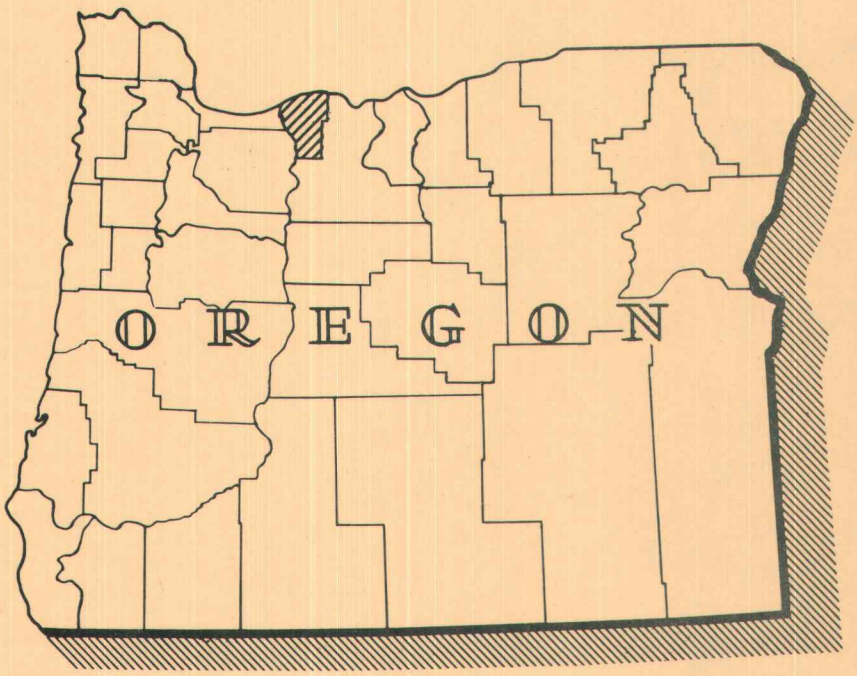
FOREST STATISTICS FOR HOOD RIVER CO., OREGON

FOREST SURVEY REPORT NO. 125



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

PORTLAND, OREGON SEPTEMBER 1956

PREPARED BY THE DIVISION OF FOREST ECONOMICS RESEARCH

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1/ Acknowledgment is made of cooperation from public and private agencies in furnishing cutting and ownership records.

FOREST STATISTICS

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HOOD RIVER COUNTY, OREGON

(Forest Survey Report No. 125)

by

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and

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

R. W. Cowlin Director
September 1956

FOREWORD

This publication summarizes in statistical form the results of a reinventory of the forests of Hood River County, Oregon, conducted in 1954. This reinventory is a part of the maintenance phase of the Forest Survey, a nationwide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928, 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 and programs.

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, the forests of Hood River County were inventoried in 1932. A statistical report "Forest Statistics for Hood River County, Washington," and a detailed forest type map on a scale of 1 inch to the mile were released a short time later. The reinventory has resulted in a revised statistical report and a forest type map available on a scale of either 1 or 2 inches to the mile. 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, P. O. Box 4059, Portland 8, Oregon

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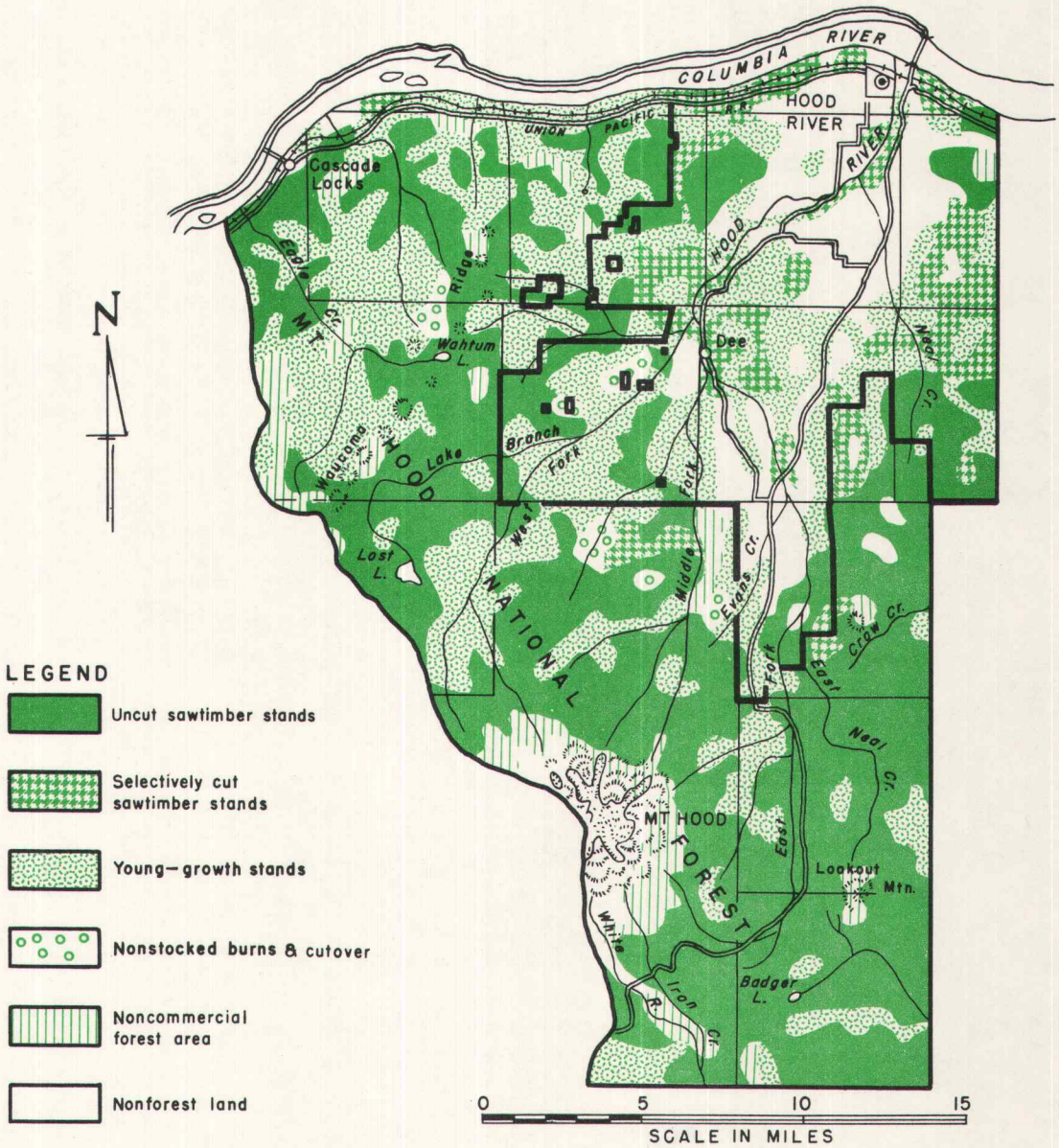
HOOD RIVER COUNTY, OREGON

