

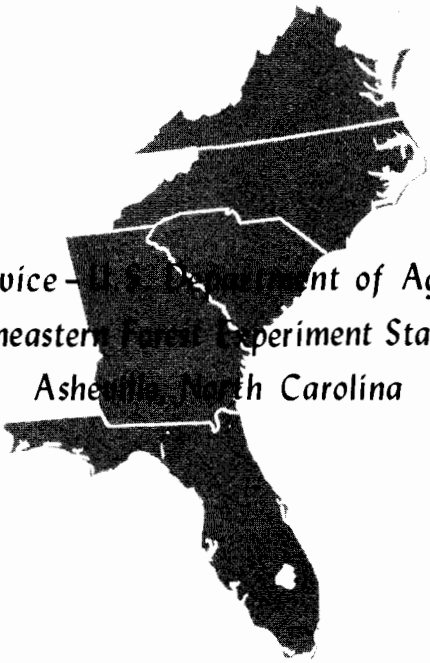
# ABOVEGROUND BIOMASS OF LONGLEAF PINE IN A NATURAL SAWTIMBER STAND IN SOUTHERN ALABAMA

by

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Conversion factors: English to metric

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| <u>Multiply</u>       |   | <u>By</u> |   | <u>To Obtain</u>          |
|-----------------------|---|-----------|---|---------------------------|
| Inches                | x | 2.540     | = | centimeters               |
| Feet                  | x | .3048     | = | meters                    |
| Pounds                | x | .4536     | = | kilograms                 |
| Cubic feet            | x | .02832    | = | cubic meters              |
| Pounds per cubic foot | x | 16.02     | = | kilograms per cubic meter |

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All English units of measure in this report can be converted to metric units by multiplying by the appropriate conversion factor listed above.

# ABOVEGROUND BIOMASS OF LONGLEAF PINE IN A NATURAL SAWTIMBER STAND IN SOUTHERN ALABAMA<sup>1</sup>

by

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Abstract.---Longleaf pine trees 6 to 18 inches d.b.h. were selected from a natural, uneven-aged sawtimber stand in southern Alabama to determine weight and volume of aboveground biomass. On the average, 85 percent of the dry weight of the total tree was wood, 11 percent was bark, and 4 percent was needles. The average tree sampled had 88 percent of its wood in the stem and 12 percent in the crown. Trends in biomass proportions are discussed. Specific gravity, moisture content, and green weight per cubic foot are presented for the total tree and its components. Tables developed with regression equations predict weight and cubic foot volume of the total tree and its components by d.b.h. and total height classes.

Keywords: Pinus palustris Mill., weight, volume, prediction equations, component proportions, biomass.

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This is the third in a series of reports on the aboveground biomass of southern pine sawtimber trees. It contains information on longleaf pine (Pinus palustris Mill.). The first two papers were on loblolly pine (Pinus taeda L.)<sup>2</sup> and shortleaf pine (P. echinata Mill.).<sup>3</sup>

This paper reports weights and volumes of various tree components (wood, bark, crown, branches, and foliage) as well as equations for predicting these components. The term total tree in this study refers only to the aboveground portion of the tree and does not include stump and roots.

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<sup>1</sup>This study was conducted by the Southeastern Forest Experiment Station in cooperation with and through the financial assistance of the Range, Timber, and Wildlife Program Area of Region 8 of the National Forest System. Field personnel were provided by the Conecuh National Forest.

<sup>2</sup>Taras, Michael A., and Alexander Clark III. 1975. Aboveground biomass of loblolly pine in a natural, uneven-aged sawtimber stand in central Alabama. *Tappi* 58(2): 103-105.

<sup>3</sup>Clark, Alexander III, and Michael A. Taras. 1976. Biomass of shortleaf pine in a natural sawtimber stand in northern Mississippi. USDA For. Serv. Res. Pap. SE-146, 32 p. Southeast. For. Exp. Stn., Asheville, N.C.

# PROCEDURE

## FIELD

A stratified random sample of 47 trees was selected from a natural, uneven-aged longleaf pine stand on the Conecuh National Forest in southern Alabama. Site index (age 50) averaged 80. Three to twelve trees from each even-inch d.b.h. class from 6 to 18 inches were selected. The sample trees had an average d.b.h. of 13.2 inches and an average total height of 80 feet. Means and ranges of tree measurements are shown in table 1.

After felling and limbing, the main stem of each tree was bucked into merchantable saw logs and pulpwood. Saw logs 8 to 16 feet long were cut from the main stem to a 6-inch d.i.b. or merchantable top. All material above saw-log merchantability to a 2-inch top was classed as pulpwood. The crown was cut up and segregated into four categories: [1] large branches ( $\geq 2.0$  inches d.o.b.), [2] medium branches ( $\geq 0.6$  and  $\leq 1.9$  inches d.o.b.), [3] small branches ( $\leq 0.5$  inches d.o.b.), and [4] needles. The tip of the stem (2 inches d.i.b. to top) was included as branch material in the analysis. All crown material and pulpwood were weighted to the nearest 0.25 pound. Saw logs were weighed individually.

Moisture content and specific gravity of wood and bark were determined from disks removed at the butt of each tree, at each saw-log bucking point, and at points where d.i.b. measured 4 and 2 inches. Disks were also taken from branches randomly selected from each branch category. A sample of needles was selected for determination of needle moisture content. The disks were weighed and calipered with and without bark immediately after being sawed. A representative sample of bark and wood was removed from each disk, weighed, and sealed in a polyethylene bag for laboratory analysis.

Table 1.--Means and ranges of measurements of longleaf pine in each d.b.h. class sampled

| D.b.h. class (inches) | Sample trees | D.b.h. |             | Total height |       | Merchantable height <sup>1/</sup> |       | Age  |       | Form class |       |
|-----------------------|--------------|--------|-------------|--------------|-------|-----------------------------------|-------|------|-------|------------|-------|
|                       |              | Avg.   | Range       | Avg.         | Range | Avg.                              | Range | Avg. | Range | Avg.       | Range |
|                       | Number       | Inches |             | Feet         |       | Years                             |       |      |       |            |       |
| 6                     | 3            | 6.0    | 5.9 - 6.1   | 59           | 56-60 | --                                | --    | 34   | 32-35 | --         | --    |
| 8                     | 3            | 8.0    | 7.9 - 8.2   | 64           | 63-66 | 17                                | 16-19 | 35   | 35-36 | 79         | 76-85 |
| 10                    | 8            | 10.2   | 9.8 - 10.5  | 71           | 59-79 | 40                                | 34-48 | 43   | 39-48 | 80         | 75-83 |
| 12                    | 7            | 12.1   | 11.6 - 12.4 | 82           | 73-88 | 54                                | 39-62 | 57   | 49-63 | 84         | 82-87 |
| 14                    | 7            | 14.1   | 13.8 - 14.4 | 84           | 77-90 | 55                                | 40-64 | 55   | 44-61 | 82         | 79-86 |
| 16                    | 12           | 16.0   | 15.6 - 16.7 | 86           | 80-94 | 58                                | 48-70 | 61   | 53-66 | 85         | 80-88 |
| 18                    | 7            | 17.6   | 17.1 - 18.9 | 88           | 77-97 | 58                                | 36-73 | 64   | 59-69 | 83         | 80-85 |
| All classes           | 47           | 13.2   | 5.9 - 18.9  | 80           | 56-97 | 48                                | 16-73 | 53   | 32-69 | 82         | 75-88 |

<sup>1/</sup> Height to 6-inch d.i.b. or merchantable top.

## LABORATORY

Specific gravity was computed from green volume and oven-dry weight. Moisture content samples were dried to a constant weight at 103° C, and moisture content was computed on an oven-dry basis. Percentage of bark was determined on a weight basis from cross-section samples. Weighted values for moisture content, specific gravity, and percentage of bark in the stem, branches, and total tree were calculated by weighting disk values in proportion to the volume of the component each represented. Weighted moisture content values were used to convert component green weights to oven-dry weights.

The following equation was used to calculate green weight per cubic foot separately for wood and bark on the basis of the weighted values for specific gravity and moisture content:

$$\text{Green weight per cubic foot} = \left( 1 + \frac{\text{weighted moisture content in percent}}{100} \right) \times (62.4 \times \text{weighted specific gravity}) \quad (1)$$

The green cubic foot volume of wood and bark was computed by dividing component weight by the component's green weight per cubic foot. Green cubic foot volume of wood and bark was computed by adding the green volume of wood to the green volume of bark.

## ANALYSIS

Simple linear regression equations for predicting green and dry weight of wood, bark, and needles in the total tree and its components were developed with d.b.h., total height, merchantable height, crown length, crown ratio, and form class as independent variables. Equations were also developed to predict green cubic foot volume of wood and bark separately and combined.

The best independent variables examined were d.b.h. and total height. Thus, tree and component weights and volumes were estimated with the equation

$$Y = b_0 + b_1 D^2Th + e \quad (2)$$

where: Y = weight or volume of component,  
D = d.b.h. in inches,  
Th = total tree height in feet,  
e = experimental error, and  
b<sub>0</sub>, b<sub>1</sub> = constants.

Grouping of the data into D<sup>2</sup>Th classes indicated that the variance of Y increased with increasing D<sup>2</sup>Th. Thus, a logarithmic transformation was used to make the variance more nearly homogeneous and meet this basic assumption of regression analysis. The final form of the equation used to predict weight and volume of the total tree and each component sampled was

$$\text{Log}_{10} Y = b_0 + b_1 \text{Log}_{10} (D^2Th) \quad (3)$$

## RESULTS

### TOTAL TREE BIOMASS

Green and dry weight of the total tree and proportions of tree weight in wood, bark, and needles are shown in table 2. Green weight of the total tree ranged from 396 pounds for a 6-inch tree to 5,122 pounds for an 18-inch tree. On the average, the trees sampled had 85 percent of their dry weight in wood, 11 percent in bark, and 4 percent in needles. The proportion of tree weight in wood increased and the proportion in bark decreased as tree size increased from 6 to 12 inches d.b.h. and then remained relatively constant in trees 12 inches d.b.h. and larger. The proportion of tree weight in needles did not change consistently with tree size and averaged 4 percent. Proportions of the various tree components computed on a dry basis varied slightly from those computed on a green basis because of differences in component moisture content (table 2).

Table 2.--Average green and dry weight of the total tree and proportions of the tree in wood, bark, and needles for longleaf pine trees 6 to 18 inches d.b.h.

| D.b.h.<br>class<br>(inches) | Average<br>total<br>height | Sample<br>trees | Total<br>tree<br>green<br>weight | Tree component<br>proportions (green) |      |         | Total<br>tree<br>dry<br>weight | Tree component<br>proportions (dry) |      |         |
|-----------------------------|----------------------------|-----------------|----------------------------------|---------------------------------------|------|---------|--------------------------------|-------------------------------------|------|---------|
|                             |                            |                 |                                  | Wood                                  | Bark | Needles |                                | Wood                                | Bark | Needles |
|                             | Feet                       | Number          | Pounds                           | Percent                               |      |         | Pounds                         | Percent                             |      |         |
| 6                           | 59                         | 3               | 396                              | 79                                    | 14   | 7       | 213                            | 78                                  | 17   | 5       |
| 8                           | 64                         | 3               | 859                              | 79                                    | 13   | 8       | 451                            | 79                                  | 15   | 6       |
| 10                          | 71                         | 8               | 1,378                            | 83                                    | 11   | 6       | 740                            | 82                                  | 13   | 5       |
| 12                          | 82                         | 7               | 2,252                            | 85                                    | 10   | 5       | 1,242                          | 85                                  | 11   | 4       |
| 14                          | 84                         | 7               | 3,076                            | 84                                    | 10   | 6       | 1,718                          | 84                                  | 11   | 5       |
| 16                          | 86                         | 12              | 4,268                            | 86                                    | 9    | 5       | 2,333                          | 86                                  | 10   | 4       |
| 18                          | 88                         | 7               | 5,122                            | 84                                    | 11   | 5       | 2,765                          | 84                                  | 12   | 4       |
| Average                     | --                         | --              | 2,961                            | 85                                    | 10   | 5       | 1,617                          | 85                                  | 11   | 4       |

When the trees were viewed as being composed of stem and crown, proportion of the tree weight in stem material decreased and proportion in crown material (branches plus needles) increased with increasing tree size (table 3). Proportion of tree dry weight in crown material ranged from 13 percent in the small trees to 20 percent in the large trees and averaged 17 percent. This average value is within 1 percent of the averages previously reported in this series for loblolly pine (16 percent) and shortleaf pine (18 percent). As with the other two species, the increase in proportion of crown material was due to an increase in proportion of branch material and not to an increase in the proportion of needles.

