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Pinus ponderosa

## **Growth of Reserve Trees on Western Yellow Pine Cut-Over Areas in Oregon**

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The growth of reserve trees in the pine cut-over areas in eastern Oregon is an important field for investigation inasmuch as it has been known that certain trees make a greatly increased growth after cutting operations have taken place, and less generally known that others make practically no increased growth at all. In all literature pertaining to growth of reserve stands, the former has been stressed far more than the latter, and as a result the general impression has prevailed that a greatly increased volume growth is resulting in the reserve stands after cutting, which according to observations on certain old cut-over areas is not altogether the case.

During the past summer, in the course of obtaining data for the cut-over record on the Davis Creek unit, Wallowa National Forest, which was cut in 1915-16, a number of increment borings were taken on reserve yellow pine trees; these were classified as either bull pines or mature pines. A further classification was made as to their relation to trees which had been cut, based upon the removal of trees within a radius of 50 feet. These were listed by the following classes:

- A. Opened up on one side only –  $\frac{1}{4}$  release
- B. Opened up on two sides –  $\frac{1}{2}$  release
- C. Opened up on three sides –  $\frac{3}{4}$  release
- D. Opened up on all sides – wholly increased
- E. Tree always in the open |
- F. Tree left in clump | —no release
- G. Tree in natural stand |

## Analysis of Data

The increment data of the two maturity classes for compilation purposes were grouped according to three classes with respect to their release—trees always in the open (E), trees in clumps and natural stands (F and G), trees which had been released (A, B, C, and D). There were not sufficient data for the segregation of the different degrees of release.

### Comparative Rates of Diameter Growth Before and After Cutting; D.B.H.: and the Annual Growth Percent

#### 1. Mature Yellow Pine

Class of Release	Before Cutting		After Cutting		Increase in avg. diameter growth after cutting	Avg. annual growth % after cutting	Basis No. of Trees
	Avg. D.B.H. Inches	Avg. Dia. growth in 1 <sup>st</sup> decade before cutting Inches	Avg. D.B.H. Inches	Avg. Dia. growth in 1 <sup>st</sup> decade after cutting Inches			
A, B, C, & D	18.7"	0.48"	19.5"	0.77"	60.2%	0.81%	12
E	19.9"	0.62"	20.5"	0.63"	2.7%	0.59%	6
F&G	25.0"	0.70"	25.7"	0.70"	0%	0.52%	6
All classes	20.7"	0.57"	21.4"	0.72"	26.0%	0.68%	24

#### 2. Bull Pine (trees 12" D.B.H. and up)

Class of Release	Before Cutting		After Cutting		Increase in avg. diameter growth after cutting	Avg. annual growth % after cutting	Basis No. of Trees
	Avg. D.B.H. Inches	Avg. Dia. growth in 1 <sup>st</sup> decade before cutting Inches	Avg. D.B.H. Inches	Avg. Dia. growth in 1 <sup>st</sup> decade after cutting Inches			
A, B, C, & D	15.9	1.10	17.6	1.66	50.9%	2.0%	5
E	15.6	1.85	17.4	1.81	- 2.0	2.3	7
F&G	13.6	1.04	14.6	1.00	- 5.5	1.4	16
All classes	15.2	1.51	16.8	1.65	9.0	2.1	28

The preceding tables show very clearly the great increase in diameter growth of trees which have been released, and as clearly bring out that the rate of diameter growth of trees, which are not released, continues very much as if cutting had not taken place. This increase in the diameter growth amounted to 60.2% for the released mature pines, and 50.9% for the released bull pines, while the other two classes for the latter show a slightly decreased growth.

Comparing the two maturity classes, the mature pines, all classes had an average growth of 0.68% per year, ranging from 0.52% for the trees in clumps (F and G) to 0.81% for those released; the bull pines averaged 2.1% per annum, the trees in clumps (F and G), having the slowest rate in this maturity class, and also show the greatest decrease in the diameter growth.

The foregoing data and conclusions are based on only a comparatively small number of measurements, and are only indicative. However, in general, based upon a great number of observations in the field in addition to the foregoing, it may be safely followed that reserve trees which have always grown in the open and those left in natural clumps as a rule will show none or very little increased growth on the cut-over areas, while those released or partly released, by having trees cut within a radius of 50 feet or 60 feet, may be expected to show considerable increased diameter growth. Thus, in marking timber for increased future volume, the factor of releasing reserved trees must be counted upon, this increased diameter growth, as indicated in this case, amounting to 50% and 60% greater than that preceding cutting operations.

In the matter of the cut-over record, this factor of release also brings forward the necessity of making sample counts of sufficient area to determine the percentage of the volume of reserve trees which have been opened up by cutting, so that the proper percentage of growth may be applied in accordance with data such as above. In addition, a segregation of the yellow pine into maturity classes must also be made from the fact that the annual growth percent is considerably greater for the bull pines than for the mature timber. This rate of growth for the overmature pine, as found on the Crater Forest, is even considerably less than that of the mature thrifty, and on areas where a considerable portion of the reserve stand is overmature, this class should also be tallied separately.