1954



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SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

GENERAL

Hood River County, in northern Oregon, extents southward from the Columbia River for 30 to 32 miles and eastward 10 to 23 miles from the main crest of the Cascade Range. Hood River County was created in 1908, the area of 336,750 acres included within its present boundaries being drawn from Wasco County. Its name is derived from Hood River, which flows northward from Mount Hood.

The topography of the county is generally hilly and mountainous. The Cascades rise abruptly from the Columbia River, where they form a precipituous gorge of great beauty, and extend in rugged, broken slopes 4,500 feet above sea level, culminating in the southwest part of the county on Mount Hood's summit, at 11,245 feet elevation. Hood River Valley, containing the best agricultural land in the county, lies in the northwest portion of the county and extends 17 miles south from the Columbia River. It ranges from a fraction of a mile to 7 miles in width and in elevation from a few hundred feet to about 2,000 feet at the southern end. The valley is formed by a spur of the Cascades branching out near the base of Mount Hood and terminating in rocky cliffs along the Columbia River.

The entire county drains into the Columbia River. Hood River is the principal drainage, with the extreme northwestern and northeastern portions drained by small creeks directly into the Columbia. The eastern and much of the southern area drain by White River and lesser streams into the Deschutes River and then into the Columbia. All are rapid streams with numerous cascades and waterfalls entrenched in deep, steep canyons.

The climate, influenced by elevation, varies considerably throughout the county. At lower elevations winters are fairly moderate, summers are long, and rainfall is moderate. In the mountainous sections, the climate is more severe, with shorter growing seasons and greater extremes in temperature. Snowfall, usually light in the valley, is normally very heavy in the hills, sometimes reaching a depth of 30 feet at timberline on Mount Hood.

The settled portions of Hood River County have good transportation facilities. Two arterial highways, the Mount Hood Loop and the Columbia River Highway, run the length and breadth of the county. All-weather, feeder roads of good quality make all occupied parts of the county accessible by automobile. The main line of the Union Pacific Railroad traverses the north end of the county, and a branch line serving the upper valley extends from Hood River to Parkdale. The Columbia River is navigable by river boats.

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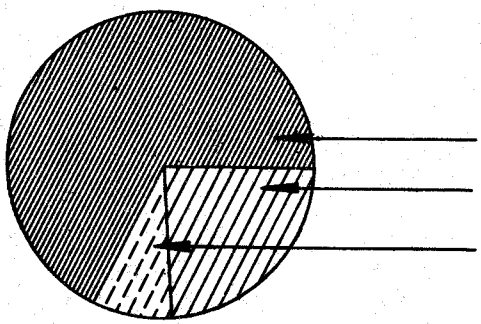
recreational purposes. They consist mainly of Mount Hood Wild Area and Eagle Creek Limited Area on the Mount Hood National Forest, and a number of State campgrounds and parks located along the Columbia River.

COMMERCIAL FOREST LAND AREA

Major Types

Though lying east of the summit of the Cascades, the majority of Hood River County's forests are more typical of the Douglas-fir subregion than of the ponderosa pine subregion. Hence the county, lying in a transition zone between the two zones, is included in the Douglas-fir subregion.

The two major forest types in the county are Douglas-fir and fir-spruce.

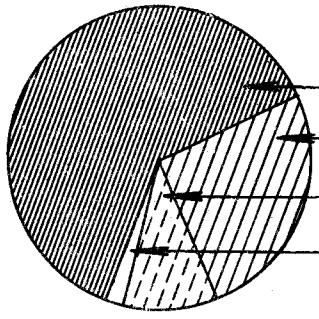


MAJOR TYPE	THOUSAND ACRES	PERCENT
DOUGLAS-FIR	158	65
FIR-SPRUCE	53	22
OTHER	31	13
TOTAL	242	100

In general, Douglas-fir stands occur throughout the county at lower elevations. With increasing elevation they are gradually replaced by stands of hemlock, fir, and spruce. Located in the eastern part of the county at lower elevations and on drier sites are 14,000 acres of ponderosa pine in blocks of from 40 to 1,000 acres. Other types are limited in area and are mainly lodgepole pine, larch, and hardwoods.

Stand-Size Class

Despite a long history of timber harvesting, 84 percent of the sawtimber stands are uncut. Sawtimber stands occur on 149 thousand acres, or 62 percent of the commercial forest area in the county. Of this area, the stands on 96 thousand acres are classified as large sawtimber; i.e., with the volume predominantly in trees more than 21 inches d.b.h. The remaining 53 thousand acres is in small-sawtimber stands.



