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Title: DRY CONIFEROUS FORESTS IN THE WESTERN OREGON CASCADES

Abstract approved: Redacted for Privacy

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Pseudotsuga menziesii dominates the forests of the Pacific Northwest. But though it is dominat, Tsuga heterophylla or Abies amabilis is usually climax. Many researchers have studied Pseudotsuga on the widespread mesic sites where it is seral, but few have examined the relatively rare ecosystems in which Pseudotsuga or its associate Libocedrus decurrens are the climax species. This is a study of the composition, structure and successional dynamics of climax Pseudotsuga and Libocedrus (dry site) forests in the central portion of the Western Cascades in Oregon.

The environment of dry site forests is characterized at seven reference stands (five dry sites) using predawn plant moisture stress (Waring and Cleary, 1967) and temperature growth index (Waring et. al., 1972). As expected, the study type is hotter and drier than adjacent Tsuga-climax sites. The data suggest that low moisture availability is more critical to the occurrence of Pseudotsuga-climax habitat than is high temperature.

Seventy-three vegetation plots are located throughout the study area, 56 in dry site stands. The location, composition, and soils of five plant communities, including two phases, are described based on this data set. Information from fire scars and tree ages on the vegetation plots indicates these forests burn at irregular intervals that average 100 years. Since initiation of the oldest cohort, most stands have experienced one or more fires which typically kill only a portion of the trees.

Stand history and successional processes are investigated on two intensive plots using primarily age structures and fire scars. These stands have each been burned twice by fires that consumed only a portion of the canopy. Regeneration following these fires was slow and continued for a century or more.

Height growth of 40 dry site Pseudotsuga is examined and found to start more slowly but continue at a greater rate later in life than Pseudotsgua on mesic sites.

These characteristics of dry site ecosystems have several management implications. A shelterwood silvicultural system is recommended on dry sites. The overstory will ameliorate the hot,dry environment and occupy the site during the long regeneration period. This silvicultural system approximates the natural functioning of these systems more closely than clear cutting.

Maximum mean annual increment occurs relatively later on dry sites due to the slow, prolonged height growth. Relatively slow reproduction further retards mean annual increment. Thus, if high volume growth is a management goal, rotations must be longer than on mesic sites.

Due to relatively linear height growth curves and reverse J-shape diameter distributions on dry sites, McArdle et. al.'s (1961) site index curves and yield tables are not applicable.

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in the
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DRY CONIFEROUS FORESTS IN THE WESTERN OREGON CASCADES

INTRODUCTION

Pseudotsuga menziesii dominates and is the major timber species in most of the forested land west of the Cascade crest in the Pacific Northwest. Research on its ecology (e.g., Grier and Logan, 1977; Franklin et. al., 1972) and management (e.g., Isaac, 1943; Bruce et. al., 1977) is extensive but most deal with sites on which Pseudotsuga is seral. These may be at low elevations where Tsuga heterophylla is climax or at higher elevations where Abies amabilis is climax. These generally productive sites cover most of the region.

Pseudotsuga its occasional associate Libocedrus decurrens are apparently climax species (sensu Daubenmire, 1968) on hot, dry sites in the western central Cascades of Oregon (Figure 1, Dyrness et. al., 1974). Dyrness et. al. (1974) characterize these sites as smooth, low elevation, south and southwest facing slopes on shallow, stony loams and silt loams and call them the Pseudotsuga menziesii/Holodiscus discolor habitat type.

In western Oregon Pseudotsuga or Libocedrus climax communities also occur on the east side of the Coast Ranges (Juday, 1977; Anderson, 1967; Bailey, 1966), in the south end of the Willamette Valley (Cole, 1977) and in southwestern Oregon (Mitchell and Moir, 1976; Waring, 1969). To the north Pseudotsuga climax forests are found in Washington (Franklin et. al., 1980; Becking, 1954) and British Columbia (Krajina, 1965; Packee, 1976).

