

FOREST GROWTH
IN THE
PONDEROSA PINE REGION
OF
OREGON AND WASHINGTON

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FOREST GROWTH IN THE
PONDEROSA PINE REGION OF OREGON AND WASHINGTON

By

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A Preliminary Forest Survey Report

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

The forest survey, a Nation-wide project authorized by Congress in 1928, consists of a complete and detailed investigation of the country's present and future forest resources in five major parts: (1) an inventory of the country's existing forest resources in terms of areas occupied by forest-cover types and of timber volumes, by species, in board feet and cubic feet, and a study of conditions on cut-over and on burned forest 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 of the United States for forest products; and (5) an analysis and correlation with other economic data of the findings of these studies in order to make available to public and private agencies the basic facts and guiding principles necessary to formulate and execute rational plans, national, regional, and local, for orderly, sound management and use of forest resources.

The Pacific Northwest Forest and Range Experiment Station was designated to conduct the forest survey of Oregon and Washington. Field work was commenced in the Douglas-fir region of western Oregon and western Washington in 1930 and completed in 1933. In 1934 field work was commenced in the ponderosa pine region of eastern Oregon and eastern Washington and completed late in 1936. This preliminary report, 78th in the forest-survey series, summarizes results of the growth phase in this portion of the ponderosa pine region. Other forest-survey publications by this station include forest statistics for each of the forested counties in Oregon and Washington except Stevens, Pend Oreille, and Spokane Counties, Washington; Forest Research Notes No. 13, Forest Resources of the Douglas-Fir Region, No. 17, Pulpwood Resources of Western Oregon and Western Washington, No. 20, Forest Growth in the Douglas-Fir Region, No. 22, Timber Volume and Type Acreage on the National Forests of the North Pacific Region, and No. 25, Forest Statistics for Eastern Oregon and Eastern Washington. In addition, lithographed $\frac{1}{4}$ -inch-to-the-mile maps showing in colors the principal forest cover types for all of Oregon and Washington and 1-inch-to-the-mile detailed type maps for each forested county have been prepared. Spokane, Stevens, and Pend Oreille Counties in northeastern Washington are in the territory assigned to the Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Montana, and the forest inventory of these counties, including publication of county reports, was made by the survey staff of that station.

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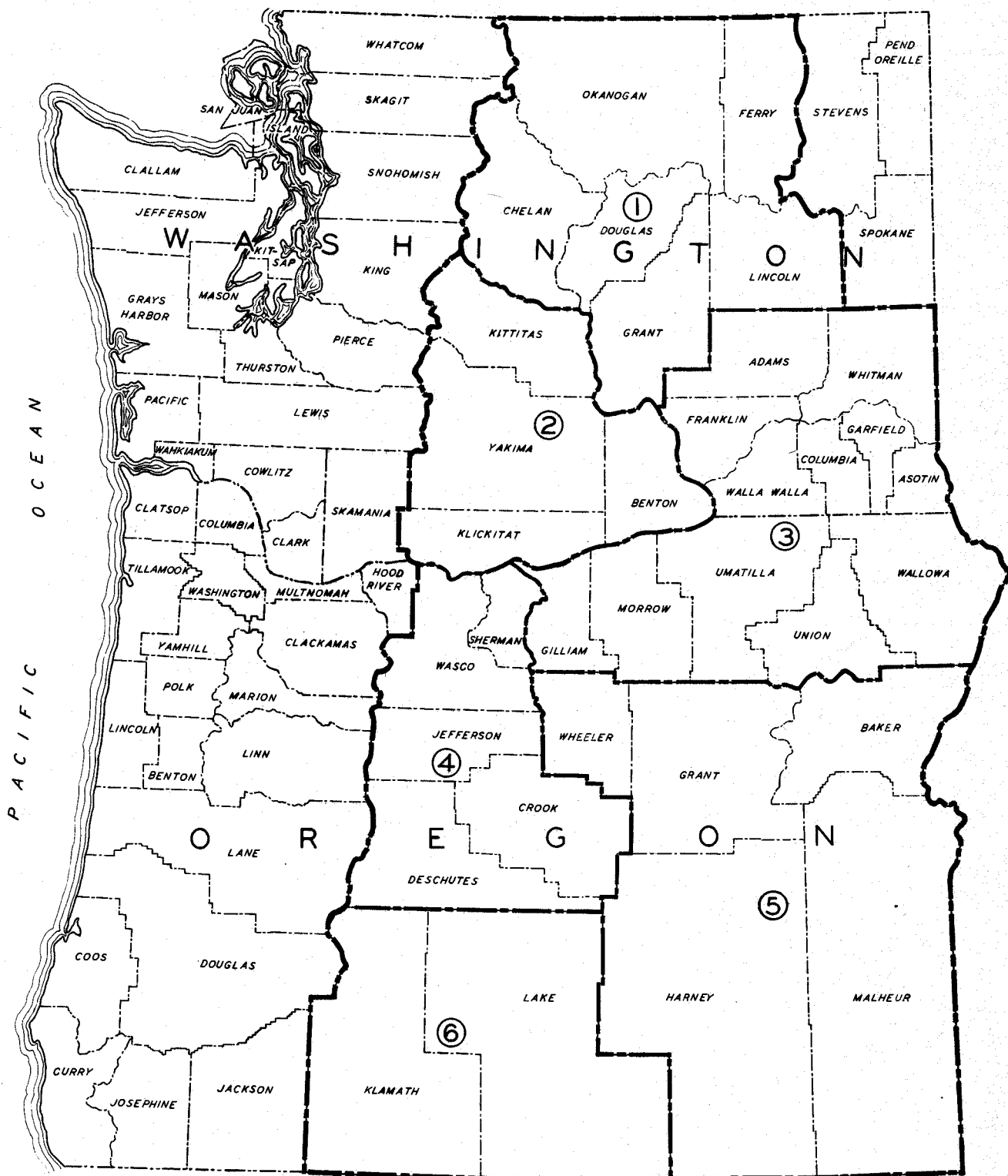
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1. CHELAN - COLVILLE UNIT
2. YAKIMA RIVER UNIT
3. NORTH BLUE MOUNTAIN UNIT

4. DESCHUTES RIVER UNIT
5. SOUTH BLUE MOUNTAIN UNIT
6. KLAMATH PLATEAU UNIT

FIGURE 1.--MAP OF WASHINGTON AND OREGON SHOWING REGION, SURVEY-UNIT, AND COUNTY BOUNDARIES.

FOREST GROWTH IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON

By Philip A. Briegleb^{1/}

Introduction

Adequacy of the forest resource is measured not only by the extent of the timber supply and its rate of depletion, but also by the present and prospective rates of timber restoration, by growth. Thus an important part of the forest survey is that dealing with the increment of timber stands. Results of this phase of the survey are presented here for the ponderosa pine region of Oregon and Washington^{2/} as a whole and for each of its six units (figure 1). In order to add to their local usefulness principal statistics regarding growth are also given by county and ownership class. In addition certain procedures, developed during the growth study, are presented in the appendix in the belief that they may be helpful in preparation of local management plans in the region. No attempt is made in this preliminary release to develop the full significance of the growth-phase results. The joint analysis of forest inventory, depletion, and growth statistics necessary for a complete appraisal of the forest situation will be presented in detail in the comprehensive regional report to be published soon.

Kinds of Growth Calculation Made

Three general kinds of volume growth calculation were made in order to reveal the present, prospective, and potential aspects of forest increment: (1) current annual growth, the annual increment of stands in their present condition; (2) periodic growth, the estimated increment within a given interval (in this study, three periods of 10 years each)

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- 1/ The author is gratefully indebted to the permanent and temporary members of the forest-survey staff and to the cooperators who contributed to this study. Acknowledgment is due especially to W. H. Meyer, formerly of the experiment station, and to J. W. Girard, Forest Service, Washington, D.C., for helpful advice in the planning and analysis phases of the work. For the computations involved, much credit is due W. V. S. Litchfield and C. H. Willison, former station members. The latter was also responsible for a large part of the field work conducted. Assistance in the compilation of data contained in this report was also furnished by personnel of Emergency Relief Administration official projects 01-82 and 01-92.
- 2/ That part of the two States east of the summit of the Cascade Range, exclusive of Stevens, Spokane, and Pend Oreille Counties in north-eastern Washington which are considered part of the white pine region of the Inland Empire.

in order to reveal the probable trend of growth; (3) potential annual growth, the average annual increment that could be obtained on the commercial forest sites through reasonably intensive forestry practice, in order to appraise the permanent productive capacity of the forest land.

Standards of Measurement

In the growth phase, as in the inventory phase, volume estimates were made in cubic feet and in board feet. Cubic-foot content was estimated for the portion of the stem between stump and 4-inch top inside bark, exclusive of bark and limbwood, for trees 5.1 inches or more in d.b.h. Board-foot content was estimated in 16-foot logs to a utilizable top (or to a minimum top of 8 inches) by the Scribner rule for coniferous trees 11.1 inches or more in d.b.h., and in 8-foot logs to a utilizable top (or to a minimum top of 10 inches) by Scribner rule for hardwood trees.

The forest land area of the region totals 22.1 million acres (table 1). Estimates of current and periodic growth, however, were confined to commercial forests, shown in this table as "immature", totaling 4.1 million acres and "mature", totaling 11.7 million acres. Noncommercial forest and woodland, consisting of rocky, subalpine, hardwood, juniper, and lodgepole pine types total 6.0 million acres, more than one-quarter of the region's forest land. Though valuable for watershed protection, recreation, and other uses, the latter class does not contribute commercial timber products in this region and hence this study is not concerned with their rates of growth. Estimates of potential annual growth were made for the lands now occupied by commercial forests and also for those areas now deforested or occupied by noncommercial species but which are capable of producing commercial forest stands.

Source of Growth Rates Used

Growth rates applied to the immature ponderosa pine stands were derived from two sources: those for even-aged stands from the normal yield tables^{3/}, those for uneven-aged stands from the growth charts and tables for selectively-cut forests^{4/}. Growth rates for the imma-

3/ Meyer, W. H. YIELD OF EVEN-AGED STANDS OF PONDEROSA PINE. U.S. Dept. Agr. Tech. Bull. 630, 60 pp., illus. 1938. Yield table adjustment factors were applied to the rates derived from the published tables in order to allow for approach of understocked stands to normal. These factors were based on findings of J. W. Girard and L. J. Cummings in connection with the growth phase of the forest survey in northeastern Washington.

4/ Meyer, W. H. GROWTH IN SELECTIVELY CUT PONDEROSA PINE FORESTS OF THE PACIFIC NORTHWEST. U.S. Dept. Agr. Tech. Bull. 407, 64 pp., illus. 1934.

Table 1.--Summary of generalized forest type areas in the ponderosa pine region of eastern Oregon and eastern Washington

Forest-type group	Area	Portion of total forest land	Portion of commercial forest land
	<u>Thousand acres</u>	<u>Percent</u>	<u>Percent</u>
Mature commercial forests ^{1/}	11,654	53	72
Immature commercial forests ^{2/}	4,117	19	25
Nonstocked forest lands			
Commercial	245	1	2
Noncommercial	20		
Total	265	1	
Noncommercial forests			
On commercial sites ^{3/}	152		1
On noncommercial sites	5,898	27	
Total	6,050	27	
Total commercial forest land	16,168	73	100
Total noncommercial forest land	5,918	27	
Total forest land	22,086	100	

^{1/} Stands more than 160 years in age.

^{2/} Stands 160 years or less in age.

^{3/} Sites now occupied by lodgepole pine but capable of producing commercial forests.

ture stands of species other than ponderosa pine were derived from the Douglas-fir yield tables.^{5/} Gross growth rates for the virgin stands were obtained from 323 samples taken throughout the virgin saw-timber types of the region and analyzed especially for this study. The methods of sampling and analysis employed and the resulting charts that were constructed for estimating growth are given in the appendix, pp. 30-38.

Current Annual Growth

Current annual growth estimates were based on type acreages as found on the date of survey inventory, which for the bulk of the region was the year 1935.

^{5/} McArdle, R. E., and Meyer, W. H. THE YIELD OF DOUGLAS FIR IN THE PACIFIC NORTHWEST. U.S. Dept. Agr. Tech. Bull. 201, 64 pp., illus. 1930.

This expression of growth has the virtue of involving no estimates or assumptions of future changes in condition or extent of forests. On the other hand such changes are inevitable and they quickly invalidate it. Hence, current growth should not be used as a basis for an estimate of volume at a future time. It is directly comparable with current depletion, but conclusions drawn from this simple comparison are likely to be misleading unless they are modified by analysis of the nature of existing growing stock and prevailing forest practice which together largely determine the trend of the growth-depletion ratio.

Gross Growth

Estimates of current annual gross growth were computed for all commercial stands, regardless of age class. The 15.8 million acres of these stands were found to be putting on an annual gross increment of 341 million cubic feet or 1,145 million board feet. Detail by ownership class, county, and maturity class of stand is given in table 2. Areas of stands in which this growth occurs are given in table 12 in the appendix.

In terms of the region's volume of growing stock gross increment in cubic feet amounts to 1.1 percent; that in board feet to 0.9 percent. Ponderosa pine trees are putting on only 58 percent of the gross saw-timber growth although this species comprises 64 percent of the total saw-timber stand. Gross growth of ponderosa pine saw timber averages 0.8 percent, that of other species 1.1 percent. The inferior growth rate of ponderosa pine is due largely to the greater preponderance of mature and overmature trees of this species. More than 97 percent of total gross saw-timber growth occurs on lands that are available for cutting, i.e., not reserved by statute, proclamation, or policy. Of the available total, 30 percent occurs on private lands, 70 percent on Federal, State, Indian, county, and municipal lands.

The values for gross growth would express the magnitude of effective increment only if all trees that die from natural causes were fully utilized. Since salvage of such trees, if widely scattered or of low quality, is economically prohibitive in this region at present, the bulk of the growth that now occurs is being offset by depletion agencies other than timber utilization. More than three-quarters of gross saw-timber growth is occurring in mature stands, those more than 160 years old, in which increment is nullified by mortality, caused principally by insects. By substituting light, thrift-maturity selection cutting at frequent intervals for clear cutting and heavy selection that have prevailed in the past, it is anticipated that the heavy mortality now occurring in the virgin stands can be reduced much more rapidly. Under this system only the least thrifty, most mature trees of high insect susceptibility and low growth rate are harvested at each cut. If the same total volume is thus removed in lighter cuts per acre more acres will be cut over annually, extension of control over the entire forest will be accelerated and the conversion of virgin forest to net growth condition will proceed at a more rapid rate. The accompanying rates of gross growth

TABLE 2. CURRENT ANNUAL GROSS GROWTH^{1/} IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, OWNERSHIP CLASS, AND BROAD AGE-CLASS OF STAND

UNIT AND COUNTY	LANDS AVAILABLE FOR CUTTING ^{2/}												LANDS RESERVED FROM CUTTING												TOTAL				
	PRIVATE						OTHER THAN PRIVATE																						
	MATURE STANDS ^{3/}			IMMATURE STANDS ^{4/}			TOTAL			MATURE STANDS ^{3/}			IMMATURE STANDS ^{4/}			TOTAL			MATURE STANDS ^{3/}			IMMATURE STANDS ^{4/}			TOTAL				
	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND	THOUSAND THOUSAND		
	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	CU. FT.	BD. FT.	
CHELAN-COLVILLE																													
FERRY	627	2,620	3,273	6,670	3,900	9,290	8,347	35,375	11,225	25,920	19,572	61,295	5	21	4	36	9	59	8,979	38,016	14,502	32,628	23,481	70,644					
OKANOGAN	1,745	7,920	1,702	2,247	3,447	10,167	13,116	59,122	6,993	18,015	20,109	77,137	1,527	5,922	690	2,026	2,217	7,948	16,398	72,964	9,385	22,298	25,773	95,252					
CHELAN	1,458	7,387	3,378	5,902	4,836	13,289	6,723	32,965	8,123	11,248	14,846	44,213	488	2,389	166	121	654	2,510	8,669	42,741	11,667	17,271	20,336	60,012					
DOUGLAS	40	150	160		200	150	13	59	7		20	59							53	209	167		220	209					
LINCOLN			1,030	1,697	1,030	1,697			118	178	118	178									1,148	1,875	1,148	1,875					
TOTAL	3,870	18,077	9,543	16,516	13,413	34,593	28,199	127,521	26,466	55,361	54,665	182,682	2,020	8,332	860	2,185	2,880	10,517	34,069	153,930	36,869	74,062	70,958	227,992					
YAKIMA RIVER																													
KITTITAS	4,795	23,350	5,575	7,032	10,370	30,382	5,801	27,703	3,700	5,065	9,501	32,793	71	350	7	3	78	353	10,667	51,408	9,282	12,120	19,949	63,528					
YAKIMA	1,160	6,012	1,034	1,604	2,194	7,616	12,859	62,097	10,581	15,721	23,440	77,818	1,012	4,650	332	418	1,344	5,068	15,031	72,759	11,947	17,743	26,978	90,502					
KLIKOKITAT	2,752	14,162	6,972	20,824	9,724	34,966	989	5,092	1,801	7,307	2,790	12,399							3,741	19,254	8,773	28,131	12,514	47,385					
TOTAL	8,707	43,524	13,581	29,460	22,288	72,964	19,649	94,997	16,082	28,113	35,731	123,010	1,083	5,000	339	421	1,422	5,421	29,439	143,421	30,002	57,994	59,441	201,415					
NORTH BLUE MOUNTAIN																													
WHITMAN			225	5	225	5																							
WALLA WALLA	32	126	845	297	877	423	8	34	144	14	152	48	2	9	48	50	9	42	169	1,037	311	1,079	480						
COLUMBIA	202	844	1,403	962	1,605	1,806	582	2,314	1,725	2,829	2,307	5,143							784	3,158	3,213	3,791	3,997	6,949					
GARFIELD	52	269	319	71	371	340	449	2,010	1,427	1,968	1,876	3,978							501	2,279	1,746	2,039	2,247	4,318					
ASOTIN	202	1,014	464	570	666	1,584	222	958	403	631	625	1,789							424	1,972	867	1,401	1,291	3,373					
TOTAL	488	2,233	3,256	1,905	3,744	4,158	1,261	5,316	3,708	5,642	4,969	10,958	2	9	133				1,751	7,578	7,097	7,547	8,648	15,125					
TOTAL EASTERN WASHINGTON UNITS	13,065	63,854	26,380	47,881	39,445	111,735	49,109	227,734	46,256	89,116	95,365	316,050	3,105	13,341	1,332	2,606	4,437	15,947	65,279	304,929	73,968	139,603	139,247	444,532					
NORTH BLUE MOUNTAIN																													
WALLOWA	1,847	8,934	5,195	6,394	7,042	15,328	5,109	22,343	5,385	9,958	10,494	32,392	155	568	329	262	484	830	7,111	31,936	10,909	16,614	18,020	48,550					
UNION	1,544	6,480	10,090	9,591	11,634	16,071	4,048	16,223	4,305	6,565	8,353	22,883	121	453	101	147	222	600	5,713	23,156	14,496	16,408	20,209	39,559					
UNATILLA	1,716	8,062	4,044	3,495	5,760	11,587	3,447	14,444	3,141	6,267	6,588	20,711	10	35	29	10	39	45	5,173	22,541	7,214	9,772	12,387	32,313					
MORROW	1,123	5,735	406	825	1,529	6,560	1,228	5,661	193	693	1,421	6,354							2,351	11,396	599	1,518	2,950	12,914					
GILLIAM	3	15			3	15													3	15			3	15					
TOTAL	6,233	29,226	19,735	20,305	25,968	49,531	13,832	58,762	13,024	23,583	26,856	82,345	286	1,056	459	419	745	1,475	20,351	89,044	33,218	44,307	53,569	133,351					
DESCHUTES RIVER																													
WASCO	695	3,637	1,440	1,734	2,135	5,371	6,644	34,446	2,723	7,007	9,367	41,453	20	99	37	56	57	155	7,359	38,182	4,200	8,797	11,559	46,979					
JEFFERSON	1,734	9,280	204	379	1,938	9,659	2,912	14,904	714	453	3,626	15,357	267	1,323	71	38	338	1,361	4,913	23,507	989	670	5,902	26,377					
DESCHUTES	2,235	12,364	5,090	1,199	7,325	13,563	6,038	31,108	6,190	4,776	12,228	35,884	49	248	4	53	248	8,322	43,720	11,284	5,975	19,606	49,695						
CROOK	2,131	11,705	738	576	2,869	12,381	4,521	24,221	1,273	2,106	5,794	26,327							6,652	35,926	2,011	2,782	8,663	38,709					
TOTAL	6,795	36,986	7,472	3,988	14,267	40,974	20,115	104,679	10,900	14,342	31,015	119,021	336	1,670	112	94	448	1,764	27,246	143,335	18,484	18,424	45,730	161,759					
SOUTH BLUE MOUNTAIN																													
BAKER	1,551	7,743	4,937	3,351	6,488	11,094	4,319	19,699	4,331	2,514	8,650	22,213	8	31	29	69	37	100	5,878	27,473	9,297	5,934	15,175	33,407					
GRANT	3,676	19,466	1,805	2,215	5,681	21,701	12,598	57,345	3,328	7,530	15,926	64,876							16,475	76,335	5,133	9,745	21,608	86,580					
WHEELER	1,495	7,657	1,493	1,585	2,988	9,242	1,770	8,525	385	1,191	2,155	9,716	25	124	12	25	37	149	3,290	16,306	1,800	2,801	5,180	19,107					
HARNEY	288	1,493	348	596	631	2,069	2,669	13,672	1,721	2,111	4,390	15,963							2,957	15,365	2,064	2,707	5,021	18,072					
MALHEUR	42	214	55	42	97	256	23	113	3	5	26	118							65	327	58	47	123	374					
TOTAL	7,252	36,593	8,633	7,789	15,885	44,382	21,379	99,554	9,768	13,351	31,147	112,965	34	159	41	94	75	253	28,665	136,506	18,442	21,294	47,107	157,540					
KLAMATH PLATEAU																													
KLAMATH	9,593	53,050	5,672	4,184	15,265	57,234	17,757	94,181	6,553	19,244	24,310	113,425	2,108	8,917	245	842	2,348	9,759	29,453	156,148	12,470	24,270	41,923	180,418					
LAKE	4,700	25,653	821	1,348	5,521	37,001	6,994	37,208	1,067	2,965	8,061	40,173							3	11,694	62,863	1,888	4,314	13,582	67,177				
TOTAL	14,293	78,703	6,493	5,532	20,786	94,235	24,751	131,389	7,620	22,209	32,371	153,598	2,108	8,919	245	843	2,348	9,762	41,147	219,011	14,358	28,584	55,505	247,595					
TOTAL EASTERN OREGON UNITS	34,573	181,508	42,333	37,614	76,906	219,122	80,077	394,384	41,312	73,485	121,389	467,869	2,759	11,804	857	1,450	3,616	13,254	117,409	587,695	84,502	112,549	201,911	700,245					
REGION TOTAL	47,638	245,362	68,713	85,495	116,351	330,857	129,186	622,118	187,568	116,201	216,754	784,719	5,864	25,145	2,189	4,056	8,093	29,201	182,588	892,625	158,470	252,152	341,158	1,144,777					

^{1/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM OF ALL TREES 5.1 INCHES OR MORE IN D.B.H. BETWEEN STUMP AND 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. GROWTH IN BOARD FEET IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, SCRIBNER RULE.