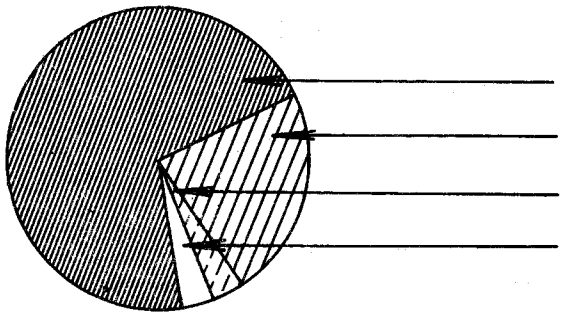
STAND SIZE	THOUSAND ACRES	PERCENT
SAWTIMBER	149	62
POLETIMBER	64	26
SEEDLING & SAPLING	24	10
NONSTOCKED	5	2
TOTAL	242	100

Cutting of timber in the past has been concentrated on private lands because of generally higher quality of timber, more desirable species, and greater accessibility. Private lands contain 11 thousand acres of uncut sawtimber stands, 11 thousand acres of residual sawtimber stands and 35 thousand acres of poles, seedlings, and nonstocked areas. National forest timber, which in general is at higher elevations, includes 107 thousand acres of uncut sawtimber stands and 4 thousand acres of residual stands, with the remaining 45 thousand acres largely in younger stands.

Fifty-five percent of the combined acreage of poletimber and seedling and sapling stands represents restocked logged land. A considerable part of the remaining area is restocked burns. The nonstocked area is almost evenly divided between recent clearcut areas and old clearcut and burned-over areas.

Stocking of Young-Growth Stands

Most of the young-growth stands are adequately stocked. Ninety-four percent of these stands, which include young-growth sawtimber, poletimber, seedlings and saplings, and nonstocked areas, are medium to well stocked. The remaining 6 percent of the area is poorly stocked or nonstocked.



STOCKING CLASS	THOUSAND ACRES	PERCENT
WELL	146	71
MEDIUM	47	23
POOR	7	3
NONSTOCKED	5	3
TOTAL	205	100

About 90 percent of the young-growth sawtimber stands are well stocked. In poletimber stands 60 percent is well stocked and 37 percent medium stocked. Twenty-six percent of the seedling and sapling areas are well stocked and 56 percent medium stocked.

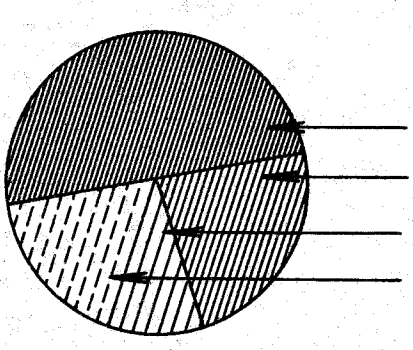
In classifying young-growth stands for stocking, all commercial tree species of all sizes are considered. Thus, a young-growth sawtimber stand may be classed as well stocked on the basis of sawtimber-size trees, poletimber, seedlings and saplings, or any combination of these tree sizes.

COMMERCIAL FOREST LAND TIMBER VOLUMES

The net volume of live sawtimber trees (11.0 inches d.b.h. and larger) on commercial forest land is estimated to be 4,397 million board-feet, log scale, Scribner rule, or 4,749 million board-feet, log scale, International $\frac{1}{4}$-inch rule. Of the total Scribner volume, 4,278 million board-feet or 97 percent is in sawtimber stands; the remaining 119 million board-feet is in scattered sawtimber trees in the overstory of poletimber and seedling and sapling stands.

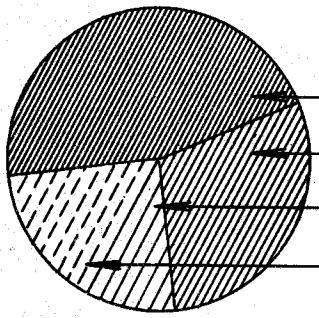
Species

The live sawtimber volume (Scribner) of softwood species totals 4,394 million board feet; the volume of hardwood species is small, amounting to only 3 million board feet. The dominant species, Douglas-fir, accounts for half of the total volume in the county. Western hemlock and the true firs, which include noble fir, Pacific silver fir, and grand fir, make up 34 percent of the volume. The remaining volume is distributed in descending magnitude among mountain hemlock, Engelmann spruce, white and ponderosa pine, larch, and lodgepole pine.



SPECIES	SAWTIMBER MILLION BD.-FT. (Scribner)	PERCENT
DOUGLAS-FIR	2,205	50
TRUE FIRS	1,066	24
WESTERN HEMLOCK	412	10
OTHER	714	16
TOTAL	4,397	100

Almost 74 percent of the softwood sawtimber is in large trees 21 inches or over in diameter. Of this volume, 15 percent is in trees 41.0 inches in diameter, 24 percent in trees 31.0 to 40.9 inches, and 35 percent in trees 21.0 to 30.9 inches d.b.h.

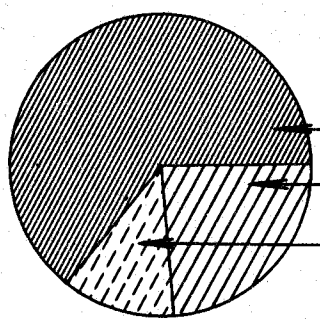


SPECIES	GROWING STOCK MILLION CU. FT.	PERCENT
DOUGLAS-FIR	480	45
TRUE FIRS	282	27
WESTERN HEMLOCK	95	9
OTHER	205	19
TOTAL	1,062	100

Growing-stock volume includes both poletimber-size trees 5.0 to 10.9 inches in diameter and sawtimber-size trees 11.0 inches and larger. Of the total growing stock, 12 percent is in poletimber-size trees; the remainder, in sawtimber trees.

FOREST OWNERSHIP

Approximately two-thirds of the commercial forest land is in Federal ownership. All of this land, with the exception of 1,000 acres, is in the Mount Hood National Forest. The smaller area is owned or managed by the Bureau of Land Management or the Indian Service. Other public land is mainly in county ownership, with 1,000 acres State-owned.

