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Forest Statistics for the Northern Mountains of Virginia, 1986

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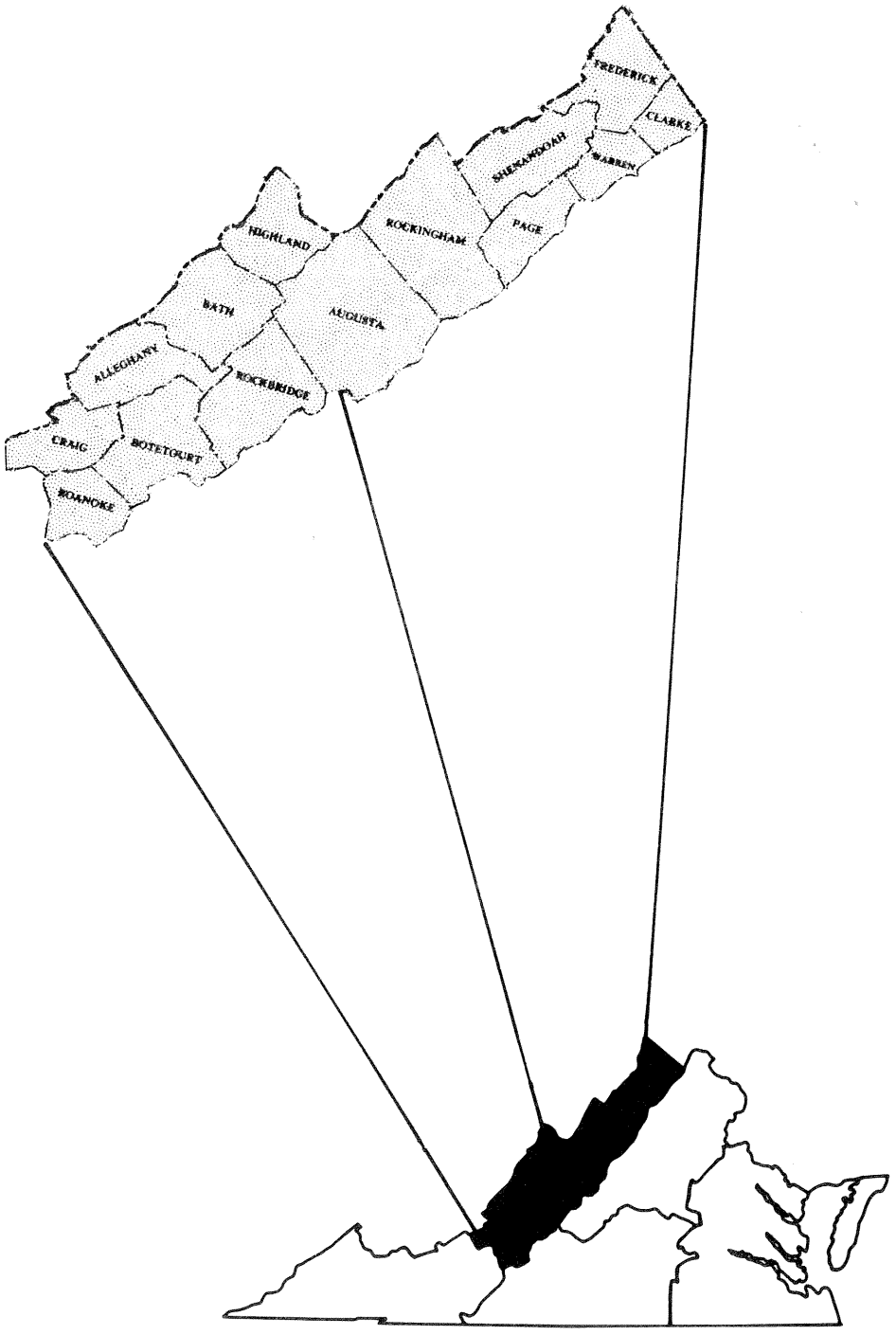

Forest Statistics for the Northern Mountains of Virginia, 1986

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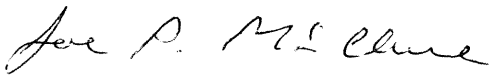
Foreword

This report highlights the principal findings of the fifth forest survey in the Northern Mountains of Virginia. Fieldwork began in August 1985 and was completed in October 1985. Four previous surveys, completed in 1940, 1957, 1966, and 1977, provide statistics for measuring changes and trends over the past 46 years. The primary emphasis in this report is on the changes and trends since 1977. 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 Rangeland 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 lands, 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-80, SE-81, and SE-84, have been issued for the Coastal Plain, Southern Piedmont, and Northern Piedmont of Virginia. A comparable report for the Southern Mountains 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.



JOE P. McCLURE
Project Leader

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*Tables 1-12, 27, 29-33, 35-38, 41, 42, and 44 are common to all Forest Inventory and Analysis forest resource statistical reports of the Eastern United States.

Since 1977 in the Northern Mountains of Virginia

• area of timberland has decreased by 99,000 acres, or by 3.8 percent. Altogether, 147,000 acres of timberland were diverted to other land uses but were partially offset by 48,000 acres of new timberland. Of the acreage diverted, 50 percent went to urban and related uses, more than 32 percent went to agriculture, 17 percent was reclassified to reserved timberland, and less than 1 percent went to water areas. Timberland now totals more than 2.5 million acres and accounts for 59 percent of the total land area in the 14 counties that make up this region of Virginia.

• area of nonindustrial private forest (NIPF) land has decreased 10 percent, from more than 1.5 to less than 1.4 million acres. Within the NIPF grouping, a 12-percent increase in the acreage owned by other individuals partially offset a 35-percent decline in farmer-owned timberland and a 12-percent decline in other corporate holdings. Acreage controlled by forest industry increased 22 percent to 88,000 acres, yet remains the smallest ownership category. Publicly owned timberland increased more than 3 percent to nearly 1.1 million acres. National Forests contain 92 percent of the publicly owned timberland.

• the area of timberland supporting stands more than 70 years old has increased 16 percent to 792,000 acres. Altogether, sawtimber stands increased more than 18 percent to 1.4 million acres. Sawtimber stands now occupy 56 percent of the total timberland. Poletimber stands have decreased 20 percent to 872,000 acres. The area covered by sapling-seedling stands has dropped 34 percent to 192,000 acres. Nonstocked timberland has declined 4 percent to 53,000 acres.

• only 9,000 acres were harvested annually and retained in timberland. Hardwood forest types accounted for 80 percent of the average annual harvest, with oak-pine types making up the remaining 20 percent. About 70 percent of the annual harvest took place on NIPF land, 19 percent on public land, and 11 percent on timberland controlled by forest industry. In addition to final harvest, selective cutting and other intermediate cutting occurred on almost 7,000 acres each year. Insects, diseases, weather, and other natural agents damaged almost 47,000 acres annually. More than 82 percent of the annual damage happened in upland hardwood stands.

• more than 9,000 acres of timberland were regenerated annually. About 68 percent of the regeneration was to an upland hardwood type and the remaining 32 percent to a pine or oak-pine type. The area artificially regenerated each year averaged less than 1,400 acres, or only 15 percent of the total regeneration. Of the area artificially regenerated, 68 percent took place on NIPF land and 32 percent on public land.

• average basal area of live trees 5.0 inches d.b.h. and larger increased from 77 to more than 83 square feet per acre, or by 8 percent. At the same time, the number of saplings per acre declined from 572 to 517. Hardwoods account for 89 percent of all saplings and decreased almost 15 percent to less than 1.2 billion in number. The number of softwood saplings showed little change. Average net volume per acre of all trees increased 11 percent to 1,655 cubic feet.

• volume of softwood growing stock has increased from 575 to 593 million cubic feet, or by 3 percent. Softwood accounts for less than 17 percent of the total growing-stock volume. Virginia pine gained 12 percent in volume to 152 million cubic feet and replaced pitch pine as the predominant softwood species. Eastern white pine also gained 38 percent in volume to 145 million cubic feet and now is the second most abundant softwood species. Pitch pine fell 29 percent in volume to 139 million cubic feet and now ranks third in abundance. Volume of softwood sawtimber increased 6 percent to 1.9 billion board feet.

• volume of hardwood growing stock has increased from 2.8 to nearly 3.0 billion cubic feet, or by almost 7 percent. Collectively, the oaks account for 72 percent of the hardwood growing-stock volume. Chestnut oak at 745 million cubic feet is the predominant species in the oak group. Yellow-poplar, maples, and hickory are the next most abundant species with 7, 7, and 6 percent of the volume, respectively. Volume of hardwood sawtimber increased 12 percent to 8.6 billion board feet.

In 1985

• net annual growth of growing stock totaled 88 million cubic feet, down 7 percent from the growth in 1976. Net growth of growing stock averaged 35 cubic feet per acre, a slight decline from the previous average of 36 cubic feet. Hardwoods make up 86 percent of the total net annual growth. Across all ownerships, net annual growth of hardwood growing stock decreased 6 percent, whereas that for softwoods was down 13 percent. The total net annual growth of growing stock for all species includes almost 344 million board feet of sawtimber, up by 3 percent since 1976.

• annual removals of growing stock totaled more than 23 million cubic feet, down 29 percent since 1976. Hardwoods accounted for 86 percent or 20 million cubic feet of the total annual removals. Hardwood removals have decreased 23 percent from the previous survey and softwood removals have decreased 53 percent. The total annual removals of growing stock included 81 million board feet of sawtimber.

• annual mortality of growing stock totaled 26 million cubic feet, up 82 percent from the previous survey. Hardwood mortality increased 120 percent to 20 million cubic feet annually. Hardwoods now make up 76 percent of the annual mortality compared with 63 percent in the last survey. By ownership, mortality on National Forest land has increased from less than one-third to almost one-half the total, whereas the proportion on NIPF land has declined. For hardwoods, disease was the leading cause of death, causing 43 percent of the mortality. Insects continue to be a major cause of death to softwoods, accounting for 25 percent of the mortality. For hardwoods and softwoods combined, annual mortality of growing stock included more than 70 million board feet of sawtimber, an increase of 163 percent since 1976. Altogether, mortality reduced gross growth of growing stock by 23 percent.

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 10,402 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 misclassifications.

2. Estimates of timber volume and forest classifications were based on measurements recorded at 580 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 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 on these standing trees required to construct volume equations.

4. Felled trees were measured at 7 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 using 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 576 permanent sample plots established in the fourth 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):

	Percent
Per million acres of timberland	1.01
Per billion cubic feet of growing stock	4.98
Per billion cubic feet of net annual growth	0.88
Per billion cubic feet of annual removals	2.62

Sampling errors for county and unit totals,[a] in terms of one standard error, Northern Mountains of Virginia, 1986

County	Timberland area	Cubic-foot volume of growing stock		
		Inventory	Growth	Removals
	Sampling error[b]			
Alleghany	1.11	7.12	8.99	62.16
Augusta	2.14	8.37	8.87	73.82
Bath	.96	7.36	7.40	56.56
Botetourt	1.76	10.30	9.65	48.44
Clarke	5.80	20.48	18.41	.00
Craig	1.85	9.35	11.75	57.24
Frederick	3.24	10.38	10.64	55.10
Highland	1.97	10.50	9.83	51.05
Page	3.59	11.65	12.75	64.22
Roanoke	3.42	16.08	14.10	100.06
Rockbridge	2.00	7.63	7.54	38.73
Rockingham	2.27	7.28	7.69	47.57
Shenandoah	2.62	9.01	15.89	100.03
Warren	4.31	17.61	18.15	55.29
Total	.60	2.62	2.95	17.13

[a]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.

