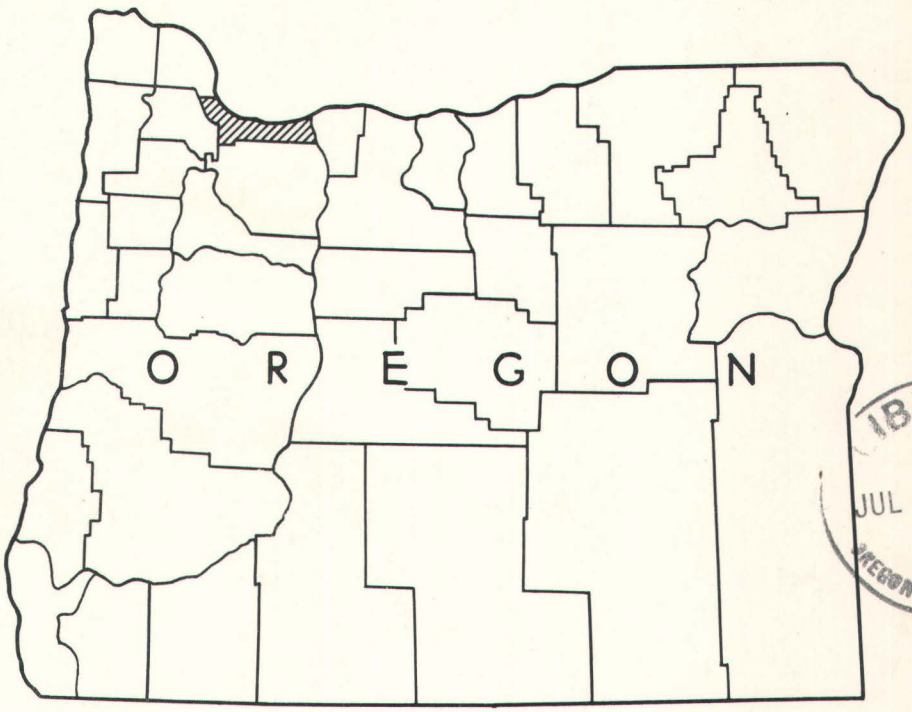
FOREST STATISTICS
FOR
MULTNOMAH COUNTY, OREGON

FROM THE FOREST SURVEY INVENTORY REVISED IN 1946
FOREST SURVEY REPORT NO. 98



U.S. DEPARTMENT OF AGRICULTURE — FOREST SERVICE
PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
J.A. HALL, DIRECTOR

