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FOREST RESOURCES OF SOUTH FLORIDA, 1949

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Division of Forest Economics

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SOUTHEASTERN FOREST EXPERIMENT STATION
ASHEVILLE, NORTH CAROLINA

I. T. HAIG, Director

In cooperation with
FLORIDA FOREST SERVICE
TALLAHASSEE, FLORIDA
C. H. COULTER, State Forester

FOREWORD

Through the McSweeney-McNary Act of 1928, Congress authorized the Secretary of Agriculture to conduct a comprehensive survey of the forest resources of the United States. The Forest Survey was organized by the Forest Service to carry out the provisions of the Act through the Regional Forest Experiment Stations. In the Southeastern states the Forest Survey is an activity of the Division of Forest Economics of the Southeastern Forest Experiment Station, Asheville, North Carolina.

The five-fold purpose of the Forest Survey is (1) to make a field inventory of the present supply of standing timber, (2) to ascertain the rate at which this supply is being increased through growth, (3) to determine the rate at which it is being reduced through industrial and domestic uses, fire, and other causes, (4) to determine the present consumption and the probable future trend in requirements for forest products, and (5) to interpret and correlate these finds to aid in the formulation of private and public policies regarding forest land management.

The State of Florida was first inventoried by the Forest Survey in the period 1934-36 and reports presenting the findings have been published. Since then, better forest management, more intensive forest use, changes in land use, and other factors have caused changes in the forest growing stock that can only be measured accurately by on-the-ground surveys. Field work on a resurvey of the forest resources of Florida was completed in August 1949. This progress report presents area and volume statistics of the resurvey in South Florida (Survey Unit No. 4). Statistical reports containing resurvey data for Northeast Florida (Survey Unit No. 1), Northwest Florida (Survey Unit No. 2), and Central Florida (Survey Unit No. 3) have already been published. The complete statistical data for the State will be used to prepare an analytical report which will interpret the findings and focus attention upon the principal forest problems.

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The Division of Forest Economics is under the direction of James W. Cruikshank. The timber inventory field work was under the supervision of Mackay B. Bryan. Photo interpretation work was done by N. F. Force and R. C. Aldrich. Sample plot work was under the direction of Fritz Lorentzen and W. A. McCarty.

Office compilation of the data was under the direction of Miss Agnes Creasman, assisted by Mrs. Christine Paxton, Miss Priscilla Walker, and Miss Camilla Young.

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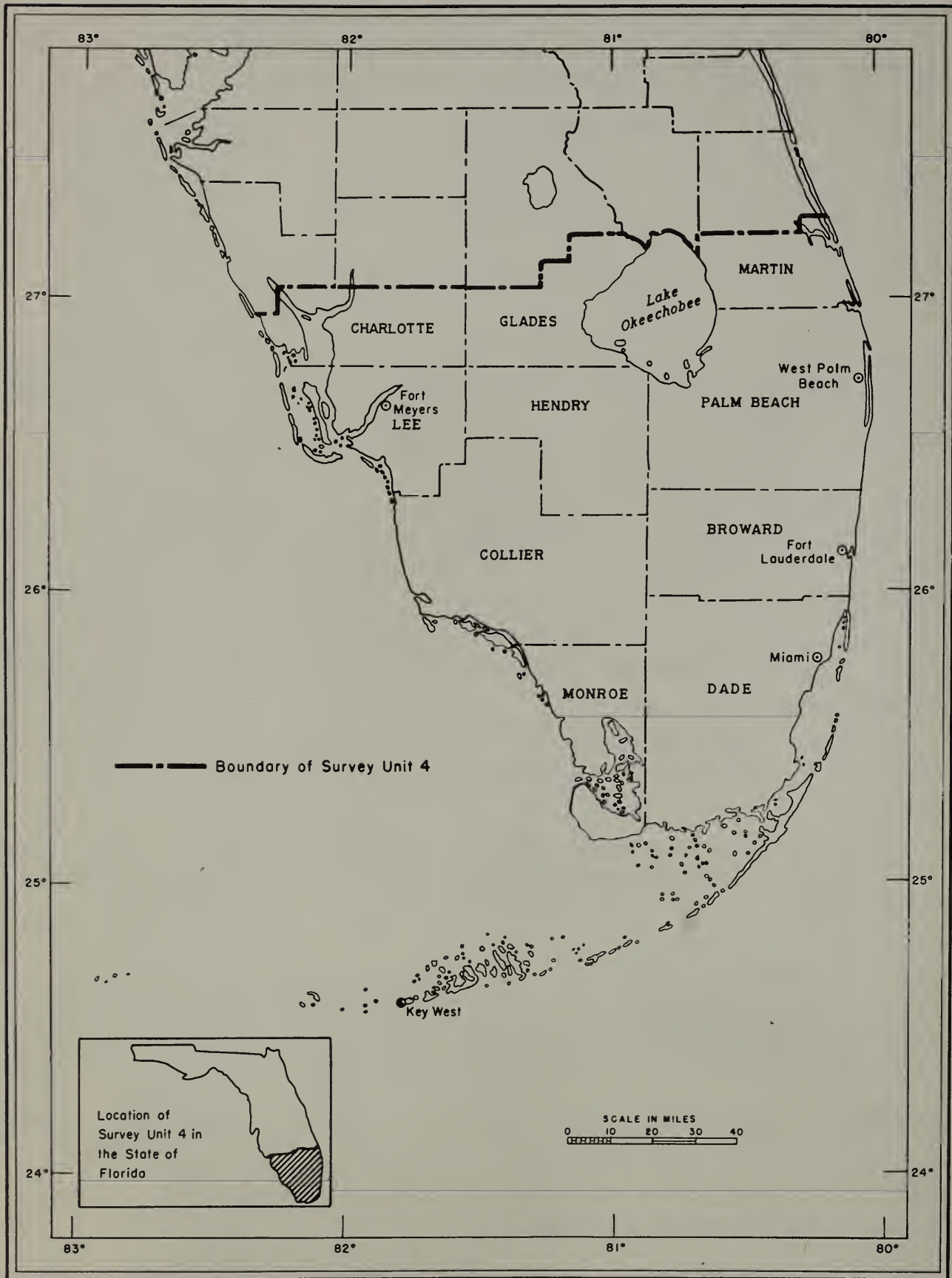