[b]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 poletimber and sawtimber-size trees.

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

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

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

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

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

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

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

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., inclusive.

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 himself 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 non-forest 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 tropical. 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 broad-leaf 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 flood plains (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 1.0 inch d.b.h. and larger which are not dead at the time of inventory.

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

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 sawtimber 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 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 nonpulpmills, chipped, and then sold to pulpmills as residues, including chipped tops, jump sections, whole trees, and pulpwood sticks.

Roundwood products. Any primary product such as lumber, poles, pilings, pulp, or fuelwood 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 growing-stock trees in the stand.

Sawtimber stands. Stands at least 16.7 percent stocked with growing-stock 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 growing-stock 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 growing-stock 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.

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	60.5	61.0	68.2	60.0
8	68.7	68.1	76.0	68.4
10	73.7	73.1	81.4	73.4
12	76.7	76.7	85.2	76.4
14	78.9	79.4	88.2	78.4
16	80.5	81.6	90.4	79.8
18	81.4	83.3	92.3	80.8
20	82.1	84.8	93.8	81.5
22	82.7	86.0	95.1	82.1
24+	83.8	87.9	97.1	83.0
Average	75.1	72.3	84.3	74.9

Metric equivalents of units used in this report

1 acre = 4,046.86 square meters or 0.404686 hectare

1 cubic foot = 0.028317 cubic meter

1 inch = 2.54 centimeters or 0.0254 meter

Breast height = 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

TABLES

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 4.

Table 1.--Area, by county and land class, Northern Mountains of Virginia, 1986

County	All land[a]	Forest land				Nonforest land[b]
		Total	Timberland	Woodland	Reserved timberland	
	Acres					
Alleghany	290,317	251,501	249,379	2,021	101	38,816
Augusta	643,097	345,921	297,003	16,681	32,237	297,176
Bath	343,651	302,052	291,651	6,246	4,155	41,599
Botetourt	348,550	245,026	235,918	5,492	3,616	103,524
Clarke	114,138	40,601	39,279	--	1,322	73,537
Craig	211,085	175,307	173,085	13	2,209	35,778
Frederick	271,532	130,947	130,606	341	--	140,585
Highland	266,112	195,822	194,889	933	--	70,290
Page	200,346	120,991	81,161	2,644	37,186	79,355
Roanoke	197,472	102,107	99,622	--	2,485	95,365
Rockbridge	389,382	243,783	234,494	2,276	7,013	145,599
Rockingham	557,376	308,742	256,501	12,258	39,983	248,634
Shenandoah	327,833	185,674	177,799	7,872	3	142,159
Warren	139,053	79,845	65,307	676	13,862	59,208
Total	4,299,944	2,728,319	2,526,694	57,453	144,172	1,571,625

[a] From U.S. Bureau of the Census, 1980.

[b] Includes 9,100 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, 1986

County	All ownerships	Ownership class							
		National Forest	Miscellaneous Federal	State	County and municipal	Forest industry[a]	Other private		
							Farmer	Corporate	Individual
	Acres								
Alleghany	249,379	138,460	2,000	145	215	8,565	14,285	23,808	61,901
Augusta	297,003	156,253	--	11,620	463	--	33,358	19,062	76,247
Bath	291,651	171,395	--	9,805	199	450	31,878	24,794	53,130
Botetourt	235,918	69,694	--	10	6,910	40,346	32,816	20,510	65,632
Clarke	39,279	--	--	84	182	5	4,334	--	34,674
Craig	173,085	112,130	--	--	--	--	30,477	4,354	26,124
Frederick	130,606	4,491	--	43	229	375	54,892	23,525	47,051
Highland	194,889	56,498	--	13,438	290	13,906	45,310	--	65,447
Page	81,161	23,826	--	45	40	60	23,549	--	33,641
Roanoke	99,622	3,006	53	7,614	5,207	7,098	22,542	9,017	45,085
Rockbridge	234,494	57,172	--	23,576	1,206	16,338	34,051	4,256	97,895
Rockingham	256,501	124,930	--	217	92	748	18,645	27,967	83,902
Shenandoah	177,799	69,631	--	45	175	--	25,907	4,318	77,723
Warren	65,307	5,362	1,738	285	414	557	26,285	8,762	21,904
Total	2,526,694	992,848	3,791	66,927	15,622	88,448	398,329	170,373	790,356

[a]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, 1986

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									
Alleghany	249,379	4,775	--	--	16,425	30,787	183,107	--	--	14,285
Augusta	297,003	463	--	--	28,203	30,106	238,231	--	--	--
Bath	291,651	3,542	--	--	11,981	37,497	238,631	--	--	--
Botetourt	235,918	8,202	--	--	24,607	22,387	176,620	--	4,102	--
Clarke	39,279	--	--	--	--	--	39,274	--	5	--
Craig	173,085	4,354	--	--	29,082	30,065	109,584	--	--	--
Frederick	130,606	3,921	--	--	11,763	7,842	107,080	--	--	--
Highland	194,889	5,034	--	--	4,346	23,107	147,987	--	--	14,415
Page	81,161	--	--	--	10,092	3,364	67,645	--	60	--
Roanoke	99,622	--	--	--	25,549	13,525	60,548	--	--	--
Rockbridge	234,494	--	--	--	21,563	31,545	177,129	--	4,257	--
Rockingham	256,501	4,256	--	--	9,323	40,955	192,644	--	9,323	--
Shenandoah	177,799	8,414	--	--	8,635	12,954	143,478	--	4,318	--
Warren	65,307	--	--	--	414	--	51,193	--	13,700	--
Total	2,526,694	42,961	--	--	201,983	284,134	1,933,151	--	35,765	28,700

Table 4.--Area of timberland, by county and stand-size class, Northern Mountains of Virginia, 1986

County	All stands	Stand-size class			Nonstocked areas
		Sawtimber	Poletimber	Sapling-seedling	
			Acres		
Alleghany	249,379	128,548	107,025	9,044	4,762
Augusta	297,003	138,260	113,664	30,782	14,297
Bath	291,651	152,431	118,800	20,420	--
Botetourt	235,918	117,954	76,013	37,849	4,102
Clarke	39,279	26,277	8,668	--	4,334
Craig	173,085	80,917	82,474	9,694	--
Frederick	130,606	79,407	39,436	11,763	--
Highland	194,889	108,431	72,732	13,726	--
Page	81,161	48,043	26,390	6,728	--
Roanoke	99,622	57,389	34,718	7,515	--
Rockbridge	234,494	148,922	58,719	26,853	--
Rockingham	256,501	175,988	62,863	8,825	8,825
Shenandoah	177,799	101,678	63,611	4,096	8,414
Warren	65,307	45,631	6,533	4,381	8,762
Total	2,526,694	1,409,876	871,646	191,676	53,496

Table 5.--Area of timberland, by county and site class, Northern Mountains of Virginia, 1986

County	All classes	Site class (cubic feet per acre per year)				
		> 164	120-164	85-119	50-84	20-49
	Acres					
Alleghany	249,379	--	4,775	14,442	114,044	116,118
Augusta	297,003	463	--	4,765	117,684	174,091
Bath	291,651	--	8,439	11,986	137,740	133,486
Botetourt	235,918	4,100	8,204	36,914	115,748	70,952
Clarke	39,279	--	4,335	8,850	21,760	4,334
Craig	173,085	--	--	8,707	105,232	59,146
Frederick	130,606	--	3,921	15,684	59,083	51,918
Highland	194,889	--	--	13,726	97,804	83,359
Page	81,161	--	--	--	43,271	37,890
Roanoke	99,622	4,508	4,508	13,525	44,486	32,595
Rockbridge	234,494	4,397	--	34,332	136,623	59,142
Rockingham	256,501	92	4,164	13,984	94,162	144,099
Shenandoah	177,799	--	--	8,414	76,609	92,776
Warren	65,307	--	--	8,762	39,023	17,522
Total	2,526,694	13,560	38,346	194,091	1,203,269	1,077,428

Table 6.--Area of timberland, by county and stocking class of growing-stock trees, Northern Mountains of Virginia, 1986

County	All classes	Stocking class (percent)[a]				
		> 130	100-130	60-99	16.7-59	< 16.7
	Acres					
Alleghany	249,379	--	35,515	152,162	56,940	4,762
Augusta	297,003	--	57,728	141,696	83,282	14,297
Bath	291,651	4,897	85,751	135,746	65,257	--
Botetourt	235,918	4,100	25,549	139,410	62,757	4,102
Clarke	39,279	--	8,668	21,938	4,339	4,334
Craig	173,085	15,032	50,439	76,562	31,052	--
Frederick	130,606	--	31,596	71,188	27,822	--
Highland	194,889	10,069	63,380	69,692	51,748	--
Page	81,161	--	10,092	39,893	31,176	--
Roanoke	99,622	4,508	22,543	56,508	16,063	--
Rockbridge	234,494	8,796	51,297	130,232	44,169	--
Rockingham	256,501	4,164	40,054	141,679	61,779	8,825
Shenandoah	177,799	16,828	54,578	55,243	42,736	8,414
Warren	65,307	--	10,156	32,689	13,700	8,762
Total	2,526,694	68,394	547,346	1,264,638	592,820	53,496

[a]See stocking standards on page 12.

Table 7.--Volume of growing stock and sawtimber on timberland, by county and species group, Northern Mountains of Virginia, 1986

County	Growing stock					Sawtimber				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	Thousand cubic feet[a]					Thousand board feet				
Alleghany	306,157	36,411	14,159	28,876	226,711	853,106	84,328	59,493	80,042	629,243
Augusta	332,337	51,903	15,030	24,544	240,860	887,520	176,291	46,095	60,796	604,338
Bath	419,651	33,083	14,247	45,039	327,282	1,186,750	98,964	40,343	107,102	940,341
Botetourt	325,930	34,840	19,829	77,650	193,611	1,057,140	93,118	88,464	325,161	550,397
Clarke	79,320	--	--	28,149	51,171	310,232	--	--	125,844	184,388
Craig	274,212	69,753	16,028	8,251	180,180	679,006	240,179	65,561	6,367	366,899
Frederick	190,419	10,886	9,206	26,958	143,369	577,467	22,947	28,779	57,375	468,366
Highland	315,366	9,053	35,308	53,647	217,358	963,373	14,313	157,322	155,156	636,582
Page	118,211	17,882	3,143	13,938	83,248	333,523	44,596	15,815	47,895	225,217
Roanoke	123,903	23,650	11,092	11,707	77,454	295,414	40,531	43,422	27,305	184,156
Rockbridge	331,371	38,256	16,097	46,903	230,115	1,002,486	101,962	63,497	138,544	698,483
Rockingham	385,678	22,630	34,124	41,334	287,590	1,268,911	68,434	115,087	106,001	979,389
Shenandoah	299,800	33,930	14,348	35,736	215,786	844,144	108,524	64,280	77,927	593,413
Warren	87,349	7,036	1,285	12,744	66,284	242,569	16,254	4,449	52,557	169,309
Total	3,589,704	389,313	203,896	455,476	2,541,019	10,501,641	1,110,441	792,607	1,368,072	7,230,521

[a]Factors for converting to cords are shown on page 12.

