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Florida's Forests— 2005 Update

Mark J. Brown



The Author:

Mark J. Brown is a Forester with the Forest Inventory and Analysis Research Work Unit, Southern Research Station, U.S. Department of Agriculture Forest Service, Knoxville, TN 37919.

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Southern Research Station
200 W.T. Weaver Blvd.
Asheville, NC 28804-3454

Foreword

This bulletin highlights the initial results of an annual inventory of Florida's forests. Annual inventories of the Nation's forests are mandated by the Agricultural Research Extension and Education Reform Act of 1998 (1998 Farm Bill). The current annual forest inventory program has changed from the previous periodic inventory system in many ways. Objectives include: (1) a nationally consistent, fixed radius, 4-point plot configuration; (2) a systematic national sampling design featuring a base grid derived by subdividing the Environmental Monitoring and Assessment Program grid into about 6,000-acre hexagons; (3) integration of the Forest Inventory and Analysis (FIA) and Forest Health Monitoring (FHM) sampling designs; (4) annual measurement of a fixed proportion of permanent FIA/FHM plots in each State; (5) reporting of data or data summaries within 6 months of completion of a year's sampling; (6) a default 5-year moving average estimator, with provisions for optional estimators based on techniques for updating information; and (7) State inventory reports every 5 years. For additional information, you may access the national FIA Web site at <http://fia.fs.fed.us/>.

The Southern Research Station's FIA Research Work Unit and the Florida Division of Forestry began the new annual inventory of Florida in 2001. The new inventory system measures a systematic sample comprising about 20 percent of all plots in the State each year. The 20-percent systematic sample is referred to as one panel of inventory data. This bulletin highlights the principal findings of 3 panels of plot measurements, or those from about 60 percent of all plots. Forest land estimates and inventory volume, growth, removals, and mortality statistics are summarized from the data collected for these three panels. Seven previous periodic inventories completed in 1936, 1949, 1959, 1970, 1980, 1987, and 1995 provide baseline information that can be used in measuring changes and trends. This bulletin primarily emphasizes changes since 1995.

The Forest and Rangeland Renewable Resources Research Act of 1978 authorized surveys of our Nation's forests. These surveys are part of a continuing, nationwide undertaking by the regional experiment stations of the Forest Service, U.S. Department of Agriculture. Inventories of the 13 Southern States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia), Puerto Rico, and the U.S. Virgin Islands are conducted by the Southern Research Station, FIA Research Work Unit, operating from its headquarters in Knoxville, TN, and offices in Asheville, NC, and Starkville, MS. The primary objective of these appraisals is to develop and maintain the resource information needed to formulate sound forest policies and programs.

Additional information about any aspect of this survey may be obtained from:

U.S. Department of Agriculture
Forest Service
Southern Research Station
Forest Inventory and Analysis
4700 Old Kingston Pike
Knoxville, TN 37919
Phone: 865-862-2000

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^a All tables in this report are available in Microsoft® Excel workbook files. Upon request, these files will be supplied in the format the customer requests.

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Florida's Forests—2005 Update

Mark J. Brown

Overview

This bulletin summarizes results from the first three annual panels of data measured across the forests of Florida and by survey unit (fig. 1). Current estimates are dated 2005 and were derived from 60 percent of all sample plots in the State. Twenty percent of the sample plots are scheduled to be completed annually hereafter. A more detailed analytical bulletin will be published when all sample plots have been completed and compiled.

Current estimates of forest area, timberland, related classifications such as ownership and forest type, and timber volumes are presented and compared with previous values (Brown 1996). Average annual rates of growth, removals, and mortality are summarized for the period since the previous inventory in 1995.

Although this inventory is similar in scope to previous inventories, it differs in sampling design and intensity, standards and definitions, and methods used to determine key attributes such as stocking, forest type, and stand class. A major change was the shift to annual inventories, in which a portion of the samples is measured each year. By contrast, previous inventories were periodic and all samples were measured prior to publication of inventory estimates. Many of the changes in methods, plot design, and sampling intensity have been designed to provide national consistency among Forest Inventory and Analysis (FIA) Research Work Units. While these changes will initially complicate data comparison among surveys, over the long term such comparisons will be easier to make and resource trends more readily identifiable. In this bulletin we make general comparisons where differences between inventories can be reconciled or are considered minimal.

Forest resource data are presented in 30 appendix tables and depicted in 13 figures. A summary of major findings follows.

Highlights

Area

Forest and timberland area—Florida's forest area was more than 16.1 million acres in 2005 (table A.1), down

slightly from 16.2 million acres in 1995. Forests accounted for 47 percent of the State's land area. Of the State's 67 counties, 19 were more than 75 percent forested. All of these were located in northern Florida and two-thirds of them were in the big bend and panhandle areas of the State (fig. 2). In contrast, 21 counties were 25 percent or less forested. All of these were located in Central and South Florida.

Ninety-six percent of Florida's forest area, or nearly 15.6 million acres, was classified as timberland. The remaining 4 percent was classified as reserved forest land. Reserved forest land was located in Federal parks, reserves, and wilderness areas. The area of timberland has increased by 901,000 acres since 1995. However, the increase was primarily confined to the southern end of the State. **Many factors combined to produce the change. Differences in survey methods, plot design, and sample intensity affected timberland area, as did altered fire regimes, reductions in woodland grazing, and inclusion of new tree species in the forest mix. The inclusion of new tree species caused many areas that were formerly considered unproductive to be included in the productive category.**

Ownership—Nonindustrial private forest (NIPF) ownership of the State's timberland increased. NIPF owners now hold 61 percent of the State's timberland (fig. 3), or almost 9.6 million acres, compared with 49 percent and 7.2 million acres in 1995. Public ownership of Florida's timberland increased again. Public agencies owned 27 percent, or nearly 4.2 million acres of Florida's timberland, compared with 19 percent and 2.8 million acres before. Continued acquisitions by State agencies drove the increase. In contrast, forest industry (FI) holdings decreased again. FI holdings accounted for 12 percent, or 1.8 million acres of timberland, compared with 31 percent and 4.6 million acres previously.

More of the publicly owned timberland occurred in the Northwest unit of the State than elsewhere (table A.2). Northwest Florida had 42 percent of the public timberland, Northeast Florida 28 percent, Central Florida 21 percent, and South Florida 9 percent. Northeast Florida had 47 percent of all private timberland, Northwest 33 percent, Central 15 percent, and South 5 percent.

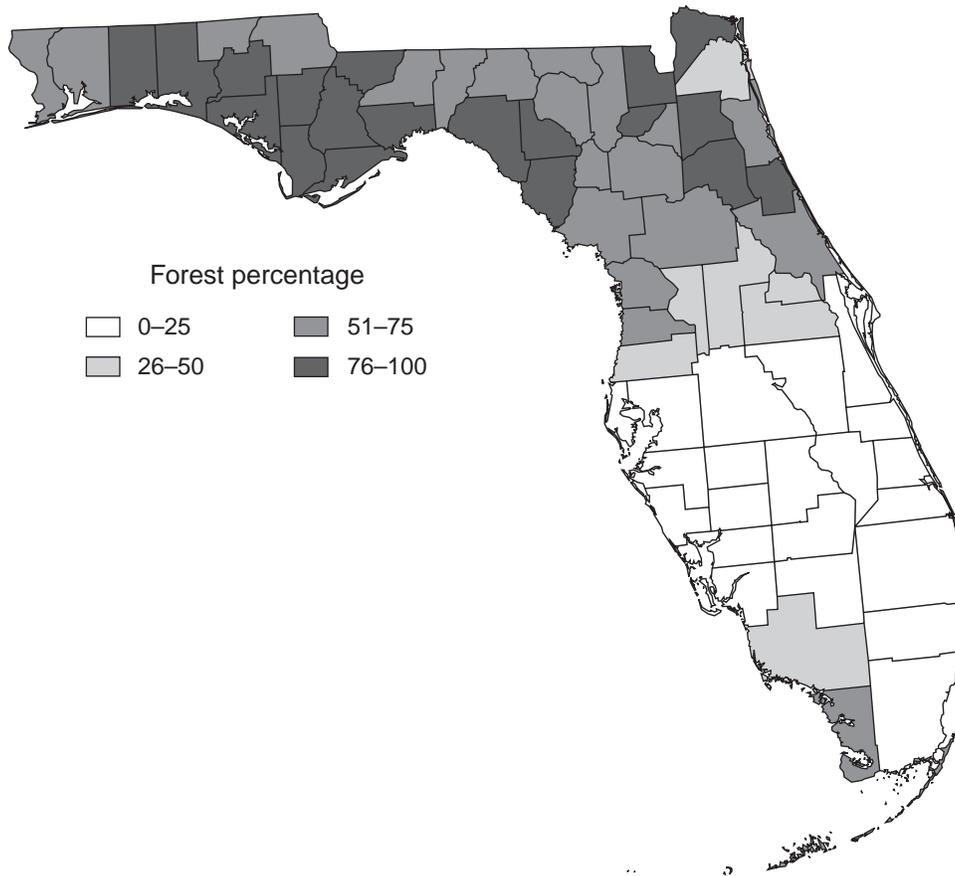


Figure 2—Florida counties by forest cover percentage, 2005.

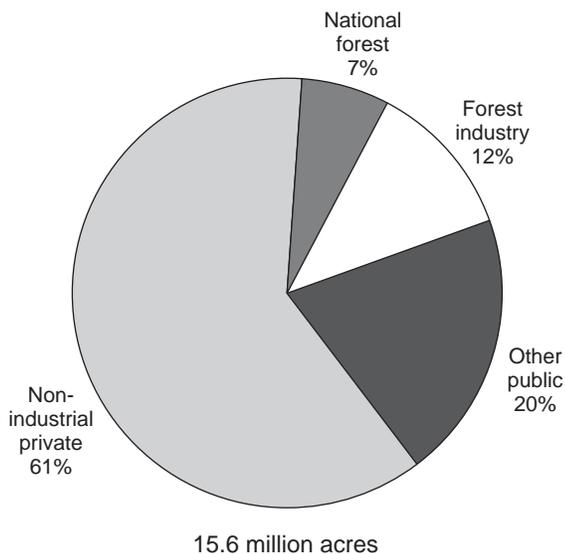


Figure 3—Area of timberland by ownership class, Florida, 2005.

Forest-type groups—Altogether, the hardwood types, which include the oak-pine type, occupied 7.8 million acres or 50 percent of the State’s timberland. The area in hardwood types increased about 500,000 acres or by 7 percent. Softwood types occupied 47 percent of the timberland or 7.3 million acres. The area in softwood types decreased 145,000 acres or by 2 percent. Nonstocked areas made up the remaining 3 percent.

The area of longleaf-slash pine group totaled 5.7 million acres and accounted for 37 percent of the State’s timberland (fig. 4), down by 2 percent since 1995. Area in oak-gum-cypress totaled 2.9 million acres and made up 19 percent of the timberland. Oak-gum-cypress dropped 22 percent, but some reclassification into new type groups not used in the previous survey is responsible for part of this change. Tropical hardwood, exotic hardwood, and the nonstocked category were not differentiated in 1995. Also involved are the aforementioned changes in inventory methods, plot design, and sample intensity. Further evidence of these impacts is seen in the change in oak-hickory type group

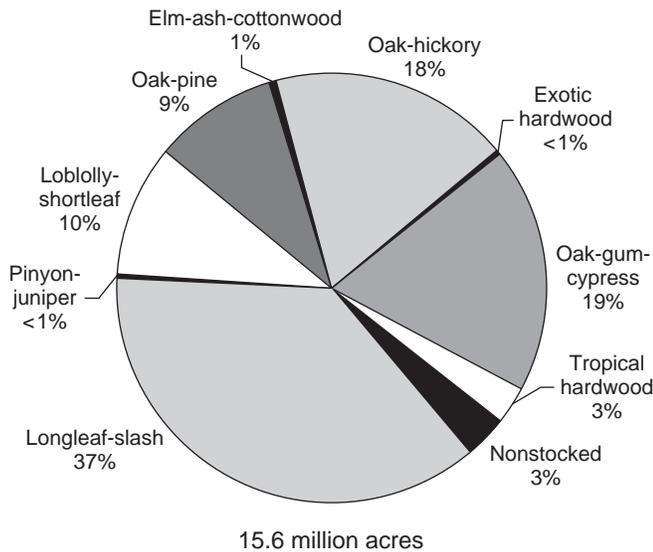


Figure 4—Area of timberland by forest-type group, Florida, 2005.

area. Current data show that the oak-hickory type group accounted for 2.8 million acres or 18 percent of the timberland, almost twice as much as in 1995. The major changes in survey procedures used from 1995 to 2005 and some reclassification based on stocking percentages offer the best explanation for this increase. The loblolly-shortleaf type group accounted for 10 percent or 1.5 million acres of the State's timberland, little change in area since 1995. The oak-pine type group accounted for 9 percent or 1.5 million acres, also about the same area as in 1995.