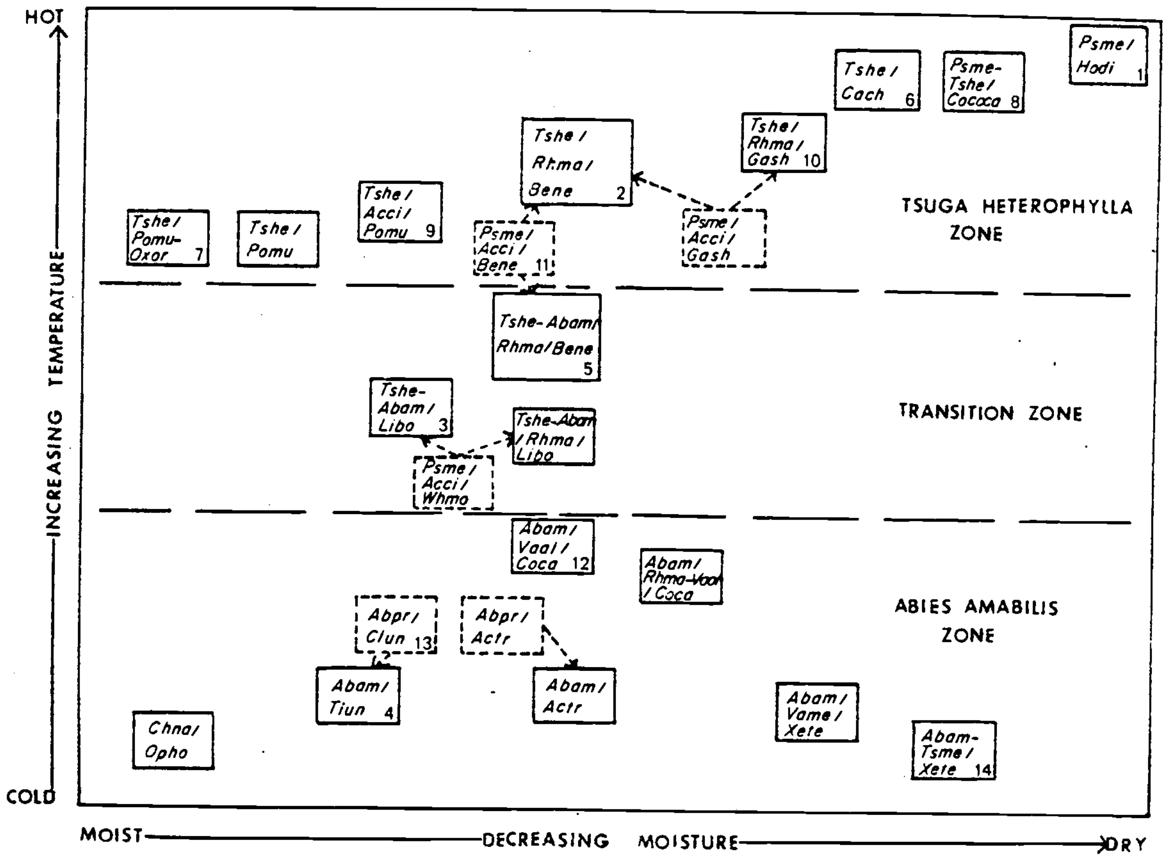

Figure 1. Hypothesized relationships among 23 forest communities defined by Dyrness et al. (1974, figure 5) in the western Cascades. This figure is based on their vegetation ordination, somewhat modified by their intuition. The Pseudotsuga menziesii / Holodiscus discolor (Psme/Hodi) habitat type is in the hot, dry corner of the environmental field.

Climax *Pseudotsuga* ecosystems have received little attention since they are areally limited (occupying two to five percent of the Willamette National Forest[1/]), and are considered less productive than other sites supporting *Pseudotsuga*. Consequently the Willamette National Forest now faces allocation of these lands to specific uses with minimal ecological knowledge on which to predict management response. Work on these ecosystems therefore serves two purposes: it fills gaps in basic knowledge of western Oregon forests and contributes biological information needed for management.

The Willamette National Forest was chosen for this study in part because the H.J. Andrews Experimental Ecological Reserve is situated near its center (Figure 2). A dry conifer association has been characterized at the Andrews (Dyrness et. al., 1974) and data are available on its environment relative to climax communities of *Tsuga heterophylla* (Zobel, et. al., 1976). These and other studies help place the results of this work in the context of the mesic forest matrix in which dry communities occur as islands.

This project evolved beyond the original intention which was an analysis of the *Pseudotsuga/Holodiscus* association (Dyrness et. al., 1974). As distance from the H.J. Andrews increases, especially to the south, *Pseudotsuga* and *Libocedrus* climax communities occur which have decreasing similarity to the *Pseudotsuga/Holodiscus* association.

A broader definition of the study type as "dry coniferous forest"

[1/] Personal communication in 1976 with Lewis Manhart, soil scientist on Willamette National Forest Long Range Planning Team, Eugene, Oregon.

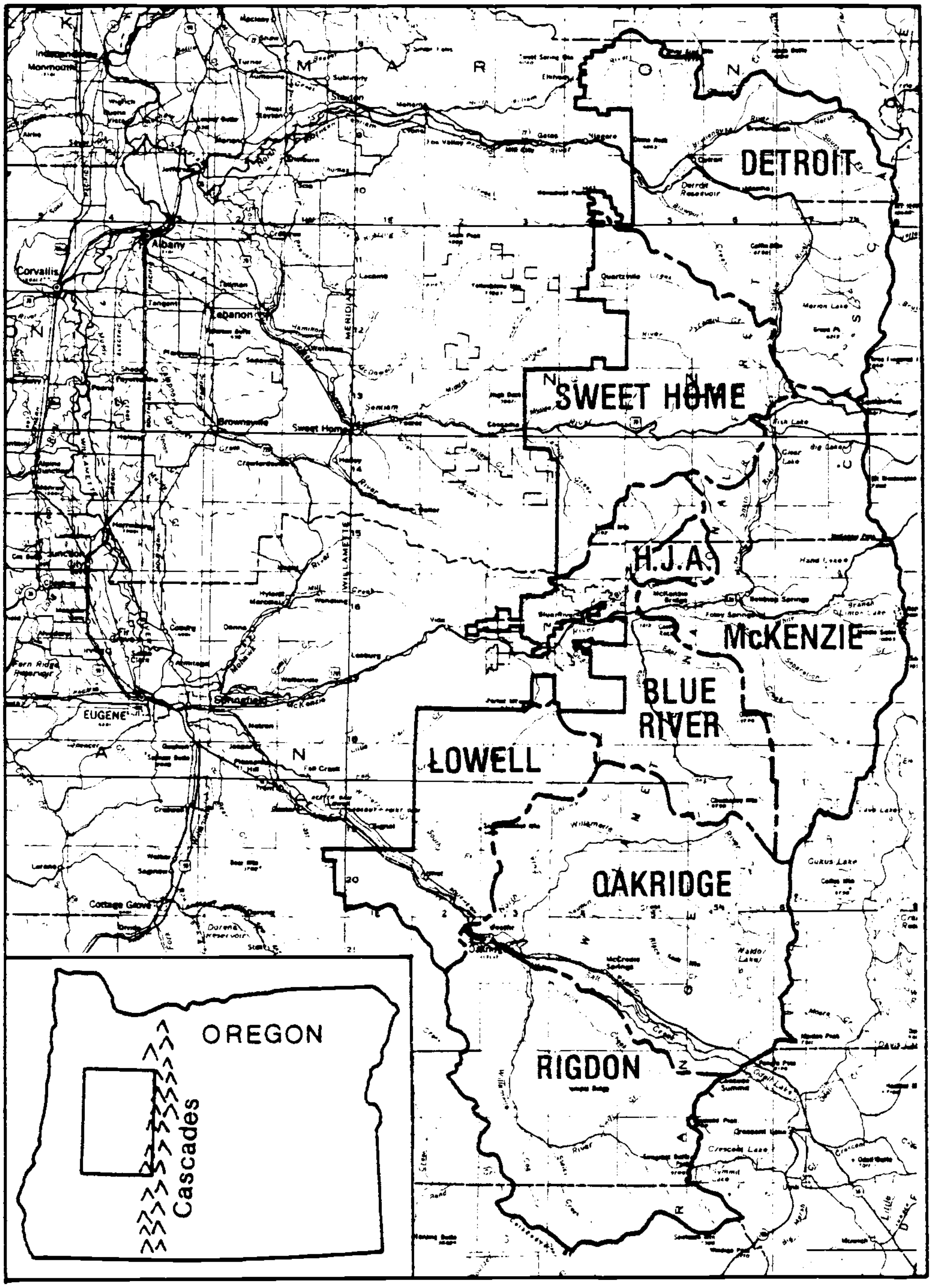

Figure 2. Location of the Willamette National Forest, its ranger districts, and the H.J. Andrew Experimental Ecological Reserve (HJA) in Oregon. The six mile by six mile township grid provides scale.

