

**NORTH
CAROLINA'S
TIMBER**

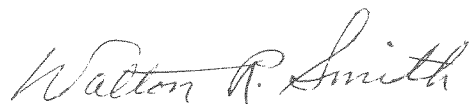
Foreword

This report presents the principal findings of the third Forest Survey of North Carolina's timber resource. The survey, conducted by the Southeastern Forest Experiment Station, was begun in August 1961 and completed in November 1964. Results of two previous surveys, completed in 1938 and 1954, provide the basis for evaluating and interpreting the significance of trends and changes in the timber resource situation.

Forest Survey, a nationwide project of the U. S. Forest Service, is a continuing undertaking designed to provide sound resource data essential to formulation of forest policies and programs at National, State, and local levels. In addition to periodic timber inventories, estimates of timber growth, depletion, and consumption are made which supply forestry interests at all levels with data needed to relate present forest trends, conditions, and timber volumes to probable future timber requirements. At the Southeastern Forest Experiment Station, Forest Survey is a function of the Division of Marketing, Utilization, and Resources Research.

The combined efforts of many people have gone into the Forest Survey in North Carolina. The Station wishes to acknowledge the cooperation of the Tennessee Valley Authority in assisting in the field work in Cherokee, Clay, Mitchell, and Yancey Counties. Acknowledgment is also due the Forest Division of the North Carolina Department of Conservation and Development for its surveys of timber products output which provided additional information for the report.

Joe P. McClure, leader of the project and co-author, organized and coordinated the various phases of the Survey. Richard L. Welch and Noel D. Cost supervised the collection of the field data. Aerial photo preparation and interpretation and the data computations were supervised by William H. Haines. Co-author Herbert A. Knight was in charge of the analysis and reporting.



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NORTH CAROLINA'S TIMBER

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FOREST SERVICE

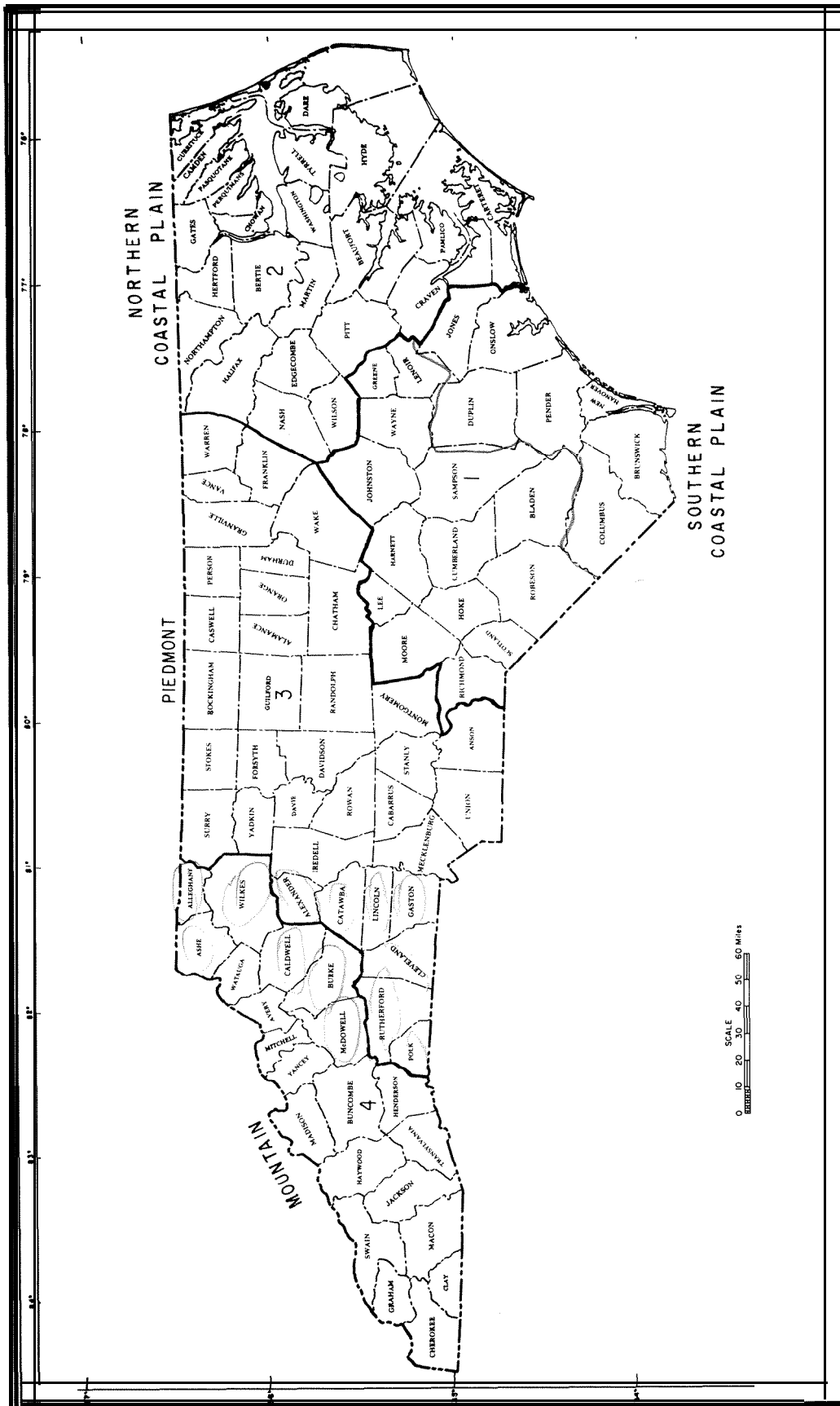


SOUTHEASTERN FOREST EXPERIMENT STATION
ASHEVILLE, NORTH CAROLINA

1966

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Highlights

Forest area continues to increase. Area of commercial forest land in North Carolina has increased by 1.9 million acres since 1938, to a total of 20.0 million acres, but the rate of increase has declined in recent years. Slightly over one-half of the increase has occurred in the Piedmont, Forest Survey Unit 3 (fig. 1). Today, 64 percent of all land area qualifies as commercial forest and places North Carolina fifth in the Nation in area of commercial timberland.

Farm holdings are down. There has been a sharp reduction in farm holdings within the private ownership pattern of commercial forest land. Today, farmers own less than one-half the commercial forest land in North Carolina, compared to two-thirds in 1955. Virtually all of the shift has been from farmer to a variety of other private owners. Public-owned lands, which make up less than 10 percent of the total, have remained relatively stable.

Mixed stands are increasing. Forests which have an oak-pine cover type have increased by 1.5 million acres since 1955, to a total of 3.6 million acres. These are forests in which southern pine makes up at least 25 percent but less than 50 percent of the stand.

Average stand density is up. Stand densities have tended to increase over the past 26 years. In 1938, the average stand of all live trees 1.0 inch and larger averaged 63 square feet of basal area per acre. By 1955, this average had increased to 73 square feet and is now up to 80 square feet. Nongrowing-stock trees now comprise about 19 percent of the basal area, compared to 26 percent in 1955.

Timber volume is increasing. Since 1938, the volume of softwood growing stock has increased 8 percent, and the volume of hardwood

42 percent. Almost all of the increase in softwood volume has occurred since 1955, but the rate of increase in hardwoods has tapered off during the past 9 years.

Pine sawtimber makes a comeback in the Coastal Plain. The downward trend in volume of pine sawtimber shown in 1955 has now been reversed in the Coastal Plain. The decline of pine sawtimber continues in the Piedmont, but at a slower rate than that which occurred between 1938 and 1955. A relatively small proportion of North Carolina's pine sawtimber occurs in the Mountains, where the trend is upward.

Volume of cypress is declining. Since 1938, the volume of cypress sawtimber has declined 17 percent and growing stock 24 percent. Cypress volume has decreased faster since 1955 than between the first two surveys. Most of the cypress grows in the Northern Coastal Plain.

Net growth drops off. In 1963, the net growth of growing stock was down almost 7 percent, compared to 1955. This reduction in net growth resulted from heavier mortality and a decrease in the growth rate, probably in response to higher stand densities with improper spacing. When all species were grouped, the rate of gross growth as related to inventory was down almost 12 percent in 1963, compared to 1955.

Margin of net growth over cut narrows. Net growth continues to exceed cut in both softwood and hardwood but the margin is narrowing. In 1955, growth of hardwood growing stock was over 1% times greater than cut. By 1963 this margin had narrowed to 32 percent. In 1955, growth of softwood growing stock exceeded cut by 21 percent, but by 1963 this margin had narrowed to 16 percent. The growth-

cut ratio for softwood sawtimber is an exception to the trend in that growth over cut has increased slightly because of a decline in cut.

Greater use is made of plant byproducts. More complete utilization of roundwood output has contributed to the increase in inventory. Over one-fifth of all pulpwood produced in North Carolina in 1964 came from slabs, edgings, veneer cores, trimmings, and other byproducts, compared to a negligible amount from these sources as recent as 1955. To the pulp industry today, this residue volume serves as the equivalent of over 550,000 cords of growing stock each year. In spite of this progress, however, an estimated 100,000 cords of plant residues suitable for chipping were unused in 1964.

The pulp industry is expanding. Pulping capacity at North Carolina's 5 pulpmills has increased 75 percent within the past 10 years and now exceeds 4,500 tons per day. In 1964, almost 2.1 million cords of round pulpwood were cut from North Carolina's forest, compared to slightly over 1.5 million cords in 1954.

A new wood-using industry is introduced. The first southern pine plywood plant constructed in North Carolina began operation in mid-1965. Three pine plywood plants are now in operation or under construction in the Coastal Plain with a combined annual capacity approaching 200 million square feet (3/8-inch basis).

Lumber production is down. Between 1954 and 1960, reported lumber production dropped almost 33 percent, with most of the decrease occurring in softwood. Since 1960, annual production has tended to level off at about 1 billion board feet. The lumber industry still outranks all other primary wood-using industries in volume of timber consumed annually.

Net growth is well below potential. There are numerous opportunities to increase growth through better management. About 30 percent of the growing space in commercial forest land is nonstocked or occupied by shrubs and nongrowing-stock trees. To bring this space into timber production calls for more intensified regeneration and stand improvement efforts.



Tidier Trends

MORE FOREST AREA

Area of commercial forest land in North Carolina has increased continuously since the first Forest Survey was completed in 1938 (table I). Between 1938 and 1955, area of commercial forest increased at an average rate of more than 70,000 acres per year. Since 1955, the net annual increase has averaged 37,000 acres exclusive of forest land shifting from unproductive to commercial because of a more lenient classification.

Although planting and natural restocking of idle and abandoned farmland have more than offset the loss of timberland to other land uses, some people have expressed concern over the amount of land that is being permanently removed from any future timber production. As the population increases, the expanding residential areas, industrial sites, highways, airports, reservoirs, transmission lines, and parks become more noticeable. Between 1955 and 1964, the increase in these land uses averaged over 40,000 acres annually. A large share of this land going into urban and other uses, however, has come from agricultural land. To date, the inroads into commercial forests have not been large enough to reduce significantly the supply of timber. There are still over 800,000 acres of idle nonforest land in North Carolina.

OWNERSHIP PATTERNS CHANGE

Adjustments in agricultural activities, particularly in the Piedmont and Mountains, have contributed to a decrease of 4 million acres in farmer-owned forest land over the past 9 years. Most of this shift in ownership has been from farmers to the miscellaneous private group, where interests in forestry range from none to the most advanced.

Because conditions of forest lands, the amount and kind of forest management applied,

prospective timber growth, and availability all depend to a great extent upon the decisions of the owners and managers of the forests.

Table I.-Commercial forest area *by Survey Unit, North Carolina, 1938, 1955 and 1964*

Survey Unit		1938	1955	1964	Change 1955-1964
----- Thousand acres -----					
Southern	Coastal	5,544.3	5,388.9	5,653.8	+264.9
Plain					
Northern	Coastal	4,045.5	4,140.4	4,302.4	+162.0
Plain					
Piedmont		4,968.1	5,821.1	6,014.6	+193.5
Mountain		3,543.8	3,991.0	4,056.5	+ 65.5
state total		18,101.7	19,341.4	20,027.3	+685.9

large-scale changes in the ownership pattern are of major interest. When the average condition of stands owned by farmers is compared to that of the miscellaneous private group, there seems to be no significant difference at present. It is probably too early, however, to draw any firm conclusions about the relationship of forest management to either ownership class or size because present stand conditions still reflect past treatment, even on forest-industry lands.

Collectively, individuals who own less than 500 acres of forest land hold about 60 percent of the commercial timberland. Over one-third of the total commercial forest land is held by individuals who own less than 100 acres. In the past, these small landowners have provided a large share of the timber cut in North Carolina, and the future timber supply will still depend on their contribution.

Most forest-industry holdings are found in the Coastal Plain, where forest industry owns about one-fourth of all commercial timberland in the Northern Coastal Plain and over 16 percent of the total in the Southern Coastal Plain. Historical ownership information is not available from previous surveys and it is there-

fore impossible to report a reliable trend in this ownership class. Most of the holdings in this class exceed 50,000 acres.

There has been only a small increase in the acreage of public-owned commercial forest since 1955. In fact, its proportion of the State total has remained about 8.5 percent. These public-owned timberlands are largely confined to the Mountains, where about one-fifth of the commercial forest land is in National Forest ownership. In addition, there are approximately 350,000 acres of productive-reserved forest land in the Mountains. Most of this reserved acreage is in the Great Smoky Mountains National Park and along the right-of-way of the Blue Ridge Parkway, both of which are administered by the Department of the Interior.

BETTER STOCKING

Along with the increase in forest area there has been an improvement in stocking. Today, 64 percent of the commercial forest land is 70 percent or better stocked with growing-stock trees, compared to 58 percent in 1955. Over this same period, the proportion of commercial forest land that is less than 40 percent stocked with growing stock declined from 18 to 8 percent.

Hardwoods make up a higher proportion of total stocking today than in the past, and they now account for 66 percent of total stocking of all live trees 1.0 inch and larger, compared to 63 percent in 1955 and 58 percent in 1938. Two out of every five of these hardwood trees fail to qualify as growing stock, however, because of poor form, rot, roughness, or noncommercial species; over 90 percent of the softwood trees qualify as growing stock. Because the growing-stock classification is based on a saw-log standard, many of the remaining trees can be used by industries that depend primarily upon wood fiber.

HARDWOOD FOREST TYPES GAIN

Natural hardwood encroachment, assisted by the heavier demand that is generally placed upon the pine component in mixed forests, has resulted in a further increase in hardwood forest types. In 1955, hardwood cover types

occupied about 56 percent of the commercial forest land, compared to 64 percent in 1961. The oak-pine and oak-hickory types have expanded at the expense of the softwood type. There has been little change in the bottomland hardwood types.'

MORE TIMBER VOLUME

The increase in forest area and stocking has been accompanied by an increase in volume of both softwood and hardwood (fig. 2). Between 1938 and 1955, a 33-percent increase in the volume of hardwood growing stock overshadowed a negligible gain in softwood volume. For North Carolina as a whole, both softwood and hardwood growing stock have increased 7 percent since 1955. The fact that hardwoods are now providing a greater share of total cut than in the past seems to be bringing the demand into somewhat better balance with the inventory in terms of species composition.

There is also an upward trend in sawtimber volume. Since 1955, softwood and hardwood sawtimber have increased 10 and 5 percent

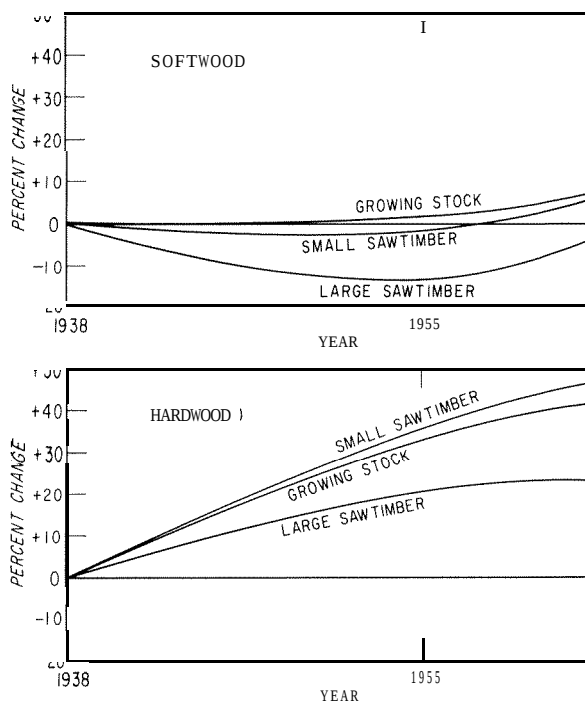


Figure 2. *Percent change in timber volume North Carolina since 1938.*

¹ A map detailing the major forest types in the South is available, upon request, from the Southeastern Forest Experiment Station. The scale is 40 miles to the inch.

respectively. Between the first and second surveys, softwood declined 6 percent and hardwood rose 26 percent. Pine sawtimber has made a comeback in the Coastal Plain, and hardwood continues to increase in the Piedmont and Mountains. Cypress is declining, but it makes up a relatively small share of total volume.

In the Southern Coastal Plain, net volume of sawtimber averages 2,370 board feet per acre, about the same as in 1955. Softwoods comprise about 60 percent of this volume. Loblolly pine, with 5.4 billion board feet, is the predominating species, followed by pond pine and longleaf pine. Blackgum, sweetgum, and tupelo combined make up over one-half the hardwood sawtimber volume, with a variety of oaks, yellow-poplar, and soft maple comprising most of the remaining volume.

Highest average volumes are found in the Northern Coastal Plain, where sawtimber volume per acre has increased from 3,960 to 4,170 board feet since 1955. Species composition differs little from that found in the Southern Coastal Plain. Loblolly pine, with almost 8.3 billion board feet, is by far the most important species.

Smallest average volume of sawtimber per acre, 2,033 board feet, is found in the Piedmont, where poletimber and sapling and seedling stands occupy a relatively high percentage of the forest. When comparisons are based on average cubic-foot volume per acre, however, average volume in the Piedmont is greater than in the Southern Coastal Plain. Shortleaf and loblolly pines, with 4.4 billion board feet, are the leading softwood species, with Virginia pine next in importance. In contrast to 41 percent in the Coastal Plain, hardwoods comprise 57 percent of the sawtimber volume in the Piedmont. White oak, yellow-poplar, sweetgum, hickory, scarlet oak, and red maple are the predominant hardwood species and comprise about two-thirds of the hardwood sawtimber. Most of the remaining hardwood consists of a mixture of other white and red oaks, river birch, beech, and sycamore.

In the Mountains, sawtimber volume per acre has risen from 2,440 to 2,653 board feet since 1955. Hardwoods predominate in this area and account for over three-fourths of the total board-foot volume (fig. 3). Chestnut oak, yellow-poplar, scarlet oak, northern red oak,

white oak, and hickory are the leading hardwood species. About 61 percent of the board-foot volume of hardwoods is in trees 15.0 inches

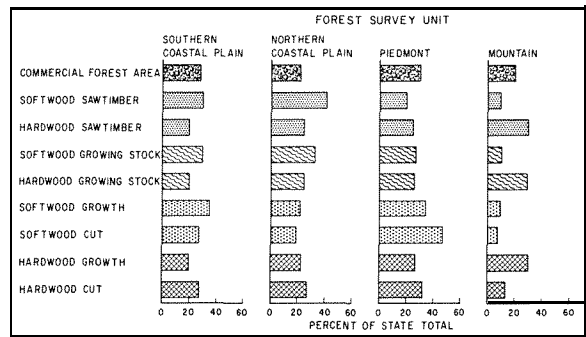


Figure 3. Relative importance of forest resource by Survey Unit, North Carolina, 1964.

d.b.h. and larger. White pine, shortleaf, pitch, and Virginia pines, and hemlock are the principal softwood species in the Mountains.

LESS NET GROWTH

Growth still exceeds cut, but net growth is down for both softwood and hardwood, compared to 1955 (fig. 4). Net growth is 13 percent lower for softwood sawtimber and 4 percent for growing stock. In hardwood, net growth has declined 12 percent for sawtimber and 10 percent for growing stock.