All of the slight decline in area of the longleaf-slash pine group mentioned above occurred in the area of slash pine type, as the area of longleaf pine type increased. The slash pine type alone accounted for 85 percent, or nearly 4.9 million acres, of the longleaf-slash pine group total acreage. Area of slash pine type dropped by 5.1 percent since 1995. In contrast, area of longleaf pine type increased by 18 percent to 874,000 acres.

From 70 to 73 percent of the timberland in these major forest-type groups was held by private ownerships. Eighty-two percent of the acreage in the oak-hickory type group was privately owned. The longleaf-slash pine type group occupied more area in Northeast Florida than elsewhere, as did the oak-hickory and oak-gum-cypress type groups (table A.3). Northwest Florida had more loblolly-shortleaf and oak-pine type group area than any other unit. The longleaf-slash pine type group occupied more area than any other in all units of the State except Central Florida where it was a close third after the oak-hickory and oak-gum-cypress type groups.

Forest management types—Almost one-third of Florida's timberland has been planted. Planted pine/oak-pine types accounted for 4.9 million acres (fig. 5) and increased by 1 percent since 1995. Natural pine/oak-pine types accounted for 3.8 million acres or 25 percent of the State's timberland. The area of natural pine/oak-pine dropped about 5 percent. Upland hardwood types accounted for 3.3 million acres or 21 percent of the timberland. According to the data, upland hardwoods experienced a huge increase in area, 65 percent. However, the inventory changes mentioned previously for one of the upland hardwood types (the oak-hickory forest-type group) are the only known explanation for the difference. Lowland hardwood types accounted for 3.0 million acres or 19 percent of the timberland. Lowland hardwoods appear to have declined 20 percent, but changes described previously for one of the lowland hardwood types (the oak-gum-cypress forest-type group) offer the best explanation for the difference.

Stand size—Sawtimber-size stands occupied more of Florida's timberland than did poletimber or sapling-seedling-size stands (fig. 6). Sawtimber-size stands occupied 38 percent or 5.9 million acres. Poletimber-size stands were found on 29 percent or 4.5 million acres, and sapling-seedling-size stands occurred on 30 percent or 4.7 million acres. Nonstocked stands made up the remaining 3 percent. In the 1995 survey, area of sapling-seedling-size stands exceeded that of sawtimber and poletimber. In both surveys, area in poletimber-size stands was less than that in sawtimber and sapling-seedling stands. The area of planted stands by size class has changed. It increased for both sawtimber- and

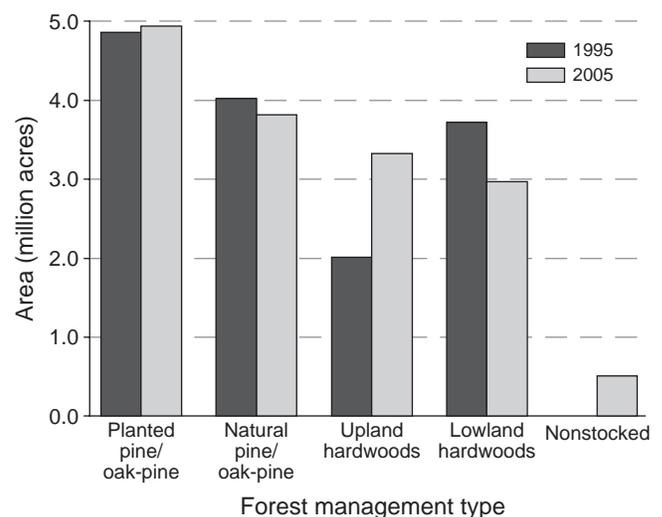


Figure 5—Area of timberland by forest management type, Florida, 1995 and 2005.

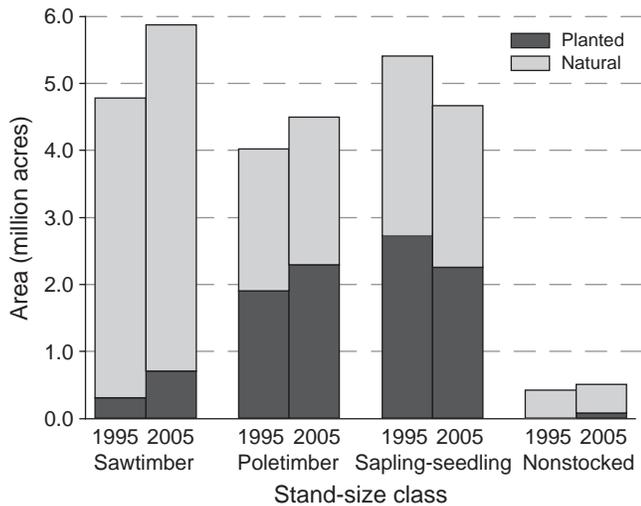


Figure 6—Area of timberland by stand-size class and stand origin, Florida, 1995 and 2005.

poletimber-size stands, but decreased for sapling-seedling-size stands. In 1995, there were more planted stands of sapling-seedling size than of poletimber and sawtimber sizes combined. In 2005, the area of planted poletimber-size stands slightly exceeded that of planted sapling-seedling-size stands. Planted stands accounted for 51 percent of the poletimber-size stands, 48 percent of the sapling-seedling-size stands, and just 12 percent of the sawtimber-size stands.

More than three-fourths (78 and 79 percent, respectively) of the poletimber- and sapling-seedling-size stands are privately owned, whereas just two-thirds of the sawtimber-size stands are. The Northeast Florida unit was the only one in which area of sapling-seedling-size stands exceeded that of each other size class (table A.4). Nevertheless, Northeast Florida still had more sawtimber-size stand acreage than any other unit.

Stand treatment—Since 1995, final harvest occurred on an average of 189,000 acres annually, 66 percent of which was on NIPF land (table A.30). Partial harvests occurred on 64,000 acres annually, 81 percent of which were on NIPF land. Commercial thinning averaged 57,000 acres annually, 75 percent of which were on NIPF land. New stands were established on about 188,000 acres each year through reforestation and afforestation. Eighty percent of the regeneration resulted from planting or seeding and the remainder occurred naturally. Weather damage occurred on 31,000 acres annually. Insects and diseases damaged just 7,000 acres annually, whereas fire damage averaged 198,000 acres each year.

Volume and Change

Softwood volume—Merchantable volume of softwood live trees accounted for 10.8 billion cubic feet or 58 percent of the State’s total tree volume (fig. 7), up from 56 percent in 1995. Live softwood volume increased 13 percent since 1995. Live softwood volume increased in all but the 6-inch diameter class (fig. 8). Planted stands held 39 percent or 4.2 billion cubic feet of the total softwood volume on Florida’s timberland as compared to 29 percent in 1995. NIPF lands accounted for 57 percent of the State’s softwood volume, FI lands 11 percent, national forest lands 9 percent, and other public lands 23 percent (fig. 9). Pine trees accounted for 80 percent of the softwood volume total (table A.11), cypress 19 percent, and other softwoods 1 percent. Within the pines, slash dominated with 5.1 billion cubic feet or 59 percent of total pine volume. Loblolly accounted for 18 percent, longleaf 14 percent, and sand 6 percent of total pine volume. Volume of all live cypress trees totaled more than 2.0 billion cubic feet in 2005, down somewhat (16 percent) from 2.4 billion cubic feet in 1995. Half of this decrease occurred in South Florida and most of the remaining decrease occurred in Northeast Florida.

Biomass estimation involves conversion of cubic-foot data to tons. Such estimates are inexact at best due to difficulties in determining accurate conversion factors. Weight differences among species resulting from physiological differences and differences in site, physiography, stand origin, etc. complicate any determination of accurate conversion factors on a large scale and still result in a wide range of conversion equivalents. Given these difficulties, the best available

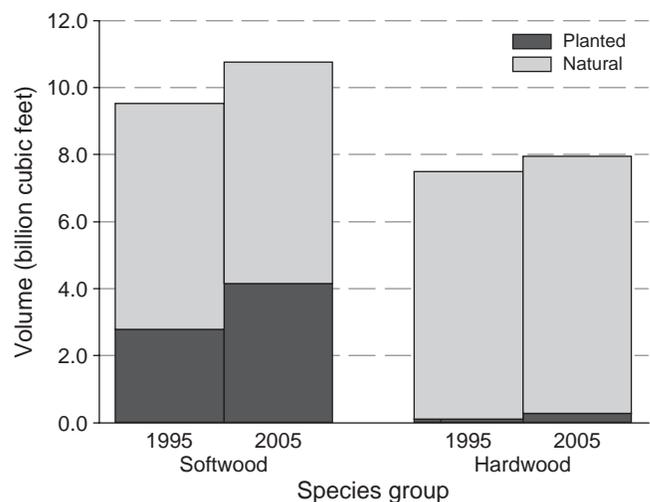


Figure 7—Volume of live trees on timberland by species group and stand origin, Florida, 1995 and 2005.

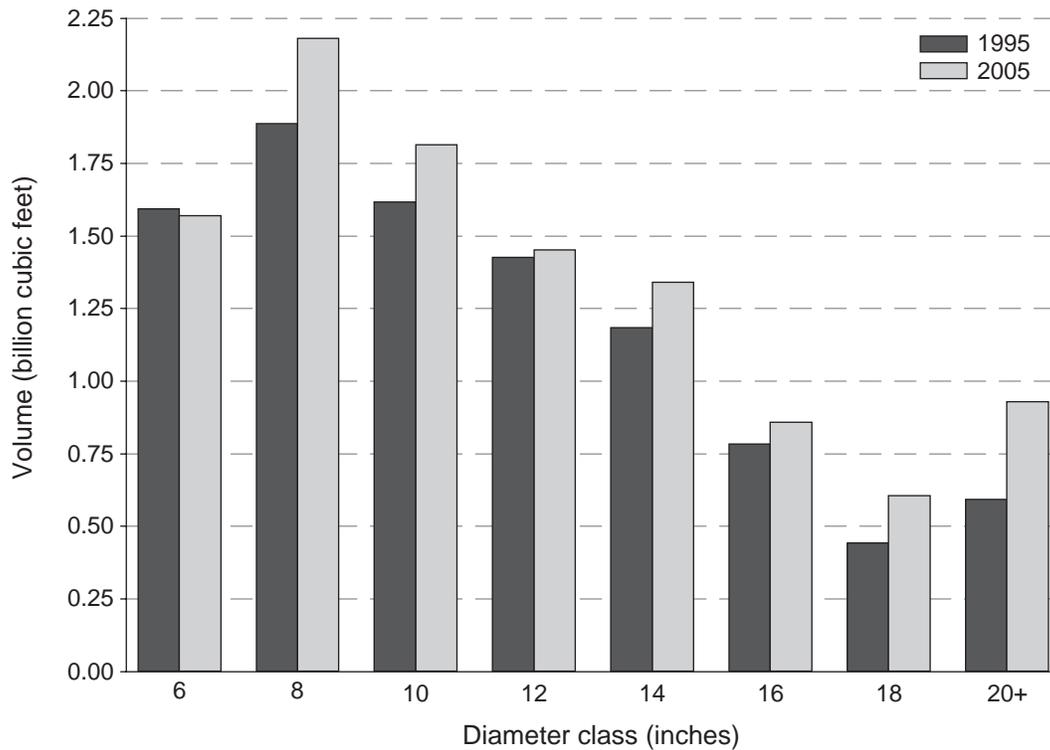


Figure 8—Volume of softwood live trees on timberland by diameter class, Florida, 1995 and 2005.