^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY.

^{3/} STANDS MORE THAN 160 YEARS OLD ON COMMERCIAL FOREST LAND.

^{4/} STANDS 160 YEARS OR LESS IN AGE ON COMMERCIAL FOREST LAND.

provide a measure of the maximum that average net increment could approach during the first cutting cycle following intensive application of this method of cutting, with the forest area under complete control.

Net Growth

A more realistic measure of current timber replenishment is that expressed by gross increment less mortality, or net growth. Current annual net growth includes the increase in volume due to growth of merchantable-sized trees plus that due to the passing of small trees into the merchantable size-class minus the volume lost through normal mortality by insects, windfall, suppression, and other natural causes other than fire. Although this annual net growth is equivalent to the amount of timber that could be currently harvested (or burned) under normal mortality conditions without diminishing total timber volume, this value should not be confused with the cut (less fire loss) allowable under sustained yield. In a region such as this in which there is an excess of mature growing stock and three-fourths of the commercial forest by area consists of virgin stands, annual cut may exceed growth for several decades without sacrificing volume of later cuts. In fact under such conditions a reasonable excess of cut over growth will result in actual improvement in the forests' future productivity if such cut is confined to the least thrifty, most mature trees.

Gross growth of mature as well as immature stands can be estimated with reasonable accuracy. Mortality, however, tends to be highly erratic. Although significant in determining the level of net growth in immature stands, the factor of mortality is proportionally far more important in this regard in the virgin forest. During the past 20 years mature stands in the region as a class have suffered a loss in volume, owing principally to insect epidemic and severe drought. It is frequently reasoned that since the remaining trees have thus been afforded some release and that abnormal drought is followed by a period of greater rainfall, there is ground for anticipating a net growth in the virgin stands over the next few decades.

This theory has not yet been substantiated by experience, in fact some stands have continued to lose volume during the past several years in spite of previous release by heavy insect depletion. It is believed there must be some sort of long time balance between growth and mortality although it is well known that these factors are not in a constant state of equilibrium. Thus in this study it was concluded impractical to predict virgin stand mortality and net growth in detail. Instead it was assumed, for these stands, that loss will in the long run and over large areas equal gross growth.

Following this assumption estimates of current **annual net growth** may be limited to stands not more than 160 years old. Included in this category are young forests that have followed clear cutting or burn and

TABLE 3. CURRENT ANNUAL NET GROWTH^{1/} IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, AND OWNERSHIP CLASS

UNIT AND COUNTY	LANDS AVAILABLE FOR CUTTING ^{2/}									TOTAL		
	PRIVATE						OTHER THAN PRIVATE			LANDS RESERVED FROM CUTTING		
	CURRENT ANNUAL NET GROWTH			CURRENT ANNUAL NET GROWTH			CURRENT ANNUAL NET GROWTH			CURRENT ANNUAL NET GROWTH		
	AREA	THOUSAND	THOUSAND	AREA	THOUSAND	THOUSAND	AREA	THOUSAND	THOUSAND	AREA	THOUSAND	THOUSAND
	ACRES	CU. FT.	BD. FT.	ACRES	CU. FT.	BD. FT.	ACRES	CU. FT.	BD. FT.	ACRES	CU. FT.	BD. FT.
CHELAN-COLVILLE												
FERRY	89,630	2,846	5,801	314,975	9,760	22,538	40	4	33	404,645	12,610	28,372
OKANOGAN	83,655	1,480	1,953	224,530	6,081	15,666	18,785	601	1,762	327,020	8,162	19,381
CHELAN	118,245	2,938	5,133	189,060	7,064	9,781	4,055	143	105	311,360	10,145	15,019
DOUGLAS	5,655	139		235	6					5,890	145	
LINCOLN	49,575	895	1,475	4,405	103	155				53,980	998	1,630
TOTAL	346,760	8,298	14,362	733,255	23,014	48,140	22,880	748	1,900	1,102,895	32,060	64,402
YAKIMA RIVER												
KITITIAS	150,930	4,848	6,114	96,724	3,217	4,422	160	6	3	247,814	8,071	10,539
YAKIMA	27,512	899	1,395	193,301	9,201	13,670	7,585	289	363	228,398	10,389	15,428
Klickitat	188,590	6,063	18,108	48,195	1,566	6,354				236,785	7,629	24,462
TOTAL	367,032	11,810	25,617	338,220	13,984	24,446	7,745	295	366	712,997	26,089	50,429
NORTH BLUE MOUNTAIN												
WHITMAN	7,375	196	4	425	7					7,800	203	4
WALLA WALLA	14,930	735	259	2,170	125	12	800	42		17,900	902	271
COLUMBIA	26,115	1,220	836	46,204	1,500	2,460	1,425	74		73,744	2,794	3,296
GARFIELD	6,286	277	62	33,885	1,241	1,712				40,170	1,518	1,774
ASOTIN	9,630	403	496	13,210	351	722				22,840	754	1,218
TOTAL	64,335	2,831	1,657	95,894	3,224	4,906	2,225	116		162,454	6,171	6,563
TOTAL EASTERN WASHINGTON UNITS	778,127	22,939	41,636	1,167,369	40,222	77,492	32,850	1,159	2,266	1,978,346	64,320	121,394
NORTH BLUE MOUNTAIN												
WALLOWA	123,659	4,518	5,560	141,775	4,683	8,659	7,977	286	228	273,411	9,487	14,447
UNION	236,625	8,773	8,339	104,845	3,744	5,796	2,730	88	128	344,200	12,605	14,263
UMATILLA	81,530	3,517	3,039	80,111	2,731	5,450	300	25	9	161,941	6,273	8,498
MORROW	11,740	353	718	7,680	167	602				19,420	520	1,320
GILLIAM												
TOTAL	453,554	17,161	17,656	334,411	11,325	20,507	11,007	399	365	798,972	28,885	38,528
DESCHUTES RIVER												
WASCO	43,350	1,252	1,508	54,585	2,368	6,093	1,240	32	48	99,175	3,652	7,649
JEFFERSON	4,980	178	329	14,355	621	395	1,915	61	32	21,250	860	756
DESCHUTES	101,245	4,425	1,043	136,215	5,383	4,153	150	4		237,610	9,812	5,196
CROOK	16,940	642	588	25,555	1,107	1,831				42,495	1,749	2,419
TOTAL	166,515	6,497	3,468	230,710	9,479	12,472	3,305	97	80	400,530	16,073	16,020
SOUTH BLUE MOUNTAIN												
BAKER	92,190	4,293	2,914	77,060	3,766	2,186	545	26	60	169,795	8,085	5,160
GRANT	48,985	1,569	1,926	120,805	2,895	6,548				169,790	4,464	8,474
WHEELER	41,220	1,299	1,377	14,320	334	1,036	315	10	22	55,855	1,643	2,435
HARNEY	11,695	298	519	48,970	1,497	1,835				60,665	1,795	2,354
MALHEUR	1,155	48	36	85	2	5				1,240	50	41
TOTAL	195,245	7,507	6,772	261,240	8,494	11,610	860	36	82	457,345	16,037	18,464
KLAMATH PLATEAU												
KLAMATH	146,665	4,933	3,638	234,838	5,698	16,734	11,272	213	733	392,775	10,844	21,105
LAKE	44,605	713	1,173	44,585	928	2,578	15			89,205	1,641	3,751
TOTAL	191,270	5,646	4,811	279,423	6,626	19,312	11,287	213	733	481,980	12,485	24,856
TOTAL EASTERN OREGON UNITS	1,006,584	36,811	32,707	1,105,784	35,924	63,901	26,489	745	1,260	2,138,827	73,480	97,868
REGION TOTAL	1,784,711	59,750	74,343	2,273,153	76,146	141,393	59,309	1,904	3,526	4,117,173	137,800	219,262

^{1/} IN STANDS 160 YEARS OR LESS IN AGE ON COMMERCIAL FOREST LAND. GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM OF ALL TREES 5.1 INCHES OR MORE IN D.B.H. BETWEEN STUMP AND 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. GROWTH IN BOARD FEET IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, SCRIBNER RULE.

^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY.

TABLE 4. CURRENT ANNUAL NET GROWTH^{1/} IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, AND TYPE GROUP

UNIT AND COUNTY	PONDEROSA PINE TYPES			OTHER TYPES			TOTAL		
	AREA	CURRENT ANNUAL GROWTH		AREA	CURRENT ANNUAL GROWTH		AREA	CURRENT ANNUAL GROWTH	
		THOUSAND	THOUSAND		THOUSAND	THOUSAND		THOUSAND	THOUSAND
	ACRES	CU. FT.	BD. FT.	ACRES	CU. FT.	BD. FT.	ACRES	CU. FT.	BD. FT.
CHELAN-COLVILLE									
FERRY	159,920	5,203	9,385	244,725	7,407	18,987	404,645	12,610	28,372
OKANOGAN	172,980	2,785	4,463	154,040	5,377	14,918	327,020	8,162	19,381
CHELAN	192,100	4,842	8,967	119,260	5,303	6,052	311,360	10,145	15,019
DOUGLAS	5,890	145					5,890	145	
LINCOLN	53,920	997	1,630	60	1		53,980	998	1,630
TOTAL	584,810	13,972	24,445	518,085	18,088	39,957	1,102,895	32,060	64,402
YAKIMA RIVER									
KITTITAS	107,755	2,968	2,901	140,059	5,103	7,638	247,814	8,071	10,539
YAKIMA	138,200	6,199	10,905	90,198	4,190	4,523	228,398	10,389	15,428
Klickitat	150,405	4,405	4,578	86,380	3,224	19,884	236,785	7,629	24,462
TOTAL	396,360	13,572	18,384	316,637	12,517	32,045	712,997	26,089	50,429
NORTH BLUE MOUNTAIN									
WHITMAN	7,800	203	4				7,800	203	4
WALLA WALLA	12,340	491	167	5,560	411	104	17,900	902	271
COLUMBIA	22,665	759	688	51,079	2,035	2,608	73,744	2,794	3,296
GARFIELD	12,755	428	223	27,415	1,090	1,551	40,170	1,518	1,774
ASOTIN	11,040	412	550	11,800	342	668	22,840	754	1,218
TOTAL	66,600	2,293	1,632	95,854	3,878	4,931	162,454	6,171	6,563
TOTAL EASTERN WASHINGTON UNITS	1,047,770	29,837	44,461	930,576	34,483	76,933	1,978,346	64,320	121,394
NORTH BLUE MOUNTAIN									
WALLOWA	151,660	4,567	5,228	121,751	4,920	9,219	273,411	9,487	14,447
UNION	234,525	8,084	8,191	109,675	4,521	6,072	344,200	12,605	14,263
UMATILLA	75,187	2,721	5,031	86,754	3,552	3,467	161,941	6,273	8,498
MORROW	12,875	364	773	6,545	156	547	19,420	520	1,320
GILLIAM									
TOTAL	474,247	15,736	19,223	324,725	13,149	19,305	798,972	28,885	38,528
DESCHUTES RIVER									
WASCO	66,640	1,916	3,706	32,535	1,736	3,943	99,175	3,652	7,649
JEFFERSON	11,695	402	527	9,555	458	229	21,250	860	756
DESCHUTES	232,350	9,561	4,995	5,260	251	201	237,610	9,812	5,196
CROOK	40,490	1,690	2,033	2,005	59	386	42,495	1,749	2,419
TOTAL	351,175	13,569	11,261	49,355	2,504	4,759	400,530	16,073	16,020
SOUTH BLUE MOUNTAIN									
BAKER	154,025	7,364	4,249	15,770	721	911	169,795	8,085	5,160
GRANT	139,755	3,773	5,801	30,035	691	2,673	169,790	4,464	8,474
WHEELER	47,945	1,485	1,907	7,910	158	528	55,855	1,643	2,435
HARNEY	60,665	1,795	2,354				60,665	1,795	2,354
MALHEUR	1,240	50	41				1,240	50	41
TOTAL	403,630	14,467	14,352	53,715	1,570	4,112	457,345	16,037	18,464
KLAMATH PLATEAU									
KLAMATH	357,365	9,824	17,319	35,410	1,020	3,786	392,775	10,844	21,105
LAKE	87,955	1,580	3,714	1,250	61	37	89,205	1,641	3,751
TOTAL	445,320	11,404	21,033	36,660	1,081	3,823	481,980	12,485	24,856
TOTAL EASTERN OREGON UNITS	1,674,372	55,176	65,869	464,455	18,304	31,999	2,138,827	73,480	97,868
REGION TOTAL	2,722,142	85,013	110,330	1,395,031	52,787	108,932	4,117,173	137,800	219,262

^{1/} IN STANDS 160 YEARS IN AGE OR LESS ON COMMERCIAL FOREST LAND. GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM OF ALL TREES 5.1 INCHES OR MORE IN D.B.H. BETWEEN STUMP AND 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. GROWTH IN BOARD FEET IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, SCRIBNER RULE.

residual stands left in a condition of net growth by selective cutting. Totaling 4.1 million acres the immature stands occupy only about one-quarter of the commercial forest area as shown in tables 1 and 12. They were found to be putting on a net annual increase in volume of 138 million cubic feet or 219 million board feet. Detail by unit, county, ownership class, and type group is given in tables 3 and 4. Tables 14 to 20 in the appendix give in addition the net growth and area of individual immature forest survey types. Growth rates per acre can readily be calculated from these data and they have far more significance than that computed for total area and total growth. Differences in per acre growth within a type between counties or ownership classes are due directly to differences in age of stands, stocking, and site quality.

In cubic measure net growth is only two-fifths of the region's total gross increment, that in board measure is less than one-fifth of gross increment; the remainder is nullified by mortality.

To date reservation of timberlands from cutting has been a negligible factor in reducing the commercially effective net growth in this region. Less than 2 percent of total net growth occurs on lands in this ownership category. Forty-four percent by area of the immature forests not reserved from cutting are privately owned. Private lands are contributing a proportionate amount of available cubic-volume growth, but only 34 percent of saw-timber growth. This is believed to be, in part, a reflection of past cutting practice. On the whole many more thrifty trees per acre of saw-timber size have been reserved for future growth on public and Indian cut-over areas than have been left following logging on private lands.

Only a part of the current net increment is being added to trees of merchantable size and quality. Net volume growth averages far lower in quality than does the timber now being logged. Most immature stands have resulted from such heavy cutting or recent burn that an economic cut appears impossible in them within half a century. Approximately one-half of current net growth occurs in ponderosa pine types (table 4). Although perhaps far in the future, ultimate economic availability of this portion of net increment seems assured because of the commercial desirability of this species and also because the ponderosa pine types, as a whole, are favorably located. In addition future merchantability is anticipated for a substantial part of that half of net volume increment being added to types other than ponderosa pine. Both the time of merchantability and the volume ultimately available depend upon future market values and production costs.

Periodic Growth

As existing forest stands grow older and are altered in extent and other characteristics by design and by natural means their rate of growth will likewise change. In this region with extensive virgin forests being rapidly depleted, change in growth rate is rapid. In fact

the trend of growth and of the growth-depletion ratio are of far greater significance than is the current level of a swiftly changing rate of net increment. Periodic growth has been computed to indicate the prospective trend of net increment in the future. Following detailed analysis of past cutting and fire depletion records, lumber production and requirement trend, of volume, location, and ownership of timber supplies, assumptions of forest drain for each of the three decades, 1935-44, 1945-54, and 1955-64, were made with as much realism as possible. (Method and results of this depletion calculation will be presented in the comprehensive regional report.) As here estimated periodic growth is the net increment that will occur during these three decades if the depletion assumed takes place. It is recognized that over a 30-year period cutting, insect depletion, and fire loss may either considerably exceed or underrun any assumptions set up at the start of that period. In such an event it is believed that the illustrated relation between increment and cutting practice would remain essentially constant although the absolute values of future periodic growth would depart from those presented here.

Periodic growth was computed for three classes of cutting practice in ponderosa pine stands. (1) Comparatively light selection in which cutting is assumed to remove the more mature and less thrifty 50 percent of the virgin stand per acre on lands of all ownerships; (2) heavy selection (75-percent removal per acre) on private lands, 50-percent on other lands; (3) virtual clear cutting (95-percent removal per acre) on private lands, heavy selection (75-percent) on other lands. The third class approximates that which has prevailed in the past; the current trend is toward lighter cutting.

Desirable cutting technique varies tract by tract and none of the broad classes of cut employed in the computations is recommended as most favorable for any specific forest. A range in practice was assumed merely to illustrate in principle the effect upon estimated increment. Owing to the small amount of exploitation anticipated in the non-pine types only one class of cutting practice, clear cutting, was assumed for this group. This assumption was made to facilitate computation and does not infer that there may not be real advantages in selective cutting in certain of these types as well as in ponderosa pine.

In computing periodic growth of immature stands existing at the date of survey allowance was made for change of age, for anticipated reduction in area by fire and cutting, and for normal loss due to other agencies of depletion. In addition growth was estimated for that portion of the areas occupied by virgin forest at date of survey which, decade by decade were assumed to be converted to a condition of net growth by cutting. Estimated average annual net growth per acre for such areas following cutting are shown in table 5 for the principal commercial timber producing counties of the region by ownership class and by severity of cut.

TABLE 5. ESTIMATED PERIODIC ANNUAL NET GROWTH^{1/} PER ACRE THAT COULD BE DERIVED OVER FIRST CYCLE FOLLOWING MATURITY SELECTION CUTTING OF MATURE PONDEROSA PINE TYPES^{2/} OF CERTAIN COUNTIES IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY OWNERSHIP CLASS AND SEVERITY OF CUT

STATE AND COUNTY	PRIVATE			LANDS OTHER THAN PRIVATE	
	50 PERCENT	75 PERCENT	95 PERCENT	50 PERCENT	75 PERCENT
	VOLUME REMOVAL	VOLUME REMOVAL	VOLUME REMOVAL	VOLUME REMOVAL	VOLUME REMOVAL
	BOARD FEET	BOARD FEET	BOARD FEET	BOARD FEET	BOARD FEET
EASTERN WASHINGTON					
FERRY	88	81	32	84	78
OKANOGAN	69	48	26	71	50
CHELAN	95	76	36	100	81
KITTITAS	72	72	36	71	73
YAKIMA	86	85	39	98	93
Klickitat	90	86	41	88	82
COLUMBIA	79	52	29	60	39
ASOTIN	86	56	29	75	--
EASTERN OREGON					
WALLOWA	79	53	31	74	46
UNION	64	54	30	50	49
UMATILLA	67	60	33	65	58
MORROW	69	63	34	64	57
WASCO	83	64	31	100	73
JEFFERSON	72	64	34	76	58
DESCHUTES	85	72	38	85	72
CROOK	91	68	36	94	70
BAKER	83	85	40	82	84
GRANT	62	56	31	62	57
WHEELER	50	49	28	53	51
HARNEY	65	66	35	70	69
MALHEUR	52	56	31	70	68
KLAMATH	93	85	39	98	86
LAKE	85	85	42	76	76

^{1/} GROWTH IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, SCRIBNER RULE, AND ALSO THAT FOR TREES ESTIMATED TO GROW INTO THIS SIZE CLASS.

^{2/} PONDEROSA PINE FORESTS, LARGE; PURE PONDEROSA PINE, LARGE; AND PINE MIXTURE, LARGE; AS A GROUP.

The unweighted regional average annual net growth rate per acre anticipated over the first cycle following cutting of virgin pine stands is 77 board feet following 50-percent cutting, 67 board feet for 75-percent cut, and only 34 board feet for 95-percent cut. These rates are far less than potential growth. Owing to the maturity and decadence of the virgin stands the areas they occupy cannot be converted to the ultimate increment obtainable in a single cutting cycle. Within any one class of cut, variation in growth rates between counties or between ownership classes is due to differences in virgin stand volume, structure, or to site quality. For the region as a whole the growth rates for private lands are virtually identical to those for other lands for corresponding severities of cut although such comparisons county by county commonly show substantial differences. On the average, the net per acre growth rate following 75-percent cut is about double that for 95-percent volume removal over the first cutting cycle; that for 50-percent cut averages only 15 percent greater than that for 75-percent cut. In every comparison given the estimated growth rate following 75-percent selection exceeds that for virtual clear cutting. In 39 out of 46 instances the anticipated net growth following 50-percent selection is greater than that after 75-percent cutting. For the remaining 7 cases anticipated increase in gross growth due to the additional volume reserved under the lighter cut was equaled or exceeded by expected increase in mortality. Gross growth and quality of growth are of course substantially greater under the lighter cuts in every instance.

In general, the advantages of light cutting, in regard to growth per acre, are even more pronounced in relatively thrifty than in decadent stands. Advantages of light cutting, however, are not confined to per acre growth rate. In addition a greater area of virgin forest is thereby converted to net growth condition each year. For example, for each acre cut over on a 95-percent basis 1.9 acres would be converted to net growth status in harvesting the same total volume on a 50-percent selection basis.

Prospective Trend of Growth

Estimates of total net periodic saw-timber growth that will occur from 1935 to 1964 are shown in detail in table 6 and are summarized graphically on an annual basis and compared with current annual net growth in figure 2.

Anticipated conversion of additional areas to net growth condition as cutting continues is largely responsible for the substantial increase in estimated net annual increment during the three decades following 1935. In 1935 annual regional net growth was measured to be about 219 million board feet. If cutting practice that has prevailed in the past continues it is estimated that annual net growth for the region will average 230 million board feet during the decade 1935-44, increase to an average of about 378 million board feet during the following decade and to about 523 million board feet during the period 1955-64.

