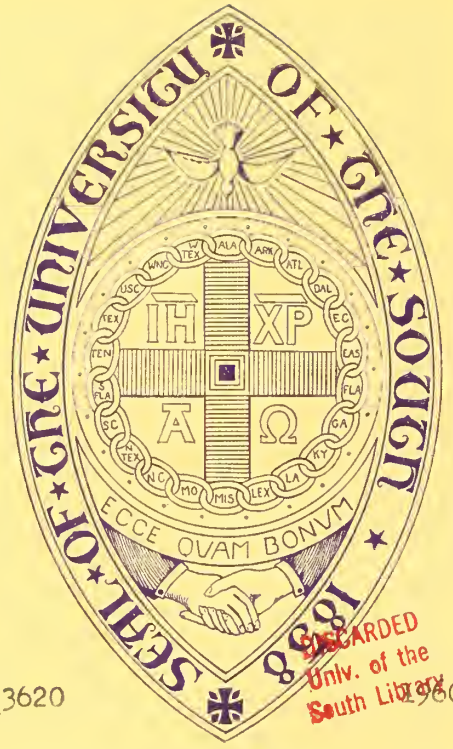


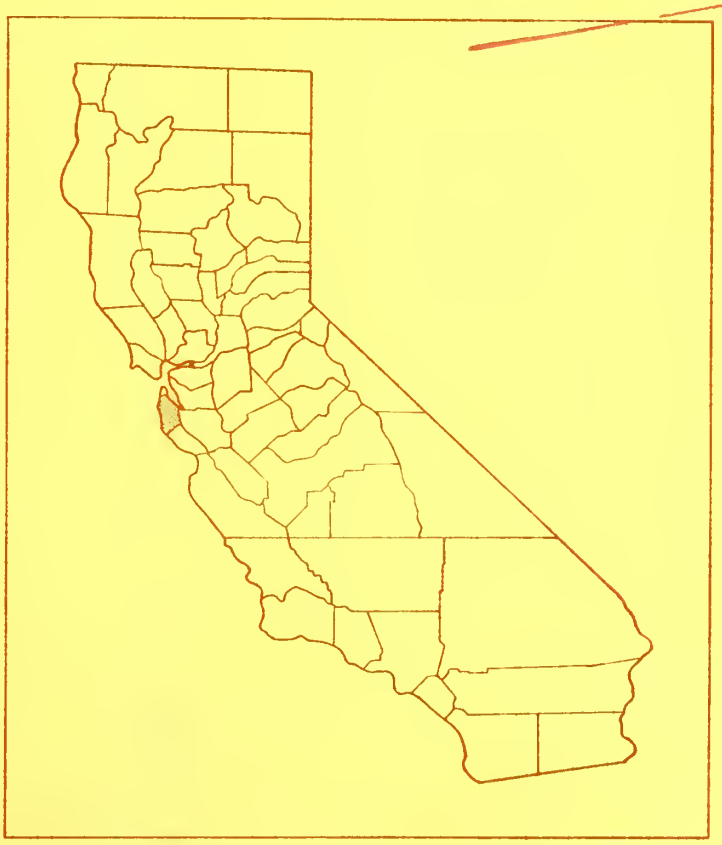
Forest Survey Release No. 22

May 1954

AREA AND OWNERSHIP OF FOREST LAND IN SAN MATEO COUNTY, CALIFORNIA

HAROLD L. BAKER, Forest Economist
Forest Service

ADON POLI, Agricultural Economist
Agricultural Research Service



U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
George M. Jemison, Director
Berkeley, California

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CALIFORNIA FOREST AND RANGE EXPERIMENT STATION

Survey procedure and supervision of basic data collection: A. E. Wieslander, G. F. Burks, and E. M. Hornibrook

Photo interpretation: R. E. Nelson, G. W. Tourtillott, and P. G. Clifford

Drafting and compilations: R. M. Miller, Alda O. Desch, and Alma B. Smith

Illustrative material: Audrey E. Kursinski

Statistical analysis: A. A. Hasel

Multilith plates: R. F. Perenin

CALIFORNIA STATE DIVISION OF FORESTRY

Ownership survey questionnaires: State Forester and members of his staff

SAN MATEO COUNTY

Basic ownership data: County Assessor and Tax Collector

The ownership data presented in this report were the responsibility of the Production Economics Research Branch, Agricultural Research Service, U. S. Department of Agriculture.

The California Forest and Range Experiment Station is maintained at Berkeley in cooperation with the University of California

Agriculture--Berkeley

FOREWORD

The Forest Survey, authorized by the McSweeney-McNary Research Act of 1928, is a nationwide project of the Forest Service designed to provide a comprehensive survey of the forest resource of the United States. This Survey has the following primary objectives:

(1) To inventory all forest lands and the standing timber on those lands.

(2) To measure the current and probable future rate of timber growth and the productive capacity of the forest lands.

(3) To determine the rate of timber depletion through cutting, insects, disease, and other causes.

(4) To determine the present and expected requirements for lumber and other forest products.

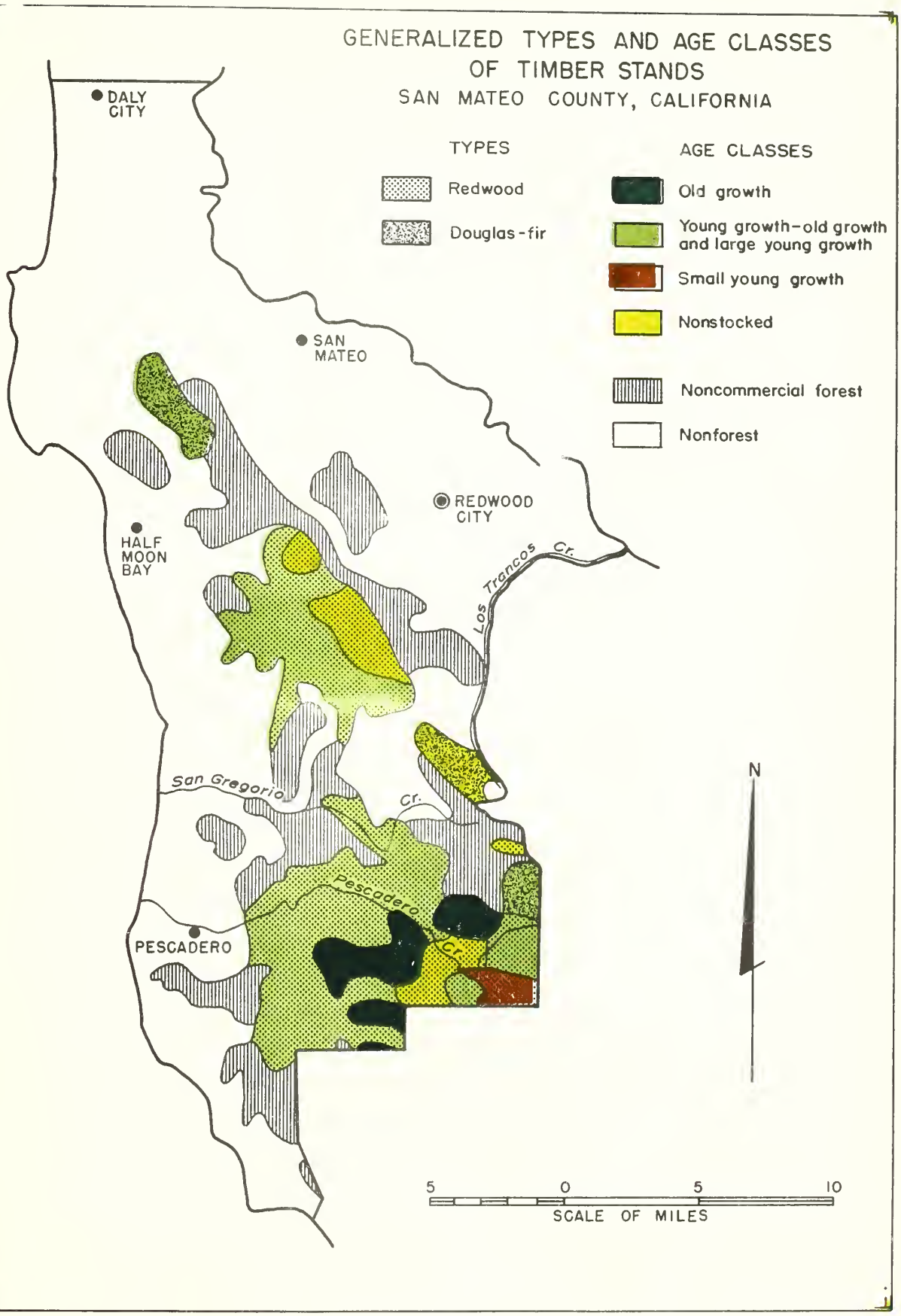
(5) To provide, through correlation of these facts with one another and with other economic knowledge, a basis for formulating local, State, and national forest policies and management plans.

In California this work is the responsibility of the Division of Forest Economics of the California Forest and Range Experiment Station at Berkeley.

This report presents the statistics of forest areas and forest land ownership for San Mateo County, California as of 1948. Besides the facts about the extent, location, and condition of all forest lands and the timber stands on those lands, this release gives quantitative data as to the type of ownership, size of ownership, and number and kinds of owners. Estimates of timber volumes are not included because sampling was not designed to provide this information on areas as small as counties.

This report is the last in a series of county statistical reports presenting data on area and ownership of forest land in the Redwood--Douglas-fir subregion. County reports have already been published for Del Norte, Humboldt, Mendocino, Sonoma, and Santa Cruz counties.

CONTENTS


GENERALIZED TYPES AND AGE CLASSES
OF TIMBER STANDS
SAN MATEO COUNTY, CALIFORNIA
TYPES
Redwood
Douglas-fir
AGE CLASSES
Old growth
Young growth-old growth and large young growth
Small young growth
Nonstocked
Noncommercial forest
Nonforest
DALY CITY
SAN MATEO
REDWOOD CITY
HALF MOON BAY
Los Trancos Cr.
San Gregorio Cr.
Pescadero Cr.
PESCADERO
N
5 0 5 10
SCALE OF MILES

FACTS ABOUT SAN MATEO COUNTY

San Mateo County lies immediately south of the city of San Francisco and forms the southern part of the peninsula between San Francisco Bay on the east and the Pacific Ocean on the west. The topography is predominantly hilly or mountainous; some flat land is on the east side near the bay, and some level and rolling benchland on the west coast. A small range of mountains extends north and south along the peninsula. Elevations throughout the county range from sea level to about 2,400 feet. The drainage system consists of several creeks which flow east into the bay and west into the ocean.

The commercial forest land lies mostly in the central and southern portions of the county. As in Santa Cruz County, the best and most accessible saw-timber stands were cut many years ago when commercial timber operations started in this State. Much of the cut-over land is now restocked with large young-growth stands of timber. Some old-growth stands of redwood timber are reserved in public parks.

Manufacturing and agriculture are major industries. During the war and postwar years a number of large industrial plants were established in this county. These consist largely of enterprises dealing with metals, food products, stone, clay, and glass, electrical equipment, and lumber. Dairy, poultry, and truck farming are major enterprises on the agricultural land in the eastern and western portions of the county. Floriculture is an important use of land near metropolitan areas.

The scenic beauty of the rolling foothills, secluded valleys, and forested mountains, plus a delightful climate, have encouraged residential development. Urbanization and recreational use of rural areas has resulted in considerable encroachment upon the limited acreage of land suitable for timber production. Hence, the lumbering industry will not retain the economic significance it has had here in the past.

THE TOTAL LAND AREA OF SAN MATEO COUNTY IS 291,000 acres

44 percent of this is

FOREST LAND — 127,000 acres

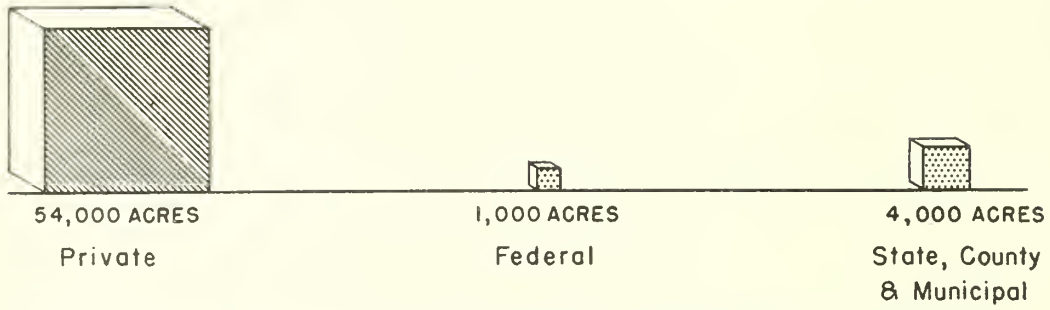
51 percent of the forest land is not suitable for growing commercial timber crops; 2 percent is timber-producing land withdrawn from timber utilization. These lands protect critical watersheds and provide recreation areas. But 47 percent is

COMMERCIAL FOREST LAND — 59,000 acres

This land is growing or capable of growing usable crops of wood.

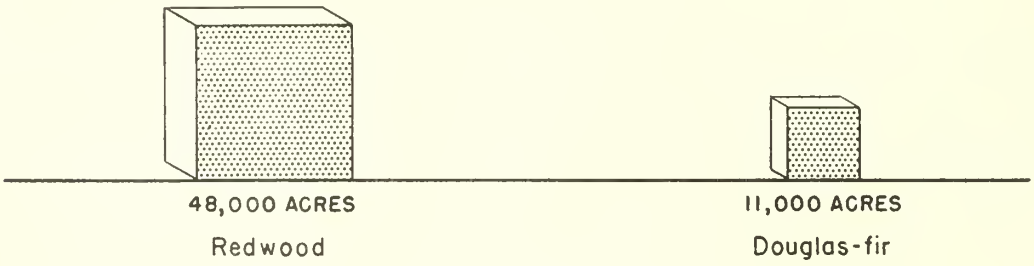
COMMERCIAL FOREST LAND

OWNERSHIP



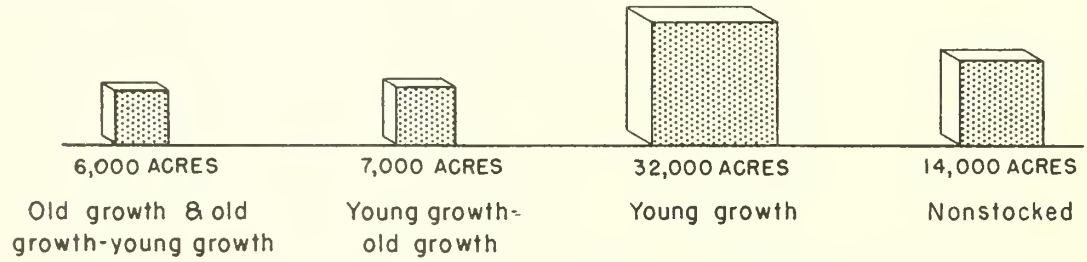
Ninety-one percent of the commercial forest land is privately owned, 7 percent is in State, county, and municipal ownership, and only 2 percent is federal. (table 1)

TYPES



The redwood type occupies a little more than four-fifths of the commercial forest land. Stands classified as Douglas-fir occur on the remaining area. (table 5)

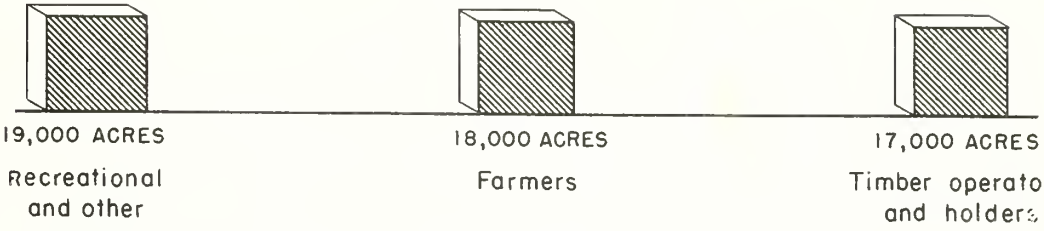
AGE CLASSES



Young growth stands occupy a little more than half of the commercial forest land area. Nearly a fourth is land non-stocked with commercial conifers. Twelve percent is in mixed stands of mature and immature timber in which immature timber is dominant. The remaining area is occupied by old growth stands. (table 7)

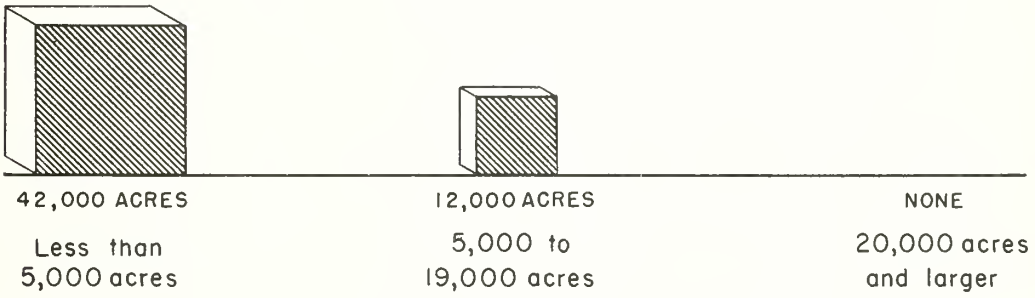
PRIVATELY OWNED
COMMERCIAL FOREST LAND

TYPE OF OWNERSHIP



Owners of recreational, residential, and other similar properties have 35 percent of the privately owned commercial forest land. Farmers own 33 percent; and the remaining 32 percent belongs to corporations and individuals engaged in commercial logging and milling of timber or planning future operations. (table 3)

SIZE OF OWNERSHIP



A little more than three-fourths of the privately owned timberland is in small ownership holdings of less than 5,000 acres. The remainder is in ownership units ranging from 5,000 to 19,000 acres. There are no holdings of 20,000 acres and larger. (table 6)

Table 1.- Total land area by major classes of land and by ownership class, 1948

Class of land	Total all ownerships	Federally owned[1/]	State, County, and municipal	Private	Unclassified[2/]
	Thousand acres				
Forest land					
Commercial	59	1	4	54	-
Noncommercial					
Reserved productive	3	-	3	-	-
Unproductive	65	1	15	49	(3/)
Total forest land	127	2	22	103	(3/)
Nonforest land	164	1	10	119	34
All land	4/291	3	32	222	34

1/ Because the figures in this tabulation are derived by sampling procedure, they may vary somewhat from the actual published figures. For details on sampling procedures and sampling errors for various area sizes see appendix.

2/ A portion of the county located outside the broad limits of commercial forest land and classified as agriculture and otherwise intensively developed land. Ownership aspects of this area were not considered essential to this study.

3/ Less than 500 acres.

4/ From "Areas of the United States 1940," U. S. Bureau of the Census.

Table 2.- Total land area by cover type and use, 1948

Cover type and use	Area Thousand acres
Commercial forest land	
Redwood	48
Douglas-fir	11
Total commercial	59
Noncommercial forest land	
Productive reserved	
Redwood	3
Unproductive	
Coniferous woodland	1
Woodland (hardwoods)	25
Woodland-grass	2
Chaparral	37
Total noncommercial	68
Total forest land	127
Nonforest	
Coastal sagebrush	13
Grass	53
Barren	1
Marsh	13
Cultivated, urban and industrial	84
Total nonforest land	164
All land	291

Table 3.- Number of ownerships and area of privately owned land by type of ownership, 1948

Type of ownership	Ownerships		Total land area		Commercial forest land	Non-commercial forest land	Non-forest land
	No.	Pct.	Thousand acres	Pct.	--- Thousand acres ---		
Timber operating company	3	0.3	13	5.8	13	(1/)	-
Timber holding company	2	0.2	1	0.5	1	(1/)	-
Timber operating individual	4	0.4	(1/)	-	(1/)	-	-
Timber holding individual	30	3.2	3	1.3	3	(1/)	-
Range livestock farming company	-	-	-	-	-	-	-
Range livestock farming individual	24	2.6	41	18.5	12	12	17
Other farmers	400	42.4	65	29.3	6	13	46
Recreational property owners	54	5.7	20	9.0	6	7	7
Other classified owners2/	426	45.2	50	22.5	12	15	23
Unclassified3/	-	-	29	13.1	1	2	26
All types	943	100.0	222	100.0	54	49	119

1/ Less than 500 acres.

2/ All other landowners whose classification is known but does not logically fit the classes listed above. Examples are owners of land held for residential purposes only, mining claims, reservoir sites, commercial enterprises, and speculation.

3/ Small urban, suburban, and industrial ownerships that are too small to map and classify properly, and ownerships that for other reasons cannot be classified and placed in appropriate categories.

Table 4.- Number of ownerships and area of privately owned land by size of ownership, 1948

Size of ownership	Ownerships		Total land area		Commercial forest land	Non-commercial forest land	Non-forest land
Acres	No.	Pct.	Thousand acres	Pct.	----- Thousand acres------		
1- 179	779	82.6	40	20.7	7	8	25
180- 379	59	6.3	19	9.8	4	6	9
380- 699	51	5.4	38	19.7	9	14	15
700- 1,299	32	3.4	36	18.7	11	7	18
1,300- 2,599	14	1.5	25	13.0	4	6	15
2,600- 4,999	3	0.3	11	5.7	6	2	3
5,000- 9,999	3	0.3	12	6.2	7	1	4
10,000-19,999	2	0.2	12	6.2	5	3	4
20,000 and over	-	-	-	-	-	-	-
All classified ownerships	943	100.0	193	100.0	53	47	93
Unclassified	-	-	29	-	1	2	26
Total acreage	-	-	222	-	54	49	119

Table 5.- Commercial forest land by type of ownership and by timber type, 1948

Type of ownership	Total		Timber type	
			Redwood	Douglas-fir
	Thousand acres	Pct.	--- Thousand acres ---	
Federal	1	1.7	1	-
State, county, and municipal	4	6.8	1	3
Timber operating company	13	22.0	13	-
Timber holding company	1	1.7	1	-
Timber operating individual	(1/)	-	(1/)	-
Timber holding individual	3	5.1	3	-
Range livestock farming company	-	-	-	-
Range livestock farming individual	12	20.3	8	4
Other farmers	6	10.2	4	2
Recreational property owners	6	10.2	6	(1/)
Other classified owners	12	20.3	10	2
Unclassified	1	1.7	1	-
All types	59	100.0	48	11

1/ Less than 500 acres.

Table 6.- Privately owned commercial forest land by size of ownership and by timber type, 1948

Size of ownership	Total		Timber type	
			Redwood	Douglas-fir
Acres	Thousand acres	Pct.	--- Thousand acres ---	
1- 179	7	13.2	6	1
180- 379	4	7.5	3	1
380- 699	9	17.0	7	2
700- 1,299	11	20.8	10	1
1,300- 2,599	4	7.5	2	2
2,600- 4,999	6	11.3	5	1
5,000- 9,999	7	13.2	7	-
10,000-19,999	5	9.5	5	-
20,000 and over	-	-	-	-
All classified ownerships	53	100.0	45	8
Unclassified	1	-	1	-
Total acreage	54	-	46	8

Table 7.- Commercial forest land by type of ownership and by age class of timber, 1948

Type of ownership	Total		Age class					
			Old growth	Old growth-young growth	Young growth-old growth	Large young growth	Small young growth	Non-stocked 1/
	Thousand acres	Pct.	Thousand acres					
Federal	1	1.7	-	-	(2/)	1	(2/)	-
State, county, and municipal	4	6.8	(2/)	1	1	1	(2/)	1
Timber operating company	13	22.0	1	2	2	4	1	3
Timber holding company	1	1.7	-	1	(2/)	(2/)	-	-
Timber operating individual	(2/)	-	-	-	-	(2/)	-	-
Timber holding individual	3	5.1	-	1	-	1	1	(2/)
Range livestock farming company	-	-	-	-	-	-	-	-
Range livestock farming individual	12	20.3	-	-	2	8	(2/)	2
Other farmers	6	10.2	-	-	-	3	1	2
Recreational property owners	6	10.2	-	(2/)	1	4	(2/)	1
Other classified owners	12	20.3	-	-	1	6	-	5
Unclassified	1	1.7	-	-	-	1	-	(2/)
All types	59	100.0	1	5	7	29	3	14

1/ Commercial forest land nonstocked with commercial conifers but covered primarily with hardwoods and chaparral.

2/ Less than 500 acres.

AGE CLASSES OF TIMBER STANDS ON COMMERCIAL FOREST LAND

Old growth

Young growth - old growth

Large young growth

Small young growth

Table 8.- Privately owned commercial forest land by size of ownership and by age class of timber, 1948

Size of ownership	Total		Age class					
			Old growth	Old growth-young growth	Young growth-old growth	Large young growth	Small young growth	Non-stocked
Acres	Thousand acres	Pct.	Thousand acres					
1- 179	7	13.2	-	1	1	4	(1/)	1
180- 379	4	7.5	-	-	1	2	(1/)	1
380- 699	9	17.0	-	1	(1/)	5	1	2
700- 1,299	11	20.8	-	1	(1/)	6	(1/)	4
1,300- 2,599	4	7.5	-	-	-	-	1	3
2,600- 4,999	6	11.3	1	1	1	2	-	1
5,000- 9,999	7	13.2	-	-	2	3	1	1
10,000-19,999	5	9.5	-	-	1	4	(1/)	(1/)
20,000 and over	-	-	-	-	-	-	(1/)	(1/)
All classified ownerships	53	100.0	1	4	6	26	3	13
Unclassified	1	-	-	-	-	1	-	(1/)
Total acreage	54	-	1	4	6	27	3	13

1/ Less than 500 acres.

Table 9.- Commercial forest land by age class of timber and by density of stand, 1948

Age class	Total	Density of stand			
		Dense and semidense	Open	Very open	Non-stocked
	Thousand acres				
Old growth	1	1	-	-	-
Old growth-young growth	5	5	(1/)	-	-
Young growth-old growth	7	5	1	1	-
Large young growth	29	6	14	9	-
Small young growth	3	(1/)	(1/)	3	-
Nonstocked	14	-	-	-	14
Total	59	17	15	13	14

1/ Less than 500 acres.

Table 18. Commercial forest land area by timber type, stand-size class, degree of stocking, and ownership, 1948

Timber type and stand-size class[1]	All areas			Degree of stocking[2] and ownership											
				Well-stocked			Medium-stocked			Poorly stocked			Nonstocked		
	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
	Thousand acres														
Redwood															
Old-growth saw timber	4	-	4	4	-	4	(3/)	-	(3/)	-	-	-	-	-	-
Young-growth saw timber	32	2	30	11	1	10	13	1	12	8	(3/)	8	-	-	-
Pole timber	3	(3/)	3	(3/)	-	(3/)	(3/)	(3/)	-	3	(3/)	3	-	-	-
Nonstocked	9	(3/)	9	-	-	-	-	-	-	-	-	-	9	(3/)	9
Total	48	2	46	15	1	14	13	1	12	11	(3/)	11	9	(3/)	9
Douglas-fir															
Old-growth saw timber	2	2	-	2	2	-	-	-	-	-	-	-	-	-	-
Young-growth saw timber	4	(3/)	4	(3/)	-	(3/)	2	(3/)	2	2	-	2	-	-	-
Pole timber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonstocked	5	1	4	-	-	-	-	-	-	-	-	-	5	1	4
Total	11	3	8	2	2	(3/)	2	(3/)	2	2	-	2	5	1	4
All types															
Old-growth saw timber	6	2	4	6	2	4	(3/)	-	(3/)	-	-	-	-	-	-
Young-growth saw timber	36	2	34	11	1	10	15	1	14	10	(3/)	10	-	-	-
Pole timber	3	(3/)	3	(3/)	-	(3/)	(3/)	(3/)	-	3	(3/)	3	-	-	-
Nonstocked	14	1	13	-	-	-	-	-	-	-	-	-	14	1	13
Total	59	5	54	17	3	14	15	1	14	13	(3/)	13	14	1	13

1/ See relationship of stand-size class to age classes, page 16.

2/ To obtain degree of stocking, Survey density classes were converted as follows: dense and semidense -- well stocked; open -- medium stocked; and very open -- poorly stocked.

3/ Less than 500 acres.

PROCEDURES

Area Delineation

To determine the extent, location, and condition of all forest lands in San Mateo County, aerial photographs were delineated on the basis of (1) present cover of vegetation, (2) suitability for growing timber crops, and (3) age class and density of timber stands. The minimum unit classified and mapped was ten acres.

The segregation of lands suitable for growing timber crops from other lands was a matter of some difficulty, particularly where commercial conifers were entirely lacking. If these nonstocked areas were located in a timber zone where commercial conifers normally grow, they were classified as commercial forest land. While this assumption may be true in most cases, as verified by visible and historical evidence, soil surveys now in progress in other areas of California have demonstrated that some nonstocked areas have soils too shallow to grow timber. Inasmuch as the same situation probably exists in this county, some of the nonstocked areas classified in this report as commercial and reserved productive forest land must reside in the doubtful category until soil surveys provide a basis for final classification.

Transfer to base maps

After photo delineation was completed, Timber Stand Maps were prepared by transferring photo classifications to 7-1/2 minute quadrangle size base maps at a common scale of 2 inches to the mile. Kind and density of vegetation, age structure, and density of coniferous timber stands, and other information pertinent to the forest resource were shown. As a final preparation for area measurement other related information such as political and economic subdivisions, ownership, and commercial timber type boundaries, was marked along east-west transect lines spaced 2 miles apart. Because logging and fire have caused changes in the timber classification since the date of aerial photography, adjustments of age-density classes were made along these transect lines after a field examination. This was done so that class acreages when compiled would show conditions as of the inventory year.

Ownership determination

Information on land ownership in San Mateo County was obtained from the county tax assessment rolls, and other official records of the County Assessor and Tax Collector, using a line sampling technique.[1/] Ownership boundaries, taken from county plat maps, were marked along

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1/ Details of line sampling method used for estimating area and procedure for estimating number of owners are given in "A New Approach to Forest Ownership Surveys," by A. A. Hasel and Adon Poli, Land Economics, Vol. XXV, No. 1, Feb. 1949, pp. 1-10.

the transect lines drawn on the quadrangle base maps. The proportion of the total line traversing an ownership class was taken as the proportion of the total acreage in that particular class. This acreage was classified further by measuring the intercepts of the various classifications of vegetation and timber stands used in the Forest Survey.

Owners of properties traversed by the sample lines constituted the ownership sample. The property records of the county provided the address of the owners, and the acreage of each parcel of land in the sample. The acreage figures were used to classify private ownerships and land area by size. Each sample owner was mailed a questionnaire card by the State Division of Forestry. Answers on these cards provided information used to classify the sample ownerships as to type of ownership. Similar information about the land of nonrespondents was obtained by a field followup, in which key informants were questioned in local public offices and in the communities where the owners have their land.

Area measurement and compilation

To estimate areas, parallel lines spaced 2 miles apart were drawn east and west on the quadrangle base maps. Acreage figures were then obtained by recording line intercept measurements of all pertinent subdivisions along each sample line transecting the quadrangles. These subdivisions included age, density, and type of timber stands, and type and size of ownership. The ratio of total line length to total area for the quadrangle provided the factor to convert line segments in inches to area in acres. These acreages were then totaled by county, and adjusted if necessary, to check with the 1940 Bureau of Census acreages by counties. Estimated acreage figures appearing in the tables were compiled and summarized by means of punch cards and card tabulating equipment.