was therefore used to accomodate the variation in forest sites and conditions. Dry coniferous forests are herein defined as forests usually over 100 years old, within the *Tsuga heterophylla* Zone (Franklin and Dyrness, 1973) lacking significant *Tsuga* in any size class and more similar to the *Pseudotsuga/Holodiscus* type than to any other habitat type of Dyrness et. al. (1974). Oak balds of *Quercus garrayana* which are typically scattered at low elevations along the south-facing slopes of major river drainages (Hickman, 1968, 1976) were not studied. The requirement that study sites not fit any other habitat type was used to separate mesic stands young enough to have no *Tsuga* reproduction. Some *Tsuga* climax stands were sampled for comparison with the dry site stands.

This study has two distinct aspects. The first is characterization of floristic and physical features of dry coniferous forests. This work was guided by four objectives:

1. Develop a plant community classification for the dry coniferous forests in the study area, relating it to the classification of Dyrness et. al. (1974).

2. Characterize the floristics, structure, soils, productivity and topographic and geographic locations of these communities.

3. Examine fire history in these stands using fire scars, tree ages and other evidence of past fires.

4. Quantify the temperature and moisture environments of dry coniferous forests and compare them with more mesic sites.

Vegetation analysis addressed the first three objectives and results are reported in Chapter 4. Measurements of growing season temperatures and plant moisture stress provide the quantitative data for objective 4; results are reported in Chapter 3.

The second major facet of this study is analysis of stand structure and dynamics within the dry coniferous forests. This work was guided by six hypotheses:

1. Trees require more than 50 years to fully reoccupy these sites following a catastrophic disturbance.

2. *Pseudotsuga* and *Libocedrus* are climax in these ecosystems; i.e., they replace themselves as succession progresses (Whittaker, 1975).

3. Gap-phase replacement (Watt, 1947; Bray, 1956) is an important mechanism for regeneration in mature stands.

4. Patchy tree distributions are primarily due to variation in soil properties and microtopography and thus are correlated with these factors.

5. The driest sites are occupied by first generation coniferous forests.

6. Height growth curves of *Pseudotsuga* on dry sites are of different form than those of *Pseudotsuga* on mesic sites so the site index curves of McArdle et. al. (1961) are inapplicable.

The first five hypotheses guided investigations of stand structure and developmental history; results are described in Chapter 5. Trees were dissected to test the sixth hypothesis and results are reported in Chapter 6.

Tree nomenclature follows Little (1979), and Hitchkock and Cronquist (1973) are followed for other plant species.

STUDY AREA

The study area consists of the Detroit, McKenzie, Blue River, Oakridge and Rigdon ranger districts on the Willamette National Forest (Figure 2). The study area is limited to the western Cascades physiographic province (Baldwin, 1976).

Climate

The macroclimate is summer-dry and winter-wet (Waring and Franklin, 1979). Seasonal characteristics of the precipitation regime are exemplified by three weather stations spanning most of the north south range of the study area (Figure 3). The large decrease in total precipitation from Detroit to Oakridge (41 percent) is roughly paralleled by a decrease in summer precipitation (the sum of June, July and August precipitation) of 27 percent. Thus, though total annual precipitation decreases markedly from north to south, the difference is less in the driest months. Nevertheless, this difference in summer rainfall is probably important to plant growth and distribution.

Much geographic variation in annual precipitation can be seen in Figure 4 that is not evident in limited weather station data. Total estimated precipitation varies from 1015 mm (45 in) near Oakridge to over 3556 mm (140 in) in the upper Blue River drainage as estimated by the U.S. Weather Bureau River Forecast Center (Figure 4). Maximum precipitation reached on any landform and average precipitation decrease strikingly at the McKenzie River and continue to drop further south. There is a marked drop in precipitation from west to east into