Table 8.--Net annual growth of growing stock and sawtimber on timberland, by county and species group, Northern Mountains of Virginia, 1985

County	Growing stock					Sawtimber				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	Thousand cubic feet					Thousand board feet				
Alleghany	8,097	664	581	1,084	5,768	24,348	2,033	2,134	2,306	17,875
Augusta	7,993	594	483	1,128	5,788	31,669	3,655	1,757	1,483	24,774
Bath	10,356	431	430	1,688	7,807	38,618	1,899	2,851	2,959	30,909
Botetourt	7,716	557	531	2,249	4,379	37,654	1,767	2,760	12,704	20,423
Clarke	1,905	--	--	764	1,141	7,514	--	--	3,489	4,025
Craig	6,899	836	423	281	5,359	20,401	3,709	1,709	1,875	13,108
Frederick	4,672	174	291	1,066	3,141	19,470	856	1,410	1,854	15,350
Highland	7,883	202	1,067	1,435	5,179	33,139	561	4,871	5,390	22,317
Page	2,798	304	59	416	2,019	13,804	1,354	355	2,000	10,095
Roanoke	3,108	473	285	299	2,051	10,520	1,343	1,418	1,320	6,439
Rockbridge	7,872	625	611	1,395	5,241	29,445	3,156	1,968	5,162	19,159
Rockingham	8,412	249	1,057	1,274	5,832	36,938	1,207	4,113	3,766	27,852
Shenandoah	7,852	472	386	2,043	4,951	29,760	3,442	2,028	4,774	19,516
Warren	2,330	114	35	431	1,750	10,283	523	153	2,020	7,587
Total	87,893	5,695	6,239	15,553	60,406	343,563	25,505	27,527	51,102	239,429

Table 9.--Annual removals of growing stock and sawtimber on timberland, by county and species group, Northern Mountains of Virginia, 1985

County	Growing stock					Sawtimber				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	Thousand cubic feet					Thousand board feet				
Alleghany	1,288	461	--	553	274	5,254	2,115	--	3,139	--
Augusta	530	--	--	--	530	2,362	--	--	--	2,362
Bath	2,137	--	--	124	2,013	6,154	--	--	--	6,154
Botetourt	4,774	279	141	89	4,265	19,165	1,573	558	--	17,034
Clarke	--	--	--	--	--	--	--	--	--	--
Craig	1,491	627	--	--	864	3,736	2,318	--	--	1,418
Frederick	714	--	--	--	714	1,583	--	--	--	1,583
Highland	2,326	649	322	281	1,074	8,640	4,188	1,864	--	2,588
Page	1,115	--	--	--	1,115	4,475	--	--	--	4,475
Roanoke	993	--	--	993	--	4,793	--	--	4,793	--
Rockbridge	4,053	--	243	651	3,159	14,510	--	1,453	3,427	9,630
Rockingham	2,387	115	145	329	1,798	7,455	450	751	1,931	4,323
Shenandoah	120	120	--	--	--	518	518	--	--	--
Warren	1,392	132	--	--	1,260	2,802	--	--	--	2,802
Total	23,320	2,383	851	3,020	17,066	81,447	11,162	4,626	13,290	52,369

Table 10.--Area of timberland, by forest type and ownership class, Northern Mountains of Virginia, 1986

Forest type	All ownerships	Ownership class				
		National Forest	Other public	Forest industry	Forest industry-leased	Other private
	Acres					
Softwood types:						
White pine-hemlock	42,961	17,135	555	--	--	25,271
Spruce-fir	--	--	--	--	--	--
Longleaf pine	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--
Loblolly pine	--	--	--	--	--	--
Shortleaf pine	--	--	--	--	--	--
Virginia pine	94,438	12,649	414	2,142	--	79,233
Sand pine	--	--	--	--	--	--
Eastern redcedar	4,102	--	--	--	--	4,102
Pond pine	--	--	--	--	--	--
Spruce pine	--	--	--	--	--	--
Pitch pine	60,010	30,496	--	--	--	29,514
Table Mountain pine	43,433	25,555	--	--	--	17,878
Total	244,944	85,835	969	2,142	--	155,998
Hardwood types:						
Oak-pine	284,134	127,482	11,903	16,312	--	128,437
Oak-hickory	1,702,354	653,820	54,663	60,243	--	933,628
Chestnut oak	226,031	121,365	18,805	9,129	--	76,732
Southern scrub oak	4,766	--	--	--	--	4,766
Oak-gum-cypress	--	--	--	--	--	--
Elm-ash-cottonwood	35,765	--	--	622	--	35,143
Maple-beech-birch	28,700	4,346	--	--	--	24,354
Total	2,281,750	907,013	85,371	86,306	--	1,203,060
All types	2,526,694	992,848	86,340	88,448	--	1,359,058

Table 11.--Area of timberland, by ownership and stocking classes of growing-stock trees, Northern Mountains of Virginia, 1986

Ownership class	All classes	Stocking class (percent)[a]				
		> 130	100-130	60-99	16.7-59	< 16.7
	Acres					
National Forest	992,848	40,827	233,156	486,451	224,154	8,260
Other public	86,340	--	8,246	56,611	21,483	--
Forest industry	88,448	--	13,213	44,211	31,024	--
Forest industry-leased	--	--	--	--	--	--
Other private	1,359,058	27,567	292,731	677,365	316,159	45,236
All ownerships	2,526,694	68,394	547,346	1,264,638	592,820	53,496

[a]See stocking standards on page 12.

Table 12.--Area of timberland, by forest type and stand-size class, Northern Mountains of Virginia, 1986

Forest type	All stands	Stand-size class			Nonstocked areas
		Sawtimber	Poletimber	Sapling-seedling	
	Acres				
Softwood types:					
White pine-hemlock	42,961	30,192	9,227	3,542	--
Spruce-fir	--	--	--	--	--
Longleaf pine	--	--	--	--	--
Slash pine	--	--	--	--	--
Loblolly pine	--	--	--	--	--
Shortleaf pine	--	--	--	--	--
Virginia pine	94,438	20,388	57,709	12,239	4,102
Sand pine	--	--	--	--	--
Eastern redcedar	4,102	--	--	4,102	--
Pond pine	--	--	--	--	--
Spruce pine	--	--	--	--	--
Pitch pine	60,010	35,294	21,710	3,006	--
Table Mountain pine	43,433	22,080	21,353	--	--
Total	244,944	107,954	109,999	22,889	4,102
Hardwood types:					
Oak-pine	284,134	143,404	109,537	31,193	--
Oak-hickory	1,702,354	978,602	571,351	129,393	23,008
Chestnut oak	226,031	138,166	67,086	8,201	12,578
Southern scrub oak	4,766	--	--	--	4,766
Oak-gum-cypress	--	--	--	--	--
Elm-ash-cottonwood	35,765	18,085	8,638	--	9,042
Maple-beech-birch	28,700	23,665	5,035	--	--
Total	2,281,750	1,301,922	761,647	168,787	49,394
All types	2,526,694	1,409,876	871,646	191,676	53,496

Table 13.--Area of timberland, by stand-age and broad management classes, all ownerships, Northern Mountains of Virginia, 1986

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
			Acres			
00-10	75,950	3,542	4,102	8,760	59,546	--
11-20	108,717	555	22,342	34,519	51,301	--
21-30	62,211	4,397	16,364	9,291	32,159	--
31-40	51,447	--	8,266	--	43,181	--
41-50	167,207	--	36,768	8,876	121,563	--
51-60	316,854	--	51,389	21,649	243,816	--
61-70	397,155	--	41,483	50,077	296,957	8,638
71-80	315,144	--	14,762	29,491	266,789	4,102
81+	476,962	--	21,536	48,812	406,614	--
No manageable stand	555,047	--	19,438	72,659	439,925	23,025
All classes	2,526,694	8,494	236,450	284,134	1,961,851	35,765

Table 14.--Area of timberland, by stand-age and broad management classes, public ownerships, Northern Mountains of Virginia, 1986

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
			Acres			
00-10	23,613	--	--	4,099	19,514	--
11-20	46,479	555	3,006	26,720	16,198	--
21-30	15,645	4,397	--	--	11,248	--
31-40	12,505	--	4,164	--	8,341	--
41-50	50,849	--	10,680	4,774	35,395	--
51-60	127,424	--	20,772	5,538	101,114	--
61-70	168,271	--	25,490	28,448	114,333	--
71-80	162,359	--	5,340	17,313	139,706	--
81+	255,604	--	12,400	19,234	223,970	--
No manageable stand	216,439	--	--	33,259	183,180	--
All classes	1,079,188	4,952	81,852	139,385	852,999	--

Table 15.--Area of timberland, by stand-age and broad management classes, forest industry,[a] Northern Mountains of Virginia, 1986

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
	Acres					
00-10	4,922	--	--	--	4,922	--
11-20	6,226	--	2,142	--	4,084	--
21-30	--	--	--	--	--	--
31-40	--	--	--	--	--	--
41-50	5,043	--	--	--	5,043	--
51-60	--	--	--	--	--	--
61-70	5,044	--	--	--	5,044	--
71-80	17,184	--	--	--	17,184	--
81+	16,478	--	--	4,085	12,393	--
No manageable stand	33,551	--	--	12,227	20,702	622
All classes	88,448	--	2,142	16,312	69,372	622

[a]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,[a] Northern Mountains of Virginia, 1986

Stand-age class (years)	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
	Acres					
00-10	47,415	3,542	4,102	4,661	35,110	--
11-20	56,012	--	17,194	7,799	31,019	--
21-30	46,566	--	16,364	9,291	20,911	--
31-40	38,942	--	4,102	--	34,840	--
41-50	111,315	--	26,088	4,102	81,125	--
51-60	189,430	--	30,617	16,111	142,702	--
61-70	223,840	--	15,993	21,629	177,580	8,638
71-80	135,601	--	9,422	12,178	109,899	4,102
81+	204,880	--	9,136	25,493	170,251	--
No manageable stand	305,057	--	19,438	27,173	236,043	22,403
All classes	1,359,058	3,542	152,456	128,437	1,039,480	35,143

[a]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, 1986

Broad management class	All classes	Stand-volume class (cubic feet of growing stock per acre)				
		0-499	500-999	1000-1499	1500-1999	2000+
	Acres					
Pine plantation	8,494	7,939	--	--	555	--
Natural pine	236,450	31,991	47,860	67,118	39,148	50,333
Oak-pine	284,134	72,216	73,861	50,150	34,028	53,879
Upland hardwood	1,961,851	295,728	312,128	384,238	451,197	518,560
Lowland hardwood	35,765	4,446	18,579	8,359	--	4,381
All classes	2,526,694	412,320	452,428	509,865	524,928	627,153

Table 18.--Volume of growing stock on timberland, by broad management class, species group, and stand-age class, Northern Mountains of Virginia, 1986

