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**BIG HUCKLEBERRY ABUNDANCE AS RELATED TO ENVIRONMENT AND
 ASSOCIATED VEGETATION NEAR MOUNT ADAMS, WASHINGTON**

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ABSTRACT

Big huckleberry abundance was correlated with associated vegetation and soil pH in a 625 square kilometer (241 square mile) area southwest of Mount Adams, Washington. Annual berry production appeared to be influenced by weather more than by site factors in this area. Douglas-fir site index was not correlated with either *Vaccinium membranaceum* abundance or berry production.

KEYWORDS: Huckleberries, *Vaccinium membranaceum*, ecology (plant), indicator plants, soil pH, climate (-plant adaptation).

Many mountain huckleberry fields in northwestern America are declining as forest trees invade the old burns that provided suitable conditions for huckleberry production early in this century (Minore 1972). Modern fire control techniques have all but eliminated large wildfires in recent decades, and the dwindling areas now suitable for big huckleberry (*Vaccinium membranaceum* Dougl. ex Hook.), the most frequently picked species, appear insufficient to maintain the huckleberry resource. If this resource is to be preserved, some forest land should be managed for huckleberries, but only where optimum environments occur. Huckleberry management may be costly, and it should be concentrated on the areas best suited to *V. membranaceum* growth and berry production.

Emmett and Ashby (1934) studied the relationships between soil pH and distribution of *Vaccinium myrtillus* in Britain, only to conclude that their data represented the distribution of acidity in random soil samples rather than the effects of pH on species occurrence. Lilly et al. (1972) compared adjacent areas and found that soil profile characteristics influencing soil moisture status differed between successful and unsuccessful sites, but their conclusions applied only to cultivated highbush blueberries grown in North Carolina. Unfortunately, optimum environments for growth of *V. membranaceum* have not been identified or described.

If meaningful conclusions are to be obtained for *V. membranaceum*, western huckleberry environments should be studied and compared. Some of the most heavily used huckleberry fields in the Northwest are located near Mount Adams, Washington. We studied this area in 1976 and 1977, seeking answers to the following questions:

1. Can easily measured environmental factors and vegetation be correlated with the abundance and productivity of *V. membranaceum*? If they can, what are the correlations?

2. Are Douglas-fir site quality and *Vaccinium* abundance or productivity related? If they are, do the best *V. membranaceum* areas occur on high or low quality forest land?

METHODS

Vaccinium membranaceum environments and associated vegetation were sampled within a 625-square-kilometer^{1/} area approximately 25 kilometers southwest of Mount Adams. Located in the Mount Adams District, Gifford Pinchot National Forest, the area includes a variety of soils, vegetation types, and landforms. Sample plots were established at 30 locations chosen to represent a wide range of slope, aspect, elevation, and vegetative conditions. Each plot consisted of sixteen 4-square-meter circular subplots spaced 20 meters apart to sample an area of 0.65 hectares. The sample plots all supported *V. membranaceum*. None were disturbed by logging. There was great variation among plots; but soil, aspect, slope, and vegetation were homogeneous within each plot.

On each sample plot, 13 variables were measured: average aspect azimuth, elevation, slope percent, overstory canopy density, stone cover, stone frequency percent, species presence of all seed plants, species cover percent, species frequency percent, soil pH, silt + clay percent, total nitrogen percent, and acetate exchangeable iron. Because azimuth degrees are poor quantitative expressions of aspect (1° and 359° represent almost identical aspects), aspect azimuths were coded for regression

^{1/}English equivalents are given on page 8.