>	<b>294,046</b>	<b>144,140</b>	<b>102,032</b>	<b>60,477</b>	<b>38,613</b>	<b>24,831</b>	<b>13,885</b>	<b>9,133</b>	<b>4,899</b>	<b>5,689</b>	<b>582</b>

Table 33--Number of growing-stock trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 and larger
Thousand trees													
<b>Softwood</b>													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	1,366	532	--	--	161	323	128	113	--	80	29	--	--
Loblolly pine	829	254	508	--	--	67	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	48,214	17,379	10,017	7,825	7,385	3,379	1,513	552	130	34	--	--	--
Pitch pine	23,702	7,727	3,439	2,064	3,468	2,931	1,892	1,410	537	172	62	--	--
Table Mountain pine	14,505	2,706	2,508	2,954	2,885	1,702	1,128	418	168	21	15	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	68,366	36,453	15,248	5,927	3,827	2,717	1,515	961	806	402	239	271	--
Eastern hemlock	19,896	7,625	4,824	3,498	1,838	767	652	250	154	134	49	77	28
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	7,254	3,418	1,576	1,373	462	250	80	95	--	--	--	--	--
<b>Total softwoods</b>	<b>184,132</b>	<b>76,094</b>	<b>38,120</b>	<b>23,641</b>	<b>20,026</b>	<b>12,136</b>	<b>6,908</b>	<b>3,799</b>	<b>1,795</b>	<b>843</b>	<b>394</b>	<b>348</b>	<b>28</b>
<b>Hardwood</b>													
Select white oaks	53,310	9,779	9,432	9,587	8,108	5,806	4,004	2,641	1,676	944	623	647	63
Select red oaks	27,965	6,812	3,497	3,778	3,336	3,170	2,091	1,571	1,147	765	699	970	129
Chestnut oak	104,385	10,071	19,458	22,256	19,323	13,152	7,807	4,936	2,654	2,165	1,142	1,330	91
Other white oaks	1,346	836	--	179	225	--	44	36	26	--	--	--	--
Other red oaks	76,999	15,865	10,124	14,957	13,643	8,754	5,189	4,593	1,727	1,317	387	436	7
Hickory	63,713	25,084	19,328	8,130	5,221	2,126	1,706	950	593	311	170	94	--
Yellow birch	320	267	--	--	--	53	--	--	--	--	--	--	--
Hard maple	14,526	5,368	3,718	1,844	1,663	624	489	380	197	116	60	61	6
Soft maple	97,110	50,458	23,941	10,376	7,164	2,209	1,610	705	319	165	94	54	15
Beech	792	--	267	351	--	--	53	--	24	60	15	22	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	50,519	26,557	17,589	3,599	1,831	328	307	93	122	65	17	11	--
Ash	11,580	6,311	2,396	669	847	388	384	182	121	197	77	--	8
Cottonwood	12	--	--	--	--	--	--	--	--	--	--	12	--
Basswood	2,195	809	278	240	159	172	129	88	146	93	32	35	14
Yellow-poplar	28,141	9,191	4,845	4,592	1,844	2,486	1,368	1,207	971	820	437	367	13
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	3,967	2,384	511	237	186	386	74	32	--	58	--	--	--
Black walnut	2,287	--	537	--	632	473	345	174	--	20	--	23	--
Sycamore	896	--	254	--	181	111	116	32	45	18	55	84	--
Black locust	14,880	5,603	2,754	3,057	1,019	988	791	406	98	76	63	25	--
Elm	4,954	1,839	1,347	1,085	219	241	132	34	--	34	--	23	--
Other eastern hardwoods	22,198	9,932	5,636	2,984	1,328	1,103	561	353	123	94	47	37	--
<b>Total hardwoods</b>	<b>582,095</b>	<b>187,166</b>	<b>125,912</b>	<b>87,921</b>	<b>66,929</b>	<b>42,570</b>	<b>27,200</b>	<b>18,413</b>	<b>10,171</b>	<b>7,318</b>	<b>3,918</b>	<b>4,231</b>	<b>346</b>
<b>All species</b>	<b>766,227</b>	<b>263,260</b>	<b>164,032</b>	<b>111,562</b>	<b>86,955</b>	<b>54,706</b>	<b>34,108</b>	<b>22,212</b>	<b>11,966</b>	<b>8,161</b>	<b>4,312</b>	<b>4,579</b>	<b>374</b>