Stand-size class determination

The national pattern established for the Forest Survey requires classification of commercial forest land into stand-size classes. To present California forest resource data in terms of stand-size classes, mapped age classes have been grouped as follows:

Age class	Stand-size class
Old growth Old growth-young growth	Old growth saw timber
Young growth-old growth Large young growth	Young growth saw timber
Small young growth	Pole timber
Nonstocked	Nonstocked

The forest stands classified as saw timber by this grouping conform closely to the Forest Survey definitions. Areas of seedlings and saplings are not shown separately as these areas occurred in such small and widely scattered units that separate photo classification was not practicable. These areas were included with other stand-size classes, chiefly pole timber and nonstocked.

ACCURACY OF ESTIMATE

Estimates of acreages in the various classes of land as determined by Forest Survey procedures are subject to two general types of errors: (1) nonsampling errors in photo classification, mapping, tabulation, computation, and compilation, and (2) sampling errors which arise from taking a sample rather than making a complete inventory. Errors of the first type are kept to a minimum by frequent checking and close supervision of all field and office work. If these nonsampling errors are negligible or compensating, then the sampling errors provide measures of the reliability of the acreage estimates and can be computed by statistical methods. Magnitudes of the sampling errors depend on the intensity of the sample and the variability of the data.

For the principal classes of forest land of San Mateo County, the sampling errors2/ are as follows:

Class	Sampling error	
	Acres	Percent
Forest land	7,620	6.0
Commercial forest land	5,074	8.6
Noncommercial forest land	5,440	8.0

Statistics of forest area by age class, type, and ownership classes presented in this report are subject to increasing sampling errors as the class acreages decrease. A partial range of area sampling errors applicable to areas in this report is shown below:

Acres in class	Sampling error in percent
10,000	21.0
20,000	14.5
40,000	10.5
100,000	6.5
200,000	4.5

2/ For one standard error; that is, the chances are 2 in 3 that the class acreages as determined by 100-percent measurement lie within the limits of the calculated acreages plus and minus the amounts shown.

DEFINITION OF TERMS

Area

Forest land area. Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested areas; and (d) chaparral areas.

Commercial forest land area. Forest land which is (a) producing or capable of producing usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area. Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order which otherwise qualifies as commercial forest land and (b) incapable of yielding wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Chaparral land area. Lands supporting heavily branched dwarf trees or shrubs, usually evergreen, the crown cover of which normally covers more than 50 percent of the ground and whose primary value is watershed protection. The more common chaparral constituents are species of Quercus, Cercocarpus, Garrya, Ceanothus, Arctostaphylos, and Adenostoma. Types dominated by such shrubs as Artemisia, Opuntia, Purshia, Gutierrezia or semidesert species are not commonly considered chaparral.

Nonforest land area. Land that does not qualify as forest land. Includes land which has never supported forest growth; land from which the forest has been removed to less than 10 percent stocking and has been developed for other use, such as grazing, agricultural, residential, or industrial; all land in thickly populated urban and suburban areas; and water classified as land by the Bureau of Census.

Timber stand classifications

Age classes of commercial conifer stands[3] on commercial forest land.

1. Old growth. Mature trees[4] compose more than 80 percent of the conifer canopy.

2. Old growth-young growth. Mature trees compose from 50 to 80 percent of the conifer canopy.

3/ Stands composed of the following species, singly or in combination: Redwood and Douglas-fir.

4/ All trees that can be considered as having passed their optimum growth.

3. Young growth-old growth. Mature trees compose 20 to 50 percent of the conifer canopy.

4. Young growth. Mature trees compose less than 20 percent of the conifer canopy.

   a. Large young growth. More than 5 percent of the immature trees are larger than 11.0 inches d.b.h.

   b. Small young growth. Ninety-five percent or more of the immature trees are less than 11 inches d.b.h.

Stand-size classes of timber stands on commercial forest land.

1. Saw-timber stands. Defined as stands having a minimum net volume per acre of 4,000 board feet, International 1/4-inch rule, in saw-timber trees (11.0 inches d.b.h. and larger for all species).

   a. Old-growth saw-timber stands. Saw-timber stands in which over 50 percent of the net board-foot volume is in old-growth saw-timber trees.

   b. Young-growth saw-timber stands. Saw-timber stands in which 50 percent or more of the net board-foot volume is in young-growth saw-timber trees.

2. Pole-timber stands. Defined as stands failing to meet the saw-timber stand specification, but at least 10 percent stocked with pole-timber and larger trees and with at least half the minimum stocking in pole-timber trees (5.0 to 10.9 inches d.b.h.).

3. Seedling and sapling stands. Stands not qualifying as either saw-timber or pole-timber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling and sapling trees (0 to 4.9 inches d.b.h.).

4. Nonstocked. Defined as areas of forest land not qualifying as saw-timber, pole-timber, or seedling and sapling stands.

Density classes of commercial conifer stands on commercial forest land.

1. Dense and semidense. Commercial conifers cover 50 percent or more of the ground space.

2. Open. Commercial conifers cover from 20 to 50 percent of the ground space.

3. Very open. Commercial conifers cover 5 to 20 percent of the ground space.

4. Nonstocked. Commercial conifers cover less than 5 percent of the ground space.

Timber type. An extensive area of commercial or reserved productive forest land characterized by a predominant conifer species or group of conifer species. Other vegetation (such as hardwood and chaparral areas) and/or nonvegetation types (such as barren areas) may also occur in subordinate amounts within the same area.

Commercial timber types

a. Redwood. Areas with redwood comprising 20 percent or more of the commercial conifer cover.

b. Douglas-fir. Areas with Douglas-fir comprising more than 80 percent of the commercial conifer cover; or mixtures of Douglas-fir and true fir in which Douglas-fir comprises 20 percent or more of the commercial conifer cover.

Other timber and vegetation types

a. Coniferous woodland. Areas with such trees as knobcone pine, digger pine, juniper, and scattered and scrub trees of other conifer species, covering more than 5 percent of the ground space and predominant over hardwoods that may partly compose the cover.

b. Hardwoods (woodland). Areas with hardwood trees (oaks, madrone, etc.), covering more than 50 percent of the ground except where in mixture with commercial conifers or herbaceous vegetation.

c. Woodland-grass. Areas with hardwood trees and herbaceous vegetation occurring in mixture--without commercial conifers--and the trees covering from 5 to 80 percent of the ground area and predominant over minor conifers5/ present in the cover.

d. Shrub and herb types consist of the following, where not in mixture with minor conifers or hardwood.

   1. Chaparral. Areas with such shrubs as manzanita, ceanothus, scrub oaks, etc., covering more than 50 percent of the ground.

5/ Minor conifer species are knobcone pine, digger pine, juniper, western yew, and California nutmeg.

2. Coastal sagebrush. Areas with such shrubs as California sagebrush, coyote brush, and wild buckwheat covering more than 50 percent of the ground.

3. Grass. Areas with grasses and associated herbaceous vegetation covering more than 50 percent of the ground except where the type qualifies as woodland-grass.

4. Marsh. Areas with herbaceous vegetation characteristic of very poorly drained areas.

Nonvegetation types

a. Barren. Bare ground, rocky areas, river beds, mine dredgings, and talus essentially devoid of vegetation.

b. Cultivated, urban, and industrial. Areas that are under cultivation or are used for residential or industrial purposes.

Ownership classifications

Federal. Land owned by the Federal Government.

State, county, and municipal. Lands in State, county, or municipal ownership.

Timber operating company. A corporation actively engaged in commercial logging and sawing of timber as a major enterprise.

Timber holding company. A corporation holding timberland principally for future commercial timber operations. The timber may be held for the company's own future use or for sale to other operators.

Timber operating individual. A person whose major enterprise is commercial timber operations. This includes individuals logging timber, operating a large or small sawmill, or splitting timber commercially for sale.

Timber holding individual. A person holding timberland principally for future commercial timber operations. The timber may be held for his own future operations or for sale to other operators.

Range livestock farming company. A corporation engaged primarily in range livestock farming.

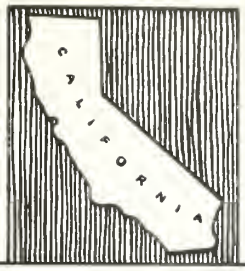
Range livestock farming individual. A person whose major enterprise is range livestock farming.

Other farmers. Persons or corporations that have farming as their major activity, but whose principal agricultural enterprise is not range livestock farming.

Recreational property owners. Persons or corporations holding land principally for recreational purposes.

Other classified owners. All other landowners whose classifications are known but do not logically fit the classes listed above. Examples are owners of land held for residential purposes only, mining claims, and reservoir sites.

Unclassified. Land ownerships in urban, suburban, and industrial settlements that are too small to map and classify properly, and ownerships that for other reasons cannot be classified and placed in appropriate categories.



FOREST SURVEY RELEASE No. 23

JULY 1954

U. S. DEPARTMENT
OF AGRICULTURE
FOREST SERVICE

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
GEORGE M. JEMISON, DIR.

OUTPUT OF FOREST PRODUCTS IN CALIFORNIA, 1952

By Richard H. May, Forester
Division of Forest Economics

Information on the output of forest products in California during the year 1952 has been compiled from several sources. These include the Bureau of the Census, U. S. Department of Commerce; the Western Pine Association; and surveys conducted by the California Forest and Range Experiment Station. The cooperation of other agencies and of company officials canvassed by the Station is greatly appreciated. Their aid has made this report possible.

Highlights

Lumber. Lumber production in California during 1952 remained at about the same level as in 1951 (table 1). The 1952 estimate is 4,837 million board feet, compared to 4,843 in 1951. The Redwood Region showed a 4 percent increase in 1952, but Pine Region production decreased 3 percent as compared with 1951.

Plywood Logs. Production of logs for green veneer and plywood plants was about 250 million board feet in 1952, an increase of 77 percent over 1950 (table 2). The volume of "peelers" was more than doubled in the Redwood Region but increased only slightly in the Pine Region.

Pulpwood. Production of logs for pulp plants amounted to almost 100 million board feet in 1952 -- equivalent to 200,000 cords and about twice the 1950 volume (table 2). The increase in pulp-log production was greater in the Redwood Region than in the Pine Region. Mill residues used for pulp were equivalent to about 110,000 cords in 1952 (table 6).

The California Forest and Range Experiment Station is maintained at Berkeley, California, in cooperation with the University of California

Poles and Piling. About 45,000 poles were produced in 1952, or more than 3 times the number produced in 1950 (table 2). Both the Pine and Redwood Regions showed substantial increases. The Redwood Region, which had a negligible cut of poles in 1950, produced about one-third of the State total in 1952. More than a million lineal feet of piling were produced in 1952 -- about double the 1950 amount. Most of this increase occurred in the Pine Region.

Other Commodities. Production of logs and bolts for container veneer increased 13 percent in 2 years, to about 20 million board feet (table 2). All the increase was in the Redwood Region. Production of shingle and shake bolts amounted to more than 5 million board feet in 1952 -- a decrease of about 60 percent since 1950. This commodity has decreased almost to the vanishing point in the Pine Region. Production of cooperage logs was 4-1/2 million board feet in 1952, a decline of 14 percent since 1950. Cooperage logs are cut only in the Redwood Region.

Production by Species. Douglas-fir was the leading species by volume in 1952 for lumber, plywood and veneer, pulpwood, poles and piling, and cooperage. Ponderosa pine was the second most common species for lumber, plywood and veneer, and poles and piling. Redwood was third in importance for lumber, the chief species used for shingles, shakes, and various split products, and second in use as pulp logs. Production of lumber by species is shown in table 1, and other major products by species in tables 3 to 5 and 7 to 9 inclusive.

Procedure

Two regions have been designated for use in reporting forest product volumes in California. These are: (1) the Redwood Region, which includes the north coastal portion of the State, extending from Del Norte County through Monterey County; and (2) the Pine Region, which embraces the remaining counties of the State.

Lumber

Information on lumber production is collected and published annually by the Bureau of the Census, U. S. Department of Commerce, and by the lumber trade associations. Estimates for California for 1952 were obtained by combining the Census figure for the California Redwood Region with the Western Pine Association figure for the California Pine Region. The Pine Association figures were used for the Pine Region because they represented a more complete coverage of mills there than did those of the Bureau of the Census. The State Forester's report on sawlog output for California by counties in 1952 closely substantiates the Western Pine estimate in the Pine Region and the Census estimate in the Redwood Region.

Other Products

The figures for products other than lumber represent logs and bolts produced in 1952 for conversion into commodities during that year or for stockpiling until the following year, and were compiled by region of origin.

Figures on consumption and stocks of logs used at plywood plants were collected by the U. S. Bureau of the Census. Production estimates were derived from these figures, using supplementary information on peeler logs obtained by the Station, including figures on log consumption and stocks obtained from green veneer plants.

Production information on several other products was obtained by the Station, by means of mailed questionnaires, with follow-up in the field to obtain important unreported figures. Response was 100 percent from the pulp and cooperage plants. Response for other commodities was: container veneer, 94 percent of total estimated production; green veneer, 92 percent; poles, 98 percent; piling, 74 percent; shingles and sawed shakes, 16 percent of total estimated production.

Production estimates for the miscellaneous products shown in Table 10 were derived from figures obtained from key persons and companies in industry, from government agencies, and by projections of trends. Although some of these estimates are rough, they give a general idea of the current output of those products in California.

Table 1.- Lumber production in California by region and species, 1952; and by species, 1951

Species	1952[1]			1951[2]
	Pine region	Redwood region	California	Total California
	Million bd. ft.			
Douglas-fir	502.2	1,198.4	1,700.6	1,610.9
Ponderosa pine[3]	1,145.9	22.0	1,167.9	1,235.8
Redwood[4]	5.5	894.1	899.6	867.2
True firs[5]	636.6	15.0	651.6	705.2
Sugar pine	311.1	7.0	318.1	326.4
Cedar[6]	84.1	2.7	86.8	84.0
Sitka spruce	0.0	6.7	6.7	8.6
Other softwoods[7]	3.1	2.0	5.1	4.7
Hardwoods	0.5	0.1	0.6	0.3
All species	2,689.0	2,148.0	4,837.0	4,843.1

1/ Source: (1) Pine Region: Western Pine Association estimates for softwood production in California and Nevada combined, from which the Nevada production was deducted, the latter obtained from U. S. Forest Service Region 4; (2) Redwood Region: U. S. Bureau of the Census; (3) in both regions: hardwood and some softwood volumes were estimated at the California Forest and Range Experiment Station.

2/ Source: Bureau of the Census--Forest Service cooperative survey. See Forest Survey Release No. 17, California Forest and Range Experiment Station.

3/ Includes Jeffrey pine.

4/ Includes giant sequoia.

5/ White fir, California red fir, and grand fir.

6/ California incense-cedar, Port-Orford white-cedar, western red-cedar.

7/ Western white, lodgepole, and Digger pines in Pine Region; western hemlock and Monterey pine in Redwood Region.

Table 2.- Production of logs and bolts for commodities by region, California, 1952 and 1950

Commodity and region	1952 Volume	1950 1/ Volume	Percent change 1950 to 1952
	-- Thousand board feet 2/ --		
PLYWOOD 3/			
Redwood region	198,675	93,445	+113
Pine region	53,970	49,040	+ 10
Total both regions	252,645	142,485	+ 77
CONTAINER VENEER			
Redwood region	16,560	14,180	+ 17
Pine region	3,710	3,725	--
Total both regions	20,270	17,905	+ 13
PULP 4/			
Redwood region	84,810	39,645	+114
Pine region	15,026	9,195	+ 63
Total both regions	99,836	48,840	+104
SHINGLE AND SAWED SHAKE			
Redwood region	5,470	13,550	- 60
Pine region	220	1,290	- 83
Total both regions	5,690	14,840	- 62
COOPERAGE			
Redwood region	4,530	5,275	- 14
(None in Pine region)			
	-------- Pieces --------		
POLES (utility)			
Redwood region	14,850	280	+5204
Pine region	30,410	12,045	+ 152
Total both regions	45,260	12,325	+ 367
	------ Lineal feet -----		
PILING			
Redwood region	467,300	366,495	+ 28
Pine region	649,100	181,455	+ 257
Total both regions	1,116,400	547,950	+ 104

1/ From Forest Research Note No. 79, California Forest and Range Experiment Station, which also includes comparable figures for 1948 and 1946.
2/ In net scale, except pulp logs which are in gross scale.
3/ Includes logs going to both plywood and green veneer plants.
4/ In gross scale.

Table 3.- Estimated production of logs and bolts for plywood, 1/ by species and region, California, 1952

Species	Redwood region	Pine region	State	
			Volume	Percent
	-------- Thousand bd. ft. --------			
Douglas-fir	193,255	9,830	203,085	81
Ponderosa pine	85	36,070	36,155	14
Sugar pine	20	5,615	5,635	2
Redwood	5,300	--	5,300	2
True firs	15	2,455	2,470	1
All species	198,675	53,970	252,645	100
Number of plants				
Plywood	8	4	12	-
Green veneer	8	2	10	-
Total	16	6	22	-

1/ Peelers for both plywood and green veneer plants. The latter peel veneer, but have no presses, so ship their product to plants which press the veneer into plywood. The Bureau of the Census, U. S. Dept. of Commerce, provided basic data on consumption and stocks of logs by plywood plants. Some details from plywood plants and the information from green veneer plants were obtained by the Station.

Table 4.- Estimated production of logs and bolts for container veneer, by species and region, California, 1952

Species	Redwood region	Pine region	State	
			Volume	Percent
	-------- Thousand bd. ft. ----------			
Douglas-fir	16,170	--	16,170	80
Ponderosa pine	--	3,290	3,290	16
Digger pine	--	420	420	2
Sitka spruce	350	--	350	2
Monterey pine	40	--	40	--
All species	16,560	3,710	20,270	100
Number of plants	2	7	9	--

Table 5.- Estimated pulp log and bolt production by species and region, California - 1952

Species	Redwood region	Pine region	State	
			Volume	Percent
	--- Thousand bd. ft. gross scale[1] ---			
Douglas-fir	53,475	5,000	58,475	59
Redwood	31,110	--	31,110	31
True firs[2]	--	9,000	9,000	9
Pines[3]	225	1,000	1,225	1
Eucalyptus	--	26	26	--
All species	84,810	15,026	99,836	100

1/ A large portion of the logs used by the pulp industry are considered cull by the lumber industry, and by Forest Survey inventory standards.

2/ White fir and California red fir.

3/ Ponderosa, Jeffrey and lodgepole pines in the Pine Region; Monterey pine in the Redwood Region.

Table 6.- Total use of pulpwood in California, 1952

Kind of material	Plants reporting use	Common units	Equivalent in solid wood	Equivalent in cords
	Number		Thousand cu. ft.	Thousand cords
Logs and bolts	3	99,836 M bd.ft.[1]	17,971	200
Chips	6	34,103 units[2]	2,436	27
Wood flour[3]	4	21,006 tons	1,237	14
Mill ends[4]	5	70,614 cords	5,081	70
All kinds	7	--	26,725	311

1/ Gross scale.

2/ Units of 200 cubic feet of loose chips.

3/ Some of this volume is from out-of-state sources.

4/ Slabs, trimmings, veneer cores, etc., includes some chips not reported separately.

Table 7.- Estimated production[1] of bolts for shingles and sawed shakes, by species and region, California, 1952

Species	Redwood region	Pine region	State	
			Volume	Percent
	------- Thousand bd. ft. ---------			
Redwood	5,470	--	5,470	96
Giant sequoia[2]	--	150	150	3
Sugar pine	--	70	70	1
All species	5,470	220	5,690	100
Number of plants	30	6	36	--

1/ Based on returns of 12 identical mills which reported both in 1950 and in 1952 and estimates for active mills not reporting in 1952.

2/ Formerly designated "Bigtree."

Table 8.- Cooperage log production by species, California Redwood Region, 1952

Species	Volume	Percent
	M bd. ft.	
Douglas-fir	4,286	95
Sitka spruce	145	3
Redwood	96	2
Other[1]	3	-
All species	4,530	100
Number of plants	1[2]	-

1/ Sugar pine, 2M; grand fir, 1M.

2/ Permission to publish these figures has been granted by the producer.

Table 9.- Estimated production of poles and piling,[1] by region and species, California, 1952

Region	Species	Poles[2]		Piling[2]	
		Pieces	Cu. ft.	Lin ft.	Cu. ft.
Redwood region	Douglas-fir	14,850	400,770	308,200	196,280
	Redwood	--	--	141,300	122,180
	Eucalyptus	--	--	17,800	10,870
	Subtotal	14,850	400,770	467,300	329,330
Pine region	Douglas-fir	14,210	355,480	201,900	128,590
	Ponderosa pine	16,200	262,350	439,000	279,620
	Eucalyptus	--	--	8,200	5,010
	Subtotal	30,410	617,830	649,100	413,220
State	Douglas-fir	29,060	756,250	510,100	324,870
	Ponderosa pine	16,200	262,350	439,000	279,620
	Redwood	--	--	141,300	122,180
	Eucalyptus	--	--	26,000	15,880
	All species	45,260	1,018,600	1,116,400	742,550

1/ Four California producers reported for 1952, 2 reporting production of both poles and piling, and 2 reporting one product each. Estimates have been made to cover the few small non-reporting producers.

2/ Cubic volumes for poles and piling are based on average measurements reported with production figures. The range in measurements or averages were as follows:

Product and species	Top diameter	Butt diameter	Length
	inches	inches	feet
POLES			
Douglas-fir	6 - 9	10 - 17	40 - 50
Ponderosa pine	6 - 9	9 - 17	25 - 35
PILING			
Douglas-fir	7 - 8	13 - 14	50 - 60
Ponderosa pine	8	13	50
Eucalyptus	6	14	60
Redwood (1950 data)	8	16	35

Table 10.- Estimated output of miscellaneous forest products, California, 1952 and 1950

Product	Unit	Volume	
		1952	1950
Fuelwood (residential and farm use)	Cords	170,000	245,000[1/]
Round wood	Cords	70,000	105,000
Slab wood[2/]	Cords	100,000	140,000
Fenceposts (round and split)	M pieces	3,400	3,100
Hewn ties (redwood)	M pieces	8	35[1/]
Miscellaneous split products (primarily grapestakes)	M pieces	9,800	9,000
Mine timbers (round and hewn)	Cubic feet	455,000	337,700
Tan-oak bark	Cords	5,086	8,000

1/ Revised downward from earlier estimates.
2/ Residues from sawmills, etc.

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
FORESTRY BUILDING, UNIVERSITY OF CALIFORNIA
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BERKELEY 1, CALIFORNIA

OFFICIAL BUSINESS

FOREST SURVEY
RELEASE No. 25
DECEMBER — 1954

FOREST STATISTICS FOR CALIFORNIA

CALIFORNIA
FOREST AND RANGE
EXPERIMENT STATION
GEORGE M. JEMISON, DIRECTOR

FOREST SERVICE - U. S. DEPARTMENT OF AGRICULTURE

FOREST STATISTICS FOR CALIFORNIA

By
Forest Survey Staff
California Forest and Range Experiment Station

During the course of the Forest Survey in California the following persons and agencies participated in the collection and compilation of the data and preparation of this report.

E. V. ROBERTS, Chief, Division of Forest Economics

SURVEY PROCEDURES AND SUPERVISION OF BASIC DATA COLLECTION:
A. E. Wieslander, G. F. Burks, E. M. Hornibrook, and H.A. Jensen
REPORT PREPARATION: H. L. Baker
FIELD SAMPLING AND PHOTO INTERPRETATION:
H. W. Camp, Jr., K. E. Bradshaw, R. H. May, R. E. Nelson, W. L. Colwell, Jr., K. A. Cuff, A. L. Hartong, H. L. Baker, I. I. Holland, G. W. Tourtillott, R. H. Neuns, P. G. Clifford, M. Swensen, J. H. Murray, Jr., J. C. Gilman, R. C. Sias, J. F. Calef, K. Schoenlank, W. P. Hoffman, P. J. Zinke, W. M. Hersh, F. H. Hill, E. F. Peterson, A. W. Otto, and P. Wild
DRAFTING AND COMPUTING: R. M. Miller
DRAFTING: A. O. Desch, R. W. Hanson, M. M. Cushman, P.R. Haskey, M. E. Cameron, E. T. Knight, C. C. McGlynn, W. G. Young, L. G. Hibbard, E. R. White, L. R. da Roza, H. Yee, J. Tracheme, M. Lusk, and G. Ishida
COMPUTING: A. B. Smith, M. S. Hart, B. J. Jackson, A. Sullivan, R. C. Lancaster, E. R. White, B. M. Fadie, M. B. Naughten, S. A. Rhoads, A. Dykzeul, and D. E. Jacques
VOLUME TABLES AND STATISTICAL ANALYSIS:
A. A. Hasel, E. M. Hornibrook, R. W. Larson, J. J. Van Akkeren, A. L. Hartong, and A. E. Rae
ANNUAL CUT AND LOGGING RESIDUE:
R. H. May, A. L. Hartong, A. Simontacchi, and H. J. Vaux
TABLES AND MULTILITH PLATES: R. F. Perenin
ILLUSTRATIONS: A. E. Kursinski
CULL FACTORS: J. W. Kimmey
EDITING: C. M. Walker

Cooperating agencies:

FOREST SERVICE, REGION 5: Supervisors of the National Forests and their staffs
AGRICULTURAL RESEARCH SERVICE, PRODUCTION ECONOMICS RESEARCH BRANCH, U.S. DEPARTMENT OF AGRICULTURE: Adon Poli, Agricultural Economist
CALIFORNIA STATE DIVISION OF FORESTRY: State Forester and members of his staff

The California Forest and Range Experiment Station is maintained at Berkeley in cooperation with the University of California

FOREWORD

The Forest Survey, authorized by the McSweeney--McNary Act of 1928, is a nation-wide activity of the Forest Service, U. S. Department of Agriculture, and is designed to provide a comprehensive inventory of the forest resource of the United States. In California, this work is the responsibility of the Division of Forest Economics, California Forest and Range Experiment Station at Berkeley.

The Survey has a five-fold objective: (1) To make an inventory of all forest land and the standing timber on that land. (2) To determine the current and probable future rate of timber growth, and the productive capacity of the forest land. (3) To determine the rate of timber depletion through cutting, fire, insects, disease, and other causes. (4) To determine the present and expected requirements for lumber and other forest products. (5) To provide, through correlation of these facts with one another and with other economic knowledge, a basis for formulating local, State, and national forest policies and management plans.

This release presents statistics of forest area, timber volume, and ownership for California as of January 1, 1953. These statistics are based on Forest Survey data collected from 1946 through 1952 and adjusted for changes up to January 1, 1953. Data on timber growth and annual cut are for the year 1952. Lumber production by mill-size class is shown for 1951, the last year this detailed information was collected.

The first ten tables in this report are standard in all Forest Survey reports so that readers may combine or compare the data with similar data for other forest regions. The remaining tables present detailed forest statistics for California by major forest subregions. Timber volumes are not presented for counties because sampling was not designed to provide estimates for such small areas.

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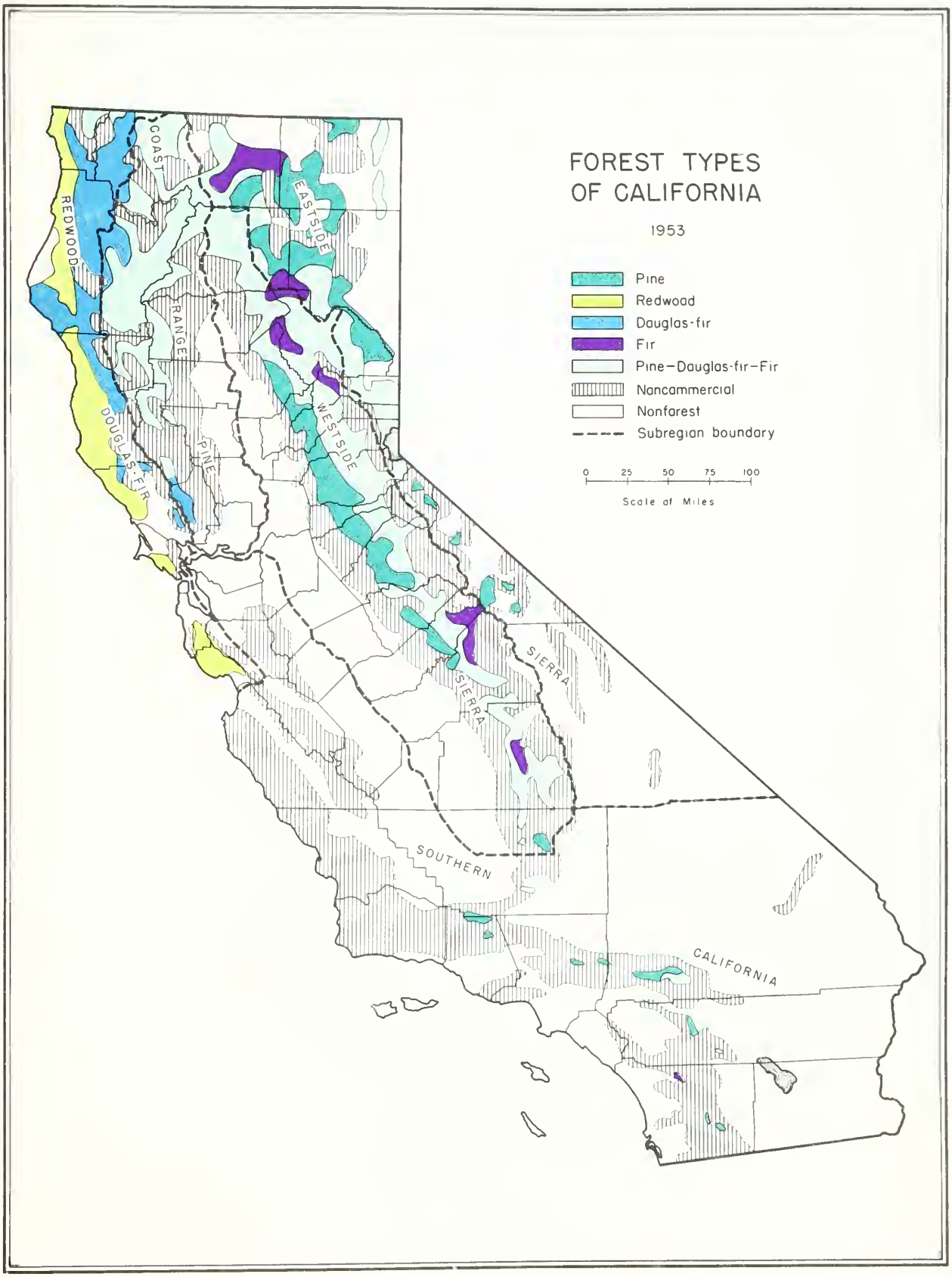

FOREST TYPES
OF CALIFORNIA
1953
Pine
Redwood
Douglas-fir
Fir
Pine–Douglas-fir–Fir
Noncommercial
Nonforest
Subregion boundary
0 25 50 75 100
Scale of Miles
COAST
REDWOOD
RANGE
DOUGLAS-FIR
PINE
EASTSIDE
WESTSIDE
SIERRA
SIERRA
SOUTHERN
CALIFORNIA

THE FOREST SITUATION

In California, forest land makes up 42 percent of the total land area. The forests on this land furnish about 13 percent of the Nation's lumber production and substantial quantities of other timber products. But providing timber products, and the accompanying wages and jobs for mill and woods workers, is only part of the economic value of the forests. They attract into the State large numbers of tourists, who add millions of dollars to the incomes of residents. The forests also provide a recreational outlet for the increasing population of the State. The forests provide forage for domestic livestock and food and cover for wildlife. Furthermore, because of California's great need for irrigation, industrial, and domestic water supplies, forests are of especially high value for watershed protection.