This trend raises the question of what has caused this decrease in net growth. The statistics show that a combination of heavier mortality and a decrease in the rate of gross growth accounts for the reduction. The 1963 survey figures show that mortality reduced the growth of softwood and hardwood growing stock by 14 and 19 percent, respectively, compared to 10 percent for both softwood and hardwood in 1955. Gross growth as related to inventory declined from 6.0 to 5.3 percent for all species—possibly the result of increased density with improper spacing. Natural regeneration from inadequate seed sources has tended to produce

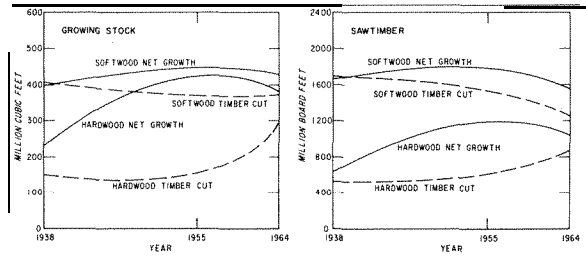


Figure 4. Trend in net growth and timber cut in North Carolina since 1938.

irregular stands which have less than optimum growth potential.

The fact that this latest survey shows hardwood mortality almost double that in 1955 and softwood mortality up 39 percent must be evaluated carefully. The latest survey was the first to utilize remeasurements made on the permanent sample plots established in 1955. Mortality figures are now based on an average of the losses occurring over the 9-year interval between 1955 and 1964. Mortality estimates on previous surveys were based on the single year preceding the survey, which may not have been the most representative year. The increase in mortality for 1963 over that of 1955, as shown by the plot data, may well represent, in large part, this change in sampling techniques.

In both surveys, the exact cause of death in many instances was impossible to determine and was recorded as unknown. During the remeasurement period between 1955 and

1963, suppression, particularly in overcrowded stands, was one of the leading causes of death and, because of its inconspicuous nature, mortality from suppression often gains little attention. In 1963, North Carolina experienced its worst fire year since 1955 in terms of area burned, and the result was a considerable loss of timber, particularly in the Coastal Plain. Other leading identifiable causes of death included pine bark beetles and littleleaf disease, the latter confined to the Piedmont. An outbreak of the elm spanworm in the Mountains existed for several years and resulted in considerable damage to the hardwoods and, in some instances, led to mortality. The balsam woolly aphid represents still another cause of death and continues to present a threat to the small remaining area of Fraser fir. Many rust fungi plague the hardwoods throughout the State and, although they are not leading causes of death, they have the biggest impact of all the diseases on net increment.



abandoned farmland.

other uses has been offset by the planting and natural restocking of idle and

-Photo by Forestry Div., N. C. Dept. Conservation and Development

Timber Products Output

Annual timber cut shown in tables 21 to 24 and in table 45 of this report is based on trend level between 1955 and 1963 as developed from the remeasurement of permanent sample plots, and should not be confused with annual timber cut shown in tables 30 and 31, which is based on the 1964 State commodity drain survey. Timber removal for specific years often differs substantially from the trend or average. The estimate of timber cut based on trend level is probably more reliable for describing the current average growth and cut relationship and more nearly explains the changes in the inventory since 1955. On the other hand, the cut figures for a particular year are more useful when cut is related to timber products output. In this section the data obtained in the State commodity drain survey are used and supplemented with information on utilization obtained by Forest Survey.

In 1964, timber products from North Carolina forests totaled about 490 million cubic feet, compared to almost 550 million cubic feet in 1955. Reductions in volume of softwood timber cut for saw logs and both softwood and hardwood cut for domestic fuelwood account for most of this decline. The output of timber products from hardwood has actually increased over this 9-year span.

SAW LOGS LEAD ALL OTHER PRODUCTS

The number of sawmills in North Carolina has declined since 1955, but there were still over 650 active mills in 1964. About 220 of these mills each produced 2 million board feet of lumber or more. The lumber industry consumes slightly more growing-stock timber annually than do all other wood-using industries combined. Reported softwood lumber production dropped off sharply between 1956 and

1960, but has tended to level off in more recent years. Hardwood lumber production has fluctuated from year to year, but the general level of production has remained about the same since 1950, with only a very small decrease in average annual production (fig. 5).

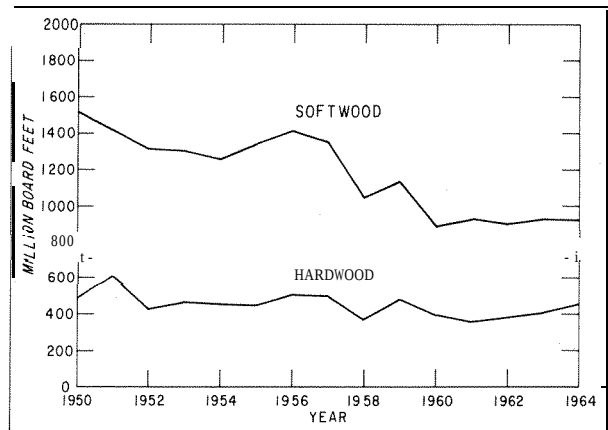


Figure 5. Lumber production in North Carolina, 1950 to 1964.

PULPWOOD PRODUCTION SETS RECORD

There are 5 pulpmills in North Carolina, and the pulping capacity at each of these mills has been increased within the past 10 years. In 1964, pulpwood production reached a record high of over 2.6 million cords, and the industry is the second largest consumer of wood in the State. Between 1950 and 1964, annual pine pulpwood production, including chips from residues, increased from 790,000 cords to 1,965,000 cords, and hardwood production rose from 234,000 cords to 659,000 cords (fig. 6).

VENEER LOGS ANOTHER MAJOR PRODUCT

North Carolina is one of the Nation's leading producers of hardwood veneer logs and



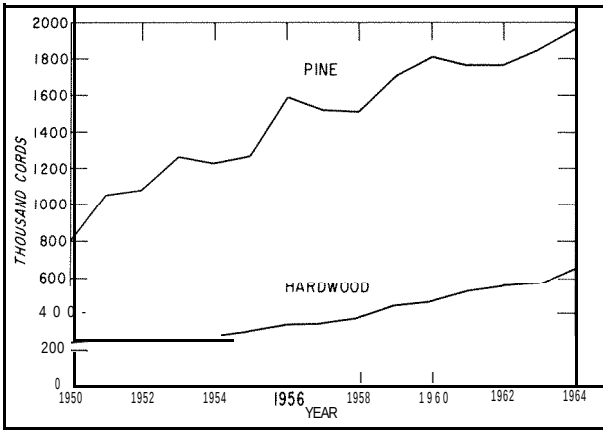


Figure 6. *Pulpwood production in North Carolina, including residues, 1950 to 1964.*

had over 60 active veneer plants in 1964. Most of these plants are concentrated in the Piedmont, where they support the wood furniture industry (fig. 7). Output of hardwood veneer

logs in 1964 totaled 155 million board feet, compared to about 122 million board feet in 1955.

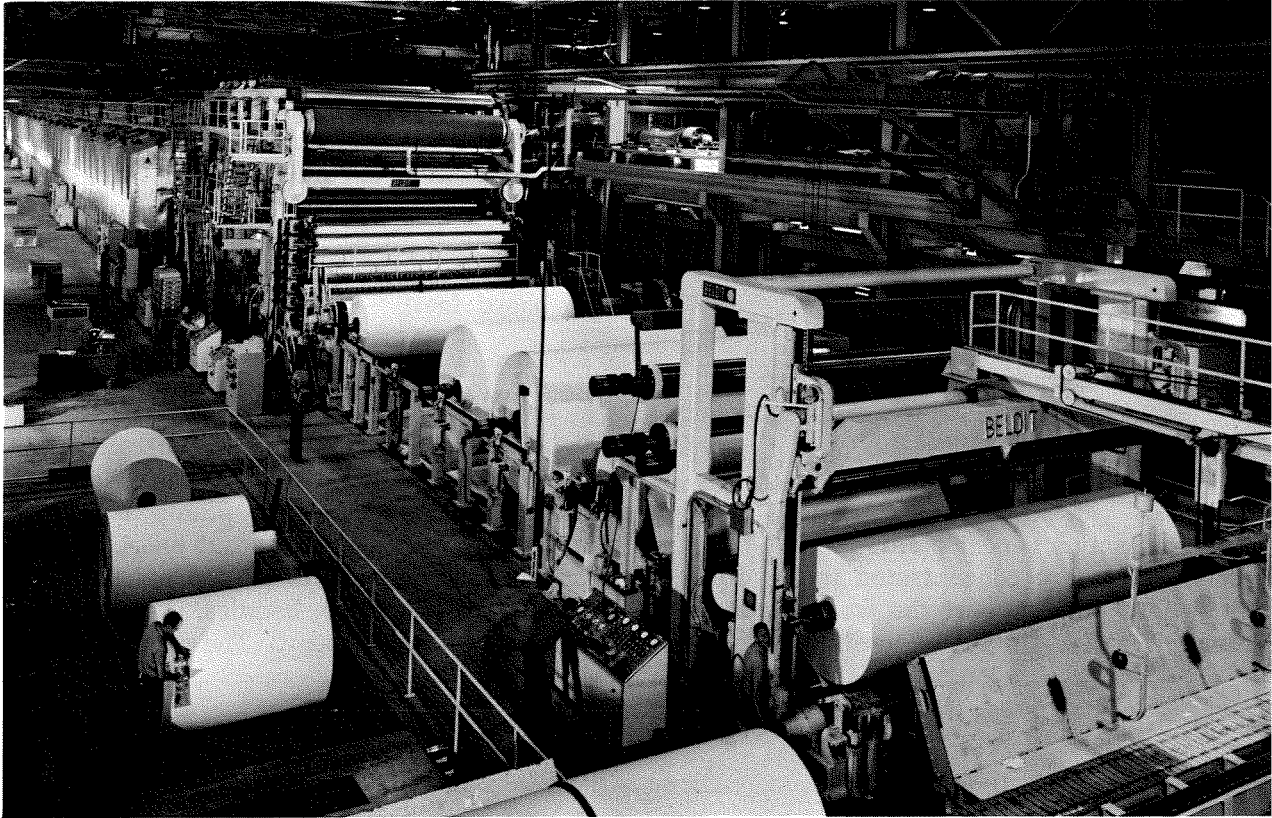
The new southern pine plywood industry has moved into the Coastal Plain. Three plants are in operation or under construction there at this time. Based on the announced capacities of these three mills, their annual pine sawtimber requirements will approach 80 million board feet.

MISCELLANEOUS PRODUCTS

In addition to the sawmills, pulpmills, and veneer plants, there are approximately 30 other primary wood-using plants in North Carolina. These plants turn out miscellaneous products that range from treated poles, piling, and posts to cooperage, handles, shuttleblocks, and various kinds of board. The combined out-



North Carolina is one of the Nation's leading producers of hardwood veneer logs.



-Photo courtesy of Carolina Division. Champion Papers Inc., Canton, N. C.



nearby pulpmill.

put of these products in 1964 totaled about 24 million cubic feet, with hardwood providing about two-thirds of this volume.

PLANT RESIDUES

The primary wood-using industries in North Carolina produced an estimated 143 million cubic feet of wood residues in 1964. Slightly over one-half of these residues were either used in the manufacture of fiber products, small dimension, specialty items, or for fuel and litter. Over 65 million cubic feet were not used for any purpose. Of the amount not used, about 46 million cubic feet were fine residues, such as sawdust and shavings, which have very limited use at this time.

FUELWOOD CONSUMPTION IS DOWN

It is difficult to measure the volume of wood burned annually for domestic fuel, but the available data indicate that fuelwood consumption has declined about 60 percent since 1955. In spite of this decrease, it is estimated that North Carolina residents burned 678,000 cords of roundwood in 1964 and, of all wood products produced, fuelwood ranked third in volume.

Use of hardwood for fuel far exceeds the use of softwood. Oil, gas, coal, and electricity have been increasingly substituted for wood in home cooking and heating, especially by farm residents who consume most of the fuelwood. Because many of the modern homeowners like to retain some of the environment that surrounded the old-time fireplace, the use of firewood as a luxury may very well influence the trend in the future.

SUBSTANTIAL VOLUME OF TIMBER CUT IS NOT USED

About 24 percent of the cubic-foot volume of growing stock that was cut, girdled, poisoned, or destroyed in 1964 did not go into a product. Unused portions of cut trees and whole trees destroyed in logging operations totaled almost 84 million cubic feet. Logging residues in hardwood ran particularly high. In addition, it is estimated that about 56 million cubic feet were destroyed by land clearing and never reached a market of any kind. A small amount of low-quality hardwood destroyed in cultural treatments met the minimum standards for growing stock.

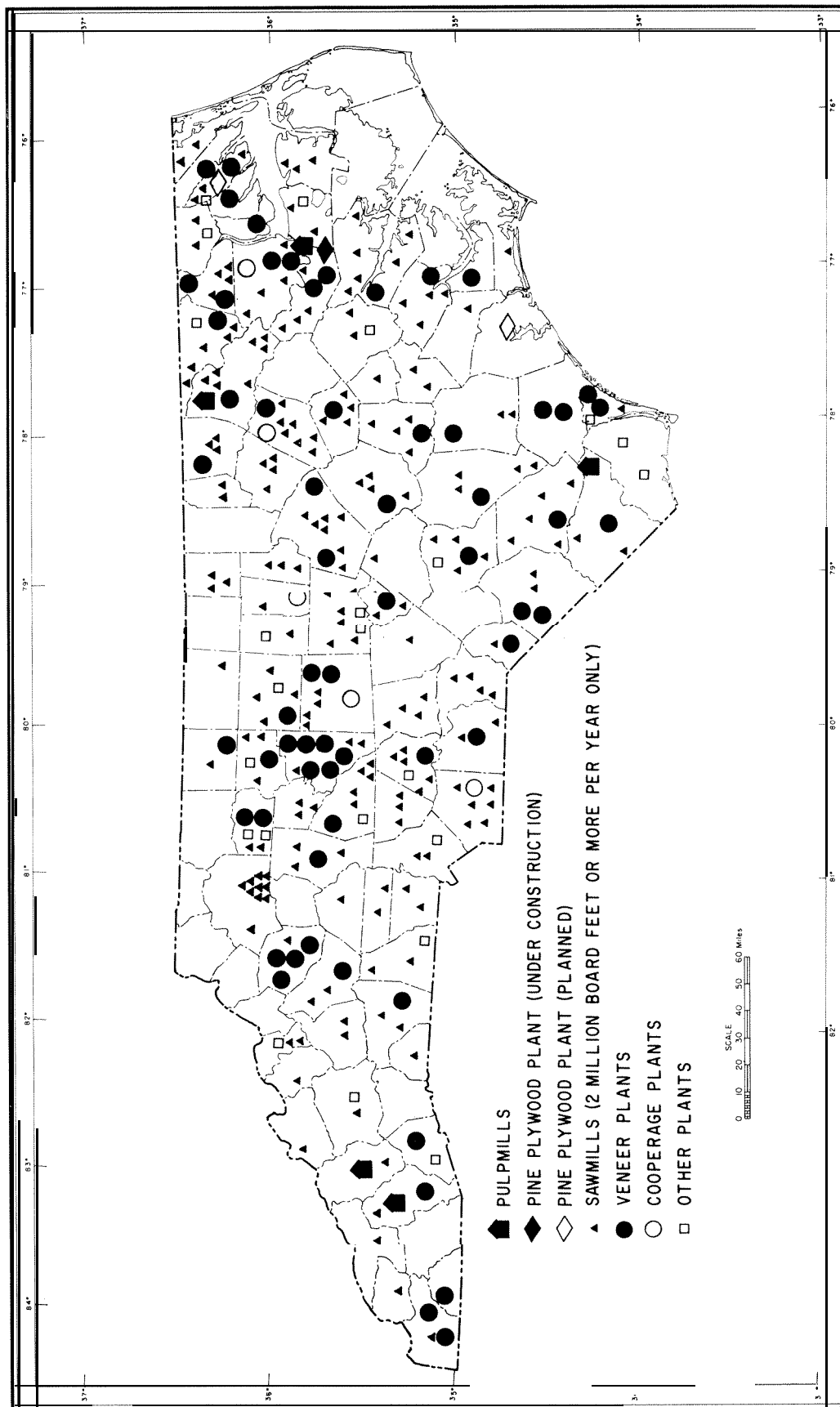


Figure 7. Location of primary wood-using industries in North Carolina, 1964.

Timber Supply Outlook

Any long-term projection of timber supply is subject to many uncertainties, and the results largely reflect the assumptions that must be made about future forest area, levels of protection, and other management activities. Nevertheless, by introducing some reasonable assumptions, it is possible to estimate the prospective volume of timber that will be available if the current trend in forest management continues. This estimate can also be compared to the potential volume of timber that would be available annually if the present inventory were improved to the degree that near maximum timber production could be obtained from North Carolina's forest land. The results of projections made for North Carolina and the assumptions used are described in this section. No attempt is made to project the timber supply beyond 50 years or to project timber demand.

PROSPECTIVE AVAILABLE CUT

This first projection was made to obtain estimates of the volume of timber that will be available to forest industries annually, based on assumptions that the difference in cut and growth will gradually diminish until growth equals cut in 50 years, and that the current trend in forest management will continue. This assumes that forest protection, planting, stand improvement, thinning, stand conversion, and improved utilization will counteract any tendency for mortality to increase and radial growth to decrease in response to higher stand densities.

Results from this projection indicate that by the year 2000, available cut from softwood growing stock and sawtimber will increase by 46 and 40 percent, respectively. This means that the present cut from softwood growing stock can be increased from about 370 to over

550 million cubic feet within the next 35 to 40 years. Over the same period, cut from softwood sawtimber can be increased from 1.2 to 1.8 billion board feet (fig. 8). Based on the same assumptions, available cut from hardwood growing stock will more than double by the year 2000, whereas only a 28-percent increase can be expected in available cut from hardwood sawtimber (fig. 9).

These estimates of prospective available cut are gross figures and can mask deficiencies that are likely to occur in the volume of select species, certain tree sizes, and quality material.

POTENTIAL AVAILABLE CUT

A second projection was made to obtain estimates of the volume of timber that could be available to forest industries annually, based on the increase in production that could result from intensified forest management. This would call for an acceleration of management over the next 50 years to develop the inventory needed to sustain a level of productivity that would more nearly reflect the capacity of North Carolina's forest land.

Results from this projection show a potential available cut from softwood growing stock of about 780 million cubic feet at the end of 50 years. Potential available cut from softwood sawtimber over the same period could reach 2.8 billion board feet.

Potential available cut from hardwood growing stock could increase from the present 300 million to slightly over 800 million cubic feet by the year 2013. Although the projections of hardwood growing stock show very little difference between prospective and potential available cut through the year 2000, the latter projection allows for considerable improvement in stand structure and tree quality and an inventory that would sustain a greater cut.

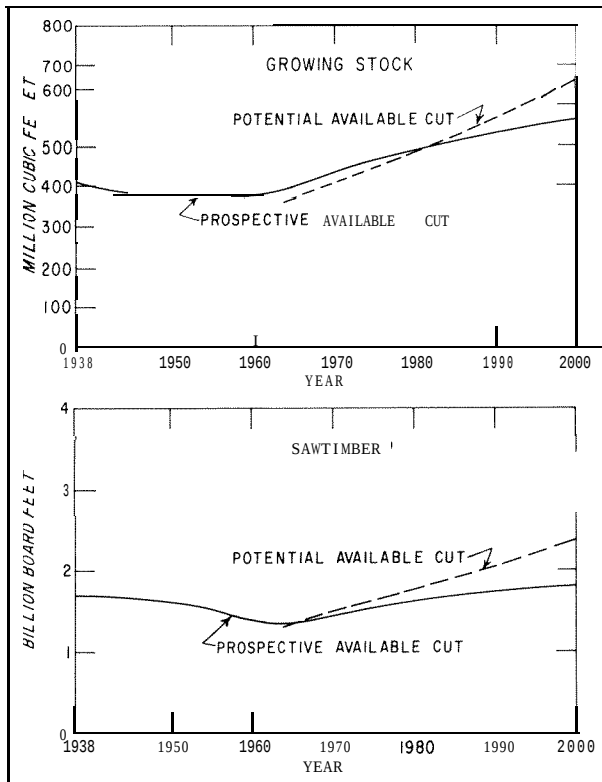


Figure 8. Prospective and potential available cut, softwood, 1963-2000, North Carolina.

Potential available cut from hardwood sawtimber could increase from the present 1.0 billion to slightly over 2.0 billion board feet. The reduction of excessive stocking of cull and undesirable hardwood trees through extensive stand improvement efforts provides an opportunity to improve the hardwood situation.

BASIS FOR PROJECTIONS

In these projections for North Carolina, it is assumed that the present acreage with pine cover types will be retained, and that pines will continue to occupy about 40 percent of the area within those stands that now have an oak-pine forest type. This would necessitate a greater control over hardwood encroachment upon upland sites that are better suited for growing pines.