Broad management class and species group	All classes	No manageable stand	Stand-age class (years)								
			0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81+
	Thousand cubic feet										
Pine plantation:											
Softwood	1,789	--	--	--	1,789	--	--	--	--	--	--
Hardwood	--	--	--	--	--	--	--	--	--	--	--
Total	1,789	--	--	--	1,789	--	--	--	--	--	--
Natural pine:											
Softwood	274,759	7,537	--	8,252	19,776	9,739	57,181	63,063	60,186	15,375	33,650
Hardwood	53,979	2,048	--	1,807	937	373	12,955	12,594	12,044	963	10,258
Total	328,738	9,585	--	10,059	20,713	10,112	70,136	75,657	72,230	16,338	43,908
Oak-pine:											
Softwood	150,143	24,938	--	12,160	3,688	--	3,745	23,865	25,487	19,286	36,974
Hardwood	177,212	12,024	433	7,432	4,203	--	7,316	27,443	37,064	28,673	52,624
Total	327,355	36,962	433	19,592	7,891	--	11,061	51,308	62,551	47,959	89,598
Upland hardwood:											
Softwood	165,997	23,268	1,089	4,102	1,843	2,896	7,422	21,293	31,587	30,957	41,540
Hardwood	2,730,266	264,161	7,974	23,528	17,380	44,609	176,735	406,194	514,421	490,895	784,369
Total	2,896,263	287,429	9,063	27,630	19,223	47,505	184,157	427,487	546,008	521,852	825,909
Lowland hardwood:											
Softwood	521	521	--	--	--	--	--	--	--	--	--
Hardwood	35,038	14,566	--	--	--	--	--	--	14,249	6,223	--
Total	35,559	15,087	--	--	--	--	--	--	14,249	6,223	--
All types:											
Softwood	593,209	56,264	1,089	24,514	27,096	12,635	68,348	108,221	117,260	65,618	112,164
Hardwood	2,996,495	292,799	8,407	32,767	22,520	44,982	197,006	446,231	577,778	526,754	847,251
Total	3,589,704	349,063	9,496	57,281	49,616	57,617	265,354	554,452	695,038	592,372	959,415

Table 19.--Net annual growth of growing stock on timberland, by broad management class, species group, and stand-age class, Northern Mountains of Virginia, 1985

Broad management class[a] and species group	All classes	No manageable stand	Stand-age class[a] (years)								
			0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81+
	Thousand cubic feet										
Pine plantation:											
Softwood	125	--	--	--	125	--	--	--	--	--	--
Hardwood	--	--	--	--	--	--	--	--	--	--	--
Total	125	--	--	--	125	--	--	--	--	--	--
Natural pine:											
Softwood	5,054	134	--	172	498	277	963	997	1,270	131	612
Hardwood	2,124	36	--	115	23	22	476	731	340	121	260
Total	7,178	170	--	287	521	299	1,439	1,728	1,610	252	872
Oak-pine:											
Softwood	3,465	468	--	375	370	--	78	385	591	385	813
Hardwood	5,236	476	9	586	107	--	280	939	911	842	1,086
Total	8,701	944	9	961	477	--	358	1,324	1,502	1,227	1,899
Upland hardwood:											
Softwood	3,282	426	67	110	50	59	108	434	510	563	955
Hardwood	67,678	6,455	348	1,250	976	1,829	6,537	11,445	12,054	11,269	15,515
Total	70,960	6,881	415	1,360	1,026	1,888	6,645	11,879	12,564	11,832	16,470
Lowland hardwood:											
Softwood	8	8	--	--	--	--	--	--	--	--	--
Hardwood	921	497	--	--	--	--	--	--	326	98	--
Total	929	505	--	--	--	--	--	--	326	98	--
All types:											
Softwood	11,934	1,036	67	657	1,043	336	1,149	1,816	2,371	1,079	2,380
Hardwood	75,959	7,464	357	1,951	1,106	1,851	7,293	13,115	13,631	12,330	16,861
Total	87,893	8,500	424	2,608	2,149	2,187	8,442	14,931	16,002	13,409	19,241

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

Table 20.--Annual removals of growing stock on timberland, by broad management class, species group, and stand-age class, Northern Mountains of Virginia, 1985

Broad management class[a] and species group	All classes	No manageable stand	Stand-age class[a] (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	639	--	--	--	--	178	205	141	115	--	--
Hardwood	536	--	--	--	--	--	536	--	--	--	--
Total	1,175	--	--	--	--	178	741	141	115	--	--
Oak-pine:											
Softwood	1,762	--	--	--	244	--	649	481	--	243	145
Hardwood	2,599	--	--	492	156	993	--	697	--	261	--
Total	4,361	--	--	492	400	993	649	1,178	--	504	145
Upland hardwood:											
Softwood	833	--	--	--	--	--	142	249	120	--	322
Hardwood	16,539	1,409	229	--	--	505	994	5,654	4,370	413	2,965
Total	17,372	1,409	229	--	--	505	1,136	5,903	4,490	413	3,287
Lowland hardwood:											
Softwood	--	--	--	--	--	--	--	--	--	--	--
Hardwood	412	83	--	--	--	--	329	--	--	--	--
Total	412	83	--	--	--	--	329	--	--	--	--
All types:											
Softwood	3,234	--	--	--	244	178	996	871	235	243	467
Hardwood	20,086	1,492	229	492	156	1,498	1,859	6,351	4,370	674	2,965
Total	23,320	1,492	229	492	400	1,676	2,855	7,222	4,605	917	3,432

[a]Classification before timber removals occurred.

Table 21.--Merchantable volume of live trees and growing stock on timberland, by forest-type group and species group, Northern Mountains of Virginia, 1986

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
	Thousand cubic feet									
White pine-hemlock	85,255	4,099	56,928	5,511	18,717	78,739	4,099	56,681	3,856	14,103
Spruce-fir	--	--	--	--	--	--	--	--	--	--
Longleaf-slash pine	--	--	--	--	--	--	--	--	--	--
Loblolly-shortleaf pine	268,034	213,720	9,319	10,684	34,311	251,788	206,904	8,864	8,678	27,342
Oak-pine	384,908	87,917	69,772	22,675	204,544	327,355	81,691	68,452	17,956	159,256
Oak-hickory	3,325,413	99,791	71,477	467,678	2,686,467	2,836,742	96,619	69,378	398,591	2,272,154
Oak-gum-cypress	--	--	--	--	--	--	--	--	--	--
Elm-ash-cottonwood	47,939	--	749	25,370	21,820	35,559	--	521	19,741	15,297
Maple-beech-birch	71,083	--	--	9,309	61,774	59,521	--	--	6,654	52,867
All types	4,182,632	405,527	208,245	541,227	3,027,633	3,589,704	389,313	203,896	455,476	2,541,019

Table 22.--Area of timberland treated or disturbed annually and retained in timberland, by treatment or disturbance and ownership class, Northern Mountains of Virginia, 1977 to 1986

Treatment or disturbance	All ownerships	Ownership class			
		Public	Forest industry	Forest industry-leased	Other private
			Acres[a]		
Final harvest	9,209	1,749	1,014	--	6,446
Selective cutting and high grading	4,460	996	506	--	2,958
Commercial thinning	1,426	444	--	--	982
Other stand improvement	974	444	--	--	530
Site preparation	607	607	--	--	--
Artificial regeneration[b]	1,372	444	--	--	928
Natural regeneration[b]	7,768	2,280	550	--	4,938
Other treatment	3,840	465	--	--	3,375
Natural disturbance	46,848	18,261	1,680	--	26,907

[a]Since some acres experience more than one treatment or disturbance, there are no column totals.

[b]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, 1977 to 1986

Treatment or disturbance	All classes	Broad management class[a]				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
			Acres[b]			
Final harvest	9,209	--	--	1,841	6,838	530
Selective cutting and high grading	4,460	--	--	--	4,460	--
Commercial thinning	1,426	--	--	--	1,426	--
Other stand improvement	974	--	444	--	530	--
Site preparation	607	--	--	607	--	--
Other treatment	3,840	--	--	541	2,769	530
Natural disturbance	46,848	--	3,834	4,518	38,496	--

[a]Classification before treatment or disturbance.

[b]Since some acres experience more than one treatment or disturbance, there are no column totals.

Table 24.--Area of timberland regenerated annually, by type of regeneration and broad management class, Northern Mountains of Virginia, 1977 to 1986

Type of regeneration	All classes	Broad management class[a]				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
	Acres					
Artificial regeneration following harvest	530	--	--	530	--	--
Natural regeneration following harvest	5,774	--	--	455	5,319	--
Other artificial regeneration on forest land	444	--	--	--	444	--
Other natural regeneration on forest land	495	--	--	--	495	--
Artificial regeneration on nonforest land	398	398	--	--	--	--
Natural reversion of nonforest land	1,499	--	1,499	--	--	--
Total	9,140	398	1,499	985	6,258	--

[a]Classification after regeneration.

Table 25.--Area of timberland, by treatment opportunity and broad management classes, Northern Mountains of Virginia, 1986

Treatment opportunity class	All classes	Broad management class				
		Pine plantation	Natural pine	Oak-pine	Upland hardwood	Lowland hardwood
	Acres					
Salvage	60,925	--	7,718	--	53,207	--
Harvest	420,339	--	9,246	43,037	363,954	4,102
Commercial thinning	8,273	555	7,718	--	--	--
Other stand improvement	112,461	--	4,318	20,800	87,343	--
Stand conversion	2,141	--	--	--	2,141	--
Regeneration	256,389	--	11,565	14,478	207,321	23,025
Stands in relatively good condition	797,355	7,939	133,212	80,038	567,528	8,638
Adverse sites[a]	868,811	--	62,673	125,781	680,357	--
All classes	2,526,694	8,494	236,450	284,134	1,961,851	35,765

[a]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, 1986

Treatment opportunity class	All ownerships	Ownership class			
		Public	Forest industry	Forest industry-leased	Other private
	Acres				
Salvage	60,925	13,185	--	--	47,740
Harvest	420,339	190,742	15,294	--	214,303
Commercial thinning	8,273	555	--	--	7,718
Other stand improvement	112,461	31,745	9,127	--	71,589
Stand conversion	2,141	--	2,141	--	--
Regeneration	256,389	31,173	23,135	--	202,081
Stands in relatively good condition	797,355	322,227	5,044	--	470,084
Adverse sites[a]	868,811	489,561	33,707	--	345,543
All classes	2,526,694	1,079,188	88,448	--	1,359,058

[a]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, 1986

Ownership class	Live trees					Growing stock				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	Thousand cubic feet									
National Forest	1,693,822	158,656	80,079	158,060	1,297,027	1,432,151	152,280	78,763	136,890	1,064,218
Other public	112,137	8,265	1,151	18,491	84,230	86,636	7,917	1,151	15,433	62,135
Forest industry	120,523	7,644	6,911	14,704	91,264	103,989	7,644	6,911	12,208	77,226
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	2,256,150	230,962	120,104	349,972	1,555,112	1,966,928	221,472	117,071	290,945	1,337,440
All ownerships	4,182,632	405,527	208,245	541,227	3,027,633	3,589,704	389,313	203,896	455,476	2,541,019

Table 28.--Volume of sawtimber on timberland, by ownership class and species group, Northern Mountains of Virginia, 1986

Ownership class	Small sawtimber[a]					Large sawtimber[b]				
	All species	Pine	Other softwood	Soft hardwood	Hard hardwood	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
	Thousand board feet									
National Forest	1,581,739	379,420	134,376	130,836	937,107	2,550,224	112,460	144,208	258,169	2,035,387
Other public	89,296	23,579	--	16,770	48,947	132,180	4,085	4,264	28,330	95,501
Forest industry	98,923	12,750	7,281	8,182	70,710	204,090	4,981	23,821	13,257	162,031
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	2,386,999	457,997	176,115	287,973	1,464,914	3,458,190	115,169	302,542	624,555	2,415,924
All ownerships	4,156,957	873,746	317,772	443,761	2,521,678	6,344,684	236,695	474,835	924,311	4,708,843

[a]Volume of sawtimber trees less than 15.0 inches at d.b.h.