The green and dry weight of all wood in the tree and the distribution of wood throughout the tree are presented in table 4. On the average, the trees had 89 percent of their dry wood weight in the main stem (to a 2-inch top) and 11 percent in branches. The proportion of wood in the main stem decreased and that in the branches increased as tree size increased. The increase in proportion of wood in branches was due to an increase in large branch material in

Table 3.--Average green and dry weight of the total tree and proportions of the tree in main stem<sup>1/</sup> and crown (branches and needles) for longleaf pine trees 6 to 18 inches d.b.h.

| D.b.h.<br>class<br>(inches) | Average<br>total<br>height | Sample<br>trees | Total<br>tree<br>green<br>weight | Tree component<br>proportions (green) |          |         | Total<br>tree<br>dry<br>weight | Tree component<br>proportions (dry) |          |         |
|-----------------------------|----------------------------|-----------------|----------------------------------|---------------------------------------|----------|---------|--------------------------------|-------------------------------------|----------|---------|
|                             |                            |                 |                                  | Stem                                  | Crown    |         |                                | Stem                                | Crown    |         |
|                             |                            |                 |                                  |                                       | Branches | Needles |                                |                                     | Branches | Needles |
|                             | Feet                       | Number          | Pounds                           | - - -                                 | Percent  | - - -   | Pounds                         | - - -                               | Percent  | - - -   |
| 6                           | 59                         | 3               | 396                              | 85                                    | 8        | 7       | 213                            | 87                                  | 8        | 5       |
| 8                           | 64                         | 3               | 859                              | 84                                    | 8        | 8       | 451                            | 85                                  | 9        | 6       |
| 10                          | 71                         | 8               | 1,378                            | 84                                    | 10       | 6       | 740                            | 86                                  | 9        | 5       |
| 12                          | 82                         | 7               | 2,252                            | 85                                    | 10       | 5       | 1,242                          | 86                                  | 10       | 4       |
| 14                          | 84                         | 7               | 3,076                            | 82                                    | 12       | 6       | 1,718                          | 84                                  | 12       | 4       |
| 16                          | 86                         | 12              | 4,268                            | 81                                    | 14       | 5       | 2,333                          | 83                                  | 13       | 4       |
| 18                          | 88                         | 7               | 5,122                            | 78                                    | 17       | 5       | 2,765                          | 80                                  | 16       | 4       |
| Average                     | --                         | --              | 2,961                            | 81                                    | 14       | 5       | 1,617                          | 83                                  | 13       | 4       |

<sup>1/</sup> Stem material to 2-inch d.i.b. top.

Table 4.--Average green and dry weight of wood in the total tree and distribution of wood in main stem<sup>1/</sup> and branches for longleaf pine trees 6 to 18 inches d.b.h.

| D.b.h.<br>class<br>(inches) | Average<br>total<br>height | Sample<br>trees | Total<br>tree<br>wood<br>weight | Proportion of wood in-- |          |               |          |        |       |                 |
|-----------------------------|----------------------------|-----------------|---------------------------------|-------------------------|----------|---------------|----------|--------|-------|-----------------|
|                             |                            |                 |                                 | Main stem               |          |               | Branches |        |       |                 |
|                             |                            |                 |                                 | Saw log                 | Pulpwood | Total<br>stem | Large    | Medium | Small | All<br>branches |
|                             | Feet                       | Number          | Pounds                          | Percent                 |          |               |          |        |       |                 |
| GREEN                       |                            |                 |                                 |                         |          |               |          |        |       |                 |
| 6                           | 59                         | 3               | 314                             | --                      | 94       | 94            | 0        | 4      | 2     | 6               |
| 8                           | 64                         | 3               | 681                             | 70                      | 24       | 94            | 0        | 4      | 2     | 6               |
| 10                          | 71                         | 8               | 1,142                           | 77                      | 15       | 92            | 3        | 3      | 2     | 8               |
| 12                          | 82                         | 7               | 1,908                           | 84                      | 8        | 92            | 4        | 2      | 2     | 8               |
| 14                          | 84                         | 7               | 2,582                           | 82                      | 8        | 90            | 6        | 2      | 2     | 10              |
| 16                          | 86                         | 12              | 3,667                           | 80                      | 8        | 88            | 8        | 2      | 2     | 12              |
| 18                          | 88                         | 7               | 4,306                           | 78                      | 7        | 85            | 10       | 3      | 2     | 15              |
| Average                     | --                         | --              | 2,504                           | 79                      | 9        | 88            | 7        | 3      | 2     | 12              |
| DRY                         |                            |                 |                                 |                         |          |               |          |        |       |                 |
| 6                           | 59                         | 3               | 167                             | --                      | 94       | 94            | 0        | 4      | 2     | 6               |
| 8                           | 64                         | 3               | 357                             | 74                      | 20       | 94            | 0        | 4      | 2     | 6               |
| 10                          | 71                         | 8               | 610                             | 80                      | 13       | 93            | 3        | 3      | 1     | 7               |
| 12                          | 82                         | 7               | 1,054                           | 86                      | 7        | 93            | 3        | 2      | 2     | 7               |
| 14                          | 84                         | 7               | 1,448                           | 83                      | 8        | 91            | 5        | 2      | 2     | 9               |
| 16                          | 86                         | 12              | 2,009                           | 82                      | 7        | 89            | 7        | 2      | 2     | 11              |
| 18                          | 88                         | 7               | 2,325                           | 80                      | 6        | 86            | 10       | 3      | 1     | 14              |
| Average                     | --                         | --              | 1,369                           | 81                      | 8        | 89            | 6        | 3      | 2     | 11              |

<sup>1/</sup> Stem material to 2-inch d.i.b. top.

larger trees. The proportion of wood in the pulpwood section of a tree decreased and proportion in the saw-log section increased as tree size increased. On the average, the trees contained 81 percent of their dry wood in saw-log material and 8 percent in pulpwood.

The weight and distribution of bark in the tree are presented in table 5. As tree size increased, the proportion of bark in the main stem decreased and the proportion of bark in the branches increased. This increase in proportion of bark in branches was due to an increase in the proportion of large branches in large trees. On the average, 58 percent of all dry bark in the tree was in saw-log material, 7 percent was in pulpwood, and 35 percent was in branches.

Table 5.--Average green and dry weight of bark in the total tree and distribution of bark in main stem<sup>1/</sup> and branches for longleaf pine trees 6 to 18 inches d.b.h.

| D.b.h.<br>class<br>(inches) | Average<br>total<br>height | Sample<br>trees | Total<br>tree<br>bark<br>weight | Proportion of bark in-- |          |               |          |        |       |                 |
|-----------------------------|----------------------------|-----------------|---------------------------------|-------------------------|----------|---------------|----------|--------|-------|-----------------|
|                             |                            |                 |                                 | Main stem               |          |               | Branches |        |       |                 |
|                             |                            |                 |                                 | Saw log                 | Pulpwood | Total<br>stem | Large    | Medium | Small | All<br>branches |
|                             | Feet                       | Number          | Pounds                          | Percent                 |          |               |          |        |       |                 |
| GREEN                       |                            |                 |                                 |                         |          |               |          |        |       |                 |
| 6                           | 59                         | 3               | 56                              | --                      | 78       | 78            | 0        | 7      | 15    | 22              |
| 8                           | 64                         | 3               | 110                             | 55                      | 19       | 74            | 0        | 9      | 17    | 26              |
| 10                          | 71                         | 8               | 157                             | 59                      | 12       | 71            | 6        | 10     | 13    | 29              |
| 12                          | 82                         | 7               | 221                             | 59                      | 8        | 67            | 7        | 9      | 17    | 33              |
| 14                          | 84                         | 7               | 321                             | 56                      | 7        | 63            | 10       | 8      | 19    | 37              |
| 16                          | 86                         | 12              | 383                             | 56                      | 5        | 62            | 12       | 8      | 18    | 38              |
| 18                          | 88                         | 7               | 538                             | 53                      | 5        | 58            | 16       | 10     | 16    | 42              |
| Average                     | --                         | --              | 296                             | 55                      | 8        | 63            | 11       | 9      | 17    | 37              |
| DRY                         |                            |                 |                                 |                         |          |               |          |        |       |                 |
| 6                           | 59                         | 3               | 36                              | --                      | 79       | 79            | 0        | 8      | 13    | 21              |
| 8                           | 64                         | 3               | 66                              | 58                      | 17       | 75            | 0        | 9      | 16    | 25              |
| 10                          | 71                         | 8               | 96                              | 64                      | 10       | 74            | 5        | 9      | 12    | 26              |
| 12                          | 82                         | 7               | 134                             | 62                      | 7        | 69            | 6        | 8      | 17    | 31              |
| 14                          | 84                         | 7               | 194                             | 59                      | 7        | 66            | 9        | 7      | 18    | 34              |
| 16                          | 86                         | 12              | 232                             | 58                      | 6        | 64            | 12       | 7      | 17    | 36              |
| 18                          | 88                         | 7               | 320                             | 56                      | 5        | 61            | 14       | 9      | 16    | 39              |
| Average                     | --                         | --              | 179                             | 58                      | 7        | 65            | 11       | 8      | 16    | 35              |

<sup>1/</sup> Stem material to 2-inch d.i.b. top.

## CROWN BIOMASS

When the crown was analyzed as a separate entity composed of branchwood, branchbark, and needles, the proportion of crown weight in wood increased, the proportion in needles decreased, and the proportion in bark decreased as tree size increased (table 6). On the average, 53 percent of the dry weight of the crown was in wood, 22 percent was in bark, and 25 percent was in needles.

Branches made up 8 to 16 percent of the dry weight of the total tree, depending on tree size (table 3). On the average, 24 percent of the branch dry weight was in small branches, 24 percent was in medium branches, and 52 percent was in large branches. This size distribution of branches varied greatly with tree size (fig. 1). The proportion of large branches increased rapidly with increasing tree size, and the proportion of medium and small branches decreased with increasing tree size. When branches were separated into wood and bark, large branches averaged 83 percent wood and 17 percent bark, medium branches averaged 71 percent wood and 29 percent bark, and small branches averaged 42 percent wood and 58 percent bark.

Table 6.--Average green and dry weight of the crown and proportions of the crown in wood, bark, and needles for longleaf pine trees 6 to 18 inches d.b.h.

| D.b.h.<br>class<br>(inches) | Average<br>total<br>height | Sample<br>trees | Crown<br>weight<br>(green) | Crown proportion (green)-- |                 |         | Crown<br>weight<br>(dry) | Crown proportion (dry)-- |                 |         |
|-----------------------------|----------------------------|-----------------|----------------------------|----------------------------|-----------------|---------|--------------------------|--------------------------|-----------------|---------|
|                             |                            |                 |                            | Branch-<br>wood            | Branch-<br>bark | Needles |                          | Branch-<br>wood          | Branch-<br>bark | Needles |
|                             | Feet                       | Number          | Pounds                     | Percent                    |                 |         | Pounds                   | Percent                  |                 |         |
| 6                           | 59                         | 3               | 58                         | 35                         | 22              | 43      | 28                       | 36                       | 28              | 36      |
| 8                           | 64                         | 3               | 141                        | 31                         | 21              | 48      | 66                       | 33                       | 24              | 43      |
| 10                          | 71                         | 8               | 214                        | 42                         | 21              | 37      | 103                      | 43                       | 24              | 33      |
| 12                          | 82                         | 7               | 348                        | 44                         | 21              | 35      | 173                      | 45                       | 24              | 31      |
| 14                          | 84                         | 7               | 557                        | 48                         | 21              | 31      | 279                      | 49                       | 24              | 27      |
| 16                          | 86                         | 12              | 802                        | 55                         | 18              | 27      | 389                      | 55                       | 21              | 24      |
| 18                          | 88                         | 7               | 1,148                      | 56                         | 20              | 24      | 562                      | 57                       | 22              | 21      |
| Average                     | --                         | --              | 560                        | 52                         | 19              | 29      | 274                      | 53                       | 22              | 25      |