Table 34—Merchantable volume of live trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
<b>Thousand cubic feet</b>											
<b>Softwood</b>											
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	16,279	--	1,157	3,762	2,381	2,517	--	4,555	1,901	--	--
Loblolly pine	561	--	--	561	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	166,928	27,100	51,895	38,479	28,499	14,593	4,815	1,547	--	--	--
Pitch pine	166,134	6,652	21,953	34,026	36,129	37,814	18,438	7,301	3,821	--	--
Table Mountain pine	94,226	9,127	21,989	22,832	21,305	11,885	5,179	1,008	901	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	205,283	17,301	22,412	28,907	23,812	25,245	29,253	18,681	13,880	25,792	--
Eastern hemlock	64,972	8,296	8,985	6,900	8,310	5,489	5,102	6,076	3,629	7,158	5,027
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--
Cedars	12,347	4,412	2,341	2,006	1,404	2,184	--	--	--	--	--
<b>Total softwoods</b>	<b>726,730</b>	<b>72,888</b>	<b>130,732</b>	<b>137,473</b>	<b>121,846</b>	<b>99,727</b>	<b>62,787</b>	<b>39,168</b>	<b>24,132</b>	<b>32,950</b>	<b>5,027</b>
<b>Hardwood</b>											
Select white oaks	565,218	32,094	57,349	74,908	80,107	74,536	69,239	48,846	43,709	67,180	17,250
Select red oaks	419,989	15,322	23,991	37,545	39,244	43,266	43,756	40,052	45,913	104,038	26,862
Ches nut oak	1,145,001	82,687	142,882	157,213	156,724	145,068	114,903	110,473	70,858	142,575	21,618
Other white oaks	4,024	271	1,338	--	990	650	775	--	--	--	--
Other red oaks	684,090	47,086	93,514	110,269	99,873	128,044	66,330	67,549	27,027	43,189	1,209
Hickory	197,384	18,834	30,143	26,051	31,689	27,538	24,511	16,585	11,607	8,762	1,664
Yellow birch	1,535	--	--	1,535	--	--	--	--	--	--	--
Hard maple	76,940	5,628	12,234	8,923	10,889	11,022	7,399	5,590	4,873	8,499	1,883
Soft maple	219,415	44,394	51,520	29,615	33,770	20,394	13,629	8,577	7,162	8,152	2,202
Beech	10,672	1,156	551	--	650	--	1,891	3,316	1,258	1,850	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	51,640	10,476	12,163	4,678	8,035	2,772	5,840	4,717	1,415	1,544	--
Ash	52,346	3,370	6,736	5,208	8,411	5,321	4,601	11,491	5,652	--	1,556
Cottonwood	898	--	--	--	--	--	--	--	--	898	--
Basswood	34,214	706	2,472	2,403	3,004	3,801	5,601	5,475	2,125	5,102	3,525
Yellow-poplar	279,570	14,556	12,765	31,680	30,699	36,591	41,180	42,968	32,330	33,660	3,141
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--
Black cherry	21,546	1,736	3,466	4,982	1,734	1,672	5,064	2,892	--	--	--
Black walnut	31,581	2,176	5,676	4,700	5,898	6,218	3,112	1,860	--	1,941	--
Sycamore	19,064	--	1,235	1,379	2,479	844	1,434	758	2,986	7,393	556
Black locust	78,260	8,449	6,696	13,250	17,216	14,772	5,956	2,905	4,508	4,508	--
Elm	15,174	4,108	1,529	2,949	2,267	706	269	1,520	--	1,826	--
Other eastern hardwoods	121,723	29,759	23,064	22,076	15,694	10,191	7,862	5,956	3,944	3,177	--
<b>Total hardwoods</b>	<b>4,030,284</b>	<b>322,808</b>	<b>489,324</b>	<b>539,364</b>	<b>549,373</b>	<b>533,406</b>	<b>423,352</b>	<b>381,530</b>	<b>265,367</b>	<b>444,294</b>	<b>81,466</b>
<b>All species</b>	<b>4,757,014</b>	<b>395,696</b>	<b>620,056</b>	<b>676,837</b>	<b>671,219</b>	<b>633,133</b>	<b>486,139</b>	<b>420,698</b>	<b>289,499</b>	<b>477,244</b>	<b>86,493</b>

Table 35--Volume of growing stock on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-a.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-1a.9	19.0-20.9	21.0-28.9	29.0 and larger
<u>Thousand cubic feet</u>											
<b>Softwood</b>											
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	16,279	--	1,157	3,762	2,387	2,517	--	4,555	1,901	--	--
Loblolly pine	561	--	--	561	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	164,221	26,094	51,315	38,479	27,925	14,046	4,815	1,547	--	--	--
Pitch pine	162,847	6,246	21,953	31,969	35,305	37,814	18,438	7,301	3,821	--	--
Table Mountain pine	87,997	a,759	20,095	20,808	20,569	10,678	5,179	1,008	901	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	203,420	17,301	22,412	28,907	23,179	25,245	28,753	18,681	13,880	25,062	--
Eastern hemlock	63,185	8,296	a,599	6,451	8,310	5,489	5,102	6,076	2,677	7,158	5,027
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--
Cedars	11,528	3,869	2,341	2,006	1,404	1,908	--	--	--	--	--
<b>Total softwoods</b>	<b>710,038</b>	<b>70,565</b>	<b>127,872</b>	<b>132,943</b>	<b>119,079</b>	<b>97,697</b>	<b>62,287</b>	<b>39,168</b>	<b>23,180</b>	<b>32,220</b>	<b>5,027</b>
<b>Hardwood</b>											
Select white oaks	538,874	29,310	55,822	73,133	77,741	73,695	<b>66,789</b>	46,897	42,267	62,664	10,556
Select red oaks	399,602	12,458	21,397	36,394	38,795	42,499	43,373	38,009	44,919	97,476	24,282
Chestnut oak	937,625	63,809	121,050	142,388	130,120	118,337	86,545	93,902	61,024	105,370	15,080
Other white oaks	3,883	271	1,197	--	990	650	775	--	--	--	--
Other red oaks	660,800	42,822	88,775	106,556	97,265	126,175	66,330	65,543	26,502	39,623	1,209
Hickory	190,550	18,382	29,266	24,834	30,618	26,938	24,059	16,084	11,607	a, 762	--
Yellow birch	747	--	--	747	--	--	--	--	--	--	--
Hard maple	72,010	5,628	11,830	7,644	10,406	11,022	7,399	5,590	3,834	7,577	1,080
Soft maple	<b>184,585</b>	34,297	46,668	24,691	29,364	1a, 100	10,391	a,577	5,470	4,825	2,202
Beech	<b>9,148</b>	1,156	--	--	650	--	918	3,316	<b>1,258</b>	1,850	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	36,281	a,377	9,034	3,121	5,158	2,254	3,993	2,526	1,044	774	--
Ash	43,909	2,484	4,150	4,391	7,240	4,493	4,601	10,115	4,879	--	1,556
<b>Cottonwood</b>	<b>898</b>	--	--	--	--	--	--	--	--	<b>898</b>	--
Basswood	29,072	706	1,542	2,403	2,456	<b>2,698</b>	5,601	5,475	2,125	3,417	2,649
Yellow-poplar	272,594	14,113	12,523	30,952	29,980	<b>35 719</b>	40,214	42,968	31,422	32,898	1,805
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--
Black cherry	14,026	479	982	3,791	1,187	<b>1,067</b>	3,62a	2,892	--	--	--
Black walnut	24,521	--	4,632	4,700	5,898	<b>4,503</b>	2,294	903	--	1,591	--
Sycamore	18,508	--	1,235	1,379	2,479	a44	1,434	<b>758</b>	2,986	7,393	--
Black locust	55,577	7,330	5,206	9,019	12,050	<b>10,619</b>	3,254	2,905	3,368	1,826	--
Elm	13,270	2,761	1,529	2,661	2,267	706	--	1,520	--	1,826	--
Other eastern hardwoods	61,674	a, 123	<b>8,318</b>	12,731	10,647	8,120	4,150	4,003	2,601	2,981	--
<b>Total hardwoods</b>	<b>3,568,154</b>	<b>252,506</b>	<b>425,156</b>	<b>491,535</b>	<b>495,311</b>	<b>488,439</b>	<b>375,748</b>	<b>351,983</b>	<b>245,306</b>	<b>381,751</b>	<b>60,419</b>
<b>All species</b>	<b>4,278,192</b>	<b>323,071</b>	<b>553,028</b>	<b>624,478</b>	<b>614,390</b>	<b>586,136</b>	<b>438,035</b>	<b>391,151</b>	<b>268,486</b>	<b>413,971</b>	<b>65,446</b>

