FOREST STATISTICS FOR PACIFIC COUNTY, WASHINGTON

FOREST SURVEY REPORT NO. 109

U. S. DEPARTMENT OF AGRICULTURE FOREST SERVICE
PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
R. W. COWLIN, DIRECTOR

PORTLAND, OREGON JUNE 1953

PREPARED BY THE DIVISION OF FOREST ECONOMICS

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1/ Acknowledgment is made of cooperation from several private and public agencies in mapping parts of this county.

FOREST STATISTICS

FOR

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Forest Survey Report No. 109

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F. L. Moravets

U. S. Department of Agriculture Forest Service
Pacific Northwest Forest and Range Experiment Station

R. W. Cowlin, Director
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FOREWORD

This publication summarizes in statistical form the results of a reinventory of the forests of Pacific County, Washington, conducted in 1950. This reinventory is a part of the maintenance phase of the Forest Survey, a Nation-wide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928 and amended June 25, 1949. The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products and to analyze and make available in reports survey information needed in the formulation of forest policies.

The Forest Survey is conducted in the various forest regions of the Nation by the regional forest experiment stations of the Forest Service. In the Pacific Northwest region of Oregon and Washington it is an activity of the Pacific Northwest Forest and Range Experiment Station at Portland, Oregon.

Under the initial phase of the Forest Survey Pacific County was inventoried in 1932. Later the inventory was adjusted to March 1, 1933 and a statistical report "Forest Statistics for Pacific County, Washington" and a detailed forest type map--scale 1 inch to the mile--were released. In 1938 the first reinventory of the county's forests was made and a revised statistical report and forest type map prepared.

Following the second reinventory, in 1950, the forest type map has again been revised. 1/

1/ A print of the forest type map is available at cost of blueprinting. For information write Director, Pacific Northwest Forest and Range Experiment Station, 423 U. S. Court House, Portland 5, Oregon.

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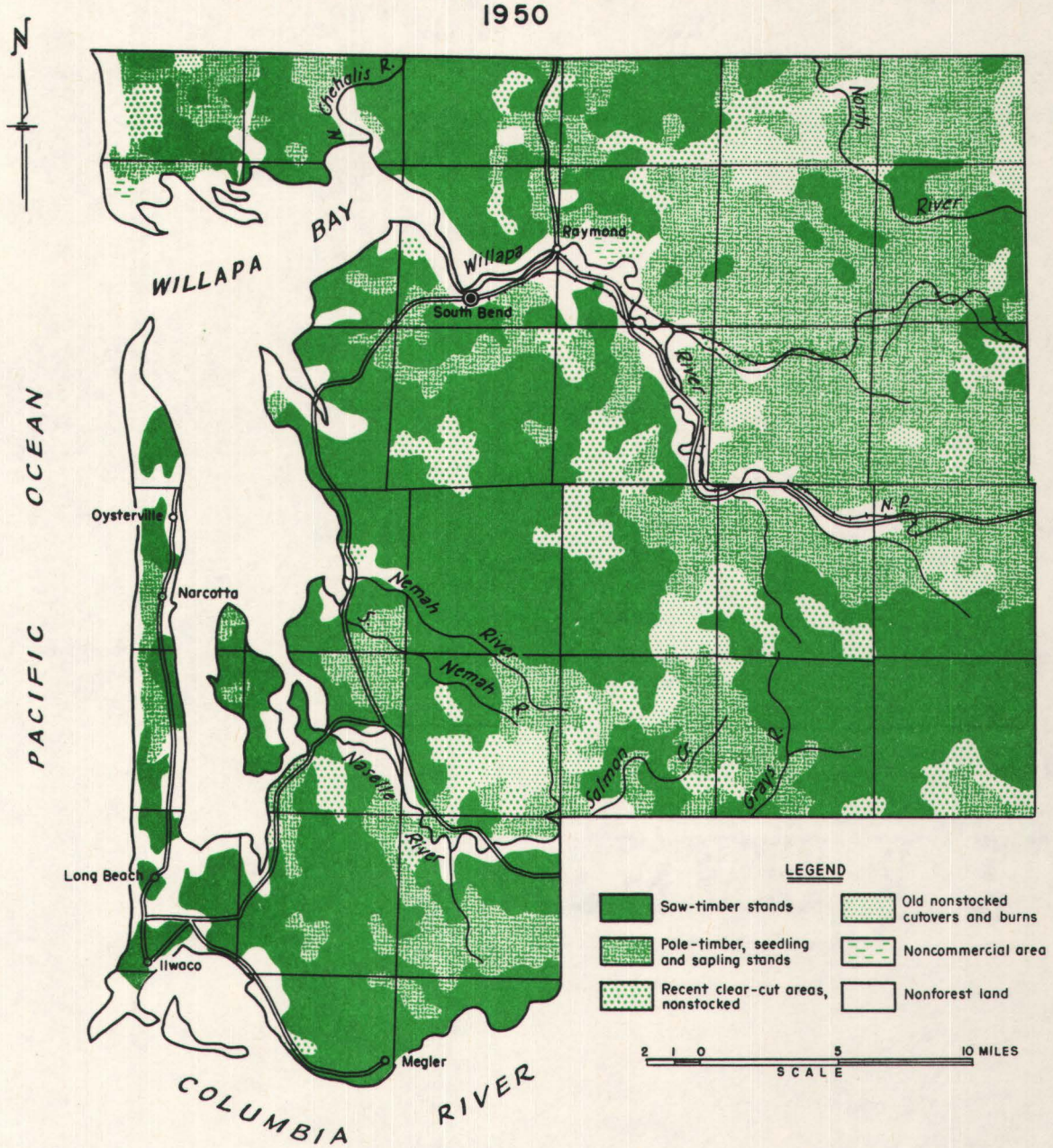
FIGURE 1