In the second projection, the development of the potential inventory would require management practices that could increase the average basal area per acre across 8.6 million acres of pine and oak-pine stands from 63 to 100 square feet. It is assumed that accelerated manage-

ment of some 11.4 million acres of hardwood and cypress stands could increase the basal area per acre from 93 to 120 square feet, and at the same time substantially improve the proportion of desirable trees over the next 50 years. Because over 3 million acres of commercial forest land in North Carolina are less than 70 percent stocked with trees of any kind it seems reasonable to assume that average basal area can be increased without decreasing the growth rate. Poor spacing probably explains present indications that the rate of gross growth is decreasing with the increase in density. Other assumptions are that intensified management could reduce mortality in volume-size trees by 75 percent, and that additional gains could be made in diameter growth and average net volume per tree by proper spacing and improving tree quality.

The present level of forest area was held constant for the purpose of projecting the timber supply in North Carolina. During the past 26 years the area of commercial forest land has been increasing, but within the past 10

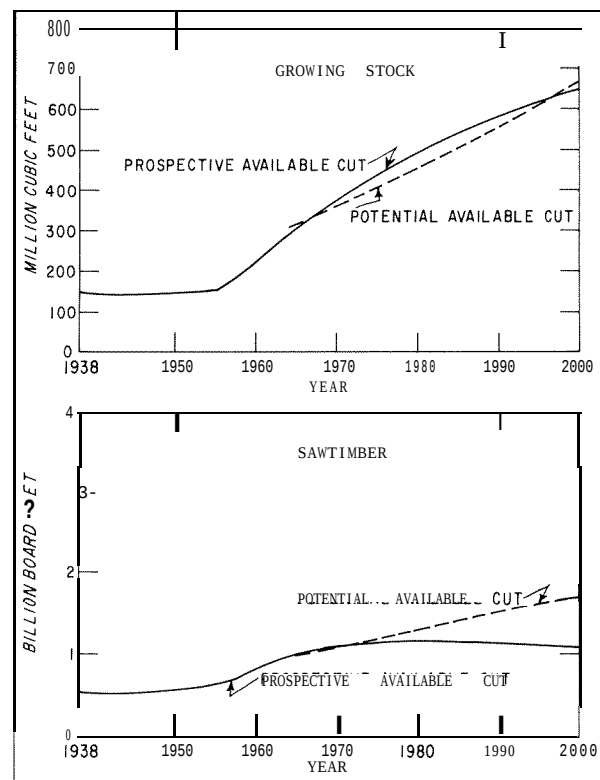


Figure 9. Prospective and potential available cut, hardwood, 1963-2000, North Carolina

years the increase has been at a slower rate. Annual forest planting reached a high of 87,000 acres in 1959; in recent years it has averaged nearer 50,000 acres (table II). Over time, a

Table II.-Acres of forest planting¹ by ownership class, North Carolina, 1954-1964

Fiscal year	Ownership class				All ownerships	Accumulative total
	National Forest	Other public	Forest industry	Other private		
----- Acres -----						
1954	121	1,010	6,206	9,867	17,204	17,204
1955	1,314	505	10,662	11,345	23,826	41,030
1956	1,901	1,451	18,494	12,270	34,116	75,146
1957	2,219	655	27,046	28,839	58,759	133,905
1958	3,169	1,703	26,968	43,826	75,666	209,571
1959	2,043	1,872	13,670	69,832	87,417	296,988
1960	1,867	1,173	20,411	49,465	72,916	369,904
1961	2,417	1,380	31,824	38,146	73,767	443,671
1962	3,212	1,341	23,176	22,626	50,355	494,026
1963	3,719	1,424	30,157	18,667	53,967	547,993
1964	4,208	2,023	30,286	15,619	52,136	600,129

¹Includes acres of planting by direct seeding.

Source: U. S. Department of Agriculture, Forest Service, Tree Planters' Notes, 1954-1964.

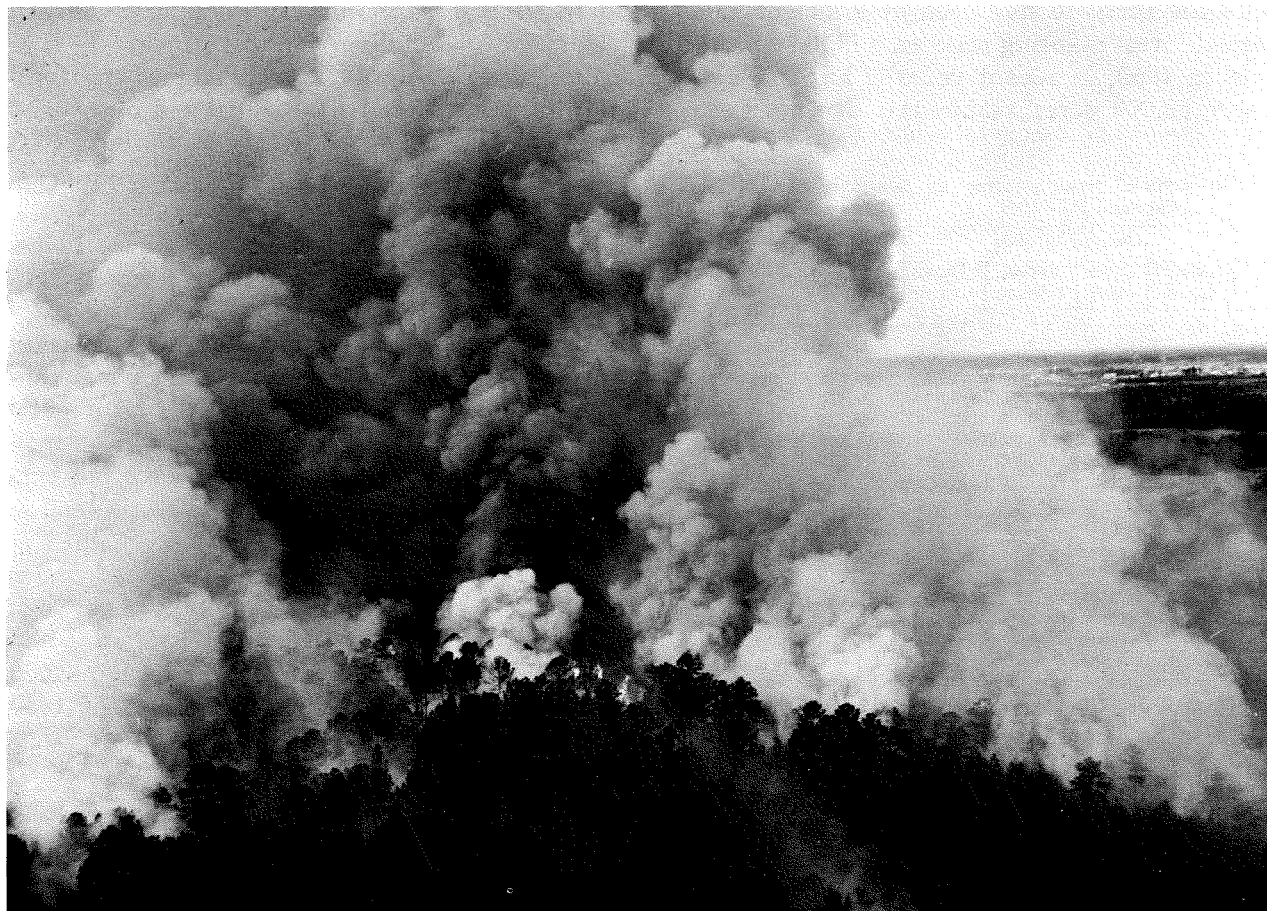
large part of the 800,000 acres of idle cropland will also revert naturally to forest. However,

with the increase in population expected by the year 2000, diversions of forest land to other uses will likely counterbalance the addition of new forest lands. More and more land will be needed for residential areas, industrial sites, highways, airports, reservoirs, and transmission lines.

In projecting the timber supply, it is assumed that fire protection efforts would continue at about the present level. In these long-range projections, the number of trees growing into the 2-inch diameter class each year from both natural and planted sources is an important factor, and this ingrowth into the 2-inch diameter class is greatly affected by the success of fire protection efforts. Fire protection in North Carolina has been extended until about 95 percent of the forest area is under protection. Area burned annually has been reduced significantly and, since 1955, protected area burned has been held to less than 100,000 acres each year, with the exceptions of 1957 and 1963 (table III).



will demand more land for roads.



-Photo by Forestry Div., N. C. Dept. Conservation and Development

TIMBER QUALITY

The large proportion of low-quality timber in the inventory presents a problem. Only 7,290.2 million cubic feet, or 35 percent, of the total net volume is in trees that qualify as desirable. These trees are thrifty and do not have any serious defects in quality that limit present or prospective use. Furthermore, only about 30 percent of this desirable-tree volume is in trees 15.0 inches d.b.h. and larger.

Other growing-stock trees classed as acceptable contain a much larger share, 11,174.5 million cubic feet, of the total volume. These trees do not qualify as desirable because of poor vigor, surface defects, excessive cull, or the presence of damaging agents. Many are of limited value to industries that depend entirely upon the best quality timber.

An additional 2,361.1 million cubic feet of volume is in rough trees and rotten culls which, together with other inhibiting brush, occupy

almost 17 percent of the growing space in commercial forests. The prospects are good, however, that continued improvements in utiliza-

Table III.—Forest area under fire protection, protected area burned, number of fires, and average size of fires, North Carolina, 1950-1964

Year	Forest area protected		Protected area burned		Fires ¹	Average size of fires ¹
	Thousand acres	Percent ²	Thousand acres	Percent	Number	Acres
1950	16,614	90.39	463	2.10	4,186	111
1951	16,887	91.86	189	1.12	3,495	54
1952	17,029	92.57	320	1.88	4,035	79
1953	17,049	92.65	163	.96	3,291	49
1954	17,013	92.79	211	1.24	4,326	49
1955	17,178	93.35	656	3.82	3,817	172
1956	17,138	93.11	89	.52	3,120	28
1951	18,299	92.19	152	.83	2,349	65
1958	18,300	92.19	55	.30	2,615	21
1959	18,691	94.20	86	.46	3,134	27
1960	18,780	94.54	77	.41	3,136	25
1961	18,761	94.55	60	.32	3,535	17
1962	18,764	94.55	55	.29	3,267	17
1963	18,774	94.56	281	1.50	4,910	57
1964	18,816	94.57	38	.20	3,424	11

¹ Fires on unprotected area are not included.

² Percent of commercial forest area.

tion technology will make it possible for industries dependent primarily upon wood fiber to use much of this inferior material, especially the 1,413.6 million cubic feet in rough trees.

Management Opportunities

GROWTH

Present net growth is far below potential in North Carolina. About 15.2 million acres, or 76 percent, of the commercial forest land is capable of growing 50 cubic feet or more per acre each year at culmination of mean annual growth when fully stocked with desirable trees. Of this, about 5.3 million acres are capable of growing 85 cubic feet or more annually. Currently, net growth of growing stock across all ownerships and site classes averages about 48 cubic feet per acre. If area of commercial forest land is not increased, an average net growth of 79 cubic feet per acre would be required to sustain the potential available cut estimated earlier in this report. There are numerous opportunities available for narrowing this gap between attained and potential growth.

STAND IMPROVEMENT

Extensive stand improvement efforts could greatly increase growth. Only about 1.6 million acres are 70 percent or more stocked with desirable trees (Condition Class 1). Another 7.5 million acres are between 40 and 70 percent stocked with desirable trees, but only about 13 percent of this area is expected to attain full stocking without treatment. The remaining 6.5 million acres require treatment to free the desirable trees from competition and overtopping.

REGENERATION

About 1.6 million acres in North Carolina have low or no growth potential in their present condition. This land is less than 40 percent stocked with growing stock (Condition Class 6). Regeneration efforts will be required to bring these acres into production, and site preparation

will be needed to remove shrubs and low-quality trees from more than 40 percent of this area prior to planting or reseeding.

Under present conditions, growth is well below potential on another 9.4 million acres which are fair to well stocked with growing stock, but less than 40 percent stocked with desirable trees (Condition Classes 4 and 5). Under these conditions, the management opportunities are not as well defined as they are for the other condition classes. However, many of these stands can be included among those requiring site preparation and planting.

PROTECTION

The reduction of timber losses caused by fire, insects, disease, and other natural destructive agents represents another important means of increasing future timber supplies. The mortality of growing stock from all causes in 1963 amounted to almost one-fourth the volume of growing stock cut for all purposes. In addition, an undetermined volume of growth was lost as the result of damage to trees that were not actually killed. Many of these same destructive agents cause defects that reduce the grade and value of standing timber.

UTILIZATION

There are also opportunities for additional improvement in the utilization of available wood supplies in North Carolina. Logging and plant residues combined total over 200 million cubic feet annually. Although full economic use of the entire volume of woods and plant residues is not feasible today, further progress toward better utilization is possible. The limited uses that are available for over 1.4 billion cubic feet of rough trees in the standing-tree inventory, however, dwarf most of the other utilization problems.

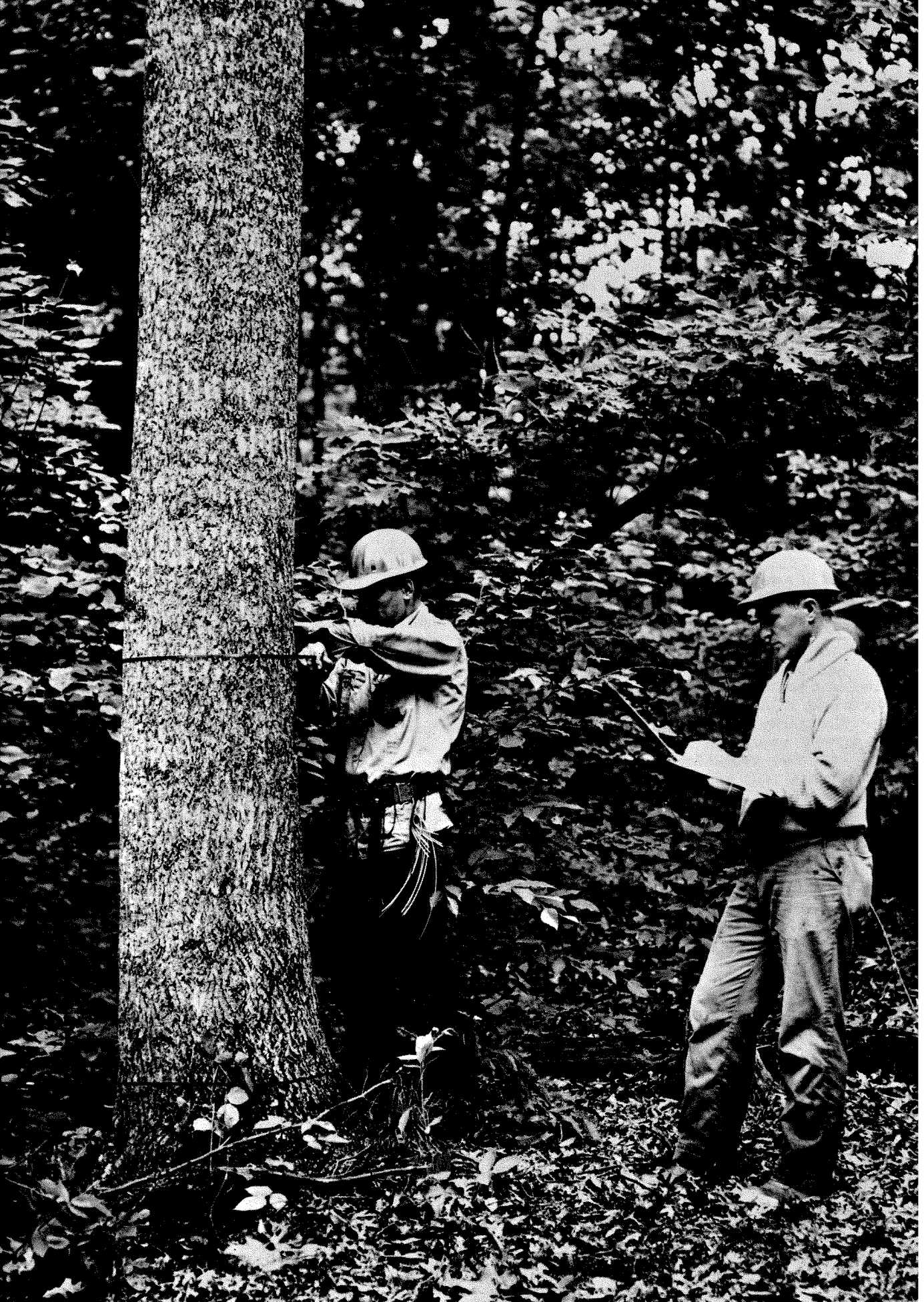
CONDITIONS IN GENERAL

This third Statewide inventory of North Carolina's timber resource found forest conditions generally improved. In most areas, the level of net growth has been high enough to support forest industry's timber needs and at the same time contribute to a buildup in the inventory of growing stock. Regeneration and protection have resulted in the establishment of young trees in great number.

Nevertheless, the timber resource in North Carolina presents a wide range of opportunities for improving its future use through intensified management efforts. Not only can timber supplies be replenished, but species composition and timber quality can be controlled to some extent by the forest managers. The economic potential of these opportunities in North Carolina today provides a strong incentive for improving timber productivity.



Carolina



Appendix

ACCURACY OF THE SURVEY

The data on forest acreage and timber volume in this report include estimates based on samples having an associated sampling error. A large enough sample is taken to keep the sampling error below a specified minimum for forest area and timber volume. Nonsampling errors, such as may arise from mistakes in judgment, measurement, recording, and compilation, are kept to a minimum through training, supervision, field check cruises, and complete editing and machine verification in compiling the data.

Estimates of forest area were based on the classification of 209,174 sample points systematically spaced on aerial photographs with a ground check of 9,395 of these points to adjust for changes in land use since date of photography. Estimates of volume and growth are based on measurements recorded at 6,474 of the ground check points classed as forest land. Estimates of timber products output are based primarily on data collected for the southern pulpwood production report, a special canvass to determine veneer-log production in 1963, and commodity drain surveys made by the State for 1962 and 1964.

Statistical analysis of the data indicates a sampling error of ± 0.3 percent for the estimate of total forest area, 1.1 percent for total cubic volume, and 1.7 percent for total cubic-volume growth. As these totals are broken down by forest type, species, tree diameter, and other subdivisions, the possibility of error increases. The order of this increase is suggested in the following tabulation,

Forest area	Sampling error ¹	Cubic volume	Sampling error ¹	Net cu. ft. growth	Sampling error ¹
Thousand acres	Percent	Million cu. ft.	Percent	Million cu. ft.	Percent
20,448.1	0.3				
1,840.3	1.0	18,464.7	1.1	812.1	1.7
460.1	2.0	5,585.6	2.0	586.7	2.0
204.5	3.0	2,482.5	3.0	260.8	3.0
115.0	4.0	1,396.4	4.0	146.7	4.0
73.6	5.0	893.7	5.0	93.9	5.0
18.4	10.0	223.4	10.0	23.5	10.0
8.2	15.0	99.3	15.0	10.4	15.0
4.6	20.0	55.9	20.0	5.9	20.0
2.9	25.0	35.7	25.0	3.8	25.0

¹By random-sampling formula.

which shows the sampling error to which the estimates are liable, two chances out of three.

HOW THE FOREST INVENTORY IS MADE

These latest forest statistics for North Carolina were obtained by aerial photo interpretation with ground checks, remeasurement of plots established in the previous survey, and measurements taken at new sample locations. The basic steps of the procedure were as follows:

1. From the most recent aerial photograph available, every third photo was obtained in alternate flight lines most nearly coinciding with those used in the previous survey. Extra photos were obtained for forest sample plots drawn for remeasurement when they fell between the selected photos or off the flight line. Preliminary estimates of the acreage of forest land and other land-use classes were obtained by classifying grid points printed on the flight-line photos. A grid was not printed on the extra photos. The proportion of grid points falling in each land-use class provided the initial acreage estimates.

2. Each land-use class was sampled proportionally on the ground. Plots in nonforest land were systematically chosen to verify and adjust the area estimates based on the photo grid points. When available, enough old forest plots to meet established limits of error per billion cubic feet of timber were relocated on the new photos. In counties with more established plots than were needed, the extra plots were deleted at random. If there were not enough established plots, additional plots were added using the grid points. The first added plot was chosen at random and subsequent plots selected at systematic intervals from the first. The photos, both old and new, and the old plot tally sheets were then sent to the field crews.