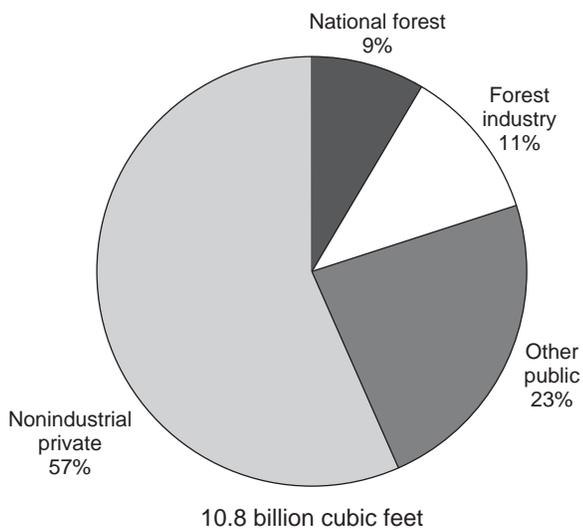


Figure 9—Volume of softwood live trees by ownership class, Florida, 2005.

conversion factors for use in southern coastal plain areas including Florida are 71 to 72 pounds per cubic foot for all pine (Clark and others 2006), 68 to 69 pounds per cubic foot for soft hardwoods, and 78 pounds per cubic foot for hard hardwoods (Clark and others 1985).

Hardwood volume—Merchantable volume of hardwood live trees accounted for 7.9 billion cubic feet or 42 percent of the State’s total tree volume (fig. 7), down from 44 percent in 1995. Live hardwood volume increased 6 percent since 1995. A portion of the hardwood volume resulted from the inclusion of a few new species that were not formerly classified as trees. Live hardwood volume increased in most diameter classes, decreases were confined to the 6-, 14-, and 18-inch diameter classes (fig. 10). **It should be noted here that FIA recommends use of live volume as opposed to growing-stock volume, particularly for hardwoods. The 2005 hardwood growing-stock estimates were found to deviate from previous surveys due to stricter field grading methods that resulted in higher than normal cull rates and hence lower estimates of hardwood growing-stock volume. Using previous ratios of growing stock as a percentage of live volume for the hardwood resource should be substituted if growing-stock values are desired.** NIPF lands accounted for 62 percent of the

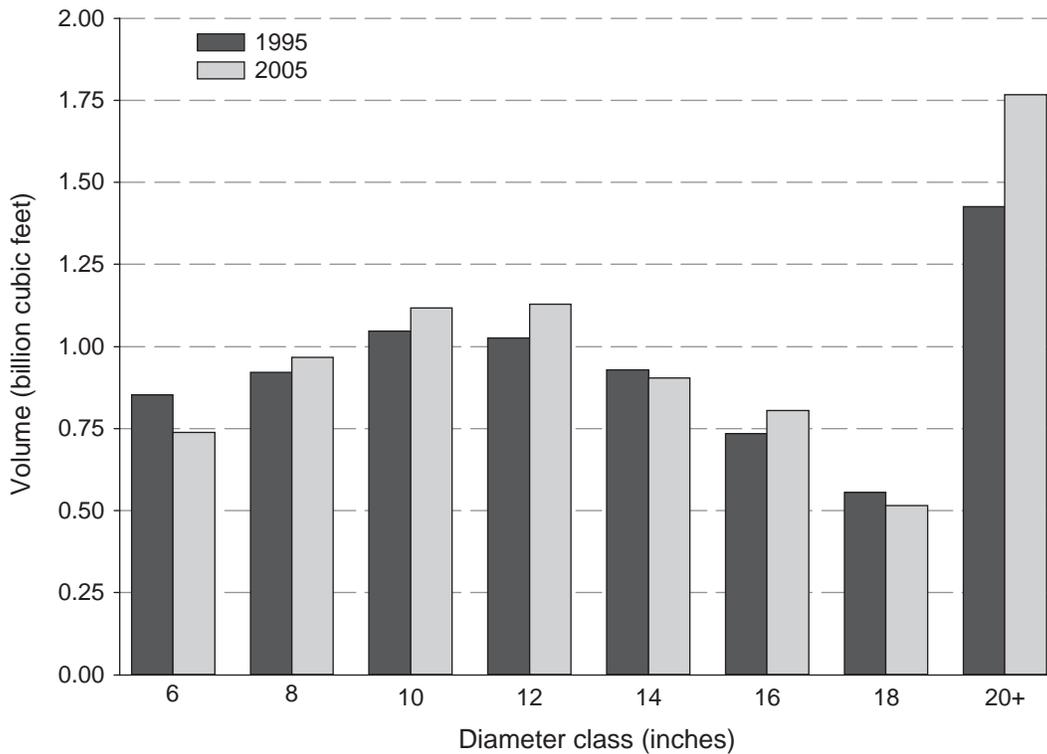


Figure 10—Volume of hardwood live trees on timberland by diameter class, Florida, 1995 and 2005.

hardwood volume, FI 9 percent, national forest lands 3 percent, and other public lands 26 percent (fig. 11). Hardwood species were diverse. Overall, 56 percent of hardwoods were classed as soft hardwood species (table A.11). Collectively, the tupelos at nearly 1.6 billion cubic feet accounted for 20 percent of total hardwood volume in the State. Laurel oak alone accounted for 15 percent of the hardwood volume, live oak 12 percent, sweetgum nearly 7 percent, and water oak 6 percent. Collectively, the bays accounted for 11 percent, maples almost 7 percent, and the ashes 4 percent. The invasive exotic melaleuca accounted for just 0.2 percent of the hardwood volume on timberland.

Mortality—Total mortality of all live trees averaged 209.7 million cubic feet annually for the period 1995–2005. Hardwoods accounted for 126.4 million cubic feet or 60 percent of the mortality (table A.24). Softwoods accounted for 83.2 million cubic feet or 40 percent. Mortality for softwood and hardwood trees increased since 1987–94 by 50 and 52 percent, respectively.

Growth—Total or gross growth (explained in ensuing net change section) of all live trees averaged 1.03 billion cubic feet annually in the State for the period 1995–2005. Softwoods accounted for 72 percent or 743 million cubic

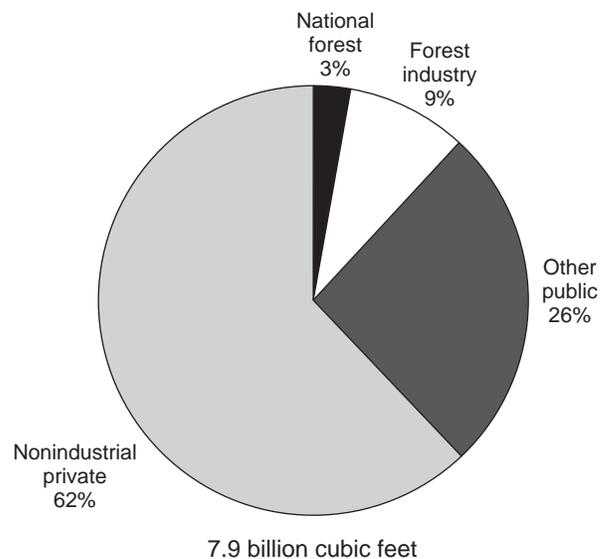


Figure 11—Volume of hardwood live trees by ownership class, Florida, 2005.

feet of gross growth. Hardwoods accounted for 28 percent or 290 million cubic feet. Gross growth of softwood and hardwood trees increased since 1987–94 by 26 and 9 percent, respectively. However, mortality reduced the growth accumulation leaving net growth. Net growth of all live softwoods averaged 660 million cubic feet annually (fig. 12) for the period 1995–2005. Net growth of all live hardwoods averaged 163 million cubic feet annually.

Sixty-five percent of the softwood net growth occurred on NIPF lands, 18 percent on FI lands, and 18 percent on public lands (table A.25). Seventy-three percent of the hardwood net growth occurred on NIPF lands, 7 percent on FI lands, and 20 percent on public lands. Forty-eight percent of softwood net growth occurred in Northeast Florida, 38 percent in Northwest Florida, 11 percent in Central Florida, and 3 percent in South Florida (table A.17). Thirty-nine percent of hardwood net growth occurred in Northeast Florida, 34 percent in Northwest Florida, 21 percent in Central Florida, and 5 percent in South Florida.

Removals—Total removals of all live trees averaged 580 million cubic feet annually for the period 1995–2005. Softwoods accounted for 81 percent or 473 million cubic feet of the removals. Hardwoods accounted for just 19 percent or 107 million cubic feet. Removals of softwoods and hardwoods changed little since 1987–94, both down about 1 percent (fig. 12).

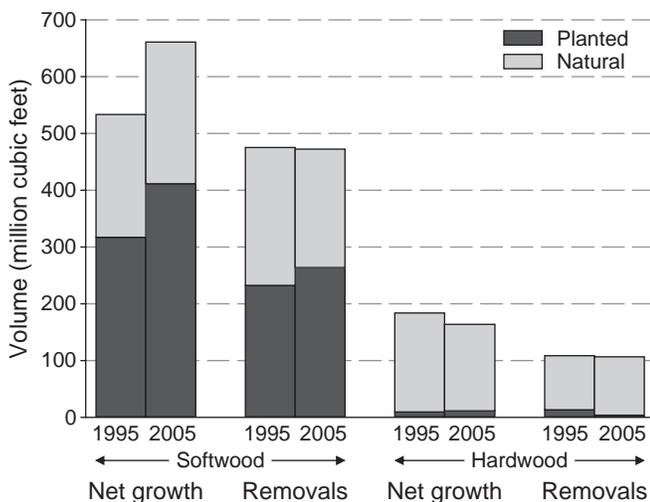


Figure 12—Average net annual growth and average annual removals of live trees on timberland by species group and stand origin, Florida, for the periods ending in 1995 and 2005.

Sixty-four percent of softwood removals came from NIPF lands, 21 percent from FI lands, and 15 percent from public lands (table A.25). Seventy-five percent of hardwood removals came from NIPF lands, 11 percent from FI lands, and 14 percent from public lands. Fifty-seven percent of softwood removals came from Northeast Florida, 33 percent from Northwest Florida, 8 percent from Central Florida, and 2 percent from South Florida (table A.20). Fifty-one percent of hardwood removals came from Northeast Florida, 25 percent from Northwest Florida, 20 percent from Central Florida, and 4 percent from South Florida.

Net change—Net change is determined by the interaction of gross growth, mortality, and removals. Gross growth, the sum of all growth components, is reduced by mortality. The deduction of mortality from gross growth leaves net growth. The resultant net growth is further reduced by removals. The deduction of removals yields a remainder referred to as net change. Net change can be positive or negative for the period.

The net change for softwoods in 2005 involved the aforementioned gross growth of 743 million cubic feet, mortality of 83 million cubic feet, and average annual net growth of 660 million cubic feet. This net growth was reduced by removals of 473 million cubic feet which yields a positive net change in the softwood resource of 187 million cubic feet. This follows the positive change recorded in the 1995 inventory—about 58 million cubic feet.

The net change for hardwoods in 2005 involved 290 million cubic feet of gross growth, 126 million cubic feet of mortality, and 163 million cubic feet of net growth. Removals of 107 million cubic feet deducted from the net growth left a surplus of 56 million cubic feet, another positive net change after one of about 75 million cubic feet in 1995.

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Appendix

Inventory Methods

The Southern Research Station's FIA unit and the Florida Department of Agriculture and Consumer Services Division of Forestry embarked on a new annual inventory system of the State's forests in 2001. The objective is to measure 20 percent (one-fifth) of the total plots in the State each year. This annual subsample is referred to as a panel. The plots measured in each panel are selected to ensure that there is systematic coverage of each county across the State. The data from a single panel is statistically weak, but after all five panels have been collected, the data from a single panel can be used in a rolling average to annually update the inventory. At this time, only 3 panels of inventory data have been completed, and this special one-time update report is being issued on the basis of measurement data and analysis for 60 percent (fig. 13) of the plots.

The inventory design, sample intensity, and methodology used to collect and process the information to derive current forest estimates for the 2005 update have undergone substantial change since the previous periodic survey conducted in 1995. These changes necessitate the use of caution when comparisons between the surveys are made. The 1995 periodic survey used a variable radius prism sample plot design that involved shifting of sample points to keep them in a single forest condition. The sample intensity was 1 plot per 2,800 acres of land in the State. The new annual inventory system uses a fixed-radius plot that can straddle multiple forest conditions and sample intensity is 1 plot per 5,700 acres in the State.

The annual inventory uses a three-phase sample of aerial photo points and permanent ground plots. Phase 1 (remote sensing estimates) involves the use of aerial photography to determine the area of forest land in each county. Phase 2 (mensurational estimates) is based on a network of ground sample locations physically visited and measured by field crews. Phase 3 (forest health estimates) takes additional measurements on tree crowns, soils, lichens, understory vegetation, and down woody material. The phase 3 sample is based on a 1/16th sample of the phase 2 plots.