FOREST STAND-SIZE AND CONDITION CLASSES

PACIFIC COUNTY, WASHINGTON

1950



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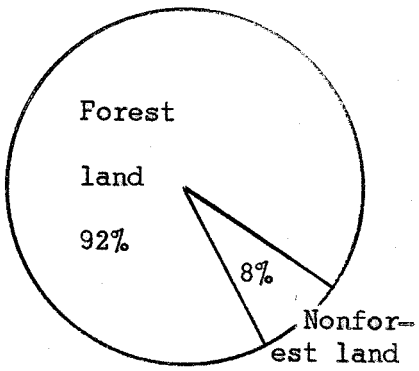
SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

LAND USE

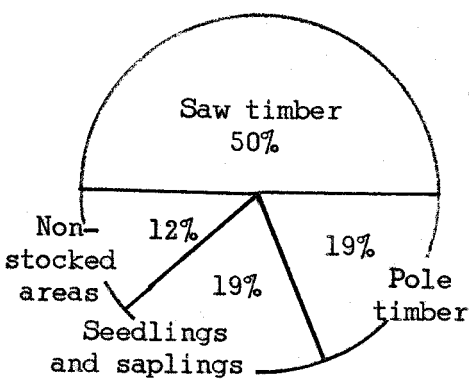
Pacific County, Washington, with a total land area of 596,470 acres, borders on the Pacific Ocean on the west and on the Columbia River on the south (figure 1). The bulk of the county lies in a coastal fog belt of humid climate and heavy rainfall. The topography in general is rough, a low mountainous terrain broken by numerous streams with small drainage basins. Elevations vary from sea level to a maximum of approximately 2,800 feet. Forest productive capacity of a very large part of the land is high. Prior to white settlement, roughly a century ago, the county was completely forested except on the tidelands along the coast and on the river deltas. The 1950 inventory classified 550,400 acres as forest land. The nonforest land, 46,070 acres, consisted of 30,230 acres in agricultural use, and 15,840 acres of tideflats, salt marshes, and townsites. Lands in agricultural use, chiefly dairying, are cleared bottomland along the lower courses of the larger streams. Most of these lands were cleared during the first 60 or 70 years of settlement. Very little area has been cleared in more recent years; there has been some forest reclamation of small abandoned isolated homestead tracts.



FOREST LAND

Of the 550,400 acres of forest land, 548,830 acres was classed as commercial forest land, i.e., physically capable of producing usable crops of wood and not withdrawn from timber utilization. A total of 200 acres was reserved commercial forest land in State parks, and several small areas of low-lying bogs covered with a sparse scrubby growth of Sitka spruce and totaling 1,370 acres were classed as unproductive for timber use.

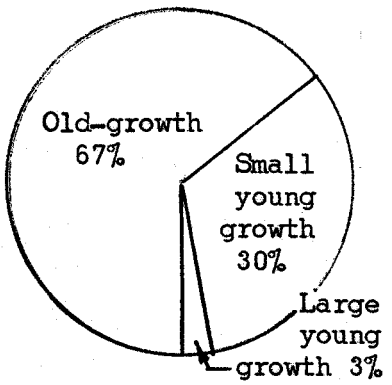
Stand-Size and Condition Classes



A classification of the commercial forest land by stand-size and condition classes found 275,570 acres, approximately one-half the total area, occupied by saw-timber stands (trees 11" d.b.h. and larger). Of the young stands, pole timber (trees 5" to 11" d.b.h.) covered 104,250 acres; seedlings and saplings (trees 0 to 5" d.b.h.) covered a slightly larger area, 105,960 acres. The area of nonstocked forest land, totaling 63,050 acres, consisted of 62,120 acres of clear-cut area, the major part of which was cut in recent years; 680 acres of burns; and 240 acres deforested by wind.