Figure 1.--Counties in South Florida included in Survey Unit No. 4

FOREST RESOURCES OF SOUTH FLORIDA

This report presents data on the forest resources of South Florida, including the group of ten counties designated as Survey Unit No. 4 (fig. 1). The data were obtained from a resurvey which was started in March 1949 and completed in June 1949. The field work was based on the combined use of aerial photographs, cover type maps, and ground plot examinations to obtain current statistics on forest area and timber volumes. Because of the noncommercial character of the timber, the areas of mangrove forest along the seacoast and forested areas on the Florida Keys were not surveyed.

South Florida is an unusual area from a forest sampling standpoint. Timber volumes are considerably lower than elsewhere in the State, and the distribution of the timber is poor. The classification of nonforest and nonproductive forest land is often difficult. Also, many swamp and marshy areas are nearly inaccessible making ground observations slow and difficult. The intensity of the Forest Survey work was lowered in this Unit because it is not heavily forested. As a result, the data presented herein are subject to greater sampling errors than for other portions of the State, and are shown in considerably less detail. The original Forest Survey of South Florida was completed in 1936. Some comparisons between the original and present surveys can be drawn to indicate changes in forest areas and timber volumes during the intervening period.

1949 FACTS AND SIGNIFICANT CHANGES

Acreage of forest land: Approximately 42 percent of the total land area in South Florida is occupied by forests. However, one-third of the forest land is considered nonproductive because it lacks the capacity to produce timber of commercial size or because the timber is so scattered and isolated it could not be economically harvested. In 1949, about 2.2 million acres in this Survey Unit were classified as commercial forest land. The original survey in 1936 found very nearly the same acreage in commercial forest land, indicating little, if any, change during the period. It is interesting to note that marsh lands in the Everglades occupy a slightly greater acreage in the Unit than the forests do. The forest and marsh areas combined make up nearly 86 percent of the total land area.

Area by forest types: Slash pine and cypress together occupy 93 percent of the commercial forest land in the Unit, with the pine type predominating. The total acreage in softwood types is now only slightly lower than was found in the first survey. However, since 1936, the area in pine types has increased 11 percent, while the area of cypress types decreased. This change is believed due to a general

lowering of the water table in the Unit, caused by drainage and irrigation projects. As sites have become drier, scattered slash pine reproduction has become established in some areas where only stunted or scrub cypress grew before.

Saw-timber volume decreases: The total volume of saw timber standing in South Florida in 1949 was 865 million board feet. Practically all of this volume is in slash pine and cypress timber, with a negligible amount in other pine species and hardwoods. The total volume of saw timber in 1936 was nearly 1.6 billion board feet, and the decrease during the period amounts to 45 percent. In proportion to total volume, pine species have been cut more heavily than cypress, and at present the volume in these two species groups is about equal. Only 5 percent of the commercial forest land supports stands of saw timber.

Table A.--Change in volume of saw timber, 1936 to 1949

Species group	:	1936	:	1949	:	Change
		<u>Thousand</u> <u>bd. ft.</u>		<u>Thousand</u> <u>bd. ft.</u>		<u>Percent</u>
Pines		941,400		434,300		-54
Hardwoods ^{1/}		12,200		1,300		-89
Cypress		618,800		429,100		-31
All species		1,572,400		864,700		-45

^{1/} Excludes volume of hardwoods 12 inches d.b.h.