In phase 1, a forest-nonforest classification was derived by interpreting 91,394 points on aerial photographs. These photo classifications were adjusted based on ground observations at 6,177 sample locations. The plot installed at each ground sample location (phase 2) was a cluster of four points spaced 120 feet apart. Each point served as the center of a 1/24th-acre circular subplot used to sample trees 5.0 inches in diameter at breast height (d.b.h.) and larger. A 1/300th-acre microplot, located at the subplot center, was used to sample trees 1.0 to 4.9 inches d.b.h. and seedlings

(trees < 1.0 inch d.b.h.). These fixed-radius sample plots were established without regard to land use or land cover. Forest and nonforest condition classes were delineated and recorded on each plot. Condition classes were defined by six attributes: (1) land use, (2) forest type, (3) stand origin, (4) stand size, (5) forest density, and (6) major ownership class. The process of delineating a fixed-radius plot into numerous sections based on forest and land use conditions is called mapping. All trees tallied were assigned to their respective condition class.

The cluster of four fixed plots found and sampled timberland at 1,803 ground sample locations in Florida. Estimates of timber volume and forest classifications were derived from tree measurements and classifications made at these locations. Volumes for individual tally trees were computed using equations for each of the major species in Florida. Estimates of growth, removals, and mortality were determined from the remeasurement of 1,527 permanent sample plots established in the previous inventory. The plot design for the previous inventory was based on a cluster of 10 points. Variable plots were systematically spaced within a single forest condition at three to five points. At each point, trees 5.0 inches d.b.h. and larger were selected for measurement on a variable-radius plot defined by a 37.5-factor prism. Trees < 5.0 inches d.b.h. were tallied on a fixed-radius plot around points 1 through 3. A more detailed explanation of previously employed methods can be found in "Forest Statistics for Florida, 1995" (Brown 1996).

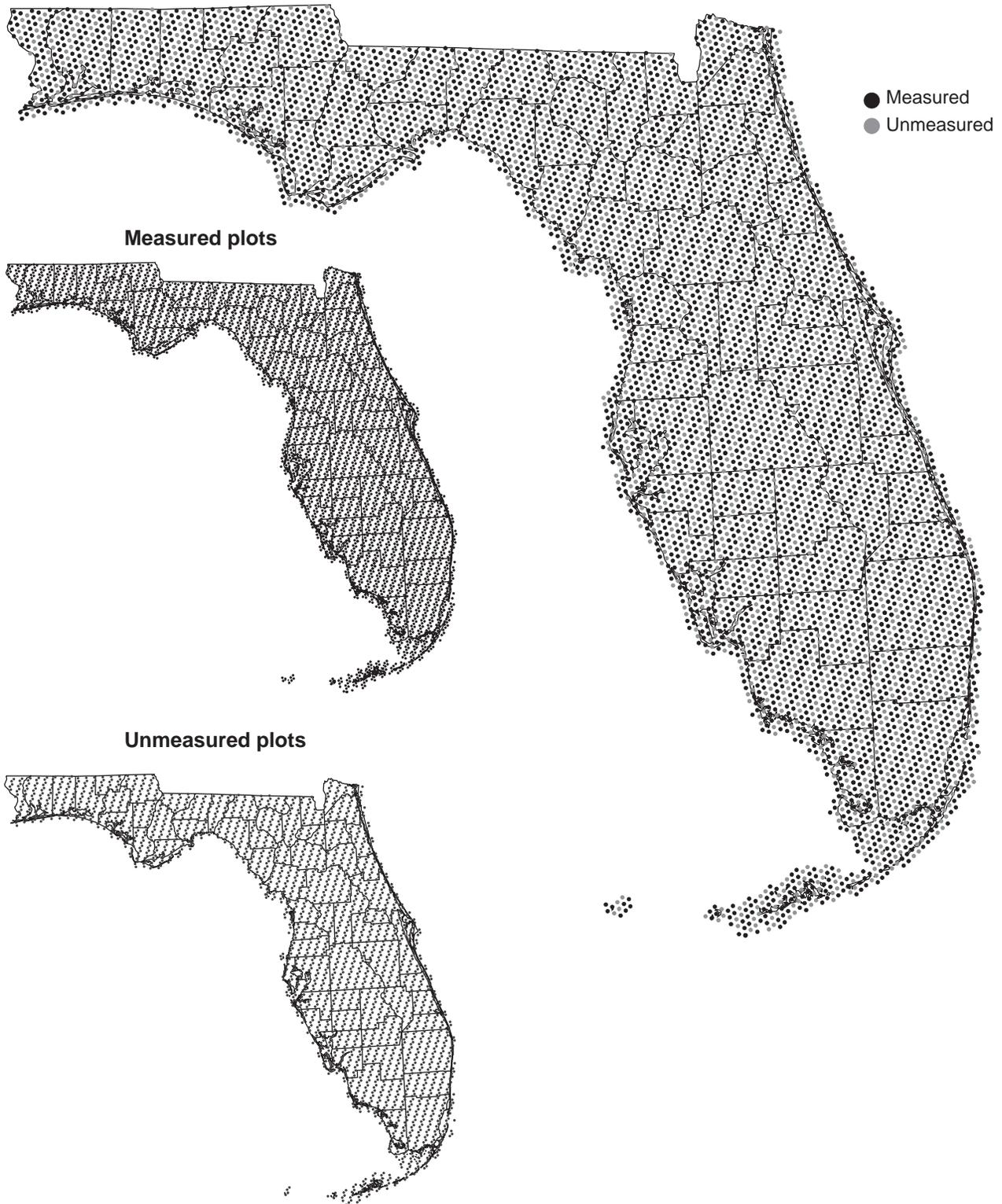


Figure 13—Approximate sample distribution of measured and unmeasured plots, Florida, 2005.

Statistical Reliability

A measure of reliability of inventory statistics is provided by sampling errors. Because the inventory statistics presented in this bulletin are based upon about 60 percent of all plots in the State, users should be aware of the sampling errors presented in this section and utilize the inventory statistics accordingly. FIA inventories based upon 100 percent of the sample plots are designed to produce reliable statistics at the survey unit and State levels. For most uses of these data, the statistics generated from 60 percent of the samples should provide reliable statistics for key totals at the State and survey unit levels. However, users should note that sampling error increases as the area or volume considered decreases. Sampling errors and associated confidence intervals are often unacceptably high for small populations of the total resource.

Sampling errors are calculated in such a way that the chances are two out of three that the true population value is within the limits indicated by a confidence interval. Sampling errors (in percent) and associated confidence intervals around the sample estimates for timberland area, inventory volumes, and components of change are presented in the following tabulation:

Item	Sample estimate and confidence interval	Sampling error <i>percent</i>
Timberland (1,000 acres)	15,551.9 ± 171.2	1.10
All live (million cubic feet)		
Inventory	18,693.1 ± 448.6	2.40
Net annual growth	822.9 ± 34.8	4.23
Annual removals	580.0 ± 38.6	6.66
Annual mortality	209.7 ± 14.4	6.89
Growing stock (million cubic feet)		
Inventory	14,821.0 ± 385.3	2.60
Net annual growth	736.3 ± 31.7	4.31
Annual removals	554.2 ± 37.5	6.76
Annual mortality	160.6 ± 12.7	7.93
Sawtimber (million board feet ^a)		
Inventory	45,659.9 ± 1,611.8	3.53
Net annual growth	2,047.3 ± 103.0	5.03
Annual removals	1,368.5 ± 119.9	8.76
Annual mortality	472.5 ± 44.1	9.34

^a International 1/4-inch rule.

Statistical confidence may be computed for any subdivision of any survey unit or State total using the following formula. Sampling errors obtained by this method are only approximations of reliability because this process assumes constant variance across all subdivisions of totals.

$$SE_s = SE_t \frac{\sqrt{X_t}}{\sqrt{X_s}}$$

where

SE_s = sampling error for subdivision of survey unit or State total

SE_t = sampling error for survey unit or State total

X_s = sum of values for the variable of interest (area or volume) for subdivision of survey unit or State

X_t = total area or volume for survey unit or State

For example, the estimate of sampling error for softwood live-tree volume on NIPF timberland (table A.14) is computed as:

$$SE_s = 2.40 \frac{\sqrt{18,693.1}}{\sqrt{6,086.5}} = 4.21.$$

Thus, the sampling error is 4.21 percent, and the resulting confidence interval (two times out of three) for softwood live-tree inventory on NIPF timberland is 6,086 ± 256.2 million cubic feet.

Species List^a

Common name	Scientific name ^b	Common name	Scientific name ^b
Softwoods		Hardwoods (continued)	
Australian pine	<i>Casuarina</i> L.	Pigeon plum	<i>Coccoloba diversifolia</i> Jacq.
Atlantic white-cedar	<i>Chamaecyparis thyoides</i> (L.) B.S.P.	Soldierwood	<i>Colubrina elliptica</i> (Sw.) Briz. & Stern
Southern redcedar	<i>Juniperus silicicola</i> (Small) Bailey	Button-mangrove	<i>Conocarpus erectus</i> L.
Eastern redcedar	<i>J. virginiana</i> L.	Largeleaf geigertree	<i>Cordia sebestena</i> L.
Caribbean pine	<i>Pinus caribaea</i> Morelet	Flowering dogwood	<i>Cornus florida</i> L.
Sand pine	<i>P. clausa</i> (Chapman ex Engelm.) Vasey ex Sarg.	Hawthorn	<i>Crataegus</i> spp. L.
Shortleaf pine	<i>P. echinata</i> Mill.	Carrotwood	<i>Cupaniopsis anacardioides</i> (A. Rich.) Radlk.
Slash pine	<i>P. elliottii</i> Engelm.	Common persimmon	<i>Diospyros virginiana</i> L.
Spruce pine	<i>P. glabra</i> Walt.	Red stopper	<i>Eugenia rhombea</i> Krug & Urban
Longleaf pine	<i>P. palustris</i> Mill.	Inkwood (butterbough)	<i>Exothea paniculata</i> (Juss.) Radlk.
Pond pine	<i>P. serotina</i> Michx.	American beech	<i>Fagus grandifolia</i> Ehrh.
Loblolly pine	<i>P. taeda</i> L.	Strangler fig	<i>Ficus aurea</i> Nutt.
Baldcypress	<i>Taxodium distichum</i> (L.) Rich.	Shortleaf fig (wild banyantree)	<i>F. citrifolia</i> P. Mill.
Pondcypress	<i>T. distichum</i> var. <i>nutans</i>	White ash	<i>Fraxinus americana</i> L.
Florida yew	<i>Taxus floridana</i> Nutt. ex Chapman	Carolina ash	<i>F. caroliniana</i> P. Mill.
Florida torreyia	<i>Torreya taxifolia</i> Arn.	Green ash	<i>F. pennsylvanica</i> Marsh.
Hardwoods		Pumpkin ash	<i>F. profunda</i> (Bush) Bush
Florida maple	<i>Acer barbatum</i> Michx.	Waterlocust	<i>Gleditsia aquatica</i> Marsh.
Boxelder	<i>A. negundo</i> L.	Honeylocust	<i>G. triacanthos</i> L.
Red maple	<i>A. rubrum</i> L.	Loblolly bay	<i>Gordonia lasianthus</i> (L.) Ellis
Silver maple	<i>A. saccharinum</i> L.	Longleaf blolly (beefree)	<i>Guapira discolor</i> (Spreng.) Little
Ailanthus	<i>Ailanthus altissima</i> (Mill.) Swingle	Manchineel	<i>Hippomane mancinella</i> L.
Tung-oil tree	<i>Aleurites fordii</i> Hemsl.	American holly	<i>Ilex opaca</i> Ait.
Serviceberry	<i>Amelanchier</i> spp. Med.	Black walnut	<i>Juglans nigra</i> L.
Torchwood	<i>Amyris elemifera</i> L.	White mangrove	<i>Laguncularia racemosa</i> (L.) Gaertn. f.
Pond apple	<i>Annona glabra</i> L.	Sweetgum	<i>Liquidambar styraciflua</i> L.
Black mangrove	<i>Avicennia germinans</i> (L.) L.	Yellow-poplar	<i>Liriodendron tulipifera</i> L.
River birch	<i>Betula nigra</i> L.	False tamarind	<i>Lysiloma latisiliquum</i> (L.) Benth.
Gumbo limbo	<i>Bursera simaruba</i> (L.) Sarg.	Cucumbertree	<i>Magnolia acuminata</i> L.
American hornbeam	<i>Carpinus caroliniana</i> Walt.	Southern magnolia	<i>M. grandiflora</i> L.
Hickory	<i>Carya</i> spp. Nutt.	Bigleaf magnolia	<i>M. macrophylla</i> Michx.
Water hickory	<i>C. aquatica</i> (Michx. f.) Nutt.	Sweetbay	<i>M. virginiana</i> L.
Bitternut hickory	<i>C. cordiformis</i> (Wangenh.) K. Koch	Crabapple	<i>Malus angustifolia</i> (Ait.) Michx.
Pignut hickory	<i>C. glabra</i> (Mill.) Sweet	Mango	<i>Mangifera indica</i> L.
Pecan	<i>C. illinoensis</i> (Wangenh.) K. Koch	False mastic	<i>Mastichodendron foetidissimum</i> (Jacq.) H.J. Lam
Shellbark hickory	<i>C. laciniosa</i> (Michx. f.) Loud.	Melaleuca	<i>Melaleuca quinquenervia</i> (Cav.) Blake
Nutmeg hickory	<i>C. myristiciformis</i> (Michx. f.) Nutt.	Chinaberry	<i>Melia azedarach</i> L.
Shagbark hickory	<i>C. ovata</i> (Mill.) K. Koch	Florida poisonwood	<i>Metopium toxiferum</i> (L.) Krug & Urban
Mockernut hickory	<i>C. tomentosa</i> (Poir.) Nutt.	White mulberry	<i>Morus alba</i> L.
Allegheny chinkapin	<i>Castanea pumila</i> Mill.	Red mulberry	<i>M. rubra</i> L.
Florida chinkapin	<i>Castanea alnifolia</i> Nutt.	Water tupelo	<i>Nyssa aquatica</i> L.
Catalpa	<i>Catalpa</i> spp. Scop.	Blackgum	<i>N. sylvatica</i> Marsh.
Southern catalpa	<i>Catalpa bignonioides</i> Walt.	Swamp tupelo	<i>N. sylvatica</i> var. <i>biflora</i> (Walt.) Sarg.
Sugarberry	<i>Celtis laevigata</i> Willd.	Eastern hophornbeam	<i>Ostrya virginiana</i> (Mill.) K. Koch
Eastern redbud	<i>Cercis canadensis</i> L.	Sourwood	<i>Oxydendrum arboreum</i> (L.) DC.
Camphor tree	<i>Cinnamomum camphora</i> (L.) J. Presl	Redbay	<i>Persea borbonia</i> (L.) Spreng.
Fiddlewood	<i>Citharexylum fruticosum</i> L.		
Citrus spp.	<i>Citrus</i> L.		