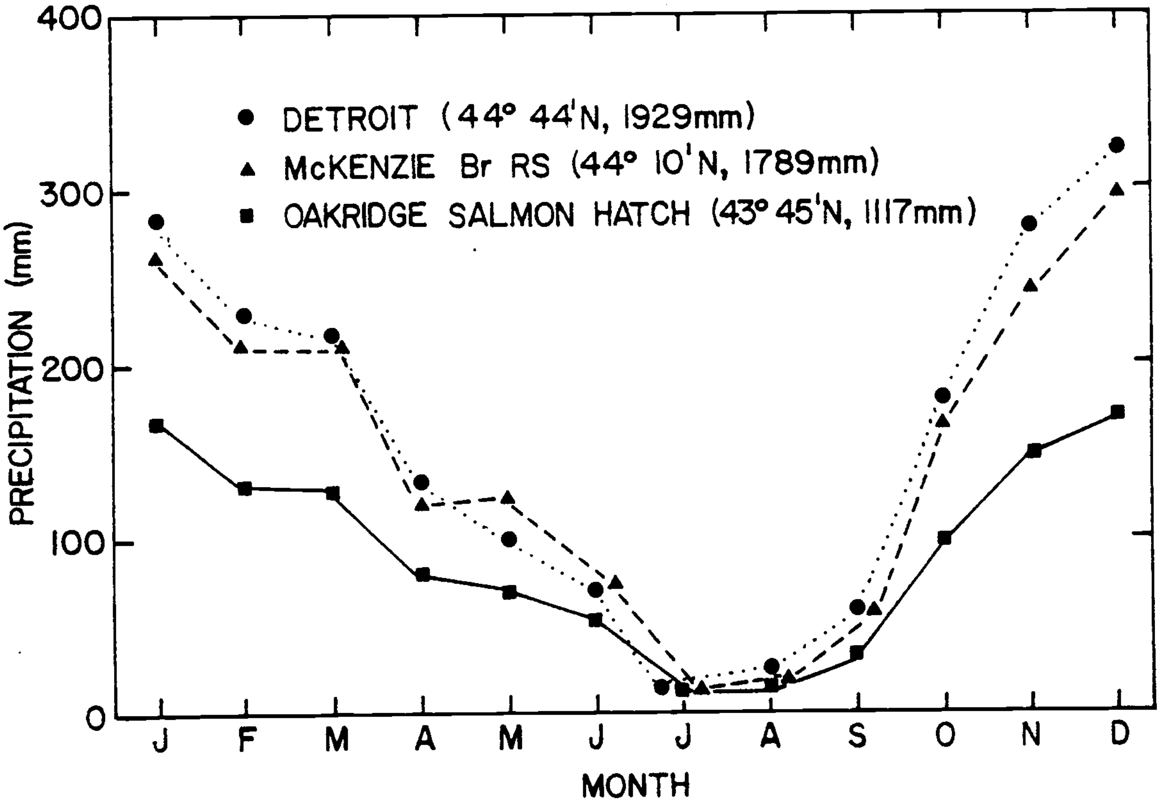

Figure 3. Seasonal course of precipitation at three weather stations spanning the north-south range of the study area. Station latitude and total annual precipitation are given in parentheses. Data is for 1931 to 1960 (Pacific Northwest River Basins Commission, Meteorology Committee 1968).

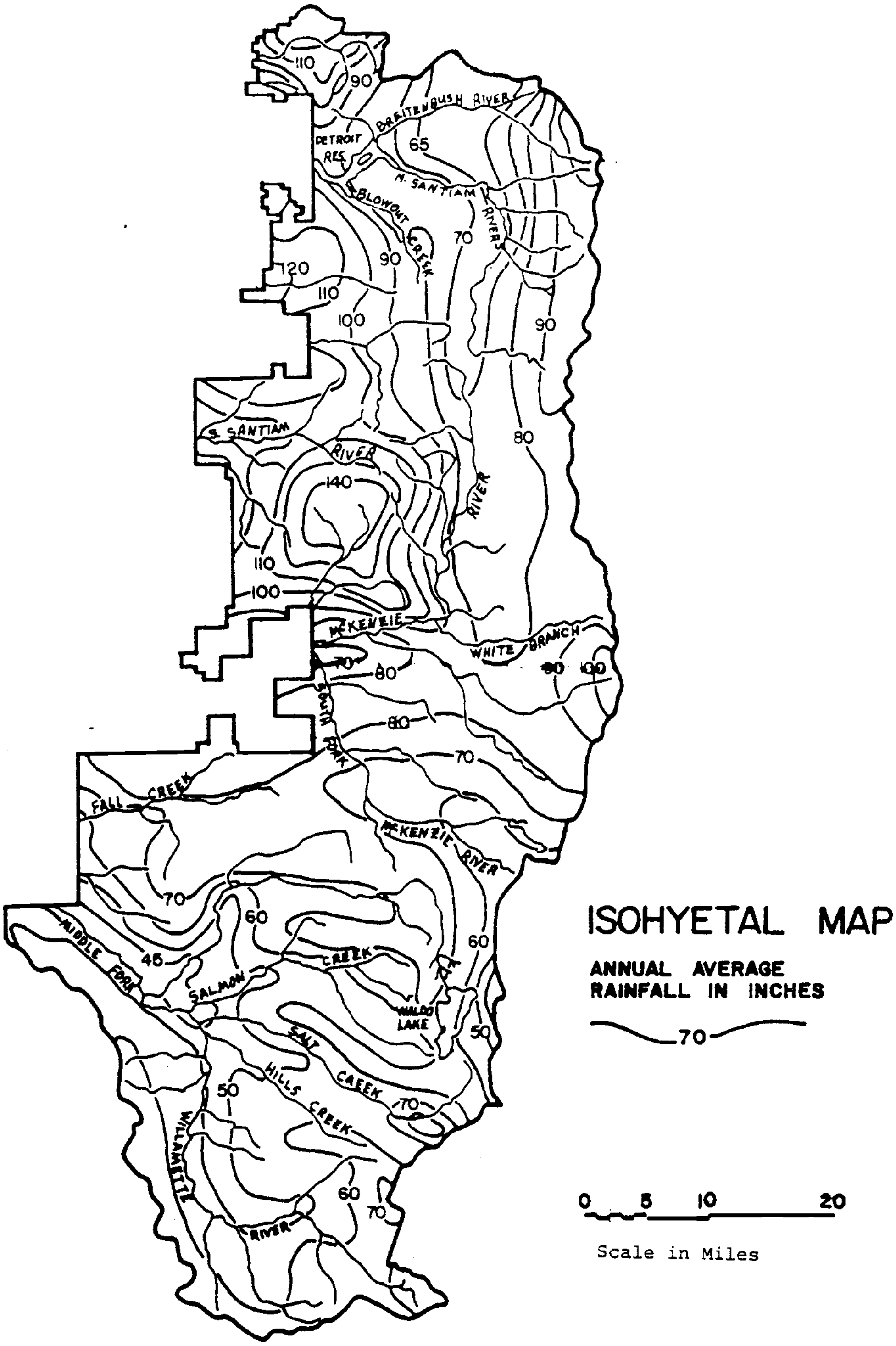

Figure 4. Isohyetal map of the study area for the period 1930-1957 using adjusted data and values derived by correlation with physiographic factors (taken from Legard and Meyer 1973, based on U.S. Weather Bureau River Forcast Center 1964).

and across the upper McKenzie River drainage which is continued northward past the Breitenbush River. Precipitation adjacent to all the major rivers is consistently lower than that in the surrounding highlands as might be expected. Though the U.S. Weather Bureau River Forcast Center (1964) does not list sources for the "adjusted data" upon which their extrapolations and correlations are based it is safe to say they were quite limited especially at higher elevations. Thus only interpretations which are consistent or striking are made above. Critical summer precipitation probably follows these geographic patterns to some degree since some of the same physiographic factors probably control it as control total precipitation.