TABLE 6. ESTIMATED PERIODIC NET SAW-TIMBER GROWTH^{1/} IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, 1935-1964, BY DECADE, TYPE GROUP, AND CLASS OF CUTTING PRACTICE

UNIT AND COUNTY	1935-1944				1945-1954				1955-1964			
	PONDEROSA PINE TYPES				PONDEROSA PINE TYPES				PONDEROSA PINE TYPES			
	50-50 ^{2/}	75-50 ^{3/}	95-75 ^{4/}	OTHER TYPES	50-50 ^{2/}	75-50 ^{3/}	95-75 ^{4/}	OTHER TYPES	50-50 ^{2/}	75-50 ^{3/}	95-75 ^{4/}	OTHER TYPES
	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.	THOUSAND : BD. FT.
CHELAN-COLVILLE												
FERRY	100,625	97,388	87,222	181,244	185,811	176,897	141,736	235,997	285,960	271,754	206,508	250,214
OKANOGAN	76,301	68,956	52,902	148,709	180,618	151,354	93,258	136,300	278,038	243,136	139,132	203,565
CHELAN	120,899	104,610	89,383	68,461	228,052	180,498	129,375	103,060	314,854	257,039	177,566	133,949
DOUGLAS	13,828	13,828	13,828		15,997	15,997	15,997		22,033	22,033	22,033	4
LINCOLN												
TOTAL	314,133	284,782	243,035	398,414	610,478	525,246	380,426	514,957	901,495	793,962	546,239	577,732
YAKIMA RIVER												
KITTITAS	59,188	52,222	38,482	84,343	132,421	115,575	73,156	127,256	181,551	164,162	112,167	151,613
YAKIMA	100,801	99,898	94,410	49,368	191,524	187,351	164,734	75,007	287,362	278,900	232,883	100,451
Klickitat	76,863	64,868	50,439	163,129	165,239	122,631	89,136	157,113	233,147	188,512	132,075	143,129
TOTAL	236,852	216,988	183,331	296,840	489,234	425,557	327,026	359,376	702,150	631,574	477,125	395,193
NORTH BLUE MOUNTAIN												
WHITMAN	37	37	37		41	41	41		102	102	102	
WALLA WALLA	3,188	3,188	3,188	1,134	8,427	8,427	8,427	7,838	12,836	12,836	12,836	11,318
COLUMBIA	10,964	9,786	9,180	24,915	23,698	19,611	16,990	41,612	31,929	28,649	23,540	57,910
GARFIELD	2,171	2,171	2,171	13,753	3,312	3,312	3,312	26,231	5,348	5,348	5,348	42,082
ASOTIN	7,640	6,194	5,536	6,766	17,810	12,847	10,620	9,181	25,779	18,371	14,626	11,110
TOTAL	24,000	21,376	20,112	46,568	52,288	44,238	39,300	84,852	75,994	65,306	56,452	122,420
TOTAL EASTERN WASHINGTON UNITS	575,005	523,146	446,478	741,822	1,152,000	995,041	746,912	959,195	1,679,649	1,490,842	1,078,816	1,105,345
NORTH BLUE MOUNTAIN												
WALLAWA	56,439	51,744	47,960	84,469	115,369	100,899	87,945	143,708	159,434	140,269	120,212	165,039
UNION	83,017	79,481	73,197	54,826	175,015	157,805	139,141	94,910	230,850	212,111	187,560	125,632
WATILLA	45,643	44,349	42,350	29,795	82,551	77,299	68,368	57,930	122,321	112,982	95,900	79,021
MORROW	7,482	6,949	6,470	4,322	33,192	25,101	16,183	5,987	75,381	56,085	32,488	6,687
GILLIAM												
TOTAL	192,581	182,523	169,977	173,412	406,127	361,104	311,637	302,535	567,986	521,447	430,158	276,379
DESCHUTES RIVER												
WASCO	42,907	41,948	39,615	49,272	72,459	68,934	55,916	63,030	113,546	106,818	79,021	71,796
JEFFERSON	18,517	13,945	10,084	3,968	72,238	52,788	29,692	7,153	150,179	111,764	58,183	10,559
DESCHUTES	156,940	121,718	82,026	2,293	332,695	289,015	181,427	2,633	427,156	412,940	296,273	3,562
CROOK	40,311	31,395	22,717	3,350	123,958	92,583	55,392	3,938	219,077	170,511	98,956	3,554
TOTAL	258,684	209,006	155,043	58,723	601,370	503,320	322,027	76,754	909,968	802,033	532,433	89,471
SOUTH BLUE MOUNTAIN												
BAKER	59,260	53,948	44,478	8,857	157,571	141,996	109,243	15,438	259,951	240,995	194,181	20,438
GRANT	92,759	83,669	66,099	21,633	255,895	226,203	154,544	28,222	373,415	334,585	228,041	28,932
WHEELER	24,394	21,212	17,360	4,002	52,998	44,272	32,073	4,602	76,391	66,121	48,768	4,703
HARNEY	20,549	19,798	18,883		31,065	28,473	25,316		113,250	107,207	78,505	
WALHEUR	875	737	541		2,433	1,875	1,196		3,590	2,782	1,865	
TOTAL	197,837	179,364	147,361	34,492	409,962	442,819	322,372	48,262	826,597	751,690	551,360	54,073
KLAMATH PLATEAU												
KLAMATH	509,432	428,995	296,226	38,069	1,114,960	942,474	573,655	38,964	1,452,337	1,320,474	836,714	41,674
LAKE	61,756	52,659	39,910		154,444	121,705	74,035		272,538	215,778	126,483	37
TOTAL	571,188	481,654	336,136	38,069	1,269,404	1,064,179	647,690	38,964	1,724,875	1,536,252	963,197	41,711
TOTAL EASTERN OREGON UNITS	1,220,290	1,052,547	808,517	304,696	2,776,853	2,371,422	1,603,726	466,415	4,049,426	3,611,422	2,483,158	561,634
REGION TOTAL	1,795,225	1,575,693	1,254,995	1,046,518	3,923,863	3,366,463	2,350,638	1,425,610	5,729,075	5,102,264	3,561,974	1,666,979

^{1/} GROWTH IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 15-FOOT LOGS TO 8-INCH TOP; SCRIBED RULE.^{2/} ESTIMATED PERIODIC GROWTH, ASSUMING ANTICIPATED TIMBER CUT WILL TAKE THE FORM OF LIGHT SELECTION, REMOVAL AVERAGING 50 PERCENT OF VIRGIN STAND VOLUME PER ACRE ON ALL AREAS WHERE CUTTING OCCURS. CUTTING ASSIGNED TO REMOVE THE MORE MATURE AND LESS THRIFTY TREES UP TO THE PERCENTAGE INDICATED.^{3/} ESTIMATED PERIODIC GROWTH, ASSUMING ANTICIPATED TIMBER CUT WILL TAKE THE FORM OF HEAVY SELECTION ON PRIVATE LANDS, REMOVAL AVERAGING 75 PERCENT OF VIRGIN STAND VOLUME PER ACRE; LIGHT SELECTION AVERAGING 50 PERCENT ON OTHER LANDS.^{4/} ESTIMATED PERIODIC GROWTH, ASSUMING ANTICIPATED TIMBER CUT WILL TAKE THE FORM OF VIRTUAL CLEAR CUTTING ON PRIVATE LANDS, REMOVAL AVERAGING 95 PERCENT OF VIRGIN STAND VOLUME PER ACRE; HEAVY SELECTION AVERAGING 75 PERCENT ON OTHER LANDS.

COMPARISON OF CURRENT AND ESTIMATED PERIODIC ANNUAL NET GROWTH
IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON BY UNIT
AND BY CLASS OF CUTTING PRACTICE

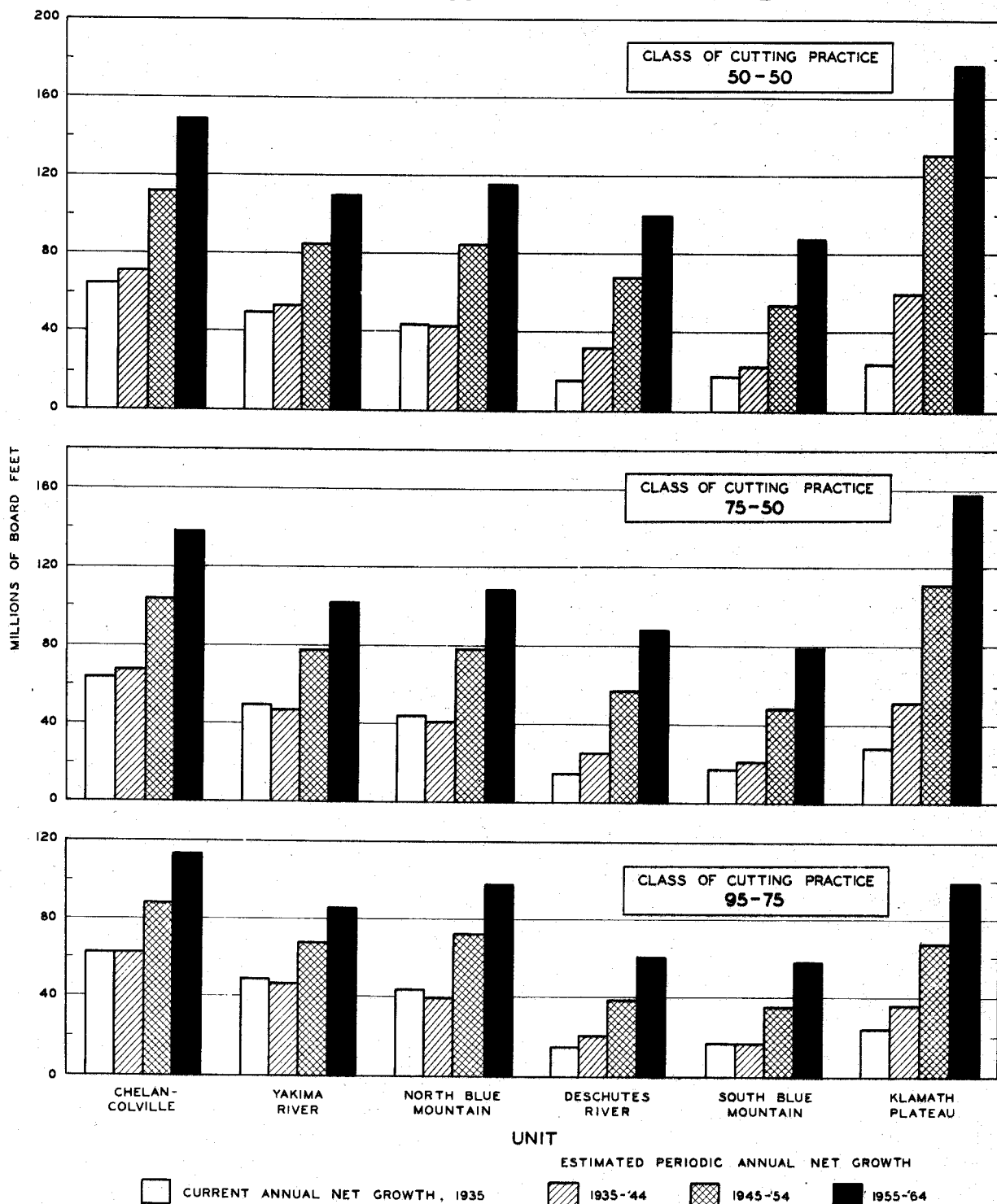


FIGURE 2.

At this trend of increase annual net growth in the year 1965 would approximate 600 million board feet. However, if the same amount of timber were harvested in lighter cuts, leaving the younger, more thrifty 50 percent of the original stand to increase in volume after logging, it is estimated that annual net growth would average 740 million board feet during the decade 1955-64 and would approximate 830 million board feet in 1965. This represents an increase in estimated net increment as of 1965 of nearly 40 percent over that anticipated following a 30-year continuation of past practice. If severity of per acre cut took a middle course averaging 75-percent removal per acre on private lands, 50-percent on other lands, it is estimated that a net annual growth of 770 million board feet could be attained by the year 1965.

Within the limits assumed for percent volume removal per acre a quicker increase in growth is anticipated following removal of the same total volume in lighter cuts per unit of area if such cuts are confined to the less thrifty and more mature trees in the stand. By covering a greater area annually the static or decadent virgin stands may be more rapidly converted to a condition of net growth. Over a rotation it is believed that the volume increment advantage of light cutting over heavy cutting will be smaller than for a 30-year period. If properly applied, however, light cutting should still be favored by a substantial difference in the quality of growth.

It is anticipated that the area converted to net growth status during the next 30 years will embrace predominantly the ponderosa pine type group in which cutting is concentrated. At the date of survey only about one-half of the net growth was occurring in ponderosa pine types, but from table 6 it appears that during the decade 1955-64 this type group will be contributing from 68 to 77 percent, depending on cutting practice, of the region's total net growth.

Potential Annual Growth

Potential annual growth has been computed to provide a measure of the average net timber yield continuously obtainable from the whole of the commercial forest land through reasonably intensive forestry practice as judged by current local standards. As here used, potential growth does not represent the maximum increment obtainable; the latter has been reduced to allow a margin for understocking and nonuse of forest land believed to be practically inevitable. Nevertheless, potential growth could be achieved over the whole region only after years of careful and effective forest-land management.

Specifically potential annual increment was computed by applying the mean annual per acre growth rates given in table 7 to the areas of commercial forest sites shown in table 13 in the appendix.

Table 7.-Rates used in calculating potential annual growth of coniferous timber in the ponderosa pine region of eastern Oregon and eastern Washington

Ponderosa pine sites					:	Other commercial conifer sites ^{1/}			
Mean annual growth per acre					:	Mean annual growth per acre			
Site	Timberland ^{2/}		Woodland ^{3/}		:	Site			
quality:					:	quality:			
class :	Total	Saw-timber	Total	Saw-timber	:	class :	Total	Saw-timber	
	growth:	growth	growth:	growth	:		growth:	growth	
	Cu.ft.:	Bd.ft.	Cu.ft.:	Bd.ft.	:		Cu.ft.:	Bd.ft.	
I	85	345	--	--	:				
II	65	255	--	--	:	II	135	675	
III	50	185	17	60	:	III	105	475	
IV	40	130	13	45	:	IV	75	275	
V	30	90	10	30	:	V	45	100	
VI	25	55	7	20	:				

- 1/ Seventy-five percent of normal yield table growth rates for Douglas-fir to technical rotation age.
2/ Sixty percent of normal yield table growth rates to technical rotation age.
3/ Twenty percent of normal yield table growth rates to technical rotation age.

In terms of normal yield table increment ponderosa pine timberland sites^{6/} were assumed to produce 60 percent; woodland sites of this species, 20 percent. For sites rated by the Douglas-fir classification^{7/} an average increment of 75 percent of the yield table value was assumed. These rates were assumed as an estimate of potential growth following an extensive study of increment in even-aged, second-growth stands made as a part of the forest survey. Those for the timberland sites approximate the mean annual increments that have taken place in such stands to about technical rotation age on sites classified as "well stocked". Rates for the woodland sites were based on a comparative study of gross growth in timberland and woodland types. Although these potential growth rates are considerably higher, particularly in board feet, than the regional average current growth per acre, they do not exceed those now found in many parts of the region's natural forests, uniformly over areas of several thousand acres.

^{6/} See footnote 3, page 7.

^{7/} See footnote 5, page 8.

TABLE B. POTENTIAL ANNUAL NET SAW-TIMBER GROWTH^{1/} ON COMMERCIAL FOREST LAND IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON,
BY UNIT, COUNTY, OWNERSHIP CLASS, AND SITE GROUP

UNIT AND COUNTY	LANDS AVAILABLE FOR CUTTING ^{2/}						LANDS RESERVED FROM CUTTING						TOTAL		
	PRIVATE			OTHER THAN PRIVATE											
	PONDEROSA	OTHER	TOTAL	PONDEROSA	OTHER	TOTAL	PONDEROSA	OTHER	TOTAL	PONDEROSA	OTHER	TOTAL	PONDEROSA	OTHER	TOTAL
	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.	THOUSAND BD. FT.
CHELAN-COLVILLE															
FERRY	11,636	6,795	18,431	69,331	75,805	145,136	23	16	39	80,990	82,616	163,606			
OKANOGAN	15,348	5,105	20,453	67,241	50,915	118,156	26	11,546	11,572	82,615	67,566	150,181			
CHELAN	24,141	2,574	26,715	31,690	27,252	58,942	251	1,791	2,042	56,082	31,617	87,699			
DOUGLAS	415		415	20		20				435		435			
LINCOLN	5,893	6	5,899	576		576				6,469	6	6,475			
TOTAL	57,433	14,480	71,913	168,858	153,972	322,830	300	13,353	13,653	226,591	181,805	408,396			
YAKIMA RIVER															
KITTITAS	22,982	37,935	60,917	11,584	46,284	57,868	459	252	711	35,025	84,471	119,496			
YAKIMA	10,174	1,235	11,409	62,192	52,838	115,030	1,350	6,795	8,145	73,716	60,868	134,584			
Klickitat	35,573	30,413	65,986	9,195	12,616	21,811				44,768	43,029	87,797			
TOTAL	68,729	69,583	138,312	82,971	111,738	194,709	1,809	7,047	8,856	153,509	188,368	341,877			
NORTH BLUE MOUNTAIN															
WHITMAN	471		471	24		24				495		495			
WALLA WALLA	1,676	885	2,561	153	356	509	8	198	206	1,837	1,439	3,276			
COLUMBIA	3,300	2,652	5,952	3,137	6,423	9,560			142	6,437	9,217	15,654			
GARFIELD	1,049		1,049	3,601	5,256	8,657				4,650	5,256	9,906			
ASOTIN	2,747	433	3,180	1,362	1,908	3,270				4,109	2,341	6,450			
TOTAL	9,243	3,970	13,213	8,277	13,943	22,220	8	340	348	17,528	18,233	35,761			
TOTAL EASTERN WASHINGTON UNITS	135,405	88,033	223,438	260,106	279,653	539,759	2,117	20,740	22,857	397,628	368,426	766,054			
NORTH BLUE MOUNTAIN															
WALLOWA	26,131	5,683	31,814	37,051	24,170	61,221	409	1,455	1,864	63,591	31,308	94,899			
UNION	28,797	9,031	37,828	14,533	22,545	37,078	55	814	869	43,385	32,390	75,775			
UMATILLA	19,251	5,814	25,065	18,068	20,867	38,935		76	76	37,319	26,757	64,076			
MORROW	11,150	1,098	12,248	9,747	3,004	12,751				20,897	4,102	24,999			
GILLIAM	33		33							33		33			
TOTAL	85,362	21,626	106,988	79,399	70,586	149,985	464	2,345	2,809	165,225	94,557	259,782			
DESCHUTES RIVER															
WASCO	8,561	1,153	9,714	29,630	21,579	51,209	262		262	38,453	22,732	61,185			
JEFFERSON	16,173	277	16,450	21,827	4,825	26,652	1,396	866	2,262	39,396	5,968	45,364			
DESCHUTES	31,886	52	31,938	46,275	9,928	56,203	174	122	296	78,335	10,102	88,437			
CROOK	19,297	156	19,453	35,467	1,902	37,369				54,764	2,038	56,802			
TOTAL	75,917	1,638	77,555	133,199	38,234	171,433	1,832	988	2,820	210,948	40,860	251,808			
SOUTH BLUE MOUNTAIN															
BAKER	23,407	2,174	25,581	31,078	11,223	42,301	12	118	130	54,497	13,515	68,012			
GRANT	43,867	1,928	45,795	109,195	26,828	136,023		7	7	153,062	28,763	181,825			
WHEELER	20,284	523	20,807	14,188	2,831	17,019	264	27	291	34,736	3,381	38,117			
HARNEY	5,283		5,283	43,171		43,171				48,454		48,454			
MALHEUR	514	7	521	170	12	182				684	19	703			
TOTAL	93,355	4,632	97,987	197,802	40,894	238,696	276	152	428	291,433	45,678	337,111			
KLAMATH PLATEAU															
KLAMATH	92,310	3,222	95,532	135,010	38,573	173,583	2,009	14,298	16,307	229,329	56,093	285,422			
LAKE	44,654	251	44,905	70,577	933	71,610	6		6	115,337	1,184	116,521			
TOTAL	136,964	3,473	140,437	205,587	39,506	245,093	2,015	14,298	16,313	344,666	57,277	401,943			
TOTAL EASTERN OREGON UNITS	391,598	31,369	422,967	616,087	189,220	805,307	4,587	17,783	22,370	1,012,272	238,372	1,250,644			
REGION TOTAL	527,003	119,402	646,405	876,193	468,873	1,345,066	6,704	38,523	45,227	1,409,900	626,798	2,036,698			

^{1/} GROWTH IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, BORISNER RULE.
^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY.

TABLE 9. POTENTIAL ANNUAL NET CUBIC VOLUME GROWTH^{1/} ON COMMERCIAL FOREST LAND IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, OWNERSHIP CLASS, AND SITE GROUP

UNIT AND COUNTY	LANDS AVAILABLE FOR CUTTING ^{2/}									LANDS RESERVED FROM CUTTING									TOTAL		
	PRIVATE						OTHER THAN PRIVATE														
	PONDEROSA			OTHER			PONDEROSA			OTHER			PONDEROSA			OTHER			PONDEROSA		
	PINE SITES	SITES	TOTAL	PINE SITES	SITES	TOTAL	PINE SITES	SITES	TOTAL	PINE SITES	SITES	TOTAL	PINE SITES	SITES	TOTAL	PINE SITES	SITES	TOTAL	PINE SITES	SITES	TOTAL
	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND	THOUSAND
	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.	CU. FT.
CHELAN-COLVILLE																					
FERRY	3,604	2,433	6,037	21,517	26,032	47,549	7	7	14	25,128	28,472	53,600									
OKANOGAN	5,065	2,121	7,186	21,717	19,951	41,668	9	4,438	4,447	26,791	26,510	53,301									
CHELAN	7,503	1,063	8,566	9,788	11,479	21,267	77	800	877	17,368	13,342	30,710									
DOUGLAS	160		160	8		8				168		168									
LINCOLN	1,920	3	1,923	191		191										2,111		3			2,114
TOTAL	18,252	5,620	23,872	53,221	57,462	110,683	93	5,245	5,338	71,566	68,327	139,893									
YAKIMA RIVER																					
KITTITAS	7,157	11,220	18,377	3,630	14,488	18,118	142	54	196	10,929	25,762	36,691									
YAKIMA	3,189	485	3,674	18,883	18,374	37,257	418	2,166	2,584	22,490	21,025	43,515									
Klickitat	10,867	7,263	18,130	2,805	3,263	6,068				13,672	10,526	24,198									
TOTAL	21,213	18,968	40,181	25,318	36,125	61,443	560	2,220	2,780	47,091	57,313	104,404									
NORTH BLUE MOUNTAIN																					
WHITMAN	194		194	11		11				205		205									
WALLA WALLA	519	249	768	48	98	146	3	58	61	570	405	975									
COLUMBIA	1,033	783	1,816	1,021	2,587	3,608			64	2,054	3,434	5,488									
GARFIELD	341		341	1,128	1,880	3,008				1,469	1,880	3,349									
ASOTIN	857	135	992	432	758	1,190				1,289	893	2,182									
TOTAL	2,944	1,167	4,111	2,640	5,323	7,963	3	122	125	5,587	6,612	12,199									
TOTAL EASTERN WASHINGTON UNITS	42,408	25,755	68,164	81,179	98,910	180,089	656	7,587	8,243	124,244	132,252	256,496									
NORTH BLUE MOUNTAIN																					
WALLA WALLA	8,277	1,784	10,061	11,761	8,998	20,759	129	652	781	20,167	11,434	31,601									
UNION	9,142	3,738	12,880	4,589	9,746	14,335	18	366	384	13,749	13,650	27,599									
UMATILLA	5,923	2,534	8,457	5,591	8,873	14,464			34	11,514	11,441	22,955									
MORROW	3,420	442	3,862	2,995	1,262	4,257				6,415	1,704	8,119									
GILLIAM	11		11							11		11									
TOTAL	26,773	8,498	35,271	24,936	28,879	53,815	147	1,052	1,199	51,856	38,429	90,285									
DESCHUTES RIVER																					
WASCO	2,719	325	3,044	9,088	6,664	15,752	77		77	11,884	6,989	18,873									
JEFFERSON	5,010	99	5,109	6,708	1,632	8,340	397	325	722	12,115	2,056	14,171									
DESCHUTES	9,815	21	9,836	14,105	4,292	18,397	54	48	102	23,974	4,361	28,335									
CROOK	5,966	64	6,030	10,998	777	11,675				16,864	841	17,705									
TOTAL	23,510	509	24,019	40,799	13,365	54,164	528	373	901	64,837	14,247	79,084									
SOUTH BLUE MOUNTAIN																					
BAKER	7,134	956	8,090	9,510	4,778	14,288	4	45	49	16,648	5,779	22,427									
GRANT	13,651	821	14,472	33,827	11,513	45,340		3	3	47,478	12,337	59,815									
WHEELER	6,302	233	6,535	4,378	1,171	5,549	77	12	89	10,757	1,416	12,173									
HARNEY	1,661		1,661	13,483		13,483				15,144		15,144									
WALHEUR	165	3	168	56	6	62				221	9	230									
TOTAL	28,913	2,013	30,926	61,254	17,468	78,722	81	60	141	90,248	19,541	109,789									
KLAMATH PLATEAU																					
KLAMATH	27,899	880	28,779	40,588	11,240	51,837	604	4,889	5,493	69,091	17,018	86,109									
LAKE	13,898	69	13,967	22,083	315	22,398				35,982	384	36,366									
TOTAL	41,797	949	42,746	62,671	11,554	74,235	605	4,889	5,494	105,073	17,402	122,475									
TOTAL EASTERN OREGON UNITS	120,993	11,969	132,962	189,660	71,276	260,936	1,361	6,374	7,735	312,014	89,619	401,633									
REGION TOTAL	163,402	37,724	201,126	270,839	170,186	441,025	2,017	13,961	15,978	436,258	221,871	658,129									

^{1/} GROWTH IS SHOWN FOR THAT PORTION OF THE STEM OF ALL TREES 5.1 INCHES OR MORE IN D.B.H. BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD.