The decrease in board-foot volume is primarily due to heavy cutting operations during the period between surveys. In 1936, 58 percent of the pine and cypress saw-timber volume was in old-growth stands located in the Big Cypress Swamp in Collier County and northward in Hendry, Lee, and Charlotte Counties. These virgin stands were among the last to be cut over in the State because they were in scattered and inaccessible areas. Several large lumber companies, along with smaller mills, have been operating in this area for a number of years and much of the timber volume in the larger stands has been removed. Practically all of the timber volume decrease can be accounted for in Collier, Hendry, Lee, and Charlotte Counties.

In this area, and elsewhere in the Unit, the growing livestock industry has contributed to the decrease of timber volume through development of pasture or grazing lands. In some instances, timber and stumps have been removed from forest land in the pine types, and improved pastures created. In others, most of the timber has merely been removed, and restocking of the forest land is held down through the use of fire. The changes due to land clearing do not appear to be significant from an area standpoint. However, the clearing, cutting, and burning have caused a material reduction in the volume of standing pine timber.

Total sound tree volume decreases: The net cubic-foot volume of all sound trees 5.0 inches d.b.h. and larger also decreased heavily, following the trend found in saw-timber volumes. In 1949, the total volume of sound trees was 354 million cubic feet, a decrease of 34 per cent since 1936. Here again, the decrease in pine and cypress species groups is due to heavy cutting during the period, much of it in virgin stands of timber. The decrease in volume of sound hardwood trees is accounted for by a higher proportion of cull in the hardwood species. In terms of cubic feet, the total volume of hardwood trees in all quality classes in both surveys was approximately the same. However, in 1949, there was a heavy increase in rotten cull hardwoods, particularly in the larger diameter classes, and a reduction of volume in both sound and rough cull trees.

Table B.--Change in volume of all trees 5.0 inches d.b.h. and larger, 1936 to 1949

Species group	Sound tree volume			Cull tree volume		
	1936	1949	Change	1936	1949	Change
	<u>Million</u> <u>cu. ft.</u>	<u>Million</u> <u>cu. ft.</u>	<u>Percent</u>	<u>Million</u> <u>cu. ft.</u>	<u>Million</u> <u>cu. ft.</u>	<u>Percent</u>
Pines ^{1/}	270	160	-41	15	3	-80
Hardwoods ^{2/}	10	3	-70	20	26	+30
Cypress	258	191	-26	68	78	+15
All species	538	354	-34	103	107	+ 4

^{1/} Excluding turpentine butts.

^{2/} Excluding limb volume of sound hardwood trees.

All of the areas supporting stands of scrub cypress and hardwoods were considered nonproductive forest land because of their inability to grow timber of commercial size. The volumes on these areas were excluded and do not appear in the above table.

Ninety percent of the forest land is understocked: Approximately two million acres of commercial forest land in South Florida are in an understocked condition, having less than 40 percent of the required number of sound trees per acre. Of this area, 1.5 million acres were found to be less than 10 percent stocked, and the remainder fell in the range of stocking from 10 to 39 percent.

Table 1.--Gross area^{1/} by broad use class, 1949

Class of use	Area	
	<u>Acres</u>	<u>Percent</u>
Forest land:		
Commercial	2,174,200	24.3
Reserved	24,200	0.3
Non-productive	1,115,600	12.5
Total forest	3,314,000	37.1
Non-forest land:		
Agricultural - active	640,400	7.2
Agricultural - idle	237,500	2.7
Marsh	3,419,600	38.3
Dunes and beaches	5,300	0.1
Urban and other ^{2/}	237,300	2.6
Total non-forest	4,540,100	50.9
Total land area	7,854,100	88.0
Total water area	1,073,800	12.0
All classes.	8,927,900	100.0

^{1/} From U. S. Bureau of the Census, 1940.

^{2/} Includes urban, suburban residential, and rural industrial areas, rights-of-way, cemeteries, schools, etc.

Table 2.--Ownership of land, 1949

Class of ownership	All land		Commercial forest land	
	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>
Public land:				
National forest	--	--	--	--
Indian	78,500	1.0	36,100	1.7
Other federal	786,900	10.0	4,600	0.2
Total federal	865,400	11.0	40,700	1.9
State	871,200	11.1	92,800	4.3
County and municipal	59,100	0.8	21,000	0.9
Total public	1,795,700	22.9	154,500	7.1
Private land	6,058,400	77.1	2,019,700	92.9
All classes	7,854,100	100.0	2,174,200	100.0

Table 3.--Commercial forest area by forest type and stand size, 1949

Forest type	Saw-timber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Pine ^{1/}	33,700	123,100	108,600	1,490,100	1,755,500
Cypress	69,300	119,400	15,000	64,500	268,200
Total sftwds.	103,000	242,500	123,600	1,554,600	2,023,700
Hardwoods ^{2/}	--	3,500	13,200	84,800	101,500
Palm	--	--	--	49,000	49,000
All types	103,000	246,000	136,800	1,688,400	2,174,200
Percent	4.7	11.3	6.3	77.7	100.0

^{1/} Principally slash pine type with small acreages of longleaf pine and sand pine.