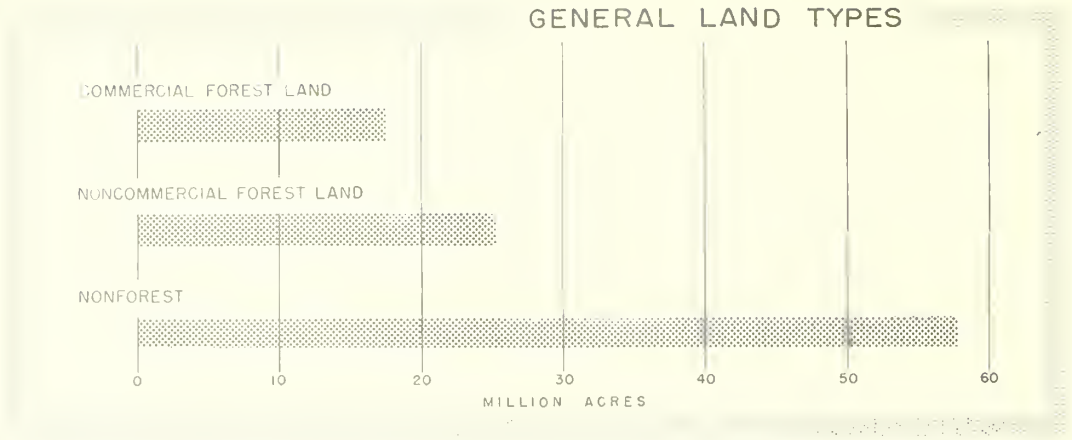
Forest Subregions

The forest land of California has been subdivided into five subregions for this survey. Each subregion represents different forest and economic conditions. The Redwood--Douglas-fir subregion, with its distinctive redwood type and associate Douglas-fir occupies the western slopes of the north coast ranges. (frontispiece map). The Coast Range Pine subregion, forested chiefly with Douglas-fir, ponderosa pine, and true firs (white fir and California red fir) is located on the eastern slopes of these ranges extending to the Sacramento River. The Westside Sierra subregion, with its fast-growing pine forests and mixed forests of pine, Douglas-fir, and fir, lies between the Sacramento and San Joaquin Valleys and the Sierra Nevada--Cascade divide. The Eastside Sierra subregion, with its slow-growing, predominantly pine forests, is located to the east of the crest. The Southern California subregion includes the remainder of the State; the widely scattered pine and fir forests in this unit have greater value for recreation and watershed protection than timber production.

Forest Area

California has 42.5 million acres of forest land (tables 1 and 12). About two-fifths of this land is growing or capable of growing usable crops of wood. This 17.3 million acres of commercial forest land[1/] is located in a U-shaped band around the Central Valley Basin. Fifty-three percent of this commercial forest area is in six counties: Siskiyou, Humboldt, Trinity, Mendocino, Shasta, and Plumas.

1/ For definition of terms used in this report see page 55.

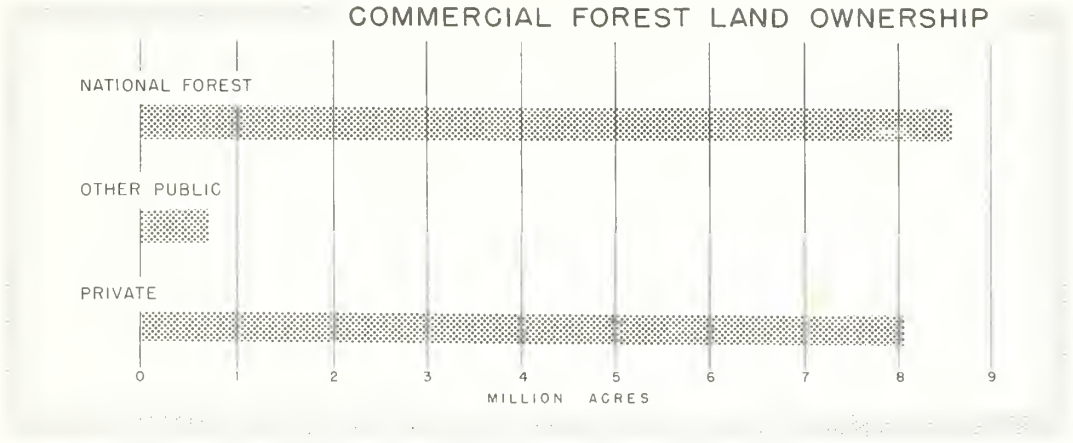


The other three-fifths of the forest land, or 25.2 million acres, is classified as noncommercial. About 24.0 million acres are incapable of producing usable crops of timber because of poor growing conditions. Most of this nonproductive land is occupied by chaparral, valuable for watershed protection and wildlife maintenance, and by a mixed cover of hardwoods and grass, valuable for grazing. The other 1.2 million acres of noncommercial forest land are productive forest areas withdrawn from timber utilization by statute, ordinance, or administrative order as parks and wilderness areas. The remainder of this summary deals with the commercial forest land.

Ownership

A little more than half of the commercial forest land--9.3 million acres--is in public ownership (table 2). National forests constitute 93 percent of the publicly owned commercial forest land; the Bureau of Land Management, Indian Service, and State of California administer most of the remainder. Public agencies own about three-fifths of the commercial forest land in each of the major forest regions of the State except the Redwood--Douglas-fir subregion (table 13). In this subregion, only 31 percent of the commercial forest land is publicly owned.

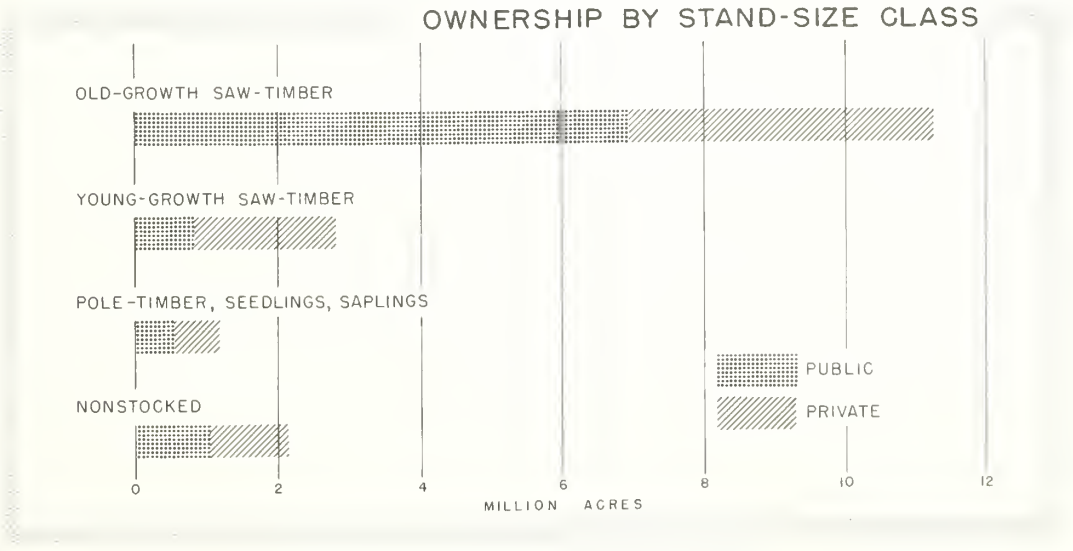
Privately owned commercial forest land totals 8.1 million acres. Eighty percent of this is in industrial and other nonfarm holdings. The other 20 percent is located on ranches and farms. Most of the large industrial holdings are located in the north and northwestern portions of the State.



Stand-size Classes

Logging operations have been active in California for more than a century, yet 11.2 million acres, or almost two-thirds of the commercial forest land, is still occupied by old-growth saw-timber stands. These are stands with more than 50 percent of the net volume in old-growth saw-timber trees (table 2). Young-growth saw-timber stands occur on an additional 2.8 million acres. Thus, 81 percent of the commercial forest land supports saw-timber stands.

Pole-timber and seedling and sapling stands occupy 1.2 million acres, or 7 percent of the total. The remaining 2.1 million acres (12 percent of the total) contain only scattered trees or groups of commercial conifers. These nonstocked areas are now covered primarily with chaparral and poor quality hardwoods.



Throughout the long history of logging in California, timber operations have occurred predominantly on the 8.1 million acres of privately owned commercial forest land. Because most private holdings were acquired before national forests were established, these operations have been in the better and most accessible timber stands.

Old-growth saw-timber stands thus occupy only 54 percent of the private commercial forest land in contrast to 75 percent of the publicly owned (table 2). Young-growth saw-timber stands occur on 25 percent of the commercial forest land in private holdings and on only 9 percent in public ownership.

Timber Types

Forty-five percent of the commercial forest land is occupied by mixed stands of ponderosa, Jeffrey, and sugar pines, Douglas-fir, true firs, and incense cedar in varying combinations and proportions (table 11). This pine--Douglas-fir--fir type is located at elevations of 4,000 to 7,000 feet, primarily in the Westside Sierra and Coast Range Pine subregions. About three-fifths of this mixed type is in public ownership (table 15).

The pine type, composed predominantly of ponderosa, Jeffrey, and sugar pine stands, covers 23 percent of the commercial forest land. Concentrated in the Sierra subregions and located principally at the 1,000 to 5,000 foot elevations, this type is about equally divided between public and private holdings.

The Douglas-fir type covers 14 percent of the timber producing area of the State and occurs chiefly in the Redwood--Douglas-fir subregion. Located at elevations of 50 to 6,000 feet, this type is also divided equally between public and private ownerships.

The fir and lodgepole pine types, located at elevations generally above 5,000 feet, occupy 1.2 million acres of commercial forest land, or 7 percent of the total area. These two types are predominantly publicly owned.

Of all the timber types, only the redwood type--which occurs on 11 percent of the commercial forest land area--is primarily privately owned. This type, composed of stands of redwood and associated Douglas-fir, is located along the Pacific Ocean at elevations varying from sea level to 3,000 feet.

Stocking

In California more than a third of the commercial forest land is occupied by well-stocked conifer stands (table 17). Another third is medium-stocked. The remainder of the commercial forest land (31 percent) is either poorly stocked or nonstocked with commercial conifers. Nonstocked commercial forest land totals 2.1 million acres and composes about 12 percent of the commercial forest land in each subregion. Best stocking occurs on the saw-timber areas, poorest on the pole-timber and seedling and sapling areas.

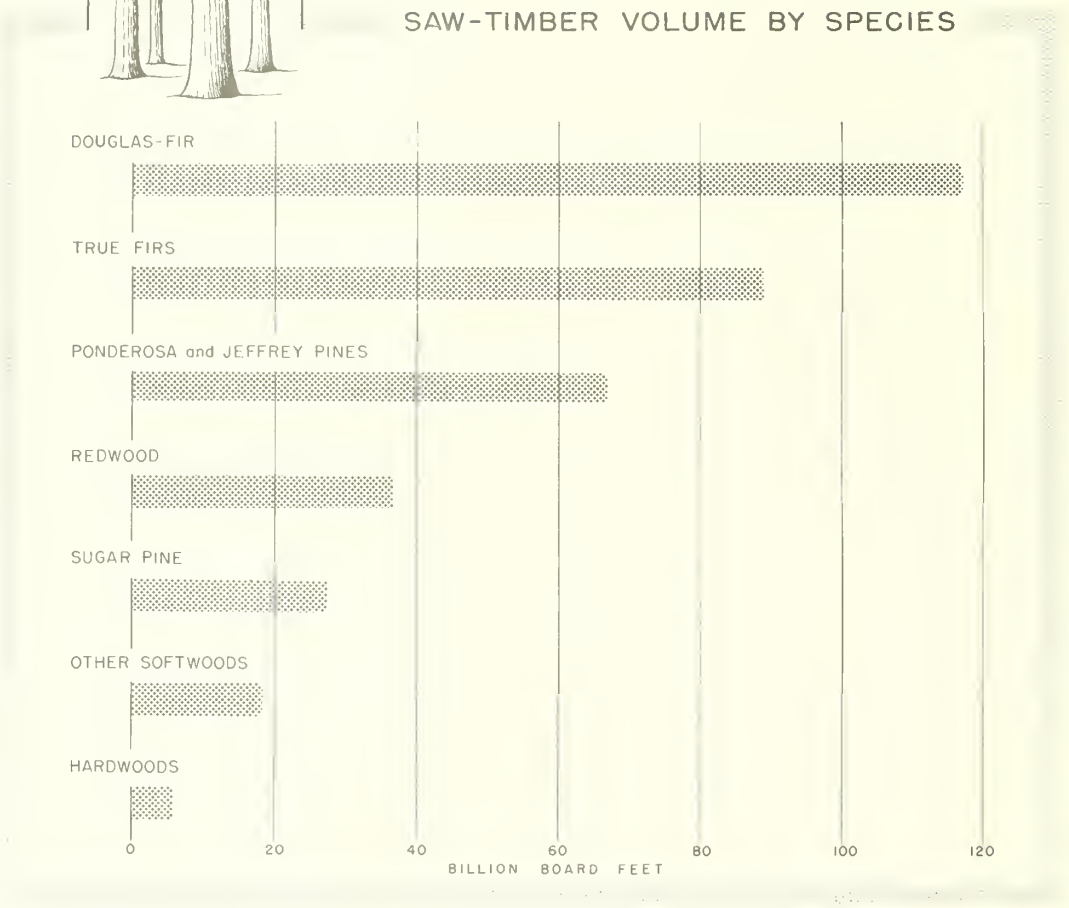
Site Quality

More than one-third of the commercial forest land is highly productive for timber growing (table 18). Forty-seven percent of the timber producing land is rated as medium in productivity. Only 18 percent is classified as poor for growing trees. The redwood type is the most productive timber growing type--81 percent of the area in this type is rated highly productive. Fifty-three percent of the Douglas-fir type is rated high in site quality. The lodgepole pine type is at the other extreme, about two-thirds classified as poor for growing trees.

Timber Volume

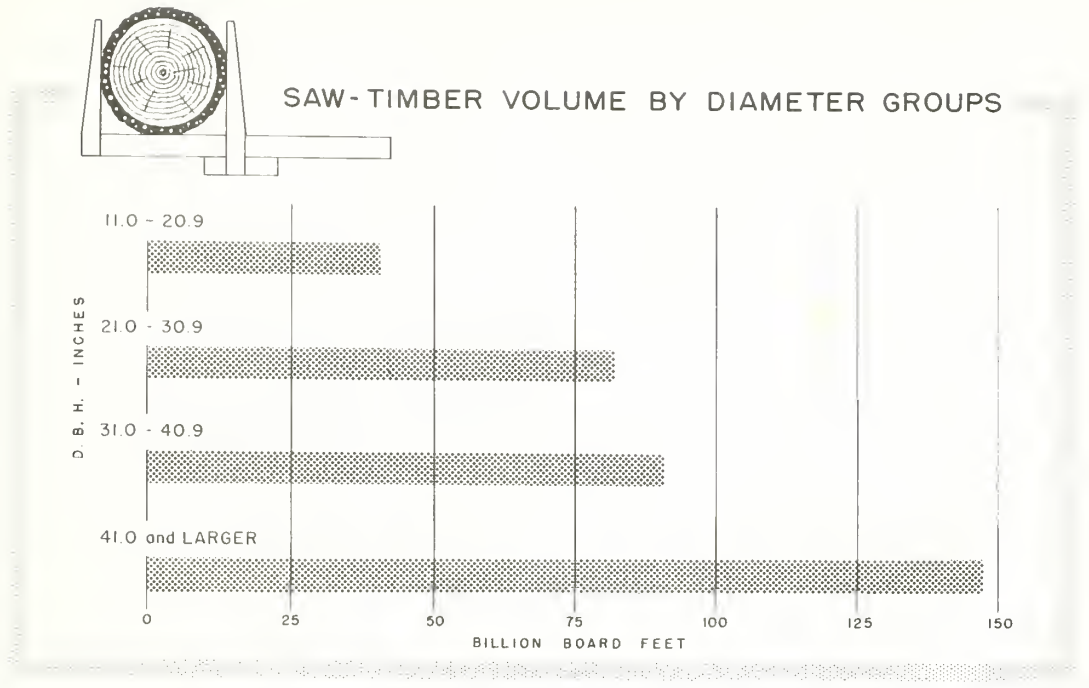
In 1953, the net live saw-timber volume on the commercial forest land in California was 360 billion board feet as measured by International 1/4-inch rule; 340 billion by Scribner rule (tables 6 and 19) The net volume includes all merchantable conifer and hardwood trees, 11.0 inches and larger in diameter, after allowance for cull and breakage and without consideration of current availability for utilization. Part of this volume is in inaccessible stands, in young or scattered stands at present not economically operable, or in areas in which watershed management, recreation, or other uses curtail timber operations.

Almost one-third (117 billion board feet) of the live saw-timber volume of California is Douglas-fir, located primarily in the Redwood--Douglas-fir subregion. The true firs contain about 89 billion board feet; ponderosa and Jeffrey pine, another 67 billion board feet. These species plus redwood (36 billion board feet) and sugar pine (27 billion board feet) account for more than 90 percent of the State's saw timber. The total live saw-timber volume of hardwoods is 6 billion board feet, principally tanoak and California black oak.



Forty-one percent of the live saw-timber volume in California is in trees 41.0 inches and larger in diameter (table 7). Two species, redwood and sugar pine, have more than half of their board-foot volume in this largest diameter class. Only 11 percent of the total volume of all species is in the smallest diameter class, 11.0 to 20.9 inches. Forty-two percent of the board-foot volume in hardwoods is in this smallest class.

Eighty-five percent (306 billion board feet) of the State saw-timber volume is in old-growth saw-timber stands (table 4). These stands contain a large volume in mature and overmature timber, which is ready for harvesting to make lumber, plywood, and other high-quality timber products. But much of this volume, particularly on the national forests, is still in inaccessible timber stands.



Fifty-four percent (194 billion board feet) of the live saw-timber volume in California is on publicly owned commercial forest land (tables 5 and 22). National forests contain 92 percent of this volume, primarily in old-growth saw-timber stands. The other publicly owned saw-timber volume, 15 billion board feet, is chiefly on Indian Service, Bureau of Land Management, and State holdings. Minor volumes occur on other Federal and county and municipal holdings.

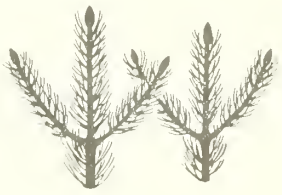
The privately owned saw-timber volume (166 billion board feet) is mostly on industrial and other nonfarm ownerships. Three-fourths of this volume is in old-growth saw-timber stands. About half the privately owned saw-timber volume is in the Redwood--Douglas-fir subregion.

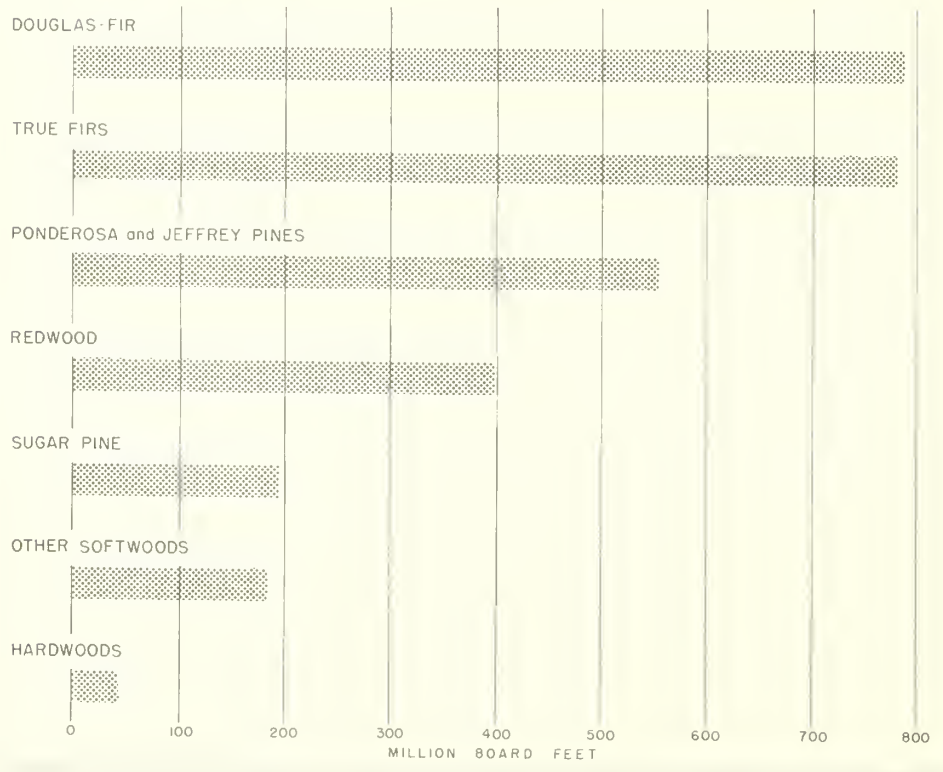
Growth

Average annual net growth on the commercial forest land in California is 2.9 billion board feet (table 9). This is equivalent to an average annual net growth per acre of 170 board feet for the decade 1943-1952. Average annual per acre mortality for the same period was 107 board feet.

Young-growth saw-timber stands showed the highest net growth rate, 322 board feet per acre (table 26). Old-growth saw-timber stands had a net annual growth per acre of 157 board feet. This is a relatively high growth rate in stands composed predominantly of mature and overmature trees. The rate reflects both the growth of the immature trees in these stands and a low insect mortality during the decade. Over a long period, natural mortality will tend to balance growth in uncut old-growth stands.

About 92 percent of the saw-timber growth in California in 1952 occurred on the seven leading species: Douglas-fir, the true firs (white and California red firs), ponderosa and Jeffrey pines, redwood, and sugar pine (table 28). The leading species was Douglas-fir with an annual growth of 787 million board feet. The true firs, with an annual growth of 780 million board feet, were

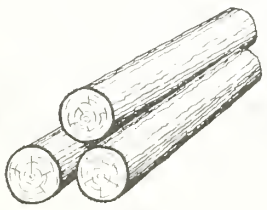


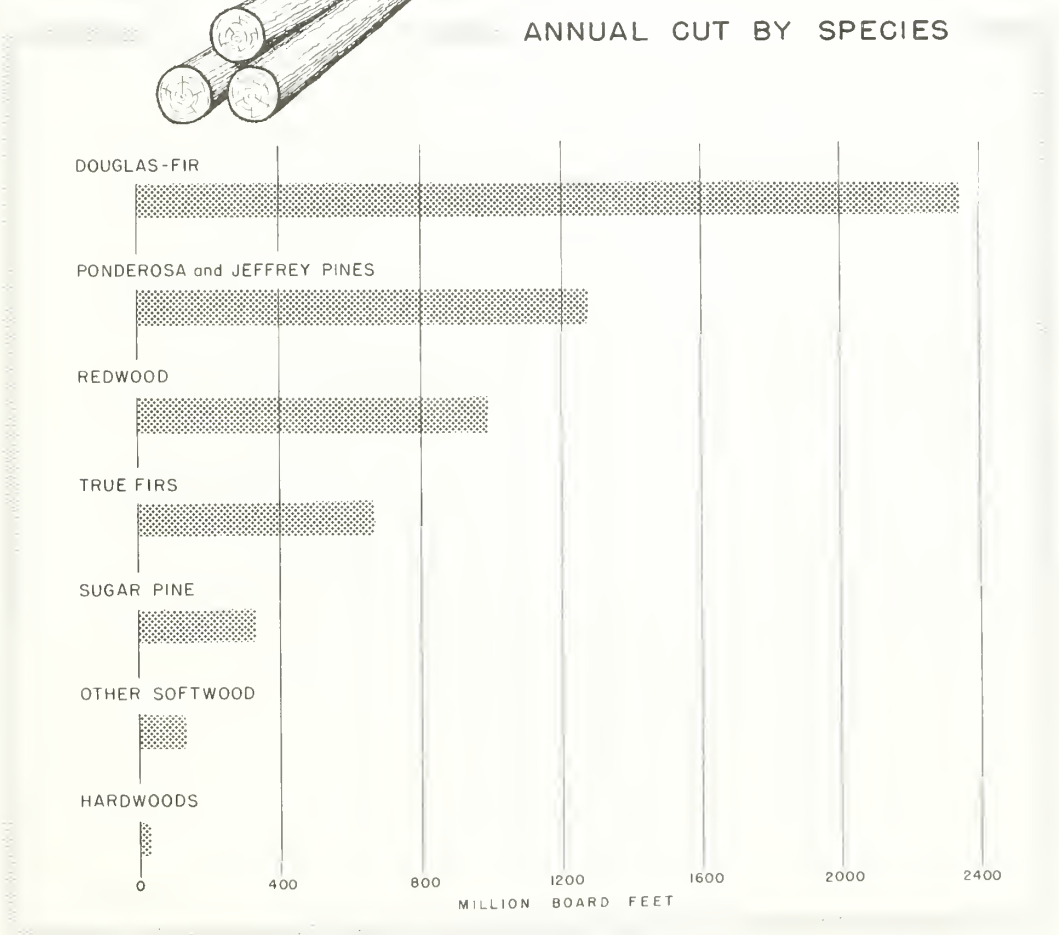


second. Ponderosa and Jeffrey pines together had an annual growth of 553 million board feet. The growth in redwood and sugar pine accounted for an additional 592 million board feet.

Annual Cut

Annual cut of live saw timber from the forest resource during 1952 was 5.7 billion board feet (table 9). Of this, 5.3 billion board feet was removed from the saw-timber growing stock as sawlogs and other products. Besides the usable products removed in logging, some saw timber was destroyed or left in the woods as rough or short logs. This logging residue amounted to about 460 million board feet. Much of this material cannot be used by existing mills because the logs are of small size or poor quality. These logs do, however, provide a potential source of raw material, particularly for supplementary mills located closer to the timbered areas and for fiber-using plants.





Lumber is the principal product from the forests of California. Sawlogs for lumber production accounted for 91 percent of the timber products output in 1952, plywood 5 percent, and other products 4 percent (table 10). Lumber production has more than doubled since World War II (table 34).

The increase in log and bolt production for plywood and pulpwood has been even more spectacular over the same period (table 35). Plywood log production increased from about 15 million board feet in 1946 to 253 million in 1952; pulpwood production from 2 million board feet to 100 million.

Production of poles and piling also showed a large increase during the period 1946 through 1952. Shingle and sawed shake and cooperage production decreased over the same period.

A special survey of lumber manufacturing in 1951 showed that 796 sawmills were active in California (table 33). The 13 largest mills, with annual outputs of 50 million board feet or more, produced 19 percent of the total lumber production. In contrast, the 279 smallest mills, with outputs of less than 1 million board feet annually, produced only about 2 percent of the total.

Net Growth vs. Annual Cut

In 1952, annual cut from the forests of California was almost twice the annual saw-timber growth (table 9). For Douglas-fir the ratio was 3 to 1. And for other valuable species--redwood and ponderosa pine (including Jeffrey pine)--about two and a half times as much saw-timber volume was being removed as grown. Growth of the less valuable true firs was greater than the cut (tables 28 and 31).

In California, annual cut can be expected to exceed growth because a large proportion of the saw-timber volume is in mature and overmature trees susceptible to heavy insect and disease losses. Harvesting practices which remove these high risk trees should help reduce mortality losses. Growth rates should increase too, as the old-growth timber stands are converted to young-growth forests.

Comparison with Reappraisal Report of 1945

These new estimates of forest area and timber volume in California are larger than those published by the Forest Service in the Reappraisal Report of 1945. Some of the differences are attributable to changes in timber specifications and some to use of better survey techniques.

Commercial forest land as estimated by the Forest Survey is 912 thousand acres greater than the 1945 estimate. This 6 percent difference is due to a more intensive aerial photo classification resulting in a greater accuracy of area determination for the Survey.

Saw-timber volume on commercial forest land, estimated to be 360 billion board feet (International 1/4-inch log rule) by the Forest Survey, was appraised at 228 billion board feet in 1945. The 132 billion-board-feet difference is the consequence of a number of factors. Among these is the difference in log scale, International 1/4-inch being used in the Survey and Scribner in 1945.2/ The new estimate is for a greater commercial forest land area. Also, the volume deduction for cull and breakage in Douglas-fir--the leading species by volume--is considerably smaller in the Survey inventory. This inventory included the net volumes of all conifer and hardwood species found on commercial forest land, whereas the 1945 estimate included only the volumes of commercial conifer species. Also, the board-foot volumes of redwood trees included all trees 11.0 inches and larger in diameter in the Forest Survey, whereas the 1945 data included only those redwood trees 24.0 inches and larger. All these factors combined account for about half the change in volume estimates.

The major factor contributing to the change in inventory volumes is the difference in method of determining timber volumes. The Forest Survey estimate is based on actual measurements of trees on field plots selected to provide a statistically sound estimate of timber volume. The 1945 volume estimate was based on data from existing timber cruises of varying reliability, supplemented by estimates for areas where no data were available. In the Redwood--Douglas-fir subregion the merchantable volume of Douglas-fir was underestimated in 1945 because "white woods" were considered of little value in the redwood areas. For the same reason, the true fir volumes were underestimated in the Westside Sierra subregion.

2/ Figures published in the Reappraisal report of 1945 are shown in lumber tally. In California, volumes were computed by Scribner log scale and reported as lumber tally because the difference between log scale and lumber tally was not considered significant.

STANDARD FOREST SURVEY TABLES

The first ten tables have been standardized as to format and contents so that forest statistics for California can be compared or combined with similar statistics for other states.

Table 1.- Land area, by major classes of land, California, 1953

Class of land	Area
	Thousand acres
Forest	
Commercial	17,317
Noncommercial	
Productive--reserved	1,202
Unproductive	24,022
Total	42,541
Nonforest[1/]	57,773
Total, all classes	100,314

1/ Includes 83 thousand acres of water according to Survey standards of area classification but defined by the Bureau of Census as land.