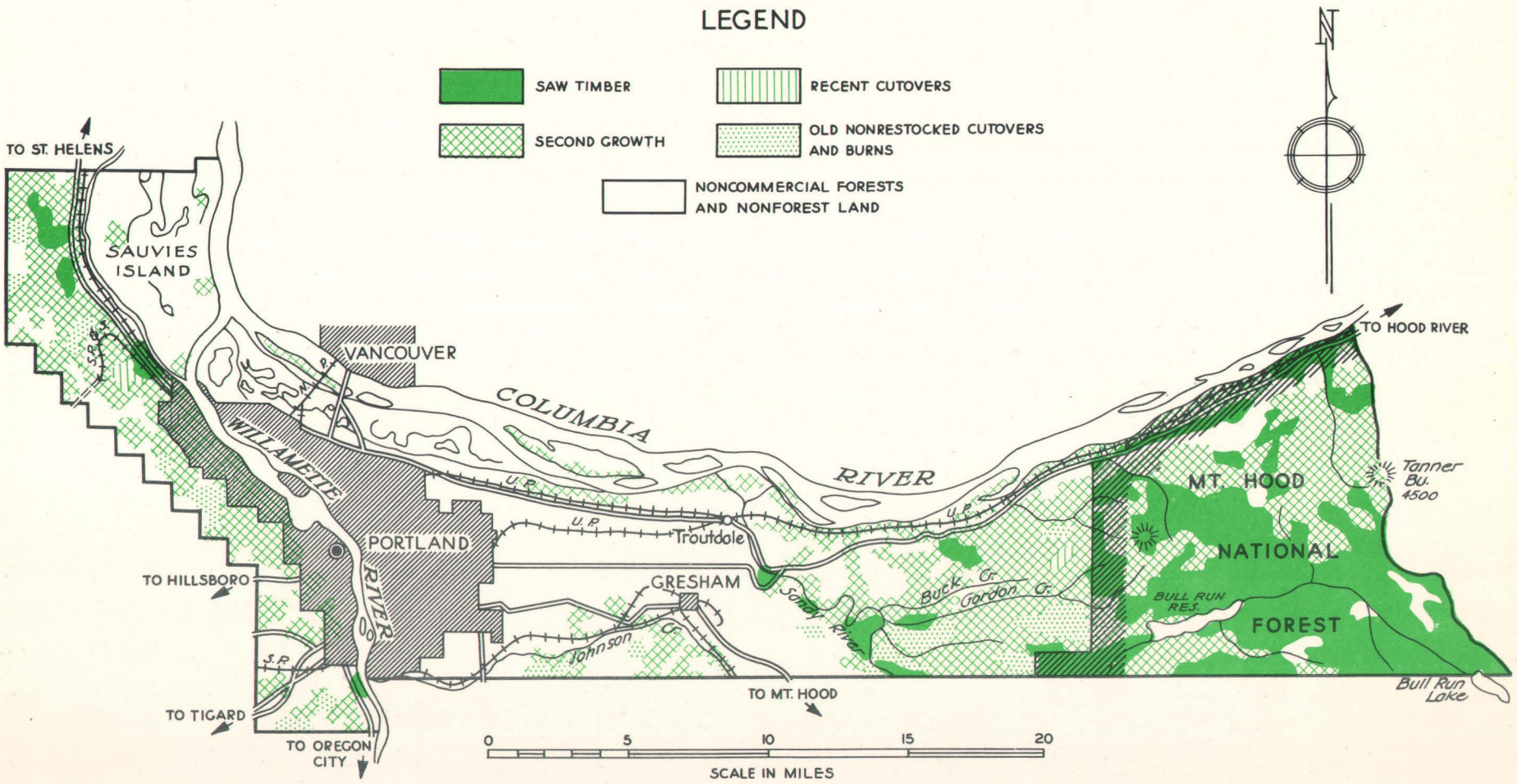
DIVISION OF FOREST ECONOMICS
PORTLAND, OREGON

JUNE 1947

FIGURE 1

OUTLINE MAP of MULTNOMAH CO., OREGON

1946



FOREWORD

The forest survey, a Nation-wide project, consists of a detailed investigation in five major parts of present and future forest resources: (1) An inventory of the country's existing forest resources in terms of areas occupied by forest-cover types and timber volumes, by species, in board feet and cubic feet, and a study of conditions on cut-over and burned-over lands; (2) a study of the depletion of the forests through cutting and through loss from fire, insects, disease, and other causes; (3) a determination of the current and potential growth on forest areas; (4) an investigation of present and prospective requirements for forest products; and (5) an analysis and correlation with other economic data of findings of these studies in order to make available basic facts and guiding principles necessary to plan for sound management and use of forest resources.

The forest survey of Oregon and Washington, an activity of the Pacific Northwest Forest and Range Experiment Station, was conducted in the Douglas-fir subregion during the period 1930-33.1/ In 1937, work of keeping the survey up to date was commenced in counties in which there had been a large amount of cutting depletion since the original survey.

The original forest inventory of Multnomah County, Oregon, was conducted in 1931 and a statistical report and a detailed forest type map were issued as of March 1, 1932. Field work for the reinventory of the county's forests was carried on during the summer of 1946. Adjustments were made for changes resulting from logging, fire, restocking of cutovers and burns, and transfer of land ownership since the original survey. Revised statistics, as of July 1, 1946, are given in this report and prints of the revised county type map may be obtained.2/

1/ Oregon and Washington were divided for survey purposes into two subregions: (1) Douglas-fir subregion, consisting of that part of both States west of the Cascade Range summit, and (2) ponderosa pine subregion, that part of both States east of the Cascade Range summit. A regional report, which includes an interpretation of the forest survey data and analysis of the forest situation, has been published for each of the two subregions.

2/ For information on the detailed 1-inch-to-the-mile forest type map of the county or the $\frac{1}{4}$-inch-to-the-mile lithographed State type maps covering Oregon and Washington, address Director, Pacific Northwest Forest and Range Experiment Station, 423 U. S. Court House, Portland 5, Oregon.

Forest Statistics for Multnomah County, Oregon

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FOREST STATISTICS FOR MULTNOMAH COUNTY, OREGON

By F. L. Moravets[1/]

The forests of Multnomah County, Oregon, were among the first to be utilized by early operations of the lumber industry in the Pacific Northwest. Prior to 1900 logging had removed practically all of the virgin timber stands from the western three-fourths of the county; subsequent operations have removed all those in the eastern portion, except from some 37,000 acres of publicly owned land managed as parks or as a watershed to supply water to the City of Portland. Land-clearing operations, following logging and expanding with the gradual development of the county, have converted the bulk of the cut-over acreage to nonforest land.

The 1946 inventory showed the land-use pattern to consist of 143,000 acres of forest land, or 52 percent of the total of 273,000 acres in the county; 69,000 acres in agricultural use; and 61,000 acres of other nonforest land, which included urban and suburban areas and unmeandered water surfaces.

The presence of a population concentration of approximately half a million people in the Portland area greatly influences the management of forest lands in the county. At present, approximately half of the forest land is now dedicated to furnishing recreational areas and a water supply for this population concentration, and the production of timber products is secondary. The other half of the forest acreage, very largely privately owned, is held in a large number of small individual tracts, a situation which greatly complicates the management pattern.