^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY.

TABLE 10. POTENTIAL ANNUAL NET GROWTH^{1/} ON COMMERCIAL FOREST LAND IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, AND COVER-TYPE GROUP

UNIT AND COUNTY	MATURE TYPES ^{2/}		IMMATURE TYPES ^{3/}		DEFORESTED TYPES ^{4/}		TOTAL	
	TOTAL	SAW-TIMBER	TOTAL	SAW-TIMBER	TOTAL	SAW-TIMBER	TOTAL	SAW-TIMBER
	GROWTH	GROWTH	GROWTH	GROWTH	GROWTH	GROWTH	GROWTH	GROWTH
	THOUSAND CU. FT.	THOUSAND BD. FT.	THOUSAND CU. FT.	THOUSAND BD. FT.	THOUSAND CU. FT.	THOUSAND BD. FT.	THOUSAND CU. FT.	THOUSAND BD. FT.
CHELAN-COLVILLE								
FERRY	29,638	91,849	19,132	59,570	4,830	12,187	53,600	163,606
OKANOGAN	39,601	111,026	12,929	36,939	771	2,216	53,301	150,181
CHELAN	17,844	49,205	12,713	38,079	153	415	30,710	87,699
DOUGLAS	9	29	159	406			168	435
LINCOLN	299	1,036	1,782	5,344	33	95	2,114	6,475
TOTAL	87,391	253,145	46,715	140,338	5,787	14,913	139,893	408,396
YAKIMA RIVER								
KITTITAS	24,139	78,665	11,905	38,658	647	2,173	36,691	119,496
YAKIMA	33,542	104,039	9,575	29,555	398	990	43,515	134,584
Klickitat	9,727	32,966	13,208	49,959	1,263	4,872	24,198	87,797
TOTAL	67,408	215,670	34,688	118,172	2,308	8,035	104,404	341,877
NORTH BLUE MOUNTAIN								
WHITMAN			205	495			205	495
WALLA WALLA	116	396	859	2,880			975	3,276
COLUMBIA	2,217	6,540	3,217	8,952	54	162	5,488	15,654
GARFIELD	1,540	4,522	1,794	5,344	15	40	3,349	9,906
ASOTIN	1,265	3,856	917	2,594			2,182	6,450
TOTAL	5,138	15,314	6,992	20,265	69	202	12,199	35,781
TOTAL EASTERN WASHINGTON UNITS	159,937	484,129	88,395	278,775	8,164	23,150	256,496	786,054
NORTH BLUE MOUNTAIN								
WALLOWA	20,227	61,598	11,122	32,604	252	697	31,601	94,899
UNION	14,537	38,539	12,909	36,799	153	437	27,599	75,775
UMATILLA	14,298	40,643	6,761	18,953	1,906	4,480	22,955	64,076
MORROW	7,085	21,975	810	2,499	224	525	8,119	24,999
GILLIAM	11	33					11	33
TOTAL	56,148	162,788	31,602	90,855	2,535	6,139	90,285	259,782
DESCHUTES RIVER								
WASCO	14,159	46,034	4,351	14,032	363	1,119	18,873	61,185
JEFFERSON	12,709	40,765	911	2,779	551	1,820	14,171	45,364
DESCHUTES	18,574	56,113	9,293	30,764	468	1,560	28,335	88,437
CROOK	16,126	51,880	1,548	4,849	31	93	17,705	56,822
TOTAL	61,568	194,792	16,103	52,424	1,413	4,592	79,084	251,808
SOUTH BLUE MOUNTAIN								
BAKER	15,604	45,517	6,689	22,068	134	427	22,427	68,012
GRANT	51,889	158,098	6,523	20,255	1,403	3,472	59,815	181,825
WHEELER	9,985	31,298	2,122	6,605	66	214	12,173	38,117
HARNEY	13,021	41,904	2,063	6,370	60	180	15,144	48,454
MALHEUR	188	573	42	130			230	703
TOTAL	90,687	277,390	17,439	55,428	1,663	4,293	109,789	337,111
KLAMATH PLATEAU								
KLAMATH	67,465	223,010	16,097	53,929	2,547	8,483	86,109	285,422
LAKE	32,414	103,940	3,216	10,127	736	2,454	36,366	116,521
TOTAL	99,879	326,950	19,313	64,056	3,283	10,937	122,475	401,943
TOTAL EASTERN OREGON UNITS	308,282	961,920	84,457	262,763	8,894	25,961	401,633	1,250,644
REGION TOTAL	468,219	1,446,049	172,852	541,538	17,058	49,111	658,129	2,036,698

1/ GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM OF ALL TREES 5.1 INCHES OR MORE IN D.B.H. BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. GROWTH IN BOARD FEET IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, SCRIBNER RULE.

2/ STANDS MORE THAN 160 YEARS IN AGE, ON COMMERCIAL FOREST LAND.

3/ STANDS 160 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LAND.

4/ NONRESTOCKED CUT-OVER LAND, DEFORESTED BURNS, AND THAT PORTION OF LODGEPOLE PINE STANDS WHICH OCCURS ON COMMERCIAL FOREST LAND.

Results of Computation

Approximately 16.2 million acres in the region are capable of producing commercial conifer forests. Computed according to the above assumptions, these lands have the capacity to produce annually 658 million cubic feet of wood, or 2 billion board feet, Scribner rule, of saw timber. Potential annual saw-timber growth is given by unit, county, ownership class, and site group in table 8; potential cubic volume increment is shown in the same detail in table 9.

Eastern Oregon contains 63 percent of the commercial forest land area which has about 61 percent of the region's potential growth.

One-third of the commercial forest land having a like proportion of regional productive capacity is privately owned; one-half is in the national forests and the remainder is principally in Indian and State ownerships. Lands reserved from cutting have only about 2 percent of the timber-growth capacity of the region.

Ponderosa pine sites constitute about three-quarters of the area capable of producing commercial forest and have about 69 percent of potential growth. These sites have 81 percent of the growth capacity of eastern Oregon, but only 51 percent of that for the Washington units of the region. Woodland sites capable of producing timber of commercial quality but only in light stands compose 7 percent by area of ponderosa pine lands, but include less than 2 percent of their growth capacity.

As shown in table 10 the growth capacity of the lands still occupied by virgin forest (in which current net growth is nil) is 1,446 million board feet or 71 percent of the regional total. Slightly less than 27 percent of total potential growth of saw timber is on lands covered by immature stands; slightly more than 2 percent is on nonstocked lands.

Comparison of Current and Potential Growth

Stands that are making net growth occupy 25 percent of the region's total area of commercial forest sites, but their present cubic-foot increment is only 21 percent of potential growth, while their board measure increment is but 11 percent of potential. Current gross growth for the entire region is 54 percent of potential net cubic-foot growth. Gross growth is 56 percent of potential net growth in board feet. Similar comparisons of saw-timber growth are shown graphically by unit in figure 3.

The wide discrepancy between current and potential net growth is due largely to the prevalence of virgin forests which occupy nearly three-quarters of the region's commercial forest land. Although these mature stands contain a substantial supply of valuable saw timber and the land they occupy possesses 71 percent of the region's growth capacity, on the average they are making no net growth because of the balan-

CURRENT AND POTENTIAL ANNUAL GROWTH IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT

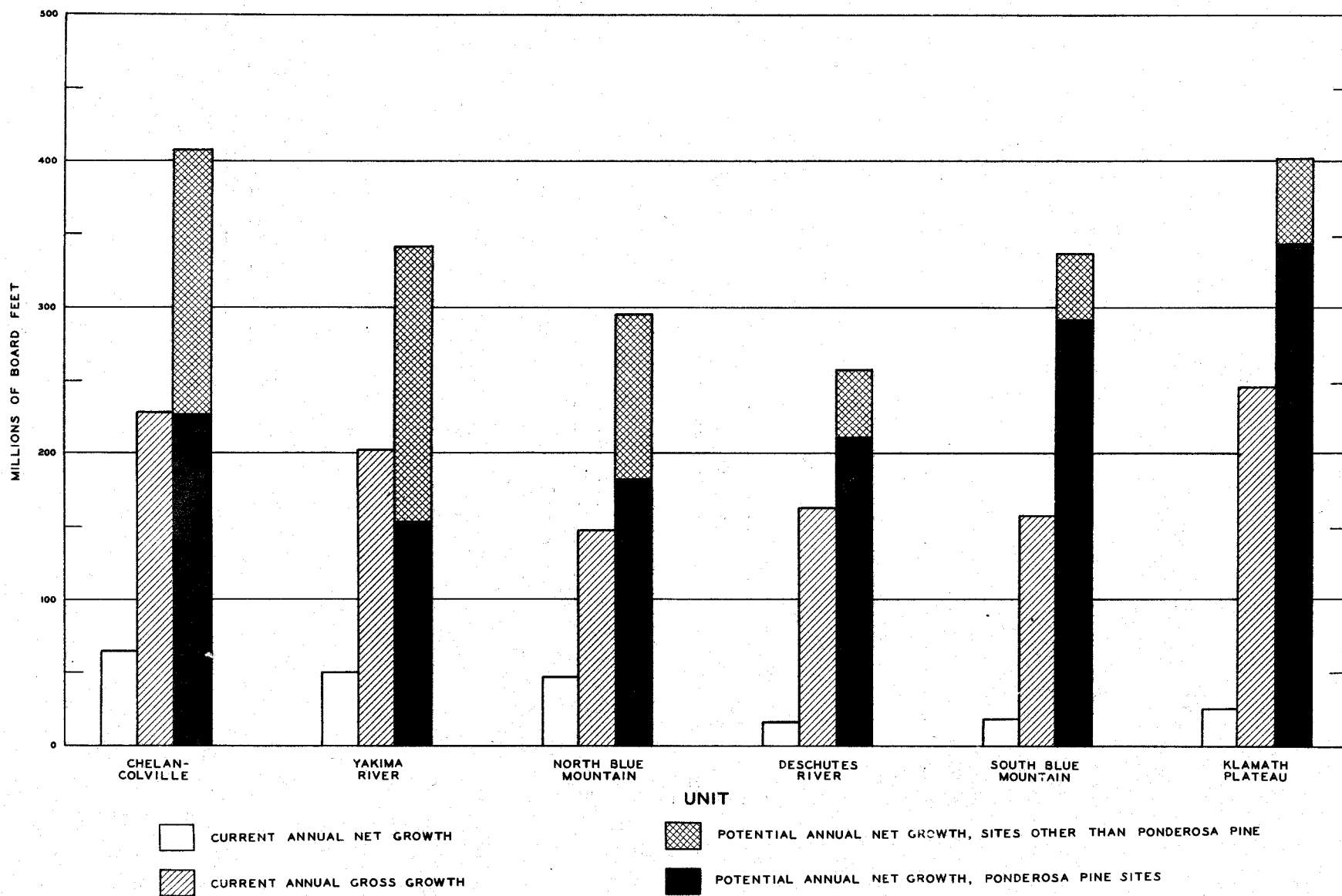


FIGURE 3.

TABLE 11. CURRENT AND POTENTIAL ANNUAL NET GROWTH^{1/} ON COMMERCIAL FOREST LAND IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, EXCLUSIVE OF THAT OCCUPIED BY MATURE^{2/} TIMBER

UNIT AND COUNTY	CURRENT ANNUAL GROWTH		POTENTIAL ANNUAL GROWTH		RATIO OF CURRENT TO POTENTIAL GROWTH	
	THOUSAND		THOUSAND		CU. FT. : BD. FT.	
	CU. FT.	BD. FT.	CU. FT.	BD. FT.	PERCENT	PERCENT
CHELAN-COLVILLE						
FERRY	12,610	28,372	23,962	71,757	53	40
OKANOGAN	8,162	19,381	13,700	39,155	60	49
CHELAN	10,145	15,019	12,866	38,494	79	39
DOUGLAS	145		159	406	91	
LINCOLN	998	1,630	1,815	5,439	55	30
TOTAL	32,060	64,402	52,502	155,251	61	41
YAKIMA RIVER						
KITTITAS	8,071	10,539	12,552	40,831	64	26
YAKIMA	10,389	15,428	9,973	30,545	104	51
Klickitat	7,629	24,462	14,471	54,831	53	45
TOTAL	26,089	50,429	36,996	126,207	71	40
NORTH BLUE MOUNTAIN						
WHITMAN	203	4	205	495	99	1
WALLA WALLA	902	271	859	2,880	105	9
COLUMBIA	2,794	3,296	3,271	9,114	85	36
GARFIELD	1,518	1,774	1,809	5,384	84	33
ASQTIN	754	1,218	917	2,594	82	47
TOTAL	6,171	6,563	7,061	20,467	87	32
TOTAL EASTERN WASHINGTON UNITS	64,320	121,394	96,559	301,925	67	40
NORTH BLUE MOUNTAIN						
WALLOWA	9,487	14,447	11,374	33,301	83	43
UNION	12,605	14,263	13,062	37,236	97	38
UMATILLA	6,273	8,498	8,667	23,433	72	36
MORROW	520	1,320	1,034	3,024	50	44
GILLIAM						
TOTAL	28,885	38,528	34,137	96,994	85	40
DESCHUTES RIVER						
WASCO	3,652	7,649	4,714	15,151	77	50
JEFFERSON	860	756	1,462	4,599	59	16
DESCHUTES	9,812	5,196	9,761	32,324	101	16
CROOK	1,749	2,419	1,579	4,942	111	49
TOTAL	16,073	16,020	17,516	57,016	92	28
SOUTH BLUE MOUNTAIN						
BAKER	8,085	5,160	6,823	22,495	118	23
GRANT	4,464	8,474	7,926	23,727	56	36
WHEELER	1,643	2,435	2,188	6,819	75	36
HARNEY	1,795	2,354	2,123	6,550	85	36
MALHEUR	50	41	42	130	119	32
TOTAL	16,037	18,464	19,102	59,721	84	31
KLAMATH PLATEAU						
KLAMATH	10,844	21,105	18,644	62,412	58	34
LAKE	1,641	3,751	3,952	12,581	42	30
TOTAL	12,485	24,856	22,596	74,993	55	33
TOTAL EASTERN OREGON UNITS	73,480	97,868	93,351	288,724	79	34
REGION TOTAL	137,800	219,262	189,910	590,649	73	37

^{1/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM OF ALL TREES 5.1 INCHES OR MORE IN D.B.H. BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. GROWTH IN BOARD FEET IS SHOWN FOR ALL TREES 11.1 INCHES OR MORE IN D.B.H. ESTIMATED IN 16-FOOT LOGS TO 8-INCH TOP, SCRIBNER RULE.

^{2/} STANDS MORE THAN 160 YEARS IN AGE, ON COMMERCIAL FOREST LAND.

cing effect of heavy mortality. The need for salvage is pronounced. It is evident that if all timber that dies could be utilized net saw-timber growth could be increased immediately about five-fold. Much of the mortality loss is high quality timber, and development of methods for salvaging such loss economically from widely scattered areas is one of the cardinal forest management problems of the region.

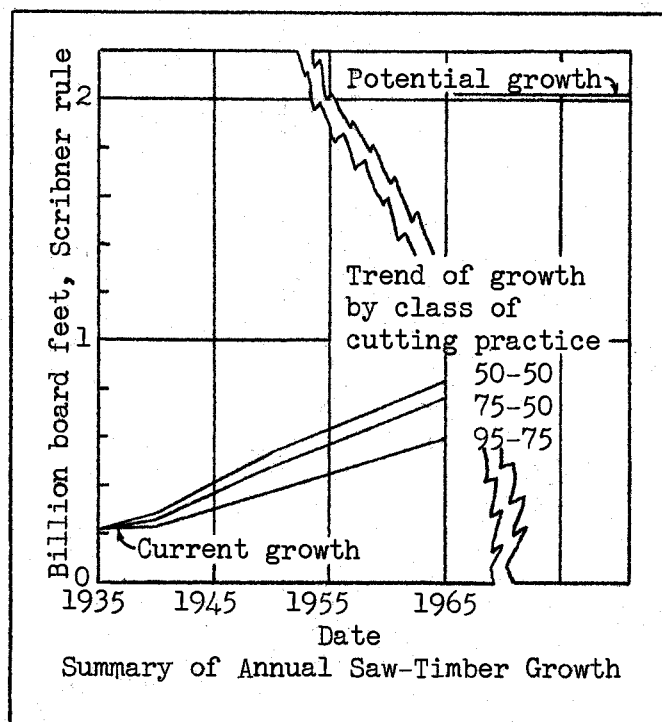
Another comparison useful in appraising the current increment situation is that shown in table 11, between current and potential net growth on the area of commercial forest land, exclusive of that occupied by virgin timber. On this area of 4.5 million acres, current annual net growth in cubic feet is 73 percent of the potential, that in board feet only 37 percent. In every county in the region current saw-timber growth is far below potential. Comparatively cubic-foot increment is progressing fairly satisfactorily, particularly in the Deschutes River and Blue Mountain units. In a few counties it now exceeds potential growth. These excesses do not represent realization of greater average productivity than was assumed in the potential growth computations. They are due to the disproportionate area of young age classes in the growing stands, which in these instances are temporarily at a stage of more rapid cubic increment than could be maintained throughout a rotation. The low level of board measure growth is pronounced in every county.

The relatively small deficiency in cubic volume increment of the immature stands, in comparison with the growth capacity of the lands they occupy, is largely attributable to the existence of non-stocked and understocked areas. The corresponding large deficiency of board measure increment is due partly to this factor also, but principally to current age-class distribution. Most of the stands that are putting on net growth are so young that they contain few trees of saw-timber size and hence their increment in terms of board measure is small. This is evidence of the low quality of current net growth, a situation largely the result of clear cutting and heavy selection cutting that have prevailed in the past.

Summary of Saw-Timber Growth

The relation of current growth, periodic growth according to three classes of cutting practice and potential growth is shown in the accompanying chart. Net increment now amounts to only 219 million board feet, but a substantial increase in this value is anticipated during succeeding decades as existing immature stands increase in age and virgin stands are converted to net growth status by timber harvest. Without change in past forest practice net growth may amount to about 600 million board feet by 1965, but the quality of such increment would be low in comparison with that of the timber now being cut. Growth can be more quickly increased in volume and also materially increased in value only by improved for-

estry practice. For example if cutting practice throughout the region were shifted now to a lighter selection basis, leaving the



younger, more thrifty 50 percent of the original stand to increase in volume after logging, it is estimated that annual net growth would approximate 830 million board feet in the year 1965. If severity of such cut averages 75-percent removal per acre on private lands and 50-percent on other lands, annual net growth is expected to approximate 770 million board feet by 1965.

An average annual net increment of 2 billion board feet could be obtained from the whole of the region's commercial forest land through reasonably intensive forestry practice.

This does not represent the theoretical maximum growth but that believed obtainable through practical measures. Nevertheless, this obtainable growth could be achieved only after years of careful and effective forest-land management.

APPENDIX

Gross Growth Study in Virgin Stands

Although it was assumed that gross growth equals mortality in the unmanaged virgin forests, which cover nearly three-quarters of the commercial forest land of the region, considerable effort was made to appraise the prospects of net growth under management from this major portion of the forest resource. In so doing 323 growth samples were taken during the summers of 1935 and 1936 throughout the virgin saw-timber types; 240 samples were taken by the Forest Survey especially for this study, 70 by the Station's section of logging economics, and 13 by University of Washington spring camp students essentially according to the Forest-Survey technique.

Plots were so located on type maps in the office as to sample with reasonable uniformity the principal virgin stands in the region. Number of samples taken within a type was determined roughly both by the type's extent and economic importance. For example, in pure ponderosa pine, large, type 20.5, most important in the region, one sample was taken per 28 thousand acres of type. In the less important upper slope, large, type 27 $\frac{1}{2}$, fir hemlock, large, type 23, and Douglas-fir old growth, small, type 7, intensity was one sample per 63 thousand acres.

The samples, taken in strip form, consisted of stand tallies by tree class, growth rates by tree class being determined from increment borings of sample trees. The sample unit consisted of one day's work for the crew of three; although most were 16 acres in area, they varied from about 8 to 32 acres. Average annual growth rate was based upon the period 1900 to 1935 or 1936, depending on date of sampling. Growth rate of ponderosa pine is characteristically cyclic. On the basis of Keen's tree-ring analysis^{8/} supplemented by additional region-wide investigation as a part of the survey growth phase, these periods were selected as ones during which actual growth approximated the normal rate. The growth rates employed were the gross rates made by trees that survived to the date of measurement. Growth of trees that grew for part of the increment period, but succumbed before measurement, could not be included. On the other hand it is believed that the average increment of the trees that survived was superior to that made by those that did not. Biases involved by these two factors tend to be compensating. Average annual increment of poles that grew into saw-timber size during the growth period was of course included.