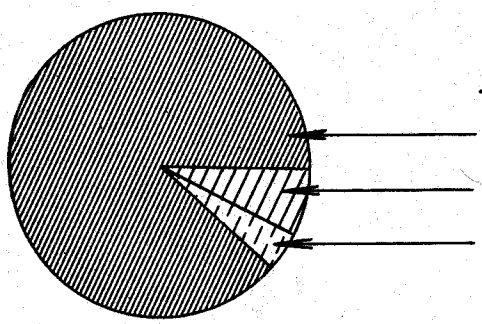


OWNERSHIP CLASS	THOUSAND ACRES	PERCENT
FEDERAL	156	64
PRIVATE	57	24
OTHER PUBLIC	29	12
TOTAL	242	100

About a fourth of the forest land is in 320 private ownerships. Of these, 230 are from 10 to 100 acres, 70 from 100 to 500 acres, and 18 over 500 acres. These classes represent 15, 18, and 67 percent, respectively, of the total private commercial area.

Sawtimber Volume

Private and county-owned forest lands, which are more accessible and have been logged more extensively, have a smaller volume per acre than Federal forest land. Private and county lands have only 11 percent of the sawtimber volume but 35 percent of the area. Federal lands have 89 percent of the volume and 64 percent of the area.



OWNERSHIP CLASS	MILLION BD.-FT.	PERCENT
FEDERAL	3,913	89
PRIVATE	290	7
OTHER PUBLIC	194	4
TOTAL	4,397	100

FOREST UTILIZATION

The timber harvest in Hood River County in 1954 was 58 million board-feet, Scribner scale. Within the last 10 years, log output has been fairly consistent, averaging 51 million board-feet and ranging from 38 million in 1949 to 65 million in 1953.

The annual harvest of logs from national-forest timber is becoming more important to the local timber economy, as it represents an increasing portion of the total cut in the county. In 1949, 34 percent of the logs cut came from the Mount Hood National Forest. This increased to almost 50 percent in 1952 and, in 1954, to 62 percent.

Clearcutting, high-lead yarding, and broadcast burning of slash; characteristic of logging operations in the Douglas-fir subregion; and selective logging, tractor or animal skidding, and partial slash disposal; typical of ponderosa pine subregion operations; are all practiced in Hood River County.

Much of the lumber cut supplies local needs or is sold to the railroad. The remainder is marketed largely through wholesale lumber dealers in Portland.

Table 1.—Land area, by major class of land, 1954

Class of land	Area
	Acres
Forest:	
Commercial	242,090
Noncommercial:	
Productive-reserved	25,410
Unproductive	25,600
Total	293,100
Nonforest	43,650
All classes	336,750

Table 2.—Area of commercial forest land by ownership and stand-size classes, 1954

(Acres)

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling and sapling stands	Nonstocked areas
Private	56,920	22,450	24,520	8,280	1,670
State	1,030	760	270	-	-
County	27,860	15,200	9,580	2,760	320
Municipal	30	30	-	-	-
Federally owned or managed:					
Indian	570	400	130	40	-
Bur. of Land Mgt.	310	270	-	40	-
National Forest	155,370	110,350	29,750	12,630	2,640
Total Federal	156,250	111,020	29,880	12,710	2,640
All ownerships	242,090	149,460	64,250	23,750	4,630

Table 3.--Area of commercial forest land by major forest type, and stand-size class, 1954

(Acres)

Forest type	Total	Sawtimber stands		Pole-timber stands	Seedling and sapling stands	Non-stocked areas
		Large[1/]	Small[2/]			
Douglas-fir	157,760	60,070	30,880	48,780	18,030	-
Hemlock-Sitka spruce	6,410	3,470	1,980	600	360	-
Ponderosa pine	13,810	9,600	1,560	2,290	360	-
Western white pine	200	-	-	200	-	-
Lodgepole pine	3,640	-	-	3,520	120	-
Larch	1,120	-	240	880	-	-
Fir-spruce	52,990	22,840	18,660	7,270	4,220	-
Hardwoods	1,530	-	160	710	660	-
Nonstocked areas	4,630	-	-	-	-	4,630
Total	242,090	95,980	53,480	64,250	23,750	4,630

1/ 21 inches d.b.h. and larger.

2/ 11 to 21 inches d.b.h.