[b]Volume of sawtimber trees 15.0 inches and larger at d.b.h.

Table 29.--Net annual growth and removals of growing stock on timberland, by ownership class and species group, Northern Mountains of Virginia, 1985

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
	Thousand cubic feet									
National Forest	35,334	2,038	2,528	4,857	25,911	3,347	671	141	213	2,322
Other public	2,118	89	30	355	1,644	--	--	--	--	--
Forest industry	2,715	121	174	575	1,845	1,639	349	--	287	1,003
Forest industy-leased	--	--	--	--	--	--	--	--	--	--
Other private	47,726	3,447	3,507	9,766	31,006	18,334	1,363	710	2,520	13,741
All ownerships	87,893	5,695	6,239	15,553	60,406	23,320	2,383	851	3,020	17,066

Table 30.--Net annual growth and removals of sawtimber on timberland, by ownership class and species group, Northern Mountains of Virginia, 1985

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
	Thousand board feet									
National Forest	135,188	8,780	11,277	14,285	100,846	8,453	2,502	558	--	5,393
Other public	7,808	425	261	1,034	6,088	--	--	--	--	--
Forest industry	7,365	284	923	1,088	5,070	6,727	1,525	--	680	4,522
Forest industry-leased	--	--	--	--	--	--	--	--	--	--
Other private	193,202	16,016	15,066	34,695	127,425	66,267	7,135	4,068	12,610	42,454
All ownerships	343,563	25,505	27,527	51,102	239,429	81,447	11,162	4,626	13,290	52,369

Table 31.--Volume of timber on timberland, by class of timber and species group, Northern Mountains of Virginia, 1986

Class of timber	All species	Pine	Other softwood	Soft hardwood	Hard hardwood
			Thousand cubic feet		
Sawtimber trees:					
Saw-log portion	1,761,489	206,533	141,709	228,681	1,184,566
Upper-stem portion[a]	622,689	44,821	15,819	69,481	492,568
Total	2,384,178	251,354	157,528	298,162	1,677,134
Poletimber trees	1,205,526	137,959	46,368	157,314	863,885
All growing-stock trees	3,589,704	389,313	203,896	455,476	2,541,019
Rough trees:					
Sawtimber size	272,793	7,959	1,499	29,941	233,394
Poletimber size	246,523	7,848	2,191	41,473	195,011
Total	519,316	15,807	3,690	71,414	428,405
Rotten trees:					
Sawtimber size	67,830	407	659	12,739	54,025
Poletimber size	5,782	--	--	1,598	4,184
Total	73,612	407	659	14,337	58,209
Salvable dead trees:					
Sawtimber size	8,718	1,137	172	343	7,066
Poletimber size	6,740	813	81	242	5,604
Total	15,458	1,950	253	585	12,670
Total, all timber	4,198,090	407,477	208,498	541,812	3,040,303

[a]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, 1986

Species	All classes	Diameter class (inches at breast height)											
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Thousand trees												
Softwood:													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	2,241	774	--	329	379	316	297	35	24	57	30	--	--
Loblolly pine	207	--	--	--	207	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	74,630	35,038	14,574	11,317	8,435	3,432	1,320	450	46	18	--	--	--
Pitch pine	25,958	9,372	2,105	3,266	4,386	2,792	2,223	992	610	182	30	--	--
Table Mountain pine	19,736	5,719	3,646	3,625	3,121	1,924	1,022	475	146	42	16	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	62,538	38,449	9,751	5,409	3,525	2,318	877	835	729	282	146	217	--
Eastern hemlock	19,466	7,154	4,874	3,887	1,589	992	361	227	170	111	16	57	28
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	10,756	5,948	1,491	2,406	469	308	71	63	--	--	--	--	--
Total softwoods	215,532	102,454	36,441	30,239	22,111	12,082	6,171	3,077	1,725	692	238	274	28
Hardwood:													
Select white oaks	74,355	22,462	14,214	12,958	8,832	5,417	3,785	2,392	1,773	1,132	522	741	127
Select red oaks	50,159	17,649	10,369	6,477	4,921	3,037	1,805	1,982	1,369	746	574	1,080	150
Chestnut oak	171,450	28,651	42,441	34,208	26,040	14,839	9,456	5,721	4,214	2,560	1,261	1,868	191
Other white oaks	1,408	839	--	341	112	--	85	31	--	--	--	--	--
Other red oaks	107,782	29,995	19,610	19,389	14,584	10,302	6,062	3,998	2,003	1,001	366	444	28
Hickory	117,913	71,627	25,617	9,151	4,789	2,737	1,666	1,191	607	294	164	56	14
Yellow birch	106	--	--	--	--	106	--	--	--	--	--	--	--
Hard maple	20,992	10,781	4,474	2,175	1,599	847	410	292	173	93	64	70	14
Soft maple	225,075	161,507	37,648	13,457	6,753	2,380	1,915	561	443	192	123	81	15
Beech	920	272	272	143	93	--	--	29	50	38	--	23	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	204,105	171,482	24,769	5,105	1,244	416	534	164	199	133	17	42	--
Ash	19,350	11,914	3,102	1,218	1,523	536	457	186	229	127	31	13	14
Cottonwood	13	--	--	--	--	--	--	--	--	--	--	13	--
Basswood	4,533	2,648	261	315	357	130	312	158	214	60	45	33	--
Yellow-poplar	39,240	16,553	8,548	5,260	2,441	1,429	1,741	1,070	977	658	267	280	16
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	14,181	9,142	2,081	1,445	752	318	91	188	143	21	--	--	--
Black walnut	6,511	1,025	3,081	674	561	488	260	292	49	17	27	37	--
Sycamore	1,620	429	429	161	183	108	128	30	--	47	26	77	2
Black locust	30,075	14,868	6,222	2,614	2,295	2,091	912	660	168	113	47	85	--
Elm	13,069	8,858	2,527	854	426	171	130	--	41	38	13	11	--
Other eastern hardwoods	400,248	317,691	62,397	11,779	4,232	2,221	853	505	325	147	78	20	--
Total hardwoods	1,503,105	898,393	268,062	127,724	81,737	47,573	30,602	19,450	12,977	7,417	3,625	4,974	571
All species	1,718,637	1,000,847	304,503	157,963	103,848	59,655	36,773	22,527	14,702	8,109	3,863	5,248	599

Table 33.--Number of growing-stock trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

Species	All classes	Diameter class (inches at breast height)											
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Thousand trees												
Softwood:													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	1,983	516	--	329	379	316	297	35	24	57	30	--	--
Loblolly pine	207	--	--	--	207	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	52,952	17,822	11,252	10,489	8,269	3,360	1,280	416	46	18	--	--	--
Pitch pine	20,905	5,436	2,105	2,953	3,979	2,546	2,107	957	610	182	30	--	--
Table Mountain pine	16,559	3,808	3,088	3,625	2,562	1,810	1,022	440	146	42	16	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	56,040	33,125	8,970	5,169	3,433	2,318	877	807	708	282	146	205	--
Eastern hemlock	18,161	6,632	4,231	3,887	1,498	992	312	227	170	111	16	57	28
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	7,947	4,215	1,001	1,899	390	308	71	63	--	--	--	--	--
Total softwoods	174,754	71,554	30,647	28,351	20,717	11,650	5,966	2,945	1,704	692	238	262	28
Hardwood:													
Select white oaks	52,748	9,659	8,869	11,573	8,198	4,881	3,576	2,167	1,672	1,002	436	644	71
Select red oaks	28,517	5,775	5,089	3,988	4,109	2,683	1,588	1,889	1,276	674	502	834	110
Chestnut oak	100,372	10,421	19,812	23,576	18,973	10,979	6,291	3,634	2,913	1,775	704	1,206	88
Other white oaks	834	265	--	341	112	--	85	31	--	--	--	--	--
Other red oaks	80,067	15,434	14,147	15,078	12,719	9,425	5,736	3,905	1,933	983	283	424	--
Hickory	64,396	26,500	19,062	8,186	4,618	2,283	1,532	1,167	534	294	150	56	14
Yellow birch	53	--	--	--	--	53	--	--	--	--	--	--	--
Hard maple	14,651	5,633	3,680	2,034	1,436	794	410	292	173	93	48	51	7
Soft maple	90,524	50,462	20,751	9,604	5,584	1,739	1,310	470	278	192	78	53	3
Beech	784	272	272	143	--	--	--	--	50	38	--	9	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	48,392	29,950	12,862	3,902	755	289	320	98	148	39	17	12	--
Ash	9,640	5,249	1,284	894	1,063	245	345	186	208	108	31	13	14
Cottonwood	13	--	--	--	--	--	--	--	--	--	--	13	--
Basswood	2,579	1,056	261	187	270	130	275	92	214	60	15	19	--
Yellow-poplar	29,144	10,303	6,017	4,463	2,129	1,320	1,741	1,007	977	658	251	266	12
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	4,922	2,593	1,556	135	295	74	49	125	74	21	--	--	--
Black walnut	2,304	--	777	--	481	488	260	222	49	--	--	27	--
Sycamore	1,167	--	429	161	183	108	128	30	--	47	26	55	--
Black locust	13,614	5,737	2,583	1,449	860	1,499	666	540	93	96	32	59	--
Elm	3,103	1,279	1,028	302	153	171	86	--	22	38	13	11	--
Other eastern hardwoods	18,469	7,473	5,097	2,461	1,089	1,130	472	414	147	113	62	11	--
Total hardwoods	566,293	188,061	123,576	88,477	63,027	38,291	24,870	16,269	10,761	6,231	2,648	3,763	319
All species	741,047	259,615	154,223	116,828	83,744	49,941	30,836	19,214	12,465	6,923	2,886	4,025	347