^{2/} Principally lowland hardwood type.

Table 4.--Net volume^{1/} of saw timber by species group and stand size, 1949
(in thousand board feet)

Species group	Saw-timber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Pine	120,400	68,400	13,500	232,000	434,300
Cypress	303,900	81,600	22,800	20,800	429,100
Total sftwds.	424,300	150,000	36,300	252,800	863,400
Hardwoods ^{2/}	400	1,500	--	--	1,900
All species	424,700	151,500	36,300	252,800	865,300
Percent	49.1	17.5	4.2	29.2	100.0

^{1/} Log scale, International 1/4-inch rule.

^{2/} Ninety-five percent of the saw-timber-size hardwood trees were considered cull from a saw-timber standpoint.

Table 5.--Net volume^{1/} of saw timber by species group and diameter class,
1949

Species group	10-12 inches ^{2/}	14-18 inches	20+ inches	All diameters	
	<u>Thousand</u> <u>bd. ft.</u>	<u>Thousand</u> <u>bd. ft.</u>	<u>Thousand</u> <u>bd. ft.</u>	<u>Thousand</u> <u>bd. ft.</u>	<u>Percent</u>
Pines	286,700	137,000	10,600	434,300	50.2
Cypress	271,400	128,500	29,200	429,100	49.6
Total sftwds.	558,100	265,500	39,800	863,400	99.8
Hardwoods	600	1,300	--	1,900	0.2
All species	558,700	266,800	39,800	865,300	100.0
Percent	64.6	30.8	4.6	100.0	

^{1/} Log scale, International 1/4-inch rule.

^{2/} Ten-inch hardwoods are not included.

Table 6.--Net volume^{1/} of saw timber by forest type and stand size, 1949
(in thousand board feet)

Forest type	Saw-timber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Pine	116,900	71,100	13,500	232,000	433,500
Cypress	307,800	78,900	17,900	12,200	416,800
Total sftwds.	424,700	150,000	31,400	244,200	850,300
Hardwoods	--	1,500	4,900	8,600	15,000
All types	424,700	151,500	36,300	252,800	865,300
Percent	49.1	17.5	4.2	29.2	100.0

^{1/} Log scale, International 1/4-inch rule.

Table 7.--Net volume^{1/} of all trees by species group and stand size, 1949

SOUND TREES (in thousand cords)

Species group	Saw-timber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Pines	381	695	115	1,094	2,285
Cypress	1,186	1,146	67	91	2,490
Total sftwds.	1,567	1,841	182	1,185	4,775
Hardwoods	4	23	5	19	51
All species	1,571	1,864	187	1,204	4,826
Percent	32.6	38.6	3.9	24.9	100.0

TREES OF OTHER QUALITY CLASSES (in thousand cords)

Rough culls:					
Softwoods	123	260	12	193	588
Hardwoods ^{2/}	24	36	10	141	211
Rotten culls	145	241	59	178	623
Palms	38	210	59	1,700	2,007
All other classes	330	747	140	2,212	3,429

Table 8.--Net volume^{1/} of all trees by species group and diameter class, 1949

SOUND TREES (in thousand cords)

Species group	Pole trees		Saw-timber trees			All diameters
	6 inches	8 inches	10 inches	12 inches	14+ inches	
Pines	463	659	535	276	352	2,285
Cypress	695	725	386	327	357	2,490
Total sftwds.	1,158	1,384	921	603	709	4,775
Hardwoods	18	23	5	2	3	51
All species	1,176	1,407	926	605	712	4,826
Percent	24.4	29.1	19.2	12.5	14.8	100.0

TREES OF OTHER QUALITY CLASSES (in thousand cords)

Rough culls:						
Softwoods	260	164	107	29	28	588
Hardwoods ^{2/}	39	43	67	26	36	211
Rotten culls	68	140	74	93	248	623
Palms	63	284	1,095	492	73	2,007
All other classes	430	631	1,343	640	385	3,429

^{1/} Sound wood and bark.^{2/} Includes scrub oak and noncommercial species.

Table 9.--Net volume^{1/} of all trees by species group and class of material,

1949

(in thousand cords)

Species group	SOUND TREES				CULL TREES	
	Saw-timber trees		Pole timber trees	Total sound trees	Rough ^{2/}	Rotten
	Sawlog portion	Upper stem				
Pines	951	212	1,122	2,285	45	--
Cypress	862	208	1,420	2,490	543	475
Total sftwds.	1,813	420	2,542	4,775	588	475
Hardwoods	4	1	46	51	211	148
All species	1,817	421	2,588	4,826	799	623
Percent	37.7	8.7	53.6	100.0	56.2	43.8

^{1/} Sound wood and bark, excluding volume of palms shown in tables 7 and 8.