Table 2.- Commercial forest land area, by ownership and stand-size classes, California, 1953

Ownership class	Total	Saw-timber stands			Pole timber stands	Seedling and sapling stands	Non-stocked and other areas 1/
		Total	Old growth	Young growth			
	Thousand acres						
Federally owned or managed							
National forest	8,573	7,198	6,500	698	448	22	905
Indian	133	107	95	12	9	(2/)	17
Bureau of Land Management	324	231	168	63	28	1	64
Other	40	29	20	9	1	(2/)	10
Total	9,070	7,565	6,783	782	486	23	996
State	186	147	130	17	15	(2/)	24
County and municipal	8	6	6	(2/)	(2/)	-	2
Total	194	153	136	17	15	(2/)	26
Private							
Farm	1,586	1,245	851	394	122	4	215
Industrial and other	6,467	5,075	3,470	1,605	499	17	876
Total	8,053	6,320	4,321	1,999	621	21	1,091
All ownerships	17,317	14,038	11,240	2,798	1,122	44	2,113

1/ Includes areas not classified elsewhere.
2/ Less than 500 acres.

Table 3.- Area of commercial forest land, by major forest types,[1/] California, 1953

Forest type	Thousand acres
Douglas-fir	4,378
Hemlock--Sitka spruce	6
Redwood	1,588
Ponderosa pine	6,057
White pine (Sugar pine)	2,255
Lodgepole pine	300
Spruce--fir	2,733
All types	17,317

1/ The forest types presented in this table conform with standard types defined by national Forest Survey (see definitions on page 56). These types differ from the forest types in general use by industry and forestry agencies in California. Data on the occurrence of these local California types are shown in tables 11, 15, 16, and 18.

Table 4.- Net volume of live saw timber and growing stock on commercial forest land, by stand-size class, California, 1953

Stand-size class	Saw timber	Growing stock
	Million board feet[1/]	Million cubic feet
Saw-timber stands		
Old growth	305,691	54,977
Young growth	45,786	9,284
Total	351,477	64,261
Pole-timber stands	4,203	1,047
Seedling and sapling stands	105	28
Nonstocked and areas not elsewhere classified	4,216	1,075
Total	[2/]360,001	66,411

1/ Log scale, International 1/4-inch rule. All board foot volumes in the remaining tables are by International 1/4-inch rule unless otherwise specified.

2/ Gross saw-timber is estimated to be 425,815 million board feet. Deductions of 48,781 million board feet for cull and 17,033 million board feet for felling breakage have been made to obtain the net volume estimate shown.

Table 5.- Net volume of live saw timber and growing stock on commercial forest land, by ownership class, California, 1953

Ownership class	Saw timber	Growing stock
	Million board feet	Million cubic feet
Federally owned or managed		
National forest	178,913	32,656
Indian	3,969	728
Bureau of Land Management	5,817	1,117
Other	370	75
Total	189,069	34,576
State	4,547	835
County and municipal	195	36
Total	4,742	871
Private		
Farm	31,379	5,857
Industrial and other	134,811	25,107
Total	166,190	30,964
All ownerships	360,001	66,411

Table 6.- Net volume of live saw timber and growing stock on commercial forest land, by species, California, 1953

Species	Saw timber	Growing stock
	Million board feet	Million cubic feet
Softwoods		
Douglas-fir	116,912	20,758
Ponderosa and Jeffrey pines	66,741	11,935
White fir	1/ 57,214	10,559
California red fir	31,510	5,540
Western hemlock	471	83
Sugar pine	27,384	4,432
Western white pine	2,131	366
Redwood	36,124	6,360
Incense-cedar	9,727	2,057
Lodgepole pine	3,807	1,092
Other	2/ 2,003	482
Total	354,024	63,664
Hardwoods		
Aspen	37	36
Red alder3/	166	57
Tanoak	2,036	836
California black oak	1,946	831
Other	1,792	987
Total	5,977	2,747
All species	360,001	66,411

1/ Includes 1,281 million bd. ft. of grand fir.
2/ Includes 170 million bd. ft. of Sitka spruce and 2 million bd. ft. of western redcedar.
3/ Includes both red and white alder.

Table 7.- Net volume of live saw timber on commercial forest land, by diameter class groups and species, California, 1953

Species	Diameter class groups				Total
	11.0-20.9 inches	21.0-30.9 inches	31.0-40.9 inches	41.0 inches and larger	
	Million board feet				
Softwoods					
Douglas-fir	9,171	23,033	28,750	55,958	116,912
Ponderosa and Jeffrey pines	7,533	17,136	21,184	20,888	66,741
Sugar pine	1,621	4,072	5,788	15,903	27,384
Western white pine	335	597	687	512	2,131
Redwood	3,358	4,490	4,438	23,838	36,124
White fir	7,586	16,261	16,168	17,199	57,214
California red fir	3,888	9,194	8,765	9,663	31,510
Other	4,393	4,733	3,770	3,112	16,008
Total	37,885	79,516	89,550	147,073	354,024
Hardwoods					
Tanoak	855	765	329	87	2,036
California black oak	600	829	452	65	1,946
Other	1,044	734	196	21	1,995
Total	2,499	2,328	977	173	5,977
All species	40,384	81,844	90,527	147,246	360,001

Table 8.- Net volume of all timber on commercial forest land, by class of material and species group, California, 1953

Class of material	Total	Softwoods	Hardwoods
	Million cubic feet	Million cubic feet	Million cubic feet
Growing stock			
Saw-timber trees			
Sawlog portion	53,668	52,456	1,212
Upper stem portion	7,788	7,788	-
Total	61,456	60,244	1,212
Pole-timber trees	4,955	3,420	1,535
Total growing stock	66,411	63,664	2,747
Other material			
Sound cull trees	375	57	318
Rotten cull trees	935	820	115
Hardwood limbs	1,581	-	1,581
Salvable dead trees	329	329	-
Total other material	3,220	1,206	2,014
Total, all timber	69,631	64,870	4,761

Table 9.- Net annual growth, annual mortality, and annual cut on live saw timber and growing stock on commercial forest land, by species groups, California, 1952

Item	Saw timber			Growing stock		
	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods
	Million board feet			Million cubic feet		
Net annual growth	2,939	2,895	44	584	539	45
Annual mortality	1,865	1,811	54	359	336	23
Annual cut						
Timber products	5,269	5,269	(1/)	766	766	(2/)
Logging residues	462	442	20	167	156	11
Total	5,731	5,711	20	933	922	11

1/ Less than 0.5 million board feet.
2/ Less than 0.5 million cubic feet.

Table 10.- Output of timber products and annual cut of live saw timber and growing stock, California, 1952

Product	Output of timber products					Annual cut of saw timber			Annual cut of growing stock		
	Volume in standard units		Roundwood volume								
	Std. units	Number	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods
			---- Thousand cu. ft. ----			----- Thousand bd. ft. -----			---- Thousand cu. ft. ----		
Sawlogs	M bd.ft.1/	5,045,198	735,452	735,362	90	5,281,982	5,266,878	15,104	862,611	853,295	9,316
Veneer logs	M bd.ft.1/	280,830	36,571	36,571	-	332,181	331,659	522	48,194	47,926	268
Cooperage logs	M bd.ft.1/	4,652	607	607	-	5,726	5,722	4	828	827	1
Pulpwood	Std. Cds.2/	3/199,674	17,971	17,966	5	60,491	60,151	340	11,419	11,156	263
Fuelwood	Std. Cds.2/	4/ 55,555	4,660	1,940	2,720	3,188	3,000	188	600	540	60
Piling	M lin. ft.	1,116	743	727	16	3,713	3,702	11	828	819	9
Poles	M pcs.	45	1,018	1,018	-	4,697	4,685	12	1,154	1,144	10
Posts	M pcs.	3,400	4,800	3,400	1,400	18,317	18,224	93	3,170	3,108	62
Hewn ties	M pcs.	8	24	24	-	249	248	1	28	28	(5/)
Mine timbers	M cu. ft.	455	455	455	-	1,517	1,516	1	448	445	3
Miscellaneous											
Shingle and shake bolts	M cu. ft.	716	716	716	-	4,658	4,633	25	656	642	14
Misc. split products	M cu. ft.	1,480	1,480	1,480	-	10,324	10,269	55	1,675	1,641	34
Other6/	M cu. ft.	648	648	88	560	3,732	70	3,662	1,145	38	1,107
Total Misc.	M cu. ft.	7/ 2,844	2,844	2,284	560	18,714	14,972	3,742	3,476	2,321	1,155
Total all products		--	805,145	800,354	4,791	5,730,775	5,710,757	20,018	932,756	921,609	11,147

1/ International 1/4" rule.
2/ Rough wood basis.
3/ Not including 7,970 M cu. ft. of wood from mill residues used for pulp and hardboard.
4/ Not including 122,477 M cu. ft. of wood from mill residues used for domestic and industrial fuel.
5/ Less than 500 cubic feet.
6/ Includes chemical wood, shook bolts, small poles, and wood residue from tanbark operations.
7/ Not including 7,927 M cu. ft. of wood from mill residues used for pickets, lath, particle board, etc.

Table 11.- Total land area in the forest subregions by cover type and use, California, 1953

Cover types[1] and use	California	Subregions				
		Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
	Thousand acres					
COMMERCIAL FOREST LAND						
Pine	3,928	1,833	1,715	213	10	157
Redwood	1,929	-	-	-	1,918	11
Douglas-fir	2,481	-	-	476	2,005	-
Fir	990	348	505	90	39	8
Pine--Douglas-fir--Fir	7,775	1,641	3,390	2,423	266	55
Lodgepole pine	214	97	117	-	-	-
Total commercial	17,317	3,919	5,727	3,202	4,238	231
NONCOMMERCIAL FOREST LAND						
Productive-reserved						
Pine	143	12	125	-	-	6
Redwood	60	-	4	-	53	3
Douglas-fir	75	-	-	9	66	-
Fir	264	47	152	40	24	1
Pine--Douglas-fir--Fir	568	36	285	201	43	3
Lodgepole pine	92	18	74	-	-	-
Total	1,202	113	640	250	186	13
Unproductive						
Coniferous woodland	6,292	2,409	1,648	485	242	1,508
Hardwoods (woodland)	2,994	104	1,070	572	431	817
Woodland-grass	6,273	62	2,550	1,305	353	2,003
Chaparral	8,463	470	1,370	1,116	356	5,151
Total	24,022	3,045	6,638	3,478	1,382	9,479
Total noncommercial	25,224	3,158	7,278	3,728	1,568	9,492
Total forest land	42,541	7,077	13,005	6,930	5,806	9,723
NONFOREST LAND						
Grass	10,685	463	3,404	754	889	5,175
Coastal sagebrush	2,332	-	-	1	45	2,286
Great Basin sagebrush	4,720	4,200	177	-	-	343
Cultivated, urban and industrial	13,425	517	4,481	2,014	736	5,677
Barren	1,848	603	994	73	44	134
Marsh	213	28	15	85	35	50
Water[2]	84	5	39	7	23	10
Desert	24,466	5,154	16	-	-	19,296
Total nonforest land	57,773	10,970	9,126	2,934	1,772	32,971
All land	100,314	18,047	22,131	9,864	7,578	42,694

1/ Forest types are based on California system of type classification. See definitions, page 57.
2/ Water according to survey standards of area classification but defined by the Bureau of Census as land.

Table 12.- County area by major classes of land and by ownership class of commercial forest land, California, 1953

County	Total land area[1]	Forest land					Non-forest
		Total	Commercial			Non-commercial	
			Total	Public	Private		
	Thousand acres						
Alameda	469	83	-	-	-	83	386
Alpine	463	344	104	86	18	240	119
Amador	380	303	139	44	95	164	77
Butte	1,066	608	356	117	239	252	458
Calaveras	658	573	243	76	167	330	85
Colusa	738	276	27	26	1	249	462
Contra Costa	470	59	-	-	-	59	411
Del Norte	642	615	451	299	152	164	27
Eldorado	1,104	981	674	315	359	307	123
Fresno	3,831	1,467	426	386	40	1,041	2,364
Glenn	843	363	113	87	26	250	480
Humboldt	2,287	1,946	1,740	446	1,294	206	341
Imperial	2,742	2	-	-	-	2	2,740
Inyo	6,458	666	7	5	2	659	5,792
Kern	5,229	1,161	106	86	20	1,055	4,068
Kings	893	15	-	-	-	15	878
Lake	804	709	175	105	70	534	95
Lassen	2,911	1,297	829	452	377	468	1,614
Los Angeles	2,605	1,096	14	13	1	1,082	1,509
Madera	1,375	707	264	231	33	443	668
Marin	333	119	31	-	31	88	214
Mariposa	931	748	168	105	63	580	183
Mendocino	2,246	1,914	1,305	249	1,056	609	332
Merced	1,269	80	-	-	-	80	1,189
Modoc	2,620	1,297	675	458	217	622	1,323
Mono	1,938	693	122	102	20	571	1,245
Monterey	2,127	1,128	16	5	11	1,112	999
Napa	505	356	39	1	38	317	149
Nevada	627	542	361	130	231	181	85
Orange	500	74	-	-	-	74	426
Placer	916	686	433	202	231	253	230
Plumas	1,645	1,421	1,228	911	317	193	224
Riverside	4,595	834	23	12	11	811	3,761
Sacramento	630	44	-	-	-	44	586
San Benito	893	416	1	-	1	415	477
San Bernardino	12,884	899	89	59	30	810	11,985
San Diego	2,725	1,225	25	11	14	1,200	1,500
San Francisco	29	(2/)	-	-	-	(2/)	29
San Joaquin	902	43	-	-	-	43	859
San Luis Obispo	2,129	806	1	(2/)	1	805	1,323
San Mateo	291	127	59	5	54	68	164
Santa Barbara	1,757	988	1	1	-	987	769
Santa Clara	835	423	25	1	24	398	412
Santa Cruz	281	190	125	(2/)	125	65	91
Shasta	2,432	2,193	1,263	532	731	930	239
Sierra	613	515	393	301	92	122	98
Siskiyou	4,040	3,370	2,323	1,605	718	1,047	670
Solano	529	53	-	-	-	53	476
Sonoma	1,011	553	296	4	292	257	458
Stanislaus	964	186	-	-	-	186	778
Sutter	388	27	-	-	-	27	361
Tehama	1,903	1,378	436	206	230	942	525
Trinity	2,042	1,959	1,357	1,002	355	602	83
Tulare	3,101	1,750	219	201	18	1,531	1,351
Tuolumne	1,456	1,145	484	308	176	661	311
Ventura	1,189	751	35	34	1	716	438
Yolo	662	138	-	-	-	138	524
Yuba	408	199	116	45	71	83	209
All counties	100,314	42,541	17,317	9,264	8,053	25,224	57,773

1/ From "Areas of the United States 1940," U. S. Bureau of the Census but with adjustments as needed to bring county acreages up to 1950 acreages.

2/ Less than 500 acres.

Table 13.- Commercial forest land by subregion, stand-size class, and age class of timber, California, 1953

(Thousand acres)

Stand-size class[1]	Age class[2]	All subregions			Eastside Sierra			Westside Sierra			Coast Range Pine			Redwood--Douglas-fir			Southern California		
		Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
Old-growth saw timber	Total old growth	11,240	6,919	4,321	2,498	1,624	874	3,560	2,489	1,071	2,530	1,714	816	2,430	948	1,482	222	144	78
	Old growth	359	138	221	40	32	8	58	48	10	27	16	11	234	42	192	-	-	-
	Old growth-young growth	5,440	3,591	1,849	926	625	301	1,544	1,175	369	1,409	1,043	366	1,371	618	753	190	130	60
	Young growth-old growth	5,441	3,190	2,251	1,532	967	565	1,958	1,266	692	1,094	655	439	825	288	537	32	14	18
Young-growth saw timber	Large young growth	2,798	799	1,999	605	301	304	1,038	321	717	173	66	107	978	110	868	4	1	3
Pole timber & seedlings & saplings	Small young growth	1,166	524	642	305	176	129	418	169	249	165	92	73	277	86	191	1	1	(3/)
Nonstocked	Nonstocked	2,113	1,022	1,091	511	335	176	711	311	400	334	202	132	553	172	381	4	2	2
All classes		17,317	9,264	8,053	3,919	2,436	1,483	5,727	3,290	2,437	3,202	2,074	1,128	4,238	1,316	2,922	231	148	83

1/ Stand-size class as defined by national Forest Survey standards.
2/ Age class is a classification of timber stands used in California.
3/ Less than 500 acres.

Table 14.- Ownership of commercial forest land by subregion and stand-size class, California, 1953

Stand-size class and subregion	Total all ownerships	Federally owned or managed					State	County and municipal	Private
		Total federal	National forest	Indian	Bur. of Land Mgt.	Other			
	Thousand acres								
OLD-GROWTH SAW TIMBER									
Eastside Sierra	2,498	1,620	1,594	5	21	(1/)	4	-	874
Westside Sierra	3,560	2,478	2,439	3	17	19	11	-	1,071
Coast Range Pine	2,530	1,671	1,600	11	60	(1/)	42	1	816
Redwood--Douglas-fir	2,430	870	725	74	70	1	73	5	1,482
Southern California	222	144	142	2	(1/)	-	-	-	78
California	11,240	6,783	6,500	95	168	20	130	6	4,321
YOUNG-GROWTH SAW TIMBER									
Eastside Sierra	605	298	290	1	7	(1/)	3	-	304
Westside Sierra	1,038	319	275	1	34	9	2	-	717
Coast Range Pine	173	63	48	1	14	-	3	(1/)	107
Redwood--Douglas-fir	978	101	84	9	8	(1/)	9	(1/)	868
Southern California	4	1	1	-	-	-	-	-	3
California	2,798	782	698	12	63	9	17	(1/)	1,999
POLE TIMBER AND SEEDLINGS AND SAPLINGS									
Eastside Sierra	305	175	169	1	5	-	1	-	129
Westside Sierra	418	166	158	(1/)	7	1	3	-	249
Coast Range Pine	165	88	76	1	11	(1/)	4	-	73
Redwood--Douglas-fir	277	79	66	7	6	(1/)	7	(1/)	191
Southern California	1	1	1	-	-	-	-	-	(1/)
California	1,166	509	470	9	29	1	15	(1/)	642
NONSTOCKED									
Eastside Sierra	511	333	323	1	9	-	2	(1/)	176
Westside Sierra	711	307	276	2	20	9	4	-	400
Coast Range Pine	334	197	173	1	22	1	5	-	132
Redwood--Douglas-fir	553	157	131	13	13	(1/)	13	2	381
Southern California	4	2	2	-	-	-	-	-	2
California	2,113	996	905	17	64	10	24	2	1,091
ALL CLASSES									
Eastside Sierra	3,919	2,426	2,376	8	42	(1/)	10	(1/)	1,483
Westside Sierra	5,727	3,270	3,148	6	78	38	20	-	2,437
Coast Range Pine	3,202	2,019	1,897	14	107	1	54	1	1,128
Redwood--Douglas-fir	4,238	1,207	1,006	103	97	1	102	7	2,922
Southern California	231	148	146	2	(1/)	-	-	-	83
California	17,317	9,070	8,573	133	324	40	186	8	8,053

1/ Less than 500 acres.

Table 15.- Ownership of commercial forest land by timber type and subregion, California, 1953

Timber type and subregion	Total all ownerships	Federally owned or managed					State	County and municipal	Private
		Total federal	National forest	Indian	Bur. of Land Mgt.	Other			
	Thousand acres								
PINE									
Eastside Sierra	1,833	1,194	1,163	5	26	(1/)	5	-	634
Westside Sierra	1,715	714	646	4	52	12	(1/)	-	1,001
Coast Range Pine	213	86	64	1	21	(1/)	4	-	123
Redwood--Douglas-fir	10	3	3	-	-	-	-	-	7
Southern California	157	104	103	1	(1/)	-	-	-	53
Total	3,928	2,101	1,979	11	99	12	9	-	1,818
REDWOOD									
Eastside Sierra	-	-	-	-	-	-	-	-	-
Westside Sierra	-	-	-	-	-	-	-	-	-
Coast Range Pine	-	-	-	-	-	-	-	-	-
Redwood--Douglas-fir	1,918	41	5	9	26	1	83	4	1,790
Southern California	11	2	2	-	-	-	-	-	9
Total	1,929	43	7	9	26	1	83	4	1,799
DOUGLAS-FIR									
Eastside Sierra	-	-	-	-	-	-	-	-	-
Westside Sierra	-	-	-	-	-	-	-	-	-
Coast Range Pine	476	348	336	3	9	-	5	-	123
Redwood--Douglas-fir	2,005	904	740	94	70	-	17	3	1,081
Southern California	-	-	-	-	-	-	-	-	-
Total	2,481	1,252	1,076	97	79	-	22	3	1,204
FIR									
Eastside Sierra	348	218	216	1	1	-	1	-	129
Westside Sierra	505	437	437	-	-	-	1	-	67
Coast Range Pine	90	64	63	-	1	-	1	-	25
Redwood--Douglas-fir	39	36	36	-	-	-	1	-	2
Southern California	8	4	3	1	-	-	-	-	4
Total	990	759	755	2	2	-	4	-	227
PINE--DOUGLAS-FIR--FIR									
Eastside Sierra	1,641	938	921	2	15	-	4	(1/)	699
Westside Sierra	3,390	2,022	1,968	2	26	26	19	-	1,349
Coast Range Pine	2,423	1,521	1,434	10	76	1	44	1	857
Redwood--Douglas-fir	266	223	222	-	1	-	1	-	42
Southern California	55	38	38	(1/)	-	-	-	-	17
Total	7,775	4,742	4,583	14	118	27	68	1	2,964
LODGEPOLE PINE									
Eastside Sierra	97	76	76	-	-	-	-	-	21
Westside Sierra	117	97	97	-	-	-	-	-	20
Coast Range Pine	-	-	-	-	-	-	-	-	-
Redwood--Douglas-fir	-	-	-	-	-	-	-	-	-
Southern California	-	-	-	-	-	-	-	-	-
Total	214	173	173	-	-	-	-	-	41
ALL TYPES									
Eastside Sierra	3,919	2,426	2,376	8	42	(1/)	10	(1/)	1,483
Westside Sierra	5,727	3,270	3,148	6	78	38	20	-	2,437
Coast Range Pine	3,202	2,019	1,897	14	107	1	54	1	1,128
Redwood--Douglas-fir	4,238	1,207	1,006	103	97	1	102	7	2,922
Southern California	231	148	146	2	-	-	-	-	83
Total	17,317	9,070	8,573	133	324	40	186	8	8,053

1/ Less than 500 acres.

Table 16.- Stand-size class of timber stands on commercial forest land, by timber type and subregion, California, 1953

Timber type and subregion	Total	Stand-size class			
		Saw timber		Pole timber and seedlings and saplings	Nonstocked
		Old growth	Young growth		
	Thousand acres				
PINE					
Eastside Sierra	1,833	1,045	324	200	264
Westside Sierra	1,715	664	566	149	336
Coast Range Pine	213	141	27	17	28
Redwood--Douglas-fir	10	6	2	1	1
Southern California	157	151	2	1	3
Total	3,928	2,007	921	368	632
REDWOOD					
Eastside Sierra	-	-	-	-	-
Westside Sierra	-	-	-	-	-
Coast Range Pine	-	-	-	-	-
Redwood--Douglas-fir	1,918	1,100	443	125	250
Southern California	11	11	(1/)	-	-
Total	1,929	1,111	443	125	250
DOUGLAS-FIR					
Eastside Sierra	-	-	-	-	-
Westside Sierra	-	-	-	-	-
Coast Range Pine	476	346	40	21	69
Redwood--Douglas-fir	2,005	1,149	463	131	262
Southern California	-	-	-	-	-
Total	2,481	1,495	503	152	331
FIR					
Eastside Sierra	348	281	33	11	23
Westside Sierra	505	450	21	15	19
Coast Range Pine	90	74	3	5	8
Redwood--Douglas-fir	39	22	9	3	5
Southern California	8	8	-	-	-
Total	990	835	66	34	55
PINE--DOUGLAS-FIR--FIR					
Eastside Sierra	1,641	1,091	233	93	224
Westside Sierra	3,390	2,331	450	253	356
Coast Range Pine	2,423	1,969	103	122	229
Redwood--Douglas-fir	266	153	61	17	35
Southern California	55	52	2	-	1
Total	7,775	5,596	849	485	845
LODGEPOLE PINE					
Eastside Sierra	97	81	15	1	(1/)
Westside Sierra	117	115	1	1	-
Coast Range Pine	-	-	-	-	-
Redwood--Douglas-fir	-	-	-	-	-
Southern California	-	-	-	-	-
Total	214	196	16	2	(1/)
ALL TYPES					
Eastside Sierra	3,919	2,498	605	305	511
Westside Sierra	5,727	3,560	1,038	418	711
Coast Range Pine	3,202	2,530	173	165	334
Redwood--Douglas-fir	4,238	2,430	978	277	553
Southern California	231	222	4	1	4
Total	17,317	11,240	2,798	1,166	2,113

1/ Less than 500 acres.

Table 17.- Degree of stocking on commercial forest land, by stand-size class and subregion, California, 1953

Stand-size class and subregion	All areas	Degree of stocking			
		Well-stocked	Medium-stocked	Poorly stocked	Non-stocked
	Thousand acres				
OLD-GROWTH SAW TIMBER					
Eastside Sierra	2,498	716	1,220	562	-
Westside Sierra	3,560	1,350	1,652	558	-
Coast Range Pine	2,530	1,265	901	364	-
Redwood--Douglas-fir	2,430	1,470	686	274	-
Southern California	222	7	150	65	-
Total	11,240	4,808	4,609	1,823	-
YOUNG-GROWTH SAW TIMBER					
Eastside Sierra	605	146	245	214	-
Westside Sierra	1,038	403	283	352	-
Coast Range Pine	173	69	43	61	-
Redwood--Douglas-fir	978	409	300	269	-
Southern California	4	2	1	1	-
Total	2,798	1,029	872	897	-
POLE TIMBER AND SEEDLINGS AND SAPLINGS					
Eastside Sierra	305	22	79	204	-
Westside Sierra	418	78	243	97	-
Coast Range Pine	165	57	68	40	-
Redwood--Douglas-fir	277	39	61	177	-
Southern California	1	-	-	1	-
Total	1,166	196	451	519	-
NONSTOCKED					
Eastside Sierra	511	-	-	-	511
Westside Sierra	711	-	-	-	711
Coast Range Pine	334	-	-	-	334
Redwood--Douglas-fir	553	-	-	-	553
Southern California	4	-	-	-	4
Total	2,113	-	-	-	2,113
ALL CLASSES					
Eastside Sierra	3,919	884	1,544	980	511
Westside Sierra	5,727	1,831	2,178	1,007	711
Coast Range Pine	3,202	1,391	1,012	465	334
Redwood--Douglas-fir	4,238	1,918	1,047	720	553
Southern California	231	9	151	67	4
Total	17,317	6,033	5,932	3,239	2,113

Table 18.- Site quality of commercial forest land, by timber type and subregion, California, 1953

Timber type and subregion	Total	Site quality		
		High	Medium	Low
	Thousand acres			
PINE				
Eastside Sierra	1,833	61	908	864
Westside Sierra	1,715	566	976	173
Coast Range Pine	213	38	125	50
Redwood--Douglas-fir	10	3	7	-
Southern California	157	5	78	74
Total	3,928	673	2,094	1,161
REDWOOD				
Eastside Sierra	-	-	-	-
Westside Sierra	-	-	-	-
Coast Range Pine	-	-	-	-
Redwood--Douglas-fir	1,918	1,559	328	31
Southern California	11	2	9	-
Total	1,929	1,561	337	31
DOUGLAS-FIR				
Eastside Sierra	-	-	-	-
Westside Sierra	-	-	-	-
Coast Range Pine	476	272	172	32
Redwood--Douglas-fir	2,005	1,051	758	196
Southern California	-	-	-	-
Total	2,481	1,323	930	228
FIR				
Eastside Sierra	348	46	207	95
Westside Sierra	505	111	297	97
Coast Range Pine	90	41	34	15
Redwood--Douglas-fir	39	6	22	11
Southern California	8	1	5	2
Total	990	205	565	220
PINE--DOUGLAS-FIR--FIR				
Eastside Sierra	1,641	129	972	540
Westside Sierra	3,390	1,291	1,669	430
Coast Range Pine	2,423	771	1,364	288
Redwood--Douglas-fir	266	110	101	55
Southern California	55	4	33	18
Total	7,775	2,305	4,139	1,331
LODGEPOLE PINE				
Eastside Sierra	97	-	12	85
Westside Sierra	117	-	58	59
Coast Range Pine	-	-	-	-
Redwood--Douglas-fir	-	-	-	-
Southern California	-	-	-	-
Total	214	-	70	144
ALL TYPES				
Eastside Sierra	3,919	236	2,099	1,584
Westside Sierra	5,727	1,968	3,000	759
Coast Range Pine	3,202	1,122	1,695	385
Redwood--Douglas-fir	4,238	2,729	1,216	293
Southern California	231	12	125	94
Total	17,317	6,067	8,135	3,115

Table 19.- Live saw timber volume on commercial forest land, by species and subregion, California, 1953

Species	California		Subregion				
			Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
	Million bd.ft. Scribner	Million bd.ft. Int.[1]	Million bd.ft. Int.				
Softwoods							
Douglas-fir	110,667	116,912	1,749	12,594	27,270	75,282	17
Ponderosa and Jeffrey pine	62,723	66,741	16,937	30,374	15,512	2,527	1,391
White fir	53,672	[2]57,214	8,986	34,024	7,853	6,197	154
California red fir	29,557	31,510	7,098	21,193	2,557	662	-
Western hemlock	439	471	-	-	-	471	-
Sugar pine	26,007	27,384	1,396	15,042	6,320	4,590	36
Western white pine	1,990	2,131	559	1,198	277	97	-
Redwood	34,346	36,124	-	-	-	35,827	297
Sitka spruce	165	170	-	-	-	170	-
Western redcedar	2	2	-	-	-	2	-
Incense cedar	9,044	9,727	1,110	7,098	935	573	11
Lodgepole pine	3,469	3,807	2,367	1,406	34	-	(3/)
Other	1,660	1,831	427	207	656	503	38
Total	333,741	354,024	40,629	123,136	61,414	126,901	1,944
Hardwoods							
California black oak	1,914	1,946	19	997	622	308	-
Tanoak	2,005	2,036	-	4	65	1,967	-
Aspen	36	37	37	-	-	-	-
Alder	161	166	-	12	49	105	-
Other	1,762	1,792	-	201	429	1,162	-
Total	5,878	5,977	56	1,214	1,165	3,542	-
All species	339,619	360,001	40,685	124,350	62,579	130,443	1,944

1/ International 1/4-inch log rule.
2/ Includes 1,281 million board feet of grand fir in Redwood--Douglas-fir subregion.
3/ Less than 0.5 million board feet.