Table 34.--Merchantable volume of live trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Thousand cubic feet										
Softwood:											
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	17,181	503	2,008	3,052	5,186	1,006	998	2,380	2,048	--	--
Loblolly pine	921	--	921	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	155,933	30,624	51,807	37,535	22,459	11,059	1,892	557	--	--	--
Pitch pine	146,156	7,681	22,467	26,829	36,990	24,052	18,830	7,806	1,501	--	--
Table Mountain pine	85,336	10,938	18,858	20,857	17,370	11,091	4,103	1,528	591	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	147,797	12,456	17,520	21,918	13,916	19,155	23,438	12,035	7,911	19,448	--
Eastern hemlock	49,854	6,693	5,881	7,922	3,758	4,989	5,473	5,012	957	4,910	4,259
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--
Cedars	10,594	3,958	2,051	2,360	1,034	1,191	--	--	--	--	--
Total softwoods	613,772	72,853	121,513	120,473	100,713	72,543	54,734	29,318	13,008	24,358	4,259
Hardwood:											
Select white oaks	499,757	33,017	56,796	59,954	64,683	59,186	62,978	52,731	31,753	60,993	17,666
Select red oaks	384,082	18,401	28,386	31,570	30,160	47,207	46,328	34,469	34,554	88,176	24,831
Chestnut oak	1,009,164	81,908	138,335	139,245	135,225	113,641	117,457	91,810	53,496	118,204	19,843
Other white oaks	3,091	643	465	--	1,321	662	--	--	--	--	--
Other red oaks	628,926	52,245	85,832	111,318	104,562	98,422	69,913	46,800	21,675	36,345	1,814
Hickory	183,110	20,346	24,828	27,974	26,576	30,179	20,669	13,819	11,946	4,633	2,140
Yellow birch	1,115	--	--	1,115	--	--	--	--	--	--	--
Hard maple	64,163	5,821	11,188	10,301	8,008	7,244	5,625	3,857	3,863	6,474	1,782
Soft maple	185,955	39,168	41,212	25,964	30,331	13,514	13,453	8,071	6,487	5,812	1,943
Beech	7,169	592	431	--	--	778	1,613	2,488	--	1,267	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	43,253	11,045	6,063	3,576	8,052	2,388	5,310	3,906	939	1,974	--
Ash	47,677	3,296	7,413	5,132	6,757	4,822	8,454	5,786	1,797	994	3,226
Cottonwood	837	--	--	--	--	--	--	--	--	837	--
Basswood	28,698	864	2,102	1,213	4,635	3,218	7,928	3,775	2,236	2,727	--
Yellow-poplar	220,889	13,867	14,839	16,676	33,381	28,381	37,069	33,462	17,725	22,939	2,550
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--
Black cherry	20,839	3,215	4,412	2,526	1,349	4,504	3,933	900	--	--	--
Black walnut	25,257	1,289	3,258	4,630	4,458	6,854	1,469	632	702	1,965	--
Sycamore	14,788	496	1,168	1,341	2,267	564	--	1,629	1,325	5,523	475
Black locust	75,878	6,249	9,014	18,080	13,377	13,478	4,857	3,906	1,982	4,935	--
Elm	12,280	1,903	2,370	1,699	2,077	--	1,194	1,381	871	785	--
Other eastern hardwoods	111,932	26,735	19,336	22,603	12,562	11,103	8,879	5,456	4,148	1,110	--
Total hardwoods	3,568,860	321,100	457,448	484,917	489,781	446,145	417,129	314,878	195,499	365,693	76,270
All species	4,182,632	393,953	578,961	605,390	590,494	518,688	471,863	344,196	208,507	390,051	80,529

Table 35.--Volume of growing stock on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20,9	21.0-28.9	29.0 and larger
	Thousand cubic feet										
Softwood:											
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	17,181	503	2,008	3,052	5,186	1,006	998	2,380	2,048	--	--
Loblolly pine	921	--	921	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	152,013	29,394	50,894	36,991	22,052	10,233	1,892	557	--	--	--
Pitch pine	138,914	6,994	20,409	24,333	35,386	23,655	18,830	7,806	1,501	--	--
Table Mountain pine	80,284	10,938	15,898	19,502	17,370	10,354	4,103	1,528	591	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	145,288	12,046	17,269	21,918	13,916	18,421	22,983	12,035	7,911	18,789	--
Eastern hemlock	49,297	6,693	5,634	7,922	3,448	4,989	5,473	5,012	957	4,910	4,259
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--
Cedars	9,311	3,079	1,647	2,360	1,034	1,191	--	--	--	--	--
Total softwoods	593,209	69,647	114,680	116,078	98,392	69,849	54,279	29,318	13,008	23,699	4,259
Hardwood:											
Select white oaks	461,405	30,366	52,996	55,369	61,796	55,854	60,576	47,847	26,935	56,675	12,991
Select red oaks	344,980	12,984	25,383	29,163	27,800	45,785	44,618	32,358	32,133	75,335	19,421
Chestnut oak	745,267	60,677	107,749	109,358	97,060	79,184	88,275	70,434	35,738	84,959	11,833
Other white oaks	3,091	643	465	--	1,321	662	--	--	--	--	--
Other red oaks	590,910	42,087	77,483	104,739	101,282	96,869	67,910	46,432	18,651	35,457	--
Hickory	173,448	18,633	24,256	24,988	25,262	29,637	19,060	13,819	11,020	4,633	2,140
Yellow birch	631	--	--	631	--	--	--	--	--	--	--
Hard maple	59,120	5,458	9,938	9,551	8,008	7,244	5,625	3,857	2,805	5,686	948
Soft maple	145,619	29,046	35,602	20,338	22,434	11,772	9,218	8,071	4,276	4,063	799
Beech	5,402	592	--	--	--	--	1,613	2,488	--	709	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	28,718	8,539	3,970	2,254	4,858	1,605	4,467	1,359	939	727	--
Ash	39,985	2,677	5,268	2,672	5,256	4,822	8,060	5,213	1,797	994	3,226
Cottonwood	837	--	--	--	--	--	--	--	--	837	--
Basswood	24,477	442	1,687	1,213	4,147	2,318	7,928	3,775	923	2,044	--
Yellow-poplar	212,579	12,170	13,516	15,497	33,381	26,880	37,069	33,462	17,008	21,821	1,775
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--
Black cherry	9,680	465	1,505	576	574	3,337	2,323	900	--	--	--
Black walnut	19,662	--	2,843	4,630	4,458	4,915	1,469	--	--	1,347	--
Sycamore	12,954	496	1,168	1,341	2,267	564	--	1,629	1,325	4,164	--
Black locust	54,257	3,797	4,065	13,539	9,905	11,332	2,838	3,439	1,337	4,005	--
Elm	8,927	788	1,377	1,699	1,442	--	584	1,381	871	785	--
Other eastern hardwoods	54,546	5,762	6,102	12,646	7,859	9,399	3,930	4,278	3,638	932	--
Total hardwoods	2,996,495	235,622	375,373	410,204	419,110	392,179	365,563	280,742	159,396	305,173	53,133
All species	3,589,704	305,269	490,053	526,282	517,502	462,028	419,842	310,060	172,404	328,872	57,392

Table 36.--Volume of sawtimber on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

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
	Thousand board feet								
Softwood:									
Longleaf pine	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--
Shortleaf pine	72,316	10,852	23,987	4,998	5,772	13,921	12,786	--	--
Loblolly pine	--	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--
Virginia pine	286,293	132,326	93,511	47,861	9,626	2,969	--	--	--
Pitch pine	504,897	80,309	152,102	116,363	101,414	45,551	9,158	--	--
Table Mountain pine	246,935	76,773	80,632	54,032	22,945	8,939	3,614	--	--
Spruce pine	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--
Eastern white pine	588,995	78,856	61,750	91,278	122,918	68,628	46,699	118,866	--
Eastern hemlock	182,961	27,260	14,287	23,690	27,972	27,311	5,416	29,283	27,742
Spruce and fir	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--
Cedars	20,651	9,355	5,051	6,245	--	--	--	--	--
Total softwoods	1,903,048	415,731	431,320	344,467	290,647	167,319	77,673	148,149	27,742
Hardwood:									
Select white oaks	1,447,827	--	208,401	222,867	268,057	228,311	136,064	306,537	77,590
Select red oaks	1,242,627	--	93,134	174,426	187,499	145,937	151,442	383,300	106,889
Chestnut oak	1,990,206	--	318,589	302,174	374,686	320,178	171,900	436,080	66,599
Other white oaks	7,703	--	4,912	2,791	--	--	--	--	--
Other red oaks	1,541,454	--	349,219	385,218	300,802	221,932	93,794	190,489	--
Hickory	454,141	--	85,578	120,030	85,340	67,589	56,983	25,723	12,898
Yellow birch	--	--	--	--	--	--	--	--	--
Hard maple	148,365	--	30,362	29,458	24,398	17,629	13,180	28,419	4,919
Soft maple	241,809	--	73,750	44,804	39,474	36,887	20,370	21,024	5,500
Beech	19,099	--	--	--	6,270	9,879	--	2,950	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	54,231	--	15,229	5,959	18,636	6,199	4,464	3,744	--
Ash	127,938	--	16,755	18,530	35,001	24,309	8,876	5,140	19,327
Cottonwood	4,646	--	--	--	--	--	--	4,646	--
Basswood	90,217	--	13,507	9,221	34,501	17,468	4,574	10,946	--
Yellow-poplar	843,047	--	120,288	117,755	181,706	179,845	97,311	133,851	12,291
Bay and magnolia	--	--	--	--	--	--	--	--	--
Black cherry	30,909	--	1,773	13,978	10,747	4,411	--	--	--
Black walnut	44,043	--	14,998	17,809	5,614	--	--	5,622	--
Sycamore	45,773	--	7,065	2,149	--	7,714	6,537	22,308	--
Black locust	122,008	--	34,944	41,682	10,755	13,323	5,243	16,061	--
Elm	21,667	--	4,800	--	2,555	6,213	4,209	3,890	--
Other eastern hardwoods	120,883	--	27,144	36,140	15,969	19,018	17,556	5,056	--
Total hardwoods	8,598,593	--	1,420,448	1,544,991	1,602,010	1,326,842	792,503	1,605,786	306,013
All species	10,501,641	415,731	1,851,768	1,889,458	1,892,657	1,494,161	870,176	1,753,935	333,755

Table 37.--Volume of sawtimber on timberland, by species, size class, and log grade, Northern Mountains of Virginia, 1986

Species	All size classes					Trees 15.0 inches d.b.h. and larger				
	All grades	Log grade				All grades	Log grade			
		1	2	3	4		1	2	3	4
	Thousand board feet									
Softwood:										
Yellow pines[a]	1,110,441	366,445	101,577	642,419	(b)	236,695	78,109	14,202	144,384	(b)
Eastern white pine[c]	588,995	39,282	36,407	295,887	217,419	357,111	39,282	17,856	142,844	157,129
Spruce and fir[c]	--	--	--	--	--	--	--	--	--	--
Cypress[c]	--	--	--	--	--	--	--	--	--	--
Other eastern softwoods[c]	203,612	12,950	11,247	97,643	81,772	117,724	12,950	10,595	38,849	55,330
Total	1,903,048	418,677	149,231	1,035,949	299,191	711,530	130,341	42,653	326,077	212,459
Hardwood:[d]										
Select white and red oaks	2,690,454	355,588	728,769	1,066,055	540,042	1,991,626	355,588	635,246	719,475	281,317
Other white and red oaks	3,539,363	430,400	739,551	1,307,720	1,061,692	2,176,460	430,400	563,434	644,136	538,490
Hickory	454,141	47,221	84,321	195,620	126,979	248,533	47,221	59,648	96,928	44,736
Yellow birch	--	--	--	--	--	--	--	--	--	--
Hard maple	148,365	10,625	30,200	63,604	43,936	88,545	10,625	23,022	30,105	24,793
Sweetgum	--	--	--	--	--	--	--	--	--	--
Ash, walnut, and black cherry	202,890	42,153	48,559	90,699	21,479	119,047	40,476	30,952	34,524	13,095
Yellow-poplar	843,047	205,701	164,742	292,092	180,512	605,004	205,701	102,851	175,451	121,001
Other eastern hardwoods	720,333	48,473	142,991	314,520	214,349	403,939	48,473	105,024	137,339	113,103
Total	8,598,593	1,140,161	1,939,133	3,330,310	2,188,989	5,633,154	1,138,484	1,520,177	1,837,958	1,136,535
All species	10,501,641	1,558,838	2,088,364	4,366,259	2,488,180	6,344,684	1,268,825	1,562,830	2,164,035	1,348,994

[a]Based on "Southern Pine Log Grades for Yard and Structural Lumber," Research Paper SE-39, published by the Southeastern Forest Experiment Station, Asheville, NC, 1968.