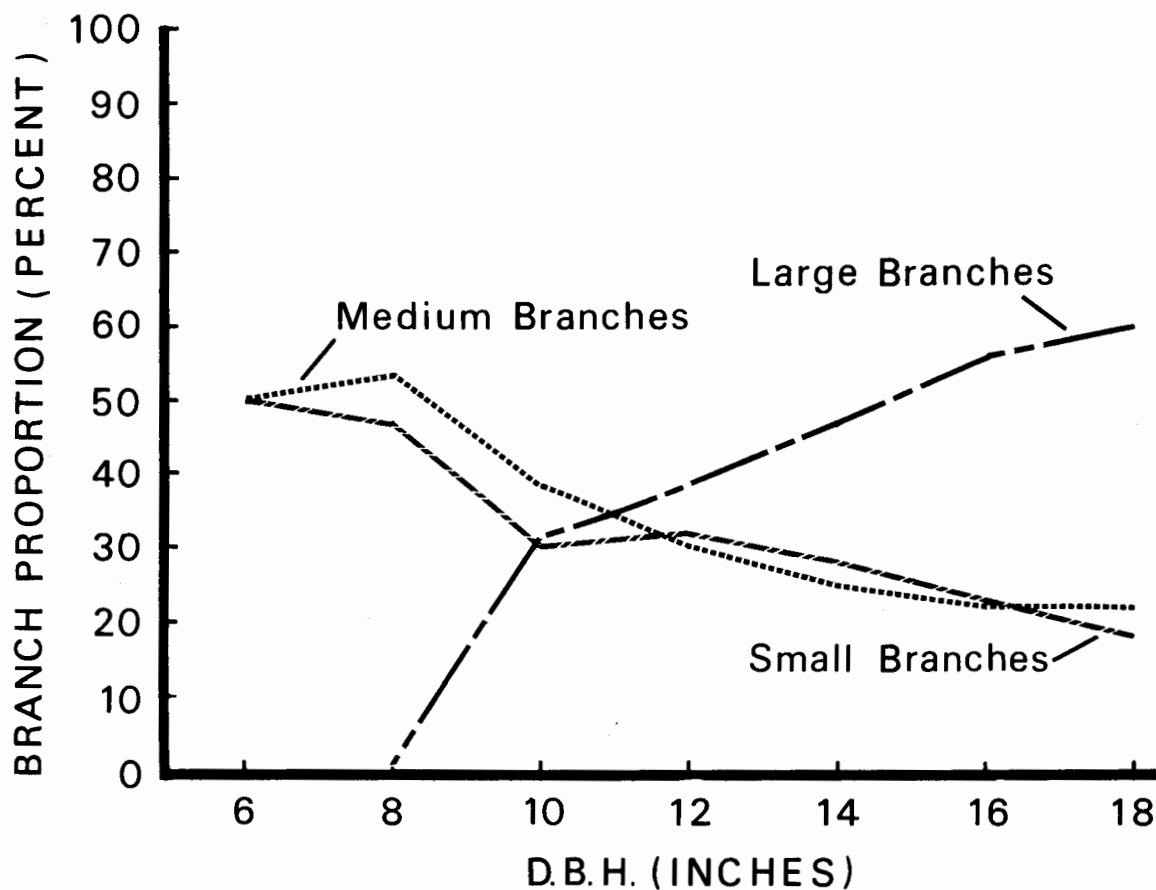


Figure 1.--Proportion of branches in crown by tree size.

## MAIN STEM BIOMASS

When the main stem was analyzed separately, the proportion of stem weight in wood increased and the proportion in bark decreased as tree size increased (table 7). On the average, 91 percent of the dry weight of the stem was wood and 9 percent was bark. Similar proportions of wood and bark in the main stem were previously reported in this series for loblolly and shortleaf pines.

Table 7.--Average green and dry weight of the stem<sup>1/</sup> and proportions of the stem in wood and bark for longleaf pine trees 6 to 18 inches d.b.h.

| D.b.h.<br>class<br>(inches) | Average<br>total<br>height | Sample<br>trees | Main<br>stem<br>weight<br>(green) | Stem proportions in<br>green-- |      | Main<br>stem<br>weight<br>(dry) | Stem proportions in<br>dry-- |      |
|-----------------------------|----------------------------|-----------------|-----------------------------------|--------------------------------|------|---------------------------------|------------------------------|------|
|                             |                            |                 |                                   | Wood                           | Bark |                                 | Wood                         | Bark |
|                             | Feet                       | Number          | Pounds                            | - -Percent- -                  |      | Pounds                          | - -Percent- -                |      |
| 6                           | 59                         | 3               | 338                               | 87                             | 13   | 185                             | 85                           | 15   |
| 8                           | 64                         | 3               | 718                               | 89                             | 11   | 384                             | 87                           | 13   |
| 10                          | 71                         | 8               | 1,164                             | 90                             | 10   | 636                             | 89                           | 11   |
| 12                          | 82                         | 7               | 1,904                             | 92                             | 8    | 1,069                           | 91                           | 9    |
| 14                          | 84                         | 7               | 2,519                             | 92                             | 8    | 1,439                           | 91                           | 9    |
| 16                          | 86                         | 12              | 3,466                             | 93                             | 7    | 1,944                           | 92                           | 8    |
| 18                          | 88                         | 7               | 3,974                             | 92                             | 8    | 2,201                           | 91                           | 9    |
| Average                     | --                         | --              | 2,401                             | 92                             | 8    | 1,343                           | 91                           | 9    |

<sup>1/</sup> Stem material to 2-inch d.i.b. top.

## PHYSICAL PROPERTIES

Wood and bark specific gravity, moisture content, and green weight per cubic foot for the total tree and its components are presented in table 8. Wood specific gravity for the total tree averaged 0.552--the same as the average specific gravity reported for the species in southeastern Alabama.<sup>4</sup> Wood specific gravity for pulpwood averaged 0.509, which is considerably lower than the average for the saw-log portion of the tree and slightly higher than that for the branches. Bark specific gravity was consistently lower than wood specific gravity, averaging 0.401 for the total tree, 0.405 for the main stem, and 0.393 for branches. Bark specific gravity in all tree components was higher for longleaf pine than has been reported previously in this series for shortleaf or loblolly pines.

Wood moisture content averaged 84 percent for the total tree, 82 percent for the main stem, and 103 percent for the branches (table 8). Wood moisture content was considerably higher for pulpwood (106 percent) than for saw logs (79 percent).

<sup>4</sup>U.S. Forest Products Laboratory. 1972 (rev. 1975). Properties of major southern pines. Part I - Wood density survey, by H. E. Wahlgren and D. R. Schumann. Part II - Structural properties and specific gravity, by B. A. Bendtsen, R. L. Ethington, and W. L. Galligan. USDA For. Serv. Res. Pap. FPL 176-177, 76 p. U.S. For. Prod. Lab., Madison, Wis.

Table 8.--Average wood and bark specific gravity, moisture content, and weight per cubic foot for longleaf pine trees and tree components

| Tree component | Average and standard deviation |                  |                             |
|----------------|--------------------------------|------------------|-----------------------------|
|                | Specific gravity               | Moisture content | Green weight per cubic foot |
|                |                                | <u>Percent</u>   | <u>Pounds</u>               |
| <u>WOOD</u>    |                                |                  |                             |
| Total tree     | 0.552 + 0.029                  | 84 + 8           | 63.3 + 2.2                  |
| Saw log        | .565 + .034                    | 79 + 8           | 63.1 + 2.5                  |
| Pulpwood       | .509 + .043                    | 106 + 16         | 65.1 + 2.5                  |
| Main stem      | .558 + .031                    | 82 + 8           | 63.3 + 2.4                  |
| Branches       | .489 + .029                    | 103 + 12         | 61.8 + 3.0                  |
| <u>BARK</u>    |                                |                  |                             |
| Total tree     | .401 + .022                    | 65 + 7           | 41.3 + 2.4                  |
| Saw log        | .407 + .025                    | 57 + 8           | 39.8 + 2.8                  |
| Pulpwood       | .390 + .029                    | 82 + 14          | 44.1 + 4.1                  |
| Main stem      | .405 + .026                    | 59 + 7           | 40.2 + 2.8                  |
| Branches       | .393 + .028                    | 78 + 12          | 43.4 + 2.7                  |

On a total-tree basis, bark moisture content averaged 65 percent, which was lower than the corresponding value for wood (table 8). Bark moisture content was also lower for saw logs (57 percent) than for pulpwood (82 percent) or branches (78 percent). The higher moisture content in branches and pulpwood sections of the tree reflected the differences in the ratio of inner bark to outer bark and the differences in bark thickness in various parts of the tree.

Average wood weight per cubic foot did not vary greatly among tree components (table 8). Average green weight per cubic foot was lower for saw logs (63.1 pounds) than for pulpwood (65.1 pounds). Nevertheless, saw logs contained 2.7 pounds more wood per cubic foot than did pulpwood because of their higher specific gravity.

Bark was consistently lower in green weight per cubic foot than wood (table 8). Bark green weight per cubic foot averaged 41.3 pounds for the total tree, 39.8 pounds for saw logs, 44.1 pounds for pulpwood, and 43.4 pounds for branches. Branchbark weighed more per cubic foot than did the stembark because of its higher moisture content (78 percent vs. 59 percent). Green weight per cubic foot of wood and bark combined averaged 60.8 pounds for the total tree, 61.3 pounds in the main stem, and 56.3 pounds in branch material.

#### EQUATIONS

Equations were developed to predict weight and volume of the total tree and its components on the basis of the biomass of the 47 trees sampled. Those for predicting green and dry weights are in table 9, and those for predicting green cubic foot volumes are in table 10. Also included in tables 9 and 10 are the coefficient of determination and standard error of estimate for each equation. In most cases, the coefficients of determination indicate a high degree of linear association between the independent variable ( $D^2Th$ ) and component

Table 9.--Regression equations for estimating green and dry weight of aboveground biomass of natural  
longleaf pine trees and tree components with d.b.h. and total height as independent variables

| Weight (Y)                                                                           | Regression equation <sup>1/</sup>                                                 | Coefficient of<br>determination<br>(R <sup>2</sup> ) | Standard<br>error<br>(S <sub>y.x</sub> ) <sup>2/</sup> |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|
| COMPLETE TREE (INCLUDING NEEDLES) <sup>3/</sup>                                      |                                                                                   |                                                      |                                                        |
| Green                                                                                | $\log_{10} Y = -0.68988 + 0.99194 \log_{10} D^2Th$                                | 0.99                                                 | 0.031                                                  |
| Dry                                                                                  | $\log_{10} Y = -0.99717 + 1.00242 \log_{10} D^2Th$ <i>0.10053 (0.74) 1.00242</i>  | .99                                                  | .036                                                   |
| COMPLETE TREE (EXCLUDING NEEDLES) <sup>3/</sup>                                      |                                                                                   |                                                      |                                                        |
| Green                                                                                | $\log_{10} Y = -0.74607 + 0.99947 \log_{10} D^2Th$                                | .99                                                  | .030                                                   |
| Dry                                                                                  | $\log_{10} Y = -1.03965 + 1.00795 \log_{10} D^2Th$ <i>0.991275 (0.74) 1.00795</i> | .99                                                  | .035                                                   |
| ALL WOOD IN TREE <sup>3/</sup>                                                       |                                                                                   |                                                      |                                                        |
| Green                                                                                | $\log_{10} Y = -0.88747 + 1.02133 \log_{10} D^2Th$                                | .99                                                  | .031                                                   |
| Dry                                                                                  | $\log_{10} Y = -1.21543 + 1.03675 \log_{10} D^2Th$                                | .99                                                  | .038                                                   |
| ALL BARK IN TREE <sup>3/</sup>                                                       |                                                                                   |                                                      |                                                        |
| Green                                                                                | $\log_{10} Y = -1.05087 + 0.84066 \log_{10} D^2Th$                                | .96                                                  | .056                                                   |
| Dry                                                                                  | $\log_{10} Y = -1.20218 + 0.82474 \log_{10} D^2Th$                                | .96                                                  | .054                                                   |
| WOOD AND BARK IN SAW-LOG PORTION OF STEM FOR TREES > 9.5 INCHES D.B.H. <sup>4/</sup> |                                                                                   |                                                      |                                                        |
| Green                                                                                | $\log_{10} Y = -0.97687 + 1.02760 \log_{10} D^2Th$                                | .96                                                  | .041                                                   |
| Dry                                                                                  | $\log_{10} Y = -1.22689 + 1.02819 \log_{10} D^2Th$                                | .96                                                  | .045                                                   |

continued

Table 9.--Regression equations for estimating green and dry weight of aboveground biomass of natural longleaf pine trees and tree components with d.b.h. and total height as independent variables (continued)

| Weight (Y)                                                                  | Regression equation <sup>1/</sup>                                       | Coefficient of determination (R <sup>2</sup> ) | Standard error (S <sub>y.x</sub> ) <sup>2/</sup> |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------|
| WOOD IN SAW-LOG PORTION OF STEM FOR TREES > 9.5 INCHES D.B.H. <sup>4/</sup> |                                                                         |                                                |                                                  |
| Green                                                                       | $\text{Log}_{10} Y = -1.08665 + 1.04530 \text{ Log}_{10} D^2 \text{Th}$ | 0.96                                           | 0.043                                            |
| Dry                                                                         | $\text{Log}_{10} Y = -1.36758 + 1.05208 \text{ Log}_{10} D^2 \text{Th}$ | .95                                            | .048                                             |
| BARK IN SAW-LOG PORTION OF STEM FOR TREES > 9.5 INCHES D.B.H. <sup>4/</sup> |                                                                         |                                                |                                                  |
| Green                                                                       | $\text{Log}_{10} Y = -1.26502 + 0.83155 \text{ Log}_{10} D^2 \text{Th}$ | .92                                            | .051                                             |
| Dry                                                                         | $\text{Log}_{10} Y = -1.35097 + 0.80530 \text{ Log}_{10} D^2 \text{Th}$ | .89                                            | .057                                             |
| WOOD AND BARK IN STEM FROM STUMP TO 2-INCH D.I.B. TOP <sup>3/</sup>         |                                                                         |                                                |                                                  |
| Green                                                                       | $\text{Log}_{10} Y = -0.65002 + 0.96146 \text{ Log}_{10} D^2 \text{Th}$ | .99                                            | .028                                             |
| Dry                                                                         | $\text{Log}_{10} Y = -0.96015 + 0.97497 \text{ Log}_{10} D^2 \text{Th}$ | .99                                            | .034                                             |
| WOOD IN STEM FROM STUMP TO 2-INCH D.I.B. TOP <sup>3/</sup>                  |                                                                         |                                                |                                                  |
| Green                                                                       | $\text{Log}_{10} Y = -0.78784 + 0.98563 \text{ Log}_{10} D^2 \text{Th}$ | .99                                            | .030                                             |
| Dry                                                                         | $\text{Log}_{10} Y = -1.13120 + 1.00588 \text{ Log}_{10} D^2 \text{Th}$ | .99                                            | .037                                             |
| BARK IN STEM FROM STUMP TO 2-INCH D.I.B. TOP <sup>3/</sup>                  |                                                                         |                                                |                                                  |
| Green                                                                       | $\text{Log}_{10} Y = -0.77468 + 0.72855 \text{ Log}_{10} D^2 \text{Th}$ | .96                                            | .046                                             |
| Dry                                                                         | $\text{Log}_{10} Y = -0.93976 + 0.71954 \text{ Log}_{10} D^2 \text{Th}$ | .95                                            | .053                                             |

continued

Table 9.--Regression equations for estimating green and dry weight of aboveground biomass of natural longleaf pine trees and tree components with d.b.h. and total height as independent variables (continued)

| Weight (Y)                                                                 | Regression equation <sup>1/</sup>                                      | Coefficient of determination (R <sup>2</sup> ) | Standard error (S <sub>y.x</sub> ) <sup>2/</sup> |
|----------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------|
| CROWN WEIGHT (INCLUDING BRANCHWOOD, BRANCHBARK, AND NEEDLES) <sup>3/</sup> |                                                                        |                                                |                                                  |
| Green                                                                      | $\text{Log}_{10} Y = -2.00999 + 1.12764 \text{ Log}_{10} D^2\text{Th}$ | 0.91                                           | 0.111                                            |
| Dry                                                                        | $\text{Log}_{10} Y = -2.37618 + 1.14054 \text{ Log}_{10} D^2\text{Th}$ | .90                                            | .118                                             |
| NEEDLES <sup>3/</sup>                                                      |                                                                        |                                                |                                                  |
| Green                                                                      | $\text{Log}_{10} Y = -1.46928 + 0.87586 \text{ Log}_{10} D^2\text{Th}$ | .90                                            | .091                                             |
| Dry                                                                        | $\text{Log}_{10} Y = -1.90676 + 0.89244 \text{ Log}_{10} D^2\text{Th}$ | .90                                            | .094                                             |
| WOOD AND BARK IN ALL BRANCH MATERIAL <sup>3/</sup>                         |                                                                        |                                                |                                                  |
| Green                                                                      | $\text{Log}_{10} Y = -2.72222 + 1.25770 \text{ Log}_{10} D^2\text{Th}$ | .90                                            | .134                                             |
| Dry                                                                        | $\text{Log}_{10} Y = -2.95713 + 1.24480 \text{ Log}_{10} D^2\text{Th}$ | .89                                            | .141                                             |
| WOOD IN ALL BRANCH MATERIAL <sup>3/</sup>                                  |                                                                        |                                                |                                                  |
| Green                                                                      | $\text{Log}_{10} Y = -3.22660 + 1.34140 \text{ Log}_{10} D^2\text{Th}$ | .90                                            | .147                                             |
| Dry                                                                        | $\text{Log}_{10} Y = -3.51387 + 1.33673 \text{ Log}_{10} D^2\text{Th}$ | .88                                            | .157                                             |
| BARK IN ALL BRANCH MATERIAL <sup>3/</sup>                                  |                                                                        |                                                |                                                  |
| Green                                                                      | $\text{Log}_{10} Y = -2.49769 + 1.07628 \text{ Log}_{10} D^2\text{Th}$ | .90                                            | .116                                             |
| Dry                                                                        | $\text{Log}_{10} Y = -2.72978 + 1.07216 \text{ Log}_{10} D^2\text{Th}$ | .89                                            | .120                                             |

$$\frac{1/}{\text{Log}_{10} Y = b_0 + b_1 \text{ Log}_{10} D^2\text{Th}}$$

where: Y = weight of tree or component in pounds,  
D = d.b.h. in inches,  
Th = total height in feet.

<sup>2/</sup>Standard error of estimate in Log<sub>10</sub> form.

<sup>3/</sup>Regression equations based on 47 trees 6 to 18 inches d.b.h.

<sup>4/</sup>Regression equations based on 41 trees 10 to 18 inches d.b.h.

Table 10.--Regression equations for estimating green cubic foot volume of the aboveground biomass of natural  
longleaf pine trees and tree components with d.b.h. and total height as independent variables

| Cubic foot<br>volume (Y)                                                   | Regression equation <sup>1/</sup>                                       | Coefficient of<br>determination<br>(R <sup>2</sup> ) | Standard<br>error<br>(S <sub>y.x</sub> ) <sup>2/</sup> |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|
| TOTAL TREE <sup>3/</sup>                                                   |                                                                         |                                                      |                                                        |
| Wood                                                                       | $\text{Log}_{10} Y = -2.80224 + 1.04936 \text{ Log}_{10} D^2 \text{Th}$ | 0.99                                                 | 0.027                                                  |
| Bark                                                                       | $\text{Log}_{10} Y = -2.54434 + 0.81138 \text{ Log}_{10} D^2 \text{Th}$ | .95                                                  | .061                                                   |
| Wood & bark                                                                | $\text{Log}_{10} Y = -2.54553 + 1.00570 \text{ Log}_{10} D^2 \text{Th}$ | .99                                                  | .026                                                   |
| STEM FROM STUMP TO SAW-LOG TOP FOR TREES > 9.5 INCHES D.B.H. <sup>4/</sup> |                                                                         |                                                      |                                                        |
| Wood                                                                       | $\text{Log}_{10} Y = -3.00060 + 1.07344 \text{ Log}_{10} D^2 \text{Th}$ | .97                                                  | .040                                                   |
| Bark                                                                       | $\text{Log}_{10} Y = -2.88643 + 0.83568 \text{ Log}_{10} D^2 \text{Th}$ | .89                                                  | .059                                                   |
| Wood & bark                                                                | $\text{Log}_{10} Y = -2.82198 + 1.04378 \text{ Log}_{10} D^2 \text{Th}$ | .97                                                  | .037                                                   |
| STEM FROM STUMP TO 2-INCH D.I.B. TOP <sup>3/</sup>                         |                                                                         |                                                      |                                                        |
| Wood                                                                       | $\text{Log}_{10} Y = -2.72558 + 1.01904 \text{ Log}_{10} D^2 \text{Th}$ | .99                                                  | .028                                                   |
| Bark                                                                       | $\text{Log}_{10} Y = -2.25358 + 0.69804 \text{ Log}_{10} D^2 \text{Th}$ | .94                                                  | .056                                                   |
| Wood & bark                                                                | $\text{Log}_{10} Y = -2.47035 + 0.97145 \text{ Log}_{10} D^2 \text{Th}$ | .99                                                  | .025                                                   |
| ALL BRANCH MATERIAL <sup>3/</sup>                                          |                                                                         |                                                      |                                                        |
| Wood                                                                       | $\text{Log}_{10} Y = -4.84899 + 1.30101 \text{ Log}_{10} D^2 \text{Th}$ | .89                                                  | .146                                                   |
| Bark                                                                       | $\text{Log}_{10} Y = -4.10690 + 1.07007 \text{ Log}_{10} D^2 \text{Th}$ | .89                                                  | .119                                                   |
| Wood & bark                                                                | $\text{Log}_{10} Y = -4.26121 + 1.20985 \text{ Log}_{10} D^2 \text{Th}$ | .90                                                  | .131                                                   |

$$1/ \text{Log}_{10} Y = b_0 + b_1 \text{ Log}_{10} D^2 \text{Th}$$

where: Y = cubic feet of tree or component,  
D = d.b.h. in inches,  
Th = total height in feet.

<sup>2/</sup> Standard error of estimate in  $\text{Log}_{10}$  form.

<sup>3/</sup> Regression equations based on 47 trees 6 to 18 inches d.b.h.

<sup>4/</sup> Regression equations based on 41 trees 10 to 18 inches d.b.h.

weight or volume. Poorest associations occurred in equations developed to predict branch weight and volume. Crown components varied more than other tree components.

#### YIELD TABLES

The equations in tables 9 and 10 were used to develop tables of biomass weight and volume. These tables of predicted yields are presented in the Appendix. Predicted green and dry weights of wood, bark, and needles in the total tree, main stem, and crown are presented in tables 11 through 21 by d.b.h. and total height classes. Predicted green cubic foot volumes of wood and bark in the total tree, main stem, and branches are presented in tables 22 through 24.

Trees with the same d.b.h. and total height can vary considerably in weight and volume because of differences in crown size, moisture content, specific gravity, and taper. The yield tables presented in the Appendix should not be used indiscriminately over the range of longleaf pine without testing. Rather, they should be applied only to natural, closed stands which are similar in age, taper rate, and wood properties to the trees sampled.

## Appendix

Table 11.--Predicted weight of total tree (wood, bark, and needles) for  
longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |
|                    | ----- Pounds -----                     |    |    |    |    |     |     |

GREEN<sup>3/</sup>

|    |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|
| 6  | 346   | 415   | 483   | 552   |       |       |       |
| 7  | 470   | 563   | 656   | 749   |       |       |       |
| 8  | 612   | 734   | 855   | 976   | 1,097 |       |       |
| 9  | 774   | 927   | 1,080 | 1,233 | 1,386 | 1,539 |       |
| 10 | 953   | 1,142 | 1,331 | 1,520 | 1,708 | 1,896 | 2,084 |
| 11 | 1,152 | 1,380 | 1,608 | 1,836 | 2,064 | 2,291 | 2,518 |
| 12 | 1,369 | 1,640 | 1,911 | 2,182 | 2,452 | 2,722 | 2,992 |
| 13 | 1,604 | 1,923 | 2,240 | 2,557 | 2,874 | 3,191 | 3,507 |
| 14 | 1,859 | 2,227 | 2,595 | 2,962 | 3,330 | 3,696 | 4,063 |
| 15 | 2,131 | 2,554 | 2,976 | 3,397 | 3,818 | 4,239 | 4,659 |
| 16 |       | 2,902 | 3,382 | 3,861 | 4,340 | 4,818 | 5,295 |
| 17 |       | 3,273 | 3,814 | 4,354 | 4,894 | 5,433 | 5,972 |
| 18 |       |       | 4,272 | 4,877 | 5,482 | 6,086 | 6,689 |
| 19 |       |       | 4,756 | 5,430 | 6,102 | 6,775 | 7,446 |
| 20 |       |       | 5,265 | 6,011 | 6,756 | 7,500 | 8,244 |

DRY<sup>4/</sup>

|    |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|
| 6  | 184   | 221   | 258   | 296   |       |       |       |
| 7  | 251   | 302   | 352   | 403   |       |       |       |
| 8  | 328   | 394   | 460   | 526   | 592   |       |       |
| 9  | 416   | 499   | 583   | 666   | 750   | 833   |       |
| 10 | 514   | 617   | 720   | 823   | 926   | 1,029 | 1,132 |
| 11 | 622   | 747   | 871   | 996   | 1,121 | 1,246 | 1,371 |
| 12 | 740   | 889   | 1,037 | 1,186 | 1,335 | 1,483 | 1,632 |
| 13 | 869   | 1,044 | 1,218 | 1,393 | 1,567 | 1,742 | 1,916 |
| 14 | 1,009 | 1,211 | 1,413 | 1,616 | 1,818 | 2,021 | 2,223 |
| 15 | 1,158 | 1,390 | 1,623 | 1,855 | 2,088 | 2,320 | 2,553 |
| 16 |       | 1,583 | 1,847 | 2,111 | 2,376 | 2,641 | 2,906 |
| 17 |       | 1,787 | 2,086 | 2,384 | 2,683 | 2,982 | 3,281 |
| 18 |       |       | 2,339 | 2,674 | 3,009 | 3,344 | 3,679 |
| 19 |       |       | 2,607 | 2,980 | 3,353 | 3,727 | 4,101 |
| 20 |       |       | 2,889 | 3,303 | 3,717 | 4,131 | 4,545 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -0.68988 + 0.99194 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -0.99717 + 1.00242 \log_{10} D^2Th.$

Table 12.--Predicted weight of all aboveground wood excluding bark for  
longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |
|                    | ----- Pounds -----                     |    |    |    |    |     |     |

GREEN<sup>3/</sup>

|    |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|
| 6  | 274   | 330   | 386   | 442   |       |       |       |
| 7  | 375   | 452   | 529   | 606   |       |       |       |
| 8  | 493   | 593   | 695   | 796   | 898   |       |       |
| 9  | 627   | 755   | 883   | 1,013 | 1,142 | 1,272 |       |
| 10 | 777   | 936   | 1,096 | 1,256 | 1,416 | 1,577 | 1,738 |
| 11 | 944   | 1,137 | 1,331 | 1,526 | 1,721 | 1,916 | 2,112 |
| 12 | 1,128 | 1,358 | 1,590 | 1,822 | 2,055 | 2,289 | 2,523 |
| 13 | 1,328 | 1,600 | 1,872 | 2,146 | 2,420 | 2,695 | 2,971 |
| 14 | 1,545 | 1,861 | 2,178 | 2,497 | 2,816 | 3,136 | 3,456 |
| 15 | 1,779 | 2,143 | 2,508 | 2,875 | 3,242 | 3,610 | 3,979 |
| 16 |       | 2,445 | 2,861 | 3,280 | 3,699 | 4,119 | 4,540 |
| 17 |       | 2,767 | 3,239 | 3,712 | 4,186 | 4,662 | 5,139 |
| 18 |       |       | 3,640 | 4,172 | 4,705 | 5,239 | 5,775 |
| 19 |       |       | 4,065 | 4,659 | 5,254 | 5,851 | 6,449 |
| 20 |       |       | 4,514 | 5,173 | 5,835 | 6,498 | 7,162 |

DRY<sup>4/</sup>

|    |     |       |       |       |       |       |       |
|----|-----|-------|-------|-------|-------|-------|-------|
| 6  | 144 | 174   | 205   | 235   |       |       |       |
| 7  | 199 | 240   | 282   | 324   |       |       |       |
| 8  | 262 | 317   | 372   | 427   | 482   |       |       |
| 9  | 335 | 404   | 474   | 545   | 616   | 687   |       |
| 10 | 416 | 503   | 590   | 678   | 766   | 854   | 943   |
| 11 | 507 | 613   | 719   | 826   | 933   | 1,041 | 1,149 |
| 12 | 608 | 734   | 861   | 989   | 1,118 | 1,247 | 1,376 |
| 13 | 717 | 867   | 1,017 | 1,168 | 1,319 | 1,472 | 1,625 |
| 14 | 837 | 1,011 | 1,186 | 1,362 | 1,539 | 1,716 | 1,894 |
| 15 | 965 | 1,166 | 1,368 | 1,571 | 1,775 | 1,980 | 2,186 |
| 16 |     | 1,333 | 1,564 | 1,796 | 2,029 | 2,264 | 2,499 |
| 17 |     | 1,511 | 1,773 | 2,037 | 2,301 | 2,567 | 2,833 |
| 18 |     |       | 1,997 | 2,293 | 2,591 | 2,890 | 3,190 |
| 19 |     |       | 2,233 | 2,565 | 2,898 | 3,233 | 3,568 |
| 20 |     |       | 2,484 | 2,853 | 3,223 | 3,595 | 3,969 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -0.88747 + 1.02133 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -1.21543 + 1.03675 \log_{10} D^2Th.$

Table 13.--Predicted weight of all aboveground bark for longleaf pine  
trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches)        | Total tree height (feet) <sup>2/</sup> |     |     |     |     |     |     |
|---------------------------|----------------------------------------|-----|-----|-----|-----|-----|-----|
|                           | 50                                     | 60  | 70  | 80  | 90  | 100 | 110 |
| ----- Pounds -----        |                                        |     |     |     |     |     |     |
| <u>GREEN<sup>3/</sup></u> |                                        |     |     |     |     |     |     |
| 6                         | 48                                     | 57  | 64  | 72  |     |     |     |
| 7                         | 63                                     | 73  | 83  | 93  |     |     |     |
| 8                         | 79                                     | 92  | 104 | 117 | 129 |     |     |
| 9                         | 96                                     | 112 | 127 | 142 | 157 | 172 |     |
| 10                        | 114                                    | 133 | 152 | 170 | 188 | 205 | 222 |
| 11                        | 134                                    | 157 | 178 | 199 | 220 | 241 | 261 |
| 12                        | 156                                    | 181 | 206 | 231 | 255 | 279 | 302 |
| 13                        | 178                                    | 207 | 236 | 264 | 292 | 319 | 345 |
| 14                        | 202                                    | 235 | 267 | 299 | 330 | 361 | 391 |
| 15                        | 226                                    | 264 | 300 | 336 | 371 | 405 | 439 |
| 16                        |                                        | 294 | 335 | 375 | 414 | 452 | 490 |
| 17                        |                                        | 326 | 371 | 415 | 458 | 500 | 542 |
| 18                        |                                        |     | 408 | 457 | 504 | 551 | 597 |
| 19                        |                                        |     | 447 | 500 | 552 | 603 | 653 |
| 20                        |                                        |     | 487 | 545 | 602 | 658 | 712 |
| <u>DRY<sup>4/</sup></u>   |                                        |     |     |     |     |     |     |
| 6                         | 30                                     | 35  | 40  | 45  |     |     |     |
| 7                         | 39                                     | 46  | 52  | 58  |     |     |     |
| 8                         | 49                                     | 57  | 64  | 72  | 79  |     |     |
| 9                         | 59                                     | 69  | 78  | 87  | 96  | 105 |     |
| 10                        | 71                                     | 82  | 93  | 104 | 115 | 125 | 135 |
| 11                        | 83                                     | 96  | 109 | 122 | 134 | 146 | 158 |
| 12                        | 95                                     | 111 | 126 | 140 | 155 | 169 | 183 |
| 13                        | 109                                    | 126 | 144 | 160 | 177 | 193 | 208 |
| 14                        | 123                                    | 143 | 162 | 181 | 200 | 218 | 235 |
| 15                        | 138                                    | 160 | 182 | 203 | 224 | 244 | 264 |
| 16                        |                                        | 178 | 202 | 226 | 249 | 271 | 294 |
| 17                        |                                        | 197 | 223 | 249 | 275 | 300 | 324 |
| 18                        |                                        |     | 246 | 274 | 302 | 329 | 356 |
| 19                        |                                        |     | 268 | 300 | 330 | 360 | 390 |
| 20                        |                                        |     | 292 | 326 | 359 | 392 | 424 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -1.05087 + 0.84066 \log_{10} D^2 Th.$

<sup>4/</sup>  $\log_{10} Y = -1.20218 + 0.82474 \log_{10} D^2 Th.$

Table 14.--Predicted weight of needles for longleaf pine trees 6 to 20

inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |

-----Pounds-----

GREEN<sup>3/</sup>

|    |     |     |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|-----|-----|
| 6  | 24  | 28  | 32  | 36  |     |     |     |
| 7  | 32  | 37  | 42  | 48  |     |     |     |
| 8  | 40  | 47  | 54  | 60  | 67  |     |     |
| 9  | 49  | 58  | 66  | 74  | 82  | 90  |     |
| 10 | 59  | 69  | 79  | 89  | 99  | 108 | 118 |
| 11 | 70  | 82  | 94  | 105 | 117 | 128 | 139 |
| 12 | 81  | 95  | 109 | 122 | 136 | 149 | 162 |
| 13 | 93  | 110 | 125 | 141 | 156 | 171 | 186 |
| 14 | 106 | 125 | 143 | 160 | 178 | 195 | 212 |
| 15 | 120 | 141 | 161 | 181 | 201 | 220 | 239 |
| 16 |     | 158 | 180 | 203 | 225 | 246 | 268 |
| 17 |     | 175 | 201 | 225 | 250 | 274 | 298 |
| 18 |     |     | 222 | 249 | 276 | 303 | 329 |
| 19 |     |     | 244 | 274 | 304 | 333 | 362 |
| 20 |     |     | 267 | 300 | 332 | 364 | 396 |

DRY<sup>4/</sup>

|    |    |    |     |     |     |     |     |
|----|----|----|-----|-----|-----|-----|-----|
| 6  | 10 | 12 | 13  | 15  |     |     |     |
| 7  | 13 | 15 | 18  | 20  |     |     |     |
| 8  | 17 | 20 | 22  | 25  | 28  |     |     |
| 9  | 21 | 24 | 28  | 31  | 35  | 38  |     |
| 10 | 25 | 29 | 33  | 38  | 42  | 46  | 50  |
| 11 | 29 | 35 | 40  | 45  | 50  | 55  | 59  |
| 12 | 34 | 40 | 46  | 52  | 58  | 64  | 69  |
| 13 | 40 | 47 | 53  | 60  | 67  | 74  | 80  |
| 14 | 45 | 53 | 61  | 69  | 76  | 84  | 91  |
| 15 | 51 | 60 | 69  | 78  | 86  | 95  | 103 |
| 16 |    | 68 | 77  | 87  | 97  | 106 | 116 |
| 17 |    | 75 | 86  | 97  | 108 | 119 | 129 |
| 18 |    |    | 96  | 108 | 120 | 131 | 143 |
| 19 |    |    | 105 | 119 | 132 | 145 | 158 |
| 20 |    |    | 115 | 130 | 144 | 159 | 173 |

<sup>1/</sup> Blocked-in area indicates range of data.<sup>2/</sup> Includes 1-foot stump allowance.<sup>3/</sup>  $\log_{10} Y = -1.46928 + 0.87586 \log_{10} D^2Th.$ <sup>4/</sup>  $\log_{10} Y = -1.90676 + 0.89244 \log_{10} D^2Th.$

Table 15.--Predicted weight of wood and bark in main stem to 2-inch  
d.i.b. top for longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |

----- Pounds -----

GREEN<sup>3/</sup>

|    |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|
| 6  | 302   | 360   | 417   | 474   |       |       |       |
| 7  | 406   | 484   | 561   | 638   |       |       |       |
| 8  | 525   | 625   | 725   | 825   | 924   |       |       |
| 9  | 658   | 784   | 910   | 1,034 | 1,158 | 1,282 |       |
| 10 | 806   | 961   | 1,114 | 1,267 | 1,418 | 1,570 | 1,720 |
| 11 | 968   | 1,154 | 1,338 | 1,521 | 1,704 | 1,885 | 2,066 |
| 12 | 1,145 | 1,364 | 1,582 | 1,798 | 2,014 | 2,229 | 2,443 |
| 13 | 1,335 | 1,591 | 1,845 | 2,098 | 2,349 | 2,600 | 2,849 |
| 14 | 1,540 | 1,834 | 2,128 | 2,419 | 2,709 | 2,998 | 3,286 |
| 15 | 1,758 | 2,095 | 2,429 | 2,762 | 3,093 | 3,423 | 3,752 |
| 16 |       | 2,372 | 2,750 | 3,127 | 3,502 | 3,875 | 4,247 |
| 17 |       | 2,665 | 3,090 | 3,514 | 3,935 | 4,355 | 4,773 |
| 18 |       |       | 3,449 | 3,922 | 4,392 | 4,861 | 5,327 |
| 19 |       |       | 3,827 | 4,352 | 4,874 | 5,393 | 5,911 |
| 20 |       |       | 4,224 | 4,803 | 5,379 | 5,952 | 6,523 |

DRY<sup>4/</sup>

|    |     |       |       |       |       |       |       |
|----|-----|-------|-------|-------|-------|-------|-------|
| 6  | 164 | 195   | 227   | 259   |       |       |       |
| 7  | 221 | 264   | 307   | 349   |       |       |       |
| 8  | 287 | 342   | 398   | 453   | 508   |       |       |
| 9  | 361 | 431   | 501   | 570   | 640   | 709   |       |
| 10 | 443 | 529   | 615   | 700   | 785   | 870   | 955   |
| 11 | 533 | 637   | 740   | 843   | 946   | 1,048 | 1,150 |
| 12 | 632 | 755   | 877   | 999   | 1,121 | 1,242 | 1,363 |
| 13 | 739 | 882   | 1,025 | 1,168 | 1,310 | 1,452 | 1,593 |
| 14 | 853 | 1,019 | 1,185 | 1,350 | 1,514 | 1,678 | 1,841 |
| 15 | 976 | 1,166 | 1,355 | 1,544 | 1,732 | 1,919 | 2,106 |
| 16 |     | 1,323 | 1,537 | 1,751 | 1,964 | 2,176 | 2,388 |
| 17 |     | 1,489 | 1,730 | 1,971 | 2,210 | 2,450 | 2,688 |
| 18 |     |       | 1,934 | 2,203 | 2,471 | 2,738 | 3,005 |
| 19 |     |       | 2,149 | 2,448 | 2,746 | 3,043 | 3,339 |
| 20 |     |       | 2,375 | 2,705 | 3,035 | 3,363 | 3,690 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -0.65002 + 0.96146 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -0.96015 + 0.97497 \log_{10} D^2Th.$

Table 16.--Predicted weight of wood excluding bark in main stem to  
2-inch d.i.b. top for longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |

----- Pounds -----

GREEN<sup>3/</sup>

|    |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|
| 6  | 263   | 315   | 367   | 419   |       |       |       |
| 7  | 357   | 427   | 497   | 567   |       |       |       |
| 8  | 464   | 556   | 647   | 738   | 829   |       |       |
| 9  | 586   | 701   | 816   | 931   | 1,046 | 1,160 |       |
| 10 | 721   | 863   | 1,005 | 1,146 | 1,287 | 1,428 | 1,568 |
| 11 | 870   | 1,041 | 1,212 | 1,383 | 1,553 | 1,723 | 1,893 |
| 12 | 1,033 | 1,236 | 1,439 | 1,642 | 1,844 | 2,045 | 2,247 |
| 13 | 1,209 | 1,448 | 1,685 | 1,922 | 2,159 | 2,395 | 2,631 |
| 14 | 1,400 | 1,675 | 1,950 | 2,224 | 2,498 | 2,772 | 3,045 |
| 15 | 1,604 | 1,919 | 2,234 | 2,548 | 2,862 | 3,175 | 3,488 |
| 16 |       | 2,180 | 2,537 | 2,894 | 3,251 | 3,606 | 3,961 |
| 17 |       | 2,456 | 2,859 | 3,262 | 3,663 | 4,064 | 4,464 |
| 18 |       |       | 3,200 | 3,651 | 4,100 | 4,549 | 4,997 |
| 19 |       |       | 3,560 | 4,061 | 4,561 | 5,060 | 5,559 |
| 20 |       |       | 3,939 | 4,493 | 5,046 | 5,599 | 6,150 |

DRY<sup>4/</sup>

|    |     |       |       |       |       |       |       |
|----|-----|-------|-------|-------|-------|-------|-------|
| 6  | 139 | 167   | 195   | 223   |       |       |       |
| 7  | 190 | 228   | 266   | 304   |       |       |       |
| 8  | 248 | 298   | 348   | 398   | 448   |       |       |
| 9  | 314 | 378   | 441   | 504   | 568   | 631   |       |
| 10 | 389 | 467   | 545   | 623   | 702   | 780   | 859   |
| 11 | 471 | 566   | 660   | 755   | 850   | 945   | 1,040 |
| 12 | 561 | 674   | 787   | 900   | 1,013 | 1,126 | 1,239 |
| 13 | 659 | 791   | 924   | 1,057 | 1,190 | 1,323 | 1,456 |
| 14 | 765 | 919   | 1,073 | 1,227 | 1,381 | 1,536 | 1,690 |
| 15 | 879 | 1,055 | 1,232 | 1,410 | 1,587 | 1,764 | 1,942 |
| 16 |     | 1,202 | 1,403 | 1,605 | 1,807 | 2,009 | 2,211 |
| 17 |     | 1,358 | 1,585 | 1,813 | 2,041 | 2,269 | 2,498 |
| 18 |     |       | 1,778 | 2,034 | 2,290 | 2,546 | 2,802 |
| 19 |     |       | 1,983 | 2,268 | 2,553 | 2,839 | 3,124 |
| 20 |     |       | 2,198 | 2,514 | 2,831 | 3,147 | 3,464 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -0.78784 + 0.98563 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -1.13120 + 1.00588 \log_{10} D^2Th.$

Table 17.--Predicted weight of bark in main stem to 2-inch d.i.b. top  
for longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches)         | Total tree height (feet) <sup>2/</sup> |     |     |     |     |     |     |
|----------------------------|----------------------------------------|-----|-----|-----|-----|-----|-----|
|                            | 50                                     | 60  | 70  | 80  | 90  | 100 | 110 |
| ----- Pounds -----         |                                        |     |     |     |     |     |     |
| <u>GREEN</u> <sup>3/</sup> |                                        |     |     |     |     |     |     |
| 6                          | 40                                     | 45  | 51  | 56  |     |     |     |
| 7                          | 49                                     | 57  | 63  | 70  |     |     |     |
| 8                          | 60                                     | 69  | 77  | 85  | 92  |     |     |
| 9                          | 71                                     | 82  | 91  | 101 | 110 | 118 |     |
| 10                         | 83                                     | 95  | 106 | 117 | 128 | 138 | 148 |
| 11                         | 96                                     | 109 | 122 | 135 | 147 | 158 | 170 |
| 12                         | 109                                    | 124 | 139 | 153 | 167 | 180 | 193 |
| 13                         | 122                                    | 139 | 156 | 172 | 187 | 202 | 217 |
| 14                         | 136                                    | 155 | 174 | 191 | 208 | 225 | 241 |
| 15                         | 150                                    | 172 | 192 | 212 | 231 | 249 | 267 |
| 16                         |                                        | 189 | 211 | 232 | 253 | 273 | 293 |
| 17                         |                                        | 206 | 230 | 254 | 277 | 299 | 320 |
| 18                         |                                        |     | 250 | 276 | 301 | 325 | 348 |
| 19                         |                                        |     | 271 | 299 | 325 | 351 | 377 |
| 20                         |                                        |     | 292 | 322 | 351 | 379 | 406 |
| <u>DRY</u> <sup>4/</sup>   |                                        |     |     |     |     |     |     |
| 6                          | 25                                     | 29  | 32  | 35  |     |     |     |
| 7                          | 32                                     | 36  | 40  | 44  |     |     |     |
| 8                          | 38                                     | 44  | 49  | 54  | 58  |     |     |
| 9                          | 45                                     | 52  | 58  | 64  | 69  | 75  |     |
| 10                         | 53                                     | 60  | 67  | 74  | 80  | 87  | 93  |
| 11                         | 60                                     | 69  | 77  | 85  | 92  | 100 | 107 |
| 12                         | 69                                     | 78  | 87  | 96  | 105 | 113 | 121 |
| 13                         | 77                                     | 88  | 98  | 108 | 117 | 127 | 136 |
| 14                         | 86                                     | 98  | 109 | 120 | 131 | 141 | 151 |
| 15                         | 94                                     | 108 | 120 | 132 | 144 | 156 | 167 |
| 16                         |                                        | 118 | 132 | 145 | 158 | 171 | 183 |
| 17                         |                                        | 129 | 144 | 159 | 173 | 186 | 199 |
| 18                         |                                        |     | 156 | 172 | 187 | 202 | 217 |
| 19                         |                                        |     | 169 | 186 | 203 | 219 | 234 |
| 20                         |                                        |     | 182 | 200 | 218 | 235 | 252 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -0.77468 + 0.72855 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -0.93976 + 0.71954 \log_{10} D^2Th.$

Table 18.--Predicted weight of crown material (branchwood, branchbark, and needles) in longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |
|                    | ----- Pounds -----                     |    |    |    |    |     |     |

GREEN<sup>3/</sup>

|    |     |     |       |       |       |       |       |
|----|-----|-----|-------|-------|-------|-------|-------|
| 6  | 46  | 56  | 67    | 78    |       |       |       |
| 7  | 65  | 80  | 95    | 110   |       |       |       |
| 8  | 88  | 108 | 128   | 149   | 170   |       |       |
| 9  | 114 | 140 | 167   | 194   | 222   | 250   |       |
| 10 | 145 | 178 | 212   | 246   | 281   | 317   | 353   |
| 11 | 180 | 221 | 263   | 305   | 349   | 393   | 437   |
| 12 | 219 | 269 | 319   | 371   | 424   | 478   | 532   |
| 13 | 262 | 322 | 383   | 445   | 508   | 572   | 637   |
| 14 | 310 | 380 | 452   | 526   | 601   | 676   | 753   |
| 15 | 362 | 444 | 528   | 614   | 702   | 790   | 880   |
| 16 |     | 514 | 611   | 711   | 812   | 914   | 1,018 |
| 17 |     | 589 | 701   | 815   | 930   | 1,048 | 1,167 |
| 18 |     |     | 797   | 927   | 1,058 | 1,192 | 1,327 |
| 19 |     |     | 901   | 1,047 | 1,196 | 1,347 | 1,499 |
| 20 |     |     | 1,011 | 1,175 | 1,342 | 1,512 | 1,683 |

DRY<sup>4/</sup>

|    |     |     |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|-----|-----|
| 6  | 22  | 27  | 32  | 37  |     |     |     |
| 7  | 31  | 38  | 45  | 53  |     |     |     |
| 8  | 42  | 52  | 61  | 72  | 82  |     |     |
| 9  | 55  | 67  | 80  | 94  | 107 | 121 |     |
| 10 | 70  | 86  | 102 | 119 | 136 | 153 | 171 |
| 11 | 87  | 107 | 127 | 148 | 169 | 191 | 213 |
| 12 | 106 | 130 | 155 | 180 | 206 | 233 | 259 |
| 13 | 127 | 156 | 186 | 216 | 248 | 279 | 311 |
| 14 | 150 | 185 | 220 | 256 | 293 | 331 | 369 |
| 15 | 176 | 216 | 258 | 300 | 343 | 387 | 431 |
| 16 |     | 250 | 298 | 348 | 398 | 448 | 500 |
| 17 |     | 287 | 343 | 399 | 457 | 515 | 574 |
| 18 |     |     | 390 | 455 | 520 | 587 | 654 |
| 19 |     |     | 442 | 514 | 588 | 663 | 740 |
| 20 |     |     | 497 | 578 | 661 | 746 | 831 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -2.00999 + 1.12764 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -2.37618 + 1.14054 \log_{10} D^2Th.$

Table 19.--Predicted weight of wood and bark in branches for longleaf  
pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches)         | Total tree height (feet) <sup>2/</sup> |     |     |     |       |       |       |
|----------------------------|----------------------------------------|-----|-----|-----|-------|-------|-------|
|                            | 50                                     | 60  | 70  | 80  | 90    | 100   | 110   |
| ----- Pounds -----         |                                        |     |     |     |       |       |       |
| <u>GREEN</u> <sup>3/</sup> |                                        |     |     |     |       |       |       |
| 6                          | 24                                     | 30  | 36  | 43  |       |       |       |
| 7                          | 35                                     | 44  | 54  | 63  |       |       |       |
| 8                          | 49                                     | 61  | 74  | 88  | 102   |       |       |
| 9                          | 65                                     | 82  | 100 | 118 | 137   | 156   |       |
| 10                         | 85                                     | 107 | 130 | 154 | 178   | 204   | 229   |
| 11                         | 108                                    | 136 | 165 | 195 | 227   | 259   | 292   |
| 12                         | 135                                    | 169 | 206 | 243 | 282   | 322   | 363   |
| 13                         | 165                                    | 207 | 251 | 297 | 345   | 394   | 444   |
| 14                         | 198                                    | 250 | 303 | 358 | 415   | 474   | 535   |
| 15                         | 236                                    | 297 | 360 | 426 | 494   | 564   | 636   |
| 16                         |                                        | 349 | 424 | 501 | 581   | 664   | 748   |
| 17                         |                                        | 407 | 494 | 584 | 677   | 773   | 872   |
| 18                         |                                        |     | 570 | 674 | 782   | 893   | 1,006 |
| 19                         |                                        |     | 653 | 772 | 896   | 1,023 | 1,153 |
| 20                         |                                        |     | 743 | 879 | 1,019 | 1,164 | 1,312 |
| <u>DRY</u> <sup>4/</sup>   |                                        |     |     |     |       |       |       |
| 6                          | 12                                     | 16  | 19  | 22  |       |       |       |
| 7                          | 18                                     | 23  | 28  | 33  |       |       |       |
| 8                          | 25                                     | 32  | 39  | 46  | 53    |       |       |
| 9                          | 34                                     | 43  | 52  | 61  | 71    | 81    |       |
| 10                         | 44                                     | 56  | 67  | 80  | 92    | 105   | 118   |
| 11                         | 56                                     | 71  | 86  | 101 | 117   | 133   | 150   |
| 12                         | 70                                     | 88  | 106 | 125 | 145   | 166   | 187   |
| 13                         | 85                                     | 107 | 130 | 153 | 177   | 202   | 228   |
| 14                         | 103                                    | 129 | 156 | 184 | 213   | 243   | 274   |
| 15                         | 122                                    | 153 | 185 | 219 | 253   | 289   | 325   |
| 16                         |                                        | 180 | 217 | 257 | 297   | 339   | 382   |
| 17                         |                                        | 209 | 253 | 299 | 346   | 394   | 444   |
| 18                         |                                        |     | 292 | 344 | 399   | 455   | 512   |
| 19                         |                                        |     | 334 | 394 | 456   | 520   | 586   |
| 20                         |                                        |     | 379 | 448 | 518   | 591   | 665   |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -2.72222 + 1.25770 \log_{10} D^2 Th.$

<sup>4/</sup>  $\log_{10} Y = -2.95713 + 1.24480 \log_{10} D^2 Th.$

Table 20.--Predicted weight of branchwood in longleaf pine trees 6 to 20  
inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |

----- Pounds -----

GREEN<sup>3/</sup>

|    |     |     |     |     |     |     |       |
|----|-----|-----|-----|-----|-----|-----|-------|
| 6  | 14  | 18  | 22  | 26  |     |     |       |
| 7  | 21  | 27  | 33  | 39  |     |     |       |
| 8  | 30  | 38  | 47  | 56  | 66  |     |       |
| 9  | 41  | 52  | 64  | 77  | 90  | 104 |       |
| 10 | 54  | 69  | 85  | 102 | 120 | 138 | 157   |
| 11 | 70  | 90  | 110 | 132 | 154 | 178 | 202   |
| 12 | 89  | 113 | 139 | 167 | 195 | 225 | 255   |
| 13 | 110 | 140 | 173 | 206 | 242 | 278 | 316   |
| 14 | 134 | 171 | 210 | 252 | 295 | 340 | 386   |
| 15 | 161 | 206 | 253 | 303 | 355 | 409 | 464   |
| 16 |     | 245 | 301 | 360 | 422 | 486 | 552   |
| 17 |     | 288 | 354 | 424 | 496 | 572 | 650   |
| 18 |     |     | 413 | 494 | 579 | 667 | 757   |
| 19 |     |     | 478 | 571 | 669 | 771 | 876   |
| 20 |     |     | 548 | 656 | 768 | 884 | 1,005 |

DRY<sup>4/</sup>

|    |    |     |     |     |     |     |     |
|----|----|-----|-----|-----|-----|-----|-----|
| 6  | 7  | 9   | 11  | 13  |     |     |     |
| 7  | 10 | 13  | 16  | 19  |     |     |     |
| 8  | 15 | 19  | 23  | 28  | 33  |     |     |
| 9  | 20 | 26  | 32  | 38  | 45  | 51  |     |
| 10 | 27 | 34  | 42  | 51  | 59  | 68  | 77  |
| 11 | 35 | 44  | 55  | 65  | 76  | 88  | 100 |
| 12 | 44 | 56  | 69  | 82  | 96  | 111 | 126 |
| 13 | 54 | 69  | 85  | 102 | 119 | 137 | 156 |
| 14 | 66 | 85  | 104 | 124 | 145 | 167 | 190 |
| 15 | 80 | 102 | 125 | 149 | 175 | 201 | 229 |
| 16 |    | 121 | 148 | 178 | 208 | 239 | 272 |
| 17 |    | 142 | 175 | 209 | 244 | 281 | 320 |
| 18 |    |     | 203 | 243 | 285 | 328 | 372 |
| 19 |    |     | 235 | 281 | 329 | 379 | 430 |
| 20 |    |     | 270 | 322 | 377 | 434 | 493 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -3.22660 + 1.34140 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -3.51387 + 1.33673 \log_{10} D^2Th.$

Table 21.--Predicted weight of branchbark in longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches) | Total tree height (feet) <sup>2/</sup> |    |    |    |    |     |     |
|--------------------|----------------------------------------|----|----|----|----|-----|-----|
|                    | 50                                     | 60 | 70 | 80 | 90 | 100 | 110 |
|                    | ----- Pounds -----                     |    |    |    |    |     |     |

GREEN<sup>3/</sup>

|    |    |     |     |     |     |     |     |
|----|----|-----|-----|-----|-----|-----|-----|
| 6  | 10 | 12  | 15  | 17  |     |     |     |
| 7  | 14 | 17  | 20  | 23  |     |     |     |
| 8  | 19 | 23  | 27  | 31  | 35  |     |     |
| 9  | 24 | 30  | 35  | 40  | 46  | 51  |     |
| 10 | 30 | 37  | 44  | 50  | 57  | 64  | 71  |
| 11 | 37 | 45  | 54  | 62  | 70  | 79  | 87  |
| 12 | 45 | 55  | 65  | 75  | 85  | 95  | 105 |
| 13 | 54 | 65  | 77  | 89  | 101 | 113 | 125 |
| 14 | 63 | 76  | 90  | 104 | 118 | 132 | 147 |
| 15 | 73 | 89  | 105 | 121 | 137 | 154 | 170 |
| 16 |    | 102 | 120 | 139 | 158 | 177 | 196 |
| 17 |    | 116 | 137 | 158 | 180 | 201 | 223 |
| 18 |    |     | 155 | 179 | 203 | 227 | 252 |
| 19 |    |     | 174 | 201 | 228 | 256 | 283 |
| 20 |    |     | 194 | 224 | 255 | 285 | 316 |

DRY<sup>4/</sup>

|    |    |    |     |     |     |     |     |
|----|----|----|-----|-----|-----|-----|-----|
| 6  | 6  | 7  | 8   | 10  |     |     |     |
| 7  | 8  | 10 | 11  | 13  |     |     |     |
| 8  | 11 | 13 | 15  | 18  | 20  |     |     |
| 9  | 14 | 17 | 20  | 23  | 26  | 29  |     |
| 10 | 17 | 21 | 25  | 29  | 32  | 36  | 40  |
| 11 | 21 | 26 | 30  | 35  | 40  | 44  | 49  |
| 12 | 25 | 31 | 37  | 42  | 48  | 54  | 59  |
| 13 | 30 | 37 | 43  | 50  | 57  | 64  | 70  |
| 14 | 35 | 43 | 51  | 59  | 67  | 75  | 83  |
| 15 | 41 | 50 | 59  | 68  | 77  | 86  | 96  |
| 16 |    | 57 | 68  | 78  | 89  | 99  | 110 |
| 17 |    | 65 | 77  | 89  | 101 | 113 | 125 |
| 18 |    |    | 87  | 101 | 114 | 128 | 141 |
| 19 |    |    | 98  | 113 | 128 | 143 | 159 |
| 20 |    |    | 109 | 126 | 143 | 160 | 177 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -2.49769 + 1.07628 \log_{10} D^2 Th.$

<sup>4/</sup>  $\log_{10} Y = -2.72978 + 1.07216 \log_{10} D^2 Th.$

Table 22.--Predicted green volume of wood and bark in total tree for  
longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches)        | Total tree height (feet) <sup>2/</sup> |      |      |      |      |       |       |
|---------------------------|----------------------------------------|------|------|------|------|-------|-------|
|                           | 50                                     | 60   | 70   | 80   | 90   | 100   | 110   |
| -----Cubic feet-----      |                                        |      |      |      |      |       |       |
| <u>WOOD</u> <sup>3/</sup> |                                        |      |      |      |      |       |       |
| 6                         | 4.1                                    | 5.0  | 5.8  | 6.7  |      |       |       |
| 7                         | 5.7                                    | 6.9  | 8.1  | 9.3  |      |       |       |
| 8                         | 7.5                                    | 9.1  | 10.7 | 12.3 | 13.9 |       |       |
| 9                         | 9.6                                    | 11.7 | 13.7 | 15.8 | 17.8 | 19.9  |       |
| 10                        | 12.0                                   | 14.5 | 17.1 | 19.7 | 22.2 | 24.8  | 27.5  |
| 11                        | 14.7                                   | 17.8 | 20.9 | 24.0 | 27.2 | 30.3  | 33.5  |
| 12                        | 17.6                                   | 21.3 | 25.1 | 28.8 | 32.6 | 36.4  | 40.3  |
| 13                        | 20.8                                   | 25.2 | 29.6 | 34.1 | 38.6 | 43.1  | 47.6  |
| 14                        | 24.3                                   | 29.4 | 34.6 | 39.8 | 45.1 | 50.3  | 55.6  |
| 15                        | 28.1                                   | 34.0 | 40.0 | 46.0 | 52.1 | 58.2  | 64.3  |
| 16                        |                                        | 39.0 | 45.8 | 52.7 | 59.6 | 66.6  | 73.6  |
| 17                        |                                        | 44.3 | 52.0 | 59.9 | 67.7 | 75.7  | 83.6  |
| 18                        |                                        |      | 58.7 | 67.5 | 76.4 | 85.3  | 94.3  |
| 19                        |                                        |      | 65.7 | 75.6 | 85.5 | 95.5  | 105.6 |
| 20                        |                                        |      | 73.2 | 84.2 | 95.3 | 106.4 | 117.6 |
| <u>DRY</u> <sup>4/</sup>  |                                        |      |      |      |      |       |       |
| 6                         | 1.3                                    | 1.4  | 1.6  | 1.8  |      |       |       |
| 7                         | 1.6                                    | 1.9  | 2.1  | 2.4  |      |       |       |
| 8                         | 2.0                                    | 2.3  | 2.6  | 2.9  | 3.2  |       |       |
| 9                         | 2.4                                    | 2.8  | 3.2  | 3.5  | 3.9  | 4.2   |       |
| 10                        | 2.9                                    | 3.3  | 3.8  | 4.2  | 4.6  | 5.0   | 5.4   |
| 11                        | 3.3                                    | 3.9  | 4.4  | 4.9  | 5.4  | 5.9   | 6.3   |
| 12                        | 3.8                                    | 4.5  | 5.1  | 5.6  | 6.2  | 6.8   | 7.3   |
| 13                        | 4.4                                    | 5.1  | 5.8  | 6.4  | 7.1  | 7.7   | 8.3   |
| 14                        | 4.9                                    | 5.7  | 6.5  | 7.2  | 8.0  | 8.7   | 9.4   |
| 15                        | 5.5                                    | 6.4  | 7.3  | 8.1  | 8.9  | 9.7   | 10.5  |
| 16                        |                                        | 7.1  | 8.1  | 9.0  | 9.9  | 10.8  | 11.6  |
| 17                        |                                        | 7.9  | 8.9  | 9.9  | 10.9 | 11.9  | 12.8  |
| 18                        |                                        |      | 9.8  | 10.9 | 12.0 | 13.0  | 14.1  |
| 19                        |                                        |      | 10.7 | 11.9 | 13.1 | 14.2  | 15.4  |
| 20                        |                                        |      | 11.6 | 12.9 | 14.2 | 15.5  | 16.7  |

continued

Table 22.--Predicted green volume of wood and bark in total tree for  
longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup> (continued)

| D.b.h.<br>(inches)            | Total tree height (feet) <sup>2/</sup> |      |      |      |       |       |       |
|-------------------------------|----------------------------------------|------|------|------|-------|-------|-------|
|                               | 50                                     | 60   | 70   | 80   | 90    | 100   | 110   |
| - - - - -Cubic feet - - - - - |                                        |      |      |      |       |       |       |
| WOOD AND BARK <sup>5/</sup>   |                                        |      |      |      |       |       |       |
| 6                             | 5.3                                    | 6.4  | 7.5  | 8.6  |       |       |       |
| 7                             | 7.3                                    | 8.8  | 10.2 | 11.7 |       |       |       |
| 8                             | 9.5                                    | 11.5 | 13.4 | 15.3 | 17.2  |       |       |
| 9                             | 12.1                                   | 14.5 | 17.0 | 19.4 | 21.8  | 24.3  |       |
| 10                            | 14.9                                   | 18.0 | 21.0 | 24.0 | 27.0  | 30.0  | 33.0  |
| 11                            | 18.1                                   | 21.7 | 25.4 | 29.0 | 32.7  | 36.4  | 40.0  |
| 12                            | 21.6                                   | 25.9 | 30.3 | 34.6 | 39.0  | 43.3  | 47.7  |
| 13                            | 25.3                                   | 30.4 | 35.5 | 40.6 | 45.8  | 50.9  | 56.0  |
| 14                            | 29.4                                   | 35.3 | 41.2 | 47.2 | 53.1  | 59.0  | 65.0  |
| 15                            | 33.8                                   | 40.6 | 47.4 | 54.2 | 61.0  | 67.8  | 74.7  |
| 16                            |                                        | 46.2 | 54.0 | 61.7 | 69.5  | 77.2  | 85.0  |
| 17                            |                                        | 52.2 | 61.0 | 69.7 | 78.5  | 87.3  | 96.0  |
| 18                            |                                        |      | 68.4 | 78.2 | 88.0  | 97.9  | 107.7 |
| 19                            |                                        |      | 76.2 | 87.2 | 98.2  | 109.1 | 120.1 |
| 20                            |                                        |      | 84.5 | 96.7 | 108.8 | 121.0 | 133.2 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -2.80224 + 1.04936 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -2.54434 + 0.81138 \log_{10} D^2Th.$

<sup>5/</sup>  $\log_{10} Y = -2.54553 + 1.00570 \log_{10} D^2Th.$

Table 23.--Predicted green volume of wood and bark in main stem to 2-inch  
d.i.b. top for longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches)        | Total tree height (feet) <sup>2/</sup> |      |      |      |      |      |       |
|---------------------------|----------------------------------------|------|------|------|------|------|-------|
|                           | 50                                     | 60   | 70   | 80   | 90   | 100  | 110   |
| ----- Cubic feet -----    |                                        |      |      |      |      |      |       |
| <u>WOOD</u> <sup>3/</sup> |                                        |      |      |      |      |      |       |
| 6                         | 3.9                                    | 4.7  | 5.5  | 6.3  |      |      |       |
| 7                         | 5.3                                    | 6.4  | 7.5  | 8.6  |      |      |       |
| 8                         | 7.0                                    | 8.5  | 9.9  | 11.3 | 12.8 |      |       |
| 9                         | 8.9                                    | 10.7 | 12.6 | 14.4 | 16.2 | 18.1 |       |
| 10                        | 11.1                                   | 13.3 | 15.6 | 17.9 | 20.1 | 22.4 | 24.7  |
| 11                        | 13.4                                   | 16.2 | 18.9 | 21.7 | 24.5 | 27.2 | 30.0  |
| 12                        | 16.0                                   | 19.3 | 22.6 | 25.9 | 29.2 | 32.5 | 35.8  |
| 13                        | 18.9                                   | 22.7 | 26.6 | 30.5 | 34.4 | 38.3 | 42.2  |
| 14                        | 22.0                                   | 26.4 | 30.9 | 35.5 | 40.0 | 44.5 | 49.0  |
| 15                        | 25.3                                   | 30.4 | 35.6 | 40.8 | 46.0 | 51.2 | 56.4  |
| 16                        |                                        | 34.7 | 40.6 | 46.5 | 52.5 | 58.4 | 64.4  |
| 17                        |                                        | 39.3 | 46.0 | 52.7 | 59.4 | 66.1 | 72.9  |
| 18                        |                                        |      | 51.6 | 59.2 | 66.7 | 74.3 | 81.9  |
| 19                        |                                        |      | 57.7 | 66.1 | 74.5 | 82.9 | 91.4  |
| 20                        |                                        |      | 64.0 | 73.3 | 82.7 | 92.1 | 101.5 |
| <u>BARK</u> <sup>4/</sup> |                                        |      |      |      |      |      |       |
| 6                         | 1.0                                    | 1.2  | 1.3  | 1.4  |      |      |       |
| 7                         | 1.3                                    | 1.5  | 1.6  | 1.8  |      |      |       |
| 8                         | 1.6                                    | 1.8  | 2.0  | 2.2  | 2.4  |      |       |
| 9                         | 1.8                                    | 2.1  | 2.3  | 2.6  | 2.8  | 3.0  |       |
| 10                        | 2.1                                    | 2.4  | 2.7  | 3.0  | 3.2  | 3.5  | 3.7   |
| 11                        | 2.4                                    | 2.8  | 3.1  | 3.4  | 3.7  | 3.9  | 4.2   |
| 12                        | 2.7                                    | 3.1  | 3.5  | 3.8  | 4.1  | 4.5  | 4.8   |
| 13                        | 3.1                                    | 3.5  | 3.9  | 4.3  | 4.6  | 5.0  | 5.3   |
| 14                        | 3.4                                    | 3.9  | 4.3  | 4.7  | 5.1  | 5.5  | 5.9   |
| 15                        | 3.8                                    | 4.3  | 4.7  | 5.2  | 5.7  | 6.1  | 6.5   |
| 16                        |                                        | 4.7  | 5.2  | 5.7  | 6.2  | 6.7  | 7.1   |
| 17                        |                                        | 5.1  | 5.7  | 6.2  | 6.7  | 7.2  | 7.7   |
| 18                        |                                        |      | 6.1  | 6.7  | 7.3  | 7.9  | 8.4   |
| 19                        |                                        |      | 6.6  | 7.2  | 7.9  | 8.5  | 9.0   |
| 20                        |                                        |      | 7.1  | 7.8  | 8.5  | 9.1  | 9.7   |

continued

Table 23.--Predicted green volume of wood and bark in main stem to 2-inch d.i.b. top for longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup> (continued)

| D.b.h.<br>(inches)          | Total tree height (feet) <sup>2/</sup> |      |      |      |      |       |       |
|-----------------------------|----------------------------------------|------|------|------|------|-------|-------|
|                             | 50                                     | 60   | 70   | 80   | 90   | 100   | 110   |
| ----- Cubic feet -----      |                                        |      |      |      |      |       |       |
| WOOD AND BARK <sup>5/</sup> |                                        |      |      |      |      |       |       |
| 6                           | 4.9                                    | 5.9  | 6.8  | 7.8  |      |       |       |
| 7                           | 6.6                                    | 7.9  | 9.2  | 10.5 |      |       |       |
| 8                           | 8.6                                    | 10.3 | 11.9 | 13.6 | 15.2 |       |       |
| 9                           | 10.8                                   | 12.9 | 15.0 | 17.1 | 19.1 | 21.2  |       |
| 10                          | 13.3                                   | 15.8 | 18.4 | 21.0 | 23.5 | 26.0  | 28.6  |
| 11                          | 16.0                                   | 19.1 | 22.2 | 25.2 | 28.3 | 31.3  | 34.4  |
| 12                          | 18.9                                   | 22.6 | 26.2 | 29.9 | 33.5 | 37.1  | 40.7  |
| 13                          | 22.1                                   | 26.4 | 30.6 | 34.9 | 39.1 | 43.3  | 47.5  |
| 14                          | 25.5                                   | 30.5 | 35.4 | 40.3 | 45.2 | 50.0  | 54.9  |
| 15                          | 29.2                                   | 34.8 | 40.5 | 46.1 | 51.7 | 57.2  | 62.8  |
| 16                          |                                        | 39.5 | 45.9 | 52.2 | 58.6 | 64.9  | 71.2  |
| 17                          |                                        | 44.4 | 51.6 | 58.8 | 65.9 | 73.0  | 80.1  |
| 18                          |                                        |      | 57.7 | 65.7 | 73.6 | 81.5  | 89.5  |
| 19                          |                                        |      | 64.1 | 72.9 | 81.8 | 90.6  | 99.4  |
| 20                          |                                        |      | 70.8 | 80.6 | 90.3 | 100.1 | 109.8 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -2.72558 + 1.01904 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -2.25358 + 0.69804 \log_{10} D^2Th.$

<sup>5/</sup>  $\log_{10} Y = -2.47035 + 0.97145 \log_{10} D^2Th.$

Table 24.--Predicted green volume of wood and bark in branches for  
longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup>

| D.b.h.<br>(inches)        | Total tree height (feet) <sup>2/</sup> |     |     |      |      |      |      |
|---------------------------|----------------------------------------|-----|-----|------|------|------|------|
|                           | 50                                     | 60  | 70  | 80   | 90   | 100  | 110  |
| ----- Cubic feet -----    |                                        |     |     |      |      |      |      |
| <u>WOOD</u> <sup>3/</sup> |                                        |     |     |      |      |      |      |
| 6                         | 0.2                                    | 0.3 | 0.4 | 0.4  |      |      |      |
| 7                         | .4                                     | .5  | .6  | .7   |      |      |      |
| 8                         | .5                                     | .7  | .8  | .9   | 1.1  |      |      |
| 9                         | .7                                     | .9  | 1.1 | 1.3  | 1.5  | 1.7  |      |
| 10                        | .9                                     | 1.2 | 1.4 | 1.7  | 2.0  | 2.3  | 2.6  |
| 11                        | 1.2                                    | 1.5 | 1.8 | 2.2  | 2.5  | 2.9  | 3.3  |
| 12                        | 1.5                                    | 1.9 | 2.3 | 2.7  | 3.2  | 3.6  | 4.1  |
| 13                        | 1.8                                    | 2.3 | 2.8 | 3.4  | 3.9  | 4.5  | 5.1  |
| 14                        | 2.2                                    | 2.8 | 3.4 | 4.1  | 4.7  | 5.4  | 6.2  |
| 15                        | 2.6                                    | 3.3 | 4.1 | 4.9  | 5.7  | 6.5  | 7.4  |
| 16                        |                                        | 4.0 | 4.8 | 5.8  | 6.7  | 7.7  | 8.7  |
| 17                        |                                        | 4.6 | 5.7 | 6.7  | 7.9  | 9.0  | 10.2 |
| 18                        |                                        |     | 6.6 | 7.8  | 9.1  | 10.5 | 11.8 |
| 19                        |                                        |     | 7.6 | 9.0  | 10.5 | 12.0 | 13.6 |
| 20                        |                                        |     | 8.6 | 10.3 | 12.0 | 13.8 | 15.6 |
| <u>BARK</u> <sup>4/</sup> |                                        |     |     |      |      |      |      |
| 6                         | 0.2                                    | 0.3 | 0.3 | 0.4  |      |      |      |
| 7                         | .3                                     | .4  | .5  | .5   |      |      |      |
| 8                         | .4                                     | .5  | .6  | .7   | 0.8  |      |      |
| 9                         | .6                                     | .7  | .8  | .9   | 1.1  | 1.2  |      |
| 10                        | .7                                     | .9  | 1.0 | 1.2  | 1.3  | 1.5  | 1.7  |
| 11                        | .9                                     | 1.1 | 1.2 | 1.4  | 1.6  | 1.8  | 2.0  |
| 12                        | 1.0                                    | 1.3 | 1.5 | 1.7  | 2.0  | 2.2  | 2.4  |
| 13                        | 1.2                                    | 1.5 | 1.8 | 2.1  | 2.3  | 2.6  | 2.9  |
| 14                        | 1.5                                    | 1.8 | 2.1 | 2.4  | 2.7  | 3.1  | 3.4  |
| 15                        | 1.7                                    | 2.1 | 2.4 | 2.8  | 3.2  | 3.6  | 3.9  |
| 16                        |                                        | 2.4 | 2.8 | 3.2  | 3.6  | 4.1  | 4.5  |
| 17                        |                                        | 2.7 | 3.2 | 3.7  | 4.1  | 4.6  | 5.1  |
| 18                        |                                        |     | 3.6 | 4.1  | 4.7  | 5.2  | 5.8  |
| 19                        |                                        |     | 4.0 | 4.6  | 5.3  | 5.9  | 6.5  |
| 20                        |                                        |     | 4.5 | 5.2  | 5.9  | 6.6  | 7.3  |

continued

Table 24.--Predicted green volume of wood and bark in branches for  
longleaf pine trees 6 to 20 inches d.b.h.<sup>1/</sup> (continued)

| D.b.h.<br>(inches)          | Total tree height (feet) <sup>2/</sup> |     |      |      |      |      |      |
|-----------------------------|----------------------------------------|-----|------|------|------|------|------|
|                             | 50                                     | 60  | 70   | 80   | 90   | 100  | 110  |
| ----- Cubic feet -----      |                                        |     |      |      |      |      |      |
| WOOD AND BARK <sup>5/</sup> |                                        |     |      |      |      |      |      |
| 6                           | 0.5                                    | 0.6 | 0.7  | 0.8  |      |      |      |
| 7                           | .7                                     | .9  | 1.0  | 1.2  |      |      |      |
| 8                           | 1.0                                    | 1.2 | 1.4  | 1.7  | 1.9  |      |      |
| 9                           | 1.3                                    | 1.6 | 1.9  | 2.2  | 2.6  | 2.9  |      |
| 10                          | 1.6                                    | 2.0 | 2.5  | 2.9  | 3.3  | 3.8  | 4.2  |
| 11                          | 2.1                                    | 2.6 | 3.1  | 3.6  | 4.2  | 4.8  | 5.4  |
| 12                          | 2.5                                    | 3.2 | 3.8  | 4.5  | 5.2  | 5.9  | 6.6  |
| 13                          | 3.1                                    | 3.9 | 4.6  | 5.5  | 6.3  | 7.1  | 8.0  |
| 14                          | 3.7                                    | 4.6 | 5.6  | 6.5  | 7.5  | 8.5  | 9.6  |
| 15                          | 4.4                                    | 5.4 | 6.6  | 7.7  | 8.9  | 10.1 | 11.3 |
| 16                          |                                        | 6.4 | 7.7  | 9.0  | 10.4 | 11.8 | 13.2 |
| 17                          |                                        | 7.4 | 8.9  | 10.4 | 12.0 | 13.7 | 15.3 |
| 18                          |                                        |     | 10.2 | 12.0 | 13.8 | 15.7 | 17.6 |
| 19                          |                                        |     | 11.6 | 13.7 | 15.8 | 17.9 | 20.1 |
| 20                          |                                        |     | 13.2 | 15.5 | 17.8 | 20.3 | 22.7 |

<sup>1/</sup> Blocked-in area indicates range of data.

<sup>2/</sup> Includes 1-foot stump allowance.

<sup>3/</sup>  $\log_{10} Y = -4.84899 + 1.30101 \log_{10} D^2Th.$

<sup>4/</sup>  $\log_{10} Y = -4.10690 + 1.07007 \log_{10} D^2Th.$

<sup>5/</sup>  $\log_{10} Y = -4.26121 + 1.20985 \log_{10} D^2Th.$

Taras, Michael A., and Alexander Clark III

1976. Aboveground biomass of longleaf pine in a natural sawtimber stand in southern Alabama. USDA For. Serv. Res. Pap. SE-162, 32 p. Southeast. For. Exp. Stn., Asheville, N.C.

Longleaf pine trees 6 to 18 inches d.b.h. were selected from a natural, uneven-aged sawtimber stand in southern Alabama to determine weight and volume of aboveground biomass. On the average, 85 percent of the dry weight of the total tree was wood, 11 percent was bark, and 4 percent was needles. The average tree sampled had 88 percent of its wood in the stem and 12 percent in the crown. Trends in biomass proportions are discussed. Specific gravity, moisture content, and green weight per cubic foot are presented for the total tree and its components. Tables developed with regression equations predict weight and cubic foot volume of the total tree and its components by d.b.h. and total height classes.

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