

VEGETATION AND SOILS IN THE SUBALPINE FORESTS OF THE
SOUTHERN WASHINGTON CASCADE RANGE

By

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INTRODUCTION

Dense coniferous forests characterized by species of Abies and Tsuga are found along the upper slopes and crest of the Cascade Range in Oregon and Washington. These forests occupy the Tsuga mertensiana and Abies amabilis Zones which together are the least known of the major phytogeographic units in the Pacific Northwest.

Forest composition and environments vary markedly within the Abies-Tsuga Zones. Fourteen tree species play the role of major components: Pacific silver fir (Abies amabilis), western hemlock (Tsuga heterophylla), mountain hemlock (Tsuga mertensiana), noble fir (Abies procera), subalpine fir (Abies lasiocarpa), Douglas-fir (Pseudotsuga menziesii), western redcedar (Thuja plicata), Alaska-cedar (Chamaecyparis nootkatensis), Shasta red fir (Abies magnifica var. shastensis), Engelmann spruce (Picea engelmannii), grand fir (Abies grandis), western white pine (Pinus monticola), lodgepole pine (Pinus contorta), and western larch (Larix occidentalis). The diversity in environmental conditions of these zones can easily be imagined for they extend through 7 degrees of latitude, cross the width of the Cascade Range, and range through as much as 5,000 feet of elevation.

The wealth of tree species, a history of past disturbances, and a complex and diverse environmental mosaic have produced an apparently chaotic assemblage of forest types within the Abies-Tsuga Zones. It was apparent that these forests needed to be stratified into areas of essentially equivalent environment, i.e., habitat types, before meaningful autecological and

silvicultural research could be carried out. Accordingly, a three-part study was planned. The first phase entailed development of a habitat type classification based on systematic study of plant communities, soils, and landforms. The second would investigate major environmental differences between habitat types to determine factors correlated with and responsible for boundaries between habitats. The third phase would evaluate the significance of the classification in resource management, e.g., differences in productivity between habitats. Autecological and silvicultural studies could then proceed on a sound basis.

This thesis provides a description and classification of forest communities and soils in the Abies amabilis and Tsuga mertensiana Zones of the southern Washington Cascade Range, presents data on vegetation composition and seral relationships among tree species within these zones, and correlates vegetation with selected aspects of environment.