Table 20.- Live saw timber volume on commercial forest land, by species, subregion, and diameter class groups, California, 1953

Subregion and diameter class groups	Total	Species						
		Ponderosa pine[1]	Sugar pine	Redwood	Douglas-fir	True firs	Other softwoods	Hardwoods
	Million board feet[2]							
EASTSIDE SIERRA								
11.0 - 20.9	6,425	2,413	51	-	154	2,394	1,374	39
21.0 - 30.9	12,096	4,849	131	-	295	5,068	1,736	17
31.0 - 40.9	11,617	5,557	182	-	408	4,567	903	-
41.0 and larger	10,547	4,118	1,032	-	892	4,055	450	-
Total	40,685	16,937	1,396	-	1,749	16,084	4,463	56
WESTSIDE SIERRA								
11.0 - 20.9	15,638	3,485	1,016	-	1,723	6,756	2,280	378
21.0 - 30.9	29,074	6,906	2,125	-	2,898	14,100	2,522	523
31.0 - 40.9	31,798	8,474	2,354	-	2,478	15,355	2,898	239
41.0 and larger	47,840	11,509	9,547	-	5,495	19,006	2,209	74
Total	124,350	30,374	15,042	-	12,594	55,217	9,916	1,214
COAST RANGE PINE								
11.0 - 20.9	6,460	1,245	352	-	2,647	1,210	524	482
21.0 - 30.9	16,172	4,111	955	-	6,194	3,835	611	466
31.0 - 40.9	18,588	5,772	2,087	-	7,052	3,115	345	217
41.0 and larger	21,359	4,384	2,926	-	11,377	2,250	422	-
Total	62,579	15,512	6,320	-	27,270	10,410	1,902	1,165
REDWOOD--DOUGLAS-FIR								
11.0 - 20.9	11,594	192	199	3,330	4,646	1,091	536	1,600
21.0 - 30.9	23,991	872	855	4,453	13,643	2,404	442	1,322
31.0 - 40.9	27,967	924	1,159	4,402	18,808	1,852	301	521
41.0 and larger	66,891	539	2,377	23,642	38,185	1,512	537	99
Total	130,443	2,527	4,590	35,827	75,282	6,859	1,816	3,542
SOUTHERN CALIFORNIA								
11.0 - 20.9	268	198	3	28	1	23	15	-
21.0 - 30.9	511	398	6	37	3	48	19	-
31.0 - 40.9	557	457	6	36	4	44	10	-
41.0 and larger	608	338	21	196	9	39	5	-
Total	1,944	1,391	36	297	17	154	49	-
CALIFORNIA								
11.0 - 20.9	40,384	7,533	1,621	3,358	9,171	11,474	4,728	2,499
21.0 - 30.9	81,844	17,136	4,072	4,490	23,033	25,455	5,330	2,328
31.0 - 40.9	90,527	21,184	5,788	4,438	28,750	24,933	4,457	977
41.0 and larger	147,246	20,888	15,903	23,838	55,958	26,862	3,624	173
Total	360,001	66,741	27,384	36,124	116,912	88,724	18,139	5,977

1/ Includes Jeffrey pine.
2/ Log scale, International 1/4-inch rule. All board foot volumes in the remaining tables are by International 1/4-inch rule unless otherwise specified.

Table 21.- Live saw-timber volume on commercial forest land, by subregion, stand-size class, and age class of timber, California, 1953

(Million board feet)

Stand-size class[1]	Age class[2]	All subregions			Eastside Sierra			Westside Sierra			Coast Range Pine			Redwood--Douglas-fir			Southern California		
		Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
Old-growth saw timber	Total old growth	305,691	179,772	125,919	36,762	23,379	13,383	107,692	75,546	32,146	57,096	40,233	16,863	102,220	39,424	62,796	1,921	1,190	731
	Old growth	26,457	6,428	20,029	555	448	107	2,012	1,747	265	870	617	253	23,020	3,616	19,404	-	-	-
	Old-growth-young growth	168,821	108,789	60,032	17,927	11,300	6,627	55,793	41,374	14,419	37,013	27,739	9,274	56,299	27,252	29,047	1,789	1,124	665
	Young growth-old growth	110,413	64,555	45,858	18,280	11,631	6,649	49,887	32,425	17,462	19,213	11,877	7,336	22,901	8,556	14,345	132	66	66
Young-growth saw timber	Large young growth	45,786	10,580	35,206	2,790	1,407	1,383	13,133	4,470	8,663	4,224	1,819	2,405	25,619	2,877	22,742	20	7	13
Pole timber & seedlings & saplings	Small young growth	4,308	1,610	2,698	645	376	269	1,770	708	1,062	570	323	247	1,322	202	1,120	1	1	-
Nonstocked	Nonstocked	4,216	1,849	2,367	488	320	168	1,755	769	986	689	417	272	1,282	342	940	2	1	1
All classes		360,000	193,811	166,190	40,685	25,482	15,203	124,350	81,493	42,857	62,579	42,792	19,787	130,443	42,845	87,598	1,944	1,199	745

1/ Stand-size class as defined by national Forest Survey standards.
2/ Age class is a classification of timber stands used in California.

Table 22.- Ownership of live saw-timber volume on commercial forest land, by stand-size class and subregion, California, 1953

Stand-size class and subregion	Total all ownerships	Federally owned or managed					State	County and municipal	Private
		Total federal	National forest	Indian	Bur. of Land Mgt.	Other			
	Million board feet								
OLD-GROWTH SAW TIMBER									
Eastside Sierra	36,762	23,312	23,017	63	231	1	67	-	13,383
Westside Sierra	107,692	75,206	74,543	46	373	244	340	-	32,146
Coast Range Pine	57,096	39,351	37,970	211	1,169	1	853	29	16,863
Redwood--Douglas-fir	102,220	36,408	30,196	3,292	2,895	25	2,863	153	62,796
Southern California	1,921	1,190	1,163	27	(1/)	-	-	-	731
Total	305,691	175,467	166,889	3,639	4,668	271	4,123	182	125,919
YOUNG-GROWTH SAW TIMBER									
Eastside Sierra	2,790	1,395	1,362	4	29	-	12	-	1,383
Westside Sierra	13,133	4,452	4,008	14	359	71	18	-	8,663
Coast Range Pine	4,224	1,721	1,392	10	319	-	98	-	2,405
Redwood--Douglas-fir	25,619	2,657	2,204	240	211	2	209	11	22,742
Southern California	20	7	7	-	-	-	-	-	13
Total	45,786	10,232	8,973	268	918	73	337	11	35,206
POLE TIMBER AND SEEDLINGS AND SAPLINGS									
Eastside Sierra	645	374	360	2	12	(1/)	2	-	269
Westside Sierra	1,770	694	661	(1/)	28	5	14	-	1,062
Coast Range Pine	570	314	263	5	46	(1/)	9	-	247
Redwood--Douglas-fir	1,322	186	154	17	15	(1/)	15	1	1,120
Southern California	1	1	1	-	-	-	-	-	-
Total	4,308	1,569	1,439	24	101	5	40	1	2,698
NONSTOCKED									
Eastside Sierra	488	318	308	1	9	-	2	(1/)	168
Westside Sierra	1,755	759	682	6	51	20	10	-	986
Coast Range Pine	689	407	359	2	45	1	10	-	272
Redwood--Douglas-fir	1,282	316	262	29	25	(1/)	25	1	940
Southern California	2	1	1	-	-	-	-	-	1
Total	4,216	1,801	1,612	38	130	21	47	1	2,367
ALL CLASSES									
Eastside Sierra	40,685	25,399	25,047	70	281	1	83	(1/)	15,203
Westside Sierra	124,350	81,111	79,894	66	811	340	382	-	42,857
Coast Range Pine	62,579	41,793	39,984	228	1,579	2	970	29	19,787
Redwood--Douglas-fir	130,443	39,567	32,816	3,578	3,146	27	3,112	166	87,598
Southern California	1,944	1,199	1,172	27	(1/)	-	-	-	745
Total	360,001	189,069	178,913	3,969	5,817	370	4,547	195	166,190

1/ Less than 0.5 million board feet.

Table 23.- Average volume per acre of live saw timber on commercial forest land, by stand-size class and subregion, California, 1953

Subregion	All classes	Stand-size class			
		Saw timber		Pole timber and seedlings and saplings	Non-stocked
		Old growth	Young growth		
	Board feet				
Eastside Sierra	10,381	14,716	4,612	2,115	955
Westside Sierra	21,713	30,251	12,652	4,234	2,468
Coast Range Pine	19,544	22,568	24,416	3,455	2,063
Redwood--Douglas-fir	30,779	42,066	26,195	4,773	2,318
Southern California	8,416	8,653	5,000	1,000	500
California	20,789	27,197	16,364	3,695	1,995

Table 24.- Ownership of growing stock on commercial forest land, by stand-size class and subregion, California, 1953

Stand-size class and subregion	Total all ownerships	Federally owned or managed					State	County and municipal	Private
		Total federal	National forest	Indian	Bur. of Land Mgt.	Other			
	Million cubic feet								
OLD-GROWTH SAW TIMBER									
Eastside Sierra	6,835	4,343	4,287	12	44	(1/)	12	-	2,480
Westside Sierra	18,801	13,127	13,003	9	68	47	59	-	5,615
Coast Range Pine	10,329	7,067	6,812	39	216	(1/)	155	6	3,101
Redwood--Douglas-fir	18,637	6,662	5,529	600	529	4	522	28	11,425
Southern California	375	232	227	5	(1/)	-	-	-	143
Total	54,977	31,431	29,858	665	857	51	748	34	22,764
YOUNG-GROWTH SAW TIMBER									
Eastside Sierra	813	405	395	1	9	(1/)	4	-	404
Westside Sierra	2,983	1,000	897	3	83	17	5	-	1,978
Coast Range Pine	820	330	264	3	63	-	18	-	472
Redwood--Douglas-fir	4,663	486	404	44	38	(1/)	38	2	4,137
Southern California	5	2	2	-	-	-	-	-	3
Total	9,284	2,223	1,962	51	193	17	65	2	6,994
POLE TIMBER AND SEEDLINGS AND SAPLINGS									
Eastside Sierra	164	96	92	1	3	-	(1/)	-	68
Westside Sierra	452	178	170	(1/)	7	1	3	-	271
Coast Range Pine	218	119	100	2	17	(1/)	4	-	95
Redwood--Douglas-fir	241	34	28	3	3	(1/)	3	(1/)	204
Southern California	(1/)	(1/)	(1/)	-	-	-	-	-	-
Total	1,075	427	390	6	30	1	10	(1/)	638
NONSTOCKED									
Eastside Sierra	146	95	92	-	3	-	1	(1/)	50
Westside Sierra	430	186	168	1	12	5	2	-	242
Coast Range Pine	266	156	138	(1/)	17	1	5	-	105
Redwood--Douglas-fir	233	58	48	5	5	(1/)	4	(1/)	171
Southern California	(1/)	(1/)	(1/)	-	-	-	-	-	(1/)
Total	1,075	495	446	6	37	6	12	(1/)	568
ALL CLASSES									
Eastside Sierra	7,958	4,939	4,866	14	59	(1/)	17	(1/)	3,002
Westside Sierra	22,666	14,491	14,238	13	170	70	69	-	8,106
Coast Range Pine	11,633	7,672	7,314	44	313	1	182	6	3,773
Redwood--Douglas-fir	23,774	7,240	6,009	652	575	4	567	30	15,937
Southern California	380	234	229	5	(1/)	-	-	-	146
Total	66,411	34,576	32,656	728	1,117	75	835	36	30,964

1/ Less than 0.5 million cubic feet.

Table [illegible].- All timber volume on commercial forest land, by species, subregion, and class of material, California, [illegible]

Subregion and class of material	Total	Ponderosa and Jeffrey pine	Sugar pine	Redwood	Douglas-fir	White fir	California red fir	Other softwoods	Hardwoods
	Million cubic feet								
EASTSIDE SIERRA									
Growing stock									
Saw-timber trees									
Sawlog	[illegible]	[illegible]	198		[illegible]	[illegible]	[illegible]	718	11
Upper stem	1,037	433	13	-	[illegible]	[illegible]	[illegible]	236	-
Total	7,219	2,921	[illegible]	-	[illegible]	1,634	[illegible]	954	11
Pole-timber trees	739	[illegible]	[illegible]	-	[illegible]	189	[illegible]	179	50
Total growing stock	7,958	[illegible]	[illegible]	-	[illegible]	1,823	1,256	1,133	61
Other material	208	47	4	-	[illegible]	53	38	25	30
Total	8,166	3,201	[illegible]	-	[illegible]	1,876	1,294	1,158	91
WESTSIDE SIERRA									
Growing stock									
Saw-timber trees									
Sawlog	18,423	[illegible]	[illegible]	-	[illegible]	[illegible]	3,232	1,547	253
Upper stem	[illegible]	[illegible]	[illegible]	-	[illegible]	538	368	321	-
Total	20,967	5,146	[illegible]	-	[illegible]	[illegible]	3,600	1,868	253
Pole-timber trees	1,699	245	[illegible]	-	[illegible]	[illegible]	119	275	335
Total growing stock	22,666	5,391	2,379	-	[illegible]	6,096	3,719	2,143	588
Other material	637	[illegible]	10	-	[illegible]	[illegible]	13	36	461
Total	23,303	[illegible]	2,389	-	[illegible]	6,134	3,732	2,179	1,049
COAST RANGE PINE									
Growing stock									
Saw-timber trees									
Sawlog	9,351	2,224	905	-	[illegible]	[illegible]	396	329	244
Upper stem	1,288	329	85	-	[illegible]	182	42	64	-
Total	10,639	[illegible]	990	-	4,594	1,427	438	393	244
Pole-timber trees	994	121	33	-	254	93	11	82	400
Total growing stock	11,633	2,674	1,023	-	4,848	1,520	449	475	644
Other material	515	8	15	-	97	27	(1/)	1	367
Total	12,148	2,682	1,038	-	4,945	1,547	449	476	1,011
REDWOOD--DOUGLAS-FIR									
Growing stock									
Saw-timber trees									
Sawlog	[illegible]	372	[illegible]	5,283	11,101	914	97	267	704
Upper stem	2,869	57	104	810	[illegible]	140	15	41	-
Total	22,284	429	781	6,093	[illegible]	1,054	112	308	704
Pole-timber trees	1,490	15	26	209	[illegible]	36	4	11	750
Total growing stock	23,774	444	807	6,302	[illegible]	1,090	116	319	1,454
Other material	[illegible]	(1/)	21	[illegible]	[illegible]	9	2	13	1,156
Total	25,634	444	828	6,528	[illegible]	[illegible]	118	332	2,610
SOUTHERN CALIFORNIA									
Growing stock									
Saw-timber trees									
Sawlog	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	8	-
Upper stem	[illegible]	[illegible]	1	[illegible]	(1/)	[illegible]	-	1	-
Total	347	[illegible]	[illegible]	[illegible]	2	[illegible]	-	9	-
Pole-timber trees	33	[illegible]	1	[illegible]	1	[illegible]	-	1	-
Total growing stock	380	272	[illegible]	[illegible]	3	30	-	10	-
Other material	-	-	-	-	-	-	-	-	-
Total	380	272	[illegible]	[illegible]	3	[illegible]	-	10	-
ALL SUBREGION									
Growing stock									
Saw-timber trees									
Sawlog	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,869	1,212
Upper stem	7,788	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	548	663	-
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9,820	5,356	3,532	1,212
Pole-timber trees	4,955	[illegible]	[illegible]	[illegible]	[illegible]	739	184	548	1,535
Total growing stock	66,411	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4,080	2,747
Other material	3,220	[illegible]	[illegible]	[illegible]	[illegible]	127	53	75	2,014
Total	69,631	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4,155	4,761

1/ Less than 0.5 million cubic feet.

Table 26.- Average annual growth of live saw timber on commercial forest land by species group, stand-size class, and subregion, California, 1952

Stand-size class and subregion	Total		Softwoods		Hardwoods		Average per acre	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net
	Million board feet						Board feet	
OLD-GROWTH SAW TIMBER								
Eastside Sierra	510	162	510	162	-	-	204	65
Westside Sierra	1,432	876	1,427	872	5	4	402	246
Coast Range Pine	603	328	589	319	14	9	238	130
Redwood--Douglas-fir	850	393	794	375	56	18	350	162
Southern California	40	10	40	10	-	-	180	45
Total	3,435	1,769	3,360	1,738	75	31	306	157
YOUNG-GROWTH SAW TIMBER								
Eastside Sierra	67	26	67	26	-	-	111	43
Westside Sierra	357	312	354	310	3	2	344	301
Coast Range Pine	94	74	93	73	1	1	543	428
Redwood--Douglas-fir	511	488	506	486	5	2	522	499
Southern California	(1/)	(1/)	(1/)	(1/)	-	-	(2/)	(2/)
Total	1,029	900	1,020	895	9	5	368	322
POLE TIMBER AND SEEDLINGS AND SAPLINGS								
Eastside Sierra	32	25	32	25	-	-	105	82
Westside Sierra	42	23	41	23	1	(1/)	100	55
Coast Range Pine	17	15	17	15	(1/)	(1/)	103	91
Redwood--Douglas-fir	146	139	144	138	2	1	527	502
Southern California	(1/)	(1/)	(1/)	(1/)	-	-	(2/)	(2/)
Total	237	202	234	201	3	1	203	173
NONSTOCKED								
Eastside Sierra	6	- 9	4	- 8	2	-1	12	-18
Westside Sierra	70	56	65	52	5	4	98	79
Coast Range Pine	16	13	15	12	1	1	48	39
Redwood--Douglas-fir	11	8	8	5	3	3	19	14
Southern California	(1/)	(1/)	(1/)	(1/)	-	-	(2/)	(2/)
Total	103	68	92	61	11	7	49	32
ALL CLASSES								
Eastside Sierra	615	204	613	205	2	-1	157	52
Westside Sierra	1,901	1,267	1,887	1,257	14	10	332	221
Coast Range Pine	730	430	714	419	16	11	228	134
Redwood--Douglas-fir	1,518	1,028	1,452	1,004	66	24	358	243
Southern California	40	10	40	10	-	-	173	43
Total	4,804	2,939	4,706	2,895	98	44	277	170

1/ Less than 0.5 million board feet.
2/ Less than 0.5 board foot.

Table 27.- Average annual growth of growing stock on commercial forest land by species group, stand-size class, and subregion, California, 1952

Stand-size class and subregion	Total		Softwoods		Hardwoods		Average per acre	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net
	Million cubic feet						Cubic feet	
OLD-GROWTH SAW TIMBER								
Eastside Sierra	97	31	97	31	-	-	39	12
Westside Sierra	251	157	242	149	9	8	71	44
Coast Range Pine	126	76	113	65	13	11	50	30
Redwood--Douglas-fir	153	65	132	59	21	6	63	26
Southern California	8	2	8	2	-	-	36	9
Total	635	331	592	306	43	25	56	29
YOUNG-GROWTH SAW TIMBER								
Eastside Sierra	22	11	22	11	-	-	36	18
Westside Sierra	72	61	69	58	3	3	69	59
Coast Range Pine	17	13	16	12	1	1	98	75
Redwood--Douglas-fir	106	98	99	92	7	6	108	100
Southern California	(1/)	(1/)	(1/)	(1/)	-	-	(2/)	(2/)
Total	217	183	206	173	11	10	78	65
POLE TIMBER AND SEEDLINGS AND SAPLINGS								
Eastside Sierra	5	4	5	4	-	-	16	13
Westside Sierra	14	9	12	7	2	2	33	22
Coast Range Pine	9	9	8	8	1	1	54	54
Redwood--Douglas-fir	30	27	28	26	2	1	108	97
Southern California	(1/)	(1/)	(1/)	(1/)	-	-	(2/)	(2/)
Total	58	49	53	45	5	4	50	42
NONSTOCKED								
Eastside Sierra	5	1	5	1	(1/)	(1/)	10	2
Westside Sierra	15	11	11	8	4	3	21	15
Coast Range Pine	8	6	6	5	2	1	24	18
Redwood--Douglas-fir	6	3	2	1	4	2	11	5
Southern California	(1/)	(1/)	(1/)	(1/)	-	-	(2/)	(2/)
Total	34	21	24	15	10	6	16	10
ALL CLASSES								
Eastside Sierra	129	47	129	47	(1/)	(1/)	33	12
Westside Sierra	352	238	334	222	18	16	61	42
Coast Range Pine	160	104	143	90	17	14	50	32
Redwood--Douglas-fir	295	193	261	178	34	15	70	46
Southern California	8	2	8	2	-	-	35	9
Total	944	584	875	539	69	45	54	34

1/ Less than 0.5 million cubic feet.
2/ Less than 0.5 cubic foot.

Table 28.- Average annual net growth of live saw timber on commercial forest land by species and by subregion, California, 1952

Species	All sub-regions	Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
	Million board feet					
Softwoods						
Ponderosa and Jeffrey pines	553	60	351	130	4	8
Sugar pine	196	3	158	25	10	-
Redwood	396	-	-	-	396	(1/)
Douglas-fir	787	19	122	164	482	-
White fir	520	52	357	73	37	1
Calif. red fir	260	54	193	12	1	-
Other	183	17	76	15	74	1
Total	2,895	205	1,257	419	1,004	10
Hardwoods	44	-1	10	11	24	-
All species	2,939	204	1,267	430	1,028	10

1/ Less than 0.5 million board feet.

Table 29.- Average annual net growth of growing stock on commercial forest land by species and by subregion, California, 1952

Species	All sub-regions	Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
	Million cubic feet					
Softwoods						
Ponderosa and Jeffrey pines	99	13	60	24	(1/)	2
Sugar pine	29	(1/)	24	3	2	(1/)
Redwood	77	-	-	-	77	(1/)
Douglas-fir	144	3	22	39	80	(1/)
White fir	98	12	65	14	7	(1/)
Calif. red fir	53	14	35	4	(1/)	(1/)
Other	39	5	16	6	12	(1/)
Total	539	47	222	90	178	2
Hardwoods	45	(1/)	16	14	15	-
All species	584	47	238	104	193	2

1/ Less than 0.5 million cubic feet.

Table 30.- Annual cut[1/] of live saw timber and growing stock on commercial forest land, by species group, product, and subregion, California, 1952

Product and subregion	Live saw timber			Growing stock		
	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods
	-Million board feet-			--Million cubic feet--		
SAWLOGS						
Eastside Sierra	745	745	0	120.9	120.9	0
Westside Sierra	1,544	1,541	3	250.9	249.3	1.6
Coast Range Pine	506	506	0	81.2	81.2	0
Redwood--Douglas-fir	2,479	2,466	13	408.3	399.9	8.4
Southern California	8	8	0	1.3	1.3	0
Total	5,282	5,266	16	862.6	852.6	10.0
VENEER LOGS AND BOLTS						
Eastside Sierra	12	12	0	1.7	1.7	0
Westside Sierra	34	34	(2/)	5.1	5.1	(3/)
Coast Range Pine	12	12	0	1.7	1.7	0
Redwood--Douglas-fir	274	274	(2/)	39.7	39.7	(3/)
Southern California	0	0	0	0	0	0
Total	332	332	(2/)	48.2	48.2	(3/)
PULPWOOD LOGS						
Eastside Sierra	1	1	0	0.2	0.2	0
Westside Sierra	3	3	0	0.5	0.5	0
Coast Range Pine	0	0	0	0	0	0
Redwood--Douglas-fir	56	56	(2/)	10.7	10.7	(3/)
Southern California	0	0	0	0	0	0
Total	60	60	(2/)	11.4	11.4	(3/)
OTHER PRODUCTS[4/]						
Eastside Sierra	1	1	0	0.1	0.1	0
Westside Sierra	8	8	(2/)	1.9	1.8	0.1
Coast Range Pine	1	1	(2/)	0.3	0.3	(3/)
Redwood--Douglas-fir	47	43	4	8.3	7.2	1.1
Southern California	0	0	0	0	0	0
Total	57	53	4	10.6	9.4	1.2
ALL PRODUCTS						
Eastside Sierra	759	759	0	122.9	122.9	0
Westside Sierra	1,589	1,586	3	258.4	256.7	1.7
Coast Range Pine	519	519	(2/)	83.2	83.2	(3/)
Redwood--Douglas-fir	2,856	2,839	17	467.0	457.5	9.5
Southern California	8	8	0	1.3	1.3	0
Total	5,731	5,711	20	932.8	921.6	11.2

1/ Includes logging residue.
2/ Less than 0.5 million board feet.
3/ Less than 50 thousand cubic feet.
4/ Cooperage, fuelwood, poles, piling, round mine timbers, fence-posts, hewn ties, shingles, and miscellaneous.

Table 31.- Annual cut[1/] of live saw timber on commercial forest land by subregion and species, California, 1952

Species	All sub-regions	Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
	Million board feet					
Softwoods						
Douglas-fir	2,338	56	255	240	1,786	1
Ponderosa and Jeffrey pines	1,274	450	604	191	24	5
Redwood	988	0	[2/]	0	985	1
True firs	663	209	403	29	21	1
Sugar pine	324	28	233	56	7	(3/)
Other[4/]	124	16	89	3	16	0
Hardwoods	20	0	3	(3/)	17	0
All species	5,731	759	1,589	519	2,856	8

1/ Includes logging residue.
2/ Giant sequoia.
3/ Less than 0.5 million board feet.
4/ Incense cedar; Port Orford white and western red cedars; Sitka spruce; western hemlock; lodgepole and western white pines.

Table 32.- Annual cut[1/] of growing stock on commercial forest land by subregion and species, California, 1952

Species	All sub-regions	Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
	Million cubic feet					
Softwoods						
Douglas-fir	372.1	8.9	40.7	37.9	284.5	0.1
Ponderosa and Jeffrey pines	205.9	73.4	98.8	31.3	1.5	0.9
Redwood	163.8	0	[2/]0.3	0	163.4	0.1
True firs	105.2	33.2	64.0	4.6	3.2	0.2
Sugar pine	50.9	4.4	36.7	8.7	1.1	(3/)
Other[4/]	23.7	3.0	16.2	0.7	3.8	0
Hardwoods	11.2	0	1.7	(3/)	9.5	0
All species	932.8	122.9	258.4	83.2	467.0	1.3

1/ Includes logging residue.
2/ Giant sequoia.
3/ Less than 50 thousand cubic feet.
4/ Incense cedar; Port Orford white and western red cedars; Sitka spruce; western hemlock; lodgepole and western white pines.

Table 33.- Lumber production and number of active sawmills by subregion and mill-size class, California, 1951

Mill-size class	Lumber production							Active sawmills						
	Total all subregions		Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California	Total all subregions		Eastside Sierra	Westside Sierra	Coast Range Pine	Redwood--Douglas-fir	Southern California
Annual production M bd. ft.	Million bd. ft.	Percent	Million board feet					Number	Percent	Number				
50,000 and over	918	19.0	346	313	(1/)	259	0	13	1.6	4	4	1	4	0
25,000 to 49,999	969	20.0	228	221	93	427	0	29	3.6	7	7	3	12	0
15,000 to 24,999	831	17.1	(1/)	436	72	323	0	44	5.5	2	21	4	17	0
10,000 to 14,999	617	12.7	87	166	110	254	0	51	6.4	7	14	9	21	0
5,000 to 9,999	693	14.3	35	204	119	335	0	99	12.5	5	29	17	48	0
1,000 to 4,999	720	14.9	33	197	69	417	4	281	35.3	11	81	27	159	3
500 to 999	57	1.2	2	25	5	23	2	84	10.6	2	37	7	35	3
50 to 499	37	0.8	1	13	3	17	3	156	19.6	4	50	11	80	11
Less than 50	1	-	0	1	(2/)	(2/)	(2/)	39	4.9	0	18	8	11	2
All classes	4,843	100.0	732	3/1,576	471	2,055	9	796	100.0	42	261	87	387	19

1/ Included in Westside Sierra subregion figures to prevent disclosure of individual mill production.
2/ Less than 0.5 million board feet.
3/ Includes production of 112 million bd. ft. outside the subregion, by 1 mill (annual production 25 to 50 million board feet) in Coast Range Pine and 2 mills (annual production 15 to 25 million board feet) in Eastside Sierra subregions.

Table 34.- Lumber production by species, California[1/]
1900 - 1952

Year	Total	Species						
		Ponderosa pine	Sugar pine	Redwood	Douglas-fir	True firs[2/]	Other soft-woods[3/]	Hard-woods[4/]
	Million board feet							
[5/]1900	738	286	52	360	18	-	21	1
1905	1,062	364	120	412	101	52	10	3
1910	1,266	409	102	543	103	66	38	5
1915	1,119	390	114	419	118	51	26	1
1920	1,482	509	141	476	162	152	41	1
1925	2,043	786	299	490	206	232	28	2
1930	1,514	647	197	400	133	111	26	(6/)
1935	1,356	680	161	329	96	61	29	0
1940	1,954	955	294	388	196	67	54	(6/)
1945	2,261	915	195	444	373	286	48	(6/)
1946	2,681	1,134	294	243	507	427	75	1
1947	3,408	1,321	281	530	769	418	88	1
1948	3,963	1,458	237	793	926	471	78	(6/)
1949	3,803	1,186	311	744	1,180	345	37	(6/)
1950	4,253	1,235	326	875	1,203	556	58	(6/)
1951	4,843	1,236	327	867	1,611	705	97	(6/)
1952	4,837	1,168	318	899	1,700	652	99	1

Source: Forest Survey Release No. 20 - "A Century of Lumber Production in California and Nevada," for years 1900-51. Year 1952 in Forest Survey Release No. 23.

1/ Includes a relatively small volume of production in Nevada for years 1900-1945 incl.

2/ White, California red, and grand firs.

3/ Incense cedar; Port Orford white and western red cedars; Sitka spruce; western hemlock; lodgepole, western white, digger and Monterey pines.

4/ Includes lumber from imported as well as domestic logs.

5/ Figures of Census 1900 actually apply to year 1899.

6/ Less than 0.5 million board feet.

Table 35.- Production of logs and bolts by commodity, California, 1946, 1948, 1950 and 1952

Commodity	Unit	Volume in units				Number of plants 1952
		1946 1/	1948 1/	1950 2/	1952 2/	
Plywood 3/	M bd. ft.	15,462	71,440	142,485	252,645	22
Container veneer	M bd. ft.	32,805	31,750	17,905	20,270	9
Pulpwood	M bd. ft.	2,241	15,927	48,840	99,836	7
Shingle and sawed shake	M bd. ft.	17,310	No survey	14,840	5,690	36
Cooperage	M bd. ft.	11,306	7,256	5,275	4,530	4/1
Poles	Pieces	21,690	No survey	12,325	45,260	4
Piling	Lin. ft.	172,460	No survey	547,950	1,116,400	4

1/ From Table 1, Forest Research Note No. 79, California Forest and Range Experiment Station.

2/ From Table 2, Forest Survey Release No. 23, California Forest and Range Experiment Station.

3/ Includes logs going into both plywood and green veneer plants.

4/ Permission to publish these figures granted by producer.

PROCEDURES

Area Delineation

To determine the extent, location, and condition of all forest lands in California, aerial photographs were delineated on the basis of (1) present cover of vegetation, (2) suitability for growing timber crops, and (3) age class and density of timber stands. The minimum unit classified and mapped under the Forest Survey was forty acres. However, under a cooperative agreement set up between the State Division of Forestry and the Forest Service, the California State Legislature provided funds for intensification of the survey on wild lands outside the national forest boundaries. On the latter area, classification and mapping were intensified to a 10-acre minimum to obtain detailed information on vegetation types and soils not obtainable with available Federal Survey funds.