Table 4.-- Land area by cover type, ownership class, and land-use class, 1954

Cover type	Total unreserved and reserved	Unreserved								Reserved		
		Total	Private	State	County	Municipal	Federally owned or managed: Indian	Federally owned or managed: Bureau of Land Mgt.	Federally owned or managed: National forest	Total	State	Federal: National forest
PRODUCTIVE FOREST LAND												
		Commercial								Noncommercial Productive-reserved		
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Douglas-fir, large old-growth sawtimber (yellow fir)	1,710	900	20	-	-	-	-	-	880	810	-	810
Douglas-fir, small old-growth and large young-growth sawtimber (red fir)	62,630	59,170	6,860	240	5,060	30	160	-	46,820	3,460	230	3,230
Douglas-fir, small young-growth sawtimber	33,140	30,880	11,220	400	8,400	-	200	190	10,470	2,260	750	1,510
Douglas-fir, poletimber	58,410	48,740	21,120	230	8,470	-	130	-	18,790	9,670	440	9,230
Douglas-fir, seedlings and saplings	18,560	18,030	7,700	-	2,740	-	40	40	7,510	530	120	410
Western hemlock, large sawtimber	3,470	3,230	-	-	-	-	-	-	3,230	240	-	240
Western hemlock, small sawtimber	1,820	1,820	-	-	-	-	-	-	1,820	-	-	-
Western hemlock, poletimber	770	600	320	-	-	-	-	-	280	170	-	170
Western hemlock, seedlings and saplings	360	360	80	-	-	-	-	-	280	-	-	-
Sitka spruce, large sawtimber	240	240	-	-	-	-	-	-	240	-	-	-
Sitka spruce, small sawtimber	160	160	-	-	-	-	-	-	160	-	-	-
Western redcedar, poletimber	40	40	-	-	-	-	-	-	40	-	-	-
White fir, large sawtimber	2,310	2,310	-	-	-	-	-	-	2,310	-	-	-
White fir, small sawtimber	2,460	2,460	160	-	-	-	-	-	2,300	-	-	-
White fir, poletimber	1,230	1,230	610	-	120	-	-	-	500	-	-	-
White fir, seedlings and saplings	200	200	80	-	-	-	-	-	120	-	-	-
True fir-mountain hemlock, large sawtimber	23,980	20,530	280	-	20	-	-	-	20,230	3,450	-	3,450
True fir-mountain hemlock, small sawtimber	19,400	16,200	-	-	-	-	-	-	16,200	3,200	-	3,200
True fir-mountain hemlock, poletimber	7,600	6,040	-	-	120	-	-	-	5,920	1,560	-	1,560
True fir-mountain hemlock, seedlings and saplings	4,070	4,020	120	-	-	-	-	-	3,900	50	-	50
Ponderosa pine, large sawtimber	9,600	9,600	2,620	120	1,570	-	-	40	5,250	-	-	-
Ponderosa pine, small sawtimber	1,560	1,560	1,130		150	-	40	40	200	-	-	-
Ponderosa pine, poletimber	2,300	2,290	1,590	40	500	-	-	-	160	10	10	-
Ponderosa pine, seedlings and saplings	360	360	300	-	20	-	-	-	40	-	-	-
White pine, poletimber	200	200	120	-	-	-	-	-	80	-	-	-
Lodgepole pine, poletimber	3,520	3,520	160	-	330	-	-	-	3,030	-	-	-
Lodgepole pine, seedlings and saplings	120	120	-	-	-	-	-	-	120	-	-	-
Western larch, small sawtimber	240	240	-	-	-	-	-	-	240	-	-	-
Western larch, poletimber	880	880	-	-	-	-	-	-	880	-	-	-
Hardwoods, small sawtimber	160	160	160	-	-	-	-	-	-	-	-	-
Hardwoods, poletimber	710	710	600	-	40	-	-	-	70	-	-	-
Hardwoods, seedlings and saplings	660	660	-	-	-	-	-	-	660	-	-	-
Recent clearcut area, nonstocked	2,250	2,250	730	-	80	-	-	-	1,440	-	-	-
Old clearcut area, nonstocked	860	860	500	-	120	-	-	-	240	-	-	-
Deforested by fire, nonstocked	1,520	1,520	440	-	120	-	-	-	960	-	-	-
Total	267,500	242,090	56,920	1,030	27,860	30	570	310	155,370	25,410	1,550	23,860
NONCOMMERCIAL UNPRODUCTIVE FOREST LAND												
Subalpine	8,100	4,890	-	-	-	-	-	-	4,890	3,210	-	3,210
Noncommercial rocky	14,660	10,450	640	-	90	-	40	-	9,680	4,210	280	3,930
Oak-madrone	2,840	2,840	1,670	40	970	-	40	80	40	-	-	-
Total	25,600	18,180	2,310	40	1,060	-	80	80	14,610	7,420	280	7,140
NONFOREST LAND												
Agriculture	27,490	27,390	26,960	40	380	-	-	-	10	100	100	-
Grass and brush	3,130	3,130	1,850	80	240	-	200	40	720	-	-	-
Open--nonvegetative	13,030	9,810	4,110	-	40	200	-	-	5,460	3,220	620	2,600
Total	43,650	40,330	32,920	120	660	200	200	40	6,190	3,320	720	2,600
ALL LAND												
Forest land:												
Commercial	242,090	242,090	56,920	1,030	27,860	30	570	310	155,370	-	-	-
Noncommercial (productive-reserved and unproductive)	51,010	18,180	2,310	40	1,060	-	40	80	14,650	32,830	1,830	31,000
Total forest land	293,100	260,270	59,230	1,070	28,920	30	610	390	170,020	32,830	1,830	31,000
Nonforest land	43,650	40,330	32,920	120	660	200	200	40	6,190	3,320	720	2,600
Total all land	336,750	300,600	92,150	1,190	29,580	230	810	430	176,210	36,150	2,550	33,600

Table 5.--Area of commercial forest land by forest-condition and ownership class, 1954

(Acres)

Forest-condition class	Total	Private	State	County	Municipal	Federally owned or managed		
						Indian	Bureau of Land Mgt. 1/	National forest
Softwoods, large sawtimber								
Uncut	84,010	5,840	160	1,660	30	80	-	76,240
Residual	11,970	3,940	200	4,990	-	80	40	2,720
Total	95,980	9,780	360	6,650	30	160	40	78,960
Softwoods, small sawtimber								
Uncut	40,860	5,050	400	4,840	-	160	140	30,270
Residual	12,460	7,460	-	3,710	-	80	90	1,120
Total	53,320	12,510	400	8,550	-	240	230	31,390
Softwoods, poletimber								
On cutovers	33,550	21,510	270	7,140	-	130	-	4,500
On plantations	-	-	-	-	-	-	-	-
On other	29,990	2,410	-	2,400	-	-	-	25,180
Total	63,540	23,920	270	9,540	-	130	-	29,680
Softwoods, seedlings & saplings								
On cutovers	14,010	8,000	-	2,040	-	-	40	3,930
On plantations	690	-	-	-	-	-	-	690
On other	8,390	280	-	720	-	40	-	7,350
Total	23,090	8,280	-	2,760	-	40	40	11,970
Hardwoods	1,530	760	-	40	-	-	-	730
Nonstocked	4,630	1,670	-	320	-	-	-	2,640
Total	242,090	56,920	1,030	27,860	30	570	310	155,370

1/ All public domain land.

Table 6.--Area of young-growth timber stands on commercial forest land, by stocking class, species group, and stand-size class, 1954

(Acres)

Stocking class and species group	Total	Sawtimber		Poletimber	Seedlings and saplings	Non-stocked area
		Large 1/ young growth	Small young growth			
Well stocked:						
Softwoods	144,870	55,850	45,730	37,720	5,570	-
Hardwoods	1,450	-	160	630	660	-
Total	146,320	55,850	45,890	38,350	6,230	-
Medium stocked:						
Softwoods	47,470	3,320	7,420	23,410	13,320	-
Hardwoods	80	-	-	80	-	-
Total	47,550	3,320	7,420	23,490	13,320	-
Poorly stocked:						
Softwoods	6,780	-	170	2,410	4,200	-
Hardwoods	-	-	-	-	-	-
Total	6,780	-	170	2,410	4,200	-
Nonstocked	4,630	-	-	-	-	4,630
All classes:						
Softwoods	199,120	59,170	53,320	63,540	23,090	-
Hardwoods	1,530	-	160	710	660	-
Nonstocked	4,630	-	-	-	-	4,630
Total	205,280	59,170	53,480	64,250	23,750	4,630

1/ Includes only the stands classified and mapped as Douglas-fir large young-growth sawtimber type.