continued

Species List^a (continued)

Common name	Scientific name ^b	Common name	Scientific name ^b
Hardwoods (continued)		Hardwoods (continued)	
Fishpoison tree	<i>Piscidia piscipula</i> (L.) Sarg.	Schefflera (octopus tree)	<i>Schefflera actinophylla</i> (Endl.) H.A.T. Harms
Planertree	<i>Planera aquatica</i> J.F. Gmel.	False mastic	<i>Sideroxylon foetidissimum</i> Jacq.
American sycamore	<i>Platanus occidentalis</i> L.	White bully (willow bastic)	<i>S. salicifolium</i> (L.) Lam.
Cottonwood	<i>Populus</i> spp. L.	Paradise tree	<i>Simarouba glauca</i> DC.
American plum	<i>Prunus americana</i> Marsh.	West Indian mahogany	<i>Swietenia mahagoni</i> (L.) Jacq.
Carolina laurelcherry	<i>P. caroliniana</i> (P. Mill.) Ait.	Java plum	<i>Syzygium cumini</i> (L.) Skeels
Black cherry	<i>P. serotina</i> Ehrh.	Tamarind	<i>Tamarindus indica</i> L.
White oak	<i>Quercus alba</i> L.	Carolina basswood	<i>Tilia americana</i> var. <i>caroliniana</i> (P. Mill.) Castigl.
Scarlet oak	<i>Q. coccinea</i> Muenchh.	White basswood	<i>T. heterophylla</i> Vent.
Durand oak	<i>Q. durandii</i> Buckl.	Winged elm	<i>Ulmus alata</i> Michx.
Southern red oak	<i>Q. falcata</i> Michx.	American elm	<i>U. americana</i> L.
Cherrybark oak	<i>Q. falcata</i> var. <i>pagodifolia</i> Ell.	Cedar elm	<i>U. crassifolia</i> Nutt.
Bluejack oak	<i>Q. incana</i> Bartr.	Chinese elm	<i>U. parvifolia</i> Jacq.
Turkey oak	<i>Q. laevis</i> Walt.	English elm	<i>U. procera</i> Salisb.
Laurel oak	<i>Q. laurifolia</i> Michx.	Slippery elm	<i>U. rubra</i> Muhl.
Overcup oak	<i>Q. lyrata</i> Walt.	Palms	
Swamp chestnut oak	<i>Q. michauxii</i> Nutt.	Paurotis palm	<i>Acoelorrhaphe wrightii</i> (Griseb. & H. Wendl.) H. Wendl. ex Becc.
Chinkapin oak	<i>Q. muehlenbergii</i> Engelm.	Florida silver palm	<i>Coccothrinax argentata</i> (Jacq.) Bailey
Water oak	<i>Q. nigra</i> L.	Coconut palm	<i>Cocos nucifera</i> L.
Nuttall oak	<i>Q. nuttallii</i> Palmer	Florida royal palm	<i>Roystonea elata</i> (Bartr.) F. Harper
Willow oak	<i>Q. phellos</i> L.	Cabbage palm	<i>Sabal palmetto</i> (Walt.) Lodd. ex J.A. & J.H. Schultes
Shumard oak	<i>Q. shumardii</i> Buckl.	Key thatch palm	<i>Thrinax morrisii</i> H. Wendl.
Post oak	<i>Q. stellata</i> Wangenh.	Florida thatch palm	<i>T. radiata</i> Lodd. ex J.A. & J.H. Schultes
Black oak	<i>Q. velutina</i> Lam.		
Live oak	<i>Q. virginiana</i> Mill.		
Red mangrove	<i>Rhizophora mangle</i> L.		
Willow	<i>Salix</i> spp. L.		
Sassafras	<i>Sassafras albidum</i> (Nutt.) Nees		

^a Scientific and common names of tree species subject to survey in Florida.

^b Little (1979).

Glossary

Afforestation. Area of land previously classified as nonforest that is converted to forest by planting trees or by natural reversion to forest.

Average annual mortality. Average annual volume of trees 5.0 inches d.b.h. and larger that died from natural causes during the intersurvey period.

Average annual removals. Average annual volume of trees 5.0 inches d.b.h. and larger removed from the inventory by harvesting, cultural operations (such as timber stand improvement), land clearing, or changes in land use during the intersurvey period.

Average net annual growth. Average annual net change in volume of trees 5.0 inches d.b.h. and larger in the absence of cutting (gross growth minus mortality) during the intersurvey period.

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

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

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

Census water. Streams, sloughs, estuaries, canals, and other moving bodies of water 200 feet wide and greater, and lakes, reservoirs, ponds, and other permanent bodies of water 4.5 acres in area and greater.

Commercial species. Tree species currently or potentially suitable for industrial wood products.

Composite panels. Roundwood products manufactured into chips, wafers, strands, flakes, shavings, or sawdust and then reconstituted into a variety of panel and engineered lumber products.

CRP. The Conservation Reserve Program, a major Federal afforestation program authorized by the 1985 Farm Bill.

D.b.h. Tree diameter in inches (outside bark) at breast height (4.5 feet aboveground).

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

D.o.b. (diameter outside bark). Stem diameter including bark.

Down woody material. Woody pieces of trees and shrubs that have been uprooted (no longer supporting growth) or severed from their root system, not self-supporting, and are lying on the ground (previously named down woody debris).

Forest land. Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. The minimum area considered for classification is 1 acre. Forested strips must be at least 120 feet wide.

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

Pine plantation. Stands that (1) have been artificially regenerated by planting or direct seeding, (2) are classed as a pine or other softwood forest type, and (3) have at least 10 percent stocking.

Natural pine. Stands that (1) have not been artificially regenerated, (2) are classed as a pine or other softwood forest type, and (3) have at least 10 percent stocking.

Oak-pine. Stands that have at least 10 percent stocking and are classed as a forest type of oak-pine.

Upland hardwood. Stands that have at least 10 percent stocking and are classed as an oak-hickory or maple-beech-birch forest type.

Lowland hardwood. Stands that have at least 10 percent stocking with a forest type of oak-gum-cypress, elm-ash-cottonwood, palm, or other tropical.

Nonstocked stands. Stands <10 percent stocked with live trees.

Forest type. A classification of forest land based on the species forming a plurality of live-tree stocking. Major eastern forest-type groups are:

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

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

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

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

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

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

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

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

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

Nonstocked stands. Stands < 10 percent stocked with live trees.

Forested tract size. The area of forest within the contiguous tract containing each FIA sample plot.

Fresh weight. Mass of tree component at time of cutting.

Fuelwood. Roundwood harvested to produce some form of energy, e.g., heat and steam, in residential, industrial, or institutional settings.

Gross growth. Annual increase in volume of trees 5.0 inches d.b.h. and larger in the absence of cutting and mortality. (Gross growth includes survivor growth, ingrowth, growth on ingrowth, growth on removals before removal, and growth on mortality before death.)

Growing-stock trees. Living trees of commercial species classified as sawtimber, poletimber, saplings, and seedlings. Trees must contain at least one 12-foot or two 8-foot logs in the saw-log portion, currently or potentially (if too small to qualify), to be classed as growing stock. The log(s) must meet dimension and merchantability standards to qualify. Trees must also have, currently or potentially, one-third of the gross board-foot volume in sound wood.

Growing-stock volume. The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches d.b.h. from a 1-foot stump to a minimum 4.0-inch top d.o.b. of the central stem.

Hardwoods. Dicotyledonous trees, usually broadleaf and deciduous.

Soft hardwoods. Hardwood species with an average specific gravity of 0.50 or less, such as gums, yellow-poplar, cottonwoods, red maple, basswoods, and willows.

Hard hardwoods. Hardwood species with an average specific gravity >0.50 such as oaks, hard maples, hickories, and beech.

Industrial wood. All roundwood products except fuelwood.

Land area. The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide), streams, sloughs, estuaries, and canals < 200 feet wide, and lakes, reservoirs, and ponds < 4.5 acres in area.

Live trees. All living trees. All size classes, all tree classes, and both commercial and noncommercial species are included.

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

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

Net annual change. Increase or decrease in volume of live trees at least 5.0 inches d.b.h. Net annual change is equal to net annual growth minus average annual removals.

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

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

Nonstocked stands. Stands < 10 percent stocked with live trees.

Other forest land. Forest land other than timberland and productive reserved forest land. It includes available and reserved forest land which is incapable of producing annually 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

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

Ownership. The property owned by one ownership unit, including all parcels of land in the United States.

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

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

Nonindustrial private forest (NIPF) land. Privately owned land excluding FI land.

Corporate. Owned by corporations, including incorporated farm ownerships.

Individual. All lands owned by individuals, including farm operators.

Other public. An ownership class that includes all public lands except national forests.

Miscellaneous Federal land. Federal land other than national forests.

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

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

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

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

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

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

Poletimber-size trees. Softwoods 5.0 to 8.9 inches d.b.h. and hardwoods 5.0 to 10.9 inches d.b.h.

Primary wood-using plants. Industries receiving roundwood or chips from roundwood for the manufacture of products, such as veneer, pulp, and lumber.

Productive-reserved forest land. Forest land sufficiently productive to qualify as timberland but withdrawn from timber utilization through statute or administrative regulation.

Pulpwood. A roundwood product that will be reduced to individual wood fibers by chemical or mechanical means. The fibers are used to make a broad generic group of pulp products that includes paper products, as well as fiberboard, insulating board, and paperboard.

Reforestation. Area of land previously classified as forest that is regenerated by planting trees or natural regeneration.

Rotten trees. Live trees of commercial species not containing at least one 12-foot saw log, or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, primarily because of rot or missing sections, and with less than one-third of the gross board-foot tree volume in sound material.

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

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

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

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

Salvable dead trees. Standing or downed dead trees that were formerly growing stock and considered merchantable. Trees must be at least 5.0 inches d.b.h. to qualify.