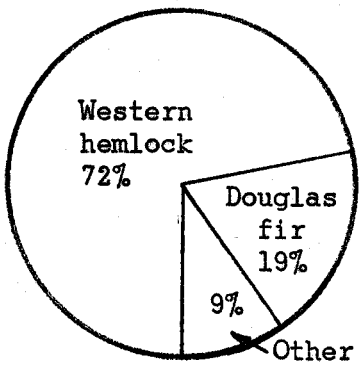
Age and Size of Saw-Timber Stands

Of the 275,570 acres of saw-timber stands on commercial forest land, 184,970 acres or approximately two-thirds is stocked with old-growth timber (more than 180 years of age). About a fifth of the old-growth acreage has been selectively logged, leaving sufficient volume in residual trees to still classify the stand as saw timber. The young-growth saw timber (under 180 years of age) was further classified on the basis of size of trees into large and small. The large class, which includes stands from about 70 to 180 years old and contains trees from 22 to 40 inches diameter, breast height, covered only 7,970 acres. The small class, including stands from about 40 to 70 years old and in which the trees are from 12 to 20 inches d.b.h., cover a much greater area, a total of 82,630 acres. A third of the small young-growth saw-timber acreage is restocked clear-cut lands dating back to some of the earlier logging operations in the county. In general, the young saw-timber stands are well stocked and occupy sites of high productive capacity; many of them are at the period of maximum rate of growth.



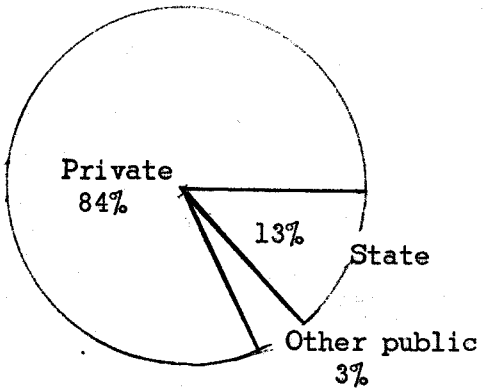
Saw-Timber Types

The climate of the coastal fog belt, which includes all of the county except the northeastern portion is particularly favorable for western hemlock. This species predominates in the saw-timber types on 199,110 acres, almost three-fourths of the saw-timber total area. It forms pure, even-aged stands on a very large part of the type's area; on the remainder of the area, where it comprises the major portion of the saw-timber volume in mixed stands, its associates are Douglas-fir and Sitka spruce. Types in which Douglas-fir is the predominant species cover 51,780 acres, located almost entirely in the eastern one-fifth of the county. The area of "other" saw-timber types, 24,680 acres, is divided between four different types: Sitka spruce, western redcedar, true fir-mountain hemlock, and red alder. The first three of the types usually contain some western hemlock and Douglas-fir as associate species. The last type, red alder, occurs as pure stands along stream bottoms and lower slopes.



Ownership of Forest Land

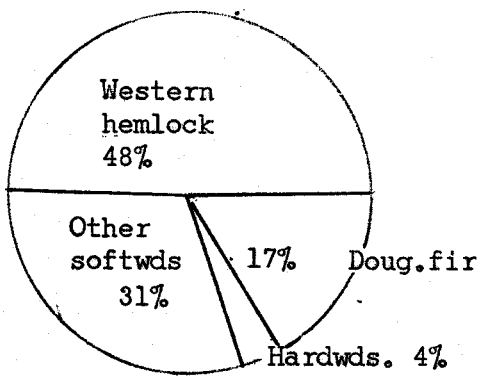
Private owners hold 460,150 acres of commercial forest land, five-sixths of the total. Forest industrial companies, in the ownership class of 50,000 acres or more, in this county own 63 percent of the private land; owners in the 5,000- to 50,000-acre class have 12 percent; owners in the less-than-5,000-acre class have 25 percent. An even greater portion of the saw-timber acreage---89 percent---is in private ownership. State ownership, which includes 72,570 acres of commercial forest land, consists of the original school land grants of sections 16 and 36 of each township and of lands more recently acquired by the State Forest Board. The usual pattern of State ownership is one of scattered tracts from 80 to 640 acres. The State owns but 8 percent of the saw-timber acreage. "Other public" includes some 10,000 acres in county ownership, about 1,000 acres municipally owned, 4,000 acres of Federal public domain lands, and a few hundred acres each in a military reservation and of Indian land.



TIMBER VOLUME

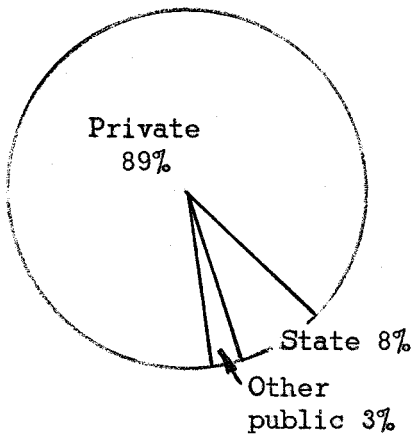
The volume of live saw-timber trees (11 inches d.b.h. and larger) on commercial forest land was estimated to total 13,178 million board feet, log scale, Scribner rule. The volume of growing stock (live trees 5 inches d.b.h. and larger, including trees of both pole- and saw-timber size) was estimated at 2,502 million cubic feet.