^{2/} Includes scrub oak and noncommercial species.

Table 10.--Net volume^{1/} of all trees by forest type and stand size,

1949

SOUND TREES (in thousand cords)

Forest type	Saw-timber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Pine	367	819	115	1,096	2,397
Cypress	1,204	1,025	55	65	2,349
Total sftwd.	1,571	1,844	170	1,161	4,746
Hardwood	--	20	17	43	80
All types	1,571	1,864	187	1,204	4,826
Percent	32.6	38.6	3.9	24.9	100.0

ROUGH AND ROTTEN CULLS (in thousand cords)

Softwood	292	504	59	245	1,100
Hardwood	--	33	22	267	322
All types	292	537	81	512	1,422
Percent	20.5	37.8	5.7	36.0	100.0

^{1/} Sound wood and bark, excluding volume of palms shown in tables 7 and 8.

Table 11.--Net volume^{1/} of all trees by species group and diameter class,

1949

SOUND TREES (in thousand cubic feet)

Species group	Pole trees		Saw-timber trees			All diameters
	6 inches	8 inches	10 inches	12 inches	14+ inches	
Pines	27,189	44,265	39,795	20,866	28,264	160,379
Cypress	45,654	54,185	31,227	27,678	31,693	190,437
Total sftwds.	72,843	98,450	71,022	48,544	59,957	350,816
Hardwoods	1,170	1,591	280	127	239	3,407
All species	74,013	100,041	71,302	48,671	60,196	354,223
Percent	20.9	28.3	20.1	13.7	17.0	100.0

TREES OF OTHER QUALITY CLASSES (in thousand cubic feet)

Rough culls:						
Softwoods	17,208	12,013	8,399	2,524	2,369	42,513
Hardwoods ^{2/}	2,252	2,748	4,669	1,953	3,097	14,719
Rotten culls	4,356	10,304	5,889	8,101	21,399	50,049
Palms	5,922	28,157	110,765	50,901	7,289	203,034
All other classes	29,738	53,222	129,722	63,479	34,154	310,315

^{1/} Excluding bark.

^{2/} Includes scrub oak and noncommercial species.

Table 12.--Net volume^{1/} of all trees by species group and class of material,

1949

(in thousand cubic feet)

Species group	SOUND TREES				CULL TREES	
	Saw-timber trees		Pole timber trees	Total sound trees	Rough ^{2/}	Rotten
	Sawlog portion	Upper stem				
Pines	72,484	16,441	71,454	160,379	3,167	16
Cypress	74,188	16,410	99,839	190,437	39,346	38,922
Total sftwds.	146,672	32,851	171,293	350,816	42,513	38,938
Hardwoods	298	68	3,041	3,407	14,719	11,111
All species	146,970	32,919	174,334	354,223	57,232	50,049
Percent	41.5	9.3	49.2	100.0	53.3	46.7

^{1/} Excluding bark and volume of palms shown in table 11.

^{2/} Includes scrub oak and noncommercial species.

Table 13.--Average volume^{1/} per acre of saw timber by forest type and stand size, 1949
(in board feet)

Forest type	Saw-timber stands	Pole timber stands	Other stand sizes	All stands
Pine	3,469	578	154	247
Cypress	4,442	661	379	1,554
Hardwood	--	429	138	148
All types	4,123	616	163	407

^{1/} Log scale, International 1/4-inch rule.

Table 14.--Average volume^{1/} per acre of all trees by forest type, stand size, and tree quality, 1949
(in standard cords)

Forest type	Saw-timber stands		Pole timber stands		Other stand sizes		All stands	
	Sound ^{2/}	Cull ^{2/}	Sound	Cull	Sound	Cull	Sound	Cull
Pine	10.9	0.1	6.7	0.3	0.8	0.1	1.4	0.1
Cypress	17.4	4.1	8.6	4.0	1.5	2.8	8.8	3.7
Hardwood	--	--	5.7	9.4	0.6	2.0	0.8	2.1
All types	15.3	2.8	7.6	2.2	0.8	0.3	2.2	0.7

^{1/} Sound wood and bark, excluding volume of palms.

^{2/} Sound trees; cull trees.

Table 15.--Area of poorly stocked stands and unstocked areas
by plantability classes, 1949

Forest type ^{1/}	No planting required ^{2/}	Suitable for machine planting	Hand planting required	All classes
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Pine	408,000	858,000	224,100	1,490,100
Hardwood	7,300	3,700	16,300	27,300
All types	415,300	861,700	240,400	1,517,400
Percent	27.4	56.8	15.8	100.0

^{1/} Lowland hardwoods and cypress types not classified.

^{2/} Sufficient seed trees present or area is restocking naturally.