Mean monthly maximum and average daily maximum air temperatures increase with decreasing latitude (Figures 5 and 6). Both Detroit weather stations are included in Figures 4 and 5 because neither is directly comparable to the other two. The Detroit station is at a relatively high elevation and the Detroit Dam Power House station is in a steepsided canyon. Together the Detroit stations show lower average daily maximum and slightly lower mean monthly air temperatures in the north.

Potential evaporation and summer moisture deficit are available for only two stations near the study area (Figure 7). Both locations experience a substantial summer moisture deficit and it is about the same in the north (Detroit) and south (Lookout Point). Lookout Point is about 25 km to the west of the study area and receives less precipitation. Since most of this difference occurs in the winter, the nearly identical potential evaporation regimes lead to similar

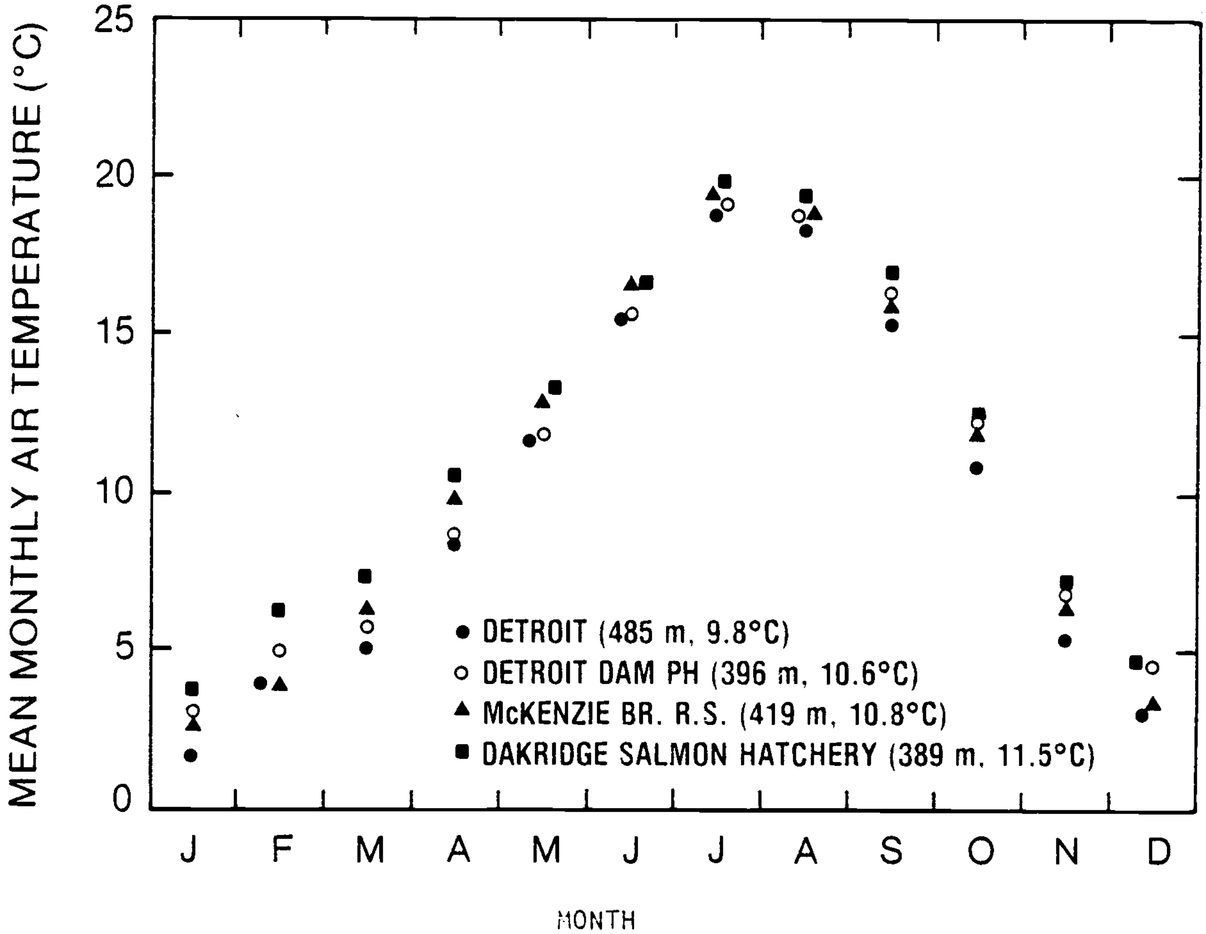

Figure 5. Mean monthly air temperature at selected weather stations in the study area for 1956 to 1965 (Pacific Northwest River Basins Commission, Meteorology Committee 1968). Station elevations and mean annual air temperatures are given in parentheses.