Transfer to Base Maps

After photo delineation was completed, Timber Stand Maps were prepared by transferring photo classifications to 7-1/2-minute quadrangle size base maps at a common scale of 2 inches to the mile. These maps were completed for the Redwood--Douglas-fir and Coast Range Pine subregions, Shasta and Tehama counties, and the wild lands outside the national forest boundaries in the Westside Sierra subregion. For the remaining commercial forest land of the State, photo delineation was completed and mapped only along sample transect lines. Kind and density of vegetation, age-structure and density of coniferous timber stands, and other information pertinent to the vegetative resource were shown. As a final preparation for area measurement, other related information such as political and economic subdivisions, ownership, and commercial timber type boundaries was added.

Area Measurement and Compilation

To estimate the areas, parallel sample lines spaced 2 or 3 miles apart were drawn across the quadrangle base maps. Adjustments in age-density timber classifications were made along these transect lines after field examination to correct for changes caused by fire and cutting since the date of aerial photography so that class acreages when compiled would show conditions as of the inventory year. Acreage figures were then obtained by recording line intercept measurements of all pertinent class subdivisions along each of the sample lines transecting the quadrangles. The ratio of total line length to total area for the quadrangle provided the factor to convert line segments in inches to area in acres. These acreages were then totaled by county, and adjusted if necessary, to check with the Bureau of Census acreages by

counties.3/ Estimated acreage figures appearing in the tables were compiled and summarized by means of punch cards and card tabulating equipment.

Ownership Determination

Information on forest land ownership in California was procured from two sources. In the Redwood--Douglas-fir and Coast Range Pine subregions and Shasta and Tehama counties ownership data were obtained through a cooperative ownership study in conjunction with the Production Economics Research Branch of the Agricultural Research Service (formerly the Bureau of Agricultural Economics). In this study ownership information was obtained from county tax assessment rolls and other official records of the County Assessors and Tax Collectors, using a line sampling technique4/ and by mail questionnaires to owners. Detailed data were obtained about the owners and the type and size of private holdings in these areas which were not available for the rest of the State. For the portion of forest land not covered in this study, ownership data was obtained from detailed maps prepared for the evaluation of the forest situation in California in 1945 as part of a nationwide forest reappraisal. These maps were brought up to date by adjusting for changes in National Forest and National Park ownerships.

Stand-Size Class Determination

The national pattern of data presentation established for Forest Survey provides for the classification of timber stands on commercial forest land according to stand-size class. In California an age-density timber classification was used. The procedure for converting age classes to stand-size classes follows:

3/ From "Areas of the United States 1940," U. S. Bureau of the Census. Some county land areas have been adjusted for changes up through 1950.

4/ Details of the line sampling method used for estimating area and procedure for estimating number of owners are given in "A New Approach to Forest Ownership Surveys," by A.A. Hasel and Adon Poli, Land Economics, Vol. XXV, No. 1, Feb. 1949, pp. 1-10.

For a more detailed statement of the overall ownership survey procedure, see "Conducting a Survey of Ownership of Forest Land in California," by Adon Poli, Agricultural Economics Research, Vol. IV, No. 1, Jan. 1952, pp. 8-12.

Age class	Stand-size class
Old growth Old growth--young growth Young growth--old growth	Old-growth saw timber
Large young growth	Young-growth saw timber
Small young growth	Pole timber and seedlings and saplings
Nonstocked	Nonstocked

The small young growth timber stands were classified on photos (and field checked) along sample transect lines by both age-density and stand-size classes. The relationships thus established were then applied to the small young growth stands to determine the pole timber and seedling and sapling areas. The nonstocked areas were considered the same under both systems of classification.

Volume Determination

The inventory of timber volumes required the use of both aerial photographs and field sampling. Photographs were used to classify the timber stands being sampled and to guide the field crews in arriving at the sampling location. At each location, three sample plots were established and detailed information recorded on the timber stand classification, and on the species, size, quality, growth, cull, and mortality of individual trees. The field crew also checked the photo classification of the forest stands in the vicinity of each location.

One thousand five hundred twenty-seven (1,527) field locations were established throughout California. These locations, selected by systematic sampling, were spaced 4-3/4 miles apart in cardinal directions. An exception was made in the dense and semi-dense old-growth saw-timber stands in the redwood type. There, three field locations were randomly selected in each 6,000 acres.

From the data collected at the field locations the average net volume per acre was determined for each age-density class of timber stands. Some of the age-density classes were grouped to provide more accurate volume estimates. These groupings were based on statistical tests of the significance of differences between classes. Finally, total volume estimates by age class, stand-size class, area, and ownership were determined for each subregion by applying age-density-class volume per acre figures to the acreages of commercial forest land in those classes. Volume estimates were compiled in board feet, by both the Scribner and International

1/4-inch log rules, and in cubic feet, using local volume tables based on standard volume tables prepared by the California Forest and Range Experiment Station. Volume estimates for the Southern California subregion were based on Forest Service estimates made in 1945.

Cull and Breakage Determinations

Net board foot and cubic foot volumes were obtained by deducting cull and breakage from gross volumes of the growing stock. These deductions for cull and breakage were based on studies made especially for this purpose.5/ Cull and breakage are expressed as a composite factor because breakage is so closely related to defect (decay) that it is difficult to separate the two factors, and because in the West both Forest Service and commercial cruising practices combine cull and breakage as one figure. The amount of breakage, independent of cull, averaged about 4 percent of the gross board foot volumes for all species.

Deductions for cull and breakage varied between species and species groups and by diameter class within species. Two types of cull factors were used. For coniferous species (Douglas-fir, true firs, and redwood) with reliable external cull indicators, such as conks, swollen knots, fire scars, broken tops, etc., deductions were made on an individual tree basis. For the remaining conifers, flat or average cull deductions (plus an additional breakage allowance) were determined for and applied by Dunning's tree classes. For hardwoods the deductions were based on average cull and breakage losses determined for each species.

Based on board foot volumes, the average cull and felling breakage deductions for all living trees of the principal species were as follows:

Species	Percent	Species	Percent
Douglas-fir	24.9	California red fir	12.3
Ponderosa and Jeffrey pines	5.8	Sugar pine	10.5
White fir	17.0	Hardwoods	58.0
Redwood	26.1		

5/ Cull and breakage factors for the Coast Range Pine and Redwood--Douglas-fir subregions are published in Forest Survey Releases No. 7 and 13 respectively. Data for the pines and incense cedar in the Sierra subregions are published in Forest Research Note No. 90.

Site-Quality Determination

Three broad site classes, high, medium, and low, were established to express the relative capacity of commercial forest land to produce timber crops. Field site determinations made on the 4,147 volume sample plots were grouped into these three classes. For each type, the number of site determinations in each site class was expressed as a percentage of all observations within the type. These percentages were then applied to the total area by type to provide estimates of relative site quality.

The relationship between the broad site quality classes--high, medium, and low--and site class and site index ratings of commercial forest land is shown in the following table and explained in the appended footnotes.

Broad rating	All types except Redwood & Douglas-fir		Redwood & Douglas-fir types	
	Site class1/	Site index2/	Site class3/	Site index4/
High	IA	200	I	200
			II	170
	I	175	III	140
Medium	II	150		
	III	125	IV	110
Low	IV	100		
	V	75	V	80

1/ According to D. Dunning in California Forest and Range Experiment Station Research Note No. 28, December 1, 1942, "A Site Classification for the Mixed-Conifer Selection Forests of the Sierra Nevada."

2/ The total height that the average dominant trees reach at 300 years of age.

3/ According to R. E. McArdle and W. H. Meyer in U. S. Dept. Agr. Tech. Bul. 201, October 1930, "The Yield of Douglas-fir in the Pacific Northwest."

4/ Average total height of dominant and codominant Douglas-fir trees at 100 years of age.

Growth Determination

The estimate of net annual growth for the subregion was derived from increment borings taken from trees on field sample plots. From measurements of growth over a ten year period, the average periodic annual gross growth for the inventory year was determined for each age-density class. Ingrowth was accounted for in all growth calculations. Gross growth was converted to net growth by subtracting the combined average annual mortality from competition, storm, insects, disease, and fire. The result was the average annual net growth per acre for each age-density class. When age-density classes were inadequately sampled, they were grouped with other classes as required. Total net annual growth for the State, then, was the sum of the products of commercial forest land acreages in each age-density class times the net annual growth per acre of that class.

Mortality Determination

One year mortality (from causes other than fire) was recorded on all survey volume sample plots. Comparison of the mortality derived from these data with that from permanent sample plots showed that the survey sample was not intensive enough to provide an adequate measure of mortality. Also, these one-year measurements failed to account for the periodic change in mortality rate.

In the Pine region, survey mortality was adjusted to conform with long-range data from permanent sample plots maintained by the Division of Forest Management and the Division of Entomology. These plots are located in the Westside Sierra subregion and in the transition zones between this subregion, the Coast Range Pine and Eastside Sierra subregions. In the Redwood region, survey mortality was supplemented by data from a special mortality survey.

From these data, per-acre mortality figures were computed for all age-density classes. To these values were added the per-acre fire loss derived from a special study using data taken from State Division of Forestry and U. S. Forest Service fire records.

The estimate of total mortality in the inventory year was obtained by multiplying the commercial forest land acreage in each age-density class by the per acre mortality of that class and totaling the results.

Logging Residue

The amount of logging residue was determined through application of data collected by the Experiment Station in a 1953 logging residue survey. Sixteen one-acre plots were taken in the

California Pine region and twelve one-half acre plots in the Redwood region. These plots were selected so as to sample (1) cutting operations on government and private land and (2) size of operation.

From the field plot measurements, logging residue--in board feet and cubic feet--was determined and expressed as a percentage of timber products produced. These percentages were then applied to the timber products output from growing stock in California in 1952 to obtain total logging residue. Logging residue was equal to 9 percent of the volume of products in board measure (International 1/4-inch rule) and 22 percent in terms of cubic feet.

Timber Products

The 1952 output of timber products for California was determined from several sources. The lumber production estimate was obtained from the Bureau of the Census and Western Pine Association.

The veneer log estimate came from the Bureau of the Census, supplemented by Forest Survey data on container veneer.

Production data on pulpwood, cooperage, poles, piling, and shingles and sawed shakes was obtained directly from the producers.

Production estimates for miscellaneous products were derived from figures obtained from key persons and companies in industry, from government agencies, and by projection of trends.

ACCURACY OF DATA

Estimates of timber volumes, timber growth and forest areas are subject to two general classes of errors: (1) Nonsampling errors in photo classification, field measurement and tabulation, and office computation and compilation, and (2) sampling errors. The size of the nonsampling errors is not determinable. They were kept to a minimum by frequent checking and close supervision of all phases of the field and office work. When these nonsampling errors are negligible or compensating, then sampling errors provide measures of the reliability of the volume, growth and area estimates and can be computed by statistical methods. Magnitudes of the sampling errors depend upon the intensity of the sampling and the variability of the data.

Statistical analysis of the forest area, timber volume, and timber growth data shows the following sampling errors[6/] for the State of California. The estimate of annual cut was derived from a number of different sources and hence does not permit the calculation of a sampling error.

Class	Sampling Error	
	Units	Percent
Commercial forest land	107,365 acres	0.62
Total net volume	1,102 million cu.ft.	1.66
Total annual net growth	35 million cu.ft.	6.07

Statistics of forest area, timber volume, and timber growth are subject to increasing sampling errors as the acreage, volume, or growth decreases.

The following tabulation may be used as a guide in estimating the probable sampling error of the subdivisions of forest areas, volumes and growth.

Commercial forest land		Growing stock		Annual net growth of growing stock	
Area	Sampling error	Volume	Sampling error	Volume	Sampling error
Thousand acres	Percent	Million cu.ft.	Percent	Million cu. ft.	Percent
17,317	0.6	66,411	1.7	584	6.1
10,000	0.8	30,000	2.5	250	9.3
5,000	1.1	10,000	4.3	100	14.7
1,000	2.6	1,000	13.5	50	20.9
500	3.6	500	19.1	10	46.4
100	8.1	100	42.8	5	65.7
				2	103.8

6/ At the level of one standard error; that is, the chances are 2 in 3 that the actual area, volume, and growth will be within the range of plus and minus 0.6 percent of the estimated area, 1.7 percent of the estimated timber volume, and 6.1 percent of the estimated timber growth.

DEFINITION OF TERMS

Area

Forest land area. Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested areas; and (d) chaparral areas.

Commercial forest land area. Forest land which (a) is producing, or physically capable of producing, usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area. Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land and (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future. Includes chaparral land.

Chaparral land area. Lands supporting heavily branched dwarf trees or shrubs, usually evergreen, the crown canopy of which covers more than 50 percent of the ground and whose primary value is watershed protection. The more common chaparral constituents are species of Quercus, Cercocarpus, Garrya, Ceanothus, Arctostaphylos, and Adenostoma. Types dominated by such shrubs as Artemisia, Opuntia, Purshia, Gutierrezia or semi-desert species are not commonly considered chaparral.

Nonforest land area. Land that does not qualify as forest land. Includes land which has never supported forest growth; land from which the forest has been removed to less than 10 percent stocking and has been developed for other use, such as grazing, agricultural, residential, or industrial; all land in thickly populated urban and suburban areas; and water classified by the Bureau of Census as land.

Types

Types segregate all land according to existing cover of vegetation or other condition.

Commercial timber type. An extensive area of commercial forest land or reserved productive forest land stocked with a commercial

conifer[7] or group of commercial conifers. Includes commingled areas of minor conifer[8], hardwood, chaparral, and grassland temporarily nonstocked with commercial conifers but located in areas where commercial conifers normally grow.

The commercial forest land area of California has been classified into major forest types by two systems of classification: national Forest Survey types and local California types. Definitions of types from both systems are presented here. The primary difference between them is the inclusion of a mixed type (pine--Douglas-fir--fir) in the California system of classification. This mixed type is important in California because mixed timber stands occupy so much of the commercial forest land and pose special management problems. To meet Forest Survey standards the area in the mixed type is subdivided between the Douglas-fir, ponderosa pine, white pine, and fir-spruce types. Another difference is the inclusion of the areas with sugar pine in the pine and mixed types by California classification but in the white pine type by the Forest Survey classification. Definitions of types under each system are listed below:

Forest Survey types

a. Douglas-fir. Forests in which 50 percent or more of the stand is Douglas-fir, except where redwood, sugar pine, or western white pine comprise 20 percent or more, in which case the stand would be classified as redwood type or white pine type.

b. Hemlock-Sitka spruce. Forests in which 50 percent or more of the stand is western hemlock and/or Sitka spruce.

c. Redwood. Forests in which 20 percent or more of the stand is redwood.

d. Ponderosa pine. Forests in which 50 percent or more of the stand is ponderosa pine, Jeffrey pine, sugar pine, limber pine, Arizona pine, Apache pine, or Chihuahua pine, singly or in combination except where western white pine or sugar pine comprise 20 percent or more, in which case the stand would be classified as white pine type.

7/ Commercial conifers are Douglas-fir, ponderosa pine, Jeffrey pine, sugar pine, white fir, California red fir, redwood, grand fir, western hemlock, western white pine, western redcedar, Sitka spruce, incense cedar, lodgepole pine, Port-Orford-cedar, and mountain hemlock.

8/ Minor conifers are Bishop pine, California torreya, Pacific yew, knobcone pine, digger pine, weeping spruce, juniper, and pinyon pine.

e. Western white pine. Forests in which 20 percent or more of the stand is western white pine or sugar pine.

f. Lodgepole pine. Forests in which 50 percent or more of the stand is lodgepole pine.

g. Fir-spruce. Forests in which 50 percent or more of the stand is true fir (Abies spp.), Engelmann spruce, Colorado blue spruce, or mountain hemlock, singly or in combination, except where western white pine comprises 20 percent or more, in which case the stand would be classified as white pine.

California types

a. Pine--Douglas-fir--Fir. Areas with mixtures of the commercial pines and/or Douglas-fir, incense cedar and the true firs in which no one species comprises as much as 80 percent of the commercial conifer cover.

b. Pine. Areas with ponderosa, Jeffrey, or sugar pine comprising more than 80 percent of the commercial conifer cover.

c. Douglas-fir. Areas with Douglas-fir comprising more than 80 percent of the commercial conifer cover; or mixtures of Douglas-fir and the true firs in which Douglas-fir comprises 20 percent or more of the commercial conifer cover.

d. Redwood. Areas with redwood comprising 20 percent or more of the commercial conifer cover. Douglas-fir occurs as the principal associate of redwood throughout this type.

e. Fir. Areas with true firs comprising more than 80 percent of the commercial conifer cover.

f. Lodgepole pine. Areas with lodgepole pine comprising 80 percent or more of the commercial conifer cover.

Other timber and vegetative types

a. Coniferous woodland. Areas with such trees as knobcone pine, digger pine, Bishop pine, pinon pine, juniper, other minor conifers, and scattered or scrub trees of commercial conifer species, covering more than 5 percent of the ground space and predominant over hardwoods that may partly compose the cover.

b. Hardwoods (woodland). Areas with hardwood trees (oaks, madrone, tanoak, etc.) covering more than 50 percent of the ground except where in mixture with commercial conifers or herbaceous vegetation.

c. Woodland-grass. Areas with hardwood trees and herbaceous vegetation occurring in mixture--without commercial conifers--and the trees covering from 5 to 80 percent of the ground area and predominant over minor conifers present in the cover.

d. Shrub and herb types consist of the following, where not in mixtures with minor conifers or hardwoods:

1. Chaparral. Areas with such shrubs as manzanitas, scrub oaks, and chamise covering more than 50 percent of the ground.

2. Coastal sagebrush. Areas with such shrubs as California sagebrush, coyote brush, and wild buckwheats covering more than 50 percent of the ground.

3. Great Basin sagebrush. Areas with such shrubs as big sagebrush, bitterbrush, and saltbushes covering over 20 percent of the ground.

4. Grass. Areas with grasses and associated herbaceous vegetation covering more than 50 percent of the ground except where the type qualifies as woodland-grass.

5. Marsh. Areas with the herbaceous vegetation characteristic of very poorly drained areas.

6. Desert. Areas with only those shrubs characteristic of the Mojave and Colorado Deserts occurring in any density, together with included barren areas.

Nonvegetation types

a. Barren. Bare ground, rocky areas, river beds, mine dredgings, and talus essentially devoid of vegetation.

b. Cultivated, urban and industrial. Areas that are under cultivation or are used for residential or industrial purposes.

Timber Stand Classes

Stand-size classes used by Forest Survey to classify timber stands on commercial forest land.

a. Saw-timber stands. Stands having a minimum net volume per acre of 5,000 board feet (1,500 board feet in East-side Sierra subregion), International 1/4-inch rule, in saw-timber trees (11.0 inches d.b.h. and larger) for all species.

   1. Old-growth saw-timber stands. Saw-timber stands in which more than 50 percent of the net board-foot volume is in old-growth saw-timber trees.

   2. Young-growth saw-timber stands. Saw-timber stands in which 50 percent or more of the net board-foot volume is in young-growth saw-timber trees.

b. Pole-timber stands. Stands failing to meet the saw-timber stand specifications, but at least 10 percent stocked with pole-timber and larger trees and with at least half the minimum stocking in pole-timber trees (5.0 to 10.9 inches d.b.h.).

c. Seedling and sapling stands. Timber stands not qualifying as either saw-timber or pole-timber stands but having at least 10 percent stocking of trees and with at least half the minimum stocking in seedlings and saplings (0 to 4.9 inches d.b.h.).

d. Nonstocked and other areas not elsewhere classified. Areas not qualifying as saw-timber, pole-timber, or seedling and sapling stands.

Age classes of commercial conifer stands used in classifying commercial forest land in California.

a. Old growth. Stands in which mature trees9/ compose more than 80 percent of the conifer canopy.

b. Old growth--young growth. Stands in which mature trees compose from 50 to 80 percent of the conifer canopy.

c. Young growth--old growth. Stands in which mature trees compose 20 to 50 percent of the conifer canopy.

9/ All trees considered to have passed their optimum growth.

d. Young growth. Stands in which mature trees compose less than 20 percent of the conifer canopy.

1. Large young growth. For the Coast Range Pine and Westside Sierra subregions, more than 20 percent of the immature trees are larger than 11.0 inches d.b.h.; for the remaining subregions more than 5 percent of the immature trees are larger than 11.0 inches d.b.h.

2. Small young growth. Eighty percent or more (95 percent or more in the Eastside Sierra and Redwood--Douglas-fir subregions) of the immature trees are less than 11 inches d.b.h.

Stocking classes of commercial conifer stands

a. Well stocked. Stands that are 70 percent or more stocked with present or potential growing stock trees.

b. Medium stocked. Stands that are 40 to 69 percent stocked with present or potential growing stock trees.

c. Poorly stocked. Stands that are 10 to 39 percent stocked with present or potential growing stock trees.

d. Nonstocked. Areas that are 0 to 10 percent stocked with present or potential growing stock trees.

Tree Classes

Pole-timber trees. Trees 5.0 inches d.b.h. and larger of commercial species that do not meet specifications for saw-timber trees but do meet regional specifications of species, soundness, and freedom from defect.

Saw-timber trees. Trees of commercial species which have a minimum diameter at breast height of 11.0 inches and which meet the following specifications of merchantability:

a. For conifer species, 25 percent or more of the gross scale of the tree in board feet is in merchantable material.

b. For hardwood species, 40 percent or more of the gross scale of the tree in board feet is in merchantable material.

c. For all species, trees classified as merchantable on a board-foot basis are considered merchantable on a cubic-foot basis.

Salvable dead trees. Merchantable dead standing trees not less than 30 inches d.b.h. and considered by the observer to be without evidence of defect and not excessively limby.

Cull and Defect

Cull factor. Amount of defect expressed as a percent of the gross volume of the tree or stand.

Cull trees. Live trees of saw-timber or pole-timber size that are unmerchantable for sawlogs now or prospectively because of defect or rot.

Volume

Net volume. Gross wood volume less deduction for cull and breakage.

All-timber volume. Net volume in cubic feet of live and salvable dead saw-timber trees and pole-timber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark. Includes bole only of softwoods but both bole and limbs of hardwoods to a minimum 4.0-inch diameter inside bark.

Live saw-timber volume. Net volume in board feet, International 1/4-inch rule, of live saw-timber trees.

a. Redwood trees. Volumes measured to an average utilized top with a minimum of 12.0 inches diameter inside bark.

b. All other trees. Volumes measured to an average utilized top with a minimum of 8.0 inches diameter inside bark.

Growing stock. Net volume in cubic feet of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0-inch top (central stem) inside bark.

Sawlog portion. Net volume in cubic feet of saw-timber trees between stump and merchantable top.

Upper stem portion. Net volume in cubic feet of bole of saw-timber trees between merchantable top and a point on the bole with a minimum top 4.0 inches in diameter inside bark when it exists.

Growth and Mortality

Net annual growth. The change during a specified year in net volume of live saw timber or growing stock on commercial forest land resulting from natural causes.

Annual timber mortality. The net volume removed from live saw timber or growing stock on commercial forest land during a specified year through death from natural causes.

Timber Cut

Annual cut. The net volume of live saw timber or growing stock cut or killed by logging on commercial forest land during a specified year.

Logging residue. The net volume of live saw timber or growing stock cut or killed by logging on commercial forest land and not converted to timber products.

Timber products. The volume of timber products cut from growing stock and other sources.

Timber products from other sources. The volume of timber products cut from cull trees, salvable dead trees, limbs, saplings, material less than 4 inches in diameter, timber on noncommercial and nonforest lands, and residues from manufacturing plants.

Ownership Classes

National forest. Federal lands which, by executive order or statute, have been designated as national forests, purchase units, or experimental areas or have been placed under the administration of the Forest Service.

Indian. Indian tribal lands and trust allotments, that is, lands held in fee by the Federal Government but administered and managed for Indian tribal groups or allotted in trust to individual Indians.

Bureau of Land Management. Federal lands under the jurisdiction of the Bureau of Land Management.

Other Federal. Lands owned by the Federal Government not classed as national forest, Indian, or Bureau of Land Management.

State. Lands in State ownership or lands under lease to States for 50 years or more.

County and municipal. Lands in county and municipal ownership.

Private. Land in private ownership.

a. Farm. Private commercial forest land in farms but excluding leased lands on which farm operators do not control timber use.

b. Industrial and other private ownership. Commercial forest land in private ownership other than farm.

Tree Species

Principal tree species found on the commercial forest land in the State include:

Softwoods

Redwood	Sequoia sempervirens (D. Don) Endl.
Douglas-fir	Pseudotsuga menziesii (Mirb.) Franco
Ponderosa pine	Pinus ponderosa Laws.
Jeffrey pine	Pinus jeffreyi Grev. and Balf.
Sugar pine	Pinus lambertiana Dougl.
Western white pine	Pinus monticola Dougl.
California red fir	Abies magnifica A. Murr.
White fir	Abies concolor (Gord. and Glend.) Lindl.
Grand fir	Abies grandis (Dougl.) Lindl.
Incense-cedar	Libocedrus decurrens Torr.
Port-Orford-cedar	Chamaecyparis lawsoniana (A. Murr.) Parl.
Sitka spruce	Picea sitchensis (Bong.) Carr.
Western hemlock	Tsuga heterophylla (Raf.) Sarg.
Mountain hemlock	Tsuga mertensiana (Bong.) Carr.
Western redcedar	Thuya plicata Donn.
Lodgepole pine	Pinus contorta Dougl.

Hardwoods

California black oak	Quercus kelloggii Newb.
Tanoak	Lithocarpus densiflorus (Hook. & Arn.)Rehd.
Aspen	Populus tremuloides Michx.
Alder (white alder)	Alnus rhombifolia Nutt.
(red alder)	Alnus rubra Bong.

FOREST SURVEY PUBLICATIONS

Forest Survey Release No.	Title	Date Issued
1	Vegetation Types and Forest Conditions of the Santa Cruz Mountains Unit of California. (Out of print.)	May 1, 1939
2	Vegetation Types and Forest Conditions of Douglas, Ormsby and Southwestern Washoe Counties, Nevada. (Out of print.)	Aug. 1, 1941
3	Land Utilization Statistics for the Northern Sierra Nevada. (Out of print.)	May 1, 1942
4	Forest Areas, Timber Volumes and Vegetation Types in California.	Mar. 1, 1946
5	Forest Land Ownership in Northern Mendocino County, California.	June 1, 1948
6	Commodity Production from Commercial Forest Land in California - 1946.	June 15, 1948
7	Cull Factors for Forest-Tree Species in Northwestern California.	June 1, 1950
8	Area and Ownership of Forest Land in Siskiyou County, California.	Dec., 1950
9	Area and Ownership of Forest Land in Trinity County, California.	April, 1951
10	Area and Ownership of Forest Land in Mendocino County, California.	Oct., 1951
11	Area and Ownership of Forest Land in Lake County, California.	Feb., 1952
12	Forest Statistics for the Coast Range Pine Subregion in California.	April, 1952
13	Cull and Breakage Factors and Other Tree Measurement Tables for Redwood.	May, 1952
14	Area and Ownership of Forest Land in Sonoma County, California.	Sept., 1952

Forest Survey Release No.	Title	Date Issued
15	Forest Products Used in Mines in California and Nevada.	Nov., 1952
16	Area and Ownership of Forest Land in Humboldt County, California.	Nov., 1952
17	Lumber Production in California and Nevada - 1951	Dec., 1952
18	Area and Ownership of Forest Land in Del Norte County, California	Jan., 1953
19	Forest Statistics for the Redwood--Douglas-fir Subregion in California.	Jan., 1953
20	A Century of Lumber Production in California and Nevada.	June, 1953
21	Area and Ownership of Forest Land in Santa Cruz County, California.	Aug., 1953
22	Area and Ownership of Forest Land in San Mateo County, California.	May, 1954
23	Output of Forest Products in California, 1952.	July, 1954
24	Area and Ownership of Forest Land in Shasta County, California.	Nov., 1954

Forest Research Note No.		
55	Production of Lumber and Other Sawed Products in California and Nevada, 1946	Oct. 1, 1947
63	Production of Logs and Bolts for Plywood, Veneer, Pulpwood, and Cooperage in California, 1948.	Sept. 15, 1949
65	Estimated Lumber Production in California, 1948.	Dec. 8, 1949
66	Board-Foot and Cubic-Foot Volume Tables for Second-Growth Redwoods.	Feb. 6, 1950

Forest Research Note No.	Title	Date Issued
67	Board-Foot and Cubic-Foot Volume Tables for Some California Hardwoods.	Feb. 23, 1950
79	Production of Logs and Bolts for Plywood, Pulp, Container Veneer, Shingles, Cooperage, Poles, and Piling in California, 1950.	Nov., 1951
90	Cull and Breakage Factors for Pines and Incense-Cedar in the Sierra Nevada.	Apr. 13, 1954

Technical Papers

2	Ownership and Use of Forest Land in the Coast Range Pine Subregion of California.	June 1, 1953
7	Ownership and Use of Forest Land in the Redwood--Douglas-fir Subregion of California.	June, 1954

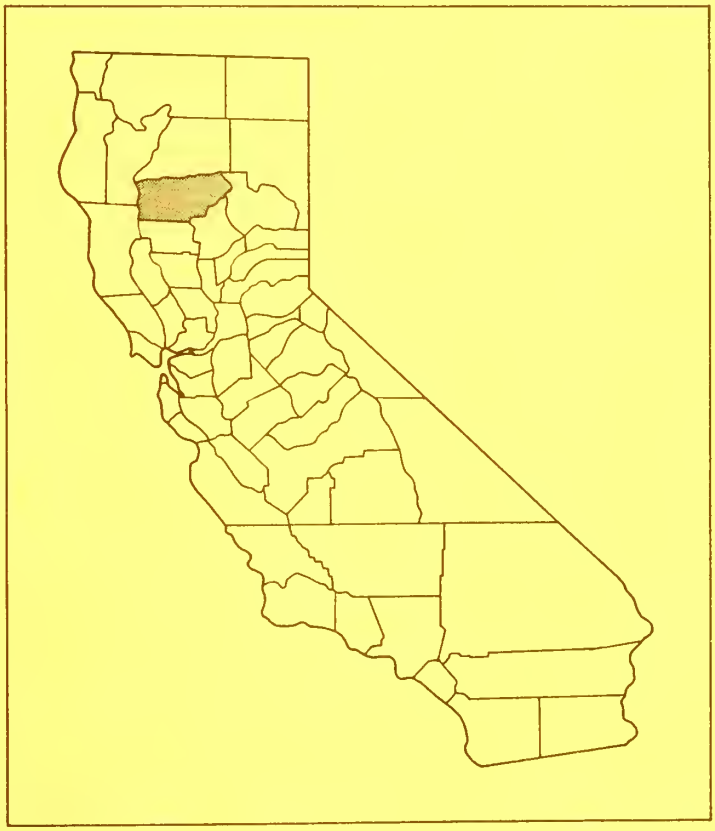
Agriculture--Berkeley

Forest Survey Release No. 26 April 1955

AREA AND OWNERSHIP OF FOREST LAND IN TEHAMA COUNTY, CALIFORNIA

HAROLD L. BAKER, Forest Economist
Forest Service

ADON POLI, Agricultural Economist
Agricultural Research Service



U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
George M. Jemison, Director
Berkeley, California

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CALIFORNIA FOREST AND RANGE EXPERIMENT STATION

Survey procedures and supervision of basic data collection: A. E. Wieslander and G. F. Burks

Photo interpretation: W. L. Colwell, Jr., I. I. Holland, J. C. Gilman, M. Swensen, K. Schoenlank, and W. P. Hoffman

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Illustrative material: A. Kursinski

Tables and multilith plates: R. F. Perenin

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CALIFORNIA STATE DIVISION OF FORESTRY. Ownership Survey questionnaires: State Forester and members of his staff.