Table 36--Volume of sawtimber on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
<b>Thousand board feet</b>									
<b>Softwood</b>									
Longleaf pine	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--
Shortleaf pine	76,151	13,706	11,049	12,569	--	26,954	11,873	--	--
Loblolly pine	1,737	1,737	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--
Virginia pine	354,268	136,970	118,700	66,079	24,135	8,384	--	--	--
Pitch pine	609,736	106,650	150,890	186,815	99,669	42,264	23,448	--	--
Table Mountain pine	275,071	83,074	96,172	55,247	29,120	5,904	5,554	--	--
Spruce pine	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--
Eastern white pine	828,756	102,133	100,280	124,876	153,739	106,446	82,224	159,058	--
Eastern hemlock	231,925	21,947	34,127	25,955	26,073	32,850	14,966	43,006	33,001
Spruce and fir	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--
Cedars	24,710	7,932	6,681	10,097	--	--	--	--	--
<b>Total softwoods</b>	<b>2,402,354</b>	<b>474,149</b>	<b>517,899</b>	<b>481,638</b>	<b>332,736</b>	<b>222,802</b>	<b>138,065</b>	<b>202,064</b>	<b>33,001</b>
<b>Hardwood</b>									
Select white oaks	1,691,588	--	265,405	293,548	295,745	223,091	212,238	339,397	62,164
Select red oaks	1,484,774	--	128,799	163,713	181,831	169,349	211,177	496,121	133,784
Chestnut oak	2,595,266	--	427,187	452,129	367,089	427,035	292,250	543,558	86,018
Other white oaks	9,822	--	3,678	2,635	3,509	--	--	--	--
Other red oaks	1,796,921	--	332,283	505,470	294,278	313,111	132,879	211,951	6,949
Hickory	509,838	--	104,683	110,249	108,680	78,139	59,988	48,099	--
Yel low birch	--	--	--	--	--	--	--	--	--
Hard maple	203,703	--	39,488	45,053	32,066	25,386	18,124	37,939	5,647
Soft maple	316,161	--	95,993	69,123	44,052	40,132	26,091	26,822	13,948
Beech	31,868	--	2,318	--	3,590	13,201	5,116	7,643	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	62,243	--	16,521	8,496	16,776	11,441	5,015	3,994	--
Ash	142,347	--	23,589	17,842	19,917	47,119	24,328	--	9,552
Cottonwood	5,073	--	--	--	--	--	--	5,073	--
Basswood	112,238	--	8,129	10,922	24,278	25,805	10,382	17,730	14,992
Yel low-poplar	1,087,969	--	110,299	155,113	199,864	228,945	179,533	201,945	12,270
Bay and magnolia	--	--	--	--	--	--	--	--	--
Black cherry	39,524	--	4,371	4,372	16,468	14,313	--	--	--
Black walnut	55,640	--	20,133	16,419	8,752	3,574	--	6,762	--
Sycamore	76,638	--	8,372	3,197	6,290	3,610	14,941	40,228	--
Black locust	125,578	--	42,359	39,235	12,290	11,187	13,231	7,276	--
Elm	26,302	--	7,612	2,626	--	7,018	--	9,046	--
Other eastern hardwoods	131,356	--	36,519	31,482	16,913	18,173	12,248	16,021	--
<b>Total hardwoods</b>	<b>10,504,849</b>	<b>--</b>	<b>1,677,738</b>	<b>1,931,624</b>	<b>1,652,388</b>	<b>1,660,629</b>	<b>1,217,541</b>	<b>2,019,605</b>	<b>345,324</b>
<b>All species</b>	<b>12,907,203</b>	<b>474,149</b>	<b>2,195,637</b>	<b>2,413,262</b>	<b>1,985,124</b>	<b>1,883,431</b>	<b>1,355,606</b>	<b>2,221,669</b>	<b>378,325</b>

Table 37--Volume of sawtimber on timberland, by species, size class, and tree grade, Northern Mountains of

Species	All size classes					Trees 15.0 i:	
	All grades	Tree grade				All grades	1
		1	2	3	4		
Thousand board feet							
Softwood							
Yellow pines <sup>a</sup>	1,316,963	48,022	309,657	959,284	--	277,305	26,641
Eastern white pine <sup>b</sup>	828,756	112,781	257,726	453,527	4,722	501,467	104,945
Spruce and fir <sup>b</sup>	--	--	--	--	--	--	--
Cypress=	--	--	--	--	--	--	--
Other eastern softwoods <sup>b</sup>	256,635	28,838	68,362	152,584	6,851	149,896	28,838
Total	2,402,354	189,641	635,745	1,565,395	11,573	928,668	160,424
Hardwood <sup>c</sup>							
Select white and red oaks	3,176,362	418,454	1,185,287	1,435,748	136,873	2,324,897	418,454
Other white and red oaks	4,402,009	155,551	1,159,021	2,685,881	401,556	2,678,627	155,551
Hickory	509,838	13,795	126,755	337,355	31,933	294,906	13,795
Yellow birch	--	--	--	--	--	--	--
Hard maple	203,703	--	53,393	137,030	13,280	119,162	--
Sweetgum	--	--	--	--	--	--	--
Ash, walnut, and black cherry	237,511	26,545	57,900	143,318	9,748	150,785	26,545
Yellow-poplar	1,087,969	159,490	408,060	439,307	81,112	822,557	159,490
Other eastern hardwoods	887,457	21,793	206,305	518,753	140,606	504,553	21,793
Total	10,504,849	795,628	3,196,721	5,697,392	815,108	6,895,487	795,628
All species	12,907,203	985,269	3,832,466	7,262,787	826,681	7,824,155	956,052

<sup>a</sup>For yellow pines, tree grade is based on "Southern Pine Tree Grades for Yard and Structural Lumber," Research the Southeastern Forest Experiment Station, Asheville, NC, 1968. Tree grade 4 does not apply to yellow pine

<sup>b</sup>For other softwoods (excluding cypress), tree grade is based on "Tree Grades for Eastern White Pine," Research by the Northeastern Forest Experiment Station, Radnor, PA, 1971.