[b]Not applicable.

[c]Based on "Sawlog Grades for Eastern White Pine," Research Paper NE-205, published by the Northeastern Forest Experiment Station, Broomall, PA, 1971.

[d]Based on "A Guide to Hardwood Log Grading (revised)," General Technical Report NE-1, published by the Northeastern Forest Experiment Station, Broomall, PA, 1973.

Table 38.--Cubic volume in the merchantable saw-log portion of sawtimber trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

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
	Thousand cubic feet								
Softwood:									
Longleaf pine	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--
Shortleaf pine	12,789	2,276	4,523	877	954	2,211	1,948	--	--
Loblolly pine	--	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--
Virginia pine	55,851	27,761	17,633	8,394	1,592	471	--	--	--
Pitch pine	91,340	16,850	28,689	20,411	16,760	7,234	1,396	--	--
Table Mountain pine	46,553	16,107	15,206	9,478	3,791	1,420	551	--	--
Spruce pine	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--
Eastern white pine	105,550	17,106	12,596	17,234	21,811	11,514	7,441	17,848	--
Eastern hemlock	31,994	5,911	2,914	4,490	4,991	4,632	863	4,434	3,759
Spruce and fir	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--
Cedars	4,165	2,029	992	1,144	--	--	--	--	--
Total softwoods	348,242	88,040	82,553	62,028	49,899	27,482	12,199	22,282	3,759
Hardwood:									
Select white oaks	235,064	--	38,976	38,915	43,990	35,962	20,791	45,306	11,124
Select red oaks	196,748	--	17,418	30,456	30,773	22,984	23,140	56,650	15,327
Chestnut oak	324,530	--	59,576	52,761	61,485	50,432	26,273	64,450	9,553
Other white oaks	1,406	--	919	487	--	--	--	--	--
Other red oaks	259,366	--	65,306	67,257	49,358	34,957	14,331	28,157	--
Hickory	75,962	--	16,001	20,957	14,001	10,646	8,706	3,801	1,850
Yellow birch	--	--	--	--	--	--	--	--	--
Hard maple	24,519	--	5,677	5,142	4,004	2,777	2,013	4,201	705
Soft maple	41,468	--	13,872	7,926	6,599	5,920	3,190	3,194	767
Beech	3,021	--	--	--	1,029	1,556	--	436	--
Sweetgum	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	9,300	--	2,865	1,055	3,117	995	699	569	--
Ash	20,831	--	3,134	3,235	5,745	3,829	1,357	760	2,771
Cottonwood	706	--	--	--	--	--	--	706	--
Basswood	15,125	--	2,541	1,632	5,769	2,804	716	1,663	--
Yellow-poplar	139,895	--	22,626	20,832	30,380	28,865	15,237	20,251	1,704
Bay and magnolia	--	--	--	--	--	--	--	--	--
Black cherry	5,312	--	334	2,473	1,797	708	--	--	--
Black walnut	7,668	--	2,805	3,110	922	--	--	831	--
Sycamore	7,359	--	1,328	380	--	1,238	1,024	3,389	--
Black locust	20,851	--	6,535	7,279	1,764	2,099	801	2,373	--
Elm	3,578	--	903	--	427	998	659	591	--
Other eastern hardwoods	20,538	--	5,082	6,329	2,621	3,016	2,722	768	--
Total hardwoods	1,413,247	--	265,898	270,226	263,781	209,786	121,659	238,096	43,801
All species	1,761,489	88,040	348,451	332,254	313,680	237,268	133,858	260,378	47,560

Table 39.--Total volume of live trees on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

Species	All classes	Diameter class (inches at breast height)											
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Thousand cubic feet												
Softwood:													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	19,944	97	--	705	2,434	3,556	5,913	1,143	1,122	2,676	2,298	--	--
Loblolly pine	1,137	--	--	--	1,137	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	210,286	6,669	16,023	40,195	62,117	43,836	25,957	12,689	2,164	636	--	--	--
Pitch pine	174,593	1,617	2,311	9,814	26,834	31,311	42,774	27,672	21,606	8,936	1,718	--	--
Table Mountain pine	105,247	1,624	3,941	14,014	22,155	24,003	19,831	12,610	4,669	1,732	668	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	195,465	10,059	10,539	16,681	21,284	25,873	16,223	22,232	27,113	13,873	9,115	22,473	--
Eastern hemlock	66,892	1,639	5,162	9,705	7,328	9,358	4,376	5,739	6,273	5,722	1,091	5,620	4,879
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	17,253	1,471	1,404	6,169	2,616	2,919	1,247	1,427	--	--	--	--	--
Total softwoods	790,817	23,176	39,380	97,283	145,905	140,856	116,321	83,512	62,947	33,575	14,890	28,093	4,879
Hardwood:													
Select white oaks	658,729	5,617	18,692	49,116	74,220	76,042	80,927	73,583	77,927	65,076	39,248	75,660	22,621
Select red oaks	496,121	4,125	11,962	25,457	36,292	39,510	37,513	58,443	57,163	42,546	42,740	109,340	31,030
Chestnut oak	1,321,573	7,553	51,794	115,091	176,660	172,986	166,513	139,255	143,705	111,939	65,504	145,551	25,022
Other white oaks	4,386	284	--	964	636	--	1,670	832	--	--	--	--	--
Other red oaks	833,078	7,308	31,934	74,666	110,912	139,734	129,709	121,342	86,021	57,453	26,687	44,710	2,602
Hickory	275,877	15,324	27,015	31,639	32,886	35,116	32,827	36,706	25,117	16,694	14,346	5,579	2,628
Yellow birch	1,376	--	--	--	--	1,376	--	--	--	--	--	--	--
Hard maple	88,032	2,913	5,555	8,284	14,154	12,611	9,701	8,735	6,751	4,671	4,621	7,900	2,136
Soft maple	329,624	40,904	53,697	55,234	52,097	31,823	36,686	16,200	16,187	9,579	7,691	7,037	2,489
Beech	9,460	113	298	832	564	--	--	964	1,992	3,061	--	1,636	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	113,156	34,184	24,619	15,317	7,541	4,326	9,560	2,910	6,346	4,817	1,094	2,442	--
Ash	63,491	2,966	4,195	4,449	9,254	6,052	7,875	5,539	9,668	6,656	2,043	1,144	3,650
Cottonwood	964	--	--	--	--	--	--	--	--	--	--	964	--
Basswood	34,428	708	496	1,095	2,486	1,413	5,339	3,743	9,080	4,309	2,597	3,162	--
Yellow-poplar	269,752	3,410	12,609	18,761	17,657	19,287	38,006	32,074	41,772	37,633	19,874	25,780	2,889
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	31,491	3,330	2,709	4,440	5,422	3,025	1,598	5,298	4,613	1,056	--	--	--
Black walnut	34,339	138	3,504	1,804	4,058	5,617	5,339	8,151	1,742	746	887	2,353	--
Sycamore	17,949	122	458	658	1,425	1,580	2,653	656	--	1,884	1,537	6,381	595
Black locust	105,340	3,434	7,637	8,583	11,632	22,315	16,347	16,335	5,866	4,750	2,448	5,993	--
Elm	20,302	1,571	3,481	2,776	2,958	2,050	2,475	--	1,444	1,616	1,016	915	--
Other eastern hardwoods	274,365	63,500	64,864	39,831	25,083	28,251	15,486	13,594	10,862	6,589	4,945	1,360	--
Total hardwoods	4,983,833	197,504	325,519	458,997	585,937	603,114	600,224	544,360	506,256	381,075	237,278	447,907	95,662
All species	5,774,650	220,680	364,899	556,280	731,842	743,970	716,545	627,872	569,203	414,650	252,168	476,000	100,541

Table 40.--Green weight of forest biomass on timberland, by species and diameter class, Northern Mountains of Virginia, 1986

Species	All classes	Diameter class (inches at breast height)											
		1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Hundred thousand pounds												
Softwood:													
Longleaf pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Slash pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Shortleaf pine	14,306	41	--	431	1,685	2,555	4,328	818	818	1,958	1,672	--	--
Loblolly pine	865	--	--	--	865	--	--	--	--	--	--	--	--
Pond pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Virginia pine	164,247	5,709	13,363	32,754	48,338	33,031	19,518	9,474	1,564	496	--	--	--
Pitch pine	119,630	1,089	2,108	6,518	18,598	21,633	29,097	18,732	14,701	5,978	1,176	--	--
Table Mountain pine	65,475	1,356	3,576	7,445	13,076	14,741	12,552	8,110	3,047	1,126	446	--	--
Spruce pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Sand pine	--	--	--	--	--	--	--	--	--	--	--	--	--
Eastern white pine	125,096	4,208	4,822	11,479	15,137	17,841	11,075	14,951	17,732	8,859	5,670	13,322	--
Eastern hemlock	52,656	947	3,311	7,865	6,703	8,293	4,003	4,595	4,814	4,211	785	3,824	3,305
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--	--	--
Baldcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Pondcypress	--	--	--	--	--	--	--	--	--	--	--	--	--
Cedars	13,015	915	910	4,911	2,103	2,175	930	1,071	--	--	--	--	--
Total softwoods	555,290	14,265	28,090	71,403	106,505	100,269	81,503	57,751	42,676	22,628	9,749	17,146	3,305
Hardwood:													
Select white oaks	540,850	4,478	13,905	34,738	58,570	61,840	66,961	61,404	65,628	54,983	33,497	64,758	20,088
Select red oaks	409,606	3,512	9,234	19,341	30,547	33,374	31,478	48,847	47,904	35,053	35,017	90,195	25,104
Chestnut oak	1,074,126	6,847	40,922	84,451	138,985	137,975	135,310	114,624	119,819	93,603	56,567	123,282	21,741
Other white oaks	3,576	211	--	756	497	--	1,402	710	--	--	--	--	--
Other red oaks	722,013	5,610	23,050	62,509	99,498	123,504	114,949	105,768	74,816	49,081	22,907	38,049	2,272
Hickory	226,817	13,535	23,941	23,147	25,781	28,434	26,819	30,264	21,181	14,294	12,147	4,942	2,332
Yellow birch	1,157	--	--	--	--	1,157	--	--	--	--	--	--	--
Hard maple	72,249	2,480	4,694	5,991	10,886	10,166	8,019	7,340	5,827	4,065	4,007	6,836	1,938
Soft maple	242,130	31,059	38,408	39,068	39,007	23,400	27,630	11,907	12,166	7,050	5,686	5,040	1,709
Beech	7,731	101	256	552	519	--	--	815	1,703	2,303	--	1,482	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--	--	--
Tupelo and blackgum	81,335	26,915	18,680	9,038	4,846	2,777	6,393	2,095	4,476	3,485	784	1,846	--
Ash	40,488	1,779	2,641	3,538	6,878	4,231	5,122	3,343	5,701	3,757	1,166	599	1,733
Cottonwood	742	--	--	--	--	--	--	--	--	--	--	742	--
Basswood	24,120	483	338	703	1,746	983	3,805	2,686	6,381	2,833	1,922	2,240	--
Yellow-poplar	192,291	2,544	8,321	11,486	12,339	13,399	26,978	23,315	30,407	27,399	14,650	19,244	2,209
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--	--	--
Black cherry	20,754	1,684	1,815	2,647	3,527	2,128	1,086	3,708	3,401	758	--	--	--
Black walnut	30,574	97	2,985	1,638	3,561	4,993	4,613	7,235	1,583	709	924	2,236	--
Sycamore	13,612	86	325	346	902	1,099	1,845	515	--	1,566	1,226	5,160	542
Black locust	104,015	2,831	6,436	7,408	11,891	22,384	16,442	16,725	6,032	4,994	2,564	6,308	--
Elm	13,625	1,140	2,419	1,618	1,977	1,347	1,613	--	1,031	1,152	688	640	--
Other eastern hardwoods	220,830	51,743	55,960	27,998	19,451	21,059	12,289	11,442	9,688	5,896	4,235	1,069	--
Total hardwoods	4,042,641	157,135	254,330	336,973	471,408	494,250	492,754	452,743	417,744	312,981	197,987	374,668	79,668
All species	4,597,931	171,400	282,420	408,376	577,913	594,519	574,257	510,494	460,420	335,609	207,736	391,814	82,973