Sample stand tallies were converted to stock tables by use of height curves prepared for each sample and regional volume tables. For

^{8/} Keen, F. P. CLIMATIC CYCLES IN EASTERN OREGON AS INDICATED BY TREE RINGS. U.S. Monthly Weather Rev. 65: 175-188, illus. 1937.

the sample trees grouped into broad classes^{9/} ratios of volume as of 1900 to volume as of 1935 or 1936 were computed for each sample. These ratios were applied to the appropriate portion of the stock table to compute estimated stand volume as of 1900. This value was subtracted from volume found at time of survey; the remainder divided by years in the growth period and acres in the sample gave a measure of the average annual growth per acre made by the sample stand.

Methods of Analysis

Preliminary study of the samples indicated significant differences in growth rate by forest type and by the various stand variables shown below by type. Alinement charts were constructed for each type as a means of quickly estimating growth corresponding to any combination of stand variables encountered. The charts for the pine woodland type were constructed by the empirical alinement chart method^{10/}, those for all other types were made by the combination mathematical-graphical method of successive approximation.^{11/}

Results and Application

The principal final charts are shown as the following figures 4 to 8, inclusive. They offer a means of making estimates of saw-timber growth in the virgin stands of the region from various stand statistics without the necessity of taking direct increment measurements. Local mortality studies should be made, however, in order to convert the increment as estimated from the charts to a net growth basis.

Ponderosa pine, large; forest-survey type 20. Thirty-five growth samples in this type were employed in making figure 4. It was constructed by reading preliminary estimates from the initial chart for the pure ponderosa pine, large; forest-survey type 20.5. Successive axis adjustments were made by analysis of the residuals. Use of this chart is illustrated for the following assumed stand values:

^{9/} Dunning, D. A TREE CLASSIFICATION FOR THE SELECTION FORESTS OF THE SIERRA NEVADA. Jour. Agr. Res. 36: 755-771, illus. 1928. The grouping approximated that employed by Meyer (see footnote 4 of text). Specifically the seven Dunning tree classes were placed into three groups: (1) Classes 1, 2, and 6; (2) class 3; (3) classes 4, 5, and 7. The Keen tree classification system (Keen, F. P., RELATIVE SUSCEPTIBILITY OF PONDEROSA PINES TO BARK-BEETLE ATTACK, Jour. Forestry 34: 919-927, illus. 1936) recently widely adopted in the region was not devised until after completion of the growth phase field work.

^{10/} Bruce, D. and Schumacher, F. X. FOREST MENSURATION. 360 pp., illus. New York. 1935.

^{11/} Bruce, D. and Reineke, L. H. CORRELATION ALINEMENT CHARTS IN FOREST RESEARCH. U.S. Dept. Agr. Tech. Bul. 210. 88 pp., illus. 1931.

Volume per acre, 14 M bd. ft., Scribner rule.

Site index, 78 feet (site quality IV).

Volume in Dunning tree classes:

Nos. 1, 2, and 6	20 percent
No. 3	15 percent

Using a straight edge, (1) span from 14 on the volume per acre or X_1 -axis to 78 on the site index or X_2 -axis and with a needle point hold the intersection of the straight edge on the S_1 -axis; (2) from this intersection span with the straight edge to 20 on the X_3 -axis and hold the intersection on the S_2 -axis; span from this S_2 -axis intersection to 15 on the X_4 -axis and read the intersection on the Y-axis, which in this instance is 104 board feet, the estimated average annual gross growth per acre for a stand of this description.

When checked against the measured increment of the basic plots this chart gave an aggregate estimate 0.32 percent high, and a standard error of estimate for individual plots of 17.3 percent. The correlation index was 0.949.

Pure ponderosa pine, large; forest-survey type 20.5. Estimates of gross growth in this type, the most important in the region, may be made from figure 5 which is based on 217 growth samples. It is used just as is figure 4, which is explained above for type 20.

The initial chart for type 20.5 was constructed from the multiple regression equation:

Gross annual growth per acre) =
(Bd. ft., Scribner rule))

$$\begin{aligned} &5.110 \text{ (volume per acre; M bd. ft.)} + 0.688 \text{ (site index; feet)} \\ &+ 1.031 \text{ (volume in Dunning tree classes 1, 2, and 6; percent)} \\ &+ 0.188 \text{ (volume in Dunning tree class 3; percent)} - 52.845 \end{aligned}$$

The resulting standard error of estimate for individual plots was 21.5 percent; the multiple correlation coefficient was 0.855. Successive curvilinear adjustments made graphically resulted in significant though small improvement of estimate. The standard error was reduced to 20.2 percent, the correlation index raised to 0.872.

Figure 5 was also used in making growth estimates for the ponderosa pine-sugar pine mixture, large, and for sugar pine mixture, large, forest survey types 20A and 20B, respectively. When checked against the 5 basic plots available for these types figure 5 yielded an aggregate error of growth estimate 0.12 percent low.

Ponderosa pine mixture, large; forest-survey type 27. Growth in this type was estimated by means of figure 6. This chart was derived from the initial chart for type 20.5 by successive approximation,

dropping the tree-class structure expressions and substituting volume of the average tree as an independent variable. When figure 6 was checked against measured growth of the 19 sample plots in the type an aggregate estimate 0.24 percent low was obtained; the standard error of estimate for individual plots was 23.5 percent, the correlation index, 0.924.

Douglas-fir, small old growth; fir-hemlock, large; upper-slope mixture, large; forest-survey types 7, 23, and 27.5, respectively. It was found that by accounting for differences in stand volume, site index and size of average tree the growth rates of these three types were similar enough to permit the use of one growth chart, figure 7, for all of them. Sites of these types were all classified according to the system for Douglas-fir.^{12/}

The initial chart for this type group was constructed from the multiple regression equation:

Gross annual growth per acre) =
(Bd. ft., Scribner rule)) =

$$6.256 (\text{volume per acre; M bd. ft.}) + 0.852 (\text{site index; feet}) \\ - 4.567 (\text{volume of average tree; bd. ft.}) - 5.496$$

First estimates from this equation yielded a standard error for individual plots of 35.7 percent, a multiple correlation coefficient of 0.795. Subsequent graphic adjustment yielded a standard error of 33.2 percent, a correlation index of 0.820.

Ponderosa pine woodland, forest-survey type 5 $\frac{1}{2}$. Figure 8 was constructed from six growth samples, totaling 135 acres in area, in the pine woodland type. Three samples were taken in Oregon, three in Washington. The basic data were insufficient to reveal significant effect of site on growth, probably owing to the relatively small range in site index (from 55 to 70 feet) encountered in the sampling of this type. The two independent variables employed, namely, volume per acre and percent of volume in Dunning tree classes 1, 2, 3, and 6 proved to be sufficiently closely related to growth rate of the samples to yield satisfactory estimates.

When applied to the sample plots the aggregate estimate obtained from the chart was 0.51 percent high, the standard error of estimate for single plots was only 3.8 percent, the correlation index 0.996.

^{12/} See footnote 5, page 8.

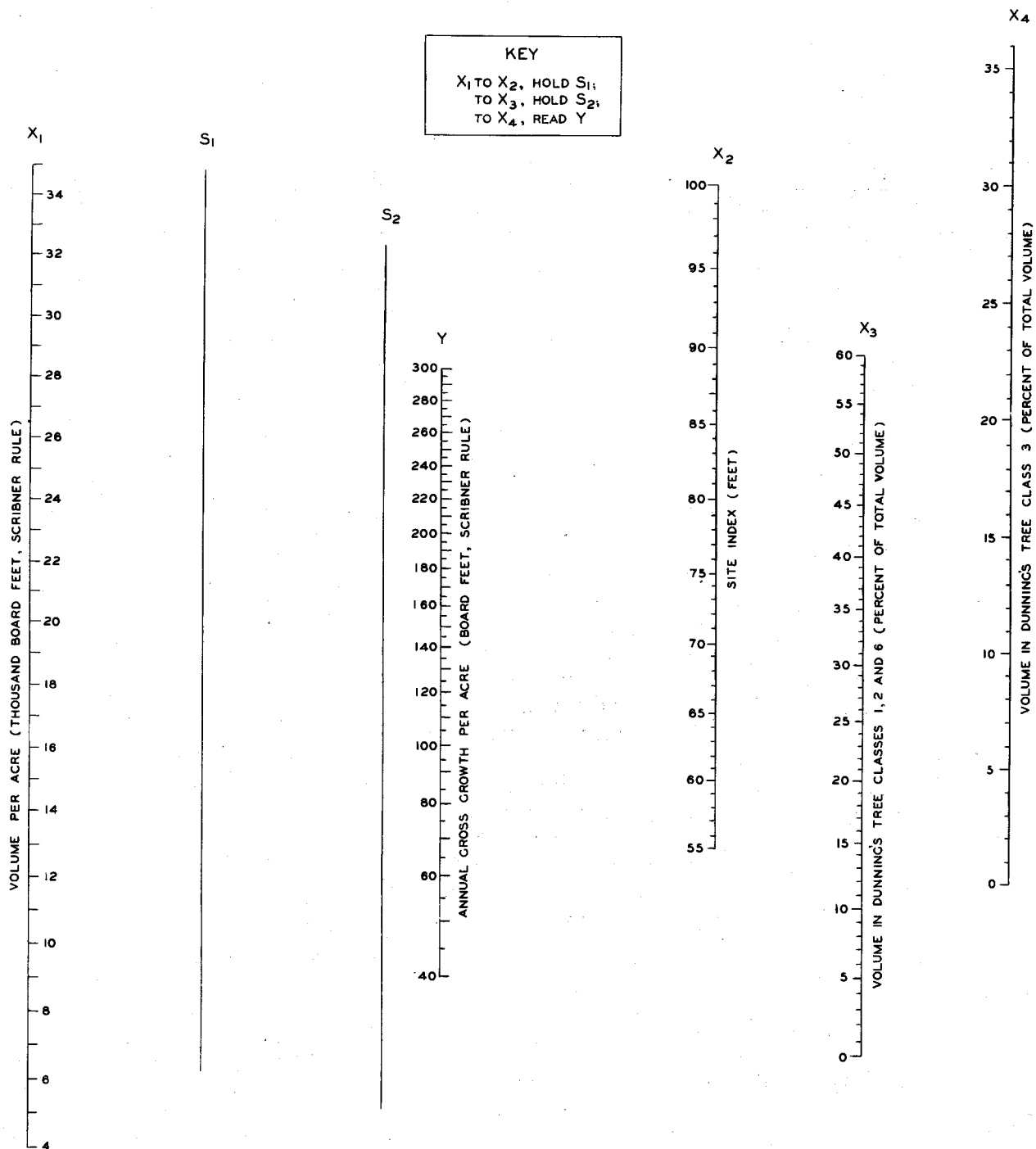


FIGURE 4.--ALINEMENT CHART FOR ESTIMATING GROWTH OF PONDEROSA PINE, LARGE (TYPE 20)

KEY
 X_1 TO X_2 , HOLD S_1
 TO X_3 , HOLD S_2
 TO X_4 , READ Y

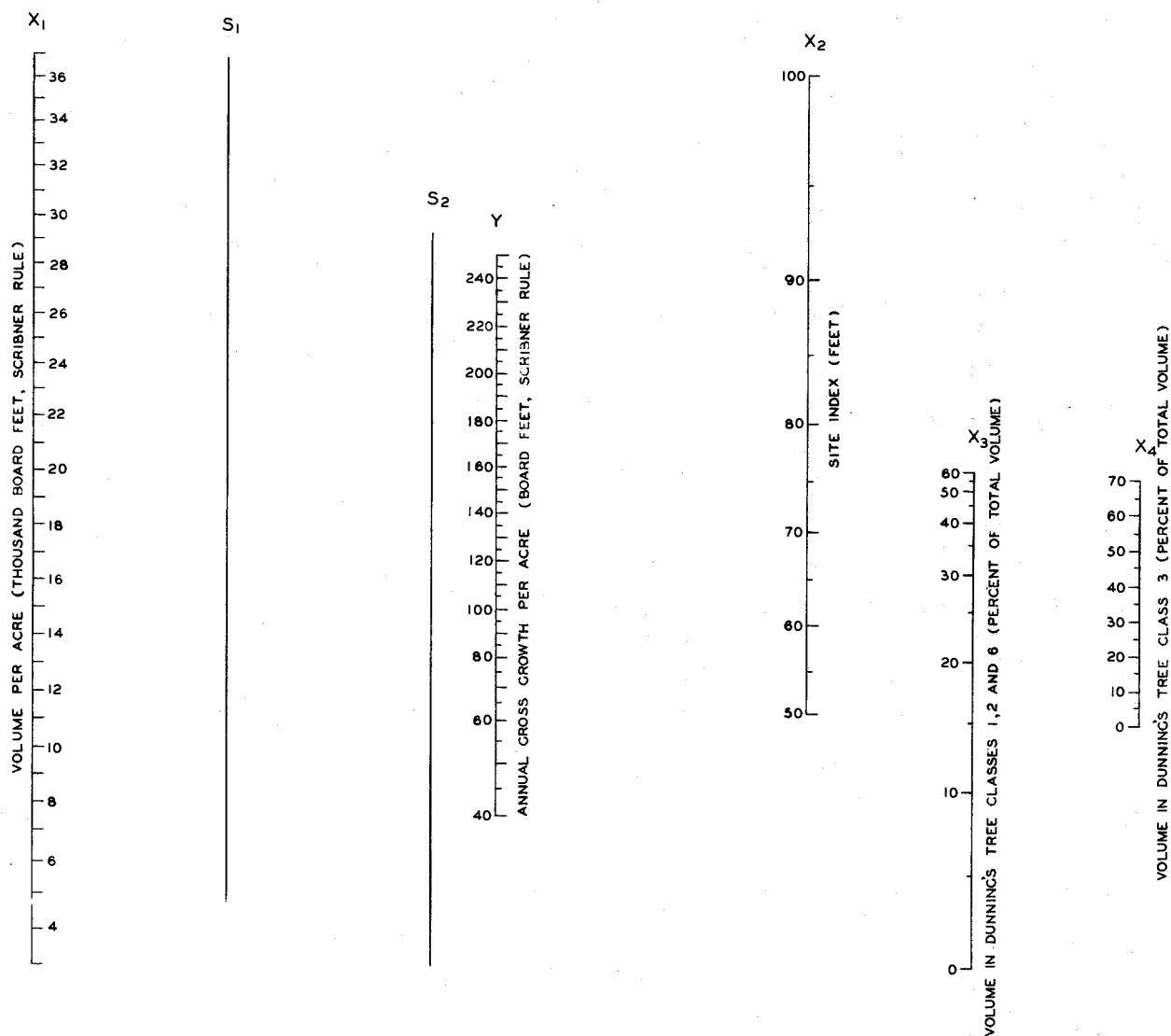


FIGURE 5.--ALINEMENT CHART FOR ESTIMATING GROWTH OF PURE PONDEROSA PINE FORESTS, LARGE (TYPE 20.5)

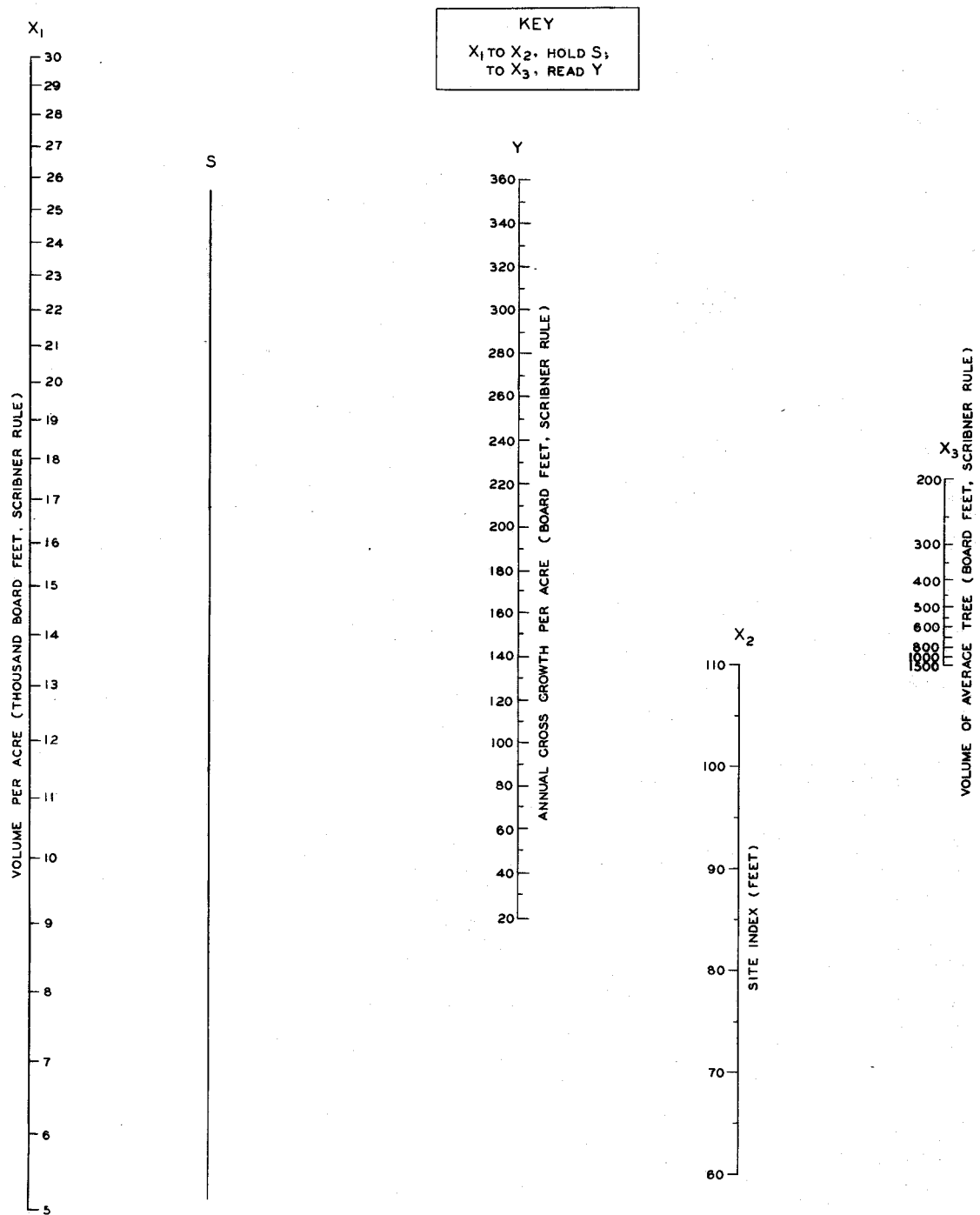


FIGURE 6--ALINEMENT CHART FOR ESTIMATING GROWTH OF PONDEROSA PINE MIXED FORESTS,
 LARGE (TYPE 27)

KEY

X_1 TO X_2 , HOLD S ;
TO X_3 , READ Y

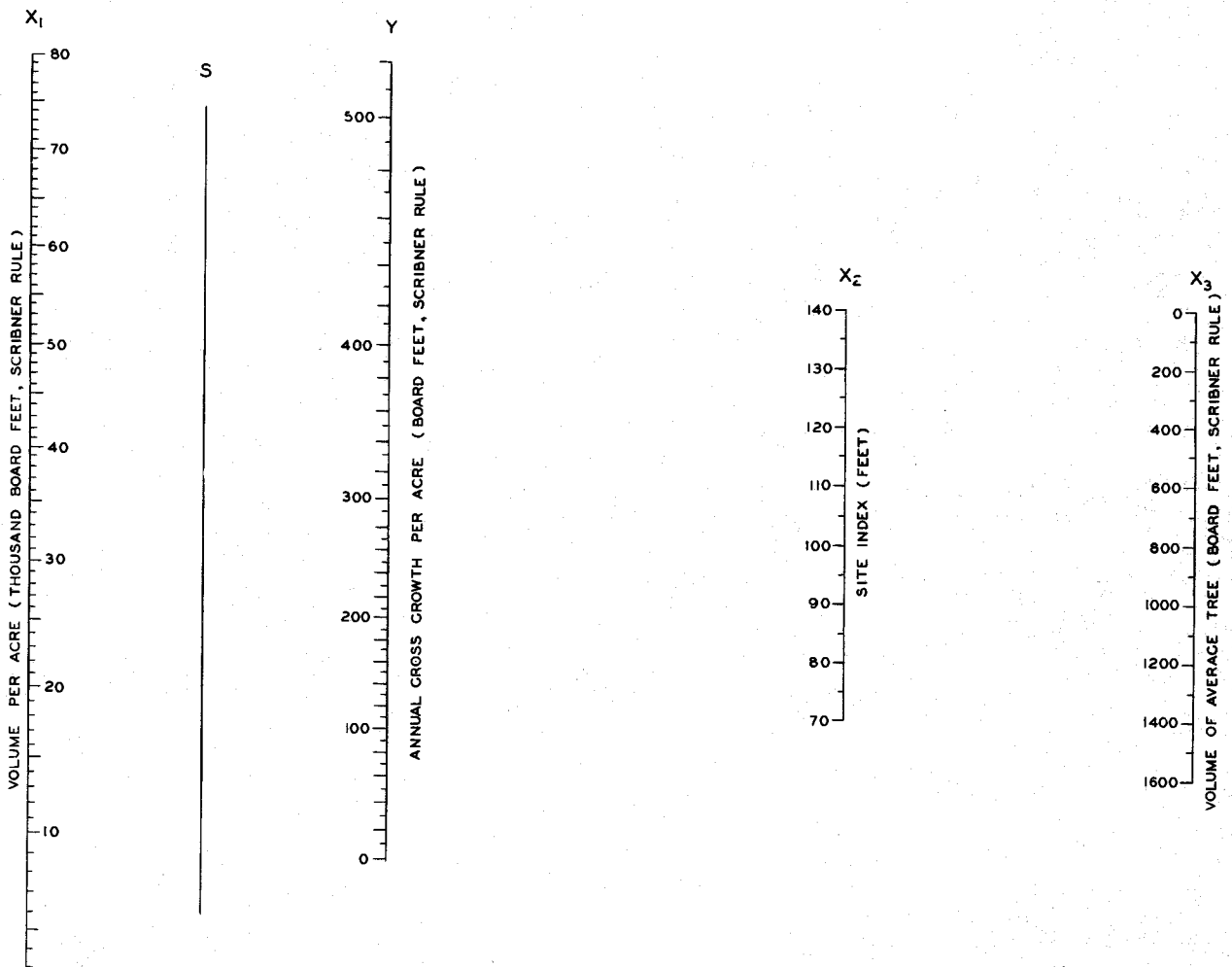


FIGURE 7.--ALINEMENT CHART FOR ESTIMATING GROWTH OF DOUGLAS FIR, SMALL OLD GROWTH (TYPE 7), FIR-MOUNTAIN HEMLOCK, LARGE (TYPE 23), AND UPPER SLOPE MIXTURE, LARGE (TYPE 27.5)