Volume of Saw Timber by Species



The volume of softwood species, totaling 12,650 million board feet, comprises 96 percent of the total saw-timber volume; hardwoods make up the remaining 528 million board feet. Western hemlock, the predominant species on a large part of the saw-timber area and an associate species on much of the remainder, has a total volume of 6,372 million board feet. The volume of Douglas-fir totals 2,228 million board feet; of this, two-thirds is in large old-growth trees 41 inches d.b.h. and larger. "Other softwoods" include appreciable volumes each of Sitka spruce, western redcedar and Pacific silver fir; there is a very small volume of lodgepole pine along the coastal portion of the county. The hardwood volume is very largely red alder; there is a small amount of bigleaf maple.

Ownership of Timber Volume



Privately owned commercial forest lands contain a total of 11,656 million board feet of live saw-timber volume. A slightly smaller portion, 87 percent, of the cubic-foot volume of growing stock is on private land. Forest lands in State ownership contain 1,098 million board feet. Of the total of 424 million board feet in "Other public" ownership, one-half is owned by the county and the remainder is distributed between the Federal public domain and military reservation, municipal, and Indian ownership classes.

Table 1.--Land area, by major classes of land, 1950

Class of land	Area
	Acres
Forest:	
Commercial	548,830
Noncommercial:	
Reserved from commercial timber use	200
Unproductive for timber use	1,370
Total	550,400
Nonforest	46,070
Total, all classes	596,470

Table 2.--Commercial forest land area by ownership and stand-size class, 1950

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling and sapling stands	Nonstocked areas
	Acres	Acres	Acres	Acres	Acres
Private	460,150	244,700	77,610	85,980	51,860
State	72,570	21,990	23,300	16,920	10,360
County	10,270	4,400	2,550	2,600	720
Municipal	970	750	40	100	80
Federally owned or managed:					
Public domain	3,990	3,280	320	360	30
Military reservation	580	450	130		
Indian	300		300		
Total Federal	4,870	3,730	750	360	30
All ownerships	548,830	275,570	104,250	105,960	63,050

Table 3.—Commercial forest land area, by major forest type and stand-size class, 1950

Forest type	Total	Saw-timber stands			Pole-timber stands	Seedling and sapling stands	Non-stocked areas
		Old growth	Large young growth	Small young growth			
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Douglas-fir	151,770	29,820	7,970	13,990	59,340	40,650	
Western hemlock	290,590	140,130		58,980	31,670	59,810	
True fir-mountain hemlock	3,140	3,140					
Sitka spruce	16,140	4,920		6,500	4,500	220	
Western redcedar	6,960	6,960					
Lodgepole pine	1,660				1,000	660	
Hardwoods	15,520			3,160	7,740	4,620	
Nonstocked areas	63,050						63,050
Total	548,830	184,970	7,970	82,630	104,250	105,960	63,050

Table 4.--Area of commercial and noncommercial forest land and nonforest land by cover type and ownership class, 1950

(Acres)

Survey type symbol	Cover type	Total	Unreserved								Reserved	
			Total	Private	State	County	Municipal	Indian	Federal: Public domain	Federal: Military reservation	Total	State
	All lands											
	Forest land	550,400	550,200	461,130	72,570	10,420	970	300	4,230	580	200	200
	Nonforest land	46,070	46,050	43,840	160	690		30	1,330		20	20
	Total	596,470	596,250	504,970	72,730	11,110	970	330	5,560	580	220	220
	Commercial forest land											
D5	Douglas-fir large old-growth saw timber (yellow fir)	29,820	29,820	28,060	1,720	40						
D4	Douglas-fir large young- and old-growth saw timber (red fir)	7,970	7,970	7,350	620							
D3	Douglas-fir small young-growth saw timber	13,990	13,990	12,510	1,400	80						
D2	Douglas-fir pole timber	59,340	59,340	40,520	18,580	240						
D1	Douglas-fir seedlings and saplings	40,650	40,650	31,370	9,200	80						
H4	Western hemlock large saw timber	140,160	140,130	121,690	13,680	1,990	170		2,600		30	30
H3	Western hemlock small saw timber	99,100	58,980	52,700	3,400	1,870	580		430		120	120
H2	Western hemlock pole timber	31,690	31,670	26,100	3,420	1,780	40	120	210		20	20
H1	Western hemlock seedlings and saplings	59,810	59,810	50,030	7,240	2,080	100		360			
S4	Sitka spruce large saw timber	4,950	4,920	4,020	250	200				450	30	30
S3	Sitka spruce small saw timber	6,500	6,500	5,870	200	180			250			
S2	Sitka spruce pole timber	4,500	4,500	4,130	40	70		180	40	40		
S1	Sitka spruce seedlings and saplings	220	220	220								
C4	Western redcedar large saw timber	6,960	6,960	6,320	600	40						
FM4	True fir-mountain hemlock large saw timber	3,140	3,140	3,060	80							
LP2	Lodgepole pine pole timber	1,000	1,000	920	40	40						
LP1	Lodgepole pine seedlings and saplings	660	660	660								
HD3	Hardwood small saw timber	3,160	3,160	3,120	40							
HD2	Hardwood pole timber	7,740	7,740	5,940	1,220	420			70	90		
HD1	Hardwood seedlings and saplings	4,620	4,620	3,700	480	440						
X	Recent clear-cut area nonstocked	41,440	41,440	33,950	7,180	200	80		30			
XO	Old clear-cut area nonstocked	20,690	20,690	17,150	3,020	520						
F	Area deforested by fire	680	680	520	160							
WT	Area deforested by wind	240	240	240								
	Total	549,030	548,830	460,150	72,570	10,270	970	300	3,990	580	200	200
	Noncommercial forest land											
NR	Noncommercial rocky	1,370	1,370	980		150			240			
	Total	1,370	1,370	980		150			240			
	Nonforest land											
A	Agricultural	30,230	30,230	29,930	160	70			70			
G	Grass and brush	8,670	8,670	8,140		420		30	80			
O	Open--nonvegetative	7,170	7,150	5,770		200			1,180		20	20
	Total	46,070	46,050	43,840	160	690		30	1,330		20	20