This report, which will deal only with the forest land of the county, will summarize statistical data obtained in the forest inventory. It will also trace the trend of forest depletion in the county, estimate the extent to which this depletion is being offset through forest growth, and show its relationship to the calculated allowable annual cut under relatively intensive forest management.

Physical Character of the County

Multnomah County, the smallest county in Oregon, is located in the northwestern portion of the State. It borders on the Columbia River for a distance of approximately 50 miles (figure 1). Varying from 6 to 15 miles in width, it has a total land area of 273,420 acres.

1/ Field work for the reinventory was by George E. Morrill, R. C. Grant, and W. H. Carmean.

Topography of the western half of the county is gentle. The western boundary lies along the crest of a low range of hills varying from 800 to 1,500 feet elevation. Slopes drop from this range to the nearby Willamette River which parallels the range and crosses the county to enter the Columbia River just north of Portland's city limits. This confluence of the two large rivers provides the city with a deep-water route to the ocean. Eastward from the Willamette a low-lying, generally level land stretches some 15 miles to the Sandy River, which also crosses the county to enter the Columbia. Between the Sandy and the eastern boundary, which is the summit of the Cascade Range, there is fairly rugged country composed of long slopes leading from stream courses to quite broad bench lands. Most rugged of all is the Gorge of the Columbia where precipitous cliffs drop 1,000 to 2,500 feet from the bench land to the river.

Throughout the county the physical factors of soil, precipitation, and climate combine to form a growing condition suitable for Douglas-fir. This species dominates in all conifer stands, except on small areas of the mountainous portion. Bottom lands along the Columbia and Willamette Rivers support sparse remnant stands of black cottonwood and Oregon ash that have escaped clearing operations.

Classification of Forest Land

On basis of capacity to produce timber of merchantable character the survey classed 139,000 acres, or 97 percent of the total forest land acreage, as commercial forest land (table 1). Practically all of the 4,000 acres classed as noncommercial forest land is located on the steep, rocky slopes of the Columbia Gorge. An area of 100 acres, mapped as oak-madrone woodland, is covered with short, rough unmerchantable trees.

Commercial Forest Land

Classification of the commercial forest land as to size of timber or condition of cut-over or burned-over lands is summarized in table 2.

Saw-Timber Stands

Practically all of the stands of conifers in which the timber is saw-timber size are located in the eastern one-fourth of the county. As shown in figure 1, there are only a few small areas of these stands in the remainder of the county.

Half of the total of 45,000 acres of saw timber is covered with old-growth Douglas-fir timber, most of which is of large diameter. There is only a small acreage of second-growth Douglas-fir saw timber.

Table 1.--Area of commercial and noncommercial forest land and nonforest land, by ownership and cover type, as of July 1, 1946

(Acres)

Type No.	Cover type	Total	Unreserved							Reserved[1]			
			Total	Private	State	County	Federal			Total	State	Municipal	National forest
							Revested land grant	Military Reservations	National forest				
	All lands												
	Forest land	143,415	126,365	64,320	440	3,695	4,010		53,900	17,050	905	2,345	13,800
	Nonforest land	130,005	127,820	124,290	180	610	110	345	2,285	2,185	550	885	750
	Total	273,420	254,185	188,610	620	4,305	4,120	345	56,185	19,235	1,455	3,230	14,550
	Commercial forest land												
	Douglas-fir												
6	Large old growth	18,860	17,790	540		20	85		17,145	1,070	40	820	210
7	Small old growth	3,785	2,730	1,280	170				1,280	1,055		20	1,035
8	Large second growth	3,785	3,270	2,840		115	315			515	165		350
9	Small second growth	49,625	45,800	37,115	265	1,620	895		5,905	3,825	55	175	3,595
10	Seedlings and saplings	19,780	17,405	9,425		1,195	1,355		5,430	2,375		220	2,155
	Western hemlock												
14	Large	9,570	5,430	35		10	145		5,240	4,140		685	3,455
15	Small	2,560	1,950	145		260	105		1,140	610		420	190
16	Seedlings and saplings	70								70			70
	Western redcedar												
17	Large	505	485						485	20			20
	Fir-mountain hemlock												
23	Large	8,760	8,635						8,635	125			125
24	Small	6,345	5,710	30					5,680	635			635
	Hardwood												
31.5	Large	3,980	3,685	3,575		95	15			295	270		25
31	Small	3,250	2,380	2,325		55				870	375	5	490
	Nonrestocked cutover												
35	Cut prior to 1920	1,625	1,625	1,625									
35A	Cut from 1920-29	3,455	3,455	2,335		250	780		90				
35B	Cut from 1930-39	865	865	550			315						
36	Recent cutover, since 1940	885	885	830		55							
37	Deforested burn	1,555	1,555	1,555									
	Total	139,260	123,655	64,205	435	3,675	4,010		51,330	15,605	905	2,345	12,355
	Noncommercial forest land												
4	Woodland (oak-madrone)	100	100	100									
38	Noncommercial rocky area	4,055	2,610	15	5	20			2,570	1,445			1,445
	Total	4,155	2,710	115	5	20			2,570	1,445			1,445
	Nonforest land												
3	In agricultural use	68,735	68,245	67,650	5	260	110	220		490	205	265	20
2	Other	61,270	59,575	56,640	175	350		125	2,285	1,695	345	620	730
	Total	130,005	127,820	124,290	180	610	110	345	2,285	2,185	550	885	750

1/ Cutting for commodity production prohibited or limited by regulation or legislation. Reserved for watershed protection or recreational use.