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

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

Saw-log portion. The part of the bole of sawtimber trees between a 1-foot stump and the saw-log top.

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

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

Sawtimber volume. Growing-stock volume in the saw-log portion of sawtimber-size trees in board feet (International ¼-inch rule).

Seedlings. Trees < 1.0 inch d.b.h. and > 1 foot tall for hardwoods, > 6 inches tall for softwoods, and > 0.5 inch in diameter at ground level for longleaf pine.

Select red oaks. A group of several red oak species composed of cherrybark, Shumard, and northern red oaks. Other red oak species are included in the “other red oaks” group.

Select white oaks. A group of several white oak species composed of white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks. Other white oak species are included in the “other white oaks” group.

Site class. A classification of forest land in terms of potential capacity to grow crops of industrial wood based on fully stocked natural stands.

Softwoods. Coniferous trees, usually evergreen, having leaves that are needles or scalelike.

Yellow pines. Loblolly, longleaf, slash, pond, shortleaf, pitch, Virginia, sand, spruce, and Table Mountain pines.

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

Stand age. The average age of dominant and codominant trees in the stand.

Stand origin. A classification of forest stands describing their means of origin.

Planted. Planted or artificially seeded.

Natural. No evidence of artificial regeneration.

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

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

Poletimber stands. Stands at least 10 percent stocked with live trees, of which one-half or more of total stocking is in poletimber and sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands. Stands at least 10 percent stocked with live trees of which more than one-half of total stocking is saplings and seedlings.

Nonstocked stands. Stands < 10 percent stocked with live trees.

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

Density of trees and basal area per acre required for full stocking:

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

— = not applicable.

Timberland. Forest land capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization.

Timber products. Roundwood products and byproducts.

Tree. Woody plants having one erect perennial stem or trunk at least 3 inches d.b.h., a more or less definitely

formed crown of foliage, and a height of at least 13 feet (at maturity).

Tree grade. A classification of the saw-log portion of sawtimber trees based on: (1) the grade of the butt log or (2) the ability to produce at least one 12-foot or two 8-foot logs in the upper section of the saw-log portion. Tree grade is an indicator of quality; grade 1 is the best quality.

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

Veneer log. A roundwood product either rotary cut, sliced, stamped, or sawn into a variety of veneer products such as plywood, finished panels, veneer sheets, or sheathing.

Volume of live trees. The cubic-foot volume of sound wood in live trees at least 5.0 inches d.b.h. from a 1-foot stump to a minimum 4.0-inch top d.o.b. of the central stem.

Volume of saw-log portion of sawtimber trees. The cubic-foot volume of sound wood in the saw-log portion of sawtimber trees. Volume is the net result after deductions for rot, sweep, and other defects that affect use for lumber.

Metric Equivalents

1 acre = 4,046.86 m² or 0.404686 ha

1 cubic foot = 0.028317 m³

1 inch = 2.54 cm or 0.0254 m

Breast height = 1.4 m above the ground

1 square foot = 929.03 cm² or 0.0929 m²

1 square foot per acre basal area = 0.229568 m²/ha

1 pound = 0.454 kg

1 ton = 0.907 MT

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Table A.1—Land area by survey unit and land class, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	Total land area ^a	Forest land			Other land ^b	
		Total forest	Timberland	Productive reserved		Other
<i>thousand acres</i>						
Northeast	9,577.3	6,587.1	6,533.3	44.4	9.3	3,139.5
Northwest	7,234.2	5,635.0	5,531.0	59.4	44.6	1,769.2
Central	9,940.3	2,663.6	2,568.7	74.0	21.0	7,457.9
South	7,761.2	1,261.2	918.9	288.1	54.2	6,512.8
All units	34,513.0	16,146.9	15,551.9	465.8	129.1	18,879.4

Numbers in rows and columns may not sum to totals due to rounding.

^a From the U.S. Bureau of Census (2002).

^b Includes 739.61 thousand acres of water according to FIA standards of area classification, but defined by the Bureau of Census as land.

Table A.2—Area of timberland by survey unit and ownership class, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	All classes	Ownership class			
		National forest	Other public	Forest industry	Nonindustrial private
<i>thousand acres</i>					
Northeast	6,533.3	449.0	730.6	1,323.6	4,030.1
Northwest	5,531.0	521.2	1,229.5	444.0	3,336.3
Central	2,568.7	58.7	800.7	65.8	1,643.4
South	918.9	0.0	374.8	0.0	544.1
All units	15,551.9	1,029.0	3,135.6	1,833.4	9,553.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = a value >0.0 but <0.05 for the cell.

Table A.3—Area of timberland by survey unit and forest-type group, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	All groups	Forest-type group									
		Longleaf-slash	Loblolly-shortleaf	Pinyon-juniper ^a	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood	Tropical hardwood	Exotic hardwood	Non-stocked
<i>thousand acres</i>											
Northeast	6,533.3	2,669.6	640.6	2.9	437.1	1,177.1	1,257.4	17.2	107.7	0.0	223.9
Northwest	5,531.0	2,160.4	837.9	0.0	640.3	859.6	880.8	37.5	0.0	0.0	114.6
Central	2,568.7	577.0	68.1	0.0	290.4	697.4	598.7	27.9	174.9	7.9	126.5
South	918.9	336.2	0.0	0.0	90.8	93.9	149.7	1.9	157.4	44.7	44.3
All units	15,551.9	5,743.1	1,546.6	2.9	1,458.6	2,827.9	2,886.6	84.4	439.9	52.6	509.2

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = a value >0.0 but <0.05 for the cell.

^a Includes eastern redcedar forest type.

Table A.4—Area of timberland by survey unit and stand-size class, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	All classes	Stand-size class			
		Sawtimber	Poletimber	Sapling-seedling	Non-stocked
<i>thousand acres</i>					
Northeast	6,533.3	2,096.7	2,000.8	2,211.9	223.9
Northwest	5,531.0	2,017.4	1,700.8	1,698.3	114.5
Central	2,568.7	1,308.9	579.9	553.5	126.5
South	918.9	449.5	217.8	207.2	44.3
All units	15,551.9	5,872.5	4,499.3	4,670.8	509.2

Numbers in rows and columns may not sum to totals due to rounding.

Table A.5—Area of timberland by forest-type group, stand origin, and ownership class, Florida, 2005, cycle 3, panels 3, 4, 5

Forest-type group ^a and stand origin	All classes	Ownership class			
		National forest	Other public	Forest industry	Nonindustrial private
<i>thousand acres</i>					
Softwood types					
Longleaf-slash					
Planted	3,615.5	158.1	366.0	744.5	2,347.0
Natural	2,127.6	346.8	739.2	68.8	972.9
Total	5,743.1	504.9	1,105.2	813.2	3,319.9
Loblolly-shortleaf					
Planted	1,015.7	116.3	72.2	267.1	560.0
Natural	531.0	82.3	169.1	9.3	270.3
Total	1,546.6	198.5	241.3	276.5	830.3
Pinyon-juniper ^b	2.9	0.0	2.9	0.0	0.0
Total softwoods	7,292.7	703.4	1,349.4	1,089.7	4,150.2
Hardwood types					
Oak-pine					
Planted	303.6	27.9	31.8	30.5	213.4
Natural	1,155.0	111.6	260.2	73.8	709.4
Total	1,458.6	139.6	292.0	104.3	922.7
Oak-hickory	2,827.9	54.5	444.2	167.9	2,161.3
Oak-gum-cypress	2,886.6	86.5	681.0	371.9	1,747.3
Elm-ash-cottonwood	84.4	9.8	35.1	7.0	32.5
Tropical hardwoods	439.9	28.0	181.0	18.8	212.1
Exotic hardwoods	52.6	0.0	20.3	0.0	32.3
Total hardwoods	7,750.1	318.4	1,653.6	669.8	5,108.2
Nonstocked	509.2	7.2	132.7	73.9	295.5
All groups	15,551.9	1,029.0	3,135.6	1,833.4	9,553.9

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = a value > 0.0 but < 0.05 for the cell.

^a Forest-type classifications are determined by an algorithm based on live-tree tally.

^b Includes eastern redcedar forest type.

Table A.6—Number of live trees on timberland by species group and diameter class, Florida, 2005, cycle 3, panels 3, 4, and 5

Species group	All classes	Diameter class (<i>inches at breast height</i>)											
		1.0–2.9	3.0–4.9	5.0–6.9	7.0–8.9	9.0–10.9	11.0–12.9	13.0–14.9	15.0–16.9	17.0–18.9	19.0–20.9	21.0–28.9	29.0 and larger
<i>thousand trees</i>													
Softwood													
Yellow pine	2,759,076	869,171	794,850	547,952	298,640	124,456	58,140	35,312	16,074	8,293	3,310	2,701	176
Other softwoods	529,343	230,775	121,787	63,657	39,807	27,820	17,960	12,412	6,096	3,865	3,063	1,863	239
All softwoods	3,288,419	1,099,945	916,636	611,610	338,447	152,276	76,100	47,723	22,170	12,158	6,373	4,565	415
Hardwood													
Soft hardwoods	2,175,533	1,232,800	446,996	172,262	110,161	82,956	61,565	32,992	18,184	8,557	3,690	4,664	707
Hard hardwoods	1,889,456	1,226,068	345,427	131,687	69,307	42,130	25,600	15,276	11,835	5,881	5,839	7,478	2,927
All hardwoods	4,064,989	2,458,868	792,422	303,949	179,468	125,086	87,165	48,268	30,020	14,438	9,529	12,142	3,634
All species	7,353,408	3,558,813	1,709,058	915,559	517,916	277,362	163,265	95,991	52,189	26,595	15,903	16,707	4,049

Numbers in rows and columns may not sum to totals due to rounding.

Table A.7—Number of growing-stock trees on timberland by species group and diameter class, Florida, 2005, cycle 3, panels 3, 4, and 5

Species group	All classes	Diameter class (<i>inches at breast height</i>)											
		1.0–2.9	3.0–4.9	5.0–6.9	7.0–8.9	9.0–10.9	11.0–12.9	13.0–14.9	15.0–16.9	17.0–18.9	19.0–20.9	21.0–28.9	29.0 and larger
<i>thousand trees</i>													
Softwood													
Yellow pine	2,484,654	690,195	735,461	528,590	290,877	119,511	56,248	34,345	15,712	7,819	3,251	2,468	176
Other softwoods	381,310	139,310	88,975	52,099	34,123	24,507	16,865	11,557	5,743	3,616	2,708	1,688	119
All softwoods	2,865,964	829,505	824,437	580,688	325,000	144,018	73,112	45,903	21,455	11,435	5,959	4,157	295
Hardwood													
Soft hardwoods	737,681	297,364	190,089	94,139	62,322	36,204	22,410	15,199	9,627	4,941	2,515	2,580	291
Hard hardwoods	452,969	225,002	91,991	51,617	29,986	20,913	11,459	7,309	5,924	2,631	2,577	2,911	650
All hardwoods	1,190,650	522,367	282,079	145,756	92,308	57,116	33,869	22,507	15,551	7,572	5,092	5,491	941
All species	4,056,614	1,351,871	1,106,516	726,444	417,308	201,135	106,982	68,410	37,006	19,007	11,051	9,647	1,236

Numbers in rows and columns may not sum to totals due to rounding.

Table A.8—Volume of live trees on timberland by species group and diameter class, Florida, 2005, cycle 3, panels 3, 4, and 5

Species group	All classes	Diameter class (<i>inches at breast height</i>)									
		5.0–6.9	7.0–8.9	9.0–10.9	11.0–12.9	13.0–14.9	15.0–16.9	17.0–18.9	19.0–20.9	21.0–28.9	29.0 and larger
<i>million cubic feet</i>											
Softwood											
Yellow pine	8,599.9	1,386.7	1,920.6	1,500.1	1,138.0	1,025.7	650.3	428.6	231.5	279.5	38.8
Other softwoods	2,150.2	183.7	260.0	313.9	314.4	314.8	207.7	176.9	181.4	169.6	27.8
All softwoods	10,750.1	1,570.4	2,180.7	1,814.0	1,452.4	1,340.5	858.0	605.6	412.9	449.1	66.6
Hardwood											
Soft hardwoods	4,457.6	439.4	614.8	735.7	757.8	585.8	466.0	309.2	172.9	297.8	78.4
Hard hardwoods	3,485.3	298.4	352.6	382.2	370.7	317.9	338.2	206.9	262.7	513.6	442.2
All hardwoods	7,943.0	737.7	967.3	1,117.9	1,128.5	903.6	804.2	516.1	435.6	811.4	520.7
All species	18,693.1	2,308.1	3,148.0	2,931.9	2,580.8	2,244.1	1,662.1	1,121.7	848.5	1,260.4	587.3

Numbers in rows and columns may not sum to totals due to rounding.