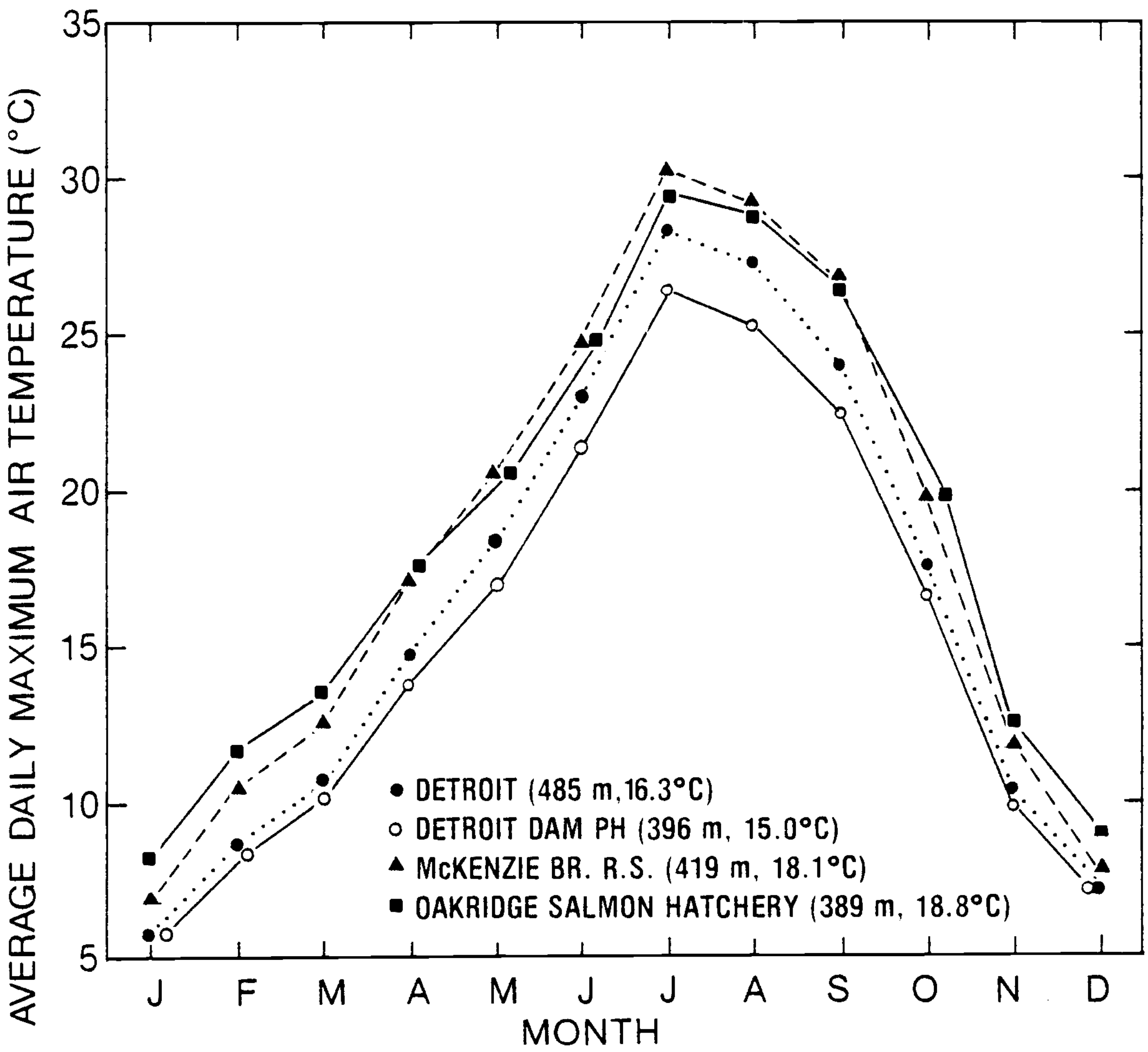

Figure 6. Average daily maximum air temperatures of selected weather stations in the study area for 1956 to 1965 (Pacific Northwest River Basins Commission, Meteorology Committee 1968). Station elevations and yearly averages of daily maximum air temperatures are given in parentheses.

