

DIAMETER GROWTH IN WESTERN WHITE PINE

A thesis

Presented in partial fulfillment of the requirements for the

Degree of Master of Science in Forestry in the

School of Forestry

Of the

University of Idaho Graduate School

By

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1944

## PROCEDURE

### Field work

Data were collected from five different areas in north Idaho. In all cases they represented virgin recently logged white pine land and are as follows: 1) Strychnie Creek, 2) Mary Creek and 3) Flat Creek, all in or adjacent to the St. Joe National Forest, 4) Deep Creek, Clearwater National Forest, and 5) Priest River, Kaniksu National Forest.

### Selection of Trees

Trees for measurement were selected at random. Saw gangs were followed and all white pine trees felled were taken in the sample, or in instances where cutting had been made earlier, trees close to a random line through the cut-over area were selected. Only relatively sound trees could be used and it was necessary, therefore, to eliminate all those with serious heart rot. Approximately one-half of the trees selected for measurement were too defective to provide reliable data and, therefore, were passed up.

Measurements were taken from recently cut stumps and the following data recorded: 1) stump height, 2) mean stump diameter inside bark and 3) number of annual growth rings in each inch of radius. The mean radius was taken in all cases as the line along which ring counts were taken. Additional information was recorded as shown in the field data sheet (figure 1).

Stump tops were surfaced in order to make the annual rings clearly visible. A steel rule and steel diameter tape were used for all stump measurements.

In a few cases increment cores were taken from standing trees by the use of a Swedish increment borer. Growth rates then were determined from the increment cores taken at D.B.H. (diameter breast height or 4<sup>1</sup>/<sub>2</sub> feet from average ground level).

## SUMMARY AND CONCLUSIONS

A study was made of the diameter growth characteristics of western white pine in North Idaho based upon analyses of stumps and increment cores from five recently logged areas.

Western white pine was found to grow in diameter inside bark at breast height at surprisingly uniform rates. In dominant trees the rate of diameter growth decreased only slightly with increased age and diameter.

For all trees, most of which were old growth, the mean growth rate was very uniform to 24 inches D.B.H and at the rate of one inch in diameter inside bark each seven or eight years. Therefore the rate was slower and at slightly decreasing rate. Above 24 inches diameter increased at the rate of one inch in ten years to one inch in twelve years at diameters between forty and forty-eight inches inside bark.

The mean number of rings per inch of radius varied among the different areas from 13.14 to 18.82, the coefficient of variation being in the general range of 33 per cent. The mean number of rings per inch of radius for all trees was 15.11, the standard deviation of the values making up the sample 6.55 and the standard deviation of the mean .21. the median value was 13 rings per inch and the modal value 11 rings per inch.

Analyses of growth patterns of individual trees indicated that the growth rate of western white pine was controlled largely by growing conditions and degree of dominance. Senescence apparently was not an important factor.

Diameter growth rate was found to decelerate rapidly in co dominant trees from a very heavily stocked even-aged stand in the one-hundred year age class. A few dominants only were able to maintain rapid, uniform rates of diameter increase.

Old growth stands of western white pine tend to be uneven-aged due perhaps to light fires or to other factors which might create small openings in the stand. Western pine will become established under partial suppression permitting a diameter growth rate of one inch in radius inside bark in approximately twenty-five years. It is capable of undergoing long periods of relative suppression, up to one hundred years or more on the basis of evidence obtained.

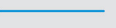
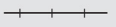

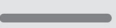











It is capable also of responding to favorable growing conditions even at all ages of three hundred years.