Table A.9—Volume of growing-stock trees on timberland by species group and diameter class, Florida, 2005, cycle 3, panels 3, 4, and 5

Species group	All classes	Diameter class (<i>inches at breast height</i>)									
		5.0–6.9	7.0–8.9	9.0–10.9	11.0–12.9	13.0–14.9	15.0–16.9	17.0–18.9	19.0–20.9	21.0–28.9	29.0 and larger
<i>million cubic feet</i>											
Softwood											
Yellow pine	8,361.1	1,347.8	1,875.0	1,450.2	1,107.9	1,004.5	638.4	411.6	229.3	257.6	38.8
Other softwoods	1,970.6	156.2	232.0	283.3	298.9	300.2	199.6	168.2	161.5	154.3	16.4
All softwoods	10,331.7	1,503.9	2,107.0	1,733.5	1,406.7	1,304.7	838.1	579.8	390.9	411.9	55.2
Hardwood											
Soft hardwoods	2,787.8	261.6	389.4	408.1	397.2	386.4	334.9	222.2	140.9	195.4	51.6
Hard hardwoods	1,701.5	138.3	182.1	223.3	196.8	175.1	198.3	113.6	135.1	235.9	102.9
All hardwoods	4,489.3	399.9	571.6	631.4	594.0	561.5	533.2	335.8	276.1	431.3	154.5
All species	14,821.0	1,903.8	2,678.6	2,364.9	2,000.7	1,866.2	1,371.3	915.6	666.9	843.2	209.7

Numbers in rows and columns may not sum to totals due to rounding.

Table A.10—Volume of sawtimber on timberland by species group and diameter class, Florida, 2005, cycle 3, panels 3, 4, and 5

Species group	All classes	Diameter class (<i>inches at breast height</i>)							
		9.0–10.9	11.0–12.9	13.0–14.9	15.0–16.9	17.0–18.9	19.0–20.9	21.0–28.9	29.0 and larger
<i>million board feet^a</i>									
Softwood									
Yellow pine	25,441.7	5,382.8	5,134.5	5,281.1	3,654.8	2,502.1	1,460.6	1,747.8	278.1
Other softwoods	7,130.5	889.3	1,177.6	1,333.0	970.9	872.2	884.1	901.4	101.9
All softwoods	32,572.2	6,272.1	6,312.2	6,614.1	4,625.7	3,374.3	2,344.6	2,649.2	380.0
Hardwood									
Soft hardwoods	7,529.3	0.0	1,331.0	1,525.6	1,489.4	1,070.2	708.5	1,094.4	310.2
Hard hardwoods	5,558.4	0.0	721.0	740.5	910.9	564.6	692.9	1,310.6	617.9
All hardwoods	13,087.7	0.0	2,052.0	2,266.1	2,400.3	1,634.9	1,401.3	2,405.0	928.1
All species	45,659.9	6,272.1	8,364.1	8,880.2	7,026.0	5,009.1	3,746.0	5,054.2	1,308.1

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = a value >0.0 but <0.05 for the cell.

^a International ¼-inch rule.

Table A.11—Volume of live trees on timberland by survey unit and species group, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Northeast	7,805.7	4,538.7	3,819.2	719.5	3,267.0	1,719.5	1,547.5
Northwest	6,816.9	4,175.8	3,659.8	516.0	2,641.1	1,673.7	967.4
Central	3,349.3	1,590.3	813.2	777.1	1,758.9	875.0	883.9
South	721.3	445.3	307.6	137.6	276.0	189.5	86.5
All units	18,693.1	10,750.1	8,599.9	2,150.2	7,943.0	4,457.6	3,485.3

Numbers in rows and columns may not sum to totals due to rounding.

Table A.12—Volume of growing stock on timberland by survey unit and species group, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Northeast	6,525.1	4,437.0	3,747.2	689.7	2,088.2	1,220.0	868.1
Northwest	5,747.8	4,020.4	3,558.7	461.7	1,727.3	1,162.8	564.5
Central	2,150.3	1,490.6	774.9	715.8	659.7	394.2	265.5
South	397.7	383.6	280.2	103.4	14.1	10.8	3.4
All units	14,821.0	10,331.7	8,361.1	1,970.6	4,489.3	2,787.8	1,701.5

Numbers in rows and columns may not sum to totals due to rounding.

Table A.13—Volume of sawtimber on timberland by survey unit and species group, Florida, 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million board feet^a</i>							
Northeast	18,625.9	12,355.4	9,955.5	2,400.0	6,270.5	3,321.4	2,949.1
Northwest	18,032.7	13,335.7	11,433.9	1,901.8	4,697.0	3,053.2	1,643.8
Central	7,746.7	5,646.5	3,093.9	2,552.6	2,100.2	1,134.6	965.6
South	1,254.5	1,234.5	958.4	276.1	20.1	20.1	0.0
All units	45,659.9	32,572.2	25,441.7	7,130.5	13,087.7	7,529.3	5,558.4

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = a value >0.0 but <0.05 for the cell.

^a International ¼-inch rule.

Table A.14—Volume of live trees and growing-stock trees on timberland by ownership class and species group, Florida, 2005, cycle 3, 4, and 5

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
Live trees (million cubic feet)							
National forest	1,139.7	918.0	875.9	42.1	221.7	149.7	72.1
Other public	4,576.5	2,508.9	1,836.7	672.1	2,067.6	1,338.2	729.4
Forest industry	1,958.4	1,236.8	1,068.3	168.5	721.6	495.8	225.7
Nonindustrial private	11,018.5	6,086.5	4,819.0	1,267.4	4,932.0	2,473.9	2,458.1
All classes	18,693.1	10,750.1	8,599.9	2,150.2	7,943.0	4,457.6	3,485.3
Growing-stock trees (million cubic feet)							
National forest	1,025.3	893.7	852.7	40.9	131.7	96.2	35.4
Other public	3,595.2	2,397.5	1,772.7	624.8	1,197.7	795.8	401.9
Forest industry	1,691.8	1,209.5	1,050.9	158.6	482.3	345.3	137.0
Nonindustrial private	8,508.7	5,831.0	4,684.7	1,146.3	2,677.7	1,550.5	1,127.2
All classes	14,821.0	10,331.7	8,361.1	1,970.6	4,489.3	2,787.8	1,701.5

Numbers in rows and columns may not sum to totals due to rounding.

Table A.15—Volume of sawtimber on timberland by ownership class, species group, and size class, Florida, 2005, cycle 3, panels 3, 4, and 5

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
All size classes (million board feet^a)							
National forest	3,786.0	3,416.9	3,277.7	139.2	369.1	258.4	110.7
Other public	13,200.1	9,220.4	6,763.2	2,457.2	3,979.7	2,584.6	1,395.1
Forest industry	3,974.9	2,820.0	2,271.4	548.6	1,154.9	765.6	389.3
Nonindustrial private	24,698.9	17,114.9	13,129.4	3,985.5	7,584.0	3,920.7	3,663.3
All classes	45,659.9	32,572.2	25,441.7	7,130.5	13,087.7	7,529.3	5,558.4
Trees ≥ 15.0 inches d.b.h. (million board feet^a)							
National forest	1,594.5	1,319.7	1,247.0	72.6	274.8	206.2	68.7
Other public	7,180.3	4,401.4	2,940.9	1,460.5	2,779.0	1,716.8	1,062.2
Forest industry	1,663.7	971.7	711.2	260.4	692.0	419.2	272.9
Nonindustrial private	11,704.9	6,681.2	4,744.2	1,937.0	5,023.8	2,330.6	2,693.2
All classes	22,143.5	13,373.9	9,643.3	3,730.5	8,769.6	4,672.7	4,096.9

Numbers in rows and columns may not sum to totals due to rounding.

^a International ¼-inch rule.

Table A.16—Volume of growing stock on timberland by forest-type group, stand origin, and species group, Florida, 2005, cycle 3, panels 3, 4, and 5

Forest-type group ^a and stand origin	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Softwood types							
Longleaf-slash pine							
Planted	3,008.6	2,948.0	2,935.4	12.6	60.6	28.5	32.2
Natural	2,389.6	2,286.5	2,241.5	45.1	103.1	67.1	35.9
Total	5,398.2	5,234.5	5,176.9	57.7	163.7	95.6	68.1
Loblolly-shortleaf pine							
Planted	1,040.2	1,003.5	1,003.5	0.0	36.7	10.1	26.6
Natural	824.2	773.6	773.5	0.1	50.6	26.7	23.9
Total	1,864.4	1,777.1	1,777.0	0.1	87.3	36.8	50.5
Pinyon-juniper ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	7,262.6	7,011.7	6,953.9	57.8	251.0	132.4	118.6
Hardwood types							
Oak-pine							
Planted	115.6	85.3	83.1	2.2	30.3	11.1	19.2
Natural	1,174.4	824.0	738.3	85.7	350.4	225.2	125.2
Total	1,290.1	909.4	821.5	87.9	380.7	236.3	144.4
Oak-hickory	1,492.5	288.4	277.5	10.9	1,204.0	343.3	860.7
Oak-gum-cypress	4,618.5	2,066.9	262.5	1,804.4	2,551.5	2,015.2	536.4
Elm-ash-cottonwood	63.6	0.0	0.0	0.0	63.6	40.6	23.0
Tropical hardwoods	67.9	34.4	26.2	8.1	33.5	17.2	16.3
Exotic hardwoods	4.4	1.1	0.9	0.1	3.3	1.3	2.0
Total hardwoods	7,536.9	3,300.2	1,388.6	1,911.6	4,236.7	2,653.9	1,582.8
Nonstocked	21.5	19.8	18.6	1.3	1.7	1.6	0.1
All groups	14,821.0	10,331.7	8,361.1	1,970.6	4,489.3	2,787.8	1,701.5

Numbers in rows and columns may not sum to totals due to rounding.

0.0 = a value > 0.0 but < 0.05 for the cell.

^a Forest-type classifications are determined by an algorithm based on live-tree tally.

^b Includes eastern redcedar forest type.

Table A.17—Average net annual growth of live trees on timberland by survey unit and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Northeast	381.9	317.7	302.6	15.1	64.2	30.6	33.6
Northwest	306.2	250.6	246.3	4.3	55.6	31.7	23.9
Central	106.7	71.9	39.0	33.0	34.8	12.2	22.5
South	28.1	19.4	16.2	3.3	8.7	2.0	6.6
All units	822.9	659.6	604.1	55.5	163.2	76.5	86.7

Numbers in rows and columns may not sum to totals due to rounding.

Table A.18—Average net annual growth of growing stock on timberland by survey unit and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Northeast	359.6	311.2	297.1	14.2	48.3	23.9	24.4
Northwest	283.5	242.4	239.0	3.4	41.0	23.3	17.7
Central	74.4	66.9	37.1	29.8	7.5	4.4	3.1
South	18.8	17.3	15.1	2.2	1.5	-0.1	1.6
All units	736.3	637.9	588.2	49.7	98.4	51.5	46.9

Numbers in rows and columns may not sum to totals due to rounding.

Table A.19—Average net annual growth of sawtimber on timberland by survey unit and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million board feet^a</i>							
Northeast	952.8	746.2	675.2	71.0	206.6	100.9	105.7
Northwest	723.1	585.8	569.4	16.4	137.4	87.2	50.2
Central	309.0	273.4	165.8	107.6	35.6	21.8	13.7
South	62.4	60.9	52.2	8.7	1.6	0.3	1.3
All units	2,047.3	1,666.3	1,462.6	203.7	381.1	210.2	170.9

Numbers in rows and columns may not sum to totals due to rounding.

^a International 1/4-inch rule.

Table A.20—Average annual removals of live trees on timberland by survey unit and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Northeast	322.9	268.2	258.4	9.8	54.7	32.7	22.0
Northwest	181.4	154.4	154.1	0.3	27.0	12.1	14.9
Central	60.8	39.4	26.4	13.1	21.4	8.0	13.4
South	14.8	10.6	4.8	5.8	4.3	1.5	2.8
All units	580.0	472.6	443.7	28.9	107.4	54.3	53.1

Numbers in rows and columns may not sum to totals due to rounding.