In the Coastal Plain, the basic plot measured at both new and relocated sample areas was a variable plot with a basal area factor of 10 square feet per acre. Timber volume, quality, and growth were tallied on this basic plot. Area description information was collected on 20 sample points systematically established within the circular acre around plot center. At each of these 20 points, stocking of trees 5.0 inches d.b.h. and larger was tallied on a variable plot with a basal area factor of 75 square

feet per acre. Stocking of smaller trees and brush was recorded on concentric fixed-radius plots around the point centers.

In the Piedmont and Mountains, a lo-point cluster of plots systematically spaced on the acre was measured at each sample location. At each of these points a variable plot was tallied using a basal area factor of 37.5 square feet per acre. Trees less than 3.0 inches d.b.h. were tallied on fixed-radius plots around the point centers.

3. Throughout the State on relocated plots, all trees tallied as 3.0 inches d.b.h. and larger in the previous survey were accounted for. Missing trees were recorded as either cut or dead. At each new sample location, the stumps of trees cut within the past 3 years were measured on a 1/5-acre plot to determine timber cut. At these same sample locations, the 1/5-acre plot used to measure timber cut was also used to measure mortality. Trees deadened in stand improvement practices were included with cut. Data from special utilization and commodity drain studies were used to break down volume of timber cut by product.

4. Growth estimates were based on increment borings taken on all trees 4.0 inches d.b.h. and larger tallied on the basic plots established in the Coastal Plain. In the Piedmont and Mountains, growth estimates were based largely on diameter remeasurements of old sample trees recorded in the previous survey.

5. Local volume equations were prepared from data collected on a lo-percent subsample of the sample locations established in the Piedmont and Mountains. On these volume plots, marked aluminum poles were extended up each tree tallied 5.0 inches d.b.h. and larger to measure section lengths and height. A mirror-caliper was designed and used to measure diameters up the trees. Additional measurements were taken to determine cull and bark thickness.

6. Ownership information was collected from local contacts, correspondence, and public records. Preliminary public ownership information was collected by the photo interpreter prior to sending the photos to the field.

7. All field data collected were sent to Asheville for editing and were punched in cards for machine computing, sorting, and tabulating. Final estimates were based on statistical summaries of the data.

DEFINITIONS OF TERMS

Land Use Classes

land.-Land at least 10 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest use.

Commercial forest land.-Forest land which is producing or is capable of producing crops of industrial wood and not withdrawn from timber

utilization by statute or administrative regulation. Includes areas suitable for management to grow crops of industrial wood generally capable of producing in excess of 20 cubic feet per acre of annual growth. Includes both accessible and inaccessible areas.

Noncommercial forest land.-Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions and productive forest land withdrawn from commercial timber use through statute or administrative regulation.

Productive-reserved forest land.-Productive public forest land withdrawn from timber utilization through statute or administrative regulation.

Unproductive forest land.-Forest land incapable of yielding crops of industrial wood because of adverse site conditions. Includes sterile or poorly drained forest land and steep rocky areas where topographic conditions are likely to prevent management for timber production.

Nonforest land.---Land that has never supported forests and lands formerly forested where use of timber is precluded by development for nonforest uses, such as crops, improved pasture, residential areas, and city parks. Also includes improved roads and adjoining rights-of-way, powerline clearings, and certain areas of water classified by the Bureau of the Census as land. Unimproved roads, streams, canals, and nonforest strips in forest areas must be more than 120 feet wide, and clearings in forest areas must be more than one acre in size, to qualify as nonforest land.

Ownership Classes

National Forest.-Federal lands which have been designated by Executive order or statute as National Forests or purchase units, and other lands under the administration of the Forest Service.

Other Federal.-Federal lands other than National Forests, including lands administered by the Bureau of Land Management, Bureau of Indian Affairs, and miscellaneous Federal agencies.

State.-Lands owned by States, or lands leased by States for more than 50 years.

County and municipal.-Lands owned by counties or municipalities, or lands leased by these governmental units for more than 50 years.

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

Farmer-owned.-Lands owned by operators of farms. (A farm is defined as a place operated as a unit of 10 or more acres from which the sale of agricultural products totaled \$50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products totaled \$250 or more annually during the previous year.)

Miscellaneous private.-Privately owned lands

other than forest-industry or farmer-owned.

Stand-Size Classes

Sawtimber stands.-Stands at least 10 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.-Stands at least 10 percent stocked with growing-stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-seedling stands.-Stands at least 10 percent stocked with growing-stock trees with more than half of this stocking in saplings or seedlings.

Nonstocked areas.-Commercial forest lands less than 10 percent stocked with growing-stock trees.

Stocking

A measure of area occupancy by trees of specified classes. Three categories of stocking are considered in the Survey: (1) all live trees, (2) growing-stock trees, and (3) desirable trees. Stocking in terms of all trees is used in the delineation of forest land and forest types. Stocking in terms of growing-stock trees is used in stand-size and age classifications. Stocking in terms of desirable trees is used in delineating area condition classes.

Forest Type Groups

White-red-jack pine.-Forests in which 50 percent or more of the stand is eastern white pine, red pine, or jack pine, singly or in combination. (Common associates include hemlock, aspen, birch, and maple.)

Spruce-fir.-Forests in which 50 percent or more of the stand is spruce or true fir, singly or in combination. (Common associates include white-cedar, tamarack, maple, birch, and hemlock.)

Longleaf-slash pine.-Forests in which 50 percent or more of the stand is longleaf or slash pine, singly or in combination. (Common associates include other southern pines, oak, and gum.)

Loblolly-shortleaf pine.-Forests in which 50 percent or more of the stand is loblolly pine, shortleaf pine, or other southern yellow pines except longleaf or slash pine, singly or in combination. (Common associates include oak, hickory, and gum.)

Oak-pine.-Forests in which 50 percent or more of the stand is hardwoods, usually upland oaks, but in which southern pines make up 25-49 percent of the stand. (Common associates include gum, hickory, and yellow-poplar.)

Oak-hickory.-Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination, except where pines comprise 25-49 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 50 percent or more of the stand is tupelo, black gum, sweetgum, oaks, or southern cypress, singly or in combination, except where pines comprise 25-49 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 50 percent or more of the stand is elm, ash, or cottonwood singly or in combination. (Common associates include willow, sycamore, beech, and maple.)

Maple-beech-birch.-Forests in which 50 percent or more of the stand is maple, beech, or yellow birch, singly or in combination. (Common associates include hemlock, elm, basswood, and white pine.)

Tree Species

Commercial species.-Tree species presently or prospectively suitable for industrial wood products excludes so-called weed species, such as blackjack oak and hawthorn.

Hardwoods.-Dicotyledonous trees, usually broad leaved and deciduous. Soft-textured hardwoods include boxelder, red and silver maple, buckeye, hackberry, loblolly-bay, silverbell (in Mts.), butternut, sweetgum, yellow-poplar, cucumbertree, magnolia, sweetbay, water tupelo, blackgum, sycamore, cottonwood, black cherry, willow, basswood, and elm. Hard-textured hardwoods include Florida; and sugar maple, birch, hickory, dogwood, persimmon (forest-grown), beech, ash, honeylocust, holly, black walnut, mulberry, all commercial oaks, and black locust.

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

Site Quality Classes

Site classes represent a classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Site classifications are based upon the mean annual growth of growing stock (not including thinnings) attainable in fully stocked stands at culmination of mean annual growth. Height-age relationships are used as indicators of the specific volume-site classes. Four site-quality classes are recognized:

1.—Sites capable of producing 120 or more cubic feet per acre annually.

Class Z.—Sites capable of producing 85 to 120 cubic feet per acre annually.

Class J.-Sites capable of producing 50 to 85 cubic feet per acre annually.

Class 4.-Sites capable of producing less than 50 cubic feet per acre annually, but excluding unproductive sites.

Area Condition Classes

Area condition classes represent a classification of commercial forest land based upon stocking by desirable trees and other conditions affecting current and prospective timber growth.

Class 1.—Areas 70 percent or more stocked with desirable trees.

Class 2.—Areas 40 to 70 percent stocked with desirable trees and with less than 30 percent of the area controlled by acceptable growing-stock trees, cull trees, inhibiting vegetation, slash, or nonstockable conditions.

Class 3.—Areas 40 to 70 percent stocked with desirable trees and with 30 percent or more of the area controlled by other trees or conditions that ordinarily prevent occupancy by desirable trees.

4.—Areas less than 40 percent stocked with desirable trees, but with 70 percent or more stocking with growing-stock trees.

Class 5.—Areas less than 40 percent stocked with desirable trees, but with 40 to 70 percent stocking with growing-stock trees.

Class 6.—Areas less than 40 percent stocked with desirable trees and with less than 40 percent stocking with growing-stock trees.

Class of Timber

Growing-stock trees.—Sawtimber trees, pole-timber trees, saplings, and seedlings; that is, all live trees except cull trees.

Sawtimber trees.—Live trees of commercial species 9.0 inches and larger in diameter at breast height for softwoods and 11.0 inches and larger in diameter at breast height for hardwoods, and containing at least one saw log.

Poletimber trees.—Live trees of commercial species at least 5.0 inches in diameter at breast height but smaller than sawtimber size, and of good form and vigor.

Saplings.—Live trees of commercial species 1.0 to 5.0 inches in diameter at breast height and of good form and vigor.

Seedlings.—Live trees of commercial species less than 1.0 inch in diameter at breast height that are expected to survive, according to regional standards.

Desirable trees.—Growing-stock trees having no serious defects in quality that limit present or prospective use; of relatively high vigor and containing no pathogens that may result in death or serious deterioration before rotation age. They include the type of trees forest managers aim to grow, that is, the trees left in silvicultural cutting or favored in cultural operations.

Acceptable trees.—Trees meeting the specifications for growing stock but not qualifying as desirable trees.

Rough trees (sound cull trees).—Live trees that

do not contain a saw log now or prospectively, primarily because of roughness, poor form, or non-commercial species.

Rotten cull trees.—Live trees that do not contain a saw log now or prospectively, primarily because of rot.

Salvable dead trees.—Standing or down dead trees that are considered currently or potentially merchantable.

Log Grades

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

White pine quality classes are based on the revised trial specifications for white pine log grades prepared by the Northeastern Forest Experiment Station in 1960. Other softwood quality classes are based on standards presented by the U. S. Forest Service in "Interim Log Grades for Southern Pines," issued by the Southern Forest Experiment Station in 1953.

Hardwood quality classes are based on "Hardwood Log Grades for Standard Lumber," issued by the Forest Products Laboratory under the designation D1737 in 1949. Hardwood log grades include, in addition to the log grades for standard lumber, a grade 4 tie and timber log. A grade 4 hardwood log must be sound internally, and no single knot or group of knots within a 6-inch section of the log can exceed one-third the log diameter at that point. Rotten defects or holes can be present on the surface of the log, but they must not extend more than 3 inches into the potential tie or timber. Sweep departure cannot exceed one-fourth the log scaling diameter per 8 feet of length.

Diameters

D.b.h. (diameter at **breast** height).—Tree diameter in inches, outside bark, measured at 4% feet above ground.

Diameter classes.—The Z-inch diameter classes extend from 1.0 inch below to 0.9 inch above the stated midpoint. For example, the 6-inch class contains trees 5.0-6.9 inches d.b.h., inclusive.

Volume

Volume of sawtimber.—Net volume of the saw-log portion of live sawtimber trees in board feet, International %-inch rule.

Volume of growing stock.—Volume of sound wood in the bole of sawtimber and poletimber trees from stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs.

Volume of timber.—The volume of sound wood in the bole of growing stock, cull, and salvable dead trees 5.0 inches and larger in diameter at breast height, from stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs.

Standard cord.-A stacked pile of round or split bolts of wood, including bark, encompassing 128 cubic feet. See "Conversion Factors" for cubic-foot content of solid wood per average cord.

Growth and Timber Cut

Gross growth.-Net annual growth plus annual mortality.

Net annual growth of growing stock.-The annual change in volume of sound wood in live sawtimber and poletimber trees resulting from natural causes.

Net annual growth of sawtimber.-The annual change in net board-foot volume of live sawtimber trees resulting from natural causes.

Mortality of growing stock.-The volume of sound wood in live sawtimber and poletimber trees dying annually from natural causes.

Mortality of sawtimber.-The net board-foot volume of sawtimber trees dying annually from natural causes.

Timber cut from growing stock.-The volume of sound wood in live sawtimber and poletimber trees cut for forest products during a specified period, including both roundwood products and logging residues.

Timber cut from sawtimber.-The net board-foot volume of live sawtimber trees cut for forest prod-

ucts during a specified period, including both round wood products and logging residues.

Timber products.-Roundwood products and by products of wood manufacturing plants.

Conversion Factors

Cubic feet of wood per average cord
(Excluding bark)

D.b.h.		Other softwoods	Hardwood
6	61.2	64.6	59.6
8	68.1	72.9	68.2
10	72.9	78.1	73.1
12	76.4	82.1	76.4
14	79.3	84.7	78.4
16	81.5	87.2	79.8
18	83.0	89.3	80.9
20	84.6	90.8	81.4
22	85.5	92.3	82.0
24	87.2	92.6	82.5
26+	89.2	95.6	83.4
Average	73.7	82.6	74.5

$$\text{Rough cords per M cubic feet (without bark)} = a + b \left(\frac{1}{\text{D.b.h.}} \right) + c \left(\frac{1}{\text{D.b.h.}} \right)^2$$

where	Pine	Other softwoods	Hardwood
a =	10.01850	9.15960	11.6841
b =	34.42135	28.75793	3.7443
c =	22.73994	25.54418	157.3941

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Table 1. *Area by land classes, North Carolina, 1964*

Land class	Area Thousand acres
Commercial forest land	20,027.3
Unproductive forest land	48.8
Productive-reserved forest land	372.0
Total forest land	20,448.1
Nonforest land ¹	10,919.2
All land ¹	31,367.3

¹Includes 163,600 acres of water according to survey standards of area classification but defined by Bureau of the Census as land, and excludes 37,300 acres of Census water created since 1960.
²From U. S. Bureau of the Census, Land and Water Area of the United States, 1960.

Table 2. *Area of commercial forest land, by ownership classes, North Carolina, 1964*

Ownership class	Area Thousand acres
National Forest	1,055.7
Other Federal:	
Bureau of Land Management	...
Indian	56.8
Miscellaneous Federal	257.3
Total other Federal	314.1
State	307.4
County and municipal	65.8
Forest industry:	
Pulp and pa-per	1,831.8
Lumber	500.2
Other	163.2
Total forest industry	2,495.2
Farmer-owned	9,315.5
Farmer, leased ¹	7.4
Miscellaneous private	6,373.3
Miscellaneous private, leased ¹	92.9
All ownerships	20,027.3

¹Leased to wood-using industry.

Table 3. *Area of commercial forest land, by stand-size and ownership classes, North Carolina, 1964*

Stand-size class	All ownerships	National Forest	Other public,	Forest industry	Farmer and misc. private
----- Thousand acres -----					
Sawtimber	10,486.0	757.9	413.3	1,185.7	8,129.1
Poletimber	4,224.4	189.9	122.2	491.3	3,421.0
Sapling and seedling	5,132.4	104.7	138.0	779.0	4,110.7
Nonstocked areas	184.5	5.2	13.8	39.2	128.3
All classes	20,027.3	1,055.7	687.3	2,495.2	15,789.1

Table 4. *Area of commercial forest land, by stand-volume classes for sawtimber and other stand-size classes, North Carolina, 1964*

Stand volumes per acre	All stands	Sawtimber stands	Other stands
----- Thousand acres -----			
Less than 1,500 board feet	7,463.8	1,313.3	6,150.5
1,500 to 5,000 board feet	5,228.8	2,820.0	2,408.8
More than 5,000 board feet	7,334.7	6,352.7	982.0
All classes	20,027.3	10,486.0	9,541.3

Table 5. *Area of commercial forest land, by stocking classes based on alternative stand components, North Carolina, 1964*

Stocking percentage	Stocking classified in terms of ---		
	All trees	Growing- stock trees	Desirable trees
----- Thousand acres -----			
90 --- 100	10,329.3	4,250.0	183.4
80 --- 90	4,110.9	4,494.1	468.9
70 - 80	2,451.6	4,114.1	900.5
60 --- 70	1,267.9	2,945.2	1,754.4
50 --- 60	738.0	1,635.8	2,574.6
40 - 50	478.1	1,004.3	3,200.4
30 - 40	266.8	704.8	3,644.2
20 --- 30	169.0	404.3	3,237.1
10 - 20	124.9	290.2	2,397.4
Less than 10	90.2	184.5	1,666.4
All areas	20,027.3	20,027.3	20,027.3

Table 6. *Area of commercial forest land, by stocking classes of growing-stock trees and by stand-size classes, North Carolina, 1964*

Stocking class	All stands	Sawtimber stands	Poletimber stands	Sapling and seedling stands	Non- stocked areas
----- Thousand acres -----					
70 percent or more	12,858.2	7,374.6	2,648.7	2,834.9	
40 to 70 percent	5,585.3	2,665.5	1,264.3	1,655.5	
10 to 40 percent	1,399.3	445.9	311.4	642.0	
Less than 10 percent	184.5				184.5
All classes	20,027.3	10,486.0	4,224.4	5,132.4	184.5

Table 7. *Area of commercial forest land, by area-condition and ownership classes, North Carolina, 1964*

Area- condition class	All ownerships	National Forest	Other public	Forest industry	Farmer and misc. private
----- Thousand acres -----					
1	1,552.8	44.3	39.9	321.5	1,147.1
2	1,003.6	12.3	43.0	153.8	794.5
3	6,525.8	302.7	169.3	753.5	5,300.3
4	5,195.0	364.5	156.2	645.3	4,029.0
5	4,166.2	273.6	136.2	424.8	3,331.6
6	1,583.9	58.3	142.7	196.3	1,186.6
All classes	20,027.3	1,055.7	687.3	2,495.2	15,789.1

Table 8. Area of commercial forest land, by area condition and stocking classes, North Carolina, 1964

Area-condition class	All classes		Stocking class								Shrubs		Nonstocked	
			Growing stock				Cull trees							
			Desirable		Other									
	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent	Thousand acre.9	Percent	Thousand acres	Percent	Thousand acres	Percent		
1	1,552.8	100.0	1,182.6	76.1	167.6	10.8	55.7	3.6	18.4	1.2	128.5	8.3		
2	1,003.6	100.0	542.4	54.0	136.0	13.6	32.9	3.3	11.0	1.1	281.3	28.0		
3	6,525.8	100.0	3,177.9	48.7	1,964.2	30.1	643.5	9.9	165.3	2.5	574.9	8.8		
4	5,195.0	100.0	1,180.0	22.7	2,931.6	56.4	508.0	9.8	94.6	1.8	480.8	9.3		
5	4,166.2	100.0	783.6	18.8	1,469.7	35.3	870.2	20.9	275.6	6.6	767.1	18.4		
6	1,583.9	100.0	157.7	10.0	185.1	11.7	399.9	25.2	258.2	16.3	583.0	36.8		
All classes	20,027.3	100.0	7,024.2	35.1	6,854.2	34.2	2,510.2	12.5	823.1	4.1	2,815.6	14.1		

Table 9. Area of commercial forest land, by site and ownership classes, North Carolina, 1964

Site class	All ownerships	National Forest	Other public	Forest industry	Farmer and misc. private
	-----Thousand acres-----				
120 cu. ft. or more	1,147.2	59.6	29.6	104.6	953.4
85 to 120 cu. ft.	4,171.8	147.7	98.4	584.2	3,341.5
50 to 85 cu. ft.	9,852.8	512.2	285.0	1,142.5	7,913.1
Less than 50 cu. ft.	4,855.5	336.2	274.3	663.9	3,581.1
All classes	20,027.3	1,055.7	687.3	2,495.2	15,789.1

Table 10. Area of commercial forest land, by forest types and ownership classes, North Carolina, 1964