<sup>c</sup>For hardwoods and cypress, tree grades 1, 2, and 3 are based on "Hardwood Tree Grades for Factory Lumber," published by the Northeastern Forest Experiment Station, Radnor, PA, 1976. Grade 4 trees are sawtimber tree grades 1, 2, or 3. The butt log of these trees qualify as construction (tie and timber) logs based on "A (revised)," General Technical Report NE-1, published by the Northeastern Forest Experiment Station, Radnor,

Table 38--Cubic volume in the merchantable saw-log portion of sawtimber trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)							
		9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
<u>Thousand cubic feet</u>									
<b>Softwood</b>									
Longleaf pine	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--
Shortleaf pine	13,889	2,954	2,189	2,375	--	4,490	1,881	--	--
Loblolly pine	383	383	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--
Virginia pine	74,538	30,389	24,986	13,097	4,572	1,494	--	--	--
Pitch pine	120,953	25,674	31,664	35,328	17,551	7,028	3,708	--	--
Table Mountain pine	54,706	18,036	19,310	10,354	5,116	998	892	--	--
Spruce pine	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--
Eastern white pine	149,514	22,638	20,519	23,441	27,228	17,913	13,392	24,383	--
Eastern hemlock	42,125	4,942	7,223	5,043	4,787	5,770	2,559	6,907	4,894
Spruce and fir	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--
Cedars	4,634	1,583	1,263	1,788	--	--	--	--	--
<b>Total softwoods</b>	<b>460,742</b>	<b>106,599</b>	<b>107,154</b>	<b>91,426</b>	<b>59,254</b>	<b>37,693</b>	<b>22,432</b>	<b>31,290</b>	<b>4,894</b>
<b>Hardwood</b>									
Select white oaks	326,138	--	55,690	60,588	58,620	42,554	39,147	59,357	10,182
Select red oaks	279,915	--	27,472	34,034	36,425	32,790	39,501	87,551	22,142
Chestnut oak	518,975	--	93,634	96,923	75,360	84,349	55,850	98,480	14,379
Other white oaks	1,938	--	742	524	672	--	--	--	--
Other red oaks	352,424	--	69,341	103,440	57,865	59,166	24,364	37,097	1,151
Hickory	98,612	--	21,918	22,288	21,015	14,494	10,691	8,206	--
Yellow birch	--	--	--	--	--	--	--	--	--
Hard maple	40,097	--	7,660	9,068	6,472	5,068	3,563	7,222	1,044
Soft maple	62,428	--	20,049	14,329	8,840	7,627	4,915	4,543	2,125
Beech	6,931	--	423	--	787	2,911	1,129	1,681	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	12,664	--	3,575	1,795	3,403	2,231	944	716	--
Ash	27,964	--	5,050	3,720	4,014	9,137	4,525	--	1,518
Cottonwood	852	--	--	--	--	--	--	852	--
Basswood	21,565	--	1,724	2,267	4,896	4,975	1,958	3,208	2,537
Yellow-poplar	189,619	--	21,408	29,382	35,875	39,592	29,744	31,832	1,786
Bay and magnolia	--	--	--	--	--	--	--	--	--
Black cherry	7,532	--	913	880	3,145	2,594	--	--	--
Black walnut	12,086	--	4,289	3,629	1,939	787	--	1,442	--
Sycamore	13,861	--	1,707	649	1,222	674	2,711	6,898	--
Black locust	26,682	--	8,406	8,518	2,714	2,486	2,943	1,615	--
Elm	5,095	--	1,560	543	--	1,341	--	1,651	--
Other eastern hardwoods	26,271	--	7,202	6,575	3,572	3,658	2,404	2,860	--
<b>Total hardwoods</b>	<b>2,031,649</b>	<b>--</b>	<b>352,763</b>	<b>399,152</b>	<b>326,836</b>	<b>316,434</b>	<b>224,389</b>	<b>355,211</b>	<b>56,864</b>
<b>All species</b>	<b>2,492,391</b>	<b>106,599</b>	<b>459,917</b>	<b>490,578</b>	<b>386,090</b>	<b>354,127</b>	<b>246,821</b>	<b>386,501</b>	<b>61,758</b>