TEHAMA COUNTY. Basic ownership data: County Assessor and Tax Collector.

The ownership data presented in this report were the responsibility of the Production Economics Research Branch, Agricultural Research Service, U. S. Department of Agriculture.

The California Forest and Range Experiment Station is maintained at Berkeley in cooperation with the University of California

Agriculture--Berkeley

FOREWORD

The Forest Survey, authorized by the McSweeney-McNary Act of 1928, is a nationwide activity of the Forest Service designed to provide a comprehensive survey of the forest resource of the United States. The five-fold objective of this Survey is:

(1) To make an inventory of all forest land and the standing timber on that land.

(2) To measure the current and probable future rate of timber growth, and the productive capacity of the forest land.

(3) To determine the rate of timber depletion through cutting, fire, insects, disease, and other causes.

(4) To determine the present and expected requirements for lumber and other forest products.

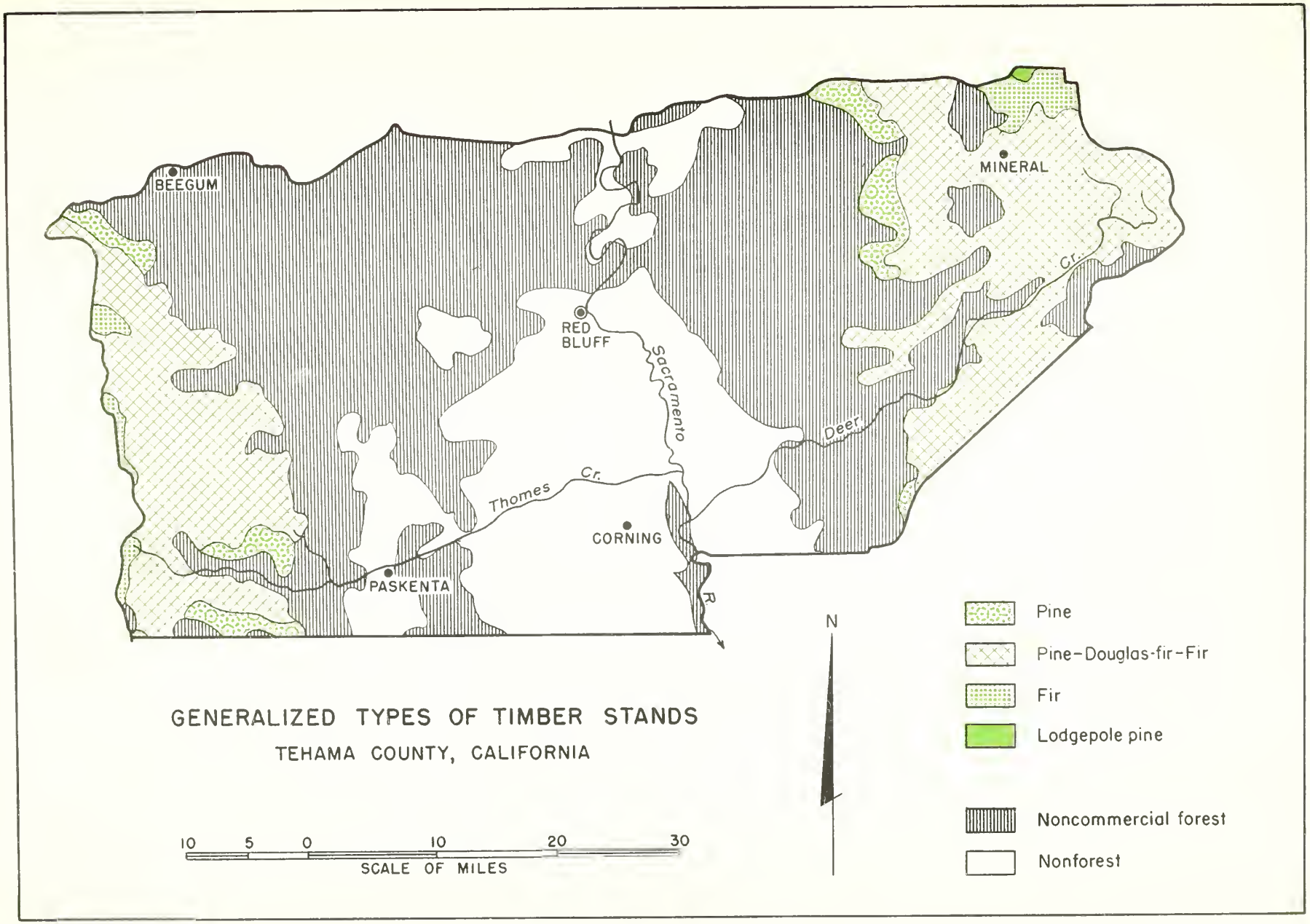
(5) To provide, through correlation of these facts with one another and with other economic knowledge, a basis for formulating local, State, and national forest policies and management plans.

Responsibility for this work in California has been assigned the Division of Forest Economics of the California Forest and Range Experiment Station at Berkeley.

This release presents the statistics of forest area and forest land ownership in Tehama County, California as of 1951. Besides the statistics on the extent, location, and condition of all forest lands and the timber stands on those lands, this report presents quantitative data on type and size of ownership and number and kinds of owners. Estimates of timber volume are not included because volume sampling was not designed to provide this information for single counties.

Similar statistical reports have been issued for the leading timber counties of the Coast Range Pine and Redwood--Douglas-fir Survey units. Also, major statistical reports have been published for these units which present data on forest areas, timber volumes, ownership, growth, and drain.

CONTENTS



GENERALIZED TYPES OF TIMBER STANDS

TEHAMA COUNTY, CALIFORNIA

FACTS ABOUT TEHAMA COUNTY

Tehama County stretches across the upper part of the Sacramento Valley from the Sierra Nevadas in the east to the Coast Range in the west. Between these two mountain ranges lies a wide belt of productive farmland. Elevations rise gently from the rich bottom land along the Sacramento River to wide plains and tablelands then abruptly to foothills and high mountain peaks. Mountains within the county attain maximum altitudes of about 9,000 feet. The Sacramento River and its tributaries form the major drainage system of the county.

The commercial forest land lies in the mountainous areas east and west of the valley and foothills. Pine, Douglas-fir, and fir are the predominant timber species. Slightly more than half of the commercial forest land is in private ownership. Most of the publicly owned land is in national forests.

Agriculture and lumbering are the major industries of the county. The range and pasture lands of the foothills and valley support numerous cattle and sheep. The rich farmlands produce large quantities of olives and other fruit. Barley, alfalfa, dairy products and poultry are also important sources of farm income. Lumber production in Tehama County has increased steadily from 10 million board feet in 1941 to 61 million in 1951.

Other industries of economic significance are recreation and mining.

THE TOTAL LAND AREA OF TEHAMA COUNTY IS 1,903,000 acres

72 percent of this is

FOREST LAND 1,378,000 acres

68 percent of the forest land is classified as noncommercial. Of this, 65 percent is not suitable for growing commercial timber crops but is valuable for producing forage and water. The other 3 percent is productive forest land withdrawn from commercial timber utilization to provide recreation areas and protect critical watersheds. But

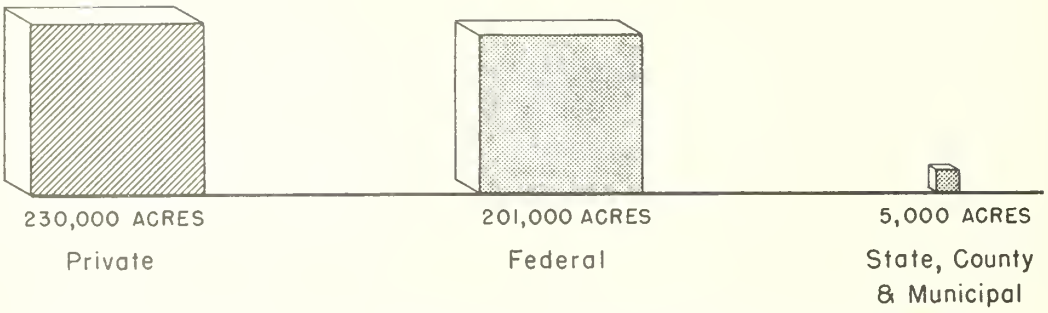
32 percent is

COMMERCIAL FOREST LAND 436,000 acres

This land is growing or capable of growing usable crops of wood.

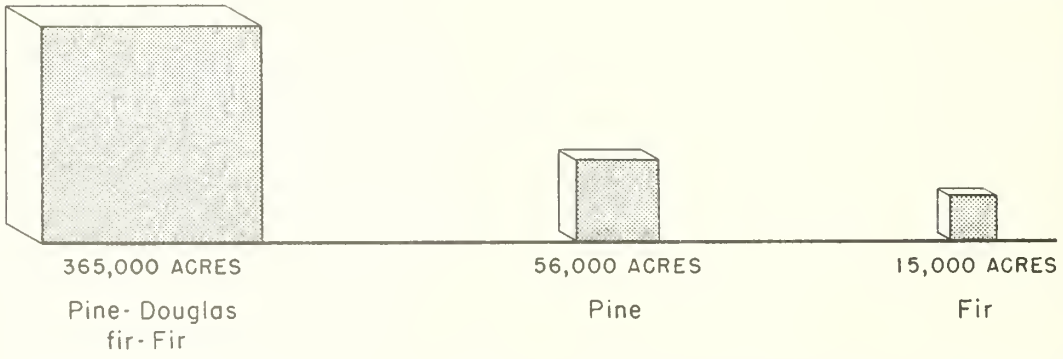
COMMERCIAL FOREST LAND

OWNERSHIP



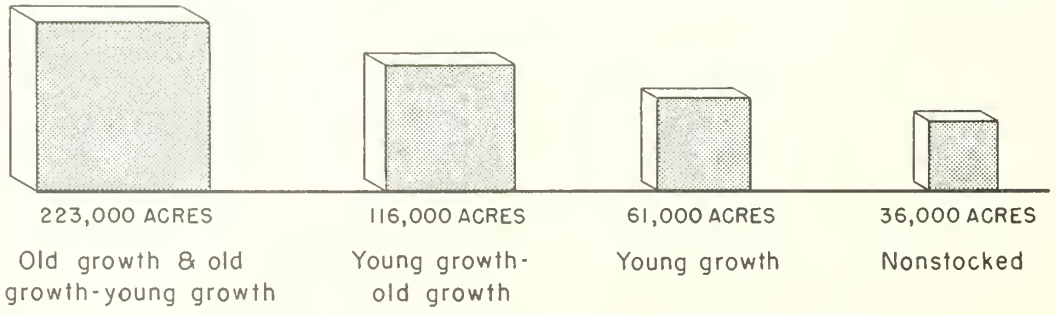
More than half of the commercial forest land is in private ownership. Nearly all the rest is in Federal ownership--principally the Trinity, Mendocino, and Lassen National Forests. (Table 1)

TYPES



Mixed stands of pine, Douglas-fir, and fir occupy more than four-fifths of the commercial forest land. The rest of the timber-producing land is occupied principally by the pine type. (Table 5)

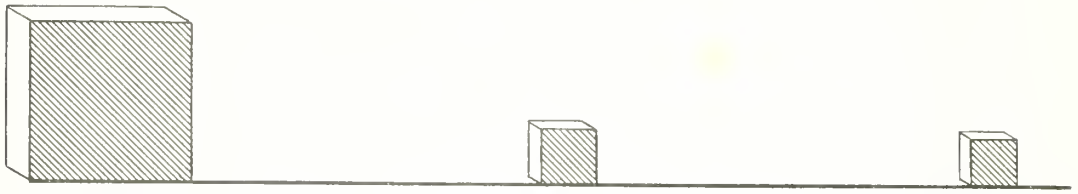
AGE CLASSES



Old-growth stands of timber occupy about half of the commercial forest land. These stands contain most of the merchantable timber of the county. Mixed stands of mature and immature timber in which immature timber predominates cover 27 percent. Fourteen percent of the timber producing land is in young-growth timber stands, and 8 percent is classified as nonstocked. (Table 7)

PRIVATELY OWNED COMMERCIAL FOREST LAND

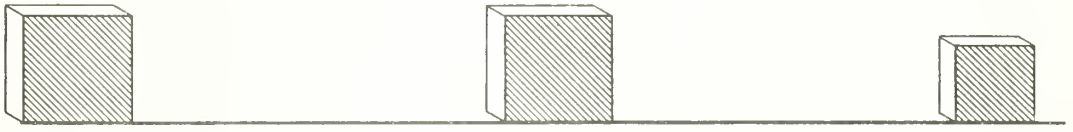
TYPE OF OWNERSHIP



183,000 ACRES	28,000 ACRES	19,000 ACRES
Timber operators and holders	Recreational and others	Farmers

Corporations and persons engaged in logging and milling operations or planning future operations own four-fifths of the privately owned commercial forest land. Owners of recreational, residential, and other similar properties have 12 percent. Ranchers and farmers own 8 percent. (Table 3)

SIZE OF OWNERSHIP



88,000 ACRES	89,000 ACRES	53,000 ACRES
50,000 acres and larger	5,000 to 49,000 acres	Less than 5,000 acres

Large and medium-sized holdings each consist of about 40 percent of the commercial forest land. The rest is in small holdings of less than 5,000 acres. (Table 6)

Table 1.- Total land area, by major classes of land and by ownership class, 1951

Class of land	Total all ownerships	Federally owned 1/				State, County, and municipal	Private	Unclassified 3/
		Total federal	National forest	National park	Other 2/			
	Thousand acres							
Forest land								
Commercial	436	201	197	-	4	5	230	-
Noncommercial Reserved from commercial timber use	41	41	39	2	-	-	-	-
Unproductive for timber use 4/	901	158	133	1	24	17	199	527
Total forest land	1,378	400	369	3	28	22	429	527
Nonforest land	525	10	9	1	(5/)	1	21	493
All land	6/1,903	410	378	4	28	23	450	1,020

1/ Because all figures in this tabulation are derived by sampling procedure, total acreage figures vary somewhat from published land acreages of public agencies listed here. For details on sampling procedures and sampling errors for various area sizes see Appendix.

2/ Chiefly public domain.

3/ A portion of the county located outside the broad limits of commercial forest land and classified as agricultural and otherwise intensively developed land. Ownership aspects of this area were not considered essential to this study.

4/ Includes 17,000 acres withdrawn for special use.

5/ Less than 500 acres.

6/ From "Areas of the United States 1940," U. S. Bureau of the Census.

Table 2.- Total land area, by cover type and use, 1951

Cover type and use	Area
	Thousand acres
Commercial forest land	
Pine	56
Fir	15
Pine--Douglas-fir--Fir	365
Total commercial	436
Noncommercial forest land	
Productive--reserved	
Pine	-
Fir	4
Pine--Douglas-fir--Fir	37
Total	41
Unproductive	
Coniferous woodland	41
Hardwood (woodland)	67
Woodland-grass	595
Chaparral	198
Total	901
Total noncommercial	942
Total forest land	1,378
Nonforest land	
Grass	341
Barren	14
Cultivated, urban and industrial	170
Water[2/]	(1/)
Total nonforest land	525
All land	1,903

1/ Less than 500 acres.

2/ Water according to survey standards of area classification but defined by the Bureau of Census as land.

Table 3.- Number of ownerships and area of privately owned land, by type of ownership, 1951

Type of ownership	Ownerships		Total land area		Commercial forest land	Non-commercial forest land	Non-forest land
	No.	Pct.	Thousand acres	Pct.	--- Thousand acres ---		
Timber operating company	7	2.8	139	30.9	130	9	(1/)
Timber holding company	1	0.4	28	6.2	10	18	(1/)
Timber operating individual	3	1.2	41	9.2	39	2	(1/)
Timber holding individual	11	4.3	5	1.1	4	1	-
Range livestock farming company	-	-	-	-	-	-	-
Range livestock farming individual	77	30.3	179	39.8	16	145	18
Other farmers	50	19.7	6	1.3	3	2	1
Recreational property owners	45	17.7	6	1.3	4	1	1
Other classified owners2/	60	23.6	36	8.0	16	19	1
Unclassified3/	-	-	10	2.2	8	2	(1/)
All types	254	100.0	450	100.0	230	199	21

1/ Less than 500 acres.

2/ All other land owners whose classification is known but does not logically fit the classes listed above. Examples are owners of land held for residential purposes only, mining claims, and reservoir sites.

3/ Small urban, suburban, and industrial ownerships that are too small to map and classify properly; nonforest ownerships within strictly agricultural communities; and ownerships that for other reasons cannot be classified and placed in appropriate categories.

Table 4.- Number of ownerships and area of privately owned land, by size of ownership, 1951

Size of ownership	Ownerships		Total land area		Commercial forest land	Non-commercial forest land	Non-forest land
Acres	No.	Pct.	Thousand acres	Pct.	----- Thousand acres -----		
1- 179	136	53.5	18	4.1	9	8	1
180- 379	21	8.2	6	1.4	5	1	(1/)
380- 699	23	9.1	15	3.4	4	9	2
700- 1,299	15	5.9	16	3.7	2	14	(1/)
1,300- 2,599	23	9.1	40	9.2	13	23	4
2,600- 4,999	17	6.7	59	13.5	10	43	6
5,000- 9,999	10	3.9	44	10.1	13	29	2
10,000-29,999	5	2.0	47	10.8	(1/)	42	5
30,000-49,999	3	1.2	97	22.2	76	21	(1/)
50,000 and over	1	0.4	94	21.6	88	6	(1/)
All classified ownerships	254	100.0	436	100.0	220	196	20
Unclassified	-	-	14	-	10	3	1
Total acreage	-	-	450	-	230	199	21

1/ Less than 500 acres.

Table 5.- Commercial forest land, by type of ownership and by timber type, 1951

Type of ownership	Total		Timber type		
			Pine	Fir	Pine--Douglas-fir--Fir
	Thousand acres	Pct.	------ Thousand acres ------		
National Forest	197	45.2	25	14	158
Other Federal	4	0.9	1	-	3
Tax deeded	(1/)	-	-	-	(1/)
Other State	5	1.1	(1/)	-	5
Timber operating company	130	29.8	15	-	115
Timber holding company	10	2.3	-	-	10
Timber operating individual	39	9.0	2	-	37
Timber holding individual	4	0.9	(1/)	-	4
Range livestock farming company	-	-	-	-	-
Range livestock farming individual	16	3.7	5	-	11
Other farmers	3	0.7	2	-	1
Recreational property owners	4	0.9	1	-	3
Other classified owners	16	3.7	5	1	10
Unclassified	8	1.8	-	-	8
All types	436	100.0	56	15	365

1/ Less than 500 acres.

Table 6.- Privately owned commercial forest land, by size of ownership and by timber type, 1951

Size of ownership	Total		Timber type		
			Pine	Fir	Pine--Douglas-fir--Fir
Acres	Thousand acres	Pct	------ Thousand acres ------		
1- 179	9	4.1	3	1	5
180- 379	5	2.3	2	-	3
380- 699	4	1.8	1	-	3
700- 1,299	2	0.9	-	-	2
1,300- 2,599	13	5.9	5	-	8
2,600- 4,999	10	4.5	4	-	6
5,000- 9,999	13	5.9	3	-	10
10,000-29,999	(1/)	-	(1/)	-	(1/)
30,000-49,999	76	34.6	-	-	76
50,000 and over	88	40.0	11	-	77
All classified ownerships	220	100.0	29	1	190
Unclassified	10	-	1	-	9
Total acreage	230	-	30	1	199

1/ Less than 500 acres.

Table 7.- Commercial forest land, by type of ownership and by age class of timber, 1951

Type of ownership	Total		Age class					
			Old growth	Old growth-young growth	Young growth-old growth	Large young growth	Small young growth	Non-stocked 1/
	Thousand acres	Pct.	Thousand acres					
National Forest	197	45.2	2	102	46	11	14	22
Other Federal	4	0.9	(2/)	2	1	(2/)	(2/)	1
Tax deeded	(2/)	-	-	(2/)	-	-	-	-
Other State	5	1.1	-	3	1	-	(2/)	1
Timber operating company	130	29.8	2	64	37	11	9	7
Timber holding company	10	2.3	-	9	1	(2/)	-	-
Timber operating individual	39	9.0	1	19	17	1	-	1
Timber holding individual	4	0.9	(2/)	1	1	1	1	-
Range livestock farming company	-	-	-	-	-	-	-	-
Range livestock farming individual	16	3.7	-	6	5	2	2	1
Other farmers	3	0.7	1	1	(2/)	1	(2/)	(2/)
Recreational property owners	4	0.9	-	1	1	-	1	1
Other classified owners	16	3.7	-	7	3	3	1	2
Unclassified	8	1.8	-	2	3	2	1	(2/)
All types	436	100.0	6	217	116	32	29	36

1/ Commercial forest land nonstocked with commercial conifers but covered primarily with hardwoods, grass, and chaparral.

2/ Less than 500 acres.

AGE CLASSES OF TIMBER STANDS ON COMMERCIAL FOREST LAND

Old growth

Young growth – old growth

Large young growth

Small young growth

Table 8.- Privately owned commercial forest land, by size of ownership and by age class of timber, 1951

Size of ownership (Acres)	Total		Age class					
			Old growth	Old growth-young growth	Young growth-old growth	Large young growth	Small young growth	Non-stocked
	Thousand acres	Pct.	Thousand acres					
1- 179	9	4.1	1	3	2	1	1	1
180- 379	5	2.3	-	2	1	1	1	(1/)
380- 699	4	1.8	-	2	(1/)	1	1	(1/)
700- 1,299	2	0.9	-	1	1	-	-	-
1,300- 2,599	13	6.4	(1/)	5	3	2	1	2
2,600- 4,999	10	4.5	-	4	2	1	2	1
5,000- 9,999	13	5.9	-	8	3	(1/)	(1/)	2
10,000-29,999	(1/)	-	-	-	(1/)	-	-	-
30,000-49,999	76	34.5	1	52	21	1	(1/)	1
50,000 and over	88	39.6	2	31	31	12	8	4
All classified ownerships	220	100.0	4	108	64	19	14	11
Unclassified	10	-	-	2	4	2	1	1
Total acreage	230	-	4	110	68	21	15	12

1/ Less than 500 acres.

Table 9.- Commercial forest land, by age class of timber and by density of stand, 1951

Age class	Total	Density of stand			
		Dense and semidense	Open	Very open	Non-stocked
	---------- Thousand acres ----------				
Old growth	6	(1/)	1	5	-
Old growth--young growth	217	99	99	19	-
Young growth--old growth	116	69	33	14	-
Large young growth	32	19	6	7	-
Small young growth	29	9	15	5	-
Nonstocked	36	-	-	-	36
Total	436	196	154	50	36

1/ Less than 500 acres.

Table 10.- Commercial forest land, by timber type and by site quality, 1951

Timber type	Total	Site quality		
		High	Medium	Low
	---------- Thousand acres ----------			
Pine	56	-	47	9
Fir	15	5	10	-
Pine--Douglas-fir--Fir	365	25	286	54
All types	436	30	343	63

Table 11.- Commercial forest land area, by timber type, stand-size class, degree of stocking, and ownership, 1951

Timber type and stand-size class[1]	All areas			Degree of stocking[2] and ownership											
				Well-stocked			Medium-stocked			Poorly stocked			Nonstocked		
	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
	Thousand acres														
Pine															
Old-growth saw timber	39	21	18	8	6	2	21	10	11	10	5	5	-	-	-
Young-growth saw timber	9	2	7	2	1	1	4	(3/)	4	3	1	2	-	-	-
Pole timber	2	(3/)	2	1	(3/)	1	1	-	1	(3/)	-	(3/)	-	-	-
Nonstocked	6	3	3	-	-	-	-	-	-	-	-	-	6	3	3
Total	56	26	30	11	7	4	26	10	16	13	6	7	6	3	3
Fir															
Old-growth saw timber	8	7	1	4	4	(3/)	3	3	-	1	-	1	-	-	-
Young-growth saw timber	1	1	-	1	1	-	-	-	-	-	-	-	-	-	-
Pole timber	3	3	-	1	1	-	2	2	-	(3/)	(3/)	-	-	-	-
Nonstocked	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-
Total	15	14	1	6	6	(3/)	5	5	-	1	(3/)	1	3	3	-
Pine--Douglas-fir--Fir															
Old-growth saw timber	292	129	163	156	66	90	109	49	60	27	14	13	-	-	-
Young-growth saw timber	22	8	14	16	6	10	2	(3/)	2	4	2	2	-	-	-
Pole timber	24	11	13	7	3	4	12	5	7	5	3	2	-	-	-
Nonstocked	27	18	9	-	-	-	-	-	-	-	-	-	27	18	9
Total	365	166	199	179	75	104	123	54	69	36	19	17	27	18	9
All types															
Old-growth saw timber	339	157	182	168	76	92	133	62	71	38	19	19	-	-	-
Young-growth saw timber	32	11	21	19	8	11	6	(3/)	6	7	3	4	-	-	-
Pole timber	29	14	15	9	4	5	15	7	8	5	3	2	-	-	-
Nonstocked	36	24	12	-	-	-	-	-	-	-	-	-	36	24	12
Total	436	206	230	196	88	108	154	69	85	50	25	25	36	24	12

1/ See relationship of stand-size classes to age classes, page 16.

2/ To obtain degree of stocking, Survey density classes were converted as follows: dense and semidense -- well stocked; open -- medium stocked; and very open -- poorly stocked.

3/ Less than 500 acres.

PROCEDURES

Area delineation

To determine the extent, location, and condition of all forest lands in Tehama County, aerial photographs were delineated on the basis of (1) present cover of vegetation, (2) suitability for growing timber crops, and (3) age class and density of timber stands. The minimum unit classified and mapped under the Federal Survey was forty acres. However, under a cooperative agreement with the State Division of Forestry, classification and mapping were extended to a 10-acre minimum on lands outside the national forest boundary.

The segregation of lands suitable for growing timber crops from other lands was a matter of some difficulty, particularly where commercial conifers were entirely lacking. If these nonstocked areas were located in a timber zone where commercial conifers normally grow, they were classified as commercial forest land. While this assumption may be true in most cases, as verified by visible and historical evidence, soil surveys now in progress in other areas of California have demonstrated that some nonstocked areas have soils too shallow to grow timber. Inasmuch as the same situation probably exists throughout this county, some of the nonstocked areas classified in this report as commercial and reserved commercial forest land must reside in the doubtful category until soil surveys provide a basis for final classification.

Transfer to base maps

After photo delineation was completed, Timber Stand Maps were prepared by transferring photo classifications to 7-1/2-minute quadrangle size base maps at a common scale of 2 inches to the mile. Kind and density of vegetation, age structure and density of coniferous timber stands, and other information pertinent to the forest resource were shown. As a final preparation for area measurement other related information such as political and economic subdivisions, ownership, and commercial timber type boundaries was marked along north-south transect lines spaced 2 miles apart. Because logging and fire have caused changes in the timber classification since the date of aerial photography, adjustments of age-density classes were made along these transect lines after a field examination. This was done so that class acreages when compiled would show conditions as of the inventory year.

Ownership determination

Information on land ownership in Tehama County was obtained from the county tax assessment rolls, and other official records of the County Assessor and Tax Collector, using a line sampling technique.1/

1/ Details of the line sampling method used for estimating area and procedure for estimating number of owners are given in "A New Approach to Forest Ownership Surveys," by A. A. Hasel and Adon Poli, Land Economics, Vol. XXV, No. 1, Feb. 1949, pp. 1-10.

Ownership boundaries, taken from county plat maps, were marked along the transect lines drawn on the quadrangle base maps. The proportion of the total line traversing an ownership class was taken as the proportion of the total acreage in that particular class. This acreage was classified further by measuring the intercepts of the various classifications of vegetation and timber stands used in the Forest Survey.

Owners of properties traversed by the sample lines constituted the ownership sample. The property records of the county provided the address of the owners, and the acreage of each parcel of land in the sample. The acreage figures were used to classify private ownerships and land area by size. Each sample owner was mailed a questionnaire card by the State Division of Forestry. Answers on these cards provided information used to classify the sample ownerships as to type of ownership. Similar information about the land of nonrespondents was obtained by a field followup, in which key informants were questioned in local public offices and in the communities where the owners have their land.

Area measurement and compilation

To estimate areas, parallel lines spaced 2 miles apart were drawn mainly north and south (with a few east and west) on the quadrangle base maps. Acreage figures were then obtained by recording line intercept measurements of all pertinent subdivisions along each sample line transecting the quadrangles. These subdivisions included age, density, and type of timber stands, and type and size of ownership. The ratio of total line length to total area for the quadrangle provided the factor to convert line segments in inches to area in acres. These acreages were then totaled by county, and adjusted if necessary, to check with the 1940 Bureau of Census acreages by counties. Estimated acreage figures appearing in the tables were compiled and summarized by means of punch cards and card tabulating equipment.

Stand-size class determination

The national pattern established for the Forest Survey requires classification of commercial forest land into stand-size classes. To present California forest resource data in terms of stand-size classes, mapped age classes have been grouped as follows:

Age class	Stand-size class
Old growth) Old growth-young growth) Young growth-old growth)	Old growth saw timber
Large young growth	Young growth saw timber
Small young growth	Pole timber
Nonstocked	Nonstocked

The forest stands classified as saw timber by this grouping conform closely to the Forest Survey definitions. Areas of seedlings and saplings are not shown separately as these areas occurred in such small and widely scattered units that separate photo classification was not practicable. These areas were included with other stand-size classes, chiefly pole timber and nonstocked.

Site quality determination

Three broad site classes -- high, medium, and low -- have been used to express the relative capacity of commercial forest land to produce timber crops. One hundred eight separate field site determinations, well distributed over the three major timber types, were grouped into the three broad classes. For each type the number of site determinations in each site class was expressed as a percentage of all observations within the type. These percentages were then applied to the total area by type to provide estimates of relative site quality.

The relationship between the broad site quality classes and site class and site index ratings of commercial forest land is shown in the following table and explained in the appended footnotes.

Broad rating	All types except Douglas-fir		Douglas-fir types	
	Site class[1/]	Site index[2/]	Site class[3/]	Site index[4/]
High	IA	200	I	200
			II	170
	I	175	III	140
Medium	II	150		
	III	125	IV	110
Low	IV	100		
	V	75	V	80

1/ According to D. Dunning in Station Research Note No. 28, December 1, 1942, "A Site Classification for the Mixed-Conifer Selection Forests of the Sierra Nevada," California Forest and Range Experiment Station.

2/ The total height that the average dominant trees reach at 300 years of age.

3/ According to R. E. McArdle and W. H. Meyer in U. S. Department of Agriculture Technical Bulletin 201, October 1930, "The Yield of Douglas-fir in the Pacific Northwest."