Table 2.--Area of commercial forest land, by ownership and generalized forest type, as of July 1, 1946

(Acres)

Generalized forest type	Total	Unreserved						Reserved[1]			
		Total	Private	State	County	Federal: Revested land grant	Federal: National forest	Total	State	Municipal	National forest
Conifer saw timber Types 6, 7, 8, 14, 17, and 23	45,265	38,340	4,695	170	145	545	32,785	6,925	205	1,525	5,195
Conifer second growth Types 9, 15, and 24											
On cut-over areas	27,455	27,430	25,875	95	810	650		25			25
On burns	25,355	20,945	11,385	170	1,070	350	7,970	4,410	55	595	3,760
Total	52,810	48,375	37,260	265	1,880	1,000	7,970	4,435	55	595	3,785
Conifer seedlings and saplings Types 10, 16, and 24											
On cut-over areas	16,900	14,000	9,215		1,195	1,355	2,235	2,900		75	2,825
On burns	8,670	8,490	240				8,250	180		145	35
Total	25,570	22,490	9,455		1,195	1,355	10,485	3,080		220	2,860
Recent cut-over areas Type 36	885	885	830		55						
Nonrestocked cut-over and burned-over areas Types 35, 35A, 35B, and 37	7,500	7,500	6,065		250	1,095	90				
Hardwoods Types 31 and 31.5	7,230	6,065	5,900		150	15		1,165	645	5	515
Total	139,260	123,655	64,205	435	3,675	4,010	51,330	15,605	905	2,345	12,355

1/ Cutting for commodity production prohibited or limited by regulation or legislation. Reserved for watershed protection or recreational use.

Western hemlock is the key species in saw-timber stands covering about 10,000 acres, and on a slightly smaller acreage there are stands composed of varying mixtures of noble fir, Pacific silver fir, mountain hemlock, western hemlock, or western white pine. These mixed stands are located on the higher elevations of the mountainous portion of the county.

Pole-Timber Stands

Immature conifer stands of pole size--6 to 20 inches in diameter breast height--stock 53,000 acres. There are three concentrations of these stands: On the range of hills along the county's western boundary; in the central portion, between the Sandy River and the boundary of the Mt. Hood National Forest; and in the northern part of the national forest area. Douglas-fir is the predominant species on 93 percent of the pole-timber acreage, western hemlock on the remaining 7 percent.

The pole stands range from 20 to 90 years in age (table 3) and average about 45 years. The Douglas-fir stands average 55 percent in density of stocking, the hemlock stands 66 percent.

In the portion of the county outside the national forest, the pole stands occupy lands that were once cut over; inside the national forest they have restocked areas that were once denuded by fire.

Seedling and Sapling Stands

Seedling and sapling stands, in which the trees are less than 6 inches in diameter breast height, are found on 26,000 acres. These young stands are located chiefly on rather recently logged areas near the western boundary of the national forest, and are both inside and outside the forest. In the extreme northeastern portion of the county there is considerable acreage of young stands on steep slopes that was originally denuded by recurring fires, but has restocked since fires have been controlled.

As is true of the saw- and pole-timber stands in the county, the seedling and sapling stands are predominantly Douglas-fir; on more than three-fourths of the area this species is the principal tree. On the remainder of the area of these stands there are mixtures of noble fir, western and mountain hemlock, Pacific silver fir, and western white pine. The Douglas-fir stands average about 15 years in age and have a density of 45 percent; the mixed stands average 30 years old and 50 percent density.

Recent Cut-Over Areas

Areas clear cut since January 1, 1940 and classed as recent cutovers total only 885 acres. Some of the acreage is in the agricultural zone and will probably be cleared for farm land. Areas of this type in the forest zone should restock readily.