Table 39--Total volume of live trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 and larger
<u>Thousand cubic feet</u>													
<b>Softwood</b>													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	18,143	165	--	--	1,375	4,377	2,722	2,854	--	5,119	2,131	--	--
Loblolly pine	1,045	62	321	--	--	662	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	219,685	5,327	14,811	35,548	62,108	44,953	32,881	16,787	5,506	1,764	--	--	--
Pitch pine	199,885	2,388	3,976	8,414	26,253	39,698	41,757	43,509	21,157	8,361	4,372	--	--
Table Mountain pine	113,706	1,044	2,810	11,838	25,842	26,257	24,320	13,549	5,885	1,142	1,019	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	273,597	10,413	20,475	23,139	27,192	34,146	27,827	29,268	33,832	21,539	15,983	29,783	--
Eastern hemlock	85,681	1,935	6,009	11,733	11,041	a, 150	9,663	6,321	5,843	6,940	4,144	8,170	5,732
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	19,480	1,350	1,919	6,384	2,988	2,480	1,708	2,651	--	--	--	--	--
<b>Total softwoods</b>	<b>931,822</b>	<b>22,684</b>	<b>50,321</b>	<b>97,056</b>	<b>156,799</b>	<b>160,723</b>	<b>140,878</b>	<b>114,939</b>	<b>72,223</b>	<b>44,865</b>	<b>27,649</b>	<b>37,953</b>	<b>5,732</b>
<b>Hardwood</b>													
Select white oaks	736,129	4,978	15,126	47,422	74,938	94,942	100,237	92,588	85,629	60,343	53,942	83,238	22,746
Select red oaks	539,327	3,411	12,294	21,185	30,775	47,078	48,934	53,600	53,945	49,372	56,555	128,613	33,565
Chestnut oak	1,480,070	6,681	45,837	116,003	182,315	195,208	192,526	177,357	140,465	134,673	86,549	175,182	27,274
Other white oaks	5,598	290	--	413	1,845	--	1,252	027	971	--	--	--	--
Other red oaks	887,877	7,002	20,209	67,553	120,739	138,360	123,931	157,942	81,454	82,937	33,173	53,104	1,473
Hickory	292,340	14,362	27,237	29,235	39,937	32,730	38,975	33,472	29,646	20,062	13,971	10,511	2,202
Yellow birch	1,970	75	--	--	--	1,895	--	--	--	--	--	--	--
Hard maple	104,929	3,158	6,660	8,032	15,465	10,953	13,204	13,309	8,082	6,724	5,892	10,368	2,282
Soft maple	380,206	41,353	61,267	63,450	64,997	36,243	41,079	24,346	16,487	10,129	8,605	9,660	2,590
Beech	13,894	83	265	1,754	748	--	825	--	2,332	4,078	1,543	2,266	--
<b>Sweetgum</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
Tupelo and blackgum	135,886	36,345	34,613	14,859	15,180	5,625	9,568	3,345	6,982	5,758	1,708	1,903	--
Ash	70,099	3,297	5,301	4,610	8,295	6,161	9,157	6,101	5,273	13,112	6,432	--	1,760
Cottonwood	1,034	--	--	--	--	--	--	--	--	--	--	1,034	--
Basswood	40,608	745	208	1,023	2,922	2,783	3,458	4,405	6,411	6,256	2,422	5,862	4,113
Yellow-poplar	333,456	3,202	10,757	19,212	15,190	36,533	34,895	41,356	46,354	48,323	36,267	31,758	3,609
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	32,938	3,121	3,726	2,467	4,249	5,972	2,078	1,997	5,941	3,387	--	--	--
Black walnut	41,740	180	3,050	3,020	7,055	5,715	7,057	7,406	3,695	2,198	--	2,364	--
Sycamore	22,848	108	515	--	1,493	1,631	2,896	983	1,662	877	3,457	8,531	695
Black locust	108,159	3,862	6,794	11,790	8,579	16,323	21,042	17,950	<b>7,191</b>	3,517	5,520	5,591	--
Elm	22,763	1,583	1,876	5,840	1,958	3,644	2,698	835	423	1,778	--	2,128	--
Other eastern hardwoods	289,929	62,175	68,027	44,814	30,170	27,627	19,320	12,435	9,631	7,184	4,759	3,787	--
<b>Total hardwoods</b>	<b>5,541,800</b>	<b>196,011</b>	<b>323,762</b>	<b>462,682</b>	<b>626,850</b>	<b>669,423</b>	<b>673,732</b>	<b>650,254</b>	<b>513,374</b>	<b>460,708</b>	<b>320,795</b>	<b>541,900</b>	<b>102,309</b>
<b>All species</b>	<b>6,473,622</b>	<b>218,695</b>	<b>374,083</b>	<b>559,738</b>	<b>783,649</b>	<b>830,146</b>	<b>814,610</b>	<b>765,193</b>	<b>585,597</b>	<b>505,573</b>	<b>348,444</b>	<b>579,853</b>	<b>108,041</b>

Table 40--Green weight of forest biomass on timberland, by species and diameter class, Northern Mountains of Virginia, 1992

Species	All classes	Diameter class (inches at breast height)											
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 and larger
<u>Hundred thousand pounds</u>													
Softwood													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	13,481	90	--	--	974	3,107	1,986	2,098	--	3,673	1,553	--	--
Loblolly pine	721	33	191	--	--	497	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	168,645	4,548	12,114	28,002	47,501	33,848	24,676	12,591	4,040	1,325	--	--	--
Pitch pine	134,920	1,896	3,605	5,522	17,407	26,924	27,874	29,019	14,167	5,632	2,874	--	--
Table Mountain pine	70,373	885	2,590	6,178	15,181	16,192	15,393	8,721	3,830	738	665	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	171,345	4,353	9,285	15,246	18,679	22,899	19,006	19,116	21,727	13,589	9,928	17,517	--
Eastern hemlock	66,323	1,103	3,821	9,261	9,842	7,137	8,341	5,085	4,422	5,112	2,966	5,511	3,716
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	14,128	822	1,237	4,716	2,293	1,862	1,189	2,009	--	--	--	--	--
Total softwoods	639,936	13,730	32,849	68,925	111,877	112,466	98,465	78,639	48,186	30,069	17,986	23,028	3,716
Hardwood													
Select white oaks	598,204	3,936	11,262	33,044	58,704	75,516	81,778	76,500	70,980	50,844	44,994	70,657	19,989
Select red oaks	441,097	2,888	9,326	16,183	25,567	39,206	40,400	44,751	44,470	40,550	46,118	104,555	27,083
Chestnut oak	1,182,947	6,052	35,657	83,644	140,128	152,428	153,425	143,308	115,661	110,576	72,109	146,749	23,210
Other white oaks	4,514	213	--	352	1,450	--	972	711	816	--	--	--	--
Other red oaks	762,428	5,359	14,690	55,941	106,826	120,362	108,419	136,551	69,842	70,922	27,636	44,692	1,188
Hickory	239,333	12,844	23,998	21,298	31,336	26,007	31,717	27,524	24,665	16,959	11,893	9,144	1,948
Yellow birch	1,524	66	--	--	--	1,458	--	--	--	--	--	--	--
Hard maple	85,890	2,665	5,551	5,620	12,064	8,822	10,866	11,032	7,504	5,751	5,037	8,923	2,055
Soft maple	277,344	31,403	43,586	43,913	48,637	26,807	30,297	17,990	12,359	7,251	6,230	6,953	1,918
Beech	11,315	74	230	1,020	827	--	701	--	1,934	3,294	1,225	2,010	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	97,063	28,874	26,143	8,394	9,594	3,619	6,411	2,337	4,892	4,120	1,237	1,442	--
Ash	44,895	1,925	3,362	3,637	6,673	4,149	6,186	3,871	3,076	7,483	3,633	--	900
Cottonwood	789	--	--	--	--	--	--	--	--	--	--	789	--
Basswood	27,894	521	150	457	1,956	1,843	2,385	3,094	4,483	4,281	1,700	4,128	2,896
Yellow-poplar	237,624	2,381	7,017	12,012	10,534	25,506	24,507	29,616	33,703	35,110	26,352	28,121	2,765
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	21,870	1,564	2,492	1,427	2,769	4,101	1,446	1,439	4,221	2,411	--	--	--
Black walnut	36,597	153	2,538	2,669	5,966	4,995	6,272	6,405	3,444	1,944	--	2,211	--
Sycamore	17,554	78	350	--	975	1,127	2,040	711	1,306	702	2,774	6,867	624
Black locust	104,938	3,248	5,663	10,005	8,514	16,036	21,004	18,070	7,376	3,613	5,680	5,729	--
Elm	14,700	1,159	1,347	3,434	1,081	2,369	1,742	569	276	1,266	--	1,457	--
Other eastern hardwoods	229,140	50,749	57,686	30,869	22,566	20,305	14,589	10,414	8,403	6,373	4,356	2,830	--
Total hardwoods	4,437,660	156,152	251,048	333,919	496,167	534,656	545,157	534,893	419,411	373,450	260,974	447,257	84,576
All species	5,077,596	169,882	283,897	402,844	608,044	647,122	643,622	613,532	467,597	403,519	278,960	470,285	88,292