Type	All ownerships	Public	Private
	-----Thousand acres-----		
Softwood types:			
White pine-hemlock	140.2	26.8	113.4
Spruce-fir	14.7	6.3	8.4
Longleaf pine	462.1	102.5	359.6
Slash pine	32.5	...	32.5
Loblolly pine	3,121.3	111.7	3,009.6
Shortleaf pine	1,079.7	42.6	1,037.1
Virginia pine	789.1	8.9	780.2
Eastern redcedar	28.2	...	28.2
Pond pine	1,408.6	227.6	1,181.0
Pitch pine	45.9	13.0	32.3
Table-Mountain pine	18.9	14.7	4.2
Total	7,141.2	554.1	6,587.1
Hardwood types:			
Oak-pine	3,556.6	230.2	3,326.4
Oak-hickory:			
Chestnut oak	275.8	92.1	183.7
Scrub oak	198.9	25.2	173.7
Other	5,541.2	668.4	4,872.8
Oak-gum-cypress	2,680.9	84.9	2,596.0
Elm-ash-cottonwood	324.6	2.6	322.0
Maple-beech-birch	308.1	85.5	222.6
Total	12,886.1	1,188.9	11,697.2
All types	20,027.3	1,743.0	18,284.3

Table 11. Area of noncommercial forest land, by forest types, North Carolina, 1964

Type	All areas	Productive-reserved areas	Unproductive areas
	-----Thousand acres-----		
White-red-jack pine	3.8	3.8	
Spruce-fir	5.5	4.5	1.0
Loblolly-shortleaf pine	49.4	20.0	29.4
Oak-pine	11.6	10.5	1.1
Oak-hickory	341.3	332.8	8.5
Oak-gum-cypress	9.2	0.4	8.8
All types	420.8	372.0	48.8

Table 12. Number of growing-stock trees on commercial forest land, by diameter classes and by softwood and hardwood, North Carolina, 1964

D.b.h. class (inches)	All species	Softwood	Hardwood
	-----Thousand trees-----		
1.0-2.9	6,519,875	1,621,255	4,898,620
3.0-4.9	1,976,601	775,833	1,200,768
5.0-6.9	924,997	434,947	490,050
7.0-8.9	533,553	257,077	276,476
9.0-10.9	307,380	144,076	163,304
11.0-12.9	177,904	82,555	95,349
13.0-14.9	102,388	41,949	60,439
15.0-16.9	55,364	20,152	35,212
17.0-18.9	28,939	9,479	19,460
19.0-28.9	27,001	6,838	20,163
29.0-38.9	1,160	182	978
39.0 and larger	125	15	110
All classes	10,655,287	3,394,358	7,260,929

Table 13. Number of cull and salvable dead trees on commercial forest land, by diameter groups and by softwood and hardwood, North Carolina, 1964

D.b.h. class -- (inches)	Cull trees	Salvable dead trees
	-----Thousand trees-----	
Softwood:		
5.0-8.9	22,446	997
9.0-18.9	11,483	224
19.0 and larger	299	11
Total	34,228	1,232
Hardwood:		
5.0-10.9	285,828	750
11.0-18.9	45,759	151
19.0 and larger	7,171	33
Total	338,758	934
All species	372,986	2,166

Table 14. Volume of timber on commercial forest land, by class and by softwood and hardwood,

Class of timber	All species	Softwood	Hardwood
- - - Million cubic feet - - -			
Sawtimber trees:			
Saw-log portion	9,916.9	4,925.6	4,991.3
Upper-stem portion	2,397.4	912.5	1,484.9
Total	12,314.3	5,838.1	6,476.2
Poletimber trees	6,150.4	2,175.3	3,975.1
All growing-stock trees	18,464.7	8,013.4	10,451.3
Rough trees:			
Sawtimber-size trees	698.4	119.4	579.0
Poletimber-size trees	715.2	48.1	667.1
Total	1,413.6	167.5	1,246.1
Rotten cull trees:			
Sawtimber-size trees	745.1	37.2	707.9
Poletimber-size trees	202.4	7.7	194.7
Total	947.5	44.9	902.6
Salvable dead trees:			
Sawtimber-size trees	12.0	4.9	7.1
Poletimber-size trees	7.2	3.7	3.5
Total	19.2	8.6	10.6
Total, all timber	20,845.0	8,234.4	12,610.6

Table 15. Volume of **growing stock and sawtimber on commercial forest land, by ownership classes and by softwood and hardwood, North Carolina, 1964**

Ownership class	Growing stock,			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
- - - Million cubic feet - - -				- - - Million board feet - - -		
National Forest	1,197.0	298.6	898.4	3,668.2	995.2	2,673.0
Other public	521.6	284.3	237.3	1,632.0	904.9	727.1
Forest industry	2,192.3	1,112.6	1,079.7	6,941.6	4,071.6	2,870.0
All ownerships	14,553.8	6,317.9	8,235.9	42,091.6	20,271.8	21,819.8
All ownerships	18,464.7	8,013.4	10,451.3	54,333.4	26,243.5	28,089.9

Table 16. Volume of growing stock and sawtimber on commercial forest land, by stand-size classes and by **softwood** and hardwood, North Carolina, 1964

Stand-size class	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
- - - Million cubic feet - - -				- - - Million board feet - - -		
Sawtimber	14,307.6	6,062.0	8,245.6	47,902.9	22,983.5	24,919.4
Poletimber	3,074.5	1,353.3	1,721.2	4,200.1	1,965.6	2,234.5
Sapling and seedling	1,080.9	596.9	484.0	2,226.2	1,292.1	934.1
Nonstocked areas	1.7	1.2	0.5	4.2	2.3	1.9
All classes	18,464.7	8,013.4	10,451.3	54,333.4	26,243.5	28,089.9

Table 17. of growing **stock** on commercial forest land, **by** species **and** diameter classes, North **Carolina**, 1964

Species	Diameter class (inches at breast height)										
	All classes	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- 28.9	29.0- 38.9	39.0 and larger
----- Million cubic feet -----											
Softwood:											
Longleaf pine	344.1	48.7	95.6	74.6	65.0	34.4	17.9	5.4	2.5	...	...
Shortleaf pine	1,380.9	218.9	321.1	336.3	248.9	138.1	62.1	26.5	21.0	0.8	:
Loblolly pine	4,091.5	278.3	491.6	692.9	763.0	685.0	496.9	329.4	336.1	11.4	0.9
Pond pine	808.8	94.0	153.1	183.1	166.3	97.3	68.7	28.6	17.7	...	...
Virginia pine	558.3	140.3	161.8	127.4	72.5	33.7	14.4	6.7	1.5	...	...
Pitch pine	112.4	11.8	24.1	22.2	23.3	13.5	8.9	4.6	4.2	...	...
Table-Mountain pine	17.5	2.1	2.6	3.2	2.6	3.0	1.8	1.5	0.7	...	...
Eastern white pine	237.0	18.6	26.1	31.8	37.7	31.4	23.2	14.7	41.7	5.8	:
Spruce and balsam fir	7.2	0.6	1.6	1.5	1.4	0.7	0.2	0.3	0.9	...	...
Eastern hemlock	106.0	6.2	6.8	9.3	11.9	9.7	11.2	7.3	28.5	12.7	2.4
cypress	271.9	4.0	15.1	26.1	38.9	50.3	33.1	36.2	59.7	5.6	1.1
Other eastern softwoods	77.8	24.2	15.7	19.5	10.8	4.7	1.3	0.9	0.7	...	...
Total	8,013.4	847.5	1,327.8	1,528.5	1,442.3	1,101.8	740.9	462.1	521.2	36.3	5.0
Hardwood:											
Select white oaks ¹	1,069.0	79.5	130.5	172.7	180.4	151.8	120.6	73.3	136.2	20.3	3.7
Select red oaks ¹	485.2	34.0	41.3	59.9	49.5	53.5	63.6	48.2	104.8	22.0	2.4
Other white oaks	803.5	12.2	111.6	140.1	110.9	86.2	65.3	66.4	132.2	14.7	3.9
Other red oaks	1,398.4	132.2	189.5	205.1	198.3	189.3	147.6	99.9	206.6	22.6	7.3
Hickory	609.3	52.5	71.0	83.9	101.4	97.3	74.6	44.0	73.1	1.6	3.9
Yellow birch	30.0	3.6	3.2	2.8	1.7	3.2	5.1	3.0	7.0	0.6	...
Hard maple	54.4	4.9	8.1	7.9	8.4	5.7	5.9	4.1	7.4	2.0	...
Soft maple	810.5	113.5	143.2	138.4	108.3	101.7	58.9	61.9	80.8	3.8	...
Beech	134.1	7.7	11.2	17.6	19.7	19.7	16.4	10.6	27.8	3.4	...
Sweetgum	1,246.2	120.7	157.1	229.7	204.0	174.8	140.3	99.1	110.5	9.1	0.9
Tupelo and blackgum	1,649.1	93.1	171.2	248.5	270.8	236.1	218.6	162.4	221.1	22.2	5.1
Ash	242.8	21.5	36.3	45.8	39.8	26.6	25.7	19.4	22.3	3.0	2.4
Cottonwood	6.1	0.2	1.9	1.3	...	0.8	1.6	...	0.9	...	...
Basswood	67.1	4.1	9.2	11.5	7.9	10.7	9.5	7.0	1.2	...	...
Yellow-poplar	1,123.0	103.4	146.6	193.6	175.2	168.5	125.4	85.3	116.2	6.0	2.8
Black cherry	28.7	6.9	7.8	4.5	2.5	4.1	0.9	1.3	0.7	...	...
Black walnut	25.7	3.8	2.4	5.6	4.7	2.5	0.8	2.6	2.2	1.1	:
Other eastern hardwoods	667.6	89.3	96.3	118.9	85.8	82.9	55.8	49.2	75.4	11.1	2.9
Total	10,451.3	943.1	1,344.4	1,687.6	1,569.3	1,415.4	1,136.6	837.7	1,332.4	149.5	35.3
All species	18,464.7	1,790.6	2,672.2	3,216.1	3,011.6	2,517.2	1,877.5	1,299.8	1,853.6	185.8	40.3

¹ Includes *Quercus alba*, *Q. macrocarpa*, *Q. michauxii*, and *Q. bicolor*.² Includes *Q. rubra*, *Q. falcata* var. *pagodaefolia*, and *Q. shumardii*.Table 18. **Volume of sawtimber on commercial forest land, by species and diameter classes, North Carolina, 1964**

Species	Diameter class (inches at breast height)									
	All classes	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 28.9	29.0- 38.9	39.0 and larger	
----- Million board feet -----										
Softwood:										
Longleaf pine		919.6	313.7	305.4	172.4	88.9	27.5	11.7	...	
Shortleaf pine		3,309.1	1,082.5	1,079.3	644.6	295.8	120.2	84.3	2.4	
Loblolly pine		15,561.2	2,362.0	3,389.9	3,421.6	2,637.5	1,802.6	1,883.5	58.8	
Pond pine		2,361.1	642.5	687.8	452.9	342.7	142.0	93.2	5.3	
Virginia pine		977.0	461.0	289.5	136.7	58.6	25.6	5.6	...	
Pitch pine		309.6	78.6	100.1	60.9	37.1	18.2	14.1	...	
Table-Mountain pine		53.9	12.1	12.0	13.8	1.5	6.1	2.4	...	
Eastern white pine		892.9	122.2	167.4	148.6	113.1	73.4	239.9	28.3	
Spruce and balsam fir		39.0	8.7	10.3	6.3	2.3	2.6	8.8	...	
Eastern hemlock		407.7	34.9	51.3	43.9	51.9	34.3	129.4	53.1	
cypress		1,198.9	76.3	148.7	228.4	175.0	193.7	335.9	32.4	
Other eastern softwoods		213.5	106.3	62.5	27.4	8.1	5.1	4.1	...	
Total		26,243.5	5,300.8	6,304.2	5,357.5	3,818.5	2,451.3	2,813.5	175.0	
Hardwood:										
Select white oaks		3,014.3		683.6	649.3	564.1	354.0	660.6	90.0	
Select red oaks		1,537.0		151.8	218.4	294.6	237.4	525.5	99.7	
Other white oaks		2,012.4		339.0	330.5	282.8	312.9	657.9	71.8	
Other red oaks		4,081.4		710.7	873.3	744.8	523.6	1,088.9	108.8	
Hickory		1,650.3		289.1	394.6	347.7	208.5	360.8	38.2	
Yellow birch		90.5		5.4	13.0	22.9	13.8	32.9	2.5	
Hard maple		185.2		29.8	21.2	33.0	25.0	53.5	16.7	
Soft maple		1,751.1		354.3	416.2	263.7	299.6	398.0	19.3	
Beech		361.0		49.4	64.5	63.2	44.5	125.7	13.7	
Sweetgum		3,328.0		734.1	767.9	669.7	509.5	592.3	49.4	
Tupelo and blackgum		4,462.4		844.9	848.9	899.0	105.9	1,036.0	102.8	
Ash		567.2		121.4	103.3	116.8	91.3	108.8	13.7	
Cottonwood		11.8		...	2.7	5.5	...	3.6	...	
Basswood		197.6		34.3	49.4	45.9	34.0	34.0	...	
Yellow-poplar		3,127.1		644.6	762.0	621.6	448.4	608.0	28.3	
Black cherry		35.3		8.3	15.2	3.8	5.3	2.7	...	
Black walnut		76.1		18.2	11.1	5.7	17.7	15.3	8.1	
Other eastern hardwoods		1,601.2		334.9	358.2	257.9	220.6	367.6	49.3	
Total		28,089.9		5,353.8	5,905.7	5,248.7	4,052.0	6,672.1	712.3	
All species		54,333.4		5,300.8	11,658.0	11,263.2	9,067.2	6,503.3	9,485.6	

¹ Includes *Quercus alba*, *Q. macrocarpa*, *Q. michauxii*, and *Q. bicolor*.² Includes *Q. rubra*, *Q. falcata* var. *pagodaefolia*, and *Q. shumardii*.

Table 19. *of sawtimber on commercial forest land, by species and log grade, North Carolina, 1964*

Species	All grades	Grade 1 logs	Grade 2 logs	Grade 3 logs	Grade 4 logs
----- Million board feet -----					
Softwood:					
Yellow pines	23,491.5	980.1	5,564.5	11,347.8	5,599.1
Eastern white pine	892.9	21.2	25.5	548.6	297.6
Spruce and balsam fir	39.0	3.4	16.3	13.4	5.9
Cypress	1,198.9	106.2	500.1	411.9	180.7
Other eastern softwoods	621.2	55.5	258.6	213.3	93.8
Total	26,243.5	1,166.4	6,365.0	12,535.0	6,177.1
Hardwood:					
Select white and red oaks	4,551.3	754.6	1,086.5	2,043.8	656.4
Other white and red oaks	6,093.8	716.8	1,461.3	2,516.0	1,399.7
Hickory	1,650.3	209.7	294.3	766.0	380.3
Yellow birch	90.5	15.3	14.6	43.5	17.1
Hard maple	185.2	6.3	58.1	87.1	33.7
Sweetgum	3,328.0	470.3	943.4	1,597.1	317.2
Ash, walnut, and black cherry	678.6	132.1	191.7	279.0	75.8
Yellow-poplar	3,127.1	316.6	615.6	1,323.8	871.1
Other hardwoods	8,385.1	1,123.7	2,438.2	3,637.9	1,185.3
Total	28,089.9	3,745.4	7,113.7	12,294.2	4,936.6
All species	54,333.4	4,911.8	13,478.7	24,829.2	11,113.7

Table 20. *Volume of salvable dead sawtimber-size trees on commercial forest land, by softwood and hardwood, North Carolina, 1964*

Species group	Volume
	Million board feet
Softwood	22.2
Hardwood	33.7
All species	55.9

Table 22. *Net annual growth and cut of growing stock on commercial forest land, by ownership classes and by softwood and hardwood, North Carolina, 1963.*

Ownership class	Net annual growth			Annual timber cut ¹		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
----- Million cubic feet -----						
National Forest	41.6	10.5	31.1	10.7	4.0	6.7
Other public	23.3	15.8	7.5	11.3	8.8	2.5
Forest industry	83.6	47.4	36.2	70.4	39.8	30.6
Farmer and misc. private	663.6	355.9	307.7	568.5	318.6	249.9
All ownerships	812.1	429.6	382.5	660.9	371.2	289.7

¹ Annual cut based on trend level between 1955 and 1963 as developed from the remeasurement of permanent sample plots.

Table 21. *Net annual growth and annual cut of growing stock on commercial forest land, by species, North Carolina, 1963*

Species	Net annual growth	Annual timber cut ¹
	Million cubic feet	
Softwood:		
Yellow pines	400.6	351.0
Eastern white pine	11.6	3.7
Spruce and balsam fir	0.2	...
Cypress	7.1	12.6
Other eastern softwoods	10.1	3.9
Total	429.6	371.2
Hardwood:		
Select white and red oaks	52.4	45.9
Other white and red oaks	78.7	56.6
Hickory	15.7	9.8
Yellow birch	3.3	0.1
Hard maple	1.7	0.5
Sweetgum	45.6	44.5
Ash, walnut, and black cherry	12.0	9.7
Yellow-poplar	64.4	37.9
Other hardwoods	108.7	84.7
Total	362.5	289.7
All species	812.1	660.9

¹ Annual cut based on trend level between 1955 and 1963 as developed from the remeasurement of permanent sample plots.

Table 23. *Net annual growth and cut of sawtimber on commercial forest land, by species, North Carolina, 1963*

Species	Net annual growth	Annual timber cut ¹
	Million board feet	
Softwood:		
Yellow pines	1,448.5	1,177.1
Eastern white pine	51.4	16.2
Spruce and balsam fir	1.3	...
Cypress	34.0	46.0
Other eastern softwoods	22.0	11.1
Total	1,557.2	1,250.4
Hardwood:		
Select white and red oaks	162.3	141.0
Other white and red oaks	225.4	159.8
Hickory	54.3	34.2
Yellow birch	4.6	0.4
Hard maple	5.0	3.1
Sweetgum	132.0	140.0
Ash, walnut, and black cherry	26.8	26.7
Yellow-poplar	182.2	112.1
Other hardwoods	255.4	248.2
Total	1,048.0	863.5
All species	2,605.2	2,113.9

¹ Annual cut based on trend level between 1955 and 1963 as developed from the remeasurement of permanent sample plots.

Table 24. Net annual growth and cut of sawtimber on commercial forest land, by ownership classes and by softwood and hardwood, North Carolina, 1963

Ownership class	Net annual growth			Annual timber cut ¹		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
----- Million board feet -----						
National Forest	129.0	38.8	90.2	37.5	12.6	24.9
Other public	86.6	17.6	19.0	44.3	35.3	9.0
Forest industry	285.3	187.5	97.8	236.7	151.7	85.0
Farmer and misc. private	2,104.3	1,263.3	841.0	1,795.4	1,050.8	744.6
All ownerships	2,605.2	1,557.2	1,048.0	2,113.9	1,250.4	863.5

¹Annual cut based on trend level between 1955 and 1963 as developed from the remeasurement of permanent sample plots.

Table 25. Annual mortality ¹ of growing stock and sawtimber on commercial forest land, by species, North Carolina, 1963

Species	Growing stock	Sawtimber
	Million cubic feet	Million board feet
Softwood:		
Yellow pines	59.6	144.5
Eastern white pine	0.3	1.2
Spruce and balsam fir	0.3	2.2
Cypress	3.2	14.0
Other eastern softwoods	6.3	32.1
Total	69.7	194.0
Hardwood:		
Select white and red oaks	10.7	41.4
Other white and red oaks	26.2	79.7
Hickory	3.9	12.9
Yellow birch	(²)	(²)
Hard maple	0.1	0.2
Sweetgum	12.0	36.2
Ash, walnut, and black cherry	1.8	4.7
Yellow-poplar	4.3	9.3
Other hardwoods	32.0	78.2
Total	91.0	262.6
All species	160.7	456.6

¹Average annual mortality between 1955 and 1963 from the remeasurement of permanent sample plots.

²Negligible.

Table 26. Annual mortality of growing stock and sawtimber on commercial forest land, by ownership classes and by softwood and hardwood, North Carolina, 1963

Ownership class	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
----- Million cubic feet -----			----- Million board feet -----			
National Forest	8.0	1.6	6.4	26.2	4.4	21.8
Other public	4.5	3.3	1.2	13.8	9.3	4.5
Forest industry	28.3	17.7	10.6	92.2	58.5	33.7
Farmer and misc. private	119.9	47.1	72.8	324.4	121.8	202.6
All ownerships	160.7	69.7	91.0	456.6	194.0	262.6

¹Average annual mortality between 1955 and 1963 from the remeasurement of permanent sample plots.