Table 3.--Area of immature commercial conifer types on unreserved and reserved lands, by age class and degree of stocking, as of July 1, 1946

(Acres)

Age class (years)	Degree of stocking	Total	Unreserved						Reserved[1]						
			Total	10 Douglas-fir seedlings and saplings	9 Douglas-fir small second growth	8 Douglas-fir large second growth	15 Western hemlock small second growth	24 Fir-mountain hemlock second growth	Total	10 Douglas-fir seedlings and saplings	9 Douglas-fir small second growth	8 Douglas-fir large second growth	16 Western hemlock seedlings and saplings	15 Western hemlock small second growth	24 Fir-mountain hemlock second growth
Total all ages	Good	16,740	12,100	1,295	9,295	70	735	705	4,640	665	3,350	115	70	295	145
	Medium	39,940	36,670	7,645	23,185	1,160	1,215	3,465	3,270	1,635	430	400		315	490
	Poor	25,485	25,365	8,465	13,320	2,040		1,540	120	75	45				
	Total	82,165	74,135	17,405	45,800	3,270	1,950	5,710	8,030	2,375	3,825	515	70	610	635
10	Good	850	510	510					340	270			70		
	Medium	1,720	1,395	1,395					325	110					215
	Poor	6,735	6,660	6,660					75	75					
	Total	9,305	8,565	8,565					740	455			70		215
20	Good	1,240	845	785				60	395	395					
	Medium	7,975	6,175	5,900	115			160	1,800	1,525					275
	Poor	1,860	1,860	1,805	55										
	Total	11,075	8,880	8,490	170			220	2,195	1,920					275
30	Good	6,045	4,085		3,440			645	1,960		1,815				145
	Medium	6,005	6,005	45	3,280			2,680							
	Poor	3,455	3,455		1,915			1,540							
	Total	15,505	13,545	45	8,635			4,865	1,960		1,815				145
40	Good	2,660	2,080		1,455		625		580		285			295	
	Medium	11,675	11,225	305	9,960		335	625	450		260			190	
	Poor	6,235	6,205		6,205				30		30				
	Total	20,570	19,510	305	17,620		960	625	1,060		575			485	
50	Good	5,580	4,330		4,330				1,250		1,250				
	Medium	7,450	7,240		6,360		880		210		85			125	
	Poor	3,920	3,920		3,920										
	Total	16,950	15,490		14,610		880		1,460		1,335			125	
60	Good	70	70		70										
	Medium	2,590	2,590		2,540	50									
	Poor	520	520		520										
	Total	3,180	3,180		3,130	50									
70	Good														
	Medium	820	735		700	35			85		85				
	Poor	435	435		435										
	Total	1,255	1,170		1,135	35			85		85				
80	Good														
	Medium	230	230		210	20									
	Poor	725	725		145	580									
	Total	955	955		355	600									
90	Good	295	180			70	110		115			115			
	Medium	1,090	925		20	905			165			165			
	Poor	1,090	1,075		125	950			15		15				
	Total	2,475	2,180		145	1,925	110		295		15	280			
100 to 160	Good														
	Medium	385	150			150			235			235			
	Poor	510	510			510									
	Total	895	660			660			235			235			

1/ Cutting for commodity production prohibited or limited by regulation or legislation. Reserved for watershed protection or recreational use.

Nonrestocked Cut-Over and Burned-Over Areas

There is a total of about 6,000 acres of cut-over land logged prior to 1940 that is now in a nonrestocked condition. This acreage is made up of fifteen individual areas scattered throughout the western three-quarters of the county. Much of the acreage will probably be cleared for agricultural use.

The major portion of the 1,500 acres of nonrestocked burn is in one area on the slopes extending from the Willamette River to the county's western boundary.

Hardwood Stands

Small tracts of black cottonwood on the bottom lands along the Columbia River comprise the bulk of the 7,000 acres of hardwood stands in the county. Most of the cottonwood is saw-timber size, but the stands are sparsely stocked and timber volume low. Along the Sandy River and on the hills west of Portland there are stringers of red alder, most of which is immature.

Productive Capacity of Forest Land

The productive capacity of a forest area is a composite of a number of physical factors that influence tree growth such as soil, precipitation, climate, altitude, and aspect. In rating the relative productive capacity of Multnomah County, the Douglas-fir site classification was used. In table 4, which shows results of this classification, it is seen that 76 percent of the county's forest land rates average or better in timber-growing capacity. (In the Douglas-fir classification, Site I is the most productive, Site V the least, Site III is of average productivity.)

Timber Volume

The inventory shows a total timber volume in conifer trees 16 inches in diameter breast height and larger of 2,290 million board feet, log scale, Scribner rule, and 18 million board feet in hardwood trees 12 inches in diameter breast height and larger (table 5).

Douglas-fir volume is 1,238 million feet, of which 93 percent is in old-growth trees. The volume of western hemlock totals 559 million feet, nearly all of which is in old-growth trees. Three species of balsam firs--noble fir, Pacific silver fir, and grand fir--occur in the county in merchantable quantity, the first two to the extent of 141 million feet and 232 million feet, respectively, and the third in a very small quantity. Other conifers of limited timber volume in the county are western redcedar, mountain hemlock, and western white pine.

Black cottonwood, totalling 12 million feet, comprises two-thirds of the hardwood volume. There are small volumes each of red alder and bigleaf maple and a trace of Oregon ash.