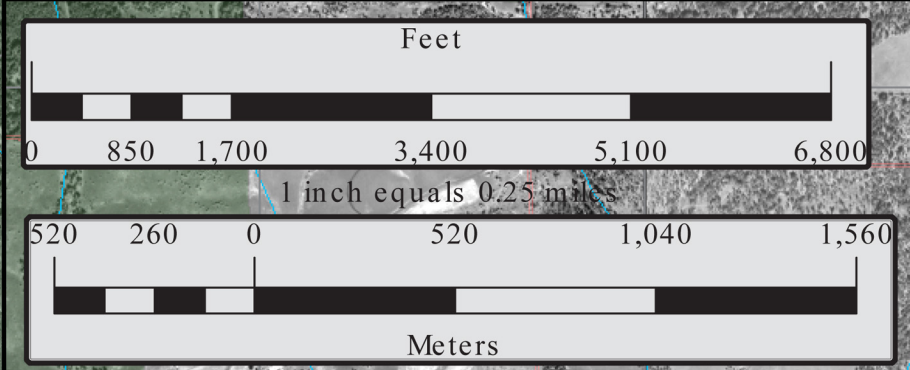
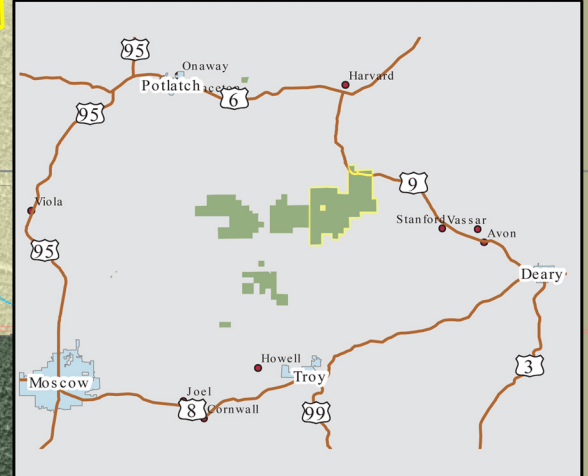
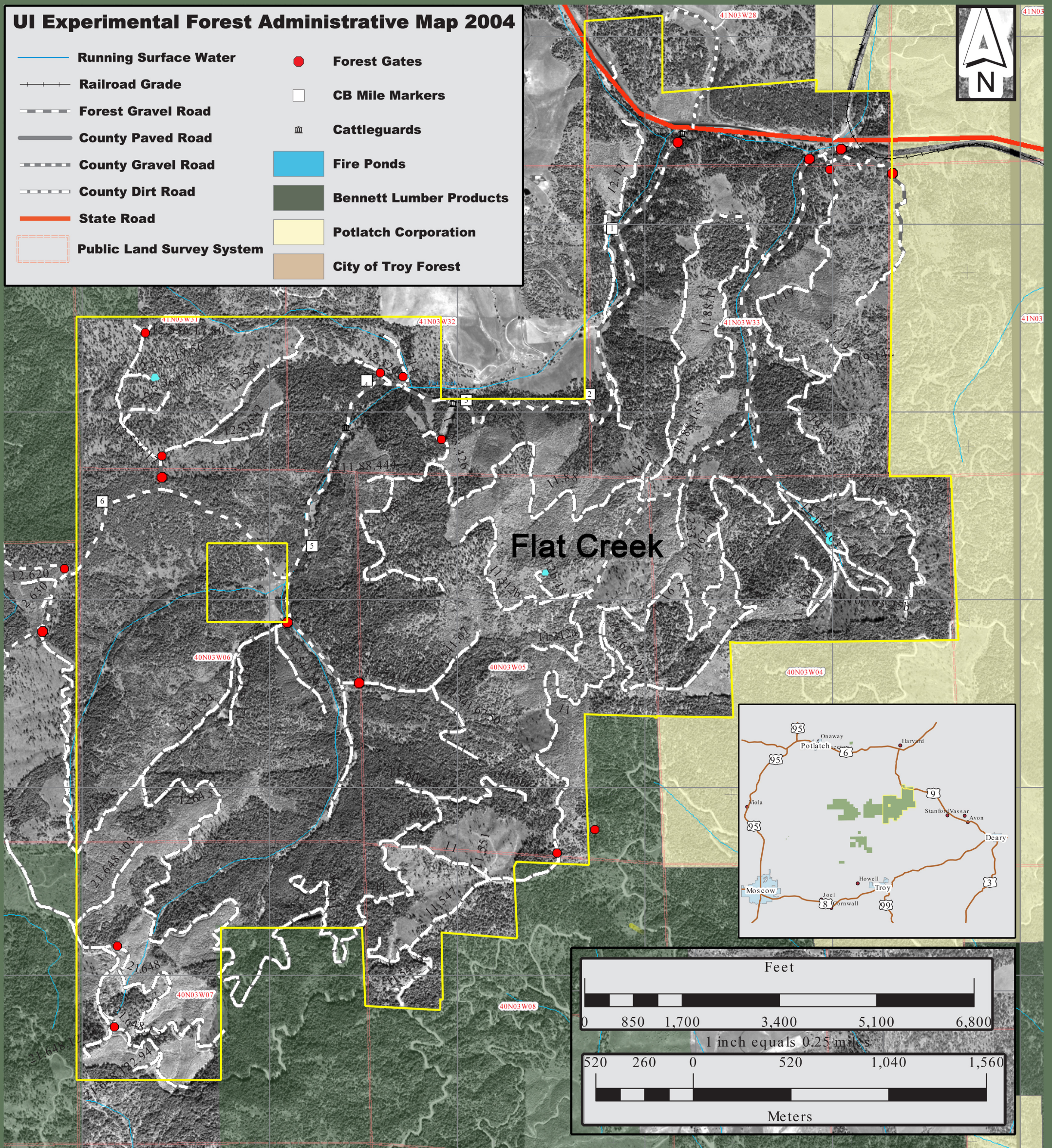
Periods of rapid growth or of suppression during early life did not appear to influence the later growth of western white pine trees.

#### Study Site

The study was conducted on the Flat Creek Unit of the University of Idaho all in or adjacent to the St. Joe National Forest. Seven of the trees selected were too small to be cut down at the time of harvest nine years ago(1935).

# UI Experimental Forest Administrative Map 2004

-  Running Surface Water
-  Railroad Grade
-  Forest Gravel Road
-  County Paved Road
-  County Gravel Road
-  County Dirt Road
-  State Road
-  Public Land Survey System
-  Forest Gates
-  CB Mile Markers
-  Cattleguards
-  Fire Ponds
-  Bennett Lumber Products
-  Potlatch Corporation
-  City of Troy Forest



Flat Creek



## Location of Complete Research:

Author & Title: Eikum, Robert L.  
Diameter Growth in Western White Pine

University of Idaho Library:  
Call Number- Spec Col MG5689

College of Natural Resources:  
Department- Forest Resources

Other Sources: