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1965 STATUS REPORT

SOUTHERN WOOD DENSITY SURVEY

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

JOINT REPORT OF:
FOREST PRODUCTS LABORATORY
SOUTHEASTERN FOREST EXPERIMENT STATION
SOUTHERN FOREST EXPERIMENT STATION

ABSTRACT

In the survey of southern forest resources, information was collected on the specific gravity of the four major southern pines. This report presents mean specific gravities by State, survey unit, and diameter class for each species.

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ACKNOWLEDGMENT

Forest Survey in the South, including increment core sampling for wood density determination, is conducted in cooperation with local wood-using industries and various State agencies. In the pilot wood density study in Mississippi, for example, State and industry cooperation amounted to 40 percent of the total cost of the field work. The very substantial assistance received from State agencies and industry cooperators throughout the South is hereby gratefully acknowledged.

Southern Wood Density Survey

1965 STATUS REPORT

BY

Forest Service[1]

U. S. Department of Agriculture

PURPOSE

The primary purpose of this publication is to provide interested State, private, and Federal agencies with the most complete and up-to-date basic information now available on the specific gravity of southern pines. The report consists largely of tables and charts that summarize the major findings to date of the Southern Wood Density Survey. The field and laboratory methods used in this continuing study are described in some detail, the tabular material and charts are explained, but there is a minimum of interpretation and discussion.

Some of the data here summarized have been published in full or in part in earlier reports (3,4,8),[2] but the bulk of the material has not been previously published. Additional reports will be issued from time to time as the survey is extended to other States, as more thorough statistical analysis and study of the data develop new information, new relationships, or suggest new applications, and as other quality characteristics are more fully explored.

INTRODUCTION

The Southern Wood Density Study is part of a systematic Nationwide survey to determine the specific gravity and related quality characteristics of all commercially important coniferous species. The overall objective is to develop better information on the quality of the Nation's forest resources.

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[1] Report issued by the Forest Products Laboratory, Madison, Wis. Collection and processing of data were handled cooperatively by the Laboratory, the Southern Forest Experiment Station at New Orleans, La., and the Southeastern Forest Experiment Station at Asheville, N.C.

[2] Underlined numbers in parentheses refer to Literature Cited at the end of this report.

All phases of the work are conducted by the U.S. Forest Service in close cooperation with industry and the States. The calibrated increment borer technique used in this work, and other now widely adopted specialized procedures, evolved from research on southern pines. These procedures were given their first large-scale test in Mississippi in the mid-1950's. Normally all field work, including increment core sampling, is carried on in connection with the regular activities of the Nationwide Forest Survey.

The pulp and paper industry early recognized the existence of major differences in specific gravity between species, as reflected in pulp yields, and also noted that wood from certain areas produced higher yields than pulpwood of the same species procured in other localities. The density survey data, to the extent now completed, provide a basis for estimating average pulp yields by species, diameter classes, and areas.

Producers of structural lumber, plywood, laminated arches and beams, and high-quality transmission poles and piling are equally concerned with the density of their raw material. Their interest, of course, stems from the well-established relationship between specific gravity and the strength and stiffness properties of solid wood and laminated products. Because their product is judged on the performance of individual pieces, they may be as much concerned with the variation in specific gravity among individual trees as with average values.

SURVEY OBJECTIVES

The objectives of the Southern Wood Density Survey as presently conceived and conducted are:

1. To obtain, by systematic sampling, adequate data on the average specific gravity and related quality characteristics of each major species of southern pine, the magnitude of the differences between species, and the variation within species.

2. To seek out, through systematic sampling, living trees that are superior in wood quality as well as form, growth rate, pest resistance, and other desirable characteristics, so they may be used in breeding studies and to provide scion material for seed orchards.

3. To learn more about the effects of environmental and other factors on specific gravity and related wood quality characteristics so forest managers can put this information to practical use in growing higher value trees.

4. When existing test data are deficient, to conduct such destructive sampling and laboratory testing as are' necessary to better establish, for each of the commercially important species over the range of specificgravities found in the systematic survey, the relationships between specific gravity and the strength and stiffness of clear wood specimens. Sound data on specific gravity–strength relationships are basic to the establishment of basic stresses and working stresses for structural applications.

ASSIGNMENT OF RESPONSIBILITIES

The Southern Wood Density Survey divides logically into four phases:

Phase I––This phase is concerned with the planning and collection of increment core and related data from sample trees on plots distributed throughout the commercial forest area of the Southern States. The Forest Survey units of the Southern and Southeastern Forest Experiment Stations collect these data as a part of their regular survey work.

Phase 11––Included in this phase are the laboratory processing of the sample cores and the statistical analysis of the resulting data. These two tasks are the responsibility of the Forest Products Laboratory (FPL). Interpretation of the results and report writing are handled jointly by FPL and the two Experiment Stations.

Phase 111––This task consists of studies to determine, for each major species over its natural range, the relationship between increment core specific gravity at breast height and the average (tree) specific gravity for the merchantable volume of the whole tree, or various portions thereof. Included are presampling in the field, the felling and destructive sampling of over a thousand selected trees, the collection of sample disks at various intervals up the bole from stump to a variable merchantable top diameter, laboratory processing of the disks, and statistical analysis and interpretation of the resulting data. In the South, planning and field work are handled jointly by FPL and the two Stations; laboratory processing of the sample material and statistical analysis of the resulting data are the responsibility of FPL; and interpretation of results and report writing are jointly handled by FPL and the Stations.

Phase IV––This phase of the study is aimed at utilizing the wood density data derived from the earlier phases to obtain more reliable estimates of strength properties. The exact nature and magnitude of Phase IV cannot be precisely determined until substantially complete data on the other phases become available

for inspection and comparison with existing information on specific gravity-strength relationships for clear wood specimens of the species concerned. If deemed adequate, then existing specific gravity-strength relationship data will be so combined with the systematic survey data as to develop more reliable estimates of strength properties for the various species and major producing areas. The procedures to be followed are essentially similar to those discussed in Report No. 1 on the Western Wood Density Survey (6). Precise estimates of the strength and stiffness of clear wood specimens are basic to the establishment of basic stresses and working stresses for structural applications. The FPL will do this phase of the work.

PHASE I--COLLECTION OF SAMPLE INCREMENT CORES AND RELATED DATA

Collection of increment cores and related data for the Southern Wood Density Survey was begun in Mississippi in 1956.

The Forest Survey Project at the Southeastern Forest Experiment Station completed Phase I of the survey in Georgia, North Carolina, and Florida (except the Northwest Unit). The Forest Survey Project at the Southern Forest Experiment Station completed this phase in Mississippi, Arkansas, Alabama, and Louisiana. The work was conducted in conjunction with scheduled forest inventories.

Field data collected for the wood density survey include:

Trees	Cores	Plots
Species	Length to 1/100 inch	State
Diameter at breast height to 1/10 inch	Diameter to 1/1000 inch	Survey unit
Merchantable length		County
		Geographic coordinates

Maintenance of plot and tree identity permits recovery of other items measured or described for inventory purposes.

Sampling Design

In Florida, Georgia, and North Carolina, wood density was sampled at every fifth forest inventory plot. Initially the forest inventory plots were selected from a systematic grid printed on every third aerial photograph in alternate flight lines, using an interval which would provide sufficient plots to meet specified limits of error for volume estimates.

In Mississippi, wood density was sampled at all forest inventory locations at the intersections of a 3- by 3-mile grid extending over the State.

In Alabama, Arkansas, and Louisiana, wood density samples were taken at forest inventory locations positioned at the intersections of 12- by 12-mile grids extending over the States. In Arkansas and Mississippi, two wood density plots were sampled at each wood density location.

To indicate the intensity of sampling, the following tabulation shows the commercial forest area divided by the number of wood density sampling locations:

State	Unit	Commercial forest area represented by each sample location[3] (acres)
Florida	Northeast	20,885
	Central	15,355
	South	17,395
Georgia	Southeast	15,515
	Southwest	11,165
	Central	14,025
	North Central	14,730
	Northern	17,885
North Carolina	N. Coastal Plain	14,355
	S. Coastal Plain	15,700
	Piedmont	17,525
Alabama	All	91,740
Arkansas	Excluding North Delta	93,090
Louisiana	Excluding Delta units	89,691
Mississippi	All	5,340

[3]Includes wood density sample plots that did not yield any cores.

Sample Tree Selection

Using point sampling procedures, sample trees were selected with frequency proportional to basal area. The basal area factors, the number of points sampled per location, and the minimum tree d.b.h. (diameter at breast height) class included were as follows:

State	Plots per location	Sampling points per plot	Basal area factor (sq-ft.)	Minimum d.b.h. class included (inch)
Alabama	1	10	37.5	5
Arkansas	2	1	10	3
Florida	1	1	10	4
Georgia	1	1	10	4
Louisiana	1	10	37.5	5
Mississippi	2	1	10	3
North Carolina:				
Coastal Plain	1	1	10	4
Piedmont	1	4	37.5	4

Core Sample

In all states sampled, one core was extracted from each sample tree on the side of the tree facing plot center. In Alabama and Arkansas, a second core was taken at a position 90° clockwise from the first core.

Cores were obtained from a boring extending as nearly to the pith center at d.b.h. as permitted by the length of the borer and the size of the tree. The bark, pith, and the most recent incomplete season's growth were removed by trimming. The length of the core was then carefully measured. The bore diameter of the increment borer, previously determined with a taper gage,

was recorded as core diameter. Each core was placed in a paper straw and properly labeled. As the surveys progressed, accumulated cores were sent to the Forest Products Laboratory, where specific gravity determinations were made.

The number of trees sampled by species and States were:

State	Loblolly	Shortleaf	Longleaf	Slash	Total
Alabama	609	209	99	84	1,001
Arkansas	259	393	---	---	652
Florida	35	---	167	307	509
Georgia	1,247	599	337	760	2,943
Louisiana	500	138	45	36	719
Mississippi	3,752	2,815	992	576	8,135
North Carolina	1,311	407	109	---	1,827

The number of trees shown here includes only the principal species—loblolly, shortleaf, longleaf, and slash. Cores were also collected from other southern pine species occurring in the sample.

PHASE II--INCREMENT CORE PROCESSING

Increment cores and accompanying field data sheets were mailed to the Forest Products Laboratory by the Experiment Stations. To prevent loss or breakage during shipment, the cores were placed in individual straws and then packed in special corrugated containers.

At the Laboratory, routine determinations were made of age, by ring count, and of specific gravity. Use of individually calibrated increment borers of known diameter, and measurement of green core lengthinthe field (and of the resoaked core again in the Laboratory), permitted direct calculation of the green volume

of each core. Ovendrying and weighing to 0.001 gram was the final step in the determination of specific gravity on a dry weight-green volume basis. The procedures followed have been described in detail by Mitchell (2).

To facilitate statistical analysis, all pertinent field and laboratory data were punched on automatic data processing (ADP) cards--one card for each tree sampled.

PHASE III--ESTIMATING TREE SPECIFIC GRAVITIES FROM CORE SPECIFIC GRAVITIES

In southern pines, specific gravity tends to decrease with height in the tree and to increase with distance from pith. Thus, an increment core specific gravity taken at breast height normally overestimates the average specific gravity of the merchantable portion of the tree. Studies of the relationships between tree specific gravity and breast height increment core specific gravities have been made for the four southern pines in Mississippi (7), for longleaf and slash pines in Georgia (5), and for loblolly and shortleaf pines in Arkansas (1). Also, although results have not been published, additional studies of loblolly and shortleaf pines were conducted in Virginia, South Carolina, and Georgia. Locations of the sampling areas are indicated in figure 1.

Sampling procedures in each of the above studies involved extracting at least one increment core at a breast height position from each tree. After felling the tree, a disk was sawn at approximately breast height and from the top end of each consecutive 5-foot bolt up to a merchantable top diameter of 3 inches, d.i.b. (diameter inside bark). For sawtimber trees (at least 9 inches d.b.h.) disks were cut from the top end of each saw log and from each pulpwood bolt in the upper bole. Specific gravity for trees was calculated as the average of component logs and bolts, each piece being weighted according to its volume (7).

To provide regression equations for converting increment core specific gravity to average weighted tree specific gravity, all available data for a species were pooled. For each species, a separate simple regression of the form,

$$\text{Tree gravity} = a + b\ (\text{core gravity})$$

was developed for each of four diameter classes, 3.0-4.9, 5.0-8.9, 9.0-14.9, and 15.0 inches plus.

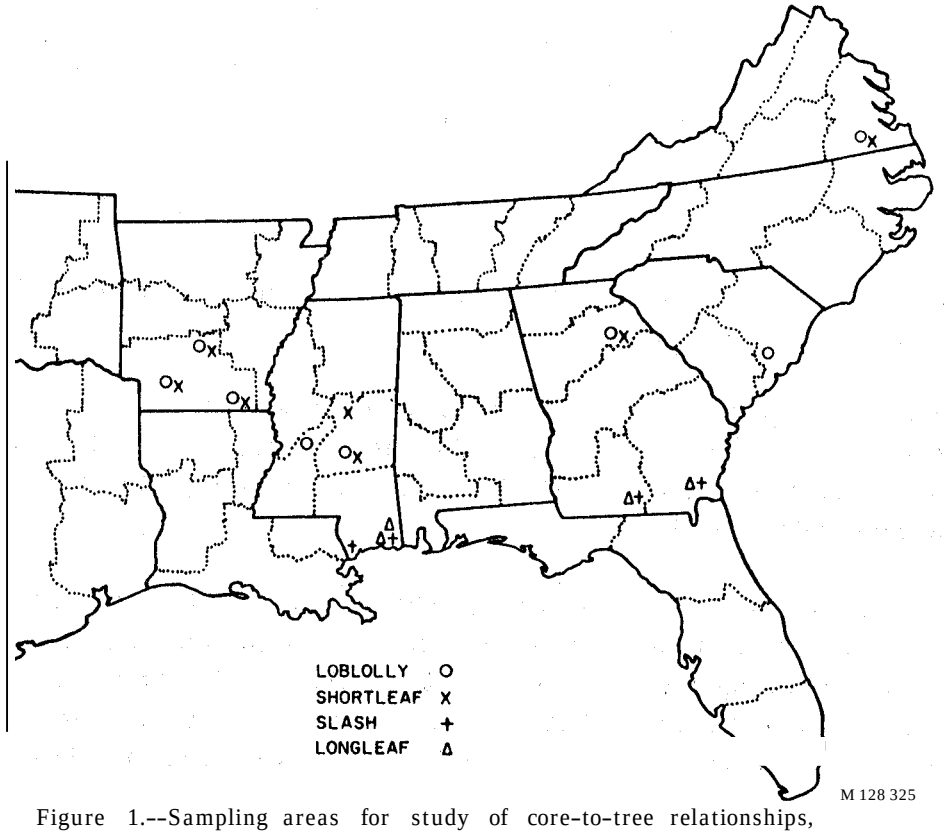

Figure 1.--Sampling areas for study of core-to-tree relationships,

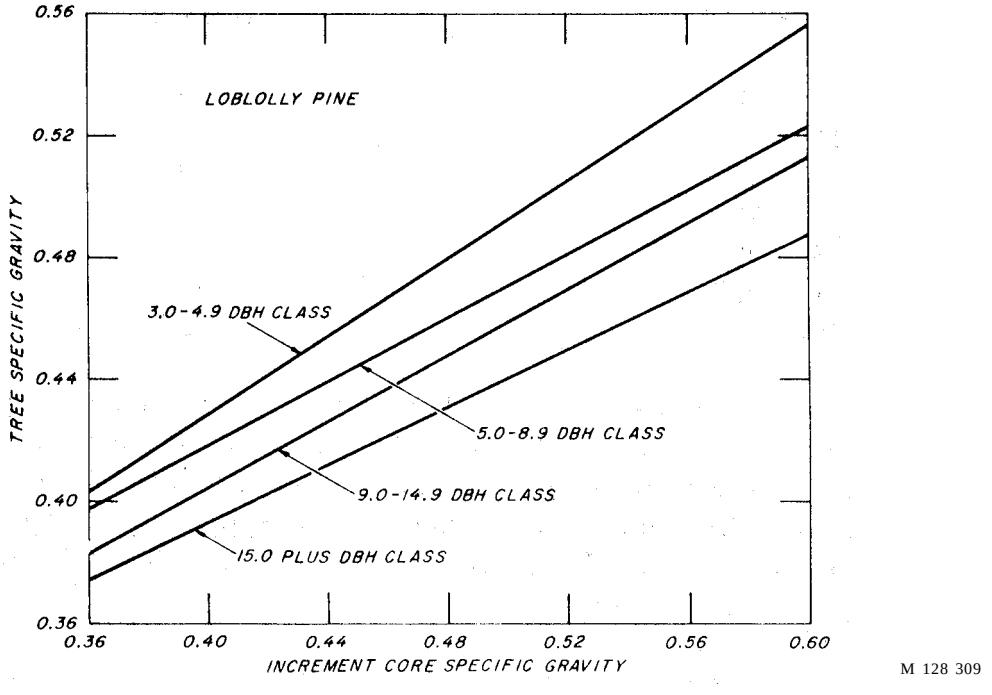

Figure 2. --Loblolly pine: Relationship between tree specific gravity and core specific gravity for four diameter classes,

Where data were insufficient, as in longleaf and slash pine, only two diameter classes were recognized, 3.0–8.9 and 9.0 inches plus. With these broader diameter classes a multiple regression equation of the form,

$$\text{Tree gravity} = a + b_1 \text{ (core gravity)} + b_2 \text{ (d.b.h.3}$$

was generally a significant improvement over a simple equation utilizing core gravity alone.

Another regression equation was developed for an "all diameters" class for each species. As with the broader diameter classes, a multiple regression equation involving core gravity and d.b.h. also proved a significant improvement over a simple relationship.

In addition to the above equations, which are used to predict the average gravity of the wood in a tree up to a pulpwood top, separate equations were derived for predicting the average gravity of the sawtimber material in trees 9.0 inches d.b.h. and larger. The minimum top diameters used in defining the saw log top depended on the tree d.b.h. (in line with standard Forest Survey practice). The specified limits were as follows:

D.b.h. (inches)	Minimum top d.i.b. (inches)
9 - 10	6
11 - 12	7
13 - 14	8
15 - 17	9
18 - 20	10
21 - 25	11
26+	12

Tree specific gravities for sawtimber size trees, therefore, represent the average specific gravity of the material that can be converted to lumber, excluding the material between the saw log top and a top d.i.b. of 3 inches. Tree specific gravities for <u>any other diameter classification used in the report</u> represent the average specific gravity of the total merchantable volume from a 1–foot stump to a 3–inch d.i.b. top.

The regression equations along with the coefficients of correlation and standard deviations from regression are shown in table 1 at the end of this report. For illustrative purposes, the simple linear equations for loblolly pine are shown in figure 2.

The equations given in table 1 were used to calculate the average tree specific gravity values for each species, diameter class, and survey unit. These values are given in tables 2 through 25. The reader should keep in mind that equations developed, except those for the sawtimber class, predict the average estimated tree specific gravity up to a 3-inch top diameter. The sawtimber equations predict the average estimated specific gravity by species and survey units for the sawtimber portion only of trees 9.0 inches d.b.h. and above.

SUMMARY OF SPECIFIC GRAVITY INFORMATION

The specific gravity information obtained thus far in the Southern Wood Density Survey is summarized in tables 2 through 25 at the end of this report. Each table presents the information for a single species and State. Within each table the data are arranged by diameter classes and Forest Survey units.

For each of these categories the following information is given:

1. Sample size.

   a. Number of sample locations at which the particular species and size class was found during the density survey.

   b. Number of trees from which increment cores were obtained,

   The size of sample provides a rough indication of the reliability of the sample data. In general, values based on a small number of trees or locations are not as reliable as those based on a large sample. It should be noted that sample sizes may be small either because of a low sampling intensity or because of the scarcity of trees of a particular species and size class.

2. Mean diameter (outside bark at breast height) of sampled trees. Core gravity tends to increase with tree diameter. For this reason, average diameter should be considered when comparing the average gravities of two or more areas. Because the sampled trees were selected with probability proportional to their basal area, the average diameter of the core-sampled trees is not an estimate of the average diameter of all stems.

3. Increment core specific gravity.

   a. For each species-diameter class-survey unit combination, the mean core specific gravity and its standard error were computed as follows:

$$\text{Mean Core Specific Gravity: } \overline{C} = \frac{\sum_i \sum_j C_{ij}}{\sum_i n_i}$$

where: C_{ij} = The core specific gravity of the jth tree at the ith location.

n_i = The number of trees sampled at the ith location.

b. The standard error of this mean is approximated by

$$\text{Standard Error} = \sqrt{\frac{k}{(\Sigma n_i)^2}\left[\frac{\Sigma S_i^2 + \overline{C}^2 \Sigma n_i^2 - 2\overline{C}\Sigma n_i S_i}{k - 1}\right]}$$

where: k = The number of locations at which trees were bored for specific gravity.

S_i = The sum of the core specific gravities at the ith location $(= \sum_j C_{ij})$

The standard error provides an indication of the precision with which the sample mean estimates the population mean. As a rough guide we can say that unless a one-in-twenty chance has occurred in sampling, the sample mean will be within two standard errors of the population mean. Standard errors could not be computed for the means that were based on samples from less than two locations.

c. The standard deviation of individuals is a measure of the variation among individuals in the population sampled. As an approximation we can say that about 95 percent of the individuals in the population will be within two standard deviations of the mean. This estimate of the standard deviation was obtained from the sample range of the core gravities (using tabular values of the ratio of the standard deviation to the range). In this report, standard deviations are not shown if there were less than two locations or five trees in the sample.

4. Estimated specific gravity of the usable portion of the tree.

a. The method of obtaining the tree gravity estimates has been discussed in the previous section. Again it should be noted that the tree gravities for sawtimber represent the average gravity of the material up to a saw log top. For all other classes in the tables, the tree gravity is an estimated average for the material up to a pulpwood (3 inches d.i.b.) top.

b. The standard error of mean tree specific gravity provides a measure of the precision with which the true mean has been estimated. As a rough guide we can say that unless a one-in-twenty chance has occurred in sampling, the sample mean will be within two standard errors of the population mean. Because of these sampling errors, considerable caution must be used in comparing the means of any two areas. As a rule of thumb, if we wish to compare two means, $\bar{X}_1$ and $\bar{X}_2$, with standard errors E_1 and E_2, then unless the difference between these two means is greater than $2\sqrt{E_1^2 + E_2^2}$ it may not represent a real difference but one due to chance (sampling error).

5. Total cubic foot volume for the given size class, species, and survey unit. These volumes include a very slight amount of cull material. It should be noted that the volumes are shown for a given diameter class only if there were increment core data available for that class. For this reason, in a given survey unit, the diameter class volumes may not add up to the volume shown for "all diameters."

Some of the information given in these tables has also been presented in figures 3 through 11. Figure 3 shows the area covered by the various survey units. Figures 4 to 7 show the mean core specific gravity by diameter classes for each species and the number of sample trees on which these averages are based. Figures 8 to 11 give the estimated mean specific gravity of the saw log portion of trees 9.0 inches in diameter and larger. In all of these figures, means are omitted if they are based on fewer than five trees or samples from less than two locations.

Remarks on Slash Pine

The average specific gravities for slashpine show a rather pronounced increase from north to south—particularly in the Florida survey units. It has been suggested that this may be, in part, attributable to differences in pitch content. To explore this possibility, 307 slash pine cores from Florida were extracted for 3 days with alcohol benzene in a Lloyd extractor. The results were as follows:

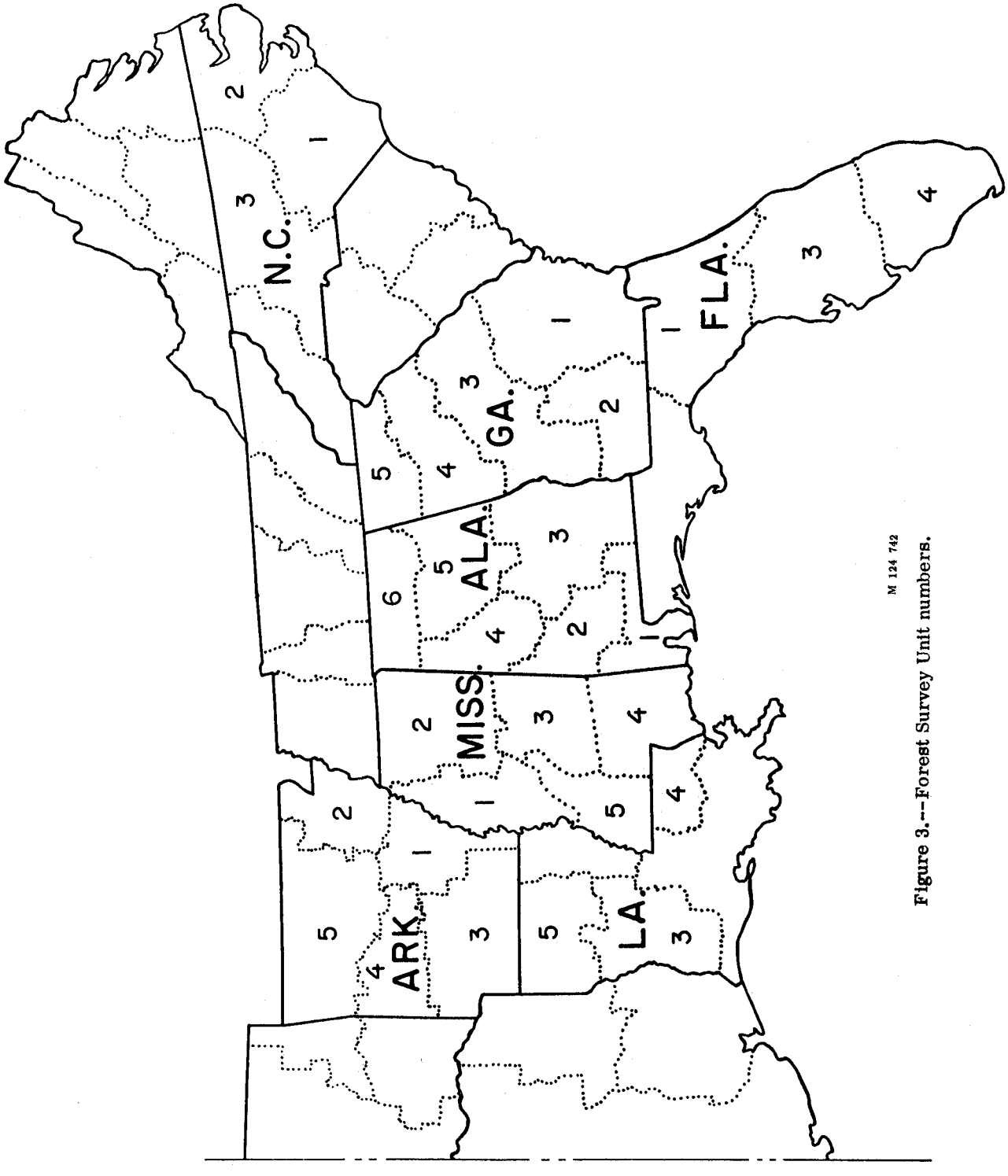

Figure 3.--Forest Survey Unit numbers.

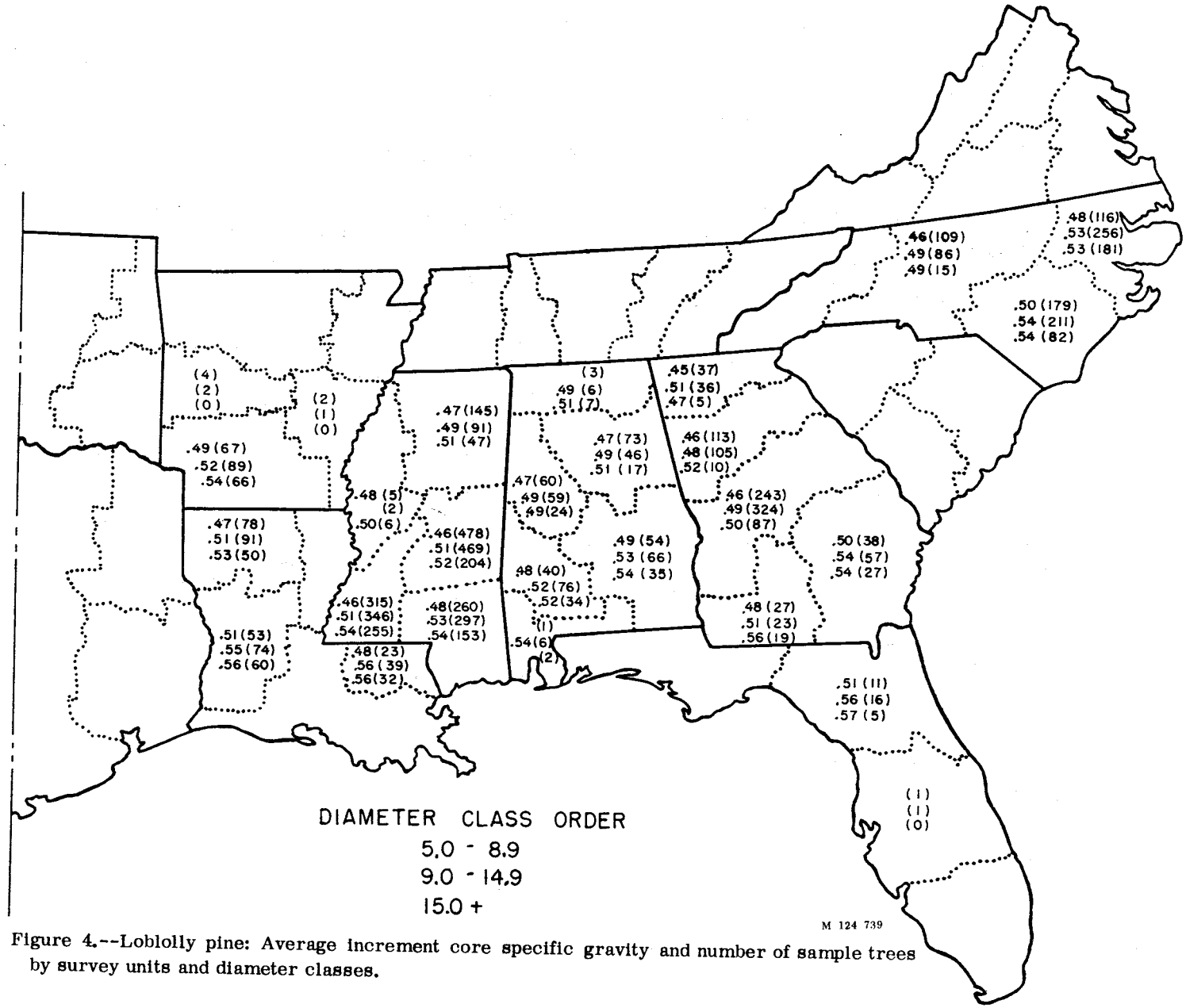

Figure 4.--Loblolly pine: Average increment core specific gravity and number of sample trees by survey units and diameter classes.

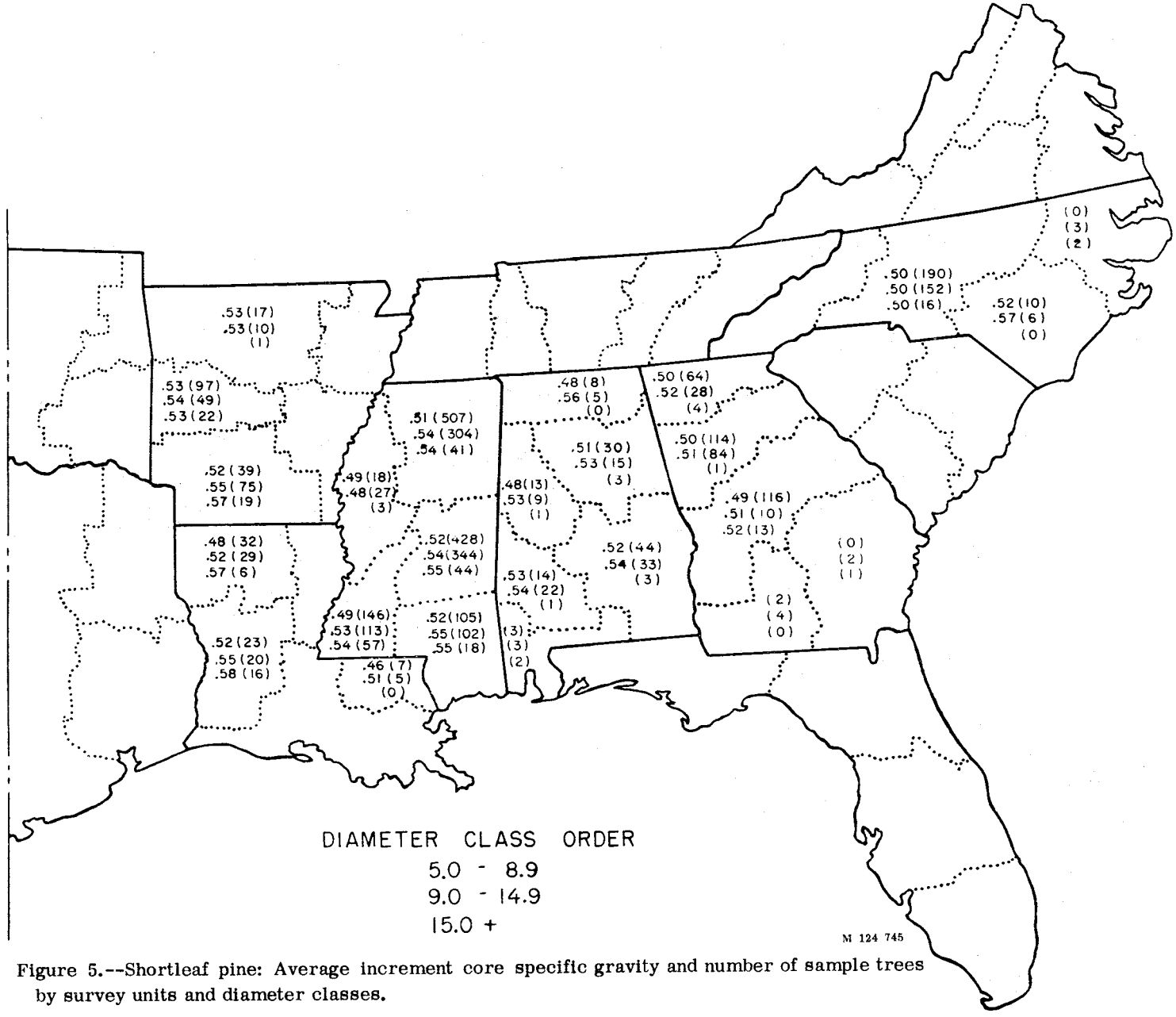

Figure 5.--Shortleaf pine: Average increment core specific gravity and number of sample trees by survey units and diameter classes.

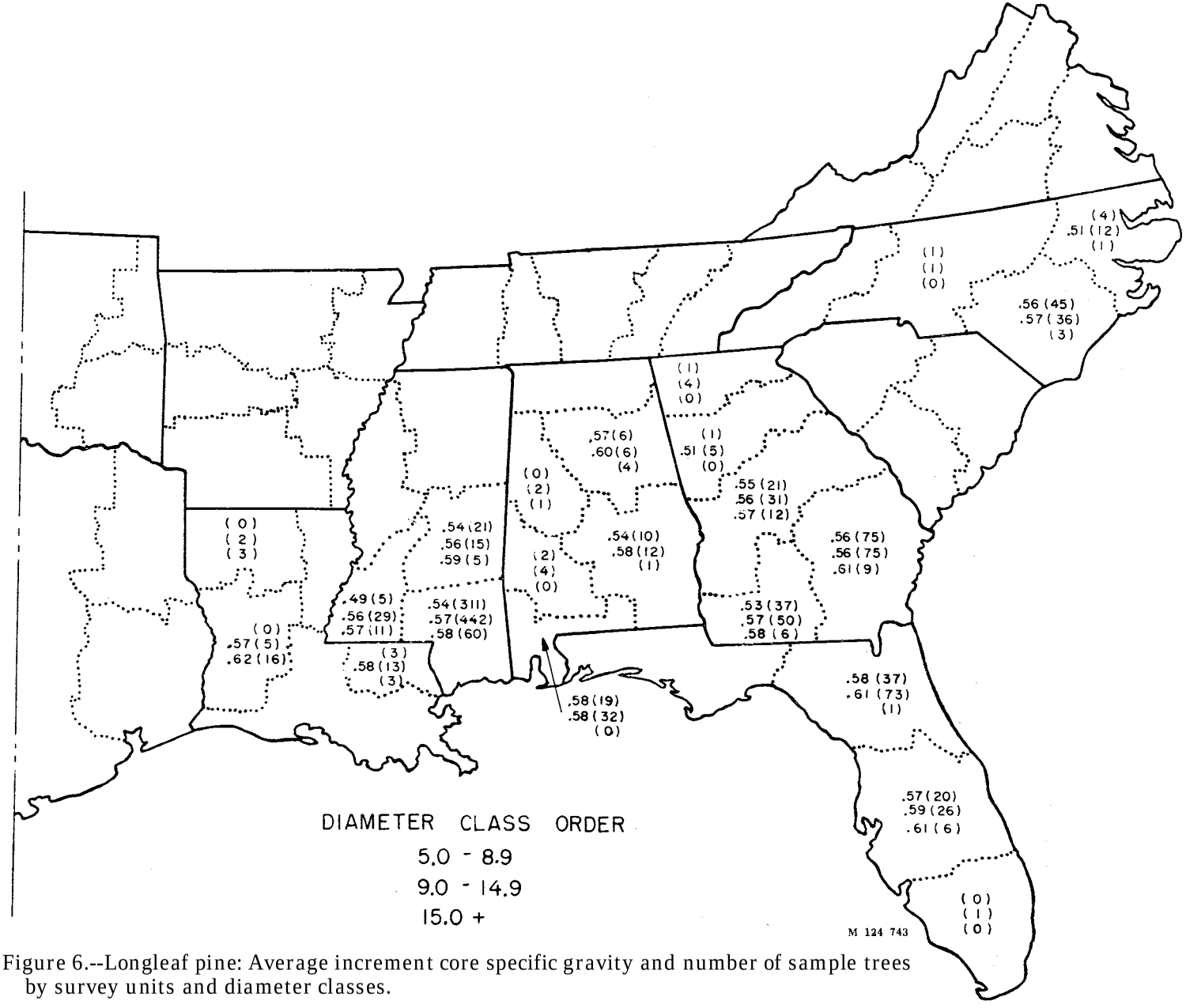

Figure 6.--Longleaf pine: Average increment core specific gravity and number of sample trees by survey units and diameter classes.

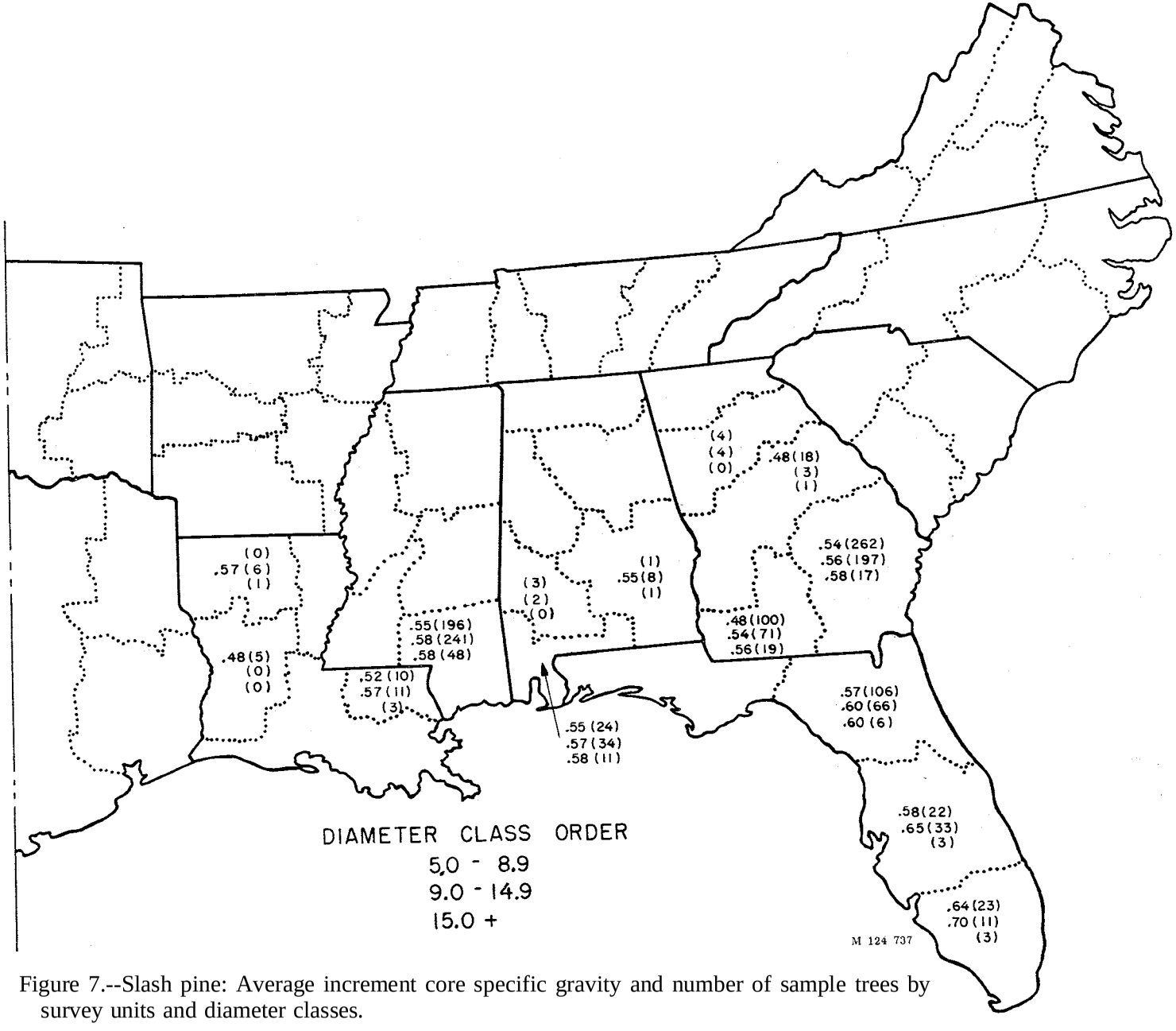

Figure 7.--Slash pine: Average increment core specific gravity and number of sample trees by survey units and diameter classes.

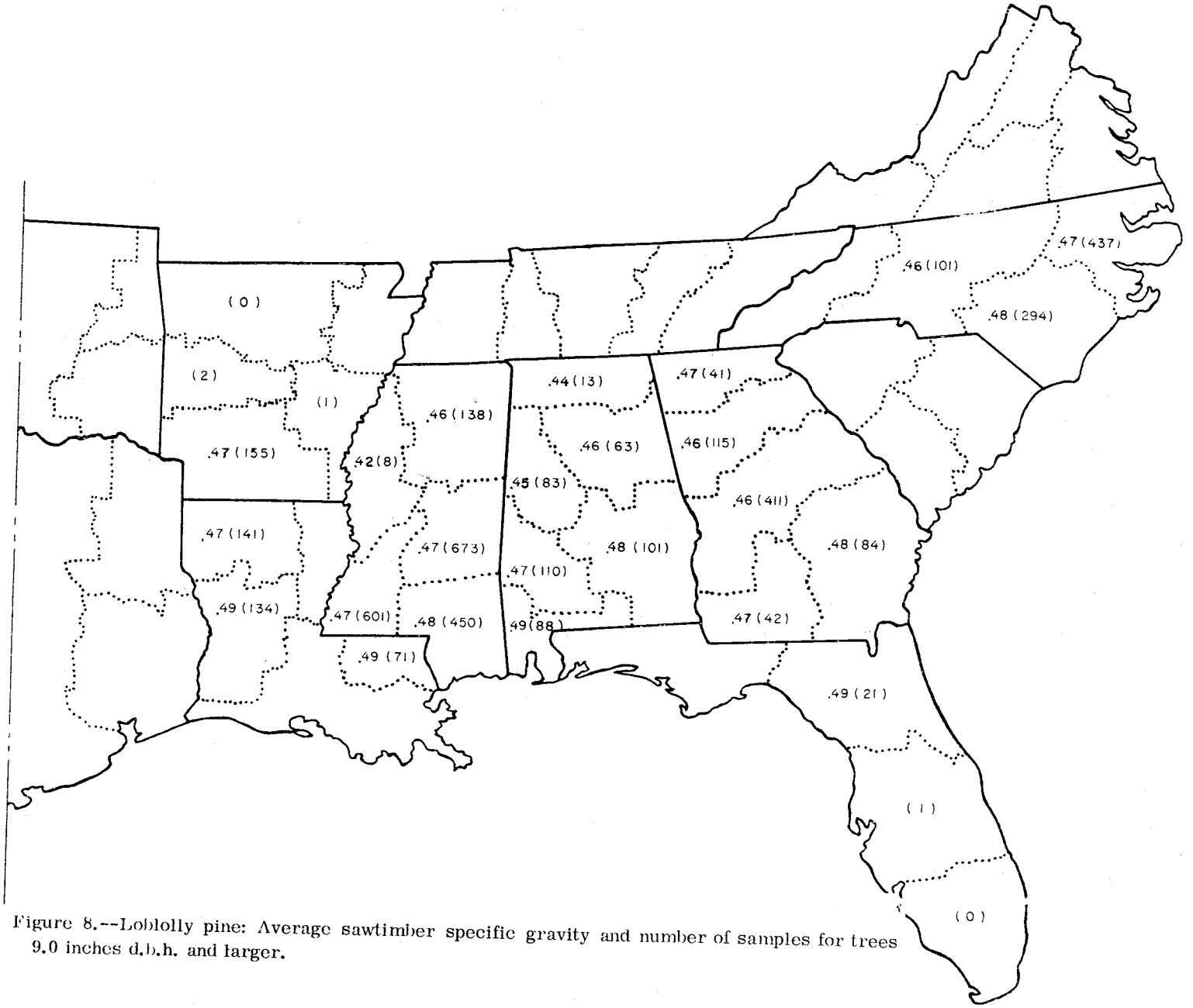

Figure 8.--Loblolly pine: Average sawtimber specific gravity and number of samples for trees 9.0 inches d.b.h. and larger.

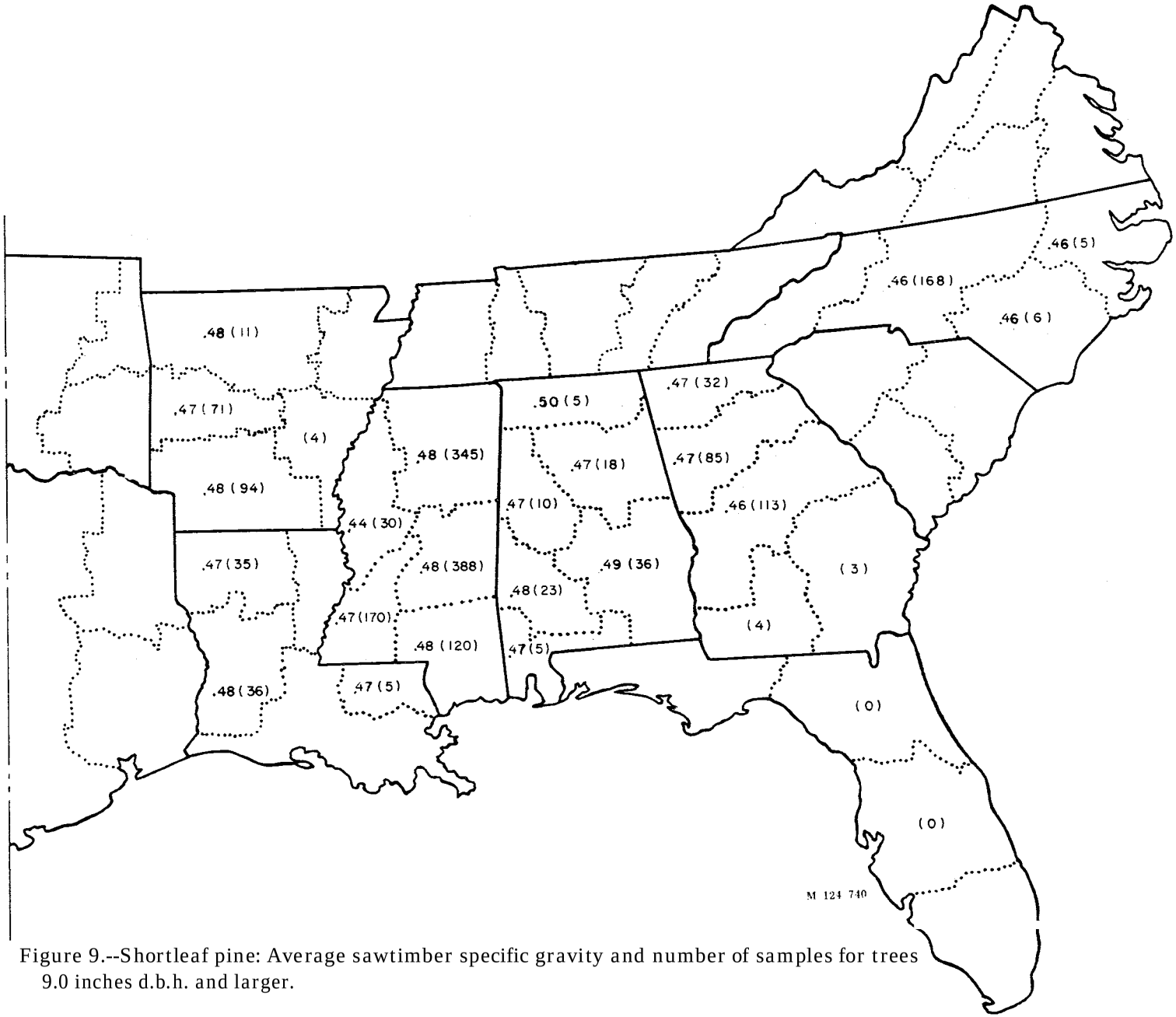

Figure 9.--Shortleaf pine: Average sawtimber specific gravity and number of samples for trees 9.0 inches d.b.h. and larger.

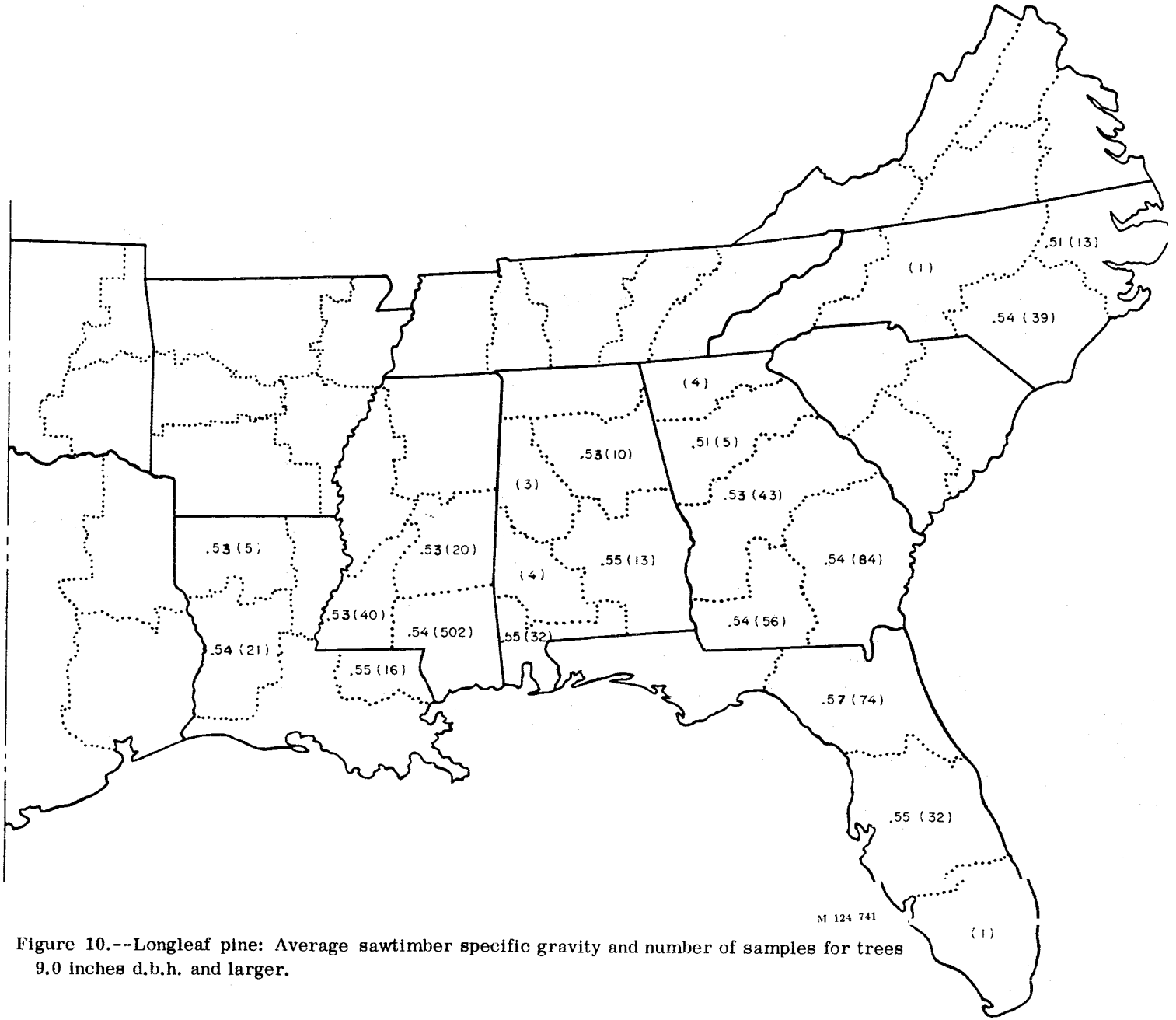

Figure 10.--Longleaf pine: Average sawtimber specific gravity and number of samples for trees 9.0 inches d.b.h. and larger.

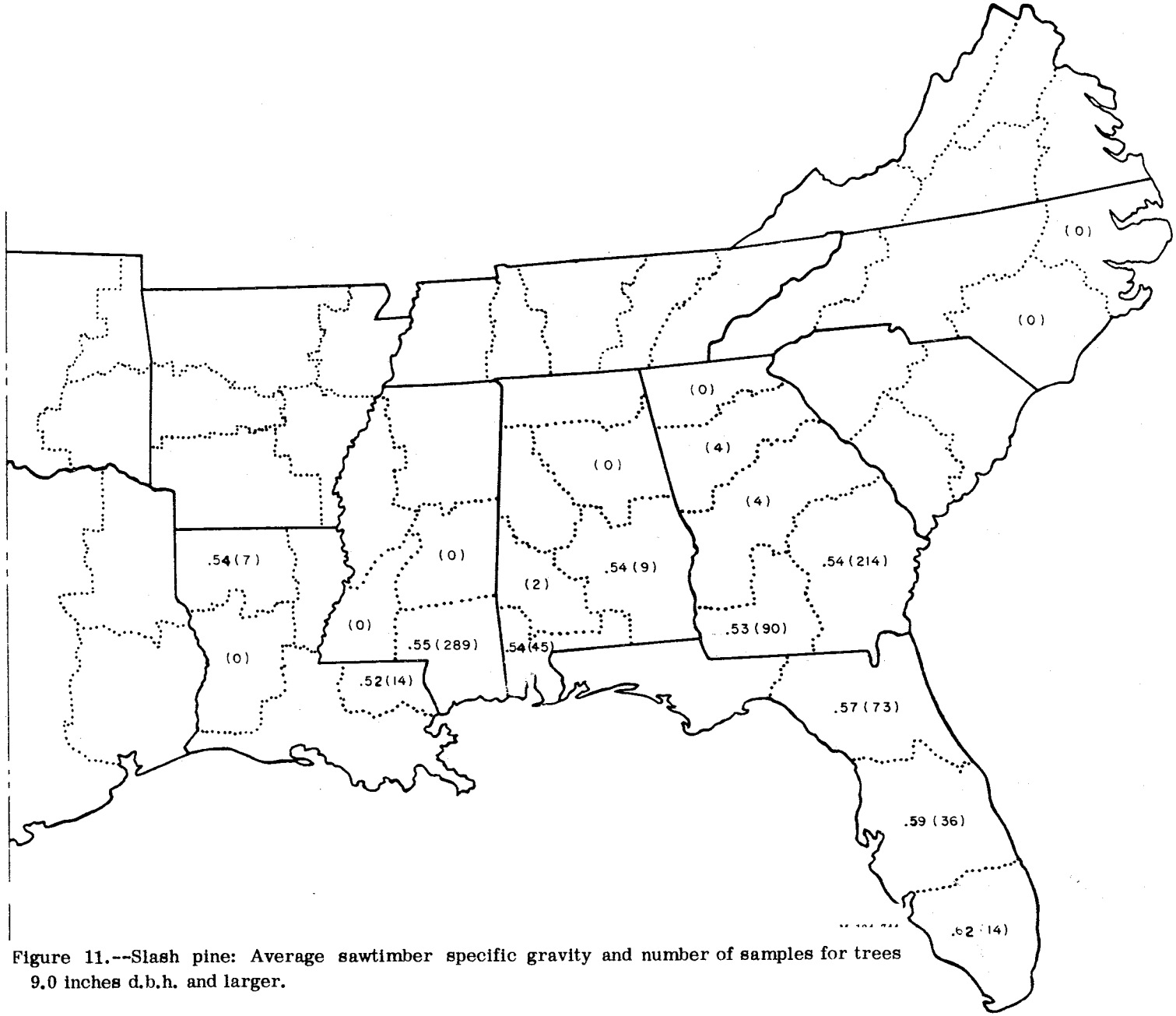

Figure 11.--Slash pine: Average sawtimber specific gravity and number of samples for trees 9.0 inches d.b.h. and larger.

Survey unit	Specific gravity before extraction		Specific gravity after extraction	
	Mean and standard error	Range	Mean and standard error	Range
1–Northeast	0.574(0.012)	0.40–0.80	0.532(0.011)	0.35–0.70
3–Central	.617(.013)	.48– .79	-566(.010)	.45– .68
4–South	.661(.028)	.52– .88	.590(.019)	.47– .70

Although extraction did reduce the magnitude of the differences between units, the observed trend remains the same.

However, this trend should be regarded with considerable caution. In sampling slash pine, no attempt was made to distinguish between the typical variety (*Pinus elliottii* Engelm. var. *elliottii*) and the south Florida variety (*Pinus elliottii* Engelm var. *densa* Little and Dorman). The wood of south Florida slash pine is generally heavier than that of the typical variety. It is, therefore, possible that the observed trend of increasing specific gravity from north to south reflects an increasing proportion of south Florida slash pine in the sample.

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Table 1.--Southern pine tree gravity estimating equations, all sampling areas combined

Diameter class	Regression equations	Number of trees	Correlation coefficient	Standard deviation from regression
In.				
	LOBLOLLY PINE			
3.0- 4.9	Y=0.17430+0.63615(Core sp.gr.)	27	0.6992	0.025
5.0- 8.9	Y=0.20775+0.52568(Core sp.gr.)	138	.7174	.022
9.0-14.9	Y=0.18529+0.54585(Core sp.gr.)	142	.7740	.020
15.0+	Y=0.20269+0.47459(Core sp.gr.)	35	.6509	.025
All diam.	Y=0.22447-0.0033442(DBH)+0.54385(Core sp.gr.)	342	.7471	.021
Sawtimber:				
9.0+	Y=0.22040-0.0035688(DBH)+0.57364(Core sp.gr.)	176	.7827	.020
	SHORTLEAF PINE			
3.0- 4.9	Y=0.09621+0.79595(Core sp.gr.)	25	.7505	.026
5.0- 8.9	Y=0.28935+0.35800(Core sp.gr.)	133	.5316	.029
9.0-14.9	Y=0.17229+0.55541(Core sp.gr.)	120	.7914	.020
15.0+	Y=0.16767+0.52278(Core sp.gr.)	22	.7698	.019
All diam.	Y=0.26033-0.0039465(DBH)+0.47243(Core sp.gr.)	300	.7051	.025
Sawtimber:				
9.0+	Y=0.20394-0.0043035(DBH)+0.60574(Core sp.gr.)	142	.8266	.020
	LONGLEAF PINE			
3.0- 8.9	Y=0.30254-0.0075103(DBH)+0.52723(Core sp.gr.)	86	.7860	.021
9.0+	Y=0.21272-0.0037375(DBH)+0.63441(Core sp.gr.)	99	.7749	.027
All diam.	Y=0.25236-0.0047277(DBH)+0.58468(Core sp.gr.)	185	.7707	.025
Sawtimber:				
9.0+	Y=0.26982-0.0039395(DBH)+0.55631(Core sp.gr.)	99	.7655	.025
	SLASH PINE			
3.0- 8.9	Y=0.22893-0.0004820(DBH)+0.57700(Core sp.gr.)	104	.6584	.027
9.0+	Y=0.31060-0.0043370(DBH)+0.47563(Core sp.gr.)	84	.6737	.023
All diam.	Y=0.27322-0.0040380(DBH)+0.53806(Core sp.gr.)	188	.6664	.025
Sawtimber:				
9.0+	Y=0.31198-0.0058519(DBH)+0.52878(Core sp.gr.)	84	.7216	.024

Table 2.--Specific gravity data for loblolly pine in Alabama,

Diameter class	Survey unit area and number		Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.			No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled								
5.0- 8.9	North	(6)	2	3	6.6	0.462(.008)	---	0.45(.018)	20.2
	N. Central	(5)	19	73	7.0	.470(.010)	0.044	.46(.004)	187.8
	W. Central	(4)	16	60	7.0	.468(.007)	.043	.45(.004)	147.2
	Southeast	(3)	22	54	6.7	.489(.007)	.038	.46(.005)	213.2
	Southwest-N	(2)	15	40	7.1	.480(.012)	.042	.46(.005)	171.2
	Southwest-S	(1)	1	1	5.8	.517(--)	---	.48(--)	31.9
9.0-14.9	North	(6)	4	6	13.0	.490(.015)	.040	.45(.013)	46.6
	N. Central	(5)	11	46	11.3	.486(.013)	.047	.45(.005)	349.4
	W. Central	(4)	18	59	11.3	.486(.008)	.046	.45(.004)	326.1
	Southeast	(3)	26	66	11.6	.527(.007)	.071	.47(.004)	540.4
	Southwest-N	(2)	18	76	11.5	.522(.009)	.054	.47(.004)	519.1
	Southwest-S	(1)	3	6	11.1	.539(.004)	.032	.48(.013)	86.0
15.0+	North	(6)	1	7	21.8	.509(--)	---	.44(--)	44.0
	N. Central	(5)	7	17	17.1	.513(.010)	.033	.45(.009)	177.9
	W. Central	(4)	6	24	18.4	.491(.011)	.036	.44(.008)	198.9
	Southeast	(3)	15	35	16.9	.537(.006)	.031	.46(.007)	299.5
	Southwest-N	(2)	11	34	18.6	.522(.008)	.050	.45(.007)	335.6
	Southwest-S	(1)	2	2	17.8	.567(.040)	---	.47(.002)	80.8
All Classes	North	(6)	4	16	15.6	.493(.008)	.034	.44(.008)	111.6
	N. Central	(5)	26	136	9.7	.481(.008)	.049	.45(.003)	715.1
	W. Central	(4)	19	143	10.7	.479(.005)	.042	.45(.003)	672.2
	Southeast	(3)	38	155	11.1	.516(.006)	.061	.47(.003)	1053.1
	Southwest-N	(2)	21	150	11.9	.511(.010)	.052	.46(.003)	1025.9
	Southwest-S	(1)	5	9	12.0	.543(.009)	.040	.48(.011)	198.7
Sawtimber 9.0+	North	(6)	4	13	17.7	.500(.010)	.036	.44(.009)	91.4
	N. Central	(5)	13	63	12.9	.493(.011)	.045	.46(.004)	527.3
	W. Central	(4)	19	83	13.3	.488(.008)	.042	.45(.004)	525.0
	Southeast	(3)	27	101	13.5	.530(.005)	.065	.48(.004)	839.9
	Southwest-N	(2)	19	110	13.7	.522(.007)	.051	.47(.004)	854.7
	Southwest-S	(1)	4	8	12.8	.546(.010)	.042	.49(.012)	166.8

Table 3.--Specific gravity data for loblolly pine in Arkansas

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Ouachita (4)	1	3	4.3	0.472(--)	---	0.47(--)	-----
	Southwest (3)	11	25	4.1	.453(.012)	0.056	.46(.008)	-----
5.0- 8.9	Ouachita (4)	1	4	6.8	.495(--)	---	.47(--)	5.5
	South Delta (1)	1	2	7.5	.454(--)	---	.45(--)	10.3
	Southwest (3)	22	67	6.7	.493(.016)	.057	.47(.004)	331.4
9.0-14.9	Ouachita (4)	1	2	11.6	.606(--)	---	.52(--)	14.0
	South Delta (1)	1	1	10.4	.566(--)	---	.49(--)	17.2
	Southwest (3)	26	89	11.9	.521(.008)	.052	.47(.004)	868.4
15.0+	Southwest (3)	19	66	18.5	.539(.006)	.035	.46(.007)	855.8
All Classes	Ouachita (4)	1	9	7.0	.512(--)	---	.48(--)	31.8
	South Delta (1)	1	3	8.5	.491(--)	---	.46(--)	44.7
	Southwest (3)	41	247	11.5	.511(.010)	.051	.46(.002)	2085.6
Sawtimber 9.0+	Ouachita (4)	1	2	11.6	.606(--)	---	.53(--)	26.3
	South Delta (1)	1	1	10.4	.566(--)	---	.51(--)	34.4
	Southwest (3)	31	155	14.7	.529(.006)	.047	.47(.003)	1754.2

Table 4.--Specific gravity data for loblolly pine in Florida

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Northeast (1)	1	1	4.3	0.490(--)	---	0.49(--)	-----
5.0- 8.9	Northeast (1)	6	11	6.0	.507(.015)	0.038	.47(.010)	23.9
	Central (3)	1	1	5.3	.576(--)	---	.51(--)	.5
9.0-14.9	Northeast (1)	9	16	11.9	.558(.013)	.045	.49(.008)	93.8
	Central (3)	1	1	11.9	.566(--)	---	.49(--)	3.0
15.0+	Northeast (1)	2	5	17.6	.567(.011)	.034	.47(.007)	43.1
All Classes	Northeast (1)	12	33	10.6	.540(.010)	.041	.48(.006)	160.8
	Central (3)	2	2	8.6	.571(.005)	---	.51(.022)	7.6
Sawtimber 9.0+	Northeast (1)	10	21	13.2	.560(.010)	.042	.49(.008)	136.9
	Central (3)	1	1	11.9	.566(--)	---	.50(--)	7.1

Table 5.--Specific gravity data for loblolly pine in Georgia

Diameter class	Survey unit area and number		Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.			No.	No.	In.				Million cu.ft.
3.0- 4.9	Northern	(5)	6	7	4.4	0.436(.020)	0.052	0.45(.014)	-----
	N. Central	(4)	16	25	4.5	.426(.008)	.041	.44(.009)	-----
	Central	(3)	41	56	4.4	.445(.010)	.046	.46(.007)	-----
	Southwest	(2)	2	2	4.2	.443(.014)	---	.46(.024)	-----
	Southeast	(1)	4	6	4.5	.515(.039)	.099	.50(.016)	-----
5.0- 8.9	Northern	(5)	15	37	6.9	.449(.009)	.052	.44(.006)	103.6
	N. Central	(4)	47	113	6.9	.461(.006)	.053	.45(.004)	288.5
	Central	(3)	105	243	6.7	.462(.005)	.083	.45(.003)	597.0
	Southwest	(2)	14	27	7.1	.479(.013)	.050	.46(.006)	22.3
	Southeast	(1)	20	38	7.0	.505(.020)	.082	.47(.006)	115.5
9.0-14.9	Northern	(5)	10	36	11.4	.510(.012)	.079	.46(.005)	99.5
	N. Central	(4)	52	105	11.0	.481(.006)	.051	.45(.003)	368.9
	Central	(3)	140	324	11.4	.490(.004)	.067	.45(.002)	1059.3
	Southwest	(2)	17	23	11.4	.512(.015)	.068	.46(.006)	82.1
	Southeast	(1)	31	57	12.0	.542(.011)	.057	.48(.005)	243.2
15.0+	Northern	(5)	4	5	20.2	.472(.015)	.034	.43(.015)	34.0
	N. Central	(4)	7	10	17.7	.517(.025)	.075	.45(.011)	71.3
	Central	(3)	53	87	17.0	.500(.004)	.076	.44(.005)	353.9
	Southwest	(2)	8	19	20.4	.560(.005)	.038	.47(.010)	82.5
	Southeast	(1)	17	27	18.0	.544(.012)	.060	.46(.008)	134.8
All Classes	Northern	(5)	20	85	9.3	.475(.011)	.078	.45(.004)	237.1
	N. Central	(4)	87	253	8.8	.468(.005)	.054	.45(.002)	728.7
	Central	(3)	210	710	10.0	.478(.003)	.071	.45(.002)	2010.2
	Southwest	(2)	30	71	12.0	.510(.012)	.058	.46(.004)	186.9
	Southeast	(1)	49	128	11.4	.530(.009)	.066	.48(.003)	493.5
Sawtimber 9.0+	Northern	(5)	11	41	12.5	.505(.011)	.076	.47(.005)	133.5
	N. Central	(4)	56	115	11.6	.484(.006)	.055	.46(.003)	440.2
	Central	(3)	158	411	12.6	.492(.003)	.063	.46(.002)	1413.2
	Southwest	(2)	24	42	15.4	.534(.010)	.060	.47(.006)	164.6
	Southeast	(1)	38	84	13.9	.542(.010)	.056	.48(.004)	378.0

Table 6.--Specific gravity data for loblolly pine in Louisiana

Diameter class	Survey unit area and number		Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.			No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled								
5.0- 8.9	Northwest	(5)	21	78	6.9	0.471(.007)	0.042	0.46(.004)	271.6
	Southwest	(3)	21	53	6.8	.511(.014)	.075	.48(.005)	229.2
	Southeast	(4)	8	23	6.8	.477(.012)	.044	.46(.007)	63.2
9.0-14.9	Northwest	(5)	26	91	11.5	.510(.008)	.058	.46(.004)	580.0
	Southwest	(3)	20	74	12.0	.550(.013)	.060	.49(.004)	601.4
	Southeast	(4)	11	39	12.0	.556(.015)	.056	.49(.006)	251.3
15.0+	Northwest	(5)	18	50	19.1	.530(.008)	.044	.45(.007)	618.6
	Southwest	(3)	15	60	18.3	.564(.011)	.054	.47(.008)	674.2
	Southeast	(4)	7	32	17.3	.557(.012)	.044	.47(.009)	308.7
All Classes	Northwest	(5)	33	219	11.6	.500(.008)	.053	.46(.002)	1,470.2
	Southwest	(3)	29	187	12.5	.543(.009)	.061	.48(.003)	1,504.8
	Southeast	(4)	15	94	12.5	.537(.015)	.060	.47(.004)	623.2
Sawtimber 9.0+	Northwest	(5)	30	141	14.2	.517(.007)	.053	.47(.003)	1,198.6
	Southwest	(3)	23	134	14.8	.556(.011)	.057	.49(.004)	1,275.6
	Southeast	(4)	12	71	14.4	.556(.012)	.048	.49(.005)	560.0

Table 7.--Specific gravity data for loblolly pine in Mississippi

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	North (2)	29	63	3.9	0.426(.006)	0.054	0.45(.008)	-----
	Central (3)	137	284	4.0	.433(.004)	.054	.45(.006)	-----
	South (4)	75	139	4.0	.446(.005)	.048	.46(.006)	-----
	Southwest (5)	79	193	4.1	.436(.006)	.065	.45(.006)	-----
5.0- 8.9	Delta (1)	3	5	6.5	.484(.003)	.009	.46(.014)	1.2
	North (2)	66	145	6.8	.470(.007)	.059	.45(.003)	32.8
	Central (3)	204	478	6.7	.464(.004)	.090	.45(.002)	136.1
	South (4)	119	260	6.9	.481(.006)	.068	.46(.003)	75.5
	Southwest (5)	120	315	6.9	.464(.005)	.072	.45(.003)	85.0
9.0-14.9	Delta (1)	2	2	11.5	.472(.007)	---	.44(.022)	.9
	North (2)	48	91	11.2	.491(.006)	.060	.45(.004)	37.1
	Central (3)	197	469	11.6	.511(.004)	.048	.46(.002)	266.3
	South (2)	123	297	11.8	.526(.005)	.078	.47(.003)	170.0
	Southwest (5)	127	346	11.9	.511(.004)	.054	.46(.002)	185.7
15.0+	Delta (1)	4	6	25.7	.496(.029)	.055	.44(.014)	4.9
	North (2)	22	47	18.5	.512(.007)	.050	.45(.006)	28.4
	Central (3)	109	204	17.9	.522(.005)	.048	.45(.005)	159.0
	South (4)	76	153	18.5	.541(.004)	.050	.46(.006)	125.4
	Southwest (5)	98	255	18.8	.535(.005)	.058	.46(.005)	206.0
All Classes	Delta (1)	7	13	16.1	.488(.013)	.042	.44(.009)	7.0
	North (2)	110	346	9.0	.473(.005)	.054	.45(.002)	98.3
	Central (3)	343	1,435	9.4	.481(.003)	.084	.46(.001)	561.4
	South (4)	225	849	10.2	.502(.004)	.080	.46(.002)	370.9
	Southwest (5)	216	1,109	10.7	.490(.004)	.063	.46(.002)	476.7
Sawtimber 9.0+	Delta (1)	5	8	22.2	.490(.021)	.049	.42(.013)	5.8
	North (2)	60	138	13.7	.498(.005)	.057	.46(.003)	65.5
	Central (3)	233	673	13.5	.514(.003)	.046	.47(.002)	425.3
	South (4)	152	450	14.0	.531(.004)	.069	.48(.003)	295.4
	Southwest (5)	156	601	14.8	.521(.004)	.058	.47(.002)	391.7

Table 8.--Specific gravity data for loblolly pine in North Carolina

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Piedmont (3)	11	23	4.5	0.460(.008)	0.042	0.47(.008)	-----
	N.Coast. Plain (2)	17	29	4.3	.452(.010)	.037	.46(.008)	-----
	S.Coast. Plain (1)	18	24	4.4	.471(.009)	.052	.47(.009)	-----
5.0- 8.9	Piedmont (3)	40	109	6.8	.461(.006)	.036	.45(.004)	176.6
	N.Coast. Plain (2)	45	116	6.8	.475(.008)	.049	.46(.003)	296.4
	S.Coast. Plain (1)	63	179	7.0	.502(.005)	.054	.47(.003)	313.4
9.0-14.9	Piedmont (3)	33	86	11.5	.487(.005)	.036	.45(.004)	339.5
	N.Coast. Plain (2)	87	256	12.1	.527(.006)	.056	.47(.003)	1,023.4
	S.Coast. Plain (1)	86	211	11.4	.538(.004)	.053	.48(.003)	801.5
15.0+	Piedmont (3)	8	15	18.0	.487(.016)	.046	.43(.009)	112.9
	N.Coast. Plain (2)	67	181	18.2	.529(.005)	.061	.45(.005)	680.6
	S.Coast. Plain (1)	43	82	18.2	.544(.007)	.056	.46(.007)	385.6
All Classes	Piedmont (3)	50	233	9.0	.472(.004)	.036	.45(.002)	629.0
	N.Coast. Plain (2)	121	582	12.5	.523(.004)	.057	.47(.002)	2,000.4
	S.Coast. Plain (1)	130	496	10.6	.513(.005)	.054	.47(.002)	1,500.5
Sawtimber 9.0+	Piedmont (3)	35	101	12.5	.487(.005)	.034	.46(.004)	452.4
	N.Coast. Plain (2)	110	437	14.6	.528(.005)	.058	.47(.003)	1,704.0
	S.Coast. Plain (1)	104	294	13.3	.539(.004)	.053	.48(.003)	1,187.1

Table 9.--Specific gravity data for shortleaf pine in Alabama

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled							
5.0- 8.9	North (6)	2	8	6.6	0.480(.009)	0.025	0.46(.012)	49.5
	N. Central (5)	15	30	6.8	.511(.010)	.054	.47(.007)	181.9
	W. Central (4)	6	13	6.2	.479(.025)	.066	.46(.010)	118.3
	Southeast (3)	12	44	6.8	.519(.009)	.057	.48(.006)	169.8
	Southwest-N (2)	7	14	6.4	.528(.016)	.041	.48(.010)	122.6
	Southwest-S (1)	2	3	6.6	.473(.004)	---	.46(.020)	16.2
9.0-14.9	North (6)	5	5	10.0	.562(.044)	.090	.48(.015)	30.2
	N. Central (5)	9	15	11.4	.532(.019)	.066	.47(.009)	170.3
	W. Central (4)	8	9	11.1	.534(.022)	.061	.47(.011)	153.7
	Southeast (3)	13	33	10.2	.544(.009)	.053	.47(.006)	228.5
	Southwest-N (2)	7	22	12.5	.535(.008)	.058	.47(.007)	293.9
	Southwest-S (1)	1	3	9.7	.532(--)	---	.47(--)	24.2
15.0+	N. Central (5)	3	3	17.1	.519(.018)	---	.44(.017)	27.0
	W. Central (4)	1	1	21.5	.522(--)	---	.44(--)	15.1
	Southeast (3)	2	3	15.8	.564(.019)	---	.46(.018)	43.8
	Southwest-N (2)	1	1	17.1	.594(--)	---	.48(--)	73.8
	Southwest-S (1)	1	2	16.8	.503(--)	---	.43(--)	2.2
All Classes	North (6)	4	13	8.0	.512(.016)	.072	.47(.010)	84.6
	N. Central (5)	20	48	8.9	.518(.010)	.056	.47(.005)	379.2
	W. Central (4)	12	23	8.8	.502(.020)	.081	.46(.008)	287.1
	Southeast (3)	18	80	8.8	.531(.007)	.056	.48(.004)	442.1
	Southwest-N (2)	10	37	10.3	.534(.006)	.051	.47(.006)	490.3
	Southwest-S (1)	2	8	10.3	.502(.008)	.039	.46(.013)	42.6
Sawtimber 9.0+	North (6)	5	5	10.0	.562(.044)	.090	.50(.016)	35.1
	N. Central (5)	10	18	12.4	.530(.017)	.063	.47(.008)	197.3
	W. Central (4)	9	10	12.1	.533(.020)	.058	.47(.011)	168.8
	Southeast (3)	14	36	11.2	.546(.009)	.052	.49(.006)	272.3
	Southwest-N (2)	7	23	12.7	.538(.006)	.057	.48(.008)	367.7
	Southwest-S (1)	1	5	12.5	.520(--)	---	.47(--)	26.4

Table 10.--Specific gravity data for shortleaf pine in Arkansas

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Ozark (5)	3	11	4.0	0.483(.005)	0.038	0.48(.013)	-----
	Ouachita (4)	13	38	4.0	.500(.008)	.047	.49(.009)	-----
	Southwest (3)	6	9	4.5	.523(.040)	.088	.51(.016)	-----
5.0- 8.9	Ozark (5)	8	17	6.3	.525(.030)	.064	.48(.009)	91.3
	Ouachita (4)	19	97	6.8	.529(.007)	.046	.48(.005)	431.2
	South Delta (1)	2	2	7.4	.456(.068)	---	.45(.025)	9.9
	Southwest (3)	18	39	7.2	.523(.008)	.061	.48(.006)	228.7
9.0-14.9	Ozark (5)	4	10	11.6	.530(.017)	.042	.47(.011)	179.6
	Ouachita (4)	16	49	11.3	.536(.007)	.060	.47(.005)	755.7
	South Delta (1)	1	3	12.3	.524(--)	---	.46(--)	24.4
	Southwest (3)	22	75	11.7	.547(.006)	.038	.48(.005)	751.4
15.0+	Ozark (5)	1	1	15.2	.565(--)	---	.46(--)	40.8
	Ouachita (4)	7	22	17.5	.531(.009)	.048	.45(.008)	285.8
	South Delta (1)	1	1	15.6	.527(--)	---	.44(--)	4.6
	Southwest (3)	11	19	17.1	.574(.012)	.065	.47(.010)	246.9
All Classes	Ozark (5)	8	39	7.3	.516(.021)	.063	.48(.006)	311.7
	Ouachita (4)	24	206	8.5	.526(.005)	.049	.48(.003)	1472.7
	South Delta (1)	2	6	11.2	.502(.038)	.059	.45(.015)	38.9
	Southwest (3)	31	142	10.7	.543(.006)	.059	.47(.004)	1227.0
Sawtimber 9.0+	Ozark (5)	4	11	11.9	.533(.015)	.041	.48(.011)	220.4
	Ouachita (4)	17	71	13.2	.535(.005)	.056	.47(.005)	1041.5
	South Delta (1)	1	4	13.1	.525(--)	---	.47(--)	29.0
	Southwest (3)	24	94	12.8	.553(.006)	.048	.48(.004)	998.3