Table 4.--Area of unreserved and reserved commercial conifer forest land by site quality class,1/ as of July 1, 1946

Site quality class	Total		Unreserved		Reserved2/	
	Acres	Percent	Acres	Percent	Acres	Percent
			Douglas-fir site			
Site class II	16,255	12.3	14,595	12.4	1,660	11.5
Site class III	84,225	63.8	74,510	63.4	9,715	67.3
Site class IV	24,725	18.7	22,770	19.3	1,955	13.5
Site class V	6,825	5.2	5,715	4.9	1,110	7.7
Total	132,030	100.0	117,590	100.0	14,440	100.0

1/ The "site quality" of a forest area is its relative productive capacity, determined by climatic, soil, topographic, and other factors. The index of site quality is the average height of the dominant stand at the age of 100 years. Five site quality classes are recognized, Class I being the highest. The Douglas-fir site classification was used in rating all commercial conifer lands in the county.

2/ Cutting for commodity production prohibited or limited by regulation or legislation. Reserved for watershed protection or recreational use.

Table 5.--Volume of timber by ownership and species, as of July 1, 1946

(Thousand board feet, log scale, Scribner rule)

Species	Total	Unreserved						Reserved[1]			
		Total	Private	State	County	Federal: Revested land grant	Federal: National forest	Total	State	Municipal	National forest
All species											
Conifers	2,289,865	2,136,285	101,589	4,054	4,224	7,949	2,018,469	153,580	3,523	57,450	92,607
Hardwoods	17,986	16,861	15,861		285	215	500	1,125	1,125		
Total	2,307,851	2,153,146	117,450	4,054	4,509	8,164	2,018,969	154,705	4,648	57,450	92,607
Conifers (trees 16 inches d.b.h. and larger)											
Douglas-fir											
Large old growth	1,022,973	979,702	8,400		524	1,275	969,503	43,271	650	29,419	13,202
Small old growth	129,341	103,942	18,880	3,968	17		81,077	25,399		6,922	18,477
Large second growth	47,297	40,501	36,026		2,004	2,471		6,796	2,767		4,029
Small second growth	38,807	37,887	32,841	54	1,276	1,942	1,774	920	106	105	709
Western hemlock											
Large	533,805	463,044	3,800	32	216	2,100	456,896	70,761		19,849	50,912
Small	25,284	24,357				161	24,196	927		927	
Mountain hemlock	24,736	24,736					24,736				
Western redcedar	82,298	81,726	88				81,638	572		228	344
Western white pine	11,239	10,120	68		3		10,049	1,119			1,119
Grand fir	185	185			77		108				
Noble fir	141,414	137,967	1,379		77		136,511	3,447			3,447
Pacific silver fir	232,486	232,118	107		30		231,981	368			368
Total	2,289,865	2,136,285	101,589	4,054	4,224	7,949	2,018,469	153,580	3,523	57,450	92,607
Hardwoods (trees 12 inches d.b.h. and larger											
Red alder	1,940	1,940	1,770			170					
Bigleaf maple	3,820	3,520	3,475			45	500	300	300		
Black cottonwood	11,681	10,856	10,571		285			825	825		
Oregon ash	45	45	45								
Total	17,486	16,361	15,861		285	215	500	1,125	1,125		

1/ Cutting for commodity production prohibited or limited by regulation or legislation. Reserved for watershed protection or recreational use.

Forest Ownership

Forest lands on which the timber is available for commodity production are classed as unreserved; those on which cutting is prohibited or limited by regulation or legislation are classed as reserved. This classification of commercial forest land is shown in both table 1 and table 2; in table 1 it is shown also for the noncommercial forest land. Eighty-nine percent of the commercial forest land and 65 percent of the noncommercial forest land is in unreserved ownership.

Unreserved Ownership

Privately owned forest lands, totalling 64,000 acres, or slightly more than half of the forest area in unreserved status, are located almost entirely in the western two-thirds of the county. Nearly three-fourths of the private forest land is occupied by immature stands, generally of pole size. Less than 5 percent of the volume of merchantable conifer timber, but practically all of the small volume of the hardwood species is privately owned. Table 5 shows the merchantable timber volume by ownership class and whether reserved or unreserved. Ninety-three percent of the volume is in unreserved ownership.

The State of Oregon owns 1,345 acres of forest land, two-thirds of which is reserved in parks in the Columbia Gorge area. Volume of timber on State lands totals about 9 million board feet.

Multnomah County holds 3,695 acres of forest land, comprised of small areas chiefly supporting immature stands of Douglas-fir. Volume of timber totals but 4 million feet.

The City of Portland owns a small acreage of forest land, part of which is in parks in the Columbia Gorge area and part in administrative sites in the Bull Run watershed area; all is in a reserved status. The city's lands support 57 million board feet of merchantable timber, all conifer.

Federal forest ownership in the county includes 68,000 acres of national forest land managed by the Forest Service, and 4,000 acres of revested grant lands managed by the O and C Administration.