Table 41.--Net annual growth and removals of live timber and growing stock on timberland, by species, Northern Mountains of Virginia, 1985

Species	Live timber[a]		Growing stock	
	Net annual growth	Annual timber removals	Net annual growth	Annual timber removals
	- - - - - Thousand cubic feet - - - - -			
Softwood:				
Yellow pines	5,695	2,383	5,695	2,383
Eastern white pine	4,700	529	4,700	529
Spruce and fir	--	--	--	--
Cypress	--	--	--	--
Other eastern softwoods	1,539	322	1,539	322
Total softwoods	11,934	3,234	11,934	3,234
Hardwood:				
Select white and red oaks	18,771	4,993	18,771	4,444
Other white and red oaks	32,183	11,075	32,183	9,315
Hickory	4,275	1,055	4,275	1,055
Yellow birch	7	--	7	--
Hard maple	1,435	894	1,435	581
Sweetgum	--	--	--	--
Ash, walnut, and black cherry	1,778	1,439	1,778	969
Yellow-poplar	8,526	1,888	8,526	1,888
Tupelo and blackgum	833	314	833	89
Bay and magnolia	--	--	--	--
Other eastern hardwoods	8,151	3,263	8,151	1,745
Total hardwoods	75,959	24,921	75,959	20,086
All species	87,893	28,155	87,893	23,320

[a]Merchantable portion only.

Table 42.--Net annual growth and removals of sawtimber on timberland, by species, Northern Mountains of Virginia, 1985

Species	Net annual growth	Annual timber removals
	Thousand board feet	
Softwood:		
Yellow pines	25,505	11,162
Eastern white pine	22,715	2,762
Spruce and fir	--	--
Cypress	--	--
Other eastern softwoods	4,812	1,864
Total softwoods	53,032	15,788
Hardwood:		
Select white and red oaks	82,414	15,898
Other white and red oaks	121,120	27,998
Hickory	15,954	1,241
Yellow birch	93	--
Hard maple	7,810	2,331
Sweetgum	--	--
Ash, walnut, and black cherry	6,470	3,973
Yellow-poplar	31,574	10,138
Tupelo and blackgum	545	--
Bay and magnolia	--	--
Other eastern hardwoods	24,551	4,080
Total hardwoods	290,531	65,659
All species	343,563	81,447

Table 43.--Annual removals of growing stock on timberland, by species and diameter class, Northern Mountains of Virginia, 1985

Species	All classes	Diameter class (inches at breast height)									
		5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0 and larger
	Thousand cubic feet										
Softwood:											
Yellow pines	2,383	132	121	629	120	590	142	428	--	221	--
Eastern white pine	529	--	--	141	--	145	--	243	--	--	--
Spruce and fir	--	--	--	--	--	--	--	--	--	--	--
Cypress	--	--	--	--	--	--	--	--	--	--	--
Other eastern softwoods	322	--	--	--	100	--	--	--	--	222	--
Total softwoods	3,234	132	121	770	220	735	142	671	--	443	--
Hardwood:											
Select white and red oaks	4,444	102	312	536	405	784	856	383	599	467	--
Other white and red oaks	9,315	745	1,045	1,243	1,674	972	1,226	1,059	983	368	--
Hickory	1,055	340	111	288	139	177	--	--	--	--	--
Yellow birch	--	--	--	--	--	--	--	--	--	--	--
Hard maple	581	111	--	--	--	--	--	233	--	237	--
Sweetgum	--	--	--	--	--	--	--	--	--	--	--
Ash, walnut, and black cherry	969	--	--	163	--	246	--	--	426	134	--
Yellow-poplar	1,888	--	--	--	--	495	498	492	--	403	--
Tupelo and blackgum	89	--	89	--	--	--	--	--	--	--	--
Bay and magnolia	--	--	--	--	--	--	--	--	--	--	--
Other eastern hardwoods	1,745	75	359	449	150	--	159	224	--	329	--
Total hardwoods	20,086	1,373	1,916	2,679	2,368	2,674	2,739	2,391	2,008	1,938	--
All species	23,320	1,505	2,037	3,449	2,588	3,409	2,881	3,062	2,008	2,381	--

Table 44.--Mortality of live timber, growing stock, and sawtimber on timberland, by species, Northern Mountains of Virginia, 1985

Species	Live timber[a]	Growing stock	Sawtimber
	Thousand cubic feet		Thousand board feet
Softwood:			
Yellow pines	6,772	5,492	15,048
Eastern white pine	768	629	2,748
Spruce and fir	--	--	--
Cypress	--	--	--
Other eastern softwoods	84	84	--
Total softwoods	7,624	6,205	17,796
Hardwood:			
Select white and red oaks	8,264	3,911	14,032
Other white and red oaks	19,172	11,666	27,621
Hickory	2,731	2,087	3,972
Yellow birch	--	--	--
Hard maple	129	--	--
Sweetgum	--	--	--
Ash, walnut, and black cherry	1,297	430	1,511
Yellow-poplar	641	641	2,426
Tupelo and blackgum	134	--	--
Bay and magnolia	--	--	--
Other eastern hardwoods	5,002	1,227	2,952
Total hardwoods	37,370	19,962	52,514
All species	44,994	26,167	70,310

[a]Merchantable portion only.

Table 45.--Change in number of live trees 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)							
		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 and larger
	Thousand trees								
Yellow pine:									
1977	133,934	48,354	26,780	23,234	16,905	9,874	5,347	2,307	1,133
1986	122,772	50,903	20,325	18,537	16,528	8,464	4,862	1,952	1,201
Change	-11,162	+2,549	-6,455	-4,697	-377	-1,410	-485	-355	+68
Other softwood:									
1977	81,770	46,962	16,637	8,097	4,424	2,522	1,157	809	1,162
1986	92,760	51,551	16,116	11,702	5,583	3,618	1,309	1,125	1,756
Change	+10,990	+4,589	-521	+3,605	+1,159	+1,096	+152	+316	+594
Hardwood:									
1977	1,709,228	1,040,442	327,519	142,844	77,783	48,674	28,518	17,522	25,926
1986	1,503,105	898,393	268,062	127,724	81,737	47,573	30,602	19,450	29,564
Change	-206,123	-142,049	-59,457	-15,120	+3,954	-1,101	+2,084	+1,928	+3,638

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 1977-1986
	1966	1977	1986	
	- - - - - - - - - - Acres - - - - - - - - - -			
Forest land:				
Timberland:				
Pine and oak-pine types	555,079	560,898	529,078	-31,820
Hardwood types	1,948,231	2,064,814	1,997,616	-67,198
Total	2,503,310	2,625,712	2,526,694	-99,018
Reserved timberland	128,100	120,020	144,172	+24,152
Woodland	180,997	66,061	57,453	-8,608
Total	2,812,407	2,811,793	2,728,319	-83,474
Nonforest land:				
Cropland	369,482	341,294	457,624	+116,330
Pasture and range	874,185	878,334	796,115	-82,219
Other	245,393	256,439	308,786	+52,347
Total	1,489,060	1,476,067	1,562,525	+86,458
All land[a]	4,301,467	4,287,860	4,290,844	+2,984

[a]Excludes all water areas.

Table 47.--Volume[a] 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
					SAWTIMBER (in thousand board feet)					
Softwood										
1966	1,250,677	--	--	325,209	319,388	218,182	138,148	89,708	50,264	109,778
1977	1,793,621	--	--	426,289	454,573	348,855	220,358	135,170	51,894	156,482
1986	1,903,048	--	--	415,731	431,320	344,467	290,647	167,319	77,673	175,891
Hardwood										
1966	5,715,018	--	--	--	977,974	1,071,905	943,453	835,202	576,384	1,310,100
1977	7,669,743	--	--	--	1,323,513	1,392,317	1,420,092	1,064,555	782,578	1,686,688
1986	8,598,593	--	--	--	1,420,448	1,544,991	1,602,010	1,326,842	792,503	1,911,799
					GROWING STOCK (in thousand cubic feet)					
Softwood										
1966	440,807	71,923	93,593	90,815	72,853	44,238	25,798	15,719	8,418	17,450
1977	574,846	72,265	110,717	119,042	103,689	70,733	41,150	23,685	8,691	24,874
1986	593,209	69,647	114,680	116,078	98,392	69,849	54,279	29,318	13,008	27,958
Hardwood										
1966	2,192,014	243,002	309,902	325,006	288,573	272,057	215,302	176,725	115,926	245,521
1977	2,807,001	263,202	357,469	419,596	390,532	353,380	324,074	225,255	157,397	316,096
1986	2,996,495	235,622	375,373	410,204	419,110	392,179	365,563	280,742	159,396	358,306
					LIVE TIMBER[b] (in thousand cubic feet)					
Softwood										
1966	457,207	75,151	99,165	94,286	74,582	45,957	26,019	15,719	8,418	17,910
1977	595,395	75,508	117,310	123,588	106,145	73,475	41,503	23,685	8,691	25,490
1986	613,772	72,853	121,513	120,473	100,713	72,543	54,734	29,318	13,008	28,617
Hardwood										
1966	2,628,236	331,021	377,619	384,183	337,168	309,461	245,646	198,199	142,159	302,780
1977	3,353,585	358,538	435,585	495,988	456,288	401,955	369,771	252,578	193,069	389,813
1986	3,568,860	321,100	457,448	484,917	489,781	446,145	417,129	314,878	195,499	441,963

[a]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.

[b]Merchantable volume.