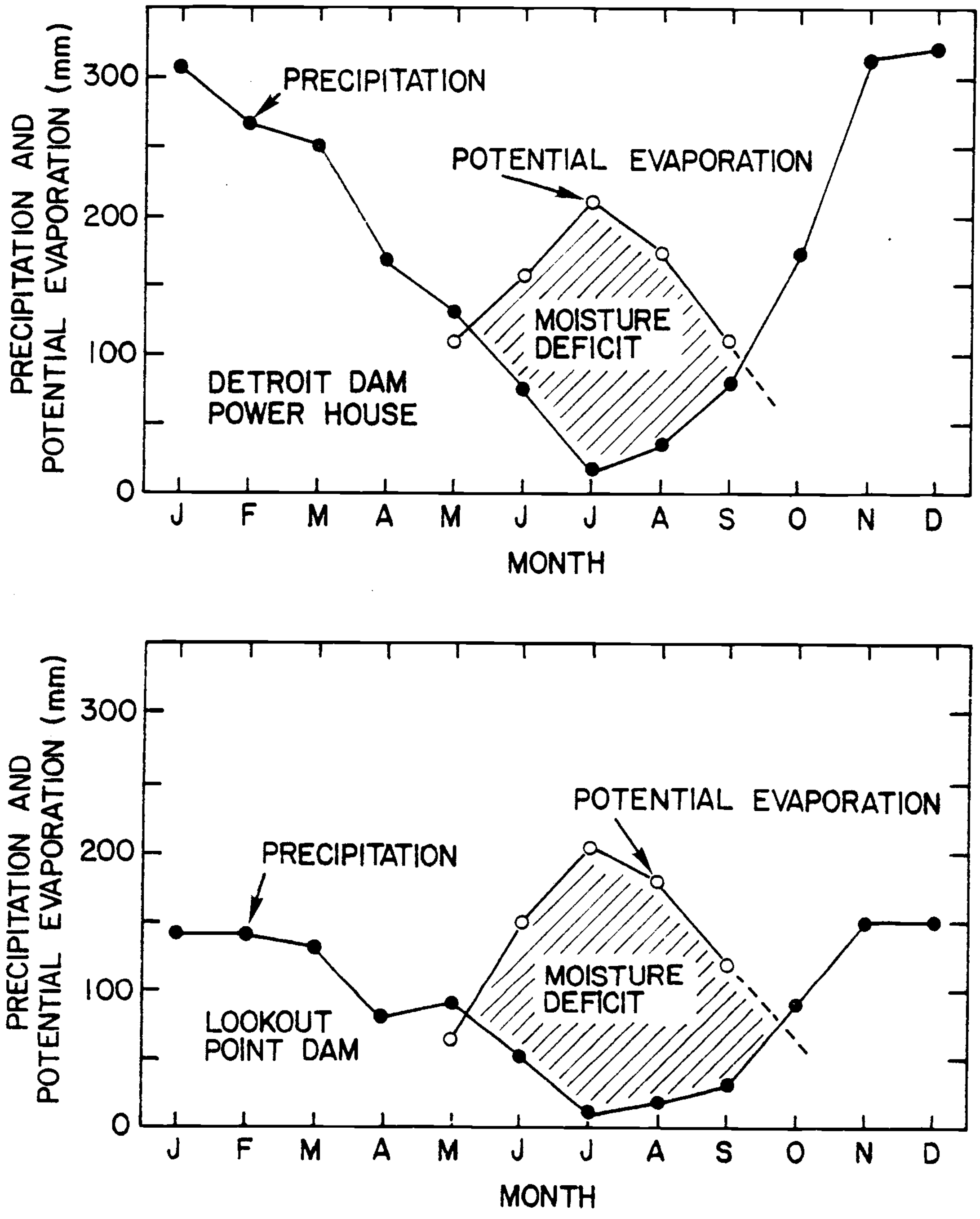

Figure 7. Moisture deficit in the north end (Detroit Dam Power House, deficit 440mm) and near the south end (Lookout Point Dam, deficit 470mm) of the study area during 1956 to 1965 (Pacific Northwest River Basins Commission, Meteorology Committee 1968). Lookout Point Dam is 25 km to the west of the study area.

moisture deficits in the two areas. Evaporative demand is an important controller of plant growth and distribution through its effect on stomatal behavior which can vary from one species to another (Waring et. al., 1975). The limited data in Figure 7 do not indicate that it varies significantly from north to south in the study area. However, this is likely in view of the known differences in evaporative demand in western Oregon (Waring et. al., 1978).

Geology

The Cascade Range is composed primarily of Cenozoic igneous rocks with minor amounts of sedimentary rocks (McKee, 1972). The Oregon Cascade Range is logically divided into the western Cascades composed of Tertiary rocks and the Pliocene and Quaternary High Cascades (Baldwin, 1976). The study area is in the central portion of the western Cascades.

The bedrock geology of the study area is described in detail by Peck et. al. (1964). The Detroit Ranger District in the north and the southern part of the Blue River District are underlain primarily by the Sardine Formation. This formation is composed of flows, breccia and tuffs of hypersthene andesite with lesser amounts of more or less silicic andesite and minor amounts of basalt and dacite.

Most of the McKenzie District, and the eastern edge of the study area as a whole, are underlain by the volcanic rocks of the High Cascades and the Boring Lava, both of Pliocene and Quarternary age. These rocks are generally more basic than those of the Sardine Formation. They are composed of flows and less abundant pyroclastic rocks of basaltic andesite and olivine basalt.

The majority of the Oakridge and Rigdon Districts in the southern end of the study area are on the Little Butte Volcanic Series. In these districts Peck et. al. (1964) map most of this series as tuff and less abundant domes and flows of andesite, dacite and rhyodacite. The other, quite common, mapping unit is composed of basaltic andesite and olivine basalt flows.

These bedrocks are important soil parent materials but volcanic ash is also important in the study area.

Soils

The study area has generally not been intensively surveyed. Extensive data are available, however (Legard and Meyer, 1973; Willamette National Forest, 1973), and the papers in Heilman et. al. (1979) give a good overview of the soils in the region dominated by *Pseudotsuga*.

Mitchel (1979) states that in this region (western Oregon and Washington), Inceptisols are the most wide spread soils followed by Alfisols and Ultisols. Other soil orders, including Entisols, are more poorly represented. The Willamette National Forest soil resource inventory (Legard and Meyer, 1973; Willamette National Forest, 1973) indicated Inceptisols as the most common order in the study area followed by Alfisols with lesser amounts of Ultisols and Entisols. Brown and Parsons (1973) classified the soils on over half of the 19 H.J. Andrews reference stands as Dystrochrepts; the remaining soils were other Inceptisols and Alfisols. These sources are in general agreement, especially on the predominance of Inceptisols. The soil taxonomic nomenclature follows the Soil Survey Staff (1975).

Several factors contribute to the predominance of Inceptisols. Mitchel (1979) cites the prevalence of young parent materials, such as occur on sites with active erosion or deposition, and occurrence of parent materials highly resistant to weathering, such as silicic pyroclastics. The volcanic ash mixed with colluvium and residuum in many soils in the study area (Legard and Meyer, 1973) may be younger than other parent materials. The prevalence of volcanic ash (Legard and Meyer, 1973) and high precipitation (at least north of the McKenzie River) promote the formation of allophane (Buol et. al., 1978) and other amorphous clays (Mitchel, 1979) which do not form illuvial horizons (Mitchel, 1979) and so slow profile development. The low bulk densities (below 0.9 gr/cc) of most H.J. Andrews reference stand soils (Brown and Parsons, 1973) probably result in part from volcanic ash parent material and production of amorphous clays in the high rainfall environment.

ENVIRONMENT

Quantification of the dry coniferous forest environment and comparison with environments of *Tsuga*-climax habitats is the study objective addressed in this chapter.

Methods

During the first field season seven reference stands were established covering most of the latitudinal range of the study area (Figure 8, Table 1). In this study reference stands are tenth hectare vegetation plots where plant moisture stress and soil and air temperatures are measured. *Pseudotsuga* was judged the climax species on five sites. One stand each in the northern and southern ends of the study area were on sites where *Tsuga* was judged the climax tree. Environmental comparisons of dry and adjacent more mesic sites at similar elevations were thus possible in these areas as well as at the H.J. Andrews. Specifically, dry site plot 24 was paired with *Tsuga*-climax plot 43 in the Detroit District and dry site plot 8 was paired with *Tsuga*-climax plot 44 in the Oakridge District (Table 1). Few good dry sites were found in the Detroit District during the first field season (see Chapter 4) so the Detroit reference stands are substantially higher in elevation than all the other reference stands. Additional data on the reference stand vegetation plots are in Appendices 4, 5 and 7.