Table 27. Annual mortality of growing stock and sawtimber on commercial forest land, by causes and by softwood and hardwood, North Carolina, 1963

Cause of death	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
----- Million cubic feet -----			----- Million board feet -----			
Fire	11.5	9.4	2.1	20.9	17.4	3.5
Insects	4.9	4.6	0.3	19.4	18.4	1.0
Disease	3.3	1.4	1.9	11.3	5.4	5.9
Other	64.0	27.7	36.3	203.7	80.5	123.2
Unknown	77.0	26.6	50.4	201.3	72.3	129.0
All causes	160.7	69.7	91.0	456.6	194.0	262.6

¹Average annual mortality between 1955 and 1963 from the remeasurement of permanent sample plots.

Table 28. Total output of timber products, by product, by type of material used, and by softwood and hardwood, North Carolina, 1964¹

Product and species group		Total output in standard units	output from roundwood	Output from plant byproducts
	Unit	Number	Standard units	M cubic feet
Saw logs:				
Softwood	M bd. ft. ²	922,061	922,061	169,632
Hardwood	M bd. ft. ²	458,979	458,979	73,610
Total	M bd. ft. ²	1,381,040	1,381,040	243,242
Veneer logs and bolts:				
Softwood	M bd. ft.	4,707	4,707	710
Hardwood	M bd. ft.	155,118	155,118	23,604
Total	M bd. ft.	159,825	159,825	24,314
Cooperage logs and bolts:				
Softwood	M bd. ft.			
Hardwood	M bd. ft.	6,388	6,388	862
Total	M bd. ft.	6,388	6,388	862
Pulpwood:				
Softwood	Std. cords ³	1,964,563	1,527,749	113,665
Hardwood	Std. cords ³	659,879	542,432	40,411
Total	Std. cords ³	2,624,442	2,070,181	154,076
Piling:				
Softwood	M linear ft.	500	500	256
Hardwood	M linear ft.	125	125	64
Total	M linear ft.	625	625	320
Poles:				
Softwood	M pieces	185	185	2,633
Hardwood	M pieces			
Total	M pieces	185	185	2,633
Misc. industrial wood: ⁴				
Softwood	M cu. ft.	3,156	3,756	3,756
Hardwood	M cu. ft.	15,231	8,387	8,387
Total	M cu. ft.	18,987	12,143	12,143
Posts (round and split):				
Softwood	M pieces	1,920	1,920	1,154
Hardwood	M pieces	567	667	369
Total	M pieces	2,487	2,487	1,523
Fuelwood: ⁵				
Softwood	Std. cords	294,419	245,351	18,254
Hardwood	Std. cords	519,661	433,054	32,263
Total	Std. cords	814,080	678,405	50,517
All products:				
Softwood	M cu. ft.			310,060
Hardwood	M cu. ft.			179,570
Total	M cu. ft.			489,630

Based on 1964 state commodity drain survey.
¹International %-inch rule.
²Rough wood basis.

⁴Includes excelsior bolts, turnery bolts, etc.
⁵Used for domestic heating and cooking; excludes industrial use.

Table 29. Total output of roundwood products, by source and by softwood and hardwood, North Carolina, 1964

Source	All species	Softwood	Hardwood
	-- Thousand cubic feet --		
Growing-stock trees:			
Sawtimber trees	334,052	209,112	124,940
Poletimber trees	73,132	50,136	22,996
Material left after logging ¹	39,724	29,257	10,467
Total	446,908	288,505	158,403
Cull trees ²	22,311	7,405	14,906
Salvable dead trees	6,213	2,126	4,087
Other sources ³	14,198	12,024	2,174
All sources	489,630	310,060	179,570

¹On commercial forest land.

²Material from growing-stock trees left after cutting for a specific product, but subsequently removed for other products.

³Includes trees less than 5.0 inches in diameter, and treetops and limbs.

Table 30. **Annual** timber cut ¹from growing stock on **commercial forest** land, by product and logging residues, and by softwood and hardwood, North Carolina, 1964

Product and residues	All species	Softwood	Hardwood
	-- Thousand cubic feet --		
Roundwood products:			
Saw logs	239,299	166,426	72,873
Veneer logs and bolts	23,532	657	22,875
Cooperage logs and bolts	862		862
Pulpwood	142,870	103,526	39,344
Piling	320	256	64
Poles	2,608	2,608	
Misc. industrial wood	11,501	3,542	7,959
Posts	950	720	230
Fuelwood	24,966	10,770	14,196
All products	446,908	286,505	158,403
Logging residues:			
Harvesting	83,775	21,236	62,539
Land clearing	55,892	27,595	28,297
Cultural operations	3,035	165	2,870
Total	142,702	48,996	93,706
Timber cut	589,610	337,501	252,109

¹Timber cut based on estimates of timber products output in 1964, by product.

Table 31. timber cut from live sawtimber on commercial forest land, by product and logging residues, and by softwood and hardwood, North Carolina, 1964

Product and residues	All species	Softwood	Hardwood
Thousand board feet ¹			
Roundwood products:			
Saw logs	1,251,849	851,320	400,529
Veneer logs and bolts	107,734	4,714	103,020
Cooperage logs and bolts	5,431		5,431
Pulpwood	377,020	219,256	157,764
Piling	1,500	1,199	301
Poles	14,847	14,847	
Misc. industrial wood	33,368	8,765	24,603
Posts	1,493	1,132	361
Fuelwood	11,062		11,062
All products	1,804,304	1,101,233	703,071
Logging residues:			
Harvesting	96,111	31,874	64,237
Land clearing	121,089	54,805	66,284
Cultural operations	7,859	239	7,620
Total	225,059	86,918	138,141
Timber cut	2,029,363	1,188,151	841,212

¹Timber cut based on estimates of timber products output in 1964, by product.

² International $\frac{3}{4}$ -inch rule.

Table 32. Volume of plant residues, by industrial source and type of residue, and by softwood and hardwood, North Carolina, 1964

Industrial source	All species			Softwood			Hardwood		
	Total	Coarse ¹	Fine ²	Total	Coarse ¹	Fine ²	Total	Coarse ¹	Fine ²
Thousand cubic feet									
Lumber industry	64,052	18,497	45,555	43,863	12,669	31,194	20,189	5,828	14,361
Veneer and plywood industry	668	369	299	20	15	5	648	354	294
Other primary industries	809	246	563	268	79	129	601	167	434
All industries	65,529	19,112	46,417	44,091	12,763	31,328	21,438	6,349	15,089

¹ Unused material suitable for chipping, such as slabs, edgings, and veneer cores.

² Unused material not suitable for chipping, such as sawdust and shavings.

Table 33. Timber growth projections, North Carolina, 1963 to 1993

Period	Assumed cut			Projected growth		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
GROWING STOCK						
Thousand cubic feet						
1963 (year of inventory)	660,900	371,200	289,700	812,100	429,600	382,500
1973 (plus 10 years)	860,300	448,800	411,500	973,900	506,200	467,700
1983 (plus 20 years)	1,026,100	502,200	523,900	1,111,000	545,800	565,200
1993 (plus 30 years)	1,149,700	541,000	608,700	1,205,200	569,000	636,200
SAWTIMBER						
Thousand board feet ¹						
1963 (year of inventory)	2,113,900	1,250,400	863,500	2,605,200	1,557,200	1,048,000
1973 (plus 10 years)	2,657,700	1,514,800	1,142,900	2,710,300	1,749,700	960,600
1983 (plus 20 years)	2,818,400	1,644,500	1,173,900	2,806,700	1,817,400	989,300
1993 (plus 30 years)	2,884,900	1,746,600	1,138,300	2,863,800	1,864,200	999,600

¹ Based on the assumption that cut starting at the 1963 level will be in balance with the growth by the year 2013, and that forestry progress will continue at the rate indicated by recent trends.

² International $\frac{3}{4}$ -inch rule.

Table 34. Volume of timber, by species group and timber quality, North Carolina, 1964

Species group	Timber quality					Cull trees	All timber
	Growing stock			Million cubic feet			
	Desirable	Other					
	000	000	000	000	000	00	000
Softwood	3,802.0	4,211.4		8,013.4		212.4	8,225.8
Hardwood	3,488.2	6,963.1		10,451.3		2,148.7	12,600.0
Total	7,290.2	11,174.5		18,464.7		2,361.1	20,825.8

Table 35. Basal area per acre of growing-stock and cull trees 5.0 inches *d.b.h.* and larger, by forest type and Survey Unit, North Carolina, 1964

Forest type	Southern Coastal Plain	Northern Coastal Plain	Piedmont	M o u n t a i n s	
----- Square feet -----					
White pine-hemlock:					
Growing stock	55.6		...		55.6
Cull	7.3		...		7.3
All trees	62.9		...	...	62.9
Spruce-fir:					
Growing stock	40.7		...	...	40.7
Cull	13.5		...	...	13.5
All trees	54.2				54.2
Longleaf-slash pine:					
Growing stock	36.1	35.3	45.8	45.7	
Cull	0.8	0.8		1.7	
All trees	36.9	36.1	45.8	47.4	
Loblolly-shortleaf pine					
Growing stock	51.0	45.6	57.4	50.7	53.2
Cull	3.6	2.3	2.6	4.9	6.2
All trees	54.6	47.9	60.0	55.6	59.4
Oak-pine:					
Growing stock	42.3	32.6	53.4	43.5	44.8
Cull	6.4	3.7	6.1	8.1	7.9
All trees	48.7	36.3	59.5	51.6	52.7
Oak-hickory:					
Growing stock	45.4	26.8	48.9	44.9	49.9
Cull	10.9	5.4	6.8	10.5	12.9
All trees	56.3	32.2	55.7	55.4	62.8
Oak-gum-cypress:					
Growing stock	63.5	58.8	68.4	39.2	
Cull	12.8	11.7	14.4	18.0	
All trees	76.3	70.5	82.8	57.2	
Elm-ash-cottonwood:					
Growing stock	48.2	76.2	66.0	37.1	42.5
Cull	16.2	19.6	12.7	16.1	38.6
All trees	64.4	95.8	78.1	53.2	81.1
Maple-beech-birch:					
Growing stock	46.5				46.5
Cull	17.3				17.3
All trees	63.8				63.8
All types:					
Growing stock	49.2	43.5	59.9	46.5	49.4
Cull	1.9	5.2	7.1	8.1	11.9
All trees	57.1	48.7	61.0	54.6	61.3

Table 36. Number of *growing-stock* and cull trees 1 .0-4.9 inches d.b.h. *per* acre, by forest type and Survey Unit, North Carolina, 1964

Forest type	State	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Mountains
----- <i>Number of trees per acre</i> -----					
White pine-hemlock:					
Growing stock	358		...		358
Cull	176		...		176
All trees	534				534
Spruce-fir:					
Growing stock	339				339
Cull	326				326
All trees	665				665
Longleaf-slash pine:					
Growing stock	226	200	697	39	
Cull	100	104	21	79	
All trees	326	304	718	118	
Loblolly-shortleaf pine:					
Growing stock	509	502	582	474	397
Cull	164	133	163	191	182
All trees	673	635	745	665	579
Oak-pine:					
Growing stock	440	473	550	383	365
Cull	258	236	191	310	263
All trees	698	709	741	693	628
Oak-hickory:					
Growing stock	302	330	418	299	277
Cull	308	348	268	345	270
All trees	610	678	746	644	547
Oak-gum-cypress:					
Growing stock	534	524	549	166	
Cull	204	214	191	375	
All trees	738	738	740	541	
Elm-ash-cottonwood:					
Growing stock	269	461	457	166	681
Cull	244	243	278	235	188
All trees	513	704	735	401	869
Maple-beech-birch:					
Growing stock	396				396
Cull	192				192
All trees	588				588
All types:					
Growing stock	424	457	557	374	312
Cull	229	193	185	279	252
All trees	653	650	742	653	564

Table 37. net volume per acre on commercial *forest land, by area description and species group, North Carolina, 1964*

Area description		Softwood		Hardwood		Total		Area description		Softwood		Hardwood		Total	
		Cubic feet	Board feet	Cubic feet	Board feet	Cubic feet	Board feet			Cubic feet	Board feet	Cubic feet	Board feet	Cubic feet	Board feet
Pine types: ¹								Oak-hickory type: ¹							
Site class 1								Site class 3							
Growing stock								Growing stock							
Desirable		804.1	3,732	114.2	305	918.3	4,037	Desirable		40.2	141	209.4	656	249.6	797
Other		1,003.5	3,820	218.2	567	1,221.7	4,387	Other		37.6	97	592.9	1,536	630.5	1,633
Culls		17.6		56.4		74.0		Culls		3.4		185.1		188.5	
Total		1,825.2	7,552	388.8	872	2,214.0	8,424	Total		81.2	238	987.4	2,192	1,068.6	2,430
Site class 2								Site class 4							
Growing stock								Growing stock							
Desirable		619.5	2,550	64.4	165	683.9	2,715	Desirable		27.9	80	138.9	401	166.8	481
Other		814.9	2,045	119.4	250	734.3	2,295	Other		34.3	74	395.0	953	429.3	1,027
Culls		15.5		29.1		44.6		Culls		3.2		187.8		191.0	
Total		1,249.9	4,595	212.9	415	1,462.8	5,010	Total		65.4	154	721.7	1,354	787.1	1,508
Site class 3								Oak-gum-cypress: ¹							
Growing stock								Site class 1							
Desirable		303.9	939	31.3	82	335.2	1,021	Growing stock							
Other		357.4	922	71.6	131	429.0	1,053	Desirable		69.5	245	835.9	3,109	905.4	3,354
Culls		19.8		28.1		47.9		Other		56.9	194	1,149.5	3,214	1,206.4	3,408
Total		681.1	1,861	131.0	213	812.1	2,074	Culls		3.8		208.6		212.4	
Site class 4								Total		130.2	439	2,194.0	6,323	2,324.2	6,762
Growing stock								Site class 2							
Desirable		185.9	478	11.9	29	197.8	507	Growing stock							
Other		253.9	506	33.3	54	287.2	560	Desirable		42.0	200	597.9	1,958	639.9	2,158
Culls		19.0		20.3		39.3		Other		53.5	209	957.0	2,575	1,010.5	2,784
Total		458.8	984	65.5	83	524.3	1,067	Culls		5.6		220.0		225.6	
Oak-pine type:								Total		101.1	409	1,774.9	4,533	1,876.0	4,942
Site class 1								Site class 3							
Growing stock								Growing stock							
Desirable		347.1	1,594	458.4	1,587	805.5	3,181	Desirable		86.0	417	257.2	912	343.2	1,329
Other		311.1	1,115	387.8	1,063	698.9	2,178	Other		73.0	282	697.4	1,649	770.4	1,931
Culls		2.5		86.0		88.5		Culls		10.3		162.6		172.9	
Total		660.7	2,709	932.2	2,650	1,592.9	5,359	Total		169.3	699	1,117.2	2,561	1,286.5	3,260
Site class 2								Site class 4							
Growing stock								Growing stock							
Desirable		292.8	1,236	195.7	592	488.5	1,828	Desirable		167.1	828	120.8	417	287.9	1,245
Other		278.5	920	374.2	882	652.7	1,802	Other		229.0	923	379.2	917	608.2	1,840
Culls		10.0		85.0		95.0		Culls		8.0		104.5		112.5	
Total		581.3	2,156	654.9	1,474	1,236.2	3,830	Total		404.1	1,751	604.5	1,334	1,008.6	3,085
Site class 3								All types:							
Growing stock								Site class 1							
Desirable		151.5	504	103.1	263	254.6	767	Growing stock							
Other		161.8	419	216.9	468	378.7	887	Desirable		356.7	1,620	408.9	1,422	765.6	3,042
Culls		7	7	64.5		72.2		Other		403.7	1,509	554.9	1,500	958.6	3,009
Total		321.0	923	384.5	731	705.5	1,654	Culls		8.3		120.0		128.3	
Site class 4								Total		768.7	3,129	1,083.8	2,922	1,852.5	6,051
Growing stock								Site class 2							
Desirable		95.0	247	56.8	161	151.8	408	Growing stock							
Other		142.9	287	177.0	331	319.9	618	Desirable		315.4	1,306	267.4	847	582.8	2,153
Culls		14.9		9.4	3	10.9	2	Other		312.5	1,036	443.5	1,131	756.0	2,167
Total		252.8	534	328.1	492	580.9	1,026	Culls		10.0		108.5		118.5	
Oak-hickory type: ²								Total		637.9	2,342	819.4	1,978	1,457.3	4,320
Site class 1								Site class 3							
Growing stock								Growing stock							
Desirable		85.6	348	283.7	886	369.3	1,234	Desirable		158.4	523	135.6	424	294.0	947
Other		55.1	170	453.9	1,127	509.0	1,297	Other		176.2	468	360.4	875	536.6	1,343
Culls		5.3		129.1		135.0		Culls		10.9		105.9		116.8	
Total		146.0	518	867.3	2,013	1,013.3	2,531	Total		345.5	991	601.9	1,299	947.4	2,290
Site class 2								Site class 4							
Growing stock								Growing stock							
Desirable		50.9	190	382.2	1,247	433.1	1,437	Desirable		106.7	311	78.8	231	185.5	542
Other		47.7	118	597.0	1,560	644.7	1,678	Other		146.4	333	229.5	529	375.9	862
Culls		4.3		166.5		170.8		Culls		11.1		106.1		117.2	
Total		102.9	308	1,145.7	2,807	1,248.6	3,115	Total		264.2	644	414.4	760	678.6	1,404

¹ Includes all softwood types.² Includes maple-beech-birch types.³ Includes elm-ash-cottonwood types.

Table 38. *Average net volume and growth per acre on commercial forest land, by ownership, tree class, and species group,*
North Carolina, 1964

Ownership and tree class	Net volume per acre						Net growth per acre					
	Softwood		Hardwood		Total		Softwood		Hardwood		Total	
	Cubic feet	Board feet	Cubic feet	Board feet	Cubic feet	Board feet	Cubic feet	Board feet	Cubic feet	Board feet	Cubic feet	Board feet
National Forest:												
Growing stock												
Desirable	143.8	532	271.1	928	414.9	1,460	6.7	22	11.1	34	17.8	56
Other	139.1	411	579.9	1,604	719.0	2,015	4.8	13	19.9	58	24.7	71
Culls	10.3		261.6		271.9		0.3		6.8		7.1	
Total	293.2	943	1,112.6	2,532	1,405.8	3,475	11.8	35	37.8	92	49.6	127
Other public:												
Growing stock												
Desirable	204.4	686	133.0	452	337.4	1,138	15.3	54	4.9	12	20.2	66
Other	209.2	631	212.4	606	421.6	1,237	10.6	34	7.0	14	17.6	48
Culls	10.6		71.7		82.3		1.0		2.2		3.2	
Total	424.2	1,317	417.1	1,058	841.3	2,375	26.9	88	14.1	26	41.0	114
Forest industry:												
Growing stock												
Desirable	199.5	805	139.6	448	339.1	1,253	14.5	39	7.1	21	21.6	60
Other	246.5	827	293.1	702	539.6	1,529	10.0	33	10.1	18	20.1	51
Culls	10.4		73.6		84.0		0.6		2.6		3.2	
Total	456.4	1,632	506.3	1,150	962.7	2,782	25.1	72	19.8	39	44.9	111
Farmer-owned:												
Growing stock												
Desirable	202.7	750	183.9	579	386.6	1,329	15.9	45	9.2	24	25.1	69
Other	219.6	641	356.2	861	575.8	1,502	12.6	41	13.7	32	26.3	73
Culls	10.5		99.4		109.9		1.0		3.6		4.6	
Total	432.8	1,391	639.5	1,440	1,072.3	2,831	29.5	86	26.5	56	56.0	142
Misc. private:												
Growing stock												
Desirable	173.6	608	162.1	495	335.7	1,103	13.6	39	8.2	20	21.8	59
Other	194.6	522	333.0	803	527.6	1,325	11.1	33	12.9	30	24.0	63
Culls	10.9		110.3		121.2		0.8		3.8		4.6	
Total	379.1	1,130	605.4	1,298	984.5	2,428	25.5	72	24.9	50	50.4	122
All ownerships:												
Growing stock												
Desirable	189.8	697	174.2	550	364.0	1,247	14.5	41	8.6	22	23.1	63
Other	210.3	613	347.7	853	556.0	1,466	11.3	36	13.1	31	24.4	67
Culls	10.6		107.3		117.9		0.8		3.7		4.5	
Total	410.7	1,310	629.2	1,403	1,039.9	2,713	26.6	77	25.4	53	52.0	130

Table 39. Land area, by class and major forest type, North Carolina, 1938, 1955, and 1964

Land class and forest type	1938	1955	1964	Change 1955-1964
----- Thousand acres -----				
Commercial forest land:				
Pine and oak-pine type	11,639.1	10,021.9	10,697.8	+675.9
Hardwood type	6,462.6	9,319.5	9,329.5	+ 10.0
Total	18,101.7	19,341.4	20,027.3	+685.9
Noncommercial forest land	298.1	134.3	420.8	-313.5
Nonforest land	12,604.5	11,192.2	10,755.6	-436.6
All land ¹	31,004.3	31,267.9	31,203.7	-64.2

¹ Excludes all water areas.