Table 41--Average net annual growth and removals of live timber and growing stock on timberland, by species, Northern Mountains of Virginia, 1986-1991

Species	Live timber <sup>a</sup>		Growing stock	
	Net annual growth	Annual timber removals	Net annual growth	Annual timber removals
	<u>Thousand cubic feet</u>			
Softwood				
Yellow pines	5,730	4,277	5,730	4,277
Eastern white pine	6,056	740	6,056	740
Spruce and fir	--	--	--	--
Cypress	--	--	--	--
Other eastern softwoods	1,888	207	1,888	207
Total softwoods	<u>13,674</u>	<u>5,224</u>	<u>13,674</u>	<u>5,224</u>
Hardwood				
Select white and red oaks	16,853	10,012	16,853	9,626
Other white and red oaks	28,642	12,565	28,642	11,377
Hickory	3,383	1,293	3,383	1,228
Yellow birch	7	--	7	--
Hard maple	1,470	167	1,470	167
Sweetgum	--	--	--	--
Ash, walnut, and black cherry	2,013	1,031	2,013	798
Yellow-poplar	8,909	3,957	8,909	3,785
Tupelo and blackgum	1,006	176	1,006	56
Bay and magnolia	--	--	--	--
Other eastern hardwoods	8,705	4,119	8,705	3,005
Total hardwoods	<u>70,988</u>	<u>33,320</u>	<u>70,988</u>	<u>30,042</u>
All species	<u>84,662</u>	<u>38,544</u>	<u>84,662</u>	<u>35,266</u>

<sup>a</sup>Merchantable portion only.

Table 42--Average net annual growth and removals of sawtimber on timberland, by species, Northern Mountains of Virginia, 1986-1991

Species	Net annual growth	Annual timber removals
	<u>Thousand board feet</u>	
Softwood		
Yellow pines	36,112	13,259
Eastern white pine	28,284	4,301
Spruce and fir	--	--
Cypress	--	--
Other eastern softwoods	8,194	869
	<hr/>	<hr/>
Total softwoods	72,590	18,429
	<hr/> <hr/>	<hr/> <hr/>
Hardwood		
Select white and red oaks	79,731	41,259
Other white and red oaks	115,952	34,201
Hickory	12,380	4,003
Yellow birch	212	--
Hard maple	7,102	770
<b>Sweetgum</b>	--	--
Ash, walnut, and black cherry	6,473	3,135
Yellow-poplar	37,366	16,244
Tupelo and <b>blackgum</b>	738	--
Bay and magnolia	--	--
Other eastern hardwoods	22,346	9,301
	<hr/>	<hr/>
Total hardwoods	282,300	108,913
	<hr/> <hr/>	<hr/> <hr/>
All species	354,890	127,342

Table 43--Average annual removals of growing stock on timberland, by species and diameter class, Northern Mountains of Virginia, 1986-1991

Species	All classes	Diameter class (inches at breast height)									
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0 and larger
<u>Thousand cubic feet</u>											
Softwood											
Yellow pines	4,277	187	1,162	786	1,090	281	518	--	253	--	--
Eastern white pine	740	--	--	--	--	--	353	--	387	--	--
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Cypress	--	--	--	--	--	--	--	--	--	--	--
Other eastern softwoods	207	--	--	207	--	--	--	--	--	--	--
Total softwoods	<u>5,224</u>	<u>187</u>	<u>1,162</u>	<u>993</u>	<u>1,090</u>	<u>281</u>	<u>871</u>	<u>--</u>	<u>640</u>	<u>--</u>	<u>--</u>
Hardwood											
Select white and red oaks	9,626	257	498	566	325	905	350	1,477	996	2,467	1,785
Other white and red oaks	11,377	1,086	1,165	1,482	989	1,383	1,620	1,093	655	1,663	241
Hickory	1,228	120	83	138	114	322	123	165	163	--	--
Yellow birch	--	--	--	--	--	--	--	--	--	--	--
Hard maple	167	--	--	--	--	--	--	167	--	--	--
<b>Sweetgum</b>	--	--	--	--	--	--	--	--	--	--	--
Ash, walnut, and black cherry	798	--	--	--	232	311	137	--	--	118	--
Yellow-poplar	3,785	199	285	172	158	674	526	735	182	854	--
Tupelo and <b>blackgum</b>	56	56	--	--	--	--	--	--	--	--	--
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--
Other eastern hardwoods	3,005	86	182	523	654	314	373	433	280	160	--
Total hardwoods	<u>30,042</u>	<u>1,804</u>	<u>2,213</u>	<u>2,881</u>	<u>2,472</u>	<u>3,909</u>	<u>3,129</u>	<u>4,070</u>	<u>2,276</u>	<u>5,262</u>	<u>2,026</u>
All species	35,266	1,991	3,375	3,874	3,562	4,190	4,000	4,070	2,916	5,262	2,026