Table A.21—Average annual removals of growing stock on timberland by survey unit and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Northeast	313.1	267.1	257.8	9.3	45.9	30.4	15.5
Northwest	174.9	153.7	153.5	0.3	21.1	10.1	11.0
Central	53.9	39.0	26.2	12.9	14.8	6.1	8.7
South	12.4	9.9	4.7	5.3	2.4	0.6	1.9
All units	554.2	469.8	442.1	27.7	84.3	47.1	37.2

Numbers in rows and columns may not sum to totals due to rounding.

Table A.22—Average annual removals of sawtimber on timberland by survey unit and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Survey unit	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million board feet^a</i>							
Northeast	742.9	624.1	597.2	26.9	118.8	69.1	49.7
Northwest	413.9	361.6	360.3	1.3	52.4	29.4	23.0
Central	176.0	130.9	101.2	29.8	45.1	7.7	37.4
South	35.6	33.5	20.4	13.1	2.1	1.1	1.1
All units	1,368.5	1,150.0	1,079.1	70.9	218.4	107.3	111.2

Numbers in rows and columns may not sum to totals due to rounding.

^a International ¼-inch rule.

Table A.23—Average net annual growth and average annual removals of live trees, growing stock, and sawtimber on timberland by species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Species group	Live trees		Growing stock		Sawtimber	
	Net annual growth	Annual removals	Net annual growth	Annual removals	Net annual growth	Annual removals
	----- million cubic feet -----				million board feet ^a	
Softwood						
Yellow pine	604.1	443.7	588.2	442.1	1,462.6	1,079.1
Other softwood	55.5	28.9	49.7	27.7	203.7	70.9
All softwoods	659.6	472.6	637.9	469.8	1,666.3	1,150.0
Hardwood						
Soft hardwood	76.5	54.3	51.5	47.1	210.2	107.3
Hard hardwood	86.7	53.1	46.9	37.2	170.9	111.2
All hardwoods	163.2	107.4	98.4	84.3	381.1	218.4
All species	822.9	580.0	736.3	554.2	2,047.3	1,368.5

Numbers in columns may not sum to totals due to rounding.

^a International ¼-inch rule.

Table A.24—Average annual mortality of live trees, growing stock, and sawtimber on timberland by species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Species group	Growing		Sawtimber
	Live trees	stock	
	- - million cubic feet - -		million board feet ^a
Softwood			
Yellow pine	72.4	72.0	198.6
Other softwood	10.8	10.2	29.4
All softwoods	83.2	82.2	228.0
Hardwood			
Soft hardwood	62.0	44.2	119.7
Hard hardwood	64.5	34.2	124.8
All hardwoods	126.4	78.4	244.4
All species	209.7	160.6	472.5

Numbers in columns may not sum to totals due to rounding.

^a International ¼-inch rule.

Table A.25—Average net annual growth and average annual removals of live trees on timberland by ownership class and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
Average net annual growth (million cubic feet)							
National forest	22.9	23.7	22.9	0.8	-0.8	0.9	-1.7
Other public	127.1	92.5	78.9	13.6	34.6	19.1	15.5
Forest industry	128.3	117.3	118.0	-0.7	11.0	5.8	5.2
Nonindustrial private	544.7	426.2	384.4	41.8	118.5	50.7	67.8
All classes	822.9	659.6	604.1	55.5	163.2	76.5	86.7
Average annual removals (million cubic feet)							
National forest	14.4	14.1	14.1	—	0.3	—	0.3
Other public	69.9	55.6	50.7	4.9	14.3	7.5	6.8
Forest industry	111.4	99.7	99.1	0.6	11.7	7.2	4.5
Nonindustrial private	384.3	303.2	279.8	23.4	81.1	39.6	41.6
All classes	580.0	472.6	443.7	28.9	107.4	54.3	53.1

Numbers in rows and columns may not sum to totals due to rounding.
 — = no sample for the cell.

Table 26—Average net annual growth and average annual removals of growing stock on timberland by ownership class and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
Average net annual growth (million cubic feet)							
National forest	22.2	21.6	21.2	0.4	0.7	1.6	-0.9
Other public	113.2	88.1	76.0	12.1	25.1	13.8	11.3
Forest industry	122.1	114.3	115.2	-0.9	7.8	3.6	4.2
Nonindustrial private	478.7	413.9	375.9	38.0	64.8	32.5	32.3
All classes	736.3	637.9	588.2	49.7	98.4	51.5	46.9
Average annual removals (million cubic feet)							
National forest	14.1	14.1	14.1	—	—	—	—
Other public	66.4	55.3	50.7	4.6	11.1	6.0	5.1
Forest industry	110.2	99.4	98.8	0.6	10.8	6.6	4.2
Nonindustrial private	363.5	301.1	278.5	22.6	62.4	34.5	27.9
All classes	554.2	469.8	442.1	27.7	84.3	47.1	37.2

Numbers in rows and columns may not sum to totals due to rounding.
 — = no sample for the cell.

Table A.27—Average net annual growth and average annual removals of sawtimber on timberland by ownership class and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Ownership class	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
Average net annual growth (million board feet^a)							
National forest	83.5	79.8	77.8	2.0	3.7	7.2	-3.5
Other public	434.2	315.4	258.3	57.0	118.8	65.8	53.1
Forest industry	270.5	241.4	242.8	-1.3	29.1	20.9	8.2
Nonindustrial private	1,259.1	1,029.7	883.6	146.0	229.4	116.3	113.1
All classes	2,047.3	1,666.3	1,462.6	203.7	381.1	210.2	170.9
Average annual removals (million board feet^a)							
National forest	43.1	43.1	43.1	—	—	—	—
Other public	172.5	140.2	131.2	9.1	32.3	22.1	10.1
Forest industry	234.0	212.4	212.4	—	21.5	14.5	7.0
Nonindustrial private	918.9	754.2	692.4	61.9	164.7	70.7	94.0
All classes	1,368.5	1,150.0	1,079.1	70.9	218.4	107.3	111.2

Numbers in rows and columns may not sum to totals due to rounding.

— = no sample for the cell.

^a International 1/4-inch rule.

Table A.28—Average net annual growth of growing stock on timberland by forest-type group, stand origin, and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Forest-type group ^a and stand origin	All species	Softwoods			Hardwoods		
		All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Softwood types							
Longleaf-slash pine							
Planted	296.6	294.6	294.3	0.2	2.1	0.4	1.7
Natural	102.9	97.2	96.9	0.3	5.6	3.8	1.8
Total	399.5	391.8	391.2	0.5	7.7	4.2	3.5
Loblolly-shortleaf pine							
Planted	99.3	98.1	98.1	—	1.2	0.1	1.1
Natural	37.2	32.2	32.1	0.2	5.0	1.2	3.8
Total	136.5	130.3	130.2	0.2	6.2	1.3	4.9
Pinyon-juniper ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	536.0	522.1	521.4	0.7	13.9	5.6	8.4
Hardwood types							
Oak-pine							
Planted	11.7	9.9	9.9	—	1.8	0.2	1.6
Natural	39.6	32.0	31.1	0.9	7.6	4.2	3.4
Total	51.4	41.9	41.0	0.9	9.4	4.4	5.0
Oak-hickory	44.7	13.2	13.2	0.0	31.4	6.7	24.7
Oak-gum-cypress	100.0	57.9	10.8	47.1	42.1	33.5	8.6
Elm-ash-cottonwood	2.9	1.3	0.5	0.8	1.6	1.4	0.3
Tropical hardwoods	0.6	0.6	0.6	—	0.0	—	—
Exotic hardwoods	0.2	0.2	0.1	0.1	0.0	—	—
Total hardwoods	199.7	115.2	66.2	49.0	84.5	46.0	38.5
Nonstocked	0.6	0.7	0.6	0.0	-0.1	-0.1	—
All groups	736.3	637.9	588.2	49.7	98.4	51.5	46.9

Numbers in rows and columns may not sum to totals due to rounding.

— = no sample for the cell; 0.0 = a value > 0.0 but < 0.05 for the cell.

^a Forest-type classifications are determined by an algorithm based on live-tree tally.

^b Includes eastern redcedar forest type.

Table A.29—Average annual removals of growing stock on timberland by forest-type group, stand origin, and species group, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Forest-type group ^a and stand origin	Softwoods				Hardwoods		
	All species	All softwood	Yellow pine	Other softwood	All hardwood	Soft hardwood	Hard hardwood
<i>million cubic feet</i>							
Softwood types							
Longleaf-slash pine							
Planted	217.4	216.5	216.3	0.2	1.0	0.4	0.5
Natural	99.4	95.4	94.2	1.2	4.0	3.6	0.4
Total	316.8	311.9	310.5	1.4	4.9	4.0	0.9
Loblolly-shortleaf pine							
Planted	41.8	41.4	41.4	—	0.5	0.2	0.3
Natural	48.8	45.7	45.7	0.0	3.2	1.1	2.1
Total	90.7	87.0	87.0	0.0	3.7	1.3	2.4
Pinyon-juniper ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total softwoods	407.5	398.9	397.5	1.4	8.6	5.3	3.2
Hardwood types							
Oak-pine							
Planted	6.4	5.3	5.3	—	1.1	0.0	1.1
Natural	33.4	27.3	26.2	1.1	6.1	2.8	3.4
Total	39.9	32.6	31.5	1.1	7.3	2.8	4.5
Oak-hickory	32.5	8.3	8.0	0.3	24.2	7.0	17.2
Oak-gum-cypress	74.0	29.8	4.9	24.9	44.2	31.9	12.3
Elm-ash-cottonwood	0.0	—	—	—	0.0	0.0	0.0
Tropical hardwoods	—	—	—	—	—	—	—
Exotic hardwoods	—	—	—	—	—	—	—
Total hardwoods	146.3	70.7	44.3	26.3	75.7	41.7	34.0
Nonstocked	0.4	0.2	0.2	—	0.1	0.1	—
All groups	554.2	469.8	442.1	27.7	84.3	47.1	37.2

Numbers in rows and columns may not sum to totals due to rounding.

— = no sample for the cell; 0.0 = a value > 0.0 but < 0.05 for the cell.

^a Forest-type classifications are determined by an algorithm based on live-tree tally.

^b Includes eastern redcedar forest type.

Table A.30—Area of timberland treated or disturbed annually and retained in timberland by treatment or disturbance and ownership class, Florida, 1995 to 2005, cycle 3, panels 3, 4, and 5

Treatment or disturbance	All classes	Ownership class		
		Public	Forest industry	Private
		<i>thousand acres</i>		
Final harvest	189.1	19.0	45.4	124.6
Partial harvest ^a	64.3	7.3	5.3	51.8
Seed tree/shelterwood	3.5	2.1	—	1.4
Commercial thinning	56.7	7.9	6.0	42.8
Other stand improvement	22.6	7.0	2.0	13.6
Site preparation	137.9	13.6	37.5	88.8
Artificial regeneration ^b	150.1	11.8	37.0	101.3
Natural regeneration ^b	38.2	10.5	4.4	23.2
Natural disturbance				
Insects	5.9	1.9	—	4.0
Disease	1.1	—	—	1.1
Weather				
Wind	29.2	10.9	1.7	16.6
Flood	2.0	2.0	—	—
Weather - other	—	—	—	—
Fire				
Ground	139.5	81.0	6.9	51.6
Crown	11.1	6.0	—	5.1
Fire - other	47.5	25.8	2.3	19.4
Animals				
Beaver	1.6	—	0.8	0.8
Deer/ungulate	0.9	—	0.9	—
Animals - other	1.5	—	—	1.5
Other disturbances				
Grazing	.5	—	—	0.5
Other human-caused disturbance	26.9	1.8	4.2	20.9
Other natural-caused disturbance	2.3	—	—	2.3

Since some acres experience more than one treatment or disturbance, there are no column totals. Numbers in rows may not sum to totals due to rounding.

— = no sample for the cell.

^a Includes high-grading and some selective cutting.

^b Includes establishment of trees for timber production on forest and nonforest land.

Brown, Mark J. 2007. Florida's forests—2005 update. Resour. Bull. SRS-118. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 39 p.

This bulletin highlights principal findings of an annual inventory of Florida's forests. Data summaries are based on measurements of 60 percent of the plots in the State. Additional data summaries and bulletins will be published as the remaining plots are measured.

Keywords: Annual inventory, FIA, forest ownership, growth, management types, mortality, removals, stand size, timberland, volume.



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