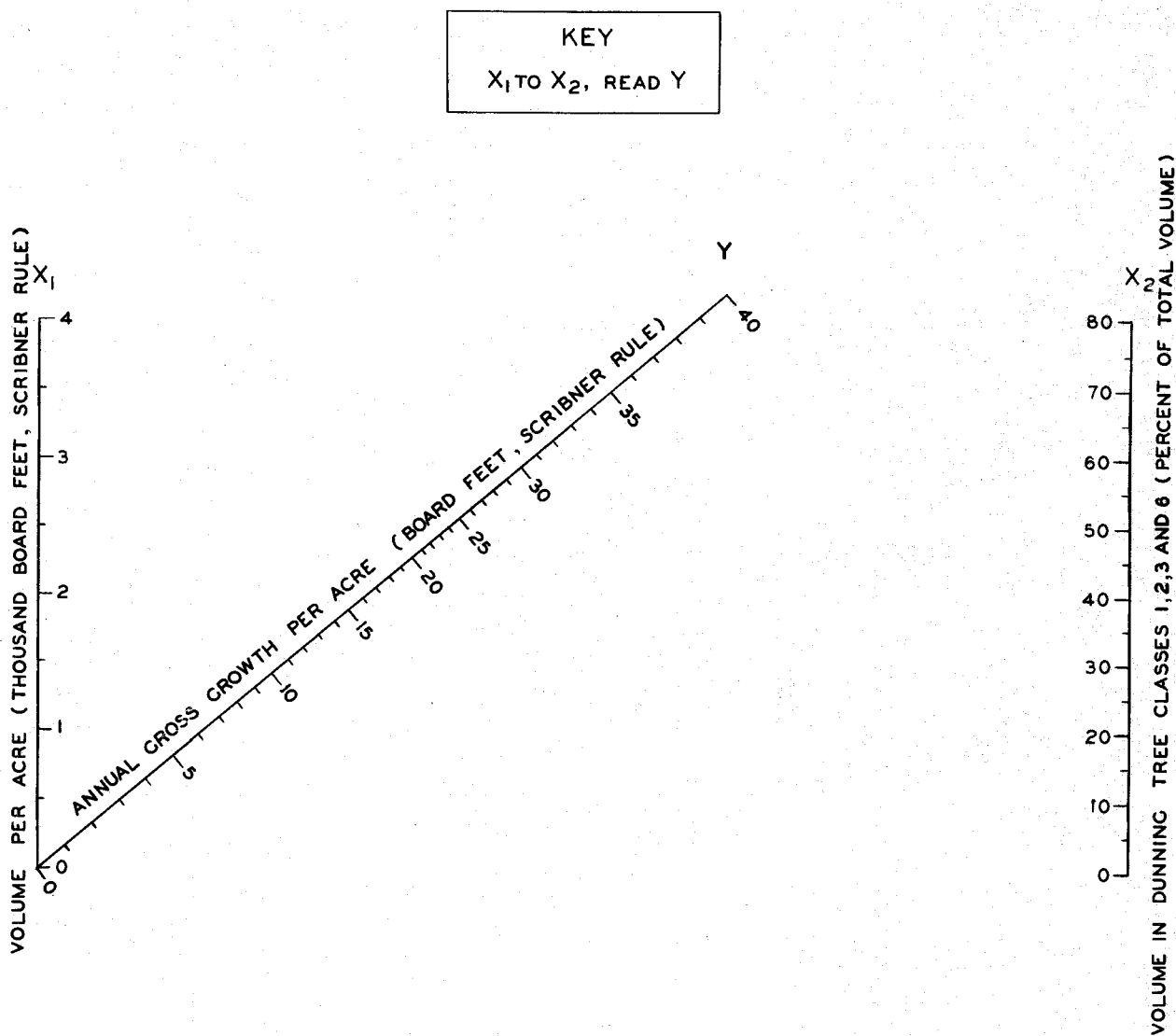


FIGURE 8 -- ALINEMENT CHART FOR ESTIMATING GROWTH OF PONDEROSA PINE WOODLAND, (TYPE 5 $\frac{1}{2}$) ON LAND OF SITE QUALITIES V AND VI

New Chart for Making Site and Structure Corrections
for Growth Estimates in Selectively-Cut Ponderosa Pine

Cut-over ponderosa pine, small; forest-survey type 34-21.
Estimates of growth for this type were based on the yield tables and charts included in U.S.D.A. technical bulletin 407, "Growth in Selectively Cut Ponderosa Pine Forests of the Pacific Northwest." However, in making allowance for the effect on growth of stand structure and site it was found to be more convenient and accurate to depart somewhat from the procedure outlined in the bulletin. In correcting for the effect of structure and site on growth, factors were computed (from figure 9) to apply directly to estimated growth, rather than to indicated volume at the end of a selected cutting cycle. Correction factors computed according to the instructions in bulletin 407 for a specific site and structure must be varied according to length of the growth period, but those computed from figure 9 apply to estimated annual growth rate and are independent of cutting cycle length. Interpolation is also readily accomplished with figure 9. The expressions of structure are the same as those used by Meyer^{13/}, namely, (1) percent of basal area or cubic volume in Dunning tree classes 1 and 2, and (2) percent of basal area or cubic volume in Dunning tree class 3. Use of figure 9 is similar to that of the preceding charts. For example, assume a reserve stand with 30 percent of its basal area in Dunning tree classes 1 and 2, 25 percent in Dunning tree class 3 growing on land of site index 85. Span from 30 on the X_1 -axis to 25 on the X_2 -axis and hold the intersection of the S-axis, from which span to 85 on the X_3 -axis and read 115 percent on the Y-axis, which is the correction factor for stands of this description, to be applied to growth rates as estimated from table 8 or figure 10 in the U.S.D.A. technical bulletin 407.

The relation between site, structure and board-foot growth correction factor presented graphically in figure 9 may be expressed mathematically by the equation:

$$\frac{\text{Board-foot growth}}{\text{Correction factor (percent)}} = \frac{0.839 (\text{percent of basal area in Dunning tree classes 1 and 2}) + 0.445 (\text{percent of basal area in Dunning tree class 3}) + 1.977 (\text{site index, feet}) - 89.819}{1}$$

This equation was computed by the method of least squares from 175 of the 179 original sample plots upon which bulletin 407 is based. No improvement appeared possible by introduction of curvilinearity. Checking against the basic plots gave an aggregate error 0.19 percent low, and a standard error of estimate of growth correction factor for

^{13/} See footnote 4, page 7.

KEY
 X_1 TO X_2 , HOLD S_1
 TO X_3 , READ Y

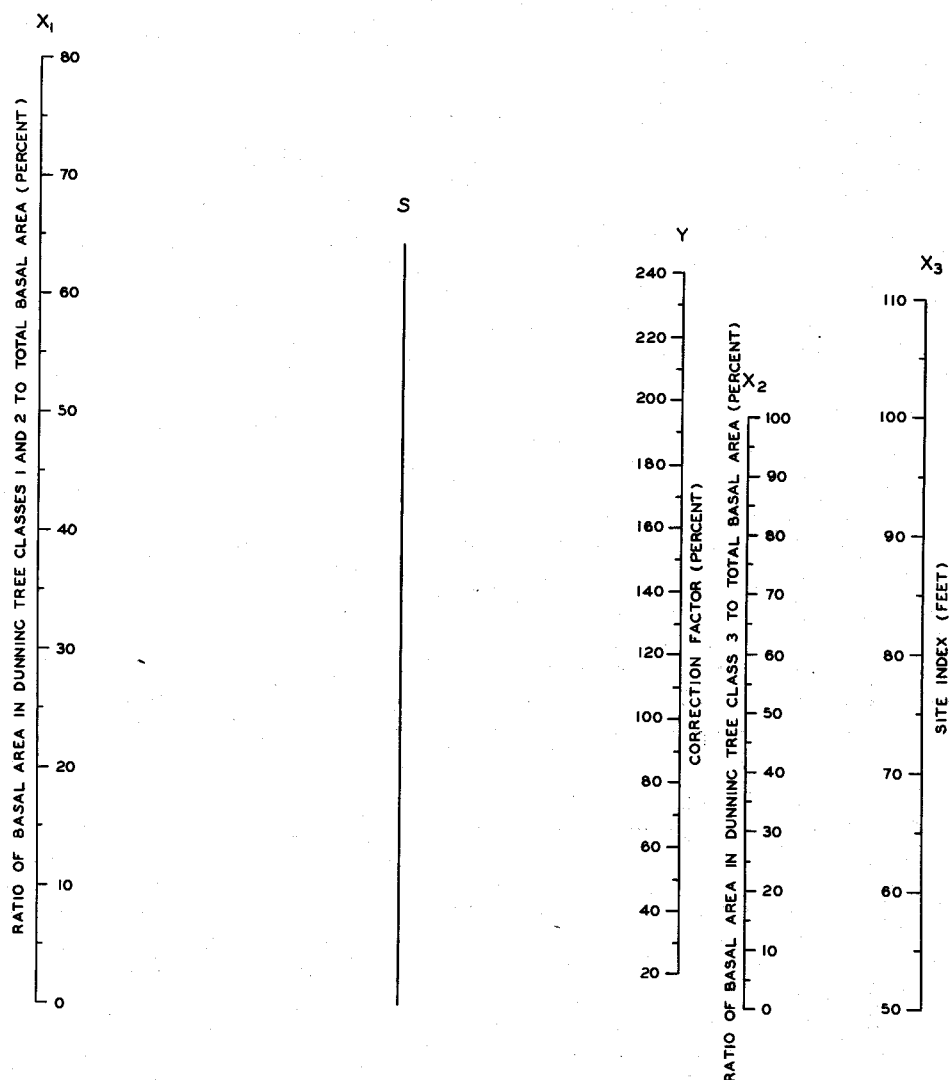


FIGURE 9. -- ALINEMENT CHART FOR COMPUTING STAND STRUCTURE AND SITE INDEX CORRECTIONS
 APPLICABLE TO BOARD FOOT GROWTH ESTIMATES DERIVED FROM TABLE NO.8 OR FIGURE 10
 IN U.S.D.A. TECHNICAL BULLETIN NO.407

individual plots of 30.0 percent. The multiple correlation coefficient is 0.608. Accuracy of this method of estimating growth cannot be judged by this correlation coefficient and standard error alone. It should be recalled that a large portion of the variation in growth rate is accounted for, prior to the application of the correction factor, by volume of the reserve stand and length of growth period as shown in bulletin 407.

Method of Making Mortality Estimates

Mortality in virgin stands was dismissed by assuming loss equal to gross growth. Normal mortality rates for even-aged immature stands were automatically allowed for by use of the normal yield tables in directly estimating their net growth. However, loss must be computed as a separate step for the uneven-aged immature stands whose gross growth rate was estimated by modification of the technique for selectively-cut stands. Mortality in these stands is characteristically so highly erratic that its prediction is subject to large error. In the forest survey an improved, though still far from completely satisfactory, method of making mortality estimates was employed. As shown in figure 10 this consisted in relating annual loss (expressed as percent of volume in reserve stand at start of growth period) to gross annual growth per acre. The curve shown in figure 10 was fitted from the measurements of mortality (from all causes) made by Meyer^{14/} on 169 of the sample plots upon which his growth study was based. It was Meyer's opinion at the time of mortality measurement that the loss values were greater than would normally be anticipated over a cutting cycle. Nevertheless, they are shown here as measured.

Use of the curve results in larger estimates of loss for stands of mature and poor-vigor trees than for young, thrifty stands, which is in accord with both logic and experience. Although the portion of the total variation in mortality explained by growth rate is small, the corresponding correlation index of 0.250 is highly significant statistically. It should be borne in mind that the plots used include the variation in mortality due to location within the region, and that the possibility of improving loss estimates by allowing for locality differences is large. The curve is intended to represent trend of average loss over a cutting cycle of from 20 to 60 years. It is of little value in estimating short term loss probability which Keen^{15/} has shown to be more closely related to reduction in growth rate, a factor which, unfortunately, is virtually as erratic as mortality.

^{14/} See footnote 4, page 7.

^{15/} Keen, F. P. RELATIVE SUSCEPTIBILITY OF PONDEROSA PINES TO BARK-BEETLE ATTACK. Jour. Forestry 34: 919-927, illus. 1936.

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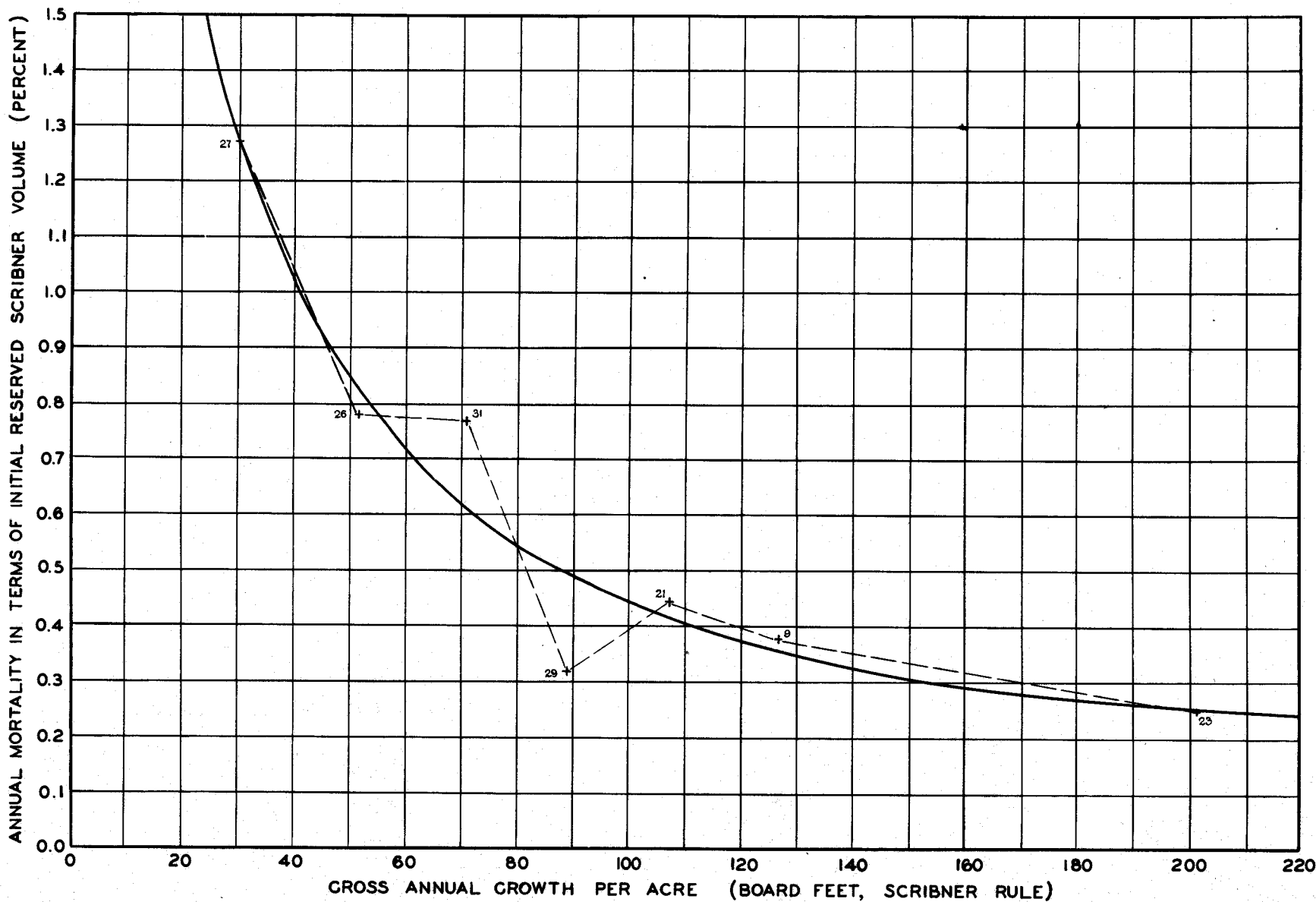


FIGURE 10.--RELATION OF MORTALITY TO GROWTH IN SELECTIVELY CUT PONDEROSA PINE STANDS

TABLE 12. AREAS OF GENERALIZED FOREST TYPES IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, AND OWNERSHIP CLASS

UNIT AND COUNTY	MATURE CONIFER TYPES ^{1/}				IMMATURE CONIFER TYPES ^{2/}				NONSTOCKED LANDS ^{3/}				NONCOMMERCIAL TYPES ^{4/}				TOTAL			
	LANDS AVAILABLE FOR CUTTING		LANDS RESERVED FROM CUTTING	TOTAL	LANDS AVAILABLE FOR CUTTING		LANDS RESERVED FROM CUTTING	TOTAL	LANDS AVAILABLE FOR CUTTING		LANDS RESERVED FROM CUTTING	TOTAL	LANDS AVAILABLE FOR CUTTING		LANDS RESERVED FROM CUTTING	TOTAL	LANDS AVAILABLE FOR CUTTING		LANDS RESERVED FROM CUTTING	TOTAL
	PRIVATE	OTHER THAN PRIVATE			PRIVATE	OTHER THAN PRIVATE			PRIVATE	OTHER THAN PRIVATE			PRIVATE	OTHER THAN PRIVATE						
ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	
CHELAN-COLVILLE																				
FERRY	47,660	637,065	295	685,020	89,630	314,975	40	404,645	6,355	23,490		29,845	8,145	157,705	90	165,940	151,790	1,133,235	425	1,285,450
OKANOGAN	163,700	887,090	67,840	1,118,630	83,655	224,580	18,785	327,020	3,240	19,405	4,945	27,590	21,455	517,315	223,445	762,215	272,050	1,648,390	315,015	2,235,435
CHELAN	115,055	325,795	15,565	456,415	118,245	189,060	4,055	311,360	2,695	10,090	195	12,980	56,400	598,895	56,380	711,675	292,395	1,123,840	76,195	1,402,430
DOUGLAS	730	115		845	5,655	235		5,890					885	335		1,220	7,270	685		7,955
LINDOLN	21,970	2,745		24,715	49,575	4,405		53,980	1,025			1,025	3,400	535		3,935	75,970	7,665		83,635
TOTAL	349,115	1,852,810	83,700	2,285,625	346,760	733,255	22,880	1,102,895	13,315	52,985	5,140	71,440	90,285	1,274,785	279,915	1,644,965	799,475	3,913,835	391,635	5,104,945
YAKIMA RIVER																				
KITTITAS	204,490	235,821	3,935	444,246	150,930	96,724	160	247,814	7,680	5,365		13,065	22,765	74,505	555	97,825	385,865	412,435	4,650	802,950
YAKIMA	73,333	627,719	39,695	740,747	87,512	193,301	7,585	228,398	450	8,870	65	9,385	14,315	170,755	8,470	193,540	115,610	1,000,645	55,815	1,172,070
KLICKITAT	170,060	65,750		236,810	188,590	48,195		236,785	12,950	6,680		19,630	33,470	12,270		45,740	405,070	133,895		538,965
TOTAL	447,893	930,290	43,630	1,421,803	367,032	338,220	7,745	712,997	21,080	20,935	65	42,080	70,550	257,530	9,025	337,105	906,545	1,546,975	60,465	2,513,965
NORTH BLUE MOUNTAIN																				
WHITMAN					7,375	425		7,800									7,375	425		7,800
WALLA WALLA	2,005	415	165	2,585	14,930	2,170	800	17,900					670	30	320	1,080	17,605	2,615	1,285	21,505
COLUMBIA	14,015	40,251		54,266	26,115	46,204	1,425	73,744	895	430		1,325	165	53,740	4,710	58,615	41,190	140,625	6,135	187,950
GARFIELD	4,255	31,825		36,080	6,285	33,885		40,170		315		315		22,065		22,065	10,540	88,090		98,630
ASOTIN	16,505	14,540		31,045	9,630	13,210		22,840					35	11,980		12,015	26,270	39,730		66,000
TOTAL	36,880	87,081	165	124,076	64,335	95,894	2,225	162,454	895	745		1,640	870	87,815	5,030	93,715	102,980	271,485	7,420	381,885
TOTAL EASTERN WASHINGTON UNITS	833,878	2,870,131	127,465	3,831,504	778,127	1,673,369	32,850	1,978,346	35,290	74,665	5,205	115,160	161,705	1,620,130	293,970	2,075,805	1,809,000	5,782,295	459,520	8,000,815
NORTH BLUE MOUNTAIN																				
WALLA WALLA	141,111	378,565	9,178	528,854	123,659	141,775	7,977	273,411	2,985	2,830	930	6,745	20,920	194,615	85,575	301,110	386,675	717,785	103,660	1,110,120
UNION	100,970	237,835	5,910	344,715	236,625	104,645	2,730	344,200	2,860	1,215		4,075	23,000	123,380	37,850	184,230	368,465	467,275	46,490	877,220
UMATILLA	123,950	214,444	480	338,874	81,530	90,111	300	161,941	945	315		1,260	13,405	53,175	135	66,715	219,830	348,045	915	568,790
MORROW	82,205	91,845		174,050	11,740	7,680		19,420	50			50	3,710	13,400		17,110	97,705	112,925		210,630
GILLIAM	365			365													365			365
TOTAL	448,601	922,689	15,568	1,386,858	453,554	334,411	11,007	798,972	6,840	4,360	930	12,130	61,035	384,570	123,560	569,165	970,030	1,646,030	151,065	2,767,125
DESCHUTES RIVER																				
WASCO	56,415	295,250	760	352,425	43,350	54,585	1,240	99,175	365	7,355		7,720	31,205	19,955		545	51,705	131,335	377,145	2,545
JEFFERSON	129,135	200,525	12,370	342,030	4,980	14,355	1,915	21,250	5,475	6,820	865	13,160	29,975	52,425	13,940	96,340	169,565	274,125	29,090	472,780
DESCHUTES	151,650	306,990	2,150	460,790	101,245	136,215	150	237,610	6,595	9,190		15,745	144,660	556,665	5,560	706,905	404,130	1,008,660	7,860	1,420,650
OROOK	146,055	281,080		427,145	16,940	25,555		42,495	275	1,640		1,915	227,820	287,840	85	515,745	391,100	596,115	85	987,300
TOTAL	483,265	1,083,445	15,280	1,581,990	166,515	230,710	3,305	400,530	12,670	25,005	865	38,540	433,680	916,885	20,130	1,370,695	1,096,130	2,256,045	39,580	3,391,735
SOUTH BLUE MOUNTAIN																				
BAKER	130,140	274,945	425	405,510	92,190	77,060	545	169,795	1,425	2,255	25	3,705	27,245	134,620	9,805	171,670	251,000	488,880	10,800	750,680
GRANT	361,595	1,014,270	70	1,375,935	48,985	120,805		169,790	1,175	4,845		6,020	51,785	216,470	30	268,295	463,540	1,356,390	100	1,620,030
WHEELER	134,330	128,345	1,760	264,435	41,220	14,320	315	55,855	1,385	340		1,725	49,850	18,135	30	68,015	226,785	161,140	2,105	390,080
HARNEY	39,270	336,475		375,745	11,695	48,970		60,665	30	1,850		1,880	36,235	156,400		192,635	87,230	548,665		630,925
WALHUR	4,700	1,965		6,665	1,155	85		1,240					4,940	22,670		27,610	10,795	24,720		35,515
TOTAL	670,035	1,756,000	2,255	2,428,290	195,245	261,240	860	457,345	4,015	9,290	25	13,330	170,055	548,295	9,865	728,215	1,039,350	2,574,825	13,005	3,627,180
KLAMATH PLATEAU																				
KLAMATH	526,940	930,187	89,598	1,546,725	146,665	234,838	11,272	392,775	41,200	23,495	1,885	66,580	167,205	625,330	109,975	902,510	882,010	1,813,850	212,730	2,908,590
LAKE	322,360	556,085	30	878,975	44,605	44,585	15	89,205	7,185	11,690		18,875	50,895	352,735		408,590	425,505	965,095	45	1,390,645
TOTAL	849,300	1,486,272	89,628	2,425,700	191,270	279,423	11,287	481,980	48,385	35,185	1,885	85,455	218,060	978,065	109,975	1,311,100	1,307,515	2,778,945	212,775	4,299,235
TOTAL EASTERN OREGON UNITS	2,451,701	5,248,406	122,731	7,822,838	1,006,584	1,105,784	26,459	2,138,827	71,910	73,840	3,705	140,455	882,830	2,827,815	263,530	3,974,175	4,413,025	9,255,845	416,425	14,085,295
REGION TOTAL	3,285,579	8,118,537	250,226	11,654,342	1,784,711	2,273,153	59,309	4,117,173	107,200	148,505	8,910	264,615	1,044,535	4,447,945	557,500	6,049,980	6,222,025	14,368,140	875,945	22,085,110

1/ STANDS MORE THAN 160 YEARS IN AGE ON COMMERCIAL FOREST LAND. 2/ STANDS 160 YEARS OR LESS IN AGE ON COMMERCIAL FOREST LAND. 3/ LANDS DEFORESTED BY CUTTING, FIRE, INSECTS, OR WIND THROW. 4/ NONCOMMERCIAL ROCKY, SUBALPINE, HARDWOOD, JUNIPER, AND LODGEPOLE PINE TYPES.