Table 5.--Area of commercial forest land by generalized forest type and ownership class, 1950

(Acres)

Generalized forest type		Total	Unreserved								Reserved	
			Total	Private	State	County	Municipal	Indian	Federal: Public domain	Federal: Military reservation	Total	State
Conifer saw timber												
Types D3, D4, D5, H3, H4, S3,	Uncut	220,840	220,680	197,980	17,810	2,620	750		1,370	150	160	160
S4, C4, and FM4	Selectively cut	51,750	51,730	43,600	4,140	1,780			1,910	300	20	20
	Total	272,590	272,410	241,580	21,950	4,400	750		3,280	450	180	180
Conifer pole timber												
Types D2, H2, S2, and LP2	On cutovers	89,530	89,510	65,250	21,620	2,050	40	300	250		20	20
	On burns	7,000	7,000	6,420	460	80				40		
	Total	96,530	96,510	71,670	22,080	2,130	40	300	250	40	20	20
Conifer seedlings and saplings												
Types D1, H1, S1 and LP1	On cutovers	98,500	98,500	79,720	16,160	2,160	100		360			
	On burns	2,760	2,760	2,480	280							
	On plantations	80	80	80								
	Total	101,340	101,340	82,280	16,440	2,160	100		360			
Recent clear-cut areas nonstocked												
Type X		41,440	41,440	33,950	7,180	200	80		30			
Nonstocked clear-cut, burned-over and wind-thrown areas												
Types XO, F, and WT		21,610	21,610	17,910	3,180	520						
Hardwoods												
Types HD1, HD2, HD3, and HD4		15,520	15,520	12,760	1,740	860			70	90		
	Total	549,030	548,830	460,150	72,570	10,270	970	300	3,990	580	200	200

Table 6.—Net volume of live saw timber[1/] and growing stock[2/] on commercial forest land by ownership class, 1950

Ownership class	Saw timber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Private	11,656	12,515	2,201
State	1,098	1,181	221
County	213	229	41
Municipal	35	38	6
Federally owned or managed:			
Public domain	154	165	28
Military reservation	21	23	4
Indian	1	1	1
Total Federal	176	189	33
All ownerships	13,178	14,152	2,502

1/ Includes live trees 11.0 inches diameter breast height and larger measured in board feet.

2/ Includes live trees 5.0 inches diameter breast height and larger measured in cubic feet.

Table 7.--Net volume of live saw timber and growing stock on commercial forest land by stand-size class, 1950

Stand-size class	Saw timber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Saw-timber stands	12,830	13,760	2,347
Pole-timber stands	285	323	135
Seedling and sapling stands	47	51	14
Nonstocked areas	16	18	6
Total	13,178	14,152	2,502

Table 8.--Net volume of live saw timber and growing stock on commercial forest land, by species, 1950

Species	Saw timber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Softwoods:			
Douglas-fir	2,228	2,356	400
Western hemlock	6,372	6,881	1,267
Sitka spruce	1,746	1,851	307
Western redcedar	1,563	1,657	251
Pacific silver fir	741	800	125
Lodgepole pine			1/
Total	12,650	13,545	2,350
Hardwoods:			
Red alder	507	582	146
Bigleaf maple	21	25	6
Total	528	607	152
All species	13,178	14,152	2,502

1/ Less than 500 thousand cubic feet.

Note: In addition to the species for which net volume estimates were obtained, other species occur in inconsequential quantities in this county.

Table 9.--Net volume of Douglas-fir live saw timber on commercial forest land by diameter class group and log rule, 1950

Diameter class and log rule	Douglas-fir
	Million board feet
11.0" to 20.9" d.b.h.	
Scribner rule	195
International ¼-inch rule	226
21.0" to 30.9" d.b.h.	
Scribner rule	205
International ¼-inch rule	222
31.0" to 40.9" d.b.h.	
Scribner rule	349
International ¼-inch rule	370
41.0" d.b.h. and larger	
Scribner rule	1,479
International ¼-inch rule	1,538
All diameter classes	
Scribner rule	2,228
International ¼-inch rule	2,356

Table 10.—Net volume of all timber on commercial forest land, by class of material and species group, 1950

Class of material	Total	Softwoods	Hardwoods
	Million cubic feet	Million cubic feet	Million cubic feet
Growing stock:			
Saw-timber trees:			
Sawlog portion	2,254	2,145	109
Upper-stem portion	104	98	6
Total	2,358	2,243	115
Pole-timber trees	144	107	37
Total growing stock	2,502	2,350	152
Other material:			
Sound cull trees	1	1	
Rotten cull trees	37	37	
Salvable dead trees	61	60	1
Total other material	99	98	1
Total, all timber	2,601	2,448	153

Table 11.--Average annual commodity drain on live saw timber and growing stock on commercial forest land, by species group, for the period 1948-1951 incl.

Species group	Saw timber						Growing stock		
	Timber products	Logging residual	Commodity drain 1/	Timber products	Logging residual	Commodity drain 1/	Timber products	Logging residual	Commodity drain 1/
	Thousand board feet log scale Scribner rule			Thousand board feet International ¼-inch rule			Thousand cubic feet		
Softwoods	427,496	61,132	488,628	457,765	65,461	523,226	95,063	13,594	108,657
Hardwoods	17,859	2,554	20,413	20,519	2,934	23,453	6,154	880	7,034
Total	445,355	63,686	509,041	478,284	68,395	546,679	101,217	14,474	115,691

1/ Total of timber-products output and logging residual. Timber-products output is the portion of the inventory volume removed from the woods; logging residual is the portion cut or killed in logging not removed from the woods.

FOREST SURVEY PROCEDURE

The procedures used in the second Forest Survey reinventory of Pacific County were materially different from the procedures used in the initial inventory and first reinventory. This change in procedures accounts for some significant differences in both the forest-area and timber-volume statistics obtained. Therefore, a brief description of each of the procedures seems desirable.

Initial Inventory

The initial inventory of the county was conducted in 1932 by what was known as the "compilation method." In this method existing information on forest types, timber cruises, and other pertinent data were collected from private timber owners and various public agencies. These data were checked in the field for reliability, and were then adjusted to the specifications and standards of Forest Survey. Forest-type and timber-volume data for areas not covered by existing information were obtained through intensive field reconnaissance.

All land in the county was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial; the commercial forest land was still further classified by type, stand-size class, and, in case of young-growth stands, by stocking and age classes. These types and classes were delineated on 1-inch-to-the-mile base maps of each township. These township type maps were then superimposed over ownership-status plats and dot-counted to obtain forest-type-area statistics by ownership class. Type delineations on the township maps were traced on a base map of the county to form a county forest type map.

In-place, timber-volume estimates were based on the existing cruise data collected from private and public sources, on field cruises, and on ocular estimates. Volume of young-growth saw timber was computed by applying yield-table values, adjusted for age of stand, stocking density, and site, to type acreages.

First Reinventory

The first reinventory included a complete revision of the forest type map of the county. For this revision, records of cutting and other forms of drain, since the original inventory, were obtained from various sources and verified in the field by ground reconnaissance. Areas on which the type had changed due to cutting, restocking of cut-over or burned-over land, and ingrowth of immature stands were re-mapped on the ground. The ownership status was brought up to date. On the basis of the new ownership data and the revised forest type map, area statistics by forest types were recomputed.

Timber volume estimates for virgin saw-timber stands were based on cruise data collected during the original survey, adjusted for cutting and other drain. Volume estimates for immature stands were determined from yield tables adjusted for site quality, age, and density of stands.

Second Reinventory

In the second reinventory complete revision of the forest type map was obtained through interpretation, classification, and mapping on aerial photos covering nearly all of the land area; the small area for which photos were not available was covered by ground reconnaissance. In the mapping on aerial photos, types whose classifications were in doubt and species composition of stands were checked in the field. The use of aerial photos in mapping resulted in type delineations of much greater accuracy and detail than were possible through the ground reconnaissance employed in the initial inventory and first reinventory. In the preparation of a revised type map, the delineations on the aerial photos were transferred to a 1-inch county base map through use of a photo projector. The new type map was then superimposed over a current ownership-status map of complete county coverage and a dot count made of forest type areas by ownership class.

Volume estimates each of live saw timber, growing stock, and salvable dead material were calculated by applying average per-acre volumes to the appropriate forest type acreages. The average per-acre volumes for saw-timber stands and pole-timber stands were obtained through a sampling procedure in which the stands were measured on randomly selected plots. Intensity of the sampling was so designed as to produce a total estimate of volume in the county of a specified sampling accuracy set by Forest Survey. In the random selection of samples each individual saw-timber or pole-timber stand in the county had an equal chance of being selected. A sample consisted of a cluster of 3 one-fifth-acre circular plots spaced at regular 6-chain intervals. A total of 103 plot clusters, or 309 one-fifth-acre plots was taken in saw-timber and pole-timber stands.