Table 11.--Specific gravity data for shortleaf pine in Georgia

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Northern (5)	13	23	4.4	0.469(.013)	0.063	0.47(.010)	-----
	N. Central (4)	13	17	4.4	.464(.013)	.056	.47(.011)	-----
	Central (3)	19	22	4.4	.470(.017)	.061	.47(.010)	-----
	Southwest (2)	1	4	4.4	.457(--)	---	.46(.020)	-----
5.0- 8.9	Northern (5)	41	64	6.7	.504(.010)	.067	.47(.005)	186.3
	N. Central (4)	57	114	7.0	.496(.007)	.044	.47(.004)	272.5
	Central (3)	57	116	6.7	.489(.008)	.063	.46(.004)	258.5
	Southwest (2)	2	2	5.5	.486(.010)	---	.46(.024)	6.7
9.0-14.9	Northern (5)	18	28	11.1	.521(.010)	.050	.46(.007)	165.5
	N. Central (4)	43	84	10.9	.511(.007)	.072	.46(.004)	245.4
	Central (3)	59	100	11.3	.508(.005)	.048	.45(.004)	351.6
	Southwest (2)	3	4	13.2	.565(.025)	---	.49(.017)	19.4
	Southeast (1)	2	2	12.0	.495(.020)	---	.45(.024)	2.2
15.0+	Northern (5)	3	4	17.3	.521(.029)	---	.44(.015)	26.9
	N. Central (4)	1	1	16.0	.560(--)	---	.46(--)	22.8
	Central (3)	8	13	16.3	.523(.019)	.063	.44(.009)	44.9
	Southeast (1)	1	1	16.2	.433(--)	---	.39(--)	2.4
All Classes	Northern (5)	52	119	7.7	.502(.009)	.059	.47(.004)	378.7
	N. Central (4)	77	216	8.3	.500(.006)	.068	.46(.003)	540.7
	Central (3)	106	251	8.8	.497(.005)	.056	.46(.003)	655.0
	Southwest (2)	5	10	8.2	.506(.033)	.078	.47(.011)	31.7
	Southeast (1)	2	3	13.4	.474(--)	---	.43(--)	5.0
Sawtimber 9.0+	Northern (5)	19	32	11.9	.521(.009)	.048	.47(.006)	192.4
	N. Central (4)	43	85	11.0	.512(.007)	.072	.47(.004)	268.2
	Central (3)	62	113	11.9	.510(.005)	.053	.46(.004)	396.5
	Southwest (2)	3	4	13.2	.565(.025)	---	.49(.018)	25.0
	Southeast (1)	2	3	13.4	.474(--)	---	.43(--)	4.6

Table 12.--Specific gravity data for shortleaf pine in Louisiana

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled							
5.0- 8.9	Northwest (5)	5	32	7.0	0.477(.011)	0.043	0.46(.007)	176.6
	Southwest (3)	6	23	6.8	.523(.021)	.078	.48(.008)	58.2
	Southeast (4)	1	7	5.6	.464(--)	---	.46(--)	16.0
9.0-14.9	Northwest (5)	10	29	11.4	.522(.013)	.040	.46(.007)	358.4
	Southwest (3)	12	20	12.4	.552(.012)	.059	.48(.008)	135.4
	Southeast (4)	1	5	11.3	.514(--)	---	.46(--)	33.2
15.0+	Northwest (5)	5	6	16.0	.566(.026)	.071	.46(.013)	163.6
	Southwest (3)	7	16	17.3	.585(.011)	.062	.47(.011)	66.2
All Classes	Northwest (5)	20	67	9.7	.505(.012)	.052	.46(.005)	698.6
	Southwest (3)	13	59	11.6	.550(.015)	.081	.47(.005)	259.8
	Southeast (4)	1	12	8.0	.485(--)	---	.46(--)	54.2
Sawtimber 9.0+	Northwest (5)	2	35	12.2	.530(.014)	.052	.47(.006)	522.0
	Southwest (3)	14	36	14.6	.567(.011)	.088	.48(.006)	201.6
	Southeast (4)	1	5	11.3	.514(--)	---	.47(--)	38.2

Table 13.--Specific gravity data for shortleaf pine in Mississippi

Diameter class	Survey unit area and number		Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.			No.	No.	In.				Million cu.ft.
3.0- 4.9	Delta	(1)	6	10	3.9	0.433(.013)	0.039	0.44(.014)	-----
	North	(2)	129	214	4.0	.472(.005)	.042	.47(.006)	-----
	Central	(3)	112	196	4.1	.484(.006)	.092	.48(.006)	-----
	South	(4)	35	58	4.0	.482(.011)	.092	.48(.007)	-----
	Southwest	(5)	38	80	3.9	.444(.010)	.054	.45(.008)	-----
5.0- 8.9	Delta	(1)	9	18	7.7	.494(.014)	.041	.47(.009)	6.8
	North	(2)	211	507	6.9	.506(.003)	.067	.47(.003)	122.0
	Central	(3)	176	428	6.9	.516(.004)	.054	.47(.003)	135.2
	South	(4)	54	105	6.8	.520(.006)	.044	.48(.004)	29.7
	Southwest	(5)	73	146	6.7	.494(.008)	.070	.47(.004)	35.2
9.0-14.9	Delta	(1)	7	27	11.4	.483(.006)	.043	.44(.007)	15.0
	North	(2)	135	304	11.2	.535(.005)	.075	.47(.003)	149.2
	Central	(3)	147	344	11.3	.541(.004)	.078	.47(.003)	197.0
	South	(4)	50	102	11.7	.548(.007)	.053	.48(.004)	60.3
	Southwest	(5)	52	113	11.8	.534(.007)	.061	.47(.004)	61.1
15.0+	Delta	(1)	3	3	17.6	.498(.056)	---	.43(.017)	2.1
	North	(2)	24	41	17.0	.537(.009)	.041	.45(.006)	30.6
	Central	(3)	30	44	16.6	.551(.012)	.073	.46(.007)	33.7
	South	(4)	14	18	16.9	.547(.013)	.044	.45(.009)	12.9
	Southwest	(5)	28	57	17.7	.543(.008)	.051	.45(.006)	44.3
All Classes	Delta	(1)	13	58	9.3	.474(.006)	.048	.45(.005)	23.9
	North	(2)	308	1,066	7.9	.509(.003)	.067	.47(.002)	301.8
	Central	(3)	267	1,012	8.3	.520(.003)	.092	.47(.002)	365.9
	South	(4)	93	283	8.6	.524(.006)	.071	.47(.003)	102.9
	Southwest	(5)	118	396	9.2	.502(.006)	.064	.46(.002)	140.6
Sawtimber 9.0+	Delta	(1)	7	30	12.0	.484(.010)	.047	.45(.007)	17.1
	North	(2)	143	345	11.9	.533(.005)	.075	.48(.003)	179.8
	Central	(3)	155	388	11.9	.542(.004)	.077	.48(.003)	230.7
	South	(4)	54	120	12.5	.548(.006)	.053	.48(.004)	73.2
	Southwest	(5)	66	170	13.8	.537(.006)	.058	.47(.003)	105.4

Table 14.--Specific gravity data for shortleaf pine in North Carolina

Diameter class	Survey unit area and number		Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.			No.	No.	In.				Million cu.ft.
3.0- 4.9	Piedmont	(3)	19	25	4.5	0.455(.007)	0.036	0.46(.010)	-----
	S.Coast. Plain	(1)	3	3	4.5	.560(.004)	---	.54(.026)	-----
5.0- 8.9	Piedmont	(3)	78	190	7.1	.495(.005)	.054	.47(.004)	464.9
	S.Coast. Plain	(1)	7	10	6.7	.517(.013)	.042	.47(.001)	24.6
9.0-14.9	Piedmont	(3)	60	152	11.4	.503(.005)	.049	.45(.003)	581.4
	N.Coast. Plain	(2)	3	3	10.8	.554(.023)	---	.48(.019)	26.5
	S.Coast. Plain	(1)	3	6	12.0	.571(.007)	.032	.49(.014)	26.4
15.0+	Piedmont	(3)	10	16	16.2	.502(.010)	.034	.43(.008)	81.6
	N.Coast. Plain	(2)	2	2	17.8	.480(.050)	---	.42(.021)	8.4
All Classes	Piedmont	(3)	108	383	9.0	.496(.004)	.048	.46(.002)	1,127.9
	N.Coast. Plain	(2)	5	5	13.6	.524(.027)	.069	.45(.016)	47.1
	S.Coast. Plain	(1)	11	19	8.1	.541(.010)	.043	.48(.008)	55.5
Sawtimber 9.0+	Piedmont	(3)	61	168	11.8	.503(.005)	.049	.46(.003)	663.0
	N.Coast. Plain	(2)	5	5	13.6	.524(.027)	.069	.46(.016)	34.9
	S.Coast. Plain	(1)	3	6	19.9	.571(.007)	.032	.46(.015)	30.9

Table 15.--Specific gravity data for longleaf pine in Alabama

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled							
5.0- 8.9	N. Central (5)	2	6	7.5	0.570(.038)	0.087	0.55(.014)	44.9
	Southeast (3)	7	10	7.1	.536(.016)	.029	.53(.011)	37.1
	Southwest-N (2)	2	2	8.6	.596(.018)	---	.55(.024)	21.8
	Southwest-S (1)	8	19	7.8	.576(.011)	.054	.55(.008)	150.0
9.0-14.9	N. Central (5)	3	6	11.3	.598(.006)	.040	.55(.018)	93.7
	W. Central (4)	1	2	11.0	.529(--)	---	.51(--)	40.0
	Southeast (3)	7	12	12.6	.584(.013)	.034	.54(.013)	95.9
	Southwest-N (2)	4	4	11.4	.566(.019)	---	.53(.022)	52.1
	Southwest-S (1)	8	32	11.3	.582(.010)	.055	.54(.008)	440.0
15.0+	N. Central (5)	2	4	17.2	.517(.029)	---	.48(.024)	33.1
	W. Central (4)	1	1	17.5	.607(--)	---	.53(--)	16.3
	Southeast (3)	1	1	15.1	.632(--)	---	.56(--)	25.1
All Classes	N. Central (5)	5	16	11.4	.567(.021)	.062	.53(.010)	171.7
	W. Central (4)	1	3	13.2	.555(--)	---	.51(--)	80.3
	Southeast (3)	12	23	10.3	.565(.014)	.042	.53(.008)	158.1
	Southwest-N (2)	5	6	10.4	.576(.010)	.032	.54(.016)	85.8
	Southwest-S (1)	10	51	10.0	.580(.010)	.053	.54(.006)	654.6
Sawtimber 9.0+	N. Central (5)	4	10	13.7	.566(.022)	.065	.53(.013)	126.8
	W. Central (4)	1	3	13.2	.555(--)	---	.53(--)	56.3
	Southeast (3)	7	13	12.7	.588(.014)	.033	.55(.011)	121.0
	Southwest-N (2)	4	4	11.4	.566(.019)	---	.54(.019)	64.0
	Southwest-S (1)	8	32	11.3	.582(.010)	.056	.55(.007)	504.6

Table 16.--Specific gravity data for longleaf pine in Florida

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Northeast (1)	2	2	4.8	0.558(--)	---	0.56(--)	-----
	Central (3)	1	1	4.9	.565(--)	---	.56(--)	-----
5.0- 8.9	Northeast (1)	27	37	7.3	.577(.011)	0.044	.55(.006)	146.1
	Central (3)	14	20	7.1	.571(.017)	.070	.55(.008)	49.0
9.0-14.9	Northeast (1)	36	73	11.2	.613(.010)	.082	.56(.006)	351.3
	Central (3)	20	26	11.4	.589(.011)	.053	.54(.009)	82.5
	South (4)	1	1	9.0	.646(--)	---	.59(--)	.4
15.0+	Northeast (1)	1	1	15.0	.609(--)	---	.54(--)	24.9
	Central (3)	6	6	16.4	.611(.016)	.036	.54(.019)	9.0
All Classes	Northeast (1)	51	113	9.8	.600(.008)	.078	.56(.004)	522.3
	Central (3)	33	53	10.2	.584(.009)	.062	.55(.006)	140.5
	South (4)	1	1	9.0	.646(--)	---	.59(--)	.4
Sawtimber 9.0+	Northeast (1)	36	74	11.2	.613(.010)	.082	.57(.006)	376.2
	Central (3)	23	32	12.3	.593(.011)	.051	.55(.007)	91.5
	South (4)	1	1	9.0	.646(--)	---	.59(--)	.4

Table 17.--Specific gravity data for longleaf pine in Georgia

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Central (3)	1	1	4.1	0.370(--)	---	0.47(--)	-----
	Southwest (2)	3	4	4.5	.487(.071)	---	.53(.018)	-----
	Southeast (1)	5	5	4.3	.524(.014)	0.034	.55(.016)	-----
5.0- 8.9	Northern (5)	1	1	6.5	.480(--)	---	.51(--)	0.5
	N. Central (4)	1	1	8.7	.479(--)	---	.49(--)	3.3
	Central (3)	11	21	7.5	.551(.017)	.080	.54(.008)	42.2
	Southwest (2)	17	37	7.0	.532(.010)	.040	.53(.006)	71.3
	Southeast (1)	32	75	7.3	.557(.009)	.068	.54(.005)	202.6
9.0-14.9	Northern (5)	1	4	12.2	.520(--)	---	.50(--)	3.9
	N. Central (4)	2	5	11.4	.507(.034)	.060	.49(.019)	9.7
	Central (3)	18	31	11.4	.559(.011)	.051	.52(.008)	97.3
	Southwest (2)	25	50	11.9	.571(.008)	.056	.53(.007)	191.6
	Southeast (1)	38	75	11.0	.564(.010)	.060	.53(.006)	449.4
15.0+	Central (3)	7	12	18.4	.571(.012)	.055	.51(.017)	23.3
	Southwest (2)	5	6	15.3	.575(.016)	.036	.52(.019)	46.5
	Southeast (1)	9	9	16.3	.607(.027)	.091	.54(.016)	43.0
All Classes	Northern (5)	1	5	11.1	.512(--)	---	.50(--)	4.4
	N. Central (4)	2	6	10.9	.502(.033)	.055	.49(.016)	14.0
	Central (3)	26	65	11.3	.556(.009)	.071	.52(.005)	162.8
	Southwest (2)	36	97	9.9	.553(.008)	.064	.53(.004)	309.4
	Southeast (1)	60	164	9.4	.562(.007)	.061	.54(.004)	695.0
Sawtimber 9.0+	Northern (5)	1	4	12.2	.520(--)	---	.51(--)	3.9
	N. Central (4)	2	5	11.4	.507(.035)	.060	.51(.017)	10.7
	Central (3)	21	43	13.4	.562(.009)	.048	.53(.007)	120.6
	Southwest (2)	28	56	12.3	.571(.008)	.055	.54(.006)	238.1
	Southeast (1)	41	84	11.6	.569(.010)	.064	.54(.005)	492.4