Table 44--Average annual mortality of live timber, growing stock, and sawtimber on timberland, by species, Northern Mountains of Virginia, 1986-1991

Species	Live timber <sup>a</sup>	Growing stock	Sawtimber
	<u>Thousand cubic feet</u>		<u>Thousand board feet</u>
Softwood			
Yellow pines	6,246	5,551	11,306
Eastern white pine	1,005	833	2,744
Spruce and fir	--	--	--
Cypress	--	--	--
Other eastern softwoods	98	52	--
Total softwoods	<b>7,349</b>	6,436	14,050
Hardwood			
Select white and red oaks	<b>7,709</b>	5,503	19,295
Other white and red oaks	20,162	14,506	41,226
Hickory	2,256	1,995	6,160
Yellow birch	--	--	--
Hard maple	148	148	--
<b>Sweetgum</b>	--	--	--
Ash, walnut, and black cherry	1,227	634	2,609
Yellow-poplar	523	236	--
Tupelo and blackgum	--	--	--
Bay and magnolia	--	--	--
Other eastern hardwoods	5,219	1,848	4,269
Total hardwoods	<b>37,244</b>	24,870	73,559
All species	44,593	31,306	87,609

<sup>a</sup>Merchantable portion only.

Table 45--Change in number of live trees on timberland, by species group, survey and diameter class, Northern Mountains of Virginia

Species group and year	All classes	Diameter class (inches at breast height)					
		1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9
<u>Thousand trees</u>							
Yellow pine							
1986	122,772	50,903	20,325	18,537	16,528	8,464	4,862
1992	105,256	41,596	18,317	13,567	14,360	8,779	4,804
Change	-17,516	-9,307	-2,008	-4,970	-2,168	<b>+315</b>	-58
Other softwood							
1986	92,760	51,551	16,116	11,702	5,583	3,618	1,309
1992	103,709	53,645	23,208	11,017	6,219	3,787	2,294
Change	<b>+10,949</b>	<b>+2,094</b>	<b>+7,092</b>	-685	<b>+636</b>	<b>+169</b>	<b>+985</b>
Hardwood							
1986	1,503,105	898,393	268,062	127,724	81,737	47,573	30,602
1992	1,420,544	835,941	252,521	119,556	81,453	47,911	31,515
Change	-82,561	-62,452	-15,541	-8,168	-284	<b>+338</b>	<b>+913</b>

Table 46--Land area, by land use class, major forest type, and **survey** completion date, Northern Mountains of Virginia

Land use class	Survey completion date			Change 1986-1992
	1977	1986	1992	
	<u>Acres</u>			
Forest land				
Timberland:				
Pine and oak-pine types	560,898	533,051	617,167	<b>+84,116</b>
Hardwood types	<b>2,064,814</b>	<b>2,021,625</b>	<b>1,919,662</b>	-101,963
Total	<b>2,625,712</b>	<b>2,554,676</b>	<b>2,536,829</b>	-17,847
Reserved timberland	120,020	144,172	186,812	<b>+42,640</b>
Woodland	66,061	57,453	43,380	-14,073
Total forest land	<b>2,811,793</b>	<b>2,756,301</b>	<b>2,767,021</b>	<b>+10,720</b>
Nonforest land				
<b>Cropland</b>	341,294	449,939	446,227	-3,712
Pasture and range	878,334	779,145	749,848	-29,297
Other	256,439	305,691	321,434	<b>+15,743</b>
Total	<b>1,476,067</b>	<b>1,534,775</b>	<b>1,517,509</b>	-17,266
<b>All land<sup>a</sup></b>	<b>4,287,860</b>	<b>4,291,076</b>	<b>4,284,530</b>	-6,546

<sup>a</sup>Excludes all water areas.

Table 47--Volume<sup>a</sup> of sawtimber, growing stock, and live timber on timberland, by species group, survey completion date, and diameter class, Northern Mountains of Virginia

Species group and year	All classes	Diameter class (inches at breast height)								
		5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0 and larger
<b>SAWTIMBER (in thousand board feet)</b>										
<b>Softwood</b>										
1977	1,954,041	--	--	464,416	495,230	380,056	240,067	147,259	56,535	170,478
1986	2,073,255	--	--	452,914	469,897	375,276	316,642	182,284	84,620	191,622
1992	2,402,354	--	--	474,149	517,899	481,638	332,736	222,802	138,065	235,065
<b>Hardwood</b>										
1977	8,430,259	--	--	--	1,454,750	1,530,376	1,560,905	1,170,114	860,177	1,853,937
1986	9,451,212	--	--	--	1,561,297	1,698,189	1,760,862	1,458,409	871,086	2,101,369
1992	10,504,849	--	--	--	1,677,738	1,931,624	1,652,388	1,660,629	1,217,541	2,364,929
<b>GROWING STOCK (in thousand cubic feet)</b>										
<b>Softwood</b>										
1977	638,053	80,211	122,891	132,131	115,090	78,510	45,675	26,289	9,647	27,609
1986	658,435	77,305	127,290	128,841	109,211	77,529	60,247	32,542	14,438	31,032
1992	710,038	70,565	127,872	132,943	119,079	97,697	62,287	39,168	23,180	37,247
<b>Hardwood</b>										
1977	3,108,968	291,516	395,924	464,735	432,544	391,395	358,937	249,487	174,329	350,101
1986	3,318,847	260,970	415,754	454,332	464,197	434,368	404,889	310,943	176,543	396,851
1992	3,568,154	252,506	425,156	491,535	495,311	488,439	375,748	351,983	245,306	442,170
<b>LIVE TIMBER<sup>b</sup> (in thousand cubic feet)</b>										
<b>Softwood</b>										
1977	660,861	83,810	130,209	137,177	117,816	81,554	46,066	26,289	9,647	28,293
1986	681,259	80,863	134,874	133,720	111,787	80,519	60,752	32,542	14,438	31,764
1992	726,730	72,888	130,732	137,473	121,846	99,727	62,787	39,168	24,132	37,977
<b>Hardwood</b>										
1977	3,714,351	397,108	482,444	549,344	505,374	445,196	409,549	279,749	213,839	431,748
1986	3,952,785	355,643	506,658	537,083	542,470	494,140	462,002	348,751	216,530	489,508
1992	4,030,284	322,808	489,324	539,364	549,373	533,406	423,352	381,530	265,367	525,760