4/ The total height that average dominant Douglas-fir trees reach at 100 years of age.

ACCURACY OF ESTIMATE

Estimates of acreages in the various classes of land as determined by Forest Survey procedures are subject to two general types of errors: (1) non-sampling errors in photo classification, mapping, tabulation, computation, and compilation, and (2) sampling errors which arise from taking a sample rather than making a complete inventory. Errors of the first type are kept to a minimum by frequent checking and close supervision of all field and office work. If these non-sampling errors are negligible or compensating, then the sampling errors provide measures of the reliability of the acreage estimates and can be computed by statistical methods. Magnitudes of the sampling errors depend on the intensity of the sample and the variability of the data.

For the principal classes of forest land of Tehama County, the sampling errors2/ are as follows:

Class	Sampling error	
	Acres	Percent
Forest land	16,536	1.2
Commercial forest land	15,696	3.6
Noncommercial forest land	22,608	2.4

Statistics of forest area by age class, type, and ownership classes presented in this report are subject to increasing sampling errors as the class acreages decrease. A partial range of area sampling errors applicable to areas in this report is shown below:

Acres in class	Sampling error in percent
10,000	21.0
20,000	14.5
40,000	10.5
100,000	6.5
200,000	4.5
500,000	3.0
1,000,000	2.0
2,000,000	1.5

2/ For one standard error; that is, the chances are two in three that the class acreages as determined by 100-percent measurement lie within the limits of the calculated acreages plus and minus the amounts shown.

DEFINITION OF TERMS

Area

Forest land area. Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or exerting an influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested areas; and (d) chaparral areas.

Commercial forest land area. Forest land which is (a) producing or capable of producing usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area. Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order which otherwise qualifies as commercial forest land and (b) incapable of yielding wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Chaparral land area. Lands supporting heavily branched dwarf trees or shrubs, usually evergreen, the crown cover of which normally covers more than 50 percent of the ground and whose primary value is watershed protection. The more common chaparral constituents are species of Quercus, Cercocarpus, Garrya, Ceanothus, Arctostaphylos, and Adenostoma. Types dominated by such shrubs as Artemisia, Opuntia, Purshia, Guttierrezia, or semidesert species are not commonly considered chaparral.

Nonforest land area. Land that does not qualify as forest land. Includes land which has never supported forest growth; land from which the forest has been removed to less than 10 percent stocking and has been developed for other use, such as grazing, agricultural, residential, or industrial; all land in thickly populated urban and suburban areas; and water classified as land by the Bureau of Census.

Timber stand classifications

Age classes of commercial conifer stands[3] on commercial forest land.

1. Old growth. Mature trees[4] compose more than 80 percent of the conifer canopy.

3/ Stands composed of the following species, singly or in combination: Ponderosa pine, Douglas-fir, Jeffrey pine, sugar pine, true firs (red and white), incense cedar, western white pine, mountain hemlock, and lodgepole pine.

4/ All trees that can be considered as having passed their optimum growth.

2. Old growth-young growth. Mature trees compose from 50 to 80 percent of the conifer canopy.

3. Young growth-old growth. Mature trees compose 20 to 50 percent of the conifer canopy.

4. Young growth. Mature trees compose less than 20 percent of the conifer canopy.

   a. Large young growth. More than 20 percent of the immature trees are larger than 11 inches d.b.h.

   b. Small young growth. Eighty percent or more of the immature trees are less than 11 inches d.b.h.

Stand-size classes of timber stands on commercial forest land.

1. Saw-timber stands. Defined as stands having a minimum net volume per acre of 5,000 board feet, International 1/4-inch rule, in saw-timber trees (11 inches d.b.h. and larger for all species).

   a. Old-growth saw-timber stands. Saw-timber stands in which over 50 percent of the net board-foot volume is in old growth saw-timber trees.

   b. Young-growth saw-timber stands. Saw-timber stands in which 50 percent or more of the net board-foot volume is in young growth saw-timber trees.

2. Pole-timber stands. Defined as stands failing to meet the saw-timber stand specification, but at least 10 percent stocked with pole-timber and larger trees and with at least half the minimum stocking in pole-timber trees (5.0 to 10.9 inches d.b.h.).

3. Seedling and sapling stands. Stands not qualifying as either saw-timber or pole-timber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

4. Nonstocked. Defined as areas of forest land not qualifying as saw-timber, pole-timber, or seedling and sapling stands.

Density classes of commercial conifer stands on commercial forest land.

1. Dense and semidense. Commercial conifers cover 50 percent or more of the ground space.

2. Open. Commercial conifers cover from 20 to 50 percent of the ground space.

3. Very open. Commercial conifers cover 5 to 20 percent of the ground space.

4. Nonstocked. Commercial conifers cover less than 5 percent of the ground space.

Timber type. An extensive area of commercial or withdrawn commercial forest land characterized by a predominant conifer species or group of conifer species. Other vegetation (such as hardwood and chaparral areas) and/or nonvegetation types (such as barren areas) may also occur in subordinate amounts within the same area.

Commercial timber types:

a. Pine--Douglas-fir--Fir. Areas with mixtures of the commercial pines and either Douglas-fir or the true firs in which the pines, Douglas-fir, and true firs each comprise 20 percent or more of the commercial conifer cover.

b. Pine. Areas with ponderosa, Jeffrey, or sugar pine comprising more than 80 percent of the commercial conifer cover or mixtures of these pines with lodgepole pine, western white pine, or mountain hemlock in which the aforenamed pines comprise 20 percent or more of the commercial conifer cover.

c. Fir. Areas with true firs (white and California red) comprising more than 80 percent of the commercial conifer cover; or mixtures of the true firs and lodgepole pine, mountain hemlock, or western white pine, in which the true firs comprise 20 percent or more of the timber cover.

Other timber and vegetation types:

a. Coniferous woodland. Areas with such trees as knobcone pine, digger pine, juniper, and scattered and scrub trees of other conifer species, covering more than 5 percent of the ground space and predominant over hardwoods that may partly compose the cover.

b. Hardwoods (woodland). Areas with hardwood trees (oaks, madrone, etc.), covering more than 50 percent of the ground except where in mixture with commercial conifers or herbaceous vegetation.

c. Woodland-grass. Areas with hardwood trees and herbaceous vegetation occurring in mixture--without commercial conifers--and the trees covering from 5 to 80 percent of the ground area and predominant over minor conifers[5/] present in the cover.

5/ Minor conifer species are knobcone pine, digger pine, juniper, Pacific yew, and California torreya.

d. Shrub and herb types consist of the following, where not in mixture with minor conifers or hardwood.

1. Chaparral. Areas with such shrubs as manzanita, ceanothus, scrub oaks, etc., covering more than 50 percent of the ground.

2. Grass. Areas with grasses and associated herbaceous vegetation covering more than 50 percent of the ground except where the type qualifies as woodland-grass.

Nonvegetation types:

a. Barren. Bare ground, rocky areas, river beds, mine dredgings, and talus essentially devoid of vegetation.

b. Cultivated, urban, and industrial. Areas that are under cultivation or are used for residential or industrial purposes.

Ownership classifications

National forest. Federal lands which, by executive order or statute, have been designated as national forests, purchase units, or experimental areas or have been placed under the administration of the Forest Service.

National park. Federal lands which have been designated as national parks, monuments, or recreational areas and are administered by the National Park Service.

Other Federal. All other lands owned by the Federal Government not classed as national forest or national park.

Tax deeded. Formerly privately owned land but now deeded to the State for nonpayment of taxes.

Other State. Lands in State ownership other than State forests, State parks, or tax deeded.

Timber operating company. A corporation actively engaged in commercial logging and sawing of timber as a major enterprise.

Timber holding company. A corporation holding timberland principally for future commercial timber operations. The timber may be held for the company's own future use or for sale to other operators.

Timber operating individual. A person whose major enterprise is commercial timber operations. This includes individuals logging timber, operating a large or small sawmill, or splitting timber commercially for sale.

Timber holding individual. A person holding timberland principally for future commercial timber operations. The timber may be held for his own future operations or for sale to other operators.

Range livestock farming company. A corporation engaged primarily in range livestock farming operations.

Range livestock farming individual. A person whose major enterprise is range livestock farming.

Other farmers. Persons or corporations that have farming as their major activity, but whose principal agricultural enterprise is not range livestock farming.

Recreational property owners. Persons or corporations holding land principally for recreational purposes.

Other classified owners. All other land owners whose classification is known but does not logically fit the classes listed above. Examples are owners of land held for residential purposes only, mining claims, and reservoir sites.

Unclassified. Land ownerships in urban, suburban, and industrial settlements that are too small to map and classify properly, and ownerships that for other reasons cannot be classified and placed in appropriate categories.

WOOD CHARCOAL IN CALIFORNIA

RICHARD H. MAY

FOREST SURVEY
RELEASE No. 28
SEPTEMBER - 1957

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
KEITH ARNOLD, DIRECTOR

FOREST SERVICE U. S. DEPARTMENT OF AGRICULTURE

ACKNOWLEDGMENTS

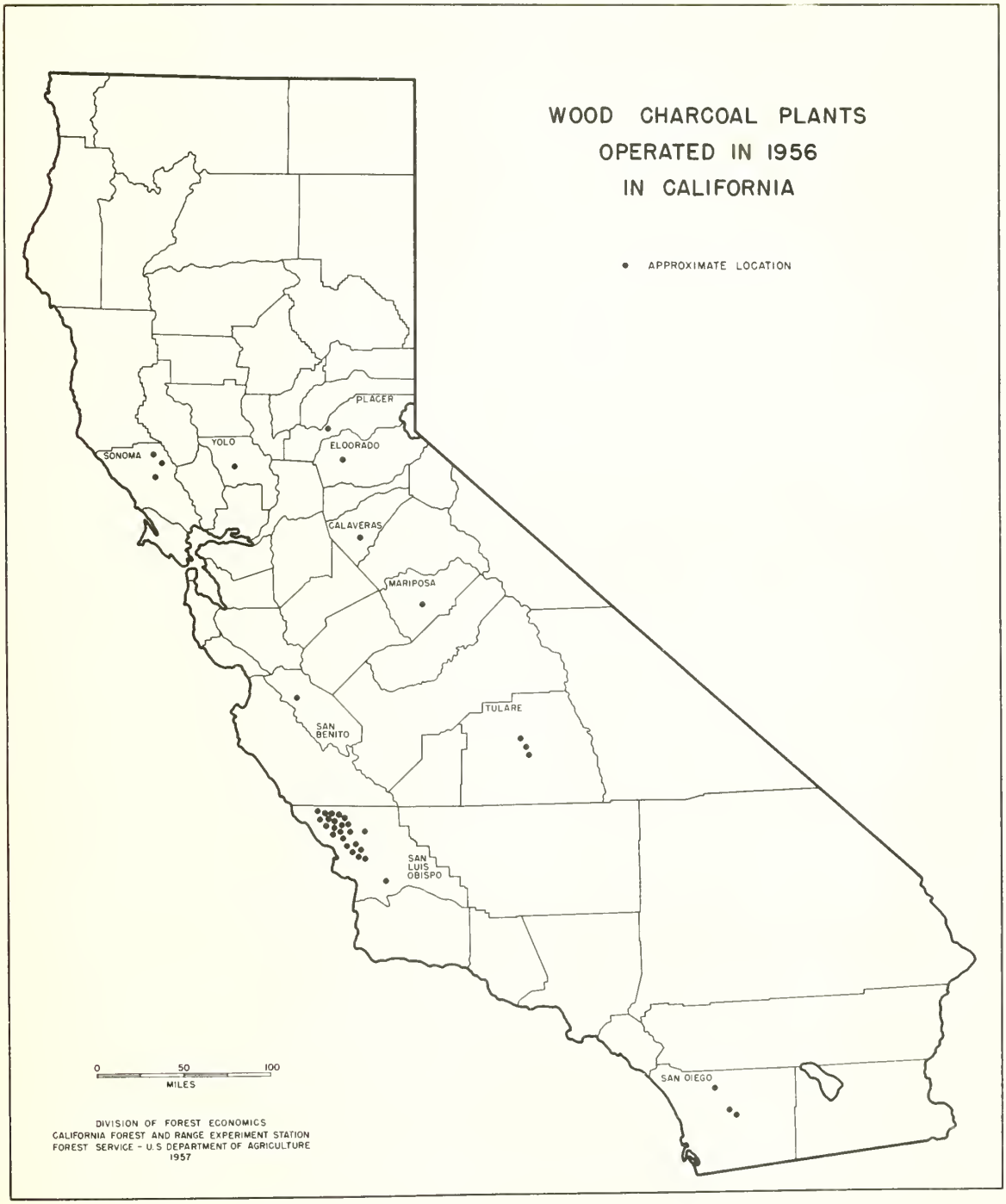
The California Station thanks the charcoal producers of California for providing information which has made this report possible. This Station also thanks the State of California Division of Forestry for a major share in compiling the list of operators. To the Extension Service of the University of California, particularly Extension Forester Ed Gilden, the Station is indebted for assistance in obtaining information regarding non-reporting plants.

NOTE

Anyone wishing information on charcoal kiln design or construction may obtain it by writing to the Director of this Station, P.O. Box 245, Berkeley 1, California; or to the U. S. Forest Products Laboratory, Madison 5, Wisconsin.

The California Forest and Range Experiment Station is maintained at Berkeley, California, in cooperation with the University of California.

Agriculture--Forest Service, Berkeley, Calif.


WOOD CHARCOAL PLANTS
OPERATED IN 1956
IN CALIFORNIA
• APPROXIMATE LOCATION
PLACER
YOLO
ELDORADO
SONOMA
CALAVERAS
MARIPOSA
TULARE
SAN BENITO
SAN LUIS OBISPO
SAN DIEGO
0 50 100
MILES
DIVISION OF FOREST ECONOMICS
CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
FOREST SERVICE - U.S. DEPARTMENT OF AGRICULTURE
1957

WOOD CHARCOAL IN CALIFORNIA

Richard H. May
Division of Forest Economics

The burning of wood for charcoal, one of man's oldest industries, has recently been revived from a low ebb in California. Popularity of the family outdoor barbecue since World War II has awakened interest in charcoal production and stimulated many queries about the amount produced, prices, kiln capacity, and other pertinent facts.

To gather such facts, the U. S. Forest Service made a nationwide survey for the years 1956 and 1955. The California Forest and Range Experiment Station conducted this survey in California. We found that 39 operators produced about 4,650 tons of wood charcoal in California in 1956. This amount, though small compared to production in the eastern States,[1/] represents a 48 percent increase over the 3,150 tons produced by 28 California operators in 1955, and is more than has been produced here for many years.

History

Wood has been used to make charcoal in California for more than a century. From early periodicals, we learn that settlers of the Gold Rush period burned wood for charcoal in the early 1850's around San Francisco and the Sierra Nevada mining communities, and charcoal was highly regarded as a fuel because of its light weight and clean, hot fire. Wood-cutters felled oak trees around San Francisco Bay to supply charcoal burners.

In the 1860's powder mills using wood charcoal were established in Santa Cruz and Marin Counties. The Marin plant blew up after a few years' operation, but the Santa Cruz plant operated several years. Mainly alder and willow, both streamside trees, were used for powder charcoal because of their fine grain.

In the 1870's Chinese working for Sisson, Wallace and Co. cut wood and burned it for charcoal to supply the newly-built Central Pacific Railroad and smelters in Nevada and Utah. About the same time the Defiance furnace in Inyo County was using charcoal, presumably locally made. In the 1880's the Clipper Gap Iron Company burned charcoal in its furnace near Auburn, requiring as much as 30,000 cords of wood--representing perhaps 10,000 to 15,000 pounds of charcoal a year.

1/ The 1956 Forest Service survey shows a total U.S. charcoal production of almost 265,000 tons--98 percent of it in the eastern States.

For the period 1905 to 1910, the California State Agricultural Society published statistics on charcoal production by sacks for various counties. Sonoma County appears to have been a top producer then, with about 100,000 sacks annually. Assuming 20 pounds per sack, Sonoma production ran about 1,000 tons per year.

So far as is known, all charcoal was produced in pits or kilns until 1910. About this time the Noble Electric Steel Company established a steel plant at Heroult on the Pit River--a site now under Shasta Lake. They needed charcoal and planned to make it by distillation of pine wood at the rate of 50 cords per day. Apparently this operation was not successful, for in 1914 the company was experimenting with oak instead of pine.

In the 1920's and 1930's, according to U. S. Bureau of the Census reports, wood distillation and charcoal manufacture accounted for 2 to 3 establishments with a product valued at $5,000 and more. Charcoal dealers of the period put California's charcoal requirements at 3,000 tons in the 1920's and 6,000 tons in the 1930's. The demand not met by local production was supplied by other states and foreign countries. Domestic, restaurant, and hotel use took 80 percent of the total; the rest went into poultry feed and chemical processes. Kilns were operated in San Luis Obispo County and one in Mendocino County, using largely local oaks.

Census figures show that 142,000 bushels (1,420 tons) of lump charcoal valued at $42,000 (about $30 per ton) were produced in California in 1939. By 1947 California had no charcoal plants with a product value exceeding $5,000; only a few small kilns operated in San Luis Obispo County.

Within 10 years, however, 39 operators were active. Of 27 who reported the year of their first operation, 9 started in 1956; another 9 in 1954 or 1955, and the remaining 9 in earlier years (table 4). Only one of the last group started before World War II, and it began operation in 1925. This old-timer is in San Luis Obispo County.

Production in 1956

San Luis Obispo County is the center of California's wood charcoal industry. It accounted for 79 percent of the 4,650 tons produced in 1956, and 87 percent of 3,150 tons in 1955. The north Sierra group of counties (Calaveras, El Dorado, Mariposa, Placer) accounted for 11 percent of the State's 1956 production. Plants in five other counties produced the remaining 10 percent (table 1).

Lump charcoal comprised 85 percent of total State production in 1956 (table 2). Lump size consists of those pieces which will

not pass through a 3/4-inch mesh screen. Lump charcoal is burned as such, or may be further crushed for briquetting or for use in the chemical and metallurgical industries. Most of the "fines" (under 3/4 inch) are used for briquetting or industrial use. Some operators reported no fines, probably because they did not recover this class of material.

Production by Size of Operation

Almost a third of the total 1956 output was produced by the four largest plants (those producing 200 to 499 tons a year). The 18 medium-sized plants accounted for almost half of the total. The 11 smallest plants (1 to 49 tons) produced but a small share of the total. Six plants whose production was estimated and their size class unknown, accounted for the remaining 17 percent (table 2). San Luis Obispo County contains most of the larger plants: 3 of the largest and 13 of the medium-sized ones, but only 3 of the 11 small plants reporting.

Number, Kind, and Capacity of Kilns

The number of kilns per operator ranged from 1 to 11 in California in 1956. The kilns varied in capacity from 1 to 27 cords per charge. The cycle for burning ran from 2 days to 30 days, this time including loading and unloading as well as coaling. This information and the kinds of kilns were reported by 34 operators in 1956. Altogether, they had 109 kilns with a total capacity of 1,131 cords (table 3). If the operators not reporting had the same average number of kilns, 134 kilns were operated in California during 1956, with a total capacity of about 1,390 cords.

Of the reporting operators, more than half had kilns of concrete or cinder block or of reinforced concrete. The rest were fairly evenly distributed among steel, brick, and other types. Other types include: rock masonry, rock and clay, adobe, steel top with earth sides, and even the time-honored "pits" in which the wood is burned with a covering of earth and straw or leaves. The concrete and cinder block kilns averaged 11 cords capacity, the steel and brick kilns each about 7, and the other types almost 14 cords. Average capacity per kiln for all reporting kilns in the State is 10.4 cords.

Wood Species Burned

Practically all--99 percent--of the wood burned was oak. Precisely which oak species were used was not reported, but it is known from general observation, and from the distribution of the various oaks, that coast live oak (*Quercus agrifolia* Nee) is most commonly used in San Luis Obispo County; Oregon white oak (*Q. garryana* Dougl.)

in Sonoma and Yolo Counties; and blue oak (Q. douglasii Hook. & Arn.) and, to lesser extent, California black oak (Q. kelloggii Newb.) in the Sierra Nevada foothills. A small amount of Pacific madrone (Arbutus menziesii Rorsh.) was used in Sonoma County. Almost all the wood was round, or split from round wood. No softwoods were reported burned for charcoal in 1955 or 1956.

About 9,180 cords of wood were consumed in 1956--very close to 2 cords of wood per ton of charcoal. San Luis Obispo operators came under the state average, getting 1 ton of charcoal for each 1.8 cords of wood (table 5). Whether this is due to the greater experience of these operators, or to the greater density of coast live oak is not known.

One operator brought the north Sierra group's average up to 3.05 cords per ton. Either this operation is unusual or the reported figures are in error.

Cost of Wood

Wood purchased for coaling in 1956 cost $12.11 per cord delivered at the plant, on the average (table 6). This figure is based on 3,623 cords bought by 14 operators and including about 40 percent of total consumption. Another 14 operators cut their own wood or got it on shares for clearing land, and assigned no value for labor. Source of wood for the other 11 operators is unknown.

Cordwood prices ranged from $7.50 to $15.00 in the State as a whole, with the maximum of $15.00 occurring in all areas. But the minimum price was $9.00 to $10.00 in coastal counties against $7.50 in the Sierra Nevada.

Price Received for Lump Charcoal

Prices received for lump charcoal averaged $57.55 per ton in bulk, with a range from $45 to $100 per ton (table 7). The price in bags averaged $101.95 per ton and ranged from $60 to $140. Prices in San Luis Obispo County were lower than the State average, presumably because of the greater competition there.

Outlets for Charcoal

Jobbers bought about two-thirds of the wood charcoal produced in California in 1956, briquet plants took a little under one-third, and the rest (7 percent) was sold to industries, restaurants, and individual users (table 8). None of California's wood charcoal producers does his own briquetting. In San Luis Obispo County, practically all (99 percent) of the charcoal went to jobbers and briquetting plants; in the other counties, 78 percent.

Consumption of Charcoal

Figures on the total consumption of charcoal in California were not collected by the Station and are not available from any known source. It appears that consumption is several times as great as production. The difference is made up by charcoal brought from outside the State. Much charcoal is imported or produced from material other than wood. Most of the outside charcoal comes from the Eastern States and some from foreign countries, particularly Mexico. In 1956 foreign imports amounted to 3,516 tons of wood charcoal; 71 percent came from Mexico and most of the rest from Japan, with Denmark supplying less than 1 percent. In earlier years California imported smaller amounts of charcoal, and Mexico supplied an even greater proportion (table 9).

Other Sources of Charcoal

Fruit pits and nut shells are also sources of charcoal for barbecue and industrial use. The present survey, however, was confined to wood charcoal. Production from sources other than wood may nearly equal the volume of wood charcoal produced.

PROCEDURE

The California Forest and Range Experiment Station conducted this survey of wood charcoal production in California as part of a nationwide survey directed by the U. S. Forest Service.

A list of operating plants was assembled by the Station Division of Forest Economics with the help of the California Division of Forestry, and the Extension Forester.

Questionnaires were mailed to all names on the list. Second and, in some cases, third requests were sent to operators who did not respond to the first request. Some operators who did not respond to any mail request were visited in the field.

Complete returns were obtained from all northern California operators. But in southern California, including San Luis Obispo County, it was not possible to get complete returns in the time and with the manpower available. Estimates for non-reporting operators were based on data from reporting operators compiled by punch-card machines.

Producers' replies were obtained as follows:

Method:	Number of operators	1956 production
Reply by mail	23	2,440 tons
Field contact with operator	3	281 "
Field contact with jobber	7	1,140 "
No reply or contact (production estimated)	6	788 "
	39	4,649 "

Accuracy

Production estimates are subject to errors in reporting, to errors of sampling non-respondent plants, and errors of calculation. Errors in reporting were reduced by mail and field follow-up on questionable points. The chances of calculation errors are slight because of mathematical checking of all calculations.

Sampling error is measured by variation in the production of sample plants and is expressed as a percentage of total production. The calculated sampling error at one standard deviation is 6.2 percent for charcoal production in the State, and 7.7 percent for San Luis Obispo County. In the counties or county groups where all plants responded there is no sampling error. In measuring sampling error, the reports obtained by field contact with jobbers were considered as valid replies.

Table 1.- Wood charcoal produced, by county, California, 1955 and 1956

County	1956 production					1955 production		
	Plants	Lump	Fine	Total	Percent	Plants	Total	Percent
	No.	---- Tons -----				No.	Tons	
Coast counties								
San Luis Obispo	24	3,197	483	3,680	79.1	19	2,742	87.1
Sonoma-Yolo[1/]	4	178	39	217	4.7	1)		
San Diego-San Benito[1/]	4	105	12	117	2.5	3)	192	6.1
Subtotal Coast	32	3,480	534	4,014	86.3	23	2,934	93.2
Sierra counties								
Calaveras-El Dorado-Mariposa-Placer[1/]	4	369	152	521	11.2	3)	213	6.8
Tulare	3	109	5	114	2.5	2)		
Subtotal Sierra	7	478	157	635	13.7	5	213	6.8
Total State	39	3,958	691	4,649	100.0	28	3,147	100.0

1/ Combined to avoid disclosure of individual plant figures.

Table 2.- Number of wood charcoal plants, by county and production size-class, and production by size-class; California, 1956

County	1 - 49 tons	50 - 199 tons	200 - 499 tons	Unknown 1/	All classes
	NUMBER OF PLANTS				
Coast counties					
San Luis Obispo	3	13	3	5	24
Sonoma-Yolo	2	2	0	0	4
San Diego-San Benito	2	1	-	1	4
Subtotal Coast	7	16	3	6	32
Sierra Counties					
Calaveras-El Dorado-Mariposa-Placer	2	1	1	0	4
Tulare	2	1	0	0	3
Subtotal Sierra	4	2	1	0	7
Total State	11	18	4	6	39
	PRODUCTION IN TONS				
Size of particle					
Lump	163	2,008	1,130	657	3,958
Fine	18	285	257	131	691
Total	181	2,293	1,387	788	4,649
Percent of total	4	49	30	17	100

1/ Production estimated.

Table 3.- Kind, number, capacity and burning cycle of wood charcoal kilns in California, 1956[1/]

Kind of kiln	Unit	Coastal counties: San Luis Obispo	Coastal counties: Sonoma-Yolo-San Diego	Sierra counties[2/]	State total	Average capacity
						Cords per kiln
Concrete or cinder block[3/]						
Kilns	No.	42	7	14	63	
Total capacity	Cords	557	121	34	712	11.3
Average cycle	Days	18.4	24.6	4.6	16.0	
Steel oven or tank[4/]						
Kilns	No.	4	14	0	18	
Total capacity	Cords	12	106	-	118	6.6
Average cycle	Days	14.0	11.6	-	12.1	
Brick						
Kilns	No.	0	0	12	12	
Total capacity	Cords	-	-	84	84	7.0
Average cycle	Days	-	-	5.0	5.0	
Other (Rock, Adobe, Pits)						
Kilns	No.	16	0	0	16	
Total capacity	Cords	217	-	-	217	13.6
Average cycle	Days	19.6	-	-	19.6	
All kinds						
Kilns	No.	62	21	26	109	
Total capacity	Cords	786	227	118	1,131	10.4
Average cycle	Days	18.4	15.9	4.7	14.7	
Plants reporting		21	6	7	34	

1/ Reporting kilns only (includes 1 plant active in 1955, but idle in 1956.)

2/ Calaveras, El Dorado, Mariposa, Placer, Tulare.

3/ Includes reinforced concrete.

4/ Square or cylindrical, but not beehive type.

Table 4.- Age of California wood charcoal plants active in 1956, by county

Year operation started[1/]	San Luis Obispo	Other coast counties[2/]	Sierra counties[3/]	State total
	Number of plants			
Pre-1940	1	-	0	1
1947-1948	2	-	0	2
1950	-	1	1	2
1951	1	-	0	1
1952	2	1	0	3
1954	2	1	1	4
1955	2	-	3	5
1956	3	4	2	9
Unknown	11	1	0	[4/] 12
Total	24	8	7	39

1/ Non reported starting in 1949 or 1953.
2/ San Benito, San Diego, Sonoma, Yolo.
3/ Calaveras, El Dorado, Mariposa, Placer, Tulare.
4/ It is estimated that 4 of these were new in 1956.

Table 5.- Wood burned by charcoal producers, by species and county, California, 1956

County	Species of wood			Charcoal produced	Ratio: wood to charcoal
	Oak	Madrone	Total		
	Cords			Tons	Cords/ton
Coast counties					
San Luis Obispo	6,648	0	6,648	3,680	1.80
Sonoma-Yolo	358	128	486	217	2.24
San Benito-San Diego	223	0	223	117	1.91
Subtotal Coast	7,229	128	7,357	4,014	1.83
Sierra counties					
Calaveras-El Dorado-Mariposa-Placer	1,595	0	1,595	521	3.05
Tulare	229	0	229	114	2.01
Subtotal Sierra	1,824	0	1,824	635	2.87
Total State	9,053	128	9,181	4,649	1.97

Table 6.- Volume and cost of wood purchased for charcoal burning, California, 1956

County	Plants reporting	Volume purchased	Total price	Cost per cord	Range in price per cord
	No.	Cords	---	Dollars	---
San Luis Obispo	5	2,284	28,798	12.61	9.00 - 15.00
Sonoma-Yolo-San Diego	5	575	7,270	12.64	10.00 - 15.00
Calaveras, Placer-Tulare	4	764	7,802	10.21	7.50 - 15.00
Total State	14	3,623	43,870	12.11	7.50 - 15.00

Table 7.- Prices per ton for lump charcoal, in bulk and in bags, received by California producers, 1956

County	Plants	Volume	Range	Weighted average
		IN BULK		
	No.	Tons	---- Dollars -----	
San Luis Obispo	17	2,032	45 - 60	54.35
Other coast counties 1/	4	122	60 - 85	79.20
Sierra counties 2/	3	121	80 -100	89.75
Total State	24	2,275	45 -100	57.55
		IN BAGS		
San Luis Obispo	3	470	60 - 90	85.70
Other coast counties	4	103	70 -135	119.55
Sierra counties	5	314	100 -140	117.20
Total State	12	887	60 -140	101.95

1/ San Benito, San Diego, Sonoma, Yolo.
2/ Calaveras, El Dorado, Mariposa, Placer, Tulare.

Table 8.- Reported outlets for wood charcoal marketed by California producers, 1956

County	Jobbers	Briquet plants	Industrial	Other 1/	All outlets	Volume reported
	Percent					Tons
San Luis Obispo	68	31	1	0	100	2,735
Other counties	56	22	2	20	100	861
State average	64	29	2	5	100	3,596

1/ Includes sales to restaurants and nurseries, and for home use.

Table 9.- Imports of wood charcoal for consumption, California 1951-1956

Year	Total imports	Imports from Mexico	
		Quantity	Percent of total
	Tons	Tons	
1/ 1956	3,516	2,512	71
1955	378	346	91
1954	1,526	1,472	96
1953	188	182	97
1952	1,261	1,261	100
1951	720	720	100

1/ In 1956, 998 tons were imported from Japan.

Source: U. S. Dept. of Commerce, Custom House, San Francisco.