Table 40. Volume of sawtimber, growing stock, and all timber, by species group and diameter class, North Carolina, 1938, 1955, and 1964

Species group	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		
SAWTIMBER (In million board feet, International ¼-inch rule)												
Pine ¹	1938	23,902.8			4,635.3	5,822.6	4,872.0	3,298.7	2,159.8	1,232.5	1,881.9	
	1955	22,519.0			4,846.6	5,741.5	4,485.6	3,035.8	1,849.6	1,057.2	1,502.7	
	1964	25,044.6			5,224.5	6,155.5	5,129.1	3,643.5	2,257.6	1,120.3	1,514.1	
cypress	1938	1,447.3			116.9	207.3	216.1	251.0	159.6	142.1	353.1	
	1955	1,286.1			93.2	195.9	209.5	239.0	182.0	120.5	246.6	
	1964	1,198.9			76.3	148.1	228.4	115.0	193.1	135.6	241.2	
Hardwood	1938	21,280.4				3,561.0	4,061.9	3,666.1	3,102.8	2,097.4	4,791.2	
	1955	26,780.6				4,771.2	5,549.0	4,682.7	3,824.4	2,680.4	5,272.9	
	1964	28,089.9				5,353.8	5,905.7	5,248.7	4,052.0	2,612.2	4,917.5	
GROWING STOCK (In million cubic feet)												
Pine ¹	1938	7,047.1	659.2	1,075.5	1,336.1	1,326.1	1,000.2	645.8	410.8	233.1	360.3	
	1955	7,176.3	809.2	1,309.2	1,397.9	1,308.2	911.6	591.9	352.7	199.8	289.8	
	1964	7,741.5	843.5	1,312.7	1,501.8	1,403.4	1,051.5	707.2	425.9	210.6	284.9	
Cypress	1938	358.3	17.2	30.0	41.6	55.2	47.2	48.3	29.8	24.5	64.5	
	1955	317.0	12.6	28.6	32.1	51.1	45.8	46.0	33.9	20.7	45.0	
	1964	211.9	4.0	15.1	26.1	38.9	50.3	33.1	36.2	23.3	43.7	
Hardwood	1938	7,337.3	603.6	801.5	1,076.2	1,046.2	919.2	791.6	643.1	426.1	963.2	
	1955	9,772.9	781.6	1,242.3	1,606.2	1,401.0	1,333.5	1,015.6	792.6	540.3	1,059.8	
	1964	10,451.3	943.1	1,344.4	1,687.6	1,569.3	1,415.4	1,136.6	837.1	527.6	989.6	
ALL TIMBER (In million cubic feet)												
Pine ¹	1938	7,228.1	681.3	1,098.9	1,395.8	1,352.3	1,019.5	654.7	416.0	237.1	372.5	
	1955	7,366.0	831.2	1,338.3	1,461.4	1,334.1	934.2	598.9	357.1	203.3	301.5	
	1964	7,934.3	870.6	1,340.7	1,567.8	1,430.7	1,071.2	714.4	430.1	214.0	294.2	
Cypress	1938	384.3	17.6	31.5	44.8	56.4	49.0	48.7	31.3	26.9	18.1	
	1955	338.8	12.9	30.0	35.5	52.7	41.6	46.5	36.6	22.5	54.5	
	1964	291.5	4.1	15.7	29.0	39.6	52.5	34.3	37.1	25.5	53.1	
Hardwood	1938	8,835.1	194.0	910.4	1,249.3	1,253.3	1,120.7	905.1	141.0	502.9	1,291.8	
	1955	11,775.3	1,034.7	1,508.7	1,869.9	1,685.5	1,528.1	1,156.1	921.4	642.9	1,428.0	
	1964	12,600.0	1,246.0	1,626.6	1,964.3	1,889.6	1,625.0	1,297.0	914.8	628.1	1,348.6	

¹ In order 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.

² Includes all softwoods except cypress.

Table 41. *Volume of all timber, by species group and Survey Unit, North Carolina, 1938, 1955, and 1964*

Species group and Survey Unit	1938	1955	Change 1938-1955	1964	Change 1955-1964
	<i>Million cubic feet</i>		<i>Percent</i>	<i>Million cubic feet</i>	<i>Percent</i>
Pine: ¹					
Southern Coastal Plain	2,010.7	1,951.8	- 2.9	2,294.5	+ 17.6
Northern Coastal Plain	2,176.8	2,220.3	+ 2.0	2,527.0	+ 13.8
Piedmont	2,376.3	2,383.9	+ 0.3	2,245.3	- 5.8
Mountains	664.3	610.0	+21.9	867.5	+ 7.1
All units	7,228.1	7,366.0	+ 1.9	7,934.3	+ 7.7
cypress:					
Southern Coastal Plain	118.8	116.7	- 1.8	103.0	-11.7
Northern Coastal Plain	265.5	222.1	-16.3	188.5	-15.1
Piedmont					
Mountains					
All units	384.3	338.8	-11.8	291.5	-14.0
Hardwood:					
Southern Coastal Plain	1,964.4	2,300.0	+17.1	2,355.7	+ 2.4
Northern Coastal Plain	2,229.8	2,800.6	+25.6	2,975.5	+ 6.2
Piedmont	2,227.9	3,157.7	+41.7	3,365.6	+ 6.6
Mountains	2,413.0	3,517.0	+45.8	3,903.2	+11.0
All units	8,835.1	11,775.3	+33.3	12,600.0	+ 7.0

¹ Includes other softwoods except cypress.

COUNTY TABLES

The tables that follow are intended for use in compiling forest resource estimates for groups of counties. Because the sampling procedure used by the Forest Survey in North Carolina was intended primarily to furnish inventory data for the State 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 is suggested in the tabulation on page 20.

Table 42. *forest, by county, North* Carolina, 1964

county	All land	Commercial forest	county	All land	Commercial forest		
	<i>Thousand acres</i>	<i>Thousand acres</i>	<i>Per- cent</i>	<i>Thousand acres</i>	<i>Thousand acres</i>	<i>Per- cent</i>	
Alamance	274.2	128.9	47.0	Jones	298.9	233.0	78.0
Alexander	164.0	98.8	60.2	Lee	163.8	111.0	67.8
Alleghany	147.2	66.1	44.9	Lenoir	250.2	139.0	55.6
Anson	341.1	240.6	70.5	Lincoln	194.2	94.1	48.5
Ashe	273.3	149.0	54.5	McDowell	282.9	230.9	81.6
Avery	158.1	126.2	79.8	Macon	330.9	274.3	82.9
Beaufort	531.9	354.2	66.6	Madison	291.8	216.0	74.0
Bertie	443.5	321.1	72.4	Martin	307.9	200.9	65.2
Bladen	562.6	455.9	81.0	Mecklenburg	342.7	166.2	48.5
Brunswick	558.3	461.2	82.6	Mitchell	140.8	111.0	78.8
Buncombe	412.8	290.9	70.5	Montgomery	313.8	268.0	85.4
Burke	323.8	239.0	73.8	Moore	482.2	393.5	81.6
Cabarrus	230.4	99.8	43.3	Nash	353.3	180.0	50.9
Caldwell	304.7	227.3	74.6	New Hanover	124.2	76.8	61.8
Camden	153.0	103.3	67.5	Northampton	345.0	206.8	59.9
Carteret	340.5	236.8	69.5	Onslow	483.8	367.5	76.0
Caswell	278.4	184.0	66.1	orange	254.7	154.5	60.7
Catawba	253.9	123.0	48.4	Pamlico	218.2	140.4	64.3
Chatham	452.5	343.6	75.9	Pasquotank	146.6	81.8	55.8
Cherokee	290.6	259.8	89.4	Pender	548.5	466.1	85.0
Chowan	115.2	68.6	59.5	Perquimans	167.1	101.2	60.6
Clay	136.3	114.4	83.9	Person	256.0	155.4	60.7
Cleveland	298.2	127.5	42.8	Pitt	419.8	216.4	51.5
Columbus	601.0	422.1	70.2	Polk	149.9	110.9	74.0
Craven	464.0	351.3	75.7	Randolph	512.6	315.0	61.5
Cumberland	423.1	254.1	60.1	Richmond	305.3	222.1	72.7
Currituck	174.7	84.4	48.3	Robeson	604.1	318.1	52.7
Dare	248.3	161.1	64.9	Rockingham	366.1	243.9	66.6
Davidson	349.8	179.0	51.2	Rowan	330.9	138.4	41.8
Davie	168.9	74.9	44.3	Rutherford	362.2	255.7	70.6
Duplin	526.7	339.0	64.4	Sampson	616.3	395.1	64.1
Durham	191.3	115.9	60.6	Scotland	202.9	106.8	52.6
Edgecombe	327.0	160.5	49.1	Stanly	255.3	107.4	42.1
Forsyth	271.3	133.7	49.3	Stokes	293.8	179.1	61.0
Franklin	316.1	185.0	58.5	Surry	343.7	193.5	56.3
Gaston	225.6	122.5	54.3	Swain	339.2	114.8	33.8
Gates	219.5	162.8	74.2	Transylvania	242.3	212.3	87.6
Graham	185.0	172.7	93.4	Tyrrell	255.4	216.9	84.9
Granville	346.9	228.0	65.7	Union	411.5	197.2	47.9
Greene	172.2	82.4	47.9	Vance	160.6	95.8	59.7
Guilford	416.7	191.8	46.0	Wake	553.0	312.6	56.5
Halifax	462.1	273.0	59.1	Warren	280.2	193.6	69.1
Harnett	388.4	244.0	62.8	Washington	215.0	142.9	66.5
Haywood	347.5	193.4	55.7	Watauga	204.8	121.1	59.1
Henderson	244.5	161.5	66.1	Wayne	355.2	157.8	44.4
Hertford	227.8	149.4	65.6	Wilkes	488.3	365.8	74.9
Hoke	212.9	146.9	69.0	Wilson	238.7	113.3	47.5
Hyde	405.8	275.3	67.8	Yadkin	214.4	99.2	46.3
Iredell	362.1	157.1	43.4	Yancey	199.0	142.8	71.8
Jackson	316.8	267.2	84.3				
Johnston	508.8	261.4	51.4	Total	31,367.3	20,027.3	63.8

Table 43. Commercial forest land, by county and ownership, North Carolina, 1964

county	All owner- ships		Public		Private	County	All owner- ships	Public			Private
		National Forest	Other public	Total				National Forest	Other public	Total	
----- Thousand acres -----						----- Thousand acres -----					
Alamance	128.9		0.3	0.3	128.8	Jones	233.0	35.2	27.4	82.8	170.4
Alexander	98.8		(¹)	(¹)	98.8	Lee	111.0		(¹)	(¹)	111.0
Alleghany	66.1		(¹)	(¹)	66.1	Lenoir	139.0		0.8	0.8	138.2
Anson	240.6		0.1	0.1	240.5	Lincoln	94.1	...	0.1	0.1	94.0
Ashe	149.0		0.1	0.1	148.9	McDowell	230.9	64.9	0.9	85.8	165.1
Avery	126.2	21.0	0.1	21.1	105.1	Macon	274.3	141.6	(¹)	141.6	132.7
Beaufort	354.2		3.2	3.2	351.0	Madison	216.0	45.8	1.5	47.1	188.9
Bertie	321.1		0.3	0.3	320.8	Martin	200.9		0.1	0.1	200.8
Bladen	455.9		31.7	31.7	424.2	Mecklenburg	166.2	...	2.0	2.0	184.2
Brunswick	461.2		11.6	11.6	449.6	Mitchell	111.0	15.7	2.2	17.9	93.1
Buncombe	290.9	29.0	26.1	55.1	235.8	Montgomery	268.0	34.2	0.2	34.4	233.6
Burke	239.0	38.0	9.7	47.7	191.3	Moore	393.5		30.1	30.1	383.4
Cabarrus	99.8	...	0.4	0.4	99.4	Nash	180.0		0.1	0.1	179.9
Caldwell	227.3	48.9	1.1	50.0	177.3	New Hanover	78.8		1.0	1.0	75.8
Camden	103.3	...	0.1	0.1	103.2	Northampton	206.8		1.9	1.9	204.9
Carteret	236.8	55.3	11.2	86.5	170.3	Onslow	367.5		122.8	122.8	244.9
Caswell	184.0		13.3	13.3	170.7	Orange	154.5		1.7	1.7	152.8
Catawba	123.0		0.3	0.3	122.7	Pamlico	140.4		1.0	1.0	139.4
Chatham	343.6	...	1.8	1.8	341.8	Pasquotank	81.8		(¹)	(¹)	81.8
Cherokee	259.8	81.1	6.8	87.9	171.9	Pender	468.1		63.0	83.0	403.1
Chowan	68.6	...	0.1	0.1	68.5	Perquimans	101.2		0.1	0.1	101.1
Clay	114.4	58.6	...	58.6	65.8	Person	155.4		0.4	0.4	155.0
Cleveland	127.5		(¹)	(¹)	127.5	Pitt	216.4		0.3	0.3	216.1
Columbus	422.1	...	0.3	0.3	421.8	Polk	110.9	...	5.3	5.3	105.8
Craven	351.3	53.1	8.5	59.6	291.7	Randolph	315.0	8.1	0.7	8.8	306.2
Cumberland	254.1		32.2	32.2	221.9	Richmond	222.1		29.8	29.8	192.3
Currituck	84.4		4.1	4.1	80.3	Robeson	318.1		0.9	0.9	317.2
Dare	161.1		...	...	161.1	Rockingham	243.9		0.3	0.3	243.6
Davidson	179.0	1.0	0.2	1.2	177.8	Rowan	138.4		0.8	0.8	137.8
Davie	74.9		...	...	74.9	Rutherford	255.7		0.3	0.3	255.4
Duplin	339.0		7.7	7.7	331.3	Sampson	395.1		0.1	0.1	395.0
Durham	115.9		8.5	8.5	109.4	Scotland	108.8		26.2	28.2	80.6
Edegcombe	160.5		0.8	0.8	159.7	Stanly	107.4		(¹)	(¹)	107.4
Forsyth	133.7		1.2	1.2	132.5	Stokes	179.1		(¹)	(¹)	179.1
Franklin	185.0		(¹)	(¹)	185.0	Surry	193.5	...	0.6	0.8	192.9
Gaston	122.5		0.4	0.4	122.1	Swain	114.8	15.8	30.5	48.3	88.5
Gates	162.8	...	...	...	162.8	Transylvania	212.3	83.4	0.7	84.1	128.2
Graham	172.7	104.9	2.2	107.1	85.6	Tyrrell	216.9		...	...	216.9
Granville	228.0		13.5	13.5	214.5	Union	197.2		0.2	0.2	197.0
Greene	82.4		...	...	82.4	Vance	95.8		6.5	6.5	89.3
Guilford	191.8		4.8	4.8	187.0	Wake	312.8		1.4	1.4	311.2
Halifax	273.0		2.2	2.2	270.8	Warren	193.8		0.8	0.8	192.8
Harnett	244.0	...	(¹)	(¹)	244.0	Washington	142.9	...	1.8	1.8	141.1
Haywood	193.4	52.7	7.7	60.4	133.0	Watauga	121.1	0.4	0.2	0.8	120.5
Henderson	161.5	18.1	...	18.1	143.4	Wayne	157.8		1.5	1.5	158.3
Herfford	149.4		0.1	0.1	149.3	Wilkes	385.8		8.2	6.2	359.8
Hoke	148.9		58.5	58.5	90.4	Wilson	113.3		0.7	0.7	112.8
Hyde	275.3		30.8	30.6	244.7	Yadkin	99.2		0.1	0.1	99.1
Iredell	157.1	...	0.3	0.3	158.8	Yancey	142.8	22.7	—(¹)	22.7	120.1
Jackson	287.2	26.4	17.6	44.0	223.2						
Johnston	261.4		0.6	0.6	280.8	Total	20,027.3	1,055.7	687.3	1,743.0	18,284.3

¹ Less than 50 acres.

Table 44. Volume of sawtimber and growing stock, by county and species *group*, North Carolina, 1964

county	Sawtimber					Growing stock				
	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	All species	Yellow pine	Other softwood	soft hardwood	Hard hardwood
	----- Million board feet -----					----- Thousand cords -----				
Alamance	316.6	140.7	4.0	52.5	119.4	1,606	772	19	333	482
Alexander	70.8	20.6	...	8.3	41.9	571	158	7	117	289
Alleghany	165.9	3.1	5.7	43.5	113.6	714	33	22	193	466
Anson	457.2	265.6	...	67.7	123.9	2,351	1,400	7	383	561
Ashe	397.1	11.4	29.5	70.9	285.3	1,892	111	146	434	1,201
Avery	297.8	2.2	36.4	96.2	163.0	1,594	10	142	532	910
Beaufort	1,321.1	806.4	46.0	349.6	119.1	5,126	2,873	102	1,663	488
Bertie	2,184.8	1,061.2	135.7	695.4	292.5	7,507	3,044	292	2,911	1,260
Bladen	1,037.9	570.5	29.2	319.9	118.3	4,207	2,189	69	1,451	498
Brunswick	598.6	311.0	52.7	149.5	85.4	3,053	1,556	198	889	410
Buncombe	849.1	59.1	41.6	153.9	594.5	3,723	302	153	769	2,499
Burke	546.6	99.4	131.5	58.3	257.4	2,990	778	449	427	1,336
Cabarrus	176.0	34.9	8.3	33.3	99.5	945	290	45	171	439
Caldwell	582.1	99.5	135.4	101.6	246.2	3,002	626	457	585	1,334
Camden	579.0	317.0	30.5	204.4	27.1	1,977	820	97	927	133
Carteret	384.0	288.2	24.1	68.3	3.4	1,708	1,158	51	442	57
Caswell	376.4 *	161.9	1.2	85.6	127.7	2,097	991	11	480	615
Catawba	239.3	100.4	...	43.8	95.1	1,127	478	7	195	447
Chatham	739.7 *	291.0	10.3	178.3	260.1	4,276	1,796	50	1,010	1,420
Cherokee	540.0	163.5	26.4	88.8	261.3	2,762	878	91	471	1,322
Chowan	401.9	284.1	...	65.6	52.2	1,501	890	...	350	261
Clay	236.2	20.0	1.3	22.4	192.5	1,049	82	3	116	848
Cleveland	187.4	95.4	...	37.8	54.2	1,163	643	8	200	312
Columbus	1,012.6	373.0	36.4	423.6	179.6	4,280	1,593	126	1,914	647
Craven	998.2	524.9	52.9	286.7	133.7	4,018	1,997	117	1,333	571
Cumberland	447.2	303.4	18.2	82.7	42.9	2,334	1,438	57	563	276
Currituck	403.5	224.4	20.5	118.2	40.4	1,659	726	46	722	165
Dare	348.6	235.5	48.5	56.2	8.4	1,380	776	189	370	45
Davidson	346.6	95.8	1.0	93.2	156.6	2,236	795	33	596	812
Davie	152.7	24.1	1.2	53.9	73.5	824	237	11	246	330
Duplin	891.2	484.6	...	290.4	116.2	3,869	1,947	...	1,421	501
Durham	294.5 *	89.9	...	97.9	106.7	1,361	455	6	439	461
Edgecombe	880.1 *	454.9	18.5	278.1	128.6	3,308	1,656	47	1,070	535
Forsyth	298.0 *	93.0	1.1	83.7	120.2	1,745	630	15	486	614
Franklin	592.7 *	377.1	...	99.8	115.8	2,532	1,426	2	541	563
Gaston	305.5	153.9	...	64.5	87.1	1,378	691	2	335	350
Gates	838.1	480.4	69.8	216.0	71.9	3,401	1,349	193	1,591	268
Graham	594.8	78.0	80.7	142.4	293.7	2,550	345	235	630	1,340
Granville	597.1 *	324.7	0.7	125.0	146.7	3,111	1,564	12	769	766
Greene	405.5	260.8	8.2	96.4	40.1	1,483	809	29	420	225
Guilford	453.9 *	157.9	1.0	126.3	168.7	2,089	820	16	526	727
Halifax	941.1 *	463.1	5.9	277.6	194.5	4,520	1,941	10	1,512	1,057
Harnett	325.8 *	146.9	...	92.3	86.6	1,647	682	...	519	446
Haywood	488.6	19.8	22.2	131.7	314.9	2,284	95	132	667	1,390
Henderson	617.9	39.4	95.6	94.2	388.7	2,659	202	276	476	1,705
Hertford	919.1	472.7	57.7	269.4	119.3	3,516	1,577	137	1,128	674
Hoke	394.4	291.0	19.3	73.2	10.9	1,465	954	51	388	72
Hyde	614.1	347.4	74.0	181.3	11.4	2,701	1,320	198	1,097	86
Iredell	337.4	141.2	2.9	54.0	139.3	1,875	845	30	374	626
Jackson	663.3	12.5	73.9	137.5	439.4	3,124	73	207	794	2,050
Johnston	1,063.5 *	593.3	...	337.1	133.1	4,346	2,126	...	1,427	793

