Observations on the Ecology of *Vaccinium membranaceum* Dougl. on the Southeast Slope of the Washington Cascades

by

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CHAPTER ONE

Introduction

Vaccinium membranaceum[1] is a recreationally, economically, and ecologically important plant species of the southern Washington Cascades. Recreational values include berry picking and, where present in open fields, association with scenic vistas and diversity of flora and fauna. On some sites the fruit crop of *V. membranaceum* may surpass the timber crop in economic value. Growing on marginal timber producing sites it may yield annual values up to $741 per hectare (Minore 1972a). Additionally, *Vaccinium* species are a valuable food source for wildlife. Bears, grouse and other birds and mammals rely on the berries, while the foliage, high in carotene and energy content, provides browse for deer, elk and mountain goats (Hamilton and Gilbert 1966, Reed 1983, Grier et al. 1981, Viereck and Little 1972). The ecological importance of *V. membranaceum* is suggested by its use (by virtue of species dominance) in the epithet, *Tsuga-Abies/Vaccinium membranaceum* (Franklin 1966), which describes one of the

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[1] For plant species referred to in this thesis, Appendix A contains a list of scientific names, authors and common names after Hitchcock and Cronquist (1973).

most widespread subalpine plant associations of the Cascade Range (Franklin and Dyrness 1973).

Populations of V. membranaceum which have elicited most attention are those existing in large open fields, probably initiated by wildfire and maintained by Indian burning (Franklin and Dyrness 1973, Barrett 1980). Most research has attempted to enhance fruit production on these pre-existing fields or document postfire sprouting (Minore et al. 1979, Miller 1977). Unfortunately, the size and productivity of these fields are declining, largely due to increasingly efficient wildfire suppression and subsequent tree encroachment (Minore 1972a).

Although knowledge and interest exist to maintain these fields with prescribed fire, economic and political constraints may preclude operational programs. Thus, it is important that some attention be given the behavior of V. membranaceum beneath a forest canopy. The purpose of the study described in this thesis is to:

1. Identify patterns of variation in V. membranaceum vegetative production and fruit yield in a variety of forest understories.
2. Relate this variation to existing combinations of disturbance history (stand age), floristic composition/structure and certain environmental factors.