Average per-acre volumes for seedling and sapling stands and nonstocked areas were obtained through an aerial-photo-plot sampling procedure. A large number of one-acre photo plots was taken in a modified systematic-random pattern. By photo interpretation, estimates were made of average number of trees per acre of both saw-timber and pole-timber size, average crown diameter, and total tree height, volume of the average tree was obtained from photo-volume tables.

ACCURACY OF DATA

Forest Area

In the reinventory, in-place mapping of the forest lands in the forest zone and their classification by forest type, stand-size class, or condition class were on the basis of 100-percent coverage. Therefore, no sampling error was involved. Errors due to techniques or judgment were possible but difficult to evaluate. Throughout all phases of the work close supervision and frequent checks assured a high level of accuracy and uniformity of standards.

Timber Volume

For the timber volume, derived from sampling surveys, the chances are two out of three that the estimated total saw-timber volume in the county does not vary in either direction from the true volume more than 6.48 percent; the estimated total growing-stock volume does not vary more than 5.14 percent.

COMPARISON OF INVENTORIES

Due to considerable differences in Forest Survey specifications, standards of utilization, and survey procedures, a direct comparison of most of the statistics from the 1950 reinventory with those from the initial inventory in 1932 (adjusted to 1933) and first reinventory of 1938 is not possible. Some of the statistics can be compared after adjustments have been made for differences in specifications and standards.

Forest Land

The forest-land areas, classified by stand-size and condition classes, resulting from the three inventories are shown in the table below on a comparable basis as far as specifications are concerned. Each of the saw-timber acreages include stands 11.0 inches d.b.h. and larger.

Changes in Forest Land by Stand-Size and Condition Classes Between Inventories

Inventory	Total forest land	Commercial forest land (Unreserved and reserved)					Noncommercial forest land
		Total	Saw timber	Pole timber	Seedlings and saplings	Nonstocked area	
	Thousands of acres						
1933	548	548	358	43	48	99	0
1938	548	548	346	39	83	80	0
1950	550	549	276	104	106	63	1

The acreage figures in this table indicate a quite consistent rate of change during the past two decades in each of the four stand-size or condition classes. There seems to have been close correlation between the factors which cause change in area of the classes such as the cutting of saw timber, the restocking of cut-over land, and area outgrowth and ingrowth in the young growing stands.

Timber Volume

Direct comparison of the total timber volume obtained in the 1950 inventory with the volumes obtained in the 1933 and 1938 inventories is not possible. One reason is that the minimum diameter specification for saw timber which was 15 inches in the 1933 and 1938 inventories was lowered to 11 inches in 1950. A second reason is that during the 17-year interval there had been much intensification of timber utilization on logging operations; in recent years more and more of the gross stand volume is being removed from the woods as timber products. In the 1950 inventory this increase in intensity of utilization was accounted for by using volume tables that gave significantly greater values for a tree of a given size than did the tables used in the two earlier inventories. And still another reason is the inclusion in 1950 of the volume in scattered trees in the overstory of pole, seedling and sapling stand and including a small volume on cut-over and burned-over lands classed as nonstocked.

Comparison of the total cubic-foot volume of growing stock obtained in 1933 with the volume in 1950 is the most feasible because of only slight differences in specifications and standards of utilization between inventories. In 1933 the volume of growing stock, which includes both saw-timber and pole-timber trees in all stands, was 3,073 million cubic feet; the 1950 volume totaled 2,502 million, a decrease of 19 percent.

A comparison of board-foot volumes in saw-timber trees in saw-timber stands only is possible only when they are put on the same basis of specifications and standards. The 1933 volume adjusted to the 11-inch minimum diameter of saw-timber trees and in terms of the volume tables used in the 1950 reinventory, totaled 15,290 million board feet; the volume in 1950 was 12,830, a decrease of 16 percent.

DEFINITION OF TERMS USED

Land Area

Total Land

Includes dry land and unmeandered water surface.

Forest Land

Includes (a) land which is 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; and (b) land from which the trees described in "(a)" have been removed to less than 10 percent stocking and which has not been developed for other use. Minimum area of forest land recognized in reinventory of the county was 40 acres.

Nonforest Land

Land that does not qualify as forest land. Minimum area recognized in the reinventory of the county was 40 acres.

Forest Land Classes

Commercial Forest Land

Forest land which is producing, or is physically capable of producing, usable crops of wood, economically available now or prospectively, and not withdrawn from timber utilization.

Reserved from Commercial Timber Use

Forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land.

Noncommercial Forest Land

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.

Unproductive for Timber Use

Forest land 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.

Forest Types

Forest Type

A forest stand characterized by the predominance of certain key

species--in terms of cubic volume for saw-timber and pole-timber stands, and in number of trees for seedling and sapling stands--or a forest condition such as nonstocked cut-over or burned-over land. The generalized forest types listed in table 3 are of the following composition:

Douglas-fir. Stands comprised of 50 percent or more of Douglas-fir by cubic volume or number of trees.