Table 7.--Net volume of live sawtimber and growing stock on commercial forest land, by ownership class, 1954

Ownership class	Live Sawtimber		Growing stock
	Million board-feet, log scale, Scribner rule	Million board-feet, International ¼-inch rule	Million cubic feet
Private	290	319	101
State	6	7	2
County	188	206	61
Municipal	1/	1/	1/
Federally owned or managed:			
Indian	3	3	1
Bur. of Land Mgt.	3	3	1
National Forest	3,907	4,211	896
Total Federal	3,913	4,217	898
All ownerships	4,397	4,749	1,062

1/ Less than .5 million.

Table 8.--Net volume of live sawtimber and growing stock on commercial forest land, by stand-size class, 1954

Stand-size class	Live sawtimber		Growing stock
	Million board-feet, log scale, Scribner rule	Million board-feet, International ¼-inch rule	Million cubic feet
Sawtimber stands	4,278	4,617	978
Poletimber stands	118	131	83
Seedling and sapling stands	1	1	1
Nonstocked areas	1/	1/	1/
Total	4,397	4,749	1,062

1/ Less than .5 million.

Table 9.--Net volume of live sawtimber and growing stock on commercial forest land, by species, 1954

Species	Live sawtimber		Growing stock
	Million board-feet, log scale, Scribner rule	Million board-feet, International ¼-inch rule	Million cubic feet
Softwoods:			
Douglas-fir	2,205	2,379	480
Western hemlock	412	445	95
Mountain hemlock	278	301	82
Engelmann spruce	120	130	26
Western redcedar	23	24	8
Western white pine	99	106	23
Ponderosa pine	83	90	16
Lodgepole pine	26	30	30
Pacific silver fir	399	431	113
Noble fir	401	433	83
Grand fir	236	256	73
Subalpine fir	30	32	13
Western larch	82	89	17
Total	4,394	4,746	1,059
Hardwoods:			
Red alder	1/	1/	1
Bigleaf maple	1/	1/	1/
Black cottonwood	3	3	1
Oregon white oak	-	-	1
Total	3	3	3
All species	4,397	4,749	1,062

1/ Less than .5 million.

Table 10.--Net volume of live sawtimber on commercial forest land, by diameter-class and species groups, 1954

(Million board-feet)

Diameter class and log rule	Total	Douglas-fir	Western hemlock	Other softwoods	Hardwoods
11.0" to 20.9" d.b.h.					
Scribner rule	1,148	378	140	628	2
International ¼-inch rule	1,276	439	151	684	2
21.0" to 30.9" d.b.h.					
Scribner rule	1,547	677	201	668	1
International ¼-inch rule	1,672	731	218	722	1
31.0" to 40.9" d.b.h.					
Scribner rule	1,070	656	53	361	-
International ¼-inch rule	1,140	695	57	388	-
41.0" d.b.h. and larger					
Scribner rule	632	494	18	120	-
International ¼-inch rule	661	514	19	128	-
All diameter classes					
Scribner rule	4,397	2,205	412	1,777	3
International ¼-inch rule	4,749	2,379	445	1,922	3

Table 11.—Net volume of all timber on commercial forest land, by class of material and species group, 1954

(Million cubic feet)

Class of material	Total	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Sawlog portion	870	870	-
Upper stem portion	65	65	-
Total	935	935	-
Poletimber trees	127	124	3
Total growing stock	1,062	1,059	3
Other material:			
Sound cull trees	1	1	-
Rotten cull trees	9	9	-
Salvable dead trees	10	10	-
Total other material	20	20	-
All timber	1,082	1,079	3

Table 12.--Average annual cut of live sawtimber and growing stock on commercial forest land, by species group for the period 1949-54

Species group	Live sawtimber						Growing stock		
	Timber products	Logging residues	Annual cut 1/	Timber products	Logging residues	Annual cut 1/	Timber products	Logging residues	Annual cut 1/
	Thousand board-feet, log scale, Scribner rule			Thousand board-feet, International $\frac{1}{4}$-inch rule			Thousand cubic feet		
Softwoods	53,678	5,239	58,917	57,989	5,660	63,649	9,336	940	10,276
Hardwoods 2/	-	-	-	-	-	-	-	-	-
Total	53,678	5,239	58,917	57,989	5,660	63,649	9,336	940	10,276

1/ Annual cut is the sum of timber products and logging residues.

2/ Hardwood cut insignificant.

FOREST SURVEY PROCEDURE

Procedures used in the reinventory of Hood River County were materially different from those used in the initial inventory. These changes in Forest Survey procedure account for some significant differences in both the forest-area and timber-volume statistics obtained. A brief description of procedures used in each inventory follows.

INITIAL INVENTORY

The initial inventory of the county was conducted in 1932-33 by what is known as the "compilation method." In this method, data from timber cruises, logging records, and other sources were collected from private timber owners and various public agencies. These data were checked in the field for reliability and were adjusted to the specifications and standards of Forest Survey. Forest-type and timber-volume data for areas not covered by reliable information were obtained through field reconnaissance.

All land in the county was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial and the commercial was still further classified by forest type, stand-size or condition class, and—in case of young growth— by stocking class. All such types and classes were mapped in place on 1-inch-to-the-mile base maps of each forested township. These township type maps were then superimposed over current ownership-status plats and dot counted to obtain area of forest types by ownership class. Type delineations on the township maps were traced to a base map of the county to form a county forest type map. The commercial forest land was also classified as to site quality, a measure of forest productive capacity.