<sup>a</sup>To provide a basis for valid comparisons, adjustments have been made to allow for differences in volume tables and sawtimber specifications used in previous surveys.

<sup>b</sup>Merchantable volume.

Johnson, Tony G. 1992. Forest statistics for the Northern Mountains of Virginia, 1992. Resour. Bull. SE-128. Asheville NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 50 pp.

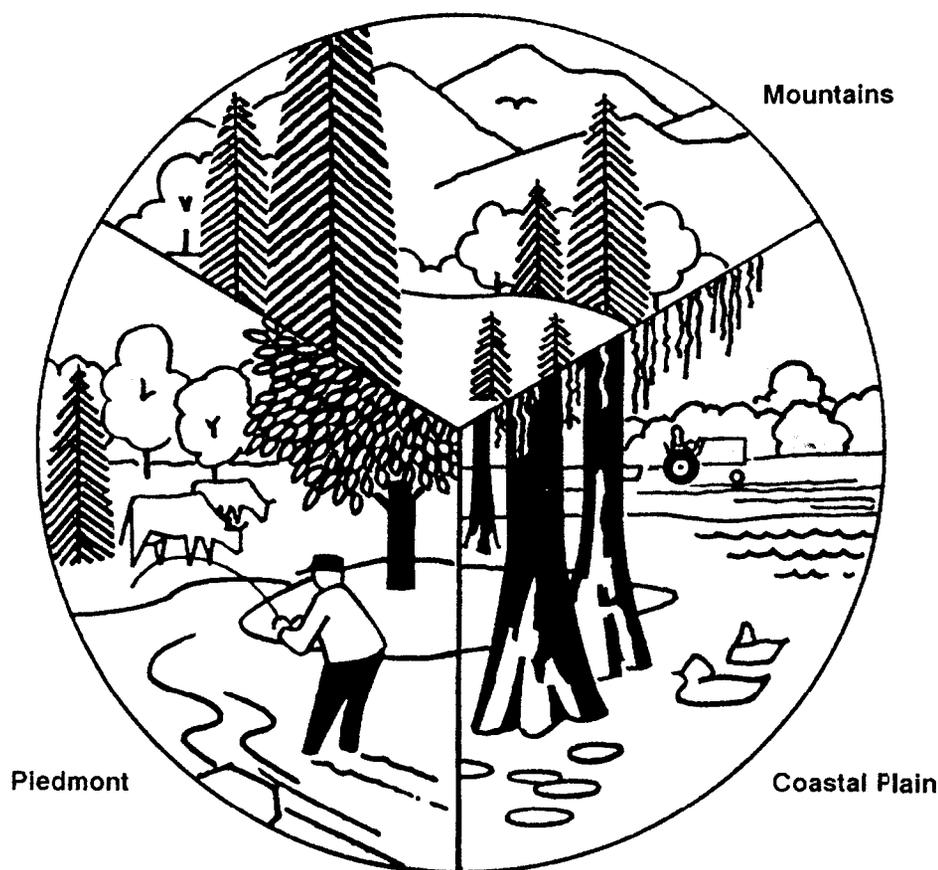
Since 1986, area of timberland in the Northern Mountains of Virginia declined less than 1 percent and currently totals 2.5 million acres. Non-industrial private forest landowners control 56 percent of this timberland, less than that for most other survey units of the Southeast. Nearly 10,000 acres were harvested annually, while 10,000 acres yearly were regenerated mostly by natural means. Volume of hardwood growing stock increased nearly 8 percent to 3.6 billion cubic feet. Volume of softwood growing stock increased 8 percent to 0.7 billion cubic feet. Net annual growth of hardwood growing stock declined 6 percent to 71 million cubic feet. Softwood growth rose 15 percent to 14 million cubic feet. Annual removals of hardwood growing stock increased 50 percent to 30 million cubic feet; softwood removals were up 62 percent to 5 million cubic feet. Annual mortality of hardwood growing stock increased 25 percent to 25 million cubic feet. Annual softwood mortality was up 4 percent to 6 million cubic feet.

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

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# Southeastern Forest Experiment Station

Established 1921

The Southeastern Forest Experiment Station, headquartered in Asheville, North Carolina, is one of the eight regional Experiment Stations, and the Forest Products Laboratory, that make up the Forest Service research organization.

## RESEARCH MISSION:

To acquire the knowledge, develop the technology, and disseminate the research findings required to manage the Southeast's forest resources in ways that satisfy demands of goods and services while maintaining a quality environment.

## RESEARCH LOCATIONS:

Blacksburg, VA  
 Research Triangle Park, NC  
 Franklin, NC  
 Clemson, SC  
 Charleston, SC  
 Athens, GA  
 Macon, GA  
 Olustee/Gainesville, FL

## EXPERIMENTAL FORESTS:

Chipola, Marianna, FL  
 Holt Walton, Vienna, GA  
 Cowetta, Otto, NC  
 Bent Creek, Asheville, NC  
 Santee, Moncks Corner, SC  
 Scull Shoals, Athens, GA  
 Hitchiti, Juliette, GA  
 Olustee, Olustee, FL