The national forest lands in an unreserved status total 54,000 acres of which 33,000, or 60 percent, is occupied by saw-timber stands. Timber volume in these stands amounts to 2,019 million board feet, or 87 percent of the total volume in the county. Reserved forest lands in national forest ownership are located in the Columbia Gorge area and are managed for their scenic value and recreational use. Of the total of 14,000 acres, 37 percent is covered with saw-timber stands, which have a volume of 93 million board feet.

The O and C revested grant lands, all of which are in unreserved status, includes only a small area of saw-timber stands with a volume of 8 million feet.

Forest Depletion

Early records, which would indicate the rate at which the forests of Multnomah County were cut, are not available. However, it is certain that cutting of timber began with the first white settlements about 1830 and expanded with growth of the settlements. Probably the peak of logging activity was reached in the last quarter of the nineteenth century. Practically all of the virgin saw timber in the county west of the Sandy River was cut prior to 1900. During this period of development, clearing of cut-over areas and slashing of immature stands to create agricultural lands very materially reduced the forest land acreage. Fires escaping from land clearing operations and originating from other causes destroyed a considerable volume of saw timber and deforested areas of immature timber. Prior to systematic forest fire control, fires were particularly destructive on some of the rough mountainous slopes of the Columbia Gorge.

Statistics of sawlog production since 1924 are available through annual records compiled by the Forest Service. Table 6 shows the average annual volume of sawlogs produced in the county from 1925 to 1943, by 5-year periods.

Table 6.--Average annual production of sawlogs for specified periods, 1925-43

Period	Million board feet, log scale, Scribner rule
1925-29	47
1930-34	29
1935-39	26
1940-43	15

Annual production in 1942 and 1943 was only a little more than 2 million board feet, and in 1945 totalled approximately 6 million board feet.

The so-called minor forest products, such as fuel wood, pulpwood, fence posts, poles and piling, shingle bolts, and excelsior bolts, have been cut in the county in the past in considerable volume. A survey of minor products in 1930 showed an average annual cut of about 16 million board feet from trees of saw-timber size and 2.5 million cubic feet from trees of less than saw-timber size. In recent years the volume of timber cut from trees of saw-timber size in form of minor products--chiefly firewood--has averaged from 3 to 5 million board feet annually.

In the past few years fire has caused very little forest depletion in the county. The few small fires that have occurred have been in immature stands or on cut-over areas that have caused only

minor loss of timber. There is an annual loss of timber due to forest insects, diseases, and windthrow, but in recent years such loss has not been in excess of that considered normal for stands of the character of those in the county.

Forest Growth

Current Annual Growth

In calculating the current rate of forest growth in Multnomah County the stands now occupying commercial forest land in unreserved ownership are placed in two classifications: Growing stands and nongrowing stands. Basis of this classification is age of the stands--growing stands are those under 160 years of age; nongrowing stands are those older than 160 years. It is recognized that growth is taking place in these older stands, particularly those from 160 to 350 years, but loss in the overmature stands, due to decay, mortality, and windthrow, is thought to offset this growth.

The growing conifer stands total 74,250 acres, hardwood stands 6,065 acres. In calculating the current annual net growth of these immature stands, data on age of the stands, their density of stocking, and site quality of the land occupied by them, obtained in the 1946 inventory, are used. Growth is calculated for two standards of forest utilization--trees 15.1 inches in diameter breast height and larger, and trees 11.1 inches in diameter breast height.

Current annual net growth in trees 15.1 inches d.b.h. and larger is computed to be 12.3 million board feet, of which 97 percent is in conifer stands and 3 percent in hardwood stands. Ninety-five percent of the conifer growth is in Douglas-fir types.

In trees 11.1 inches d.b.h. and larger the current annual net growth is computed to be 32 million board feet, of which 99 percent is in conifer trees.

Potential Annual Growth

Another measure of the productive capacity of the county's forest land is obtained through calculation of what is termed potential annual growth. This calculation presupposes that all unreserved commercial conifer lands are stocked with stands averaging 75 percent of full density, and that all age classes up to rotation age are represented. This theoretical growth in trees 15.1 inches d.b.h. and larger is computed to be 32.7 million board feet; in trees 11.1 inches d.b.h. and larger, 52.1 million board feet. Thus it appears that the present conifer stands annually have a net growth in trees of the larger standard equal to about 36 percent of an ideal growth rate obtainable under intensive forest management. In trees 11.1 inches and larger the current rate is about 61 percent of the potential rate.

Forest Industries

Portland has long been one of the larger lumber centers of the Pacific Northwest, numbering among its forest industries several large-capacity sawmills, a plywood plant, sash and door mills, a large number of planing and woodworking plants, and two large furniture factories. Several small sawmills and woodworking plants have been located in the county, outside the Portland district. In the last two decades from 15 to 25 sawmills have operated annually.