In-place, timber volume estimates were based on existing cruises adjusted to the Forest Survey standard, on field samples, and on ocular appraisals. Cruises made by commercial cruisers were obtained for most of the privately owned timber. Separate volume estimates were computed for each of the commercial tree species and for each ownership class. Methods used in this initial inventory did not permit a statistical computation of accuracy of the estimate.

REINVENTORY

In the reinventory of 1954, the forest type map of the county was completely revised. This revision was accomplished through interpretation, classification, and field mapping on aerial photos that covered the county. In the delineation of types and conditions on aerial photos, similar types and conditions were examined on the ground to ensure accuracy in interpretation. The presence of old and new roads through much of the forested area greatly facilitated these examinations.

Types, stand-size classes, and stocking classes were similar to those recognized in the initial inventory. However, field mapping on aerial photos resulted in much greater accuracy and detail than was possible in the earlier inventory through ground reconnaissance alone. Type delineations on the aerial photos were transferred to a 2-inch scale county planimetric base map through use of a photo projector. The new type map was then superimposed over a current ownership-status map and a dot count made of forest type areas by ownership class.

Estimates of net volumes of live sawtimber, growing stock, rotten and sound cull, and salvable dead material were developed by applying average per-acre volumes to the appropriate forest type acreages. The per-acre volumes for stands of sawtimber and poletimber were obtained through a sampling procedure in which the stands were measured on randomly selected plots. Comparable sawtimber and poletimber per-acre volumes contained in scattered trees in the overstory of seedling and sapling stands and nonstocked areas were based on empirical estimates.

In the random selection of samples, each individual sawtimber or poletimber plot in the county had an equal chance to be chosen. A sample consisted of a series of three one-fifth-acre circular plots spaced at 6-chain intervals. Intensity of the sampling was designed to produce a total estimate of volume within a specified sampling accuracy.

ACCURACY OF 1954 REINVENTORY DATA

FOREST AREA

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

TIMBER VOLUME

The chances are 19 out of 20 that the board-foot volume of live sawtimber, if measured by a 100-percent cruise, would be within plus or minus 11.2 percent of the estimated total of 4,397 million board-feet, log scale, Scribner rule. On the same basis, cubic-foot volume of growing stock from a 100-percent cruise would be within a range of plus or minus 9.2 percent of the estimated 1,062 million cubic feet. Volume estimates by species, stand-size class, and other subdivisions are subject to greater sampling errors.

DIFFERENCES IN RESULTS OF INVENTORIES

Some of the differences between initial inventory and reinventory with respect to forest-type, forest-area, and timber-volume statistics, are due to actual physical change. Other differences are due to variations in inventory procedures, in interpretation and classification of forest conditions, and in standards of utilization. Because of these differences, direct comparison of the statistics may not be meaningful except insofar as the differences are taken into account.

FOREST AREA

Within the commercial forest land area, changes in acreage of stand-size classes reflect in part both real differences, such as those brought about by logging or growth, and those brought about by modifications in survey procedures and specifications. In any event, it is apparent (table 13) that (1) there has been no appreciable change in the total forest area or the noncommercial unproductive area, (2) there has been an increase in the sawtimber and poletimber area due in part to ingrowth from the smaller stand-size classes, and (3) with limited exceptions reproduction has been established on cutover areas nonstocked in 1933, and clearcut or burned between 1933 and 1954.

Table 13.--Comparison of forest area statistics; initial inventory and reinventory

Inventory	Total forest land	Noncommercial 1/ unproductive	All other forest areas				
			Total	Sawtimber 2/	Poletimber 2/	Seedlings and saplings	Nonstocked
	Thousands of acres						
1933	286	24	262	144	48	56	14
1954	293	26	267	163	76	24	4

1/ Based on 1954 standards.
2/ 1932-33 data adjusted to present stand-size class definition.

In the earlier inventory, sawtimber acreage included stands 15.0" d.b.h. and larger; present standards include stands 11.0" d.b.h. and larger. Similarly poletimber standards have been changed from 5.0"-15.0" d.b.h. to 5.0"-11.0" d.b.h. In addition, in 1933 some of the areas were not differentiated between seedlings and saplings and poletimber. The figures in table 13 were adjusted for these differences.

Seedling and sapling acreages for both inventories include stands of trees from 0 to 4.9 inches d.b.h., but those for 1933 do not include

stands on areas clearcut in the prior 10 years that were restocked at time of the inventory. Such land was included in the nonstocked class. The 1954 acreage does include the area of seedling and sapling stands on recently clearcut land if trees were found to be established at time of the inventory. Adjustments for these factors have not been made in the above seedling and sapling and nonstocked classes.

TIMBER VOLUME

The two estimates of sawtimber volume on commercial forest land are shown in the tabulation that follows:

Inventory	Total	Douglas-fir	Other species
	Million bd.-ft., log scale, Scribner rule		
1933 2/	3,800	2,300	1,500
1954	4,400	2,200	2,200

The 1933 volume estimates were based on adjusted private cruises and ocular estimates of old-growth timber and yield-table values for young timber. A completely new independent estimate made in 1954 is described on page 19.

Some differences in volume estimates between 1933 and 1954 are due to differences in survey techniques, procedures, and methods. The effects of these differences on volume estimates cannot be measured. The 1954 volume estimate has a calculated sampling error (page 20). However, no statistical evaluation of the accuracy of the 1933 estimate can be made.

Another cause of the difference in volumes may have been the variation in standards of utilization between inventories. The standards for Douglas-fir, white fir, and western larch were changed between surveys to recognize increased industrial use of these species. In 1954, volume tables were used that gave a materially greater volume for a tree of a given size than did the tables used in the 1935 inventory. Other changes included lowering the minimum merchantable top diameter of sawtimber trees, and reducing the minimum requirement of net sound volume in a sawtimber tree from 33-1/3 to 25 percent of gross volume.

2/ Volume estimates adjusted to same d.b.h. and top diameter limits as were used in 1954.