Table 16.--Commercial forest area by forest type and degree of stocking,
1949

STOCKING IN SOUND TREES

Forest type	Degree of stocking ^{1/}					Total area
	0-9 percent	10-39 percent	40-69 percent	70-99 percent	100+ percent	
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Pine	1,364,600	346,300	36,500	8,100	---	1,755,500
Cypress	51,400	50,100	35,900	78,800	52,000	268,200
Hardwood	61,900	39,600	---	---	---	101,500
Palm	49,000	---	---	---	---	49,000
All types	1,526,900	436,000	72,400	86,900	52,000	2,174,200
Percent	70.2	20.1	3.3	4.0	2.4	100.0

STOCKING IN TREES OF ALL QUALITY CLASSES^{2/}

Pine	1,300,300	345,000	71,800	20,200	18,200	1,755,500
Cypress	26,400	33,700	25,100	42,600	140,400	268,200
Hardwood	19,500	34,000	21,200	9,600	17,200	101,500
Palm	11,000	16,000	5,500	5,500	11,000	49,000
All types	1,357,200	428,700	123,600	77,900	186,800	2,174,200
Percent	62.4	19.7	5.7	3.6	8.6	100.0

^{1/} Including trees 1.0 inches d.b.h. and larger.

^{2/} Includes sound trees, cull trees, and palm.

Table 17.--Number of trees^{1/} by species group, quality class, and tree size, 1949

(in thousands of trees)

Species group and quality class	Sapling-size trees	Pole-size trees	Saw-timber trees	All trees
Yellow pines:				
Sound trees	30,927	12,565	6,518	50,010
Rough culls	242	117	122	481
Rotten culls	347	5	--	352
Total	31,516	12,687	6,640	50,843
Cypress:				
Sound trees	58,062	19,573	6,667	84,302
Rough culls	26,875	5,997	974	33,846
Rotten culls	15,922	4,562	2,944	23,428
Total	100,859	30,132	10,585	141,576
Hardwoods:				
Sound trees	9,411	695	32	10,138
Rough culls ^{2/}	35,644	1,904	248	37,796
Rotten culls	8,998	1,447	379	10,824
Total	54,053	4,046	659	58,758
Palms	(^{3/})	5,587	12,675	18,262
All species	186,428	52,452	30,559	269,439

^{1/} All trees 1.0 inch d.b.h. and larger.

^{2/} Includes scrub oak and noncommercial trees.

^{3/} Data not recorded.

Table 18.--County area by broad use class, 1949

County	Total area ^{1/}	Non-forest area		Forest land		
		Land	Water	Non-commercial ^{2/}	Commercial	
	Acres	Acres	Acres	Acres	Acres	Percent
Broward	780,800	666,800	2,600	63,200	48,200	6.2
Charlotte	532,500	86,800	88,600	47,500	309,600	69.7
Collier	1,356,100	302,000	92,000	300,500	661,600	52.3
Dade	1,349,800	1,113,900	19,700	141,900	74,300	5.6
Glades	574,700	360,700	4,400	65,900	143,700	25.2
Hendry	761,000	465,500	2,600	71,800	221,100	29.2
Lee	643,200	81,200	99,300	86,700	376,000	69.1
Martin	372,400	103,900	37,700	22,900	207,900	62.1
Monroe	907,500	388,400	271,400	243,200	4,500	0.7
Palm Beach	1,649,900	970,900	455,500	96,200	127,300	10.7
Unit total	8,927,900	4,540,100	1,073,800	1,139,800	2,174,200	27.7

^{1/} Gross area from Bureau of the Census, 1940.

^{2/} Non-productive forest land plus forest land withdrawn from commercial use.

Table 19.--Ownership of commercial forest land by county, 1949

County	Private		Public				Total public	
			National forest	Other ^{1/} federal	State	County, city, town		
	Acres	Percent	Acres	Acres	Acres	Acres	Acres	Percent
Broward	32,400	67.2	---	400	14,500	900	15,800	32.8
Charlotte	260,800	84.2	--	200	47,000	1,600	48,800	15.8
Collier	651,700	98.5	--	400	9,500	--	9,900	1.5
Dade	60,400	81.3	--	200	13,200	500	13,900	18.7
Glades	137,300	95.5	--	6,100	300	--	6,400	4.5
Hendry	187,900	85.0	--	30,000	3,200	--	33,200	15.0
Lee	368,300	98.0	--	1,800	1,300	4,600	7,700	2.0
Martin	204,900	98.6	--	--	2,900	100	3,000	1.4
Monroe	4,500	100.0	--	--	--	--	--	--
Palm Beach	111,500	87.6	--	1,600	900	13,300	15,800	12.4
Unit total	2,019,700	92.9	--	40,700	92,800	21,000	154,500	7.1

^{1/} Includes Indian tribal allotments.