Table 44. Volume of sawtimber and growing stock, by county and species group, North Carolina, 1964 (Continued)

county	Sawtimber					Growing stock				
	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood	All species	Yellow pine	Other softwood	Soft hardwood	Hard hardwood
	Million board feet					Thousand cords				
Jones	520.5	208.7	17.6	210.1	84.1	2,195	1,030	33	802	330
Lee	235.6	116.9	...	40.9	77.8	1,320	561		269	490
Lenoir	438.5	266.8	16.4	93.6	61.7	1,810	1,049	40	417	304
Lincoln	180.3	69.8	1.2	31.8	77.5	940	396	2	185	357
McDowell	570.9	103.2	25.8	72.5	369.4	2,914	589	80	419	1,826
Macon	812.6	44.1	100.0	135.8	532.7	3,597	229	313	791	2,264
Madison	601.7	28.5	98.0	134.3	340.9	2,941	218	305	720	1,698
Martin	1,188.7	591.2	51.4	444.4	101.7	4,082	1,849	111	1,715	407
Mecklenburg	322.1	102.3	1.0	82.1	136.7	1,477	589	33	316	539
Mitchell	243.9	1.4	26.4	65.7	150.4	1,434	6	113	493	822
Montgomery	443.5	236.2	0.1	46.0	161.2	2,780	1,437	4	347	992
Moore	739.2	328.6	53.8	204.2	152.6	4,228	1,853	143	1,275	957
Nash	970.7	592.9	32.0	160.0	185.8	3,490	1,893	65	795	737
New Hanover	93.5	79.6	1.8	9.2	2.9	509	324	7	136	42
Northampton	818.8	348.4	44.8	247.7	177.9	3,202	1,095	119	1,234	754
Onslow	847.7	596.7	2.7	193.5	54.8	3,406	2,135	6	963	302
Orange	424.5	179.4	1.2	94.7	149.2	2,174	852	20	581	721
Pamlico	479.9	288.1	20.1	128.2	43.5	2,040	1,047	48	730	215
Pasquotank	579.7	350.4	60.6	146.1	22.6	2,051	1,053	157	735	106
Pender	926.6	544.8	73.5	161.3	147.0	4,855	2,801	222	1,141	691
Perquimans	566.5	219.4	44.8	198.7	103.6	2,141	784	121	850	386
Person	368.7	159.1	4.2	82.8	122.6	2,012	873	37	492	610
Pitt	1,080.6	595.9	55.8	339.0	89.9	3,993	1,740	145	1,676	432
Polk	177.0	52.4	10.1	28.4	86.1	963	355	26	162	420
Randolph	522.3	195.2	7.1	61.0	259.0	3,478	1,331	45	539	1,563
Richmond	420.1	225.2	...	163.0	31.9	2,133	1,097		845	191
Robeson	1,175.4	494.8	54.1	501.3	125.2	4,714	1,608	127	2,540	439
Rockingham	295.8	66.4	...	109.4	120.0	2,033	829	5	537	662
Rowan	404.2	148.0	5.2	102.8	148.2	1,866	787	27	421	631
Rutherford	300.0	132.4	1.9	36.9	128.8	2,063	1,035	6	216	806
Sampson	868.3	470.6	13.2	319.0	65.5	4,011	2,058	37	1,571	345
Scotland	240.2	188.4	6.1	33.1	12.6	1,054	774	19	206	55
Stanly	248.5	124.8	0.9	32.9	89.9	1,345	684	7	152	502
Stokes	327.1	92.0	1.4	62.2	171.5	2,001	679	4	500	818
Surry	255.4	100.4	4.0	42.3	108.7	1,894	734	17	347	796
Swain	242.5	34.3	6.2	34.5	167.5	1,277	264	22	173	818
Transylvania	806.5	48.2	69.4	167.2	521.7	3,439	219	215	774	2,231
Tyrrell	532.1	331.6	29.5	154.5	16.5	2,362	1,182	90	1,021	69
Union	288.0	114.6	1.9	51.3	120.2	1,802	783	11	289	719
Vance	194.5	97.9		52.5	44.1	1,130	640	2	280	208
Wake	822.0	362.9		269.8	189.3	3,964	1,768	4	1,219	973
Warren	441.3	190.0	...	104.1	147.2	2,290	974	6	578	732
Washington	427.7	216.3	26.2	162.7	22.5	1,850	697	94	905	154
Watauga	276.2	(¹)	85.5	57.5	133.2	1,387	(¹)	220	397	770
Wayne	719.0	580.7		108.9	29.4	2,625	1,940		502	183
Wilkes	770.1	220.2	109.9	118.8	321.2	4,841	1,607	429	895	1,910
Wilson	482.4	318.8	5.4	129.0	29.2	1,875	977	20	639	239
Yadkin	270.8	162.3	...	19.5	89.0	1,419	848		148	423
Yancey	459.2	(¹)	120.8	84.8	253.6	1,913	(¹)	318	429	1,166
Total	54,333.4	23,491.5	2,752.0	13,708.9	14,381.0	247,956	99,220	8,478	70,770	69,488

¹ Negligible.

Table 45. Annual cut of growing *stock and* sawtimber, by county, North Carolina, 1963

county	Growing stock			Sawtimber			county	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood		All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
	Million	cubic	feet	Million	board	feet		Million	cubic	feet	Million	board	feet
Alamance	1.2	4.8	2.4	18.0	10.0	8.0	Jones	6.5	4.1	2.4	25.8	18.2	7
Alexander	4.8	4.1	0.7	10.7	8.8	1.9	Lee	3.6	1.7	1.9	12.6	6.1	6
Alleghany	1.5	0.5	1.0	5.0	1.0	4.0	Lenoir	3.4	2.2	1.2	14.6	10.3	4
Anson	11.6	9.7	1.9	38.3	31.2	7.1	Lincoln	3.8	2.4	1.4	10.4	6.1	4
Ashe	2.0	0.6	1.4	8.7	2.5	6.2	McDowell	2.7	1.3	1.4	5.9	3.0	2
Avery	1.5	0.2	1.3	5.5	1.2	4.3	Macon	3.4	1.1	2.3	12.9	3.5	9
Beaufort	13.5	7.4	6.1	42.7	29.2	13.5	Madison	2.0	0.4	1.6	6.7	1.6	5
Bertie	12.6	3.4	9.2	40.9	14.3	26.6	Martin	6.0	3.1	2.9	19.2	12.2	7
Bladen	19.0	7.7	11.3	73.8	34.4	39.4	Mecklenburg	8.3	7.1	1.2	20.7	17.7	3
Brunswick	12.0	9.1	2.9	50.4	40.4	10.0	Mitchell	0.6	0.1	0.5	0.9	0.4	0
Buncombe	2.0	0.2	1.8	6.4	0.4	6.0	Montgomery	7.4	3.1	4.3	24.6	12.1	12
Burke	5.6	4.0	1.6	14.1	10.0	4.1	Moore	12.6	6.2	6.4	41.6	25.3	16
Cabarrus	6.4	3.1	3.3	20.1	11.5	8.6	Nash	8.4	3.8	4.6	24.9	14.8	10
Caldwell	5.5	3.1	2.4	16.0	8.5	7.5	New Hanover	0.9	0.8	0.1	2.7	2.5	0
Camden	1.9	0.8	1.1	4.5	1.7	2.8	Northampton	17.5	7.0	10.5	51.2	22.3	28
Carteret	2.8	2.4	0.4	8.2	7.2	1.0	Onslow	10.1	6.9	3.2	35.4	29.6	5
Caswell	7.5	1.5	6.0	14.6	2.6	12.0	Orange	7.6	5.4	2.2	20.1	12.0	8
Catawba	2.8	1.5	1.3	8.2	3.1	5.1	Pamlico	4.3	2.3	2.0	14.0	9.3	4
Chatham	15.8	11.5	4.3	49.3	35.8	13.5	Pasquotank	0.6	0.6	...	2.7	2.7	..
Cherokee	6.1	3.7	2.4	12.1	5.6	6.5	Pender	8.0	5.9	2.1	30.3	22.8	7
Chowan	3.1	0.9	2.2	9.4	3.6	5.8	Perquimans	3.0	1.6	1.4	9.4	6.9	2
Clay	0.7	(¹)	0.7	3.0	...	3.0	Person	8.6	6.5	2.1	20.8	16.9	3
Cleveland	9.7	8.8	0.9	25.6	22.6	3.0	Pitt	8.9	3.1	5.8	30.4	13.9	16
Columbus	16.8	7.8	9.0	65.4	34.9	30.5	Polk	4.7	4.1	0.6	12.7	11.0	1
Craven	6.7	4.4	2.3	24.7	17.3	7.4	Randolph	13.9	9.2	4.7	40.7	25.3	15
Cumberland	4.7	3.6	1.1	18.0	14.5	3.5	Richmond	6.3	4.4	1.9	24.6	17.7	6
Currituck	2.9	2.0	0.9	11.1	8.0	3.1	Robeson	17.4	6.0	11.4	63.2	28.8	34
Dare	0.1	0.1	...	...	...	...	Rockingham	7.8	4.9	2.9	15.9	11.2	4
Davidson	9.1	5.3	3.8	28.8	13.7	15.1	Rowan	7.1	2.6	4.5	21.8	7.8	14
Davie	1.3	1.2	0.1	2.5	1.9	0.6	Rutherford	11.7	7.4	4.3	28.0	16.5	11
Duplin	11.1	7.0	4.1	47.2	33.8	13.4	Sampson	12.9	7.1	5.8	51.0	30.5	20
Durham	7.2	3.7	3.5	23.5	8.6	14.9	Scotland	2.5	1.7	0.8	9.0	6.2	2
Edgecombe	8.6	3.2	5.4	23.8	12.3	11.5	Stanly	5.4	4.6	0.8	11.6	9.0	2
Forsyth	3.7	1.7	2.0	11.3	6.4	4.9	Stokes	3.9	2.2	1.7	9.1	6.7	2
Franklin	12.5	7.2	5.3	29.7	15.7	14.0	Surry	8.1	4.5	3.6	17.9	10.2	7
Gaston	4.1	3.4	0.7	9.2	7.1	2.1	Swain	1.1	0.9	0.2	1.2	0.9	0
Gates	6.8	4.1	2.1	19.5	14.6	4.9	Transylvania	3.0	1.1	1.9	11.1	4.1	7
Graham	1.5	0.2	1.3	5.8	0.8	5.0	Tyrrell	3.8	3.7	0.1	15.4	15.3	0
Granville	10.5	6.6	3.9	32.3	22.6	9.7	Union	3.8	2.9	0.9	6.0	5.0	1
Greene	4.5	3.2	1.3	20.6	15.5	5.1	Vance	4.2	3.4	0.8	13.4	10.1	3
Guilford	9.9	6.0	3.9	28.3	15.9	12.4	Wake	14.0	11.1	2.9	46.0	35.2	10
Halifax	10.2	2.3	7.9	30.7	1.9	22.8	Warren	10.6	7.2	3.4	30.4	20.0	10
Harnett	7.8	3.8	4.0	30.2	17.4	12.8	Washington	5.7	2.0	3.7	15.8	7.3	8
Haywood	2.6	0.1	2.5	6.7	...	6.7	Watauga	2.9	1.0	1.9	12.7	4.1	8
Henderson	4.5	1.5	3.0	15.9	5.1	10.8	Wayne	8.7	4.8	3.9	37.2	23.7	13
Hertford	11.0	5.4	5.6	38.7	21.5	17.2	Wilkes	7.7	4.0	3.7	19.0	10.5	8
Hoke	3.8	2.0	1.8	13.8	7.4	6.4	Wilson	4.4	3.7	0.7	18.1	15.9	2
Hyde	6.4	3.0	3.4	21.7	12.8	8.9	Yadkin	4.5	2.7	1.8	12.3	6.3	6
Iredell	6.3	2.2	4.1	21.1	7.6	13.5	Yancey	2.0	0.6	1.4	8.1	2.8	5
Jackson	3.6	0.4	3.2	14.3	1.2	13.1							
Johnston	10.8	6.3	4.5	43.6	28.0	15.6	Total	660.9	371.2	289.7	2,113.9	1,250.4	863

¹ Negligible.

Table 46. Net annual of growing stock and sawtimber, by county, North Carolina, 1963

county	Growing stock			Sawtimber			county	Growing stock			Sawtimber		
	All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood		All species	Soft-wood	Hard-wood	All species	Soft-wood	Hard-wood
	Million cubic feet			Million board feet				Million cubic feet			Million board feet		
Alamance	5.4	3.4	2.0	17.7	10.6	7.1	Jones	8.5	6.0	2.5	27.3	21.2	6.1
Alexander	2.0	0.8	1.2	4.5	1.2	3.3	Lee	5.3	2.8	2.5	26.6	16.4	10.2
Alleghany	1.9	0.2	1.7	6.0	0.4	5.6	Lenoir	8.1	5.6	2.5	30.9	27.4	3.5
Anson	11.5	8.8	2.7	37.5	28.3	9.2	Lincoln	3.4	1.9	1.5	8.6	4.1	4.5
Ashe	6.3	1.1	5.2	15.0	2.3	12.7	McDowell	7.6	1.9	5.7	22.2	6.2	16.0
Avery	5.5	0.7	4.8	11.3	1.4	9.9	Macon	9.2	1.5	7.7	28.1	5.0	23.1
Beaufort	13.3	7.8	5.5	46.7	36.0	10.7	Madison	8.3	1.7	6.6	24.0	6.1	17.9
Bertie	17.0	7.7	9.3	62.6	37.7	24.9	Martin	8.8	4.3	4.5	32.3	20.0	12.3
Bladen	16.3	10.7	5.6	59.1	37.7	21.4	Mecklenburg	6.1	3.6	2.5	18.5	9.9	8.6
Brunswick	13.9	10.8	3.1	37.0	32.6	4.4	Mitchell	4.9	0.4	4.5	15.0	4.0	11.0
Buncombe	10.7	2.1	8.6	35.8	6.5	29.3	Montgomery	10.9	7.2	3.7	33.8	22.8	11.0
Burke	9.8	4.8	5.0	25.4	14.3	11.1	Moore	14.6	9.6	5.0	49.1	39.5	9.6
Cabarrus	4.0	2.3	1.7	11.4	4.6	6.8	Nash	9.3	5.1	4.2	29.1	20.2	8.9
Caldwell	9.2	3.5	5.7	23.8	11.1	12.7	New Hanover	1.9	1.4	0.5	6.5	6.1	0.4
Camden	5.0	2.2	2.8	17.3	9.3	8.0	Northampton	8.3	3.0	5.3	24.4	15.6	8.8
Carteret	4.2	3.3	0.9	12.5	11.5	1.0	Onslow	13.2	9.7	3.5	49.2	43.8	5.4
Caswell	7.0	4.0	3.0	17.0	9.4	7.6	Orange	6.8	3.3	3.5	26.0	13.6	12.4
Catawba	3.9	2.0	1.9	9.9	4.3	5.6	Pamlico	5.7	3.2	2.5	18.4	14.3	4.1
Chatham	16.1	10.1	6.0	48.4	30.0	18.4	Pasquotank	4.5	2.8	1.7	18.1	14.1	4.0
Cherokee	8.2	3.7	4.5	24.6	8.5	16.1	Pender	18.5	13.9	4.6	88.4	61.1	27.3
Chowan	4.2	2.3	1.9	15.7	11.2	4.5	Perquimans	5.1	2.7	2.4	13.5	8.6	4.9
Clay	2.7	0.4	2.3	8.5	0.9	7.6	Person	6.1	3.2	2.9	18.1	10.8	7.3
Cleveland	5.0	3.6	1.4	14.0	9.7	4.3	Pitt	10.5	5.2	5.3	35.6	24.5	11.1
Columbus	15.8	9.8	6.0	49.9	32.8	17.1	Polk	3.7	2.0	1.7	10.3	5.9	4.4
Craven	10.9	7.1	3.8	32.6	21.0	11.6	Randolph	11.8	5.9	5.9	32.9	16.3	16.6
Cumberland	10.4	7.7	2.7	26.6	23.5	3.1	Richmond	8.5	5.6	2.9	29.6	21.1	8.5
Currituck	4.2	1.7	2.5	12.0	8.3	3.7	Robeson	15.8	7.0	8.8	58.7	35.9	22.8
Dare	2.7	1.7	1.0	5.9	4.7	1.2	Rockingham	1.9	4.3	3.6	19.5	7.2	12.3
Davidson	8.3	4.4	3.9	17.7	7.5	10.2	Rowan	5.5	3.0	2.5	23.1	12.6	10.5
Davie	2.7	0.9	1.8	7.5	1.3	6.2	Rutherford	8.8	5.6	3.2	21.4	13.7	7.7
Duplin	14.8	8.7	6.1	53.4	38.3	15.1	Sampson	16.3	10.6	5.7	58.5	43.5	15.0
Durham	4.4	2.3	2.1	14.1	7.9	6.2	Scotland	4.5	3.6	0.9	25.1	20.8	4.3
Edgecombe	9.6	5.0	4.6	34.3	21.3	13.0	Stanly	3.7	2.3	1.4	13.0	7.5	5.5
Forsyth	6.1	3.0	3.1	14.9	6.2	8.7	Stokes	7.8	3.8	4.0	17.5	4.7	12.8
Franklin	9.4	6.3	3.1	34.4	25.9	8.5	Surry	8.4	4.0	4.4	13.7	7.4	6.3
Gaston	4.4	2.5	1.9	13.5	8.2	5.3	Swain	3.6	1.1	2.5	8.9	3.0	5.9
Gates	7.0	2.8	4.2	19.0	12.9	6.1	Transylvania	9.2	1.3	7.9	30.1	5.0	25.1
Graham	6.9	1.7	5.2	21.2	6.2	15.0	Tyrrell	6.4	3.7	2.7	16.0	11.1	4.9
Granville	11.8	1.4	4.4	44.0	27.0	17.0	Union	6.3	3.5	2.8	17.1	10.0	7.1
Greene	5.6	3.6	2.0	19.8	14.8	5.0	Vance	6.2	4.7	1.5	14.1	10.5	3.6
Guilford	5.8	2.6	3.2	20.9	7.4	13.5	Wake	16.1	10.9	5.2	61.1	41.6	19.5
Halifax	14.1	6.1	8.0	43.0	20.9	22.1	Warren	10.3	6.5	3.8	31.1	18.8	12.3
Harnett	6.9	4.1	2.8	17.5	10.2	7.3	Washington	6.6	2.7	3.9	20.1	11.5	8.6
Haywood	6.7	0.8	5.9	17.9	3.0	14.9	Watauga	4.8	0.6	4.2	9.4	2.9	6.5
Henderson	6.5	1.3	5.2	25.5	6.0	19.9	Wayne	10.3	8.0	2.3	42.4	33.5	8.9
Hertford	9.0	4.8	4.2	36.8	27.8	9.0	Wilkes	15.1	6.7	8.4	46.7	22.5	24.2
Hoke	5.3	4.0	1.3	19.1	15.4	3.7	Wilson	6.4	3.3	3.1	23.4	15.9	7.5
Hyde	6.2	3.9	2.3	22.7	15.6	7.1	Yadkin	4.6	3.0	1.6	14.8	9.4	5.4
Iredell	7.6	4.5	3.1	19.6	11.3	8.3	Yancey	6.4	0.9	5.5	18.8	3.7	15.1
Jackson	9.2	0.9	8.3	27.4	2.6	24.8							
Johnston	16.1	9.1	7.0	51.3	38.4	12.9	Total	812.1	429.6	382.5	2,605.2	1,557.2	1,048.0