Statistics on lumber production, available by years since 1924, show an average annual output of 848 million board feet during the 5-year period 1925-29; production in 1928 was 944 million board feet, the peak year for the county's sawmills. Average yearly production for the 5 years, 1941-45, another period of high lumber output in the Pacific Northwest, was 5.5 million board feet. The lower production of this recent period compared to that of the 1925-29 period reflects the increasing scarcity of sawlogs in the Portland area. In 1945 two of the larger sawmills in the city, with a combined 8-hour capacity of 700,000 board feet, closed permanently because of the lack of sawlogs.

The forests of Multnomah County had a role in the early development of the lumber industry in the Portland area, but in recent decades they have supplied but a very insignificant volume of sawlogs to the local industry. Rather, the city reached and long maintained its high position in lumbering through its strategic location on the Willamette and Columbia Rivers, which afforded water transportation and storage for sawlogs from a broad forest territory in the Willamette Valley and lower Columbia River area.

Forest Management

Up to the present, the production of sawlogs and other forest products has not been a factor in the management of approximately half of the forest land in Multnomah County. Of the 143,000 acres of forest land, a total of about 71,000 acres is currently managed primarily for recreational purposes and as a water supply for the Portland area.

The recreational areas, consist of some 14,000 acres of national forest land located in the Columbia Gorge, and known as the Columbia Gorge Park. The State of Oregon has also established several State parks totalling about 1,000 acres in the Columbia River Gorge. These parks, which encompass the spectacularly scenic features of the area--the rough slopes, precipitous cliffs, rugged rock formations, and high waterfalls--are covered with both commercial and noncommercial forests. No timber cutting for commodity production is allowed in any of the stands.

Forest lands in the national forest ownership, totalling about 54,000 acres, lie within the Bull Run Watershed, the source of Portland's water supply. Also included in the watershed are municipally owned forests totalling over 2,000 acres and located on the

administrative sites of the city's water department. Although the timber on the national forest land within the watershed is in an unreserved status, very little cutting for commodity production has taken place to date. Some 2,000 acres of privately owned forests within the watershed were logged several years ago, and recently the cut-over land was transferred to national forest ownership through an exchange of the land for timber stumpage on other national forest lands outside the watershed.

The area of forest land in the county dedicated to recreational use will probably be increased by 5,000 to 6,000 acres through recent action taken by Portland's city commissioners. It is proposed to set aside as a forest park an area of forest land lying on the slopes and crest of the range of hills west of the city and largely stocked with immature conifer stands. Lands to be included in the park are now in county and city ownership.

The 64,000 acres of privately owned forest land is comprised of a large number of individual tracts from 40 to 200 acres in extent and few of which are in excess of 500 acres. Such small ownerships, while not generally thought of as sustained-yield management units, can be made a profitable source of income to the individual owners through intensive forestry practice. In the forest zone, between the Sandy River and the western boundary of the national forest, there is a good opportunity for private forestry. The productive capacity of the land is relatively high; most of the land is now stocked with thrifty immature stands--10 to 50 years of age and in general of fair stocking density. Other favorable factors are: Ready market for all types of forest products, easy logging ground, and established main highways for transportation. Consolidation of these private lands in fairly large units in stable ownership to insure good management practices is desirable. Intermingled with these private lands are 4,000 acres of federally owned revested grant lands administered by the O and C Administration and a few hundred acres of State land. These public forests will be managed for sustained timber production.

In the agricultural zone, the private forests are of the woodlot type. Generally a part of a farm unit, they occur as scattered isolated tracts from 40 to 200 acres in extent. A very large part of this woodlot acreage is stocked with pole-size Douglas-fir stands from 30 to 60 years old and of good stocking density. Managed on a short rotation for the production of piling, poles, posts, fuel wood, and pulpwood, these tracts can be a valuable asset to the farm economy of the county.

Allowable Annual Cutting Drain

A positive measure of the capacity of the county's present unreserved commercial forests for timber production is expressed through the calculation of the allowable annual cutting drain that could be maintained through the first rotation under relatively intensive forest management. Using as a basis the present mature

timber volume and the growth of the present immature stands for a rotation of 100 years, the allowable average annual cutting drain is calculated to be 50 million board feet. In other words, if the unreserved commercial forests have planned cutting operations at a rate of 50 million board feet annually, in which the mature timber would be cut first and then the present immature stands cut in the order of their age, the annual cut of 50 million feet could be maintained during the rotation. After the first rotation, the forest area under good forest management would support the potential annual growth of 52 million board feet, for trees 11.1 inches d.b.h. and larger, as indicated under the heading Potential Annual Growth on page 12. While such an annual supply of timber is small in comparison with the volume possible in some of the larger, heavily timbered counties of western Oregon, it would constitute an important source of raw material for the forest industries of Multnomah County, which are finding it more and more difficult to obtain sawlogs in competition with other industrial districts of the Pacific Northwest.