Table 20.--Net volume^{1/} of timber by county, 1949

County	Saw-timber trees	All trees 5.0 inches d.b.h. and larger	
		Sound trees	Cull trees ^{2/}
	<u>Thousand bd. ft.</u>	<u>Thousand cords</u>	<u>Thousand cords</u>
Broward	9,300	49	12
Charlotte	54,200	232	61
Collier	442,500	2,104	863
Dade	30,400	267	--
Glades	75,100	377	35
Hendry	128,100	620	118
Lee	60,500	611	139
Martin	21,800	196	166
Monroe	5,200	56	5
Palm Beach	38,200	314	23
Unit total	865,300	4,826	1,422

^{1/} Board-foot volumes are in terms of log scale, International 1/4-inch rule. Volumes in cords include bark and exclude volumes in palm trees.

^{2/} Limbs of sound sawlog-size hardwood trees are included in cull volumes.

DEFINITION OF TERMS

Land-Use Classes

Forest. Land bearing forest growth, land from which the forest has been removed and which shows no evidence of any other recent land use, or former agricultural land which now has a five-percent stocking of trees. Subdivided into the following classes:

Commercial: Land bearing, or capable of bearing, timber of commercial character and available now or prospectively for commercial use.

Reserved: Forest land in public ownership upon which commercial timber cutting is prohibited.

Non-productive: Forest land of such low productivity or so inaccessible that commercial timber will not be produced.

Non-forest. Land less than five percent stocked with trees and showing evidence of non-forest use.

Agriculture: Under cultivation or in pasture, including farm yards on active farms.

Idle: Land previously cultivated or pastured but now idle or abandoned. If reverting to forest there must be less than five percent stocking of trees.

Marsh: Low, boggy, non-forested land usually supporting a heavy growth of grass.

Dunes and beaches: Non-forested sand dunes or coastal beaches.

Urban and other: Includes towns, suburban areas being developed for residential or other urban purposes, school yards, cemeteries, industrial sites, roads, railroads, power lines, and other rights-of-way. Scattered areas of timber within exterior boundaries of cities or villages are also included.

Water: Includes both the small ponds and lakes less than 40 acres in size and streams, sloughs, and canals less than ten chains in width classed as "land area" by the Bureau of the Census. Also includes the "inland water" listed by the Census. On coastal areas the water-line is the mean high-tide mark; tidal flats are classed as water.

Forest Types

Pine types. Stands in which coniferous species comprise at least 25 percent of the dominant and codominant trees, with southern yellow pines predominating.

Cypress types. Stands in which coniferous species comprise at least 25 percent of the dominant and codominant trees, with cypress predominating.

Hardwood types. Stands in which mixed hardwoods such as black gum, maple, sweet bay, oak, and ash predominate and comprise at least 75 percent of the dominant and codominant trees. Stands of scrub oak and other noncommercial hardwood species are included.

Palm types. Stands in which there is at least a five-percent stocking of merchantable palm trees and less than five-percent stocking of other sound commercial species.

Stand-Size Classes

Saw timber. Stands containing at least 1,500 board feet net, International 1/4-inch log rule, per acre in sound, live, softwood trees 9.0 inches d.b.h. or larger or hardwood trees 11.0 inches d.b.h. or larger.

Pole timber. Stands at least 10 percent stocked with pole-size or larger timber, with at least one-half the minimum stocking in pole sizes, and which have less than 1,500 board feet net per acre of saw timber.

Seedling and sapling. Stands less than 10 percent stocked by pole-size or larger trees and with less than 1,500 board feet net per acre, but at least 40 percent stocked with commercial species. Eight hundred seedlings or saplings per acre are considered full stocking.

Poorly stocked and unstocked. Stands of pole-size or larger trees that are less than 10 percent stocked, seedling or sapling stands less than 40 percent stocked, or nonstocked forest land.

Diameters

D.b.h. (diameter at breast height). Stem diameter in inches, outside bark, measured at $4\frac{1}{2}$ feet above the ground.

Diameter class. All trees were tallied by 2-inch diameter classes, each class including diameters 1.0 inch below and 0.9 inch above the stated midpoint; e.g., trees 7.0 to and including 8.9 inches are in the 8-inch class.

Tree Classification

Sound saw-timber trees. Softwood trees at least 9.0 inches d.b.h. and hardwood trees at least 11.0 inches d.b.h., with not less than one merchantable log 12 feet long, or with less than 50 percent of the gross volume of the tree in sound saw timber.

Sound pole-timber trees. Straight-boled trees between 5.0 inches d.b.h. and saw-timber size.

Sound sapling-size trees. Trees 1.0 inch to 4.9 inches d.b.h. which will grow into pole- or saw-timber-size trees of sound quality.