One factor that increased the board-foot volume of sawtimber during the 21 years between inventories was forest growth--net growth in sawtimber trees and the ingrowth of poletimber trees into the sawtimber class. An offsetting factor--one that reduced the sawtimber inventory since 1933--was drain due to timber cutting and to the various natural depleting agencies, such as forest insects, diseases, windthrow, and fire.

Because of the influence of these and possibly other factors, the two inventory estimates are not comparable and do not necessarily reflect a trend in the county's total volume of sawtimber.

DEFINITION OF TERMS USED

LAND AREA

Total Land Area

Includes dry land and unmeandered water surface.

Forest Land Area

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 that has not been developed for other use. Minimum area of forest land recognized in reinventory of the county is 10 acres.

Nonforest Land Area

Land that does not qualify as forest land. Minimum area recognized in the reinventory of the county is 10 acres.

FOREST LAND CLASSES

Commercial Forest Land Area

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

Noncommercial Forest Land Area

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

TYPES

Forest Land Types

Forest land is typed on the basis of predominant species as indicated by cubic volume for sawtimber and poletimber stands, and number of trees for seedling and sapling stands, or on the basis of forest condition such as nonstocked cutover or burned-over land. Where none of the indicated species comprises 50 percent or more of a given stand, the stand is typed on the basis of plurality of cubic volume or number of trees. In classifying forest land by type, the minimum area recognized is 40 acres.

Commercial Forest Land

Major forest types. Local forest types are grouped into generalized types. The major forest types in Hood River County are as follows:

Douglas-fir. Forests in which 50 percent or more of the stand is Douglas-fir.

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

Ponderosa pine. Forests in which 50 percent or more of the stand is ponderosa pine.

Western white pine. Forests in which 50 percent or more of the stand is western white pine.

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

Larch. Forests in which 50 percent or more of the stand is larch.

Fir-spruce. Forests in which 50 percent or more of the stand is true fir or Engelmann spruce.

Hardwoods. Forests in which 50 percent or more of the stand is black cottonwood or other western hardwoods, singly or in combination.

Noncommercial Forest Land

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

Unproductive. Forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Nonforest Land Types

Agricultural. Cultivated land or stump pasture.

Grass and brush. Grass or brush on nonforest land.

Open-nonvegetative. Includes barrens, tideflats, towns, and unmeandered water.

TREE CLASSES

Sawtimber Tree

Tree of commercial species, 11 inches d.b.h. or larger, that contains at least one 16-foot coniferous sawlog or one 8-foot hardwood saw log to a variable top diameter never less than 8 inches inside the bark. Also, 25 percent or more of the gross board-foot volume must be free from rot or defect.

Poletimber Tree

Softwood or hardwood tree 5.0 to 10.9 inches d.b.h. of commercial species in which 25 percent or more of the gross cubic-foot volume is free from rot and defect.

Seedling and Sapling Trees

Live trees of commercial species less than 5.0 inches d.b.h. Seedlings must be of good form and vigor.

Cull Tree

Live tree of sawtimber or poletimber size that is unmerchantable, now or prospectively, because of defect, rot, or species.

Sound cull tree. Live tree of sawtimber or poletimber 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 sawtimber or poletimber 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 16-foot coniferous or 8-foot hardwood log.

STAND-SIZE CLASSES

Sawtimber Stand

Stand of sawtimber trees having a minimum net volume per acre as follows: 5,000 board-feet, log scale, International $\frac{1}{4}$-inch rule, in any species except hardwoods; 1,500 board-feet in hardwoods.

Large sawtimber stand. Stand in which the majority of the volume is in trees more than 21.0" d.b.h.

Small sawtimber stand. Stand in which the majority of the volume is in trees from 11.0" to 20.9" d.b.h.

Uncut Sawtimber Stand

Sawtimber stand that is essentially undisturbed by cutting.

Residual Sawtimber Stand

Sawtimber stand in which a partial harvest has been made, and in which the residual volume amounts to 5,000 board-feet or more per acre for softwoods and 1,500 board-feet for hardwood stands.

Poletimber Stand

Stand failing to meet sawtimber-stand specifications but at least 10-percent stocked with poletimber and larger (5.0" d.b.h. and larger) trees and at least half the minimum stocking in poletimber trees.

Seedling and Sapling Stand

Stand not qualifying as either sawtimber or poletimber stand 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.

Stocking

Stocking is the extent to which growing space is effectively utilized by present or potential growing-stock trees of commercial

species. "Degree of stocking" is synonymous with "percent of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Stocking may be measured in terms of number of trees, volume, basal area, cover canopy, or other criterion or combination of criteria.

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

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

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

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

TIMBER VOLUME

Live Sawtimber Volume

Net volume in board-feet of live sawtimber trees of commercial species.

Scribner rule. The common board-foot rule used in determining log-scale volume of sawtimber in the Pacific Northwest.

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

Growing Stock

Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

All-Timber Volume

Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark.

Tree Species

Tree species commonly found in Hood River County include:

Softwoods: Douglas-fir (Pseudotsuga menziesii)
Western hemlock (Tsuga heterophylla)
Mountain hemlock (Tsuga mertensiana)
Engelmann spruce (Picea engelmannii)
Western redcedar (Thuja plicata)
Western white pine (Pinus monticola)
Ponderosa pine (Pinus ponderosa)
Lodgepole pine (Pinus contorta)
Pacific silver fir (Abies amabilis)
Noble fir (Abies procera)
Grand fir (Abies grandis)
Subalpine fir (Abies lasiocarpa)
Western larch (Larix occidentalis)

Hardwoods: Red alder (Alnus rubra)
Bigleaf maple (Acer macrophyllum)
Black cottonwood (Populus trichocarpa)
Oregon white oak (Quercus garryana)

TIMBER CUT

Annual Cut of Live Sawtimber

The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from live sawtimber. The volume of timber products cut from live sawtimber.

Logging residues from live sawtimber. The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land and not converted to timber products.

Annual Cut of Growing Stock

The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from growing stock. The volume of timber products cut from growing stock.

Logging residues from growing stock. The net cubic-foot volume of growing stock cut or killed by logging on commercial forest land and not converted to timber products.