Western hemlock. Stands comprised of 50 percent or more of western hemlock by cubic volume or number of trees.

True fir-mountain hemlock. Stands in which either Pacific silver fir or mountain hemlock comprise 50 percent or more of the cubic volume or number of trees.

Sitka spruce. Stands comprised of 50 percent or more of Sitka spruce by cubic volume or number of trees.

Western redcedar. Stands comprised of 40 percent or more of western redcedar by cubic volume or number of trees.

Lodgepole pine. Stands comprised of 50 percent or more of lodgepole pine by cubic volume or number of trees.

Hardwoods. Stands comprised of 50 percent or more of one of the merchantable hardwood species.

Nonstocked area. Cut-over or burned-over area on which the restocking, if any, is less than 10 percent density and which does not support a residual stand meeting minimum saw-timber requirements.

Tree Classes

Saw-Timber Tree

Softwood or hardwood tree 11.0 inches d.b.h. or larger containing at least one 16-foot log to a variable top diameter inside bark approximating 40 percent of diameter breast height, but never less than 8 inches, and in which one-third or more of the gross board-foot volume is free from rot and defect.

Pole-Timber Tree

Softwood or hardwood tree 5.0 to 10.9 inches d.b.h. in which one-third or more of the gross cubic-foot volume is free from rot and defect.

Cull Tree

Live tree of saw-timber or pole-timber size that is unmerchantable, now or prospectively, because of defect or rot.

Sound cull tree. Live tree of saw-timber or pole-timber size which contains 25 percent or more of sound volume but will not make at least one merchantable log, now or prospectively, because of roughness or poor form.

Rotten cull tree. Live tree of saw-timber or pole-timber size in which less than 25 percent of the total volume is sound.

Salvable Dead Tree

Standing dead or down tree which contains 25 percent or more of sound volume and at least one merchantable log.

Stand-Size Classes

Saw-Timber Stand

Stand of saw-timber trees having a minimum net volume per acre as follows: 5,000 board feet, log scale, Scribner rule, in any species except the pines and hardwoods; 1,500 board feet in the pines and hardwoods.

Old-growth saw-timber stand. Stand in which the majority of the cubic-foot volume is in trees more than about 180 years of age and larger than 21.0 inches d.b.h.

Large old-growth saw-timber stand. Stand in which the majority of the volume is in trees more than 41.0 inches d.b.h.

Large young-growth saw-timber stand. Stand in which the majority of the cubic-foot volume is in trees under about 180 years of age and from 21.0 inches to 40.9 inches d.b.h.

Small young-growth saw-timber stand. Stand in which the majority of the cubic-foot volume is in trees under 180 years of age and from 11.0 to 20.9 inches d.b.h.

Pole-Timber Stand

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

Seedling and Sapling Stand

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

Timber Volume

Live Saw-Timber Volume

Net volume in board feet of live saw-timber trees:

Scribner rule. The common board-foot rule used in determining log-scale volume of saw timber in this region. This rule underestimates, particularly in case of timber of the smaller diameters, the volume of lumber that could be produced from the timber.

International $\frac{1}{4}$-inch rule. The standard board-foot rule adopted by the Forest Service in the presentation of Forest Survey volume statistics. Volumes in this rule approximate lumber tally.

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 (of central stem) inside bark.

Salvable Dead

Dead trees, standing or down, in which at least one-third of the gross volume is free from rot or defect and in which sound volume totals at least 30 board feet.

Saw-Timber Volume

Net volume in board feet of live and salvable dead saw-timber trees to a merchantable top.

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.

Commercial Tree Species

Tree species that are considered in determining stocking of stands and growing-stock volume. Includes species presently or prospectively usable for commercial timber products.

Commercial tree species in Pacific County include:

Softwoods:

Douglas-fir (Pseudotsuga taxifolia).
Western hemlock (Tsuga heterophylla).
Sitka spruce (Picea sitchensis).
Western redcedar (Thuja plicata).
Pacific silver fir (Abies amabilis).
Lodgepole pine (Pinus contorta var. latifolia).

Hardwoods:

Red alder (Alnus rubra).
Bigleaf maple (Acer macrophyllum)

Commodity Drain

Commodity Drain on Live Saw Timber

Board-foot volume of live saw-timber trees removed from commercial forest land during a specified year as timber products and that left as logging residue.

Timber products output. The live saw-timber volume entering into timber products during a specified year.

Logging residue. The live saw-timber volume that is cut or killed in logging during a specified year but is not removed from the forest as timber products.

Commodity Drain on Growing Stock

The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land during a specified year as timber products and left as logging residue.

Timber Products Output. The growing stock volume entering into timber products during a specified year.

Logging residue. The volume of growing stock that is cut or killed in logging during a specified year but is not removed as timber products.

Comparison of Inventories

Ingrowth

The volume, or number, of trees that have grown past the specified lower diameter limit of a stand-size class during a specified period of time.

Outgrowth

The volume, or number, of trees that have grown past the specified upper diameter limit of a stand-size class during a specified period of time.