TABLE 13. AREA OF COMMERCIAL FOREST LAND IN THE PONDEROSA PINE REGION OF OREGON AND WASHINGTON, BY UNIT, COUNTY, AND SITE QUALITY CLASS

UNIT AND COUNTY	PONDEROSA PINE SITES ^{1/}															COMMERCIAL FOREST SITES OTHER THAN PONDEROSA PINE ^{2/}					TOTAL AREA
	TIMBERLAND							WOODLAND													COMMERCIAL CONIFER SITES
	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	TOTAL ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	TOTAL ACRES	TOTAL ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	
CHELAN-COLVILLE																					
FERRY			10,522	519,131	113,112	330	643,095	178	8,884	30,443	1,750	41,235	684,350		1,800	174,545	337,610	513,955	1,198,305		
OKANOGAN			4,280	252,605	475,365	20,960	753,210		3,495	138,260	37,190	178,945	932,135		1,880	75,700	458,525	536,135	1,468,290		
CHELAN			36,570	271,895	143,390	1,185	453,040		1,110	29,155	3,785	34,050	487,090			18,160	266,225	284,385	771,475		
DOUGLAS					2,600	3,385	5,985					750	6,735						6,735		
LINCOLN				20,800	34,235	2,950	58,005		20	8,605	13,030	21,655	79,660				60	60	79,720		
TOTAL			51,372	1,064,431	768,722	28,810	1,913,335	178	13,509	206,463	56,505	276,655	2,189,990		3,680	268,405	1,062,450	1,334,535	3,524,525		
YAKIMA RIVER																					
KITTITAS			6,120	203,640	78,892	953	289,605		1,060	7,213	167	8,440	296,045	320	13,100	220,950	172,710	407,080	705,125		
YAKIMA		5,320	94,740	289,795	173,765	16,765	580,385	880	6,955	6,175	2,355	15,365	596,750		10,005	108,250	263,465	381,720	978,470		
Klickitat	480	3,785	51,065	188,951	92,650	10,439	347,310		3,974	14,040	6,231	24,245	371,555			55,370	57,760	8,450	121,580	489,135	
TOTAL	480	9,105	151,865	682,386	345,307	28,157	1,217,300	880	11,989	27,428	9,753	40,050	1,266,350	320	78,475	386,960	444,625	910,380	2,178,730		
NORTH BLUE MOUNTAIN																					
WHITMAN					1,900	5,900	7,800						7,800						7,800		
WALLA WALLA				12,662	2,098		14,760			50		50	14,810			4,981	694	5,675	20,485		
COLUMBIA			311	29,029	25,977	1,408	56,815		480	5,426	54	5,960	62,775			14,632	51,928	66,560	129,388		
GARFIELD			1,191	23,128	14,547	1,474	40,340		50	1,035		1,085	41,425			9,953	25,187	35,140	76,586		
ASOTIN			879	22,311	9,857	1,173	34,220		1,995	135		2,130	36,350			3,302	14,333	17,635	53,985		
TOTAL			2,381	87,130	54,379	10,045	153,935		2,525	6,646	54	9,225	163,160			32,668	92,142	125,010	238,170		
TOTAL EASTERN WASHINGTON UNITS	480	9,105	205,618	1,833,947	1,166,408	67,012	3,284,570	1,068	28,023	240,537	65,312	334,930	3,619,500	320	82,155	688,233	1,599,217	2,369,925	5,989,425		
NORTH BLUE MOUNTAIN																					
WALLOWA			4,005	304,600	244,380	5,278	558,300		2,635	23,845	6,410	32,910	591,210			54,445	163,335	217,800	809,010		
UNION			6,180	199,122	175,861	4,082	385,195		2,103	5,584	2,198	9,885	395,080			14,890	282,950	297,840	692,920		
UMATILLA			5,140	258,215	28,920	125	292,400		3,075	1,720		4,795	297,195			12,300	233,745	246,045	543,240		
MORROW			2,650	154,035	2,710		159,395		2,920	215		3,135	162,530			2,905	33,080	35,935	198,465		
GILLIAM					365		365						365						365		
TOTAL			17,975	916,012	452,236	9,432	1,395,655		10,793	31,364	8,608	50,725	1,446,380			84,540	713,080	797,620	2,244,000		
DESCHUTES RIVER																					
WASCO		483	48,830	150,736	77,879	24,352	302,280	400	9,140	19,670	16,350	45,560	347,840		3,244	59,241	48,995	111,480	489,320		
JEFFERSON		2,270	46,997	151,304	102,939	11,272	314,182	250	1,970	11,695	11,260	25,175	339,357		146	12,608	24,334	37,083	376,440		
DESCHUTES		1,120	23,525	547,162	18,683		590,490		8,813	16,287		25,100	615,590			3,775	90,635	94,410	710,000		
CROOK			26,285	328,710	68,925	2,540	426,460		2,495	23,150	960	26,605	453,065			1,750	15,785	17,515	470,580		
TOTAL		3,873	145,037	1,177,912	268,426	38,164	1,633,412	650	22,418	70,802	28,570	122,440	1,735,852		3,390	77,369	179,729	280,488	2,016,340		
SOUTH BLUE MOUNTAIN																					
BAKER			54,045	289,445	56,665	11,760	411,915	55	3,635	17,480	21,645	42,815	454,730			6,214	118,066	124,280	579,010		
GRANT			11,725	1,004,230	183,350	355	1,199,660		30,805	80,340	1,275	112,420	1,312,080			12,430	253,445	265,875	1,577,955		
WHEELER			16,675	186,962	77,608	190	281,435	5	2,288	8,257		10,550	291,985			2,160	27,870	30,030	322,015		
HARNEY			2,500	297,970	81,275	5,260	387,005		11,200	34,515	5,570	51,285	438,290						438,290		
WALHEUR			177	1,628	4,292	158	6,255		130	1,270	55	1,455	7,710					195	7,905		
TOTAL			85,122	1,780,235	403,190	17,723	2,286,270	60	48,058	141,862	28,545	218,525	2,504,795			20,804	399,576	420,380	2,925,175		
KLAMATH PLATEAU																					
KLAMATH		5,040	248,654	1,304,068	117,680	1,378	1,676,850		6,342	51,821	152	58,315	1,735,165		31,855	97,630	141,135	270,620	2,005,785		
LAKE			7,430	711,170	224,185	2,250	945,035		10,665	23,220	1,655	35,540	980,575		3,065	3,065	3,415	6,480	987,095		
TOTAL		5,040	256,084	2,015,248	341,865	3,628	2,621,885		17,007	75,041	1,807	93,855	2,715,740		31,855	100,695	144,550	277,100	2,992,840		
TOTAL EASTERN OREGON UNITS		8,913	504,218	5,889,427	1,465,717	68,947	7,937,222	710	98,236	319,069	67,530	485,545	8,422,767		35,245	283,408	1,436,935	1,755,588	10,178,393		
REGION TOTAL	480	18,018	709,836	7,723,374	2,634,125	135,959	11,221,792	1,768	126,259	559,606	132,842	820,475	12,042,267	320	117,400	971,641	3,036,152	4,125,513	16,167,780		

^{1/} BASED ON CLASSIFICATION SYSTEM FROM U.S.D.A. TECH. BULL. 407.^{2/} BASED ON CLASSIFICATION FOR DOUGLAS FIR, U.S.D.A. TECH. BULL. 201.

TABLE 14. CURRENT ANNUAL NET GROWTH^{1/} IN THE CHELAN-COLVILLE UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH		
			AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}
				IN CU.FT.	IN CU.FT.	PERCENT		IN CU.FT.	IN CU.FT.	PERCENT		IN CU.FT.	IN CU.FT.	PERCENT		IN CU.FT.	IN CU.FT.
FERRY	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	19,445	420	972	73	12,435	283	686	74					31,880	703	1,658
			10,425	681	1,275	81	58,405	2,281	4,579	79					68,630	2,962	5,854
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	29,870	1,101	2,247	77	70,840	2,564	5,265	78					100,710	3,665	7,512
	34-27	PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	11,875	167	77	88	8,615	199	164	68					20,490	366	241
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	3,335	92	87	33	2,875	69	97	30					6,210	161	184
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	14,870	516	660	30	17,640	494	788	30					32,510	1,010	1,448
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	3,740	36	393	2	35,605	369	4,085	2					39,345	405	4,478
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	9,405	169	1,510	1	39,750	767	6,479	1					49,155	936	7,989
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	5,170	244	490	1	12,605	584	1,417	1					17,775	828	1,907
	19B	WESTERN RED CEDAR: LESS THAN 12" D.B.H.	2,910	147		1	4,605	186	19	1					7,515	333	19
	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.					140	4	27	0					140	4	27
OKANOGAN	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	915	13	121	1	5,980	81	790	1	5	2	20	2	700	21	28
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	7,540	361	216	1	115,620	4,422	3,379	2	35	2	13	1	6,900	96	931
		COUNTY TOTAL	89,630	2,846	5,801	40	314,975	9,760	22,538	22	40	4	33	2	123,195	4,785	3,608
	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	16,950	218	813	88	30,320	433	1,474	88					47,270	651	2,287
			970	19	50	90	13,315	220	852	90					14,285	239	902
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	17,920	237	863	88	43,635	653	2,326	88					61,555	890	3,189
	34-27	PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	50,180	738	503	92	42,515	628	459	92	30			90	92,725	1,366	962
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	3,620	121	38	35	15,080	408	273	35					18,700	529	311
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	75	5	124	4	8,330	124	1,155	2	380	6	66	1	8,785	130	1,226
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	2,355	74	102	2	16,300	519	2,120	1	80	2	7	0	18,735	595	2,229
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	1,475	73	43	3	13,670	750	955	1					15,145	823	998
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	1,875	58		4	3,440	180	25	2					5,315	238	25
CHELAN	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.					1,935	64	241	0	290	14		0	2,225	78	241
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	1,280	16	154	2	8,735	122	1,081	2	1,790	21	197	0	11,805	159	1,432
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	4,875	163	245	2	70,940	2,633	7,031	0	16,215	558	1,492	0	92,030	3,354	8,768
		COUNTY TOTAL	83,655	1,480	1,953	63	224,580	6,081	15,666	21	18,785	601	1,762	0	327,020	8,162	19,381
	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	63,705	1,032	3,435	87	45,720	867	2,468	87	25	1	1	95	109,450	1,900	5,904
			3,540	112	290	92	15,810	668	1,430	90					19,350	720	1,720
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	67,245	1,144	3,725	87	61,530	1,475	3,898	88	25	1	1	95	128,800	2,620	7,624
	34-27	PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	35,530	1,169	399	92	17,775	675	177	92	40			80	53,345	1,844	576
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	2,115	70	180	30	2,430	85	237	30					4,545	195	417
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	1,160	50	66	33	4,230	172	284	33	20	1		30	5,410	223	350
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	1,445	25	236	5	2,585	46	483	3	220	4	37	3	4,250	75	756
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	1,680	59	211	3	17,195	679	2,218	2	160	5	16	2	19,035	743	2,445
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	3,435	168	174	4	16,700	852	644	3	40	2	10	0	20,175	1,022	828
DOUGLAS	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.	2,590	93		5	10,190	431		4	890	34		2	13,670	558	
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	740	15	1	0	13,120	538	284	0	2,050	60	41	0	15,910	613	326
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	2,305	145	141	2	43,305	2,111	1,556	0	610	36		0	46,220	2,292	1,697
		COUNTY TOTAL	118,245	2,938	5,133	72	189,060	7,064	9,781	28	4,055	143	105	2	311,360	10,145	15,019
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	5,655	139		99	235	6		99					5,390	145	
		COUNTY TOTAL	5,655	139		99	235	6		99					5,690	145	
	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	23,700	442	1,047	80	1,945	38	79	80					25,645	480	1,126
			5,750	180	357	85	1,020	35	63	85					6,770	215	420
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	29,450	622	1,404	81	2,965	73	142	82					32,415	695	1,546
	34-27	PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	18,370	207	49	95	1,270	24	13	95					19,640	231	62
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	430	6	18	33									430	6	18
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	1,265	59	4	35	170	6		35					1,435	65	4
LINCOLN		COUNTY TOTAL	60	1		5									60	1	
			49,575	895	1,475	81	4,405	103	155	82					53,980	998	1,630
UNIT TOTAL			346,760	8,298	14,362	61	733,255	23,014	48,140	24	22,880	748	1,900	0	1,102,895	32,060	64,402

^{1/} IN STANDS 160 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. ^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. ^{3/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. ^{4/} ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.

TABLE 15. CURRENT ANNUAL NET GROWTH^{1/} IN THE YAKIMA RIVER UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			AREA	CURRENT ANNUAL GROWTH			AREA	CURRENT ANNUAL GROWTH			AREA	CURRENT ANNUAL GROWTH			AREA	CURRENT ANNUAL GROWTH	
				TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}			TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}			TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}				
					TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL			TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL			TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL		TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL
			ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.
KITTITAS	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	34,490 770	587 19	1,944 42	68 87	2,850 855	65 23	159 54	70 75	30 30	1 2	1 1	70 75	37,370 1,655	653 44	2,104 97
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	35,260	606	1,986	68	3,705	88	213	71	50	3	2	72	39,025	697	2,201
	34-27	PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	36,565	1,339	12	86	4,625	92	7	80	100	3	1	80	41,490	1,434	20
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	11,515	266	299	30	1,050	24	27	30					12,565	290	326
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	12,360	463	257	28	2,315	84	96	30					14,675	547	353
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	4,605	66	657	4	1,595	30	316	3					6,200	96	973
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	950	31	114	5	3,320	109	466	3					4,270	140	580
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	9,925	550	717	3	11,130	508	476	2					21,055	1,058	1,193
	23	FIR-MOUNTAIN HEMLOCK: 12" OR MORE D.B.H.	7,900	315		11	8,170	319		5					16,070	634	
	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.	4,894	76	783	1	10,336	139	1,503	0					15,230	215	2,286
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	10,950	347	107	4	18,535	555	78	1					29,465	902	185
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	3,806	65	649	1	7,733	97	1,026	2					11,539	162	1,675
	30	WHITE FIR: LESS THAN 12" D.B.H.	11,975	722	518	5	24,010	1,172	214	1					35,985	1,894	732
		COUNTY TOTAL	225	2	15	6									225	2	15
		150,930	4,848	6,114	39	96,724	3,217	4,422	7	160	6	3	77	247,814	8,071	10,539	
YAKIMA	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	7,215 8,675	150 478	356 999	90 90	7,545 86,375	208 4,400	385 8,677	85 85	80 5	3 5	5 85	85	14,840 95,055	361 4,878	746 9,576
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	15,890	628	1,255	90	93,920	4,608	9,062	85	85	3	5	85	109,895	5,239	10,322
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	7,585	75	33	85	9,615	418	103	85	65	1		85	17,235	494	136
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	1,925	80	69	35	9,035	381	378	32	110	5		30	11,070	466	447
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	125	2	15	6	1,345	13	141	3					1,470	15	156
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.					140	10	62	5	65	2		5	205	12	62
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	130	5		4	200	11	2	5	265	10		4	595	26	2
	23	FIR-MOUNTAIN HEMLOCK: 12" OR MORE D.B.H.	10			10	530	24	4	5	240	7		5	780	31	4
	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.					3,495	32	314	2					3,495	32	314
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	150	9		1	23,845	695	41	1	1,520	72		1	25,515	776	41
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	197	2	23	3	4,996	69	688	2	1,965	33	302	1	7,178	104	1,013
		COUNTY TOTAL	1,530	98		2	46,180	2,940	2,875	2	3,250	156	56	2	50,960	3,194	2,931
			27,512	899	1,395	71	193,301	9,201	13,670	44	7,585	289	363	3	228,398	10,389	15,428
	Klickitat	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	44,730 7,820	716 293	2,252 537	85 95	3,965 2,220	107 63	223 221	90 95					48,695 10,040	823 356
22		PONDEROSA PINE: LESS THAN 12" D.B.H.	52,550	1,009	2,789	86	6,185	170	444	92					58,735	1,179	3,233
34-27		PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	65,300	2,194	647	92	10,165	401	103	88					75,465	2,595	750
28		PINE MIXTURE: LESS THAN 12" D.B.H.	8,795	295	370	35	1,025	29	23	30					9,820	324	393
8		DOUGLAS FIR: 22 TO 40" D.B.H.	5,840	281	195	35	545	26	7	35					6,385	307	202
9A		DOUGLAS FIR: 12 TO 20" D.B.H.	32,940	851	7,621	5	23,470	526	4,659	5					56,410	1,377	12,280
9B		DOUGLAS FIR: 6 TO 10" D.B.H.	13,760	842	6,011	3	2,205	136	1,010	3					15,965	978	7,021
10		DOUGLAS FIR: LESS THAN 6" D.B.H.	2,905	263	452	3	925	83	63	3					3,830	346	515
28.5		UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	6,420	320	11	5	3,505	181		5					9,925	501	11
		COUNTY TOTAL	80	8	12	5	170	14	45	2					250	22	57
			188,590	6,069	18,108	52	48,195	1,566	6,354	36					236,785	7,629	24,462
		UNIT TOTAL	367,032	11,810	25,617	48	338,220	13,984	24,446	34	7,745	295	366	4	712,997	26,089	50,429

^{1/} IN STANDS 160 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. ^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. ^{3/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. ^{4/} ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.

TABLE 16. CURRENT ANNUAL NET GROWTH^{1/} IN THE NORTH BLUE MOUNTAIN WASHINGTON UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH		
			AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}
				TOTAL GROWTH					TOTAL GROWTH							TOTAL GROWTH	
			ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.
WHITMAN	34-21 22	PODEROSA PINE, CUTOVER: 12 TO 22" D.B.H.	150	3	4	95									150	3	4
		PODEROSA PINE: LESS THAN 12" D.B.H.	7,225	193		95	425	7		95					7,650	200	
		COUNTY TOTAL	7,375	196	4	95	425	7		95					7,800	203	4
WALLA WALLA	21	PODEROSA PINE: 12 TO 22" D.B.H.	145	7	6	75	35	1	1	75					180	8	7
		ON CUTOVER AREAS	95	3	6	80	5			80					100	3	6
	22	PODEROSA PINE: LESS THAN 12" D.B.H.	240	10	12	78	40	1	1	75					280	11	13
		PINE MIXTURE: 12" OR MORE D.B.H.	3,455	136	53	90	240	9	3	90					3,695	145	56
	27	PINE MIXTURE: LESS THAN 12" D.B.H.	290	2	26	30									290	2	26
		DOUGLAS FIR: 6 TO 10" D.B.H.	7,390	302	67	35	685	31	5	35					8,075	333	72
	98	DOUGLAS FIR: LESS THAN 6" D.B.H.	60	5	17	5					80	3		5	140	8	17
		UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	125	11		7									125	11	
	27.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	495	10	82	2									495	10	82
		WHITE FIR: LESS THAN 12" D.B.H.	2,315	216	2	3	1,120	77	3	1	720	39		0	4,155	332	5
	28.5	COUNTY TOTAL	560	43		3	85	7		3					645	50	
			14,930	735	259	33	2,170	125	12	16	800	42		1	17,900	902	271
COLUMBIA	21	PODEROSA PINE: 12 TO 22" D.B.H.	3,130	71	310	75	355	8	34	75					3,485	79	344
		ON UNCLD AREAS	30	1	1	80	45		2	80					75	1	3
	22	PODEROSA PINE: LESS THAN 12" D.B.H.	3,160	72	311	75	400	8	36	75					3,560	80	347
		PINE MIXTURE: 12" OR MORE D.B.H.	5,345	239	98	90	510	23	85	85					5,855	262	98
	27	PINE MIXTURE: LESS THAN 12" D.B.H.	260	2	23	30	615	4	42	30					675	6	65
		FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.	9,070	302	153	35	3,305	108	25	30					12,375	410	178
	24	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	140	3	1	1	1,035	31	55	1					1,175	34	56
		UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	625	13	103	7	15,734	236	1,974	2					16,359	249	2,077
	27.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	7,350	581	137	2	24,550	1,087	328	2	1,425	74		2	33,325	1,742	465
		WHITE FIR: LESS THAN 12" D.B.H.	165	8	10	3	55	3		3					220	11	10
	30	COUNTY TOTAL	26,115	1,220	836	32	46,204	1,500	2,460	6	1,425	74		2	73,744	2,794	3,296
GARFIELD	34-21	PODEROSA PINE, CUTOVER: 12 TO 22" D.B.H.	505	16	20	80	490	5	17	80					995	21	37
		PODEROSA PINE: LESS THAN 12" D.B.H.	5,255	247	21	90	1,015	28		90					6,270	275	21
	27	PINE MIXTURE: 12" OR MORE D.B.H.	200	1	15	35	1,615	12	136	30					1,815	13	151
		PINE MIXTURE: LESS THAN 12" D.B.H.	325	13	6	35	3,350	105	9	30					3,675	118	15
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.					10,680	166	1,503	2					10,680	166	1,503
		UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.					16,735	925	47	3					16,735	925	47
	28.5	COUNTY TOTAL	6,285	277	62	87	33,885	1,241	1,712	8					40,170	1,518	1,774
ASOTIN	22	PODEROSA PINE: LESS THAN 12" D.B.H.	3,995	171	132	90	80	2	1	90					4,075	173	133
		PINE MIXTURE: 12" OR MORE D.B.H.	690	7	71	35	1,140	11	118	30					1,830	18	189
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	3,635	167	200	35	1,500	54	28	30					5,135	221	228
		DOUGLAS FIR: 6 TO 10" D.B.H.	120	2	1	3	775	14	4	2					895	16	5
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	500	6	65	2	5,455	51	539	2					5,955	57	604
		UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	690	50	27	3	4,260	219	32	2					4,950	269	59
	28.5	COUNTY TOTAL	9,630	403	496	54	13,210	351	722	8					22,940	754	1,218
UNIT TOTAL			64,335	2,831	1,657	45	95,894	3,224	4,906	7	2,225	116		162,454	6,171	6,563	

^{1/} IN STANDS 160 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. ^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. ^{3/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. ^{4/} ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.