Table 18.--Specific gravity data for longleaf pine in Louisiana

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled							
5.0- 8.9	Southwest (4)	1	3	6.6	0.538(--)	---	0.54(--)	35.6
9.0-14.9	Northwest (5)	1	2	13.0	.638(--)	---	.57(--)	14.8
	Southwest (3)	5	5	11.3	.566(.071)	0.172	.53(.019)	132.7
	Southeast (4)	3	13	11.4	.581(.016)	.045	.54(.012)	62.5
15.0+	Northwest (5)	3	3	17.9	.556(.036)	---	.50(.027)	16.5
	Southwest (4)	6	16	18.3	.617(.029)	.059	.54(.015)	78.5
	Southeast (4)	2	3	16.7	.608(.051)	---	.54(.026)	8.4
All Classes	Northwest (5)	4	5	16.0	.589(.033)	.082	.52(.018)	34.1
	Southwest (4)	9	21	16.6	.605(.033)	.106	.53(.010)	246.8
	Southeast (4)	4	19	11.5	.578(.009)	.046	.54(.009)	93.1
Sawtimber 9.0+	Northwest (5)	4	5	16.0	.589(.033)	.082	.53(.018)	31.3
	Southwest (3)	9	21	16.6	.605(.033)	.106	.54(.011)	211.2
	Southeast (4)	4	16	12.4	.586(.012)	.034	.55(.010)	70.9

Table 19.--Specific gravity data for longleaf pine in Mississippi

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Central (3)	2	3	3.8	0.511(.017)	---	0.54(.020)	-----
	South (4)	58	90	4.2	.515(.009)	0.056	.54(.007)	-----
5.0- 8.9	Central (3)	17	21	7.0	.536(.007)	.034	.53(.008)	7.1
	South (4)	139	311	7.2	.541(.003)	.051	.53(.003)	103.9
	Southwest (5)	5	5	7.6	.489(.028)	.064	.50(.015)	1.5
9.0-14.9	Central (3)	11	15	11.8	.556(.018)	.063	.52(.011)	7.3
	South (4)	186	442	11.3	.566(.004)	.058	.53(.003)	229.9
	Southwest (5)	11	29	11.5	.564(.012)	.057	.53(.008)	14.8
15.0+	Central (3)	5	5	17.2	.589(.028)	.064	.52(.021)	2.9
	South (4)	47	60	16.5	.584(.009)	.058	.52(.010)	38.0
	Southwest (5)	7	11	17.1	.571(.007)	.038	.51(.016)	6.8
All Classes	Central (3)	27	44	9.6	.547(.008)	.052	.53(.006)	17.3
	South (4)	276	903	9.5	.553(.003)	.057	.53(.002)	371.8
	Southwest (5)	16	45	12.4	.557(.009)	.079	.52(.006)	23.1
Sawtimber 9.0+	Central (3)	15	20	13.1	.564(.015)	.062	.53(.009)	10.2
	South (4)	208	502	12.0	.568(.004)	.057	.54(.003)	267.9
	Southwest (5)	15	40	13.0	.566(.009)	.055	.53(.007)	21.6

Table 10.--Specific gravity data for longleaf pine in North Carolina

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	N.Coast. Plain (2)	1	1	4.9	0.438(--)	---	0.50(--)	-----
	S.Coast. Plain (1)	5	5	4.5	.525(.034)	0.077	.55(.016)	-----
5.0- 8.9	Piedmont (3)	1	1	8.9	.469(--)	---	.48(--)	0.9
	N.Coast. Plain (2)	1	4	6.4	.441(--)	---	.49(--)	7.6
	S.Coast. Plain (1)	21	45	7.0	.557(.012)	.075	.54(.006)	136.3
9.0-14.9	Piedmont (3)	1	1	9.1	.439(--)	---	.46(--)	2.8
	N.Coast. Plain (2)	5	12	12.3	.513(.019)	.037	.49(.013)	18.4
	S.Coast. Plain (1)	17	36	11.2	.568(.009)	.057	.53(.008)	154.0
15.0+	N.Coast. Plain (2)	1	1	15.7	.491(--)	---	.47(--)	3.5
	S.Coast. Plain (1)	3	3	16.8	.572(.024)	---	.51(.026)	24.0
All Classes	Piedmont (3)	2	2	9.0	.454(.015)	---	.48(.028)	4.2
	N.Coast. Plain (2)	5	18	10.8	.492(.024)	.047	.49(.010)	29.5
	S.Coast. Plain (1)	31	89	8.9	.560(.009)	.066	.54(.005)	314.3
Sawtimber 9.0+	Piedmont (3)	1	1	9.1	.439(--)	---	.48(--)	3.3
	N.Coast. Plain (2)	5	13	12.5	.512(.018)	.036	.51(.011)	21.9
	S.Coast. Plain (1)	18	39	11.6	.568(.008)	.056	.54(.007)	178.0

Table 21.--Specific gravity data for slash pine in Alabama

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled							
5.0- 8.9	Southeast (3)	1	1	8.9	0.551(--)	---	0.54(--)	13.7
	Southwest-N (2)	1	3	5.9	.447(--)	---	.48(--)	16.4
	Southwest-S (1)	10	24	6.7	.546(.006)	0.028	.54(.008)	112.4
9.0-14.9	Southeast (3)	2	8	10.7	.551(.009)	.028	.53(.011)	16.0
	Southwest-N (2)	1	2	13.0	.606(--)	---	.54(--)	15.3
	Southwest-S (1)	10	34	11.7	.570(.007)	.052	.53(.006)	254.6
15.0+	Southeast (3)	1	1	15.3	.572(--)	---	.52(--)	10.3
	Southwest-S (1)	4	11	16.6	.576(.008)	.028	.51(.012)	110.3
All Classes	Southeast (3)	2	10	11.0	.553(.008)	.026	.53(.011)	40.0
	Southwest-N (2)	2	5	8.7	.511(.076)	.073	.51(.015)	33.7
	Southwest-S (1)	13	69	10.7	.563(.004)	.046	.53(.005)	477.3
Sawtimber 9.0+	Southeast (3)	2	9	11.2	.553(.008)	.027	.54(.012)	26.3
	Southwest-N (2)	1	2	12.9	.606(--)	---	.56(--)	17.3
	Southwest-S (1)	10	45	12.9	.571(.005)	.050	.54(.006)	364.9

Table 22.--Specific gravity data for slash pine in Florida

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Northeast (1)	15	24	4.4	0.533(.019)	0.060	0.53(.009)	-----
	Central (3)	5	6	4.4	.548(.032)	.083	.54(.016)	-----
	South (4)	3	4	4.6	.612(.029)	---	.58(.019)	-----
5.0- 8.9	Northeast (1)	41	106	6.5	.563(.016)	.066	.55(.005)	268.7
	Central (3)	11	22	6.6	.584(.018)	.061	.56(.008)	41.3
	South (4)	9	23	6.8	.635(.033)	.070	.59(.010)	36.7
9.0-14.9	Northeast (1)	32	66	11.0	.603(.012)	.078	.55(.005)	422.4
	Central (3)	13	33	11.1	.649(.012)	.060	.57(.008)	92.5
	South (4)	8	11	11.2	.701(.032)	.098	.60(.013)	69.5
15.0+	Northeast (1)	4	6	16.9	.599(.021)	.083	.52(.015)	63.8
	Central (3)	3	3	19.3	.644(.057)	---	.53(.022)	21.8
	South (4)	3	3	17.0	.776(.042)	---	.61(.024)	9.3
All Classes	Northeast (1)	64	202	8.1	.574(.012)	.068	.55(.003)	754.9
	Central (3)	23	64	9.3	.617(.013)	.067	.57(.006)	155.6
	South (4)	17	41	8.5	.661(.028)	.082	.59(.008)	115.5
Sawtimber 9.0+	Northeast (1)	35	73	11.5	.606(.012)	.074	.57(.006)	486.2
	Central (3)	15	36	11.8	.649(.012)	.062	.59(.009)	114.3
	South (4)	9	14	12.4	.717(.028)	.091	.62(.014)	78.8

Table 23.--Specific gravity data for slash pine in Georgia

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	N. Central (4)	1	1	4.7	0.476(--)	---	0.50(--)	-----
	Central (3)	3	5	4.7	.462(.016)	0.060	.49(.017)	-----
	Southwest (2)	10	15	4.3	.442(.017)	.060	.48(.012)	-----
	Southeast (1)	31	43	4.5	.517(.013)	.095	.53(.008)	-----
5.0- 8.9	N. Central (4)	1	4	7.8	.536(--)	---	.53(--)	6.8
	Central (3)	6	18	6.4	.447(.016)	.052	.48(.011)	20.3
	Southwest (2)	34	100	6.8	.484(.013)	.055	.50(.006)	132.4
	Southeast (1)	105	262	6.8	.542(.006)	.076	.54(.003)	644.3
9.0-14.9	N. Central (4)	1	4	11.6	.460(--)	---	.48(--)	2.2
	Central (3)	2	3	11.6	.615(.038)	---	.55(.019)	5.9
	Southwest (2)	36	71	11.5	.544(.011)	.084	.52(.005)	266.2
	Southeast (1)	89	197	10.9	.565(.005)	.067	.53(.004)	1074.0
15.0+	Central (3)	1	1	16.0	.560(--)	---	.51(--)	1.0
	Southwest (2)	9	19	17.6	.558(.016)	.051	.50(.011)	74.4
	Southeast (1)	13	17	16.8	.574(.021)	.109	.51(.010)	192.5
All Classes	N. Central (4)	2	9	9.2	.495(.032)	.054	.50(.012)	9.0
	Central (3)	7	27	7.0	.473(.024)	.078	.50(.008)	27.2
	Southwest (2)	56	205	9.2	.509(.012)	.082	.51(.004)	473.0
	Southeast (1)	153	519	8.5	.549(.004)	.068	.53(.002)	1910.8
Sawtimber 9.0+	N. Central (4)	1	4	11.6	.460(--)	---	.49(--)	2.2
	Central (3)	2	4	12.7	.605(.039)	---	.56(.017)	6.9
	Southwest (2)	39	90	12.8	.547(.010)	.084	.53(.005)	340.6
	Southeast (1)	92	214	11.3	.565(.005)	.073	.54(.003)	1266.5

Table 24.--Specific gravity data for slash pine in Louisiana

Diameter class	Survey unit area and number	Sample size: Locations	Sample size: Trees	Mean diameter of sampled trees	Increment core specific gravity: Mean and standard error	Increment core specific gravity: Standard deviation	Estimated tree specific gravity: mean and standard error	Approximate timber volume
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	Not Sampled							
5.0- 8.9	Southwest (3)	1	5	5.8	0.481(--)	---	0.50(--)	37.6
	Southeast (4)	1	10	7.0	.521(--)	---	.53(--)	29.6
9.0-14.9	Northwest (5)	1	6	12.2	.573(--)	---	.53(--)	7.9
	Southeast (4)	2	11	10.6	.570(.016)	0.047	.54(.010)	33.8
15.0+	Northwest (5)	1	1	15.3	.561(--)	---	.51(--)	1.1
	Southeast (4)	1	3	17.1	.590(--)	---	.52(--)	14.6
All Classes	Northwest (5)	1	7	12.6	.571(--)	---	.53(--)	24.0
	Southwest (3)	1	5	5.8	.481(--)	---	.51(--)	96.7
	Southeast (4)	2	24	9.9	.552(.010)	.052	.53(.007)	78.0
Sawtimber 9.0+	Northwest (5)	1	7	12.6	.571(--)	---	.54(--)	9.0
	Southeast (4)	2	14	17.0	.574(.011)	.044	.52(.012)	48.4

Table 25.--Specific gravity data for slash pine in Mississippi

Diameter class	Survey unit area and number	Sample size		Mean diameter of sampled trees	Increment core specific gravity		Estimated tree specific gravity: mean and standard error	Approximate timber volume
		Locations	Trees		Mean and standard error	Standard deviation		
In.		No.	No.	In.				Million cu.ft.
3.0- 4.9	South (4)	42	91	3.9	0.510(.007)	0.042	0.52(.008)	-----
5.0- 8.9	South (4)	78	196	7.0	.554(.004)	.065	.55(.004)	62.8
9.0-14.9	South (4)	87	241	11.4	.580(.006)	.075	.54(.003)	143.0
15.0+	South (4)	34	48	17.2	.583(.007)	.035	.51(.009)	34.6
All Classes	South (4)	137	576	9.2	.560(.004)	.064	.54(.002)	240.4
Sawtimber 9.0+	South (4)	98	289	12.4	.580(.005)	.075	.55(.004)	177.6