Rough cull trees. Trees that fail to qualify as sound timber because of poor form, excessive limbiness, or other sound defect. Volumes shown for rough cull trees also include the limbs, in sections four feet long and at least 4.0 inches in diameter inside bark, of sound saw-timber-size hardwoods. Scrub oak and noncommercial species are included in this group.

Rotten cull trees. Trees that fail to qualify as sound timber because of rotten defect.

Palms. All species of Sabal 5.0 inches d.b.h. and larger with at least 12 feet of clear stem. All palm trees were considered to be free of rotten defect.

Volume Estimates

Board-foot volume. The volume in board feet, measured by the International 1/4-inch rule, exclusive of defect, of that portion of saw-timber trees between the stump and the upper limit of merchantability for sawlogs.

Volume in cords. For sound trees the volume in standard cords (including bark) of the sound portion of trees 5.0 inches d.b.h. and larger, between stump and a minimum top-stem diameter of 4.0 inches inside bark. For cull trees similar volumes are included plus the volume in limbs, in sections four feet long and at least 4.0 inches in diameter inside bark, of saw-timber-size hardwoods.

Volume in cubic feet. Same as volume shown in cords except bark is not included.

International 1/4-inch log rule. A rule for estimating the board-foot volume of 4-foot log sections, according to the formula $V = .905 (0.22D^2 - 0.71D)$. The taper allowance for computing the volume in log lengths greater than four feet is 0.5 inch per 4-foot section. Allowance for saw kerf is 1/4 inch.

Standard cord. A stacked pile, 4 x 4 x 8 feet, of round or split bolts, estimated to contain, on the average, 90 cubic feet of softwoods (wood and bark) or 80 cubic feet of hardwoods (wood and bark).

Stocking

Stocking classifications were based on the number of stems present by d.b.h. classes. Areas having the minimum numbers of trees listed below, either in a single diameter class or in combinations, were considered adequately stocked.

<u>DBH</u>	<u>Minimum number trees per acre</u>
2 inches	800
4 inches	600
6 inches	450
8 inches	300
10 inches	200
12 inches	150
14 inches	110

RELIABILITY OF THE DATA

In general, there are two possible sources of error in estimating timber volumes and land areas in various categories under procedures used by the Forest Survey. These are (1) common mistakes resulting from errors of judgment in classifying or recording data, mistakes made in compiling the information, and errors in the application of techniques, and (2) sampling errors.

In Forest Survey work a diligent effort is made to maintain a high degree of accuracy in the collection and compilation of the data. Common errors are eliminated or minimized through training and frequent check cruises in the field and through complete editing and machine verification of office procedures in compiling the data.

Sampling errors (standard errors of estimate) carry no connotation of faulty work but are theoretical measures of the reliability of the estimates based on the variability exhibited by the sample data. Sampling errors were the only measurable errors involved in computing the reliability of the data.

Forest area. The sampling intensity was sufficient to provide an estimate of the forest acreage of the Unit with a standard error of ± 0.9 percent. This indicates the probabilities are two out of three that the actual forest area is within ± 0.9 percent of the given estimate.

Timber volumes. The standard error of estimate of the board-foot volume of saw timber in the Unit is ± 10.3 percent. Here again, the probabilities are two out of three that the actual volume is ± 10.3 percent of the given estimate. Corresponding errors for the total volume in cords or cubic feet were not computed, but they should be smaller.

Use of county data. The tables showing area and timber volumes by county are included to facilitate the grouping of county data in any combination desired. Statistics for individual counties are subject to considerable error, and detailed comparisons between counties should be avoided. Grouping a number of counties together will increase the reliability of the area and volume estimates and make these data sufficiently accurate for most general purposes.

HOW THE FOREST INVENTORY WAS MADE

The regular Forest Survey procedures using aerial photographs for preliminary estimates of forest area and forest stand size classes could not be used throughout South Florida because aerial photographs at a suitable scale were not available. In the southern and eastern portions of the Unit, cover type maps prepared by the Soil Conservation Service and the University of Florida were used in place of aerial photographs.

Acreages of forest land were estimated through the use of dot grid overlays on either aerial photographs or cover type maps. These estimates were later corrected and adjusted to Forest Survey standards on the basis of checks made on field observation plots.

Where aerial photographs were used in determining forest area; every 3rd plot listed as forest was classified by forest type and stand size through careful stereoscopic analysis. Where cover type maps were used, the forest areas were classified by forest type and stand size through the use of ground observation plots taken at fixed intervals along randomly selected line segments. These observation plots were also used to sample all cover type data plotted on the maps and to revise these data to meet Forest Survey definitions of land use.

Field plots were then selected at fixed intervals either on aerial photographs or along the line segments, and timber cruisers made a detailed on-the-ground tally of each plot to obtain data on timber volumes, growth, and mortality.

All of the field data were then sent to the Asheville office for editing and punching in cards for machine tabulation. Statistical techniques were used to correct for changes in land use classification and to determine final figures on forest areas and timber volumes.