TABLE 17. CURRENT ANNUAL NET GROWTH^{1/} IN THE NORTH BLUE MOUNTAIN OREGON UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH		
			AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}
			ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.
WALLOWA	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	31,905	698	1,702	70	15,955	239	790	73					48,860	937	2,492
			940	23	76	80	3,030	109	310	81					3,970	132	386
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	32,645	721	1,778	70	19,985	348	1,100	76					52,630	1,069	2,878
			35,760	1,210	117	80	3,900	67	19	75	20	1		75	39,680	1,278	136
	34-27	PINE MIXTURE, CUTOVER: 12" OR MORE D.B.H.	7,950	236	541	28	2,345	69	81	30					10,295	305	622
			31,685	1,295	933	30	16,675	603	635	30	495	16	24	30	48,855	1,914	1,592
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	1,210	6	57	2	3,860	22	232	1					5,070	28	289
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	190	7	32	4	22,380	585	2,865	3	35	1	4	3	22,605	593	2,901
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	220	9	1	4	20,020	749	534	3	100	6		3	20,340	764	535
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	165	6		15	1,715	59		10					1,880	65	
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	334	3	39	2	12,440	155	1,555	2	532	6		1	13,306	164	1,648
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	13,300	1,025	2,062	5	38,370	2,021	1,636	3	6,795	256	146	3	58,465	3,302	3,844
	30	WHITE FIR: LESS THAN 12" D.B.H. COUNTY TOTAL	123,659	4,518	5,560	44	141,775	4,663	8,659	15	7,977	286	228	8	273,411	9,487	14,447
UNION	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	42,675	948	2,134	85	14,400	424	777	80					57,075	1,372	2,911
			3,970	130	400	80	1,690	59	151	88					5,660	189	551
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	46,645	1,078	2,534	84	16,090	483	928	82					62,735	1,561	3,462
			104,800	4,108	2,272	90	7,100	150	66	85	5			100	111,905	4,258	2,338
	27	PINE MIXTURE: 12" OR MORE D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 27	9,375	239	500	35	1,290	30	50	26					10,665	269	550
			2,365	30	302	33	4,225	48	427	30					6,590	78	779
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	11,740	269	802	34	5,515	78	527	30					17,255	347	1,329
			37,030	1,660	901	35	5,600	259	161	30					42,630	1,919	1,062
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	1,055	19	100	3	725	8	81	3					2,390	27	271
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	1,435	47	152	0	135	5	13	0					1,570	52	165
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	945	44	2	0	110	6	1	0					955	50	3
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	285	12	0	0	5			0					290	12	
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	1,660	18	183	2	8,350	88	911	1					10,010	106	1,094
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	29,345	1,486	1,226	2	57,890	2,626	2,744	2	2,630	87	118	0	89,865	4,199	4,068
	29	WHITE FIR: 12" OR MORE D.B.H.	655	7	72	2	3,155	34	364	1	95	1	10	0	3,905	42	446
	30	WHITE FIR: LESS THAN 12" D.B.H. COUNTY TOTAL	530	25	5	0	160	7		0					690	32	5
			236,625	8,773	8,339	60	104,845	3,744	5,796	18	2,730	88	128	0	344,200	12,605	14,263
UMATILLA	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	14,630	472	776	87	1,950	44	101	87					16,580	516	877
			7,720	362	703	87	10,950	522	920	87					18,670	884	1,623
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	22,350	834	1,479	87	12,900	566	1,021	87					35,250	1,400	2,500
			7,190	263	63	90	4,430	126	32	90					11,620	389	95
	27	PINE MIXTURE: 12" OR MORE D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 27	2,150	48	56	30	240	5	6	30					2,390	53	62
			3,100	42	447	35	6,107	102	1,072	35					9,207	144	1,519
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	5,250	90	503	35	6,347	107	1,078	35					11,597	197	1,581
			13,370	600	660	35	3,350	136	195	35					16,720	736	895
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	110	1	11	2	2,200	24	242	2					2,310	25	253
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	965	28	74	2	5,070	155	462	2					6,035	183	536
	9B	DOUGLAS FIR: 6 TO 10" D.B.H.	2,635	142	4	2	3,530	178	1	2					6,165	320	5
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	915	31		2	580	7		2					1,495	38	
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	1,480	14	148	1	11,389	120	1,196	1	75	1	8	1	12,944	135	1,352
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	26,055	1,499	53	2	26,150	1,257	830	2	225	24	1	2	53,030	2,750	884
	29	WHITE FIR: 12" OR MORE D.B.H.	405	4	40	2	3,730	39	373	2					4,135	43	413
	30	WHITE FIR: LESS THAN 12" D.B.H. COUNTY TOTAL	205	11	4	3	435	16	20	3					640	27	24
			81,530	3,517	3,039	34	80,111	2,731	5,450	24	300	25	9	2	161,941	6,273	8,498
MORROW	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 21	6,750	217	394	88	130	3	8	88					6,880	220	402
			440	16	37	88	1,455	40	111	88					1,895	56	148
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	7,190	233	431	88	1,585	43	119	88					8,775	276	550
			545	8	4	90	755	8	3	90					1,300	16	7
	27	PINE MIXTURE: 12" OR MORE D.B.H. ON CUTOVER AREAS ON UNCLD AREAS TOTAL TYPE 27	285	8	27	70	315	9	30	70					600	17	57
			320	3	36	65	790	8	90	35					1,110	11	126
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	605	11	63	67	1,105	17	120	34					1,710	28	183
			1,065	43	32	35	25	1	2	35					1,090	44	34
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	1,450	17	160	2	3,155	36	347	2					4,605	53	507
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	180	2	24	0	50	1	3	0					230	3	32
			705	30	4	2	1,005	61	3	2					1,710	100	7
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H. COUNTY TOTAL	11,740	353	718	65	7,680	167	602	29					19,420	520	1,320
			453,954	17,161	17,656	51	334,411	11,325	20,507	18	11,007	399	385	6	798,972	28,885	38,528

1/ IN STANDS 150 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. 2/ NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. 3/ GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. 4/ ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.

TABLE 18. CURRENT ANNUAL NET GROWTH^{1/} IN THE DESCHUTES RIVER UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH		
			AREA	TREES	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	AREA	TREES	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}
				5.1 INCHES OR MORE IN D.B.H. ^{3/}	TOTAL GROWTH			5.1 INCHES OR MORE IN D.B.H. ^{3/}	TOTAL GROWTH			5.1 INCHES OR MORE IN D.B.H. ^{3/}	TOTAL GROWTH			5.1 INCHES OR MORE IN D.B.H. ^{3/}	TOTAL GROWTH
			ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.
WAGCO	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNOUT AREAS TOTAL TYPE 21	6,690	102	335	80	2,005	44	129	80					8,695	146	464
			3,225	92	257	85	7,585	256	972	80					10,810	348	1,229
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	9,915	194	592	82	9,590	300	1,101	80					19,505	494	1,693
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	25,910	677	306	85	5,355	177	484	85	705	18	3	85	31,970	872	793
	8	DOUGLAS FIR: 12 TO 20" D.B.H.	4,005	150	160	35	10,625	385	1,015	35	535	14	45	35	15,165	549	1,220
	9A	DOUGLAS FIR: 22 TO 40" D.B.H.					125	2	15	0					125	2	15
	98	DOUGLAS FIR: 12 TO 20" D.B.H.	1,020	74	371	3	225	14	70	2					1,245	88	441
	10	DOUGLAS FIR: 6 TO 10" D.B.H.	1,875	135	79	3	1,795	142	201	2					3,670	277	280
	24	DOUGLAS FIR: LESS THAN 6" D.B.H.	625	22		4	55	2		4					680	24	
	28.5	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.					11,075	440	1,177	0					11,075	440	1,177
		UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H. COUNTY TOTAL	15,740	906	2,030	1	15,740	906	2,030	1	1,240	32	48	63	19,740	906	2,030
			43,350	1,252	1,508	63	54,585	2,368	6,093	21	1,240	32	48	63	99,175	3,652	7,640
JEFFERSON	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNOUT AREAS TOTAL TYPE 21	2,070	49	120	97									2,070	49	120
			305	14	55	95	495	14	53	90					800	28	108
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	2,375	63	175	97	495	14	53	90					2,870	77	228
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	2,585	114	154	95	2,055	66	26	92	245	3		92	4,885	183	180
	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.	20	1		35	3,840	138	116	35	80	3	3	35	3,940	142	119
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H. COUNTY TOTAL					995	36	26	0	1,570	54	27	0	2,565	90	53
			6,970	367	174	1	6,970	367	174	1	20	1	2	0	6,990	368	176
			4,980	178	329	95	14,355	621	395	20	1,915	61	32	6	21,250	860	756
DESCHUTES	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNOUT AREAS TOTAL TYPE 21	10,525	230	597	97	28,575	570	1,544	95	20			95	39,120	800	2,141
			2,430	45	446	95	12,205	311	2,226	90					14,635	356	2,672
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	12,955	275	1,043	96	40,780	881	3,770	92	20			95	53,755	1,156	4,813
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	88,290	4,150		97	90,105	4,246	182	95	130	4		95	178,525	8,400	182
	24	FIR-MOUNTAIN HEMLOCK: LESS THAN 12" D.B.H.					70	5		30					70	5	
	30	WHITE FIR: LESS THAN 12" D.B.H. COUNTY TOTAL					5,215	250	197	0					5,215	250	197
			45	1			45	1		5					45	1	
			101,245	4,425	1,043	97	136,215	5,383	4,153	90	150	4		95	237,610	9,812	5,196
CROOK	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNOUT AREAS TOTAL TYPE 21	7,285	270	450	94	4,015	120	233	91					11,300	390	683
			1,385	69	112	90	11,745	710	1,129	88					13,130	779	1,241
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	8,670	339	562	98	15,760	830	1,362	89					24,430	1,169	1,924
	28	PINE MIXTURE: 12" OR MORE D.B.H.	8,120	296		95	7,370	205	40	93					15,490	508	40
	27	PINE MIXTURE: LESS THAN 12" D.B.H.				35	300	6	67	30					300	6	67
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	20	1		5	250	10	2	35					270	11	2
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	130	4	26		1,490	45	297	5					1,620	49	323
	29	WHITE FIR: 12" OR MORE D.B.H. COUNTY TOTAL					245	9	42	0					245	9	42
			140	2			140	2		15					140	2	
			16,940	642	588	93	25,555	1,107	1,831	84					42,495	1,749	2,419
		UNIT TOTAL	166,515	6,497	3,468	90	230,710	9,479	12,472	67	3,305	97	80	28	400,530	16,073	16,020

^{1/} IN STANDS 160 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. ^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. ^{3/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. ^{4/} ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.

TABLE 19. CURRENT ANNUAL NET GROWTH^{1/} IN THE SOUTH BLUE MOUNTAIN UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			AREA	CURRENT ANNUAL GROWTH			AREA	CURRENT ANNUAL GROWTH			AREA	CURRENT ANNUAL GROWTH			CURRENT ANNUAL GROWTH		
				TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL		TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL		TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}	PONDEROSA PINE AS PERCENT OF TOTAL
ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.			
BAKER	21	PONDEROSA PINE: 12 TO 22" O.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	19,470 1,800	333 74	1,004 181	83 85	11,575 2,285	334 127	582 201	80 82				31,045 4,085	667 201	1,586 382	
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	21,270	407	1,185	83	13,860	461	783	80				35,130	868	1,968	
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	59,185	3,331	1,034	90	50,375	2,720	897	87				109,560	6,051	1,931	
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	5,875	284	272	35	3,460	162	77	30				9,335	446	349	
	9B	DOUGLAS FIR: 5 TO 10" D.B.H.	665	26	108	2	945	48	70	2				1,610	74	178	
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.	670	33	20	2	745	41	8	2				1,415	74	28	
	26.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	150	9		5								150	9		
		COUNTY TOTAL	4,375	203	295	2	7,675	334	351	2	545	26	60	2	12,595	563	706
			92,190	4,293	2,914	80	77,060	3,766	2,186	74	545	26	60	2	169,795	8,085	5,160
	GRANT	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	15,985 6,050	430 294	911 519	85 87	45,365 8,080	881 210	3,116 750	85 87				61,350 14,140	1,311 504	4,027 1,269
22		PONDEROSA PINE: LESS THAN 12" D.B.H.	22,045	724	1,430	86	53,445	1,091	3,866	85				75,490	1,815	5,296	
27		PINE MIXTURE: 12" OR MORE D.B.H.	22,555	736	172	88	36,410	1,045	175	88				58,965	1,781	347	
28		PINE MIXTURE: LESS THAN 12" D.B.H.	1,045	11	122	33								1,045	11	122	
8		DOUGLAS FIR: 22 TO 40" O.B.H.	1,120	45	5	35	3,135	122	30	35				4,255	167	35	
9A		DOUGLAS FIR: 12 TO 20" D.B.H.	30		3	0	20		2	1				50		5	
9B		DOUGLAS FIR: 5 TO 10" D.B.H.					275	12	30	2				275	12	30	
10		DOUGLAS FIR: LESS THAN 6" D.B.H.	365	18		2	3,085	151		2				3,450	169		
27.5		UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.					150	3		2				150	3		
28.5		UPPER-SLOPE MIXTURE: LESS THAN 12" O.B.H.	1,510	17	181	2	18,570	207	2,110	1				20,080	224	2,291	
30	WHITE FIR: LESS THAN 12" D.B.H.	315	18	13	2	5,605	258	333	1				5,920	276	346		
	COUNTY TOTAL					110	6	2	2				110	6	2		
		48,985	1,569	1,926	82	120,805	2,895	6,548	65				169,790	4,464	8,474		
WHEELER	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	9,535 6,580	275 255	446 602	70 85	210 3,845	6 155	7 273	65 80				9,745 10,425	281 410	453 875	
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	16,115	530	1,048	87	4,055	161	280	79				20,170	691	1,328	
	27	PINE MIXTURE: 12" OR MORE O.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 27	19,685 200 255	605 5 2	226 15 22	80 25 30	1,610 45 2,690	52 1 19	13 36 208	70 25 25				21,295 3,045 3,025	657 6 28	239 51 244	
	28	PINE MIXTURE: LESS THAN 12" D.B.H.	455	7	37	28	2,735	20	244	25				3,270	34	295	
	8	DOUGLAS FIR: 22 TO 40" D.B.H.	2,990	87	44	30	220	16		25				3,210	103	44	
	9A	DOUGLAS FIR: 12 TO 20" D.B.H.	100		3	0	640	3	29	0	190			930	3	40	
	10	DOUGLAS FIR: LESS THAN 6" D.B.H.					270	13	100	0				270	13	100	
	27.5	UPPER-SLOPE MIXTURE: 12" OR MORE D.B.H.	1,585	67		0								1,585	67		
	28.5	UPPER-SLOPE MIXTURE: LESS THAN 12" D.B.H.	265	2	19	5	4,210	37	370	3				4,475	39	389	
		COUNTY TOTAL	25	1		5	580	32		2	45	3	5	650	36		
		41,220	1,299	1,377	70	14,320	334	1,036	49	315	10	22	18	55,855	1,643	2,435	
HARNEY	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	4,250 2,265	158 89	322 161	95 98	5,335 13,155	163 601	355 1,321	92 96				9,585 15,420	321 690	677 1,482	
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	6,515	247	483	96	18,490	764	1,676	95				25,005	1,011	2,159	
	27	PINE MIXTURE: 12" OR MORE D.B.H.	5,180	51	36	95	29,995	723	138	95				35,175	774	174	
	28	PINE MIXTURE: LESS THAN 12" D.B.H.					65	1	6	35				65	1	6	
		COUNTY TOTAL					420	9	15	30				420	9	15	
		11,695	298	519	96	48,970	1,497	1,835	95				60,665	1,795	2,354		
MALHEUR	21	PONDEROSA PINE: 12 TO 22" D.B.H. ON CUTOVER AREAS ON UNCUT AREAS TOTAL TYPE 21	55 120	1 5	3 9	95 97	75 75	2 2	4 4	95 95				130 120	3 5	7 9	
	22	PONDEROSA PINE: LESS THAN 12" D.B.H.	175	6	12	97								250	8	16	
		COUNTY TOTAL	990	42	24	95	10		1	95				990	42	25	
			1,155	48	36	95	65	2	5	95				1,240	50	41	
	UNIT TOTAL	195,245	7,507	6,772	80	261,240	8,494	11,610	74	860	36	82	7	457,345	16,037	18,464	

^{1/} IN STANDS 150 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. ^{2/} NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. ^{3/} GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. ^{4/} ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.

TABLE 20. CURRENT ANNUAL NET GROWTH^{1/} IN THE KLAMATH PLATEAU UNIT, BY COUNTY, TYPE, AND OWNERSHIP CLASS

COUNTY	SURVEY TYPE NO.	TYPE DEFINITION	PRIVATE LANDS				ALL OTHER AVAILABLE LANDS ^{2/}				RESERVED LANDS				TOTAL		
			CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH				CURRENT ANNUAL GROWTH		
			AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}		AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}		AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}		AREA	TREES 5.1 INCHES OR MORE IN D.B.H. ^{3/}	TREES 11.1 INCHES OR MORE IN D.B.H. ^{4/}
					TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL			TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL			TOTAL GROWTH	PONDEROSA PINE AS PERCENT OF TOTAL			
			ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.	PERCENT	ACRES	M CU.FT.	M BD.FT.
KLAMATH	21	ponderosa pine: 12 to 22" D.B.H. ON OUTCUT AREAS	29,240	533	1,689	60	174,460	3,801	12,442	80	410	9	25	70	204,110	4,343	14,156
		ON UNCUT AREAS	1,345	28	96	80	10,260	308	933	85	45	1	10	75	11,650	337	1,039
		TOTAL TYPE 21	30,585	561	1,785	61	184,720	4,109	13,375	80	455	10	35	71	215,760	4,680	15,195
	22	ponderosa pine: LESS THAN 12" D.B.H.	112,635	4,245	1,578	75	19,140	596	10	75	125	4		70	131,900	4,845	1,588
	34-27	pine mixture, outcutter: 12" OR MORE D.B.H.	2,290	92	176	30	7,020	191	356	30					9,310	283	532
	28	pine mixture: LESS THAN 12" D.B.H.	235	6	4	30	160	9		30					395	15	4
	9A	douglas fir: 12 TO 20" D.B.H.	50	4	22	0									50	4	22
	9B	douglas fir: 6 TO 10" D.B.H.					150	9	10	0					150	9	10
	10	douglas fir: LESS THAN 6" D.B.H.					950	39		0	40	1		0	890	40	
	23	fir-mountain hemlock: 12" OR MORE D.B.H.	430	5	52	0	13,598	159	1,438	0	8,157	73	440	0	22,185	237	1,930
	24	fir-mountain hemlock: LESS THAN 12" D.B.H.	165	9	21	0	8,530	547	1,539	10	2,450	122	258	0	11,145	678	1,818
	30	white fir: LESS THAN 12" D.B.H.	275	11		10	670	39	6	0	45	3		5	990	53	6
		COUNTY TOTAL	146,665	4,933	3,638	72	234,838	5,698	16,734	68	11,272	213	733	5	392,775	10,844	21,105
LAKE	21	ponderosa pine: 12 TO 22" D.B.H. ON OUTCUT AREAS	14,585	260	890	70	8,135	144	494	65	15			65	22,735	404	1,384
		ON UNCUT AREAS	3,250	69	232	85	22,075	449	2,031	80					25,325	518	2,263
		TOTAL TYPE 21	17,835	329	1,122	73	30,210	593	2,525	77	15			65	48,060	922	3,647
	22	ponderosa pine: LESS THAN 12" D.B.H.	26,190	361	16	80	13,110	276	14	75					39,300	637	30
	28	pine mixture: LESS THAN 12" D.B.H.	450	17	26	30	145	4	11	25					595	21	37
	28.5	upper-slope mixture: LESS THAN 12" D.B.H.					310	17		2					310	17	
	30	white fir: LESS THAN 12" D.B.H.	130	6	9	15	810	38	28	15					940	44	37
		COUNTY TOTAL	44,605	713	1,173	75	44,585	928	2,578	71	15			65	89,205	1,641	3,751
		UNIT TOTAL	191,270	5,646	4,811	72	279,423	6,626	19,312	68	11,287	213	733	5	481,980	12,485	24,856

1/ IN STANDS 100 YEARS OR LESS IN AGE, ON COMMERCIAL FOREST LANDS. 2/ NOT RESERVED FROM CUTTING BY STATUTE, PROCLAMATION, OR POLICY. 3/ GROWTH IN CUBIC FEET IS SHOWN FOR THAT PORTION OF THE STEM BETWEEN STUMP AND A 4-INCH TOP, EXCLUSIVE OF BARK AND LIMBWOOD. 4/ ESTIMATED BY SCRIBNER RULE IN 16-FOOT LOGS TO 8-INCH TOP.