At each reference stand predawn plant moisture stress (Waring and Cleary, 1967) was measured during the summers of 1977 and 1978 on one

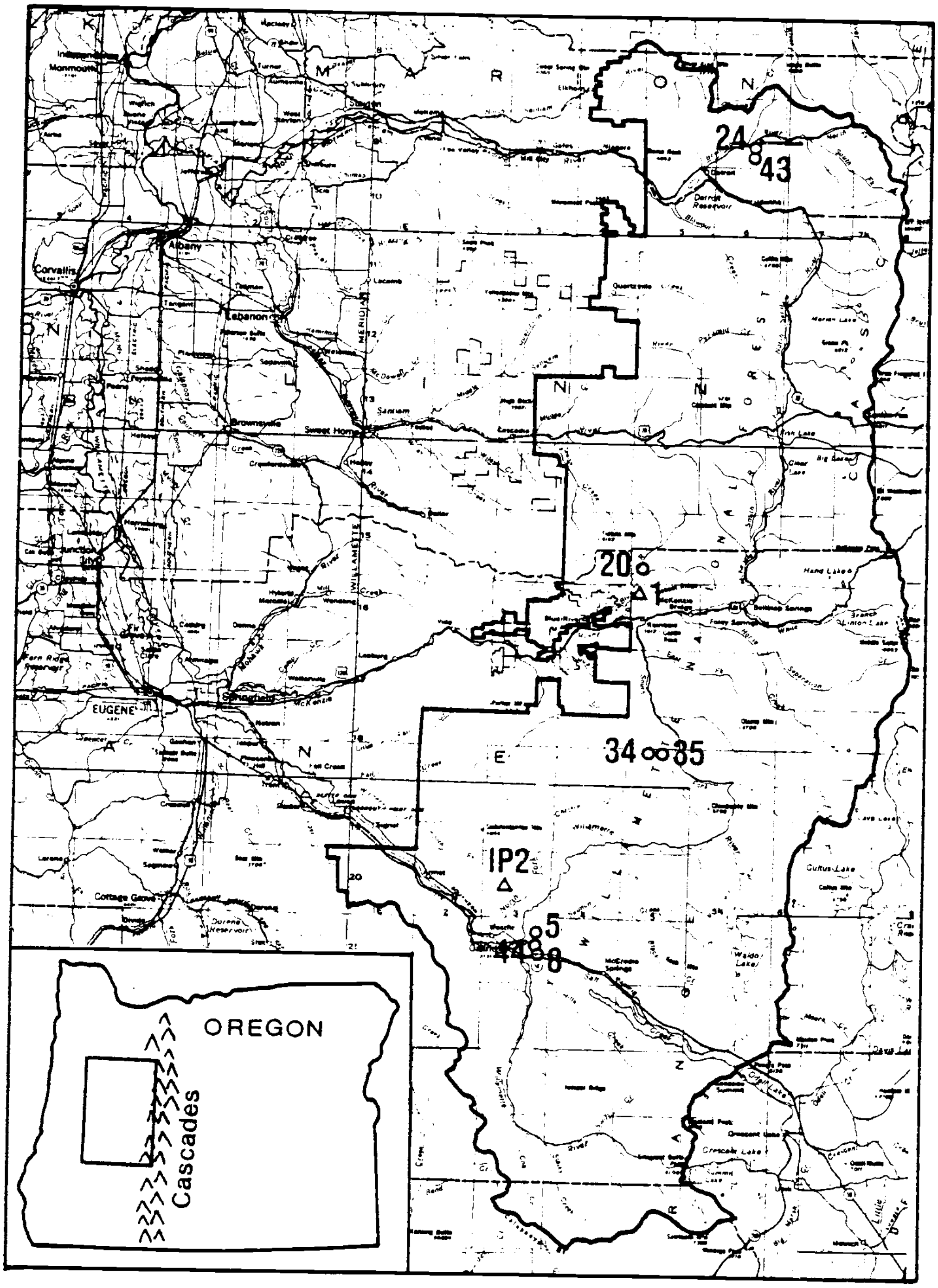

Figure 8. Locations of plots used as reference stands (numbered circles and plot 1) and of intensive study plots (plot 1 and IP2).

Table 1. Reference stand physical data and community types.

Reference stand number[1/]	Ranger district and elevation (meters)	Slope (%) and aspect (deg)	Topographic position	Community type
24	Detroit 880	68 225	Below brow of bench	Pseudotsuga/Holodiscus/grass Collomia phase
43	Detroit 870	65 170	Top slope draw	Pseudotsuga-Tsuga/Corylus[2/]
1 (HJA)[3/]	Blue River 490	60 230	Side ridge and side slope	Pseudotsuga/Holodiscus-Acer and Pseudotsuga/Holodiscus/ grass, primarily Collomia phase
20 (HJA)[3/]	Blue River 690	85 180	Side ridge and side slope near ridge crest	Pseudotsuga/Holodiscus/grass both phases and Pseudotsuga/Holodiscus-Acer
2 (HJA)[3/]	Blue River 520	35 290	Toe slope	Tsuga/Rhododendron/Berberis[2/]
34	Blue River 900	75 225	Probable old landslide scar	Pseudotsuga/Holodiscus-Acer
35	Blue River 900	60 185	Brow of main ridge	Pseudotsuga/Holodiscus/grass Aspidatis phase
5	Oakridge 560	25 210	Middle third side slope	Pseudotsuga/Holodiscus-Acer and Pseudotsuga/Berberis/Disporum

Table 1. continued.

Reference stand number [1/]	Ranger district and elevation (meters)	Slope (%) and aspect (deg)	Topographic position	Community type
8	Oakridge 630	63 260	Top slope side ridge	Pseudotsuga/Holodiscus/grass Collomia phase
44	Oakridge 640	75 315	Top slope draw	Pseudotsuga-Tsuga/Corylus [3/]

1/ Listed from north to south. Reference stands which do not have H.J.Andrews numbers are on vegetation plots of this study with the same number.

2/ These relatively mesic habitat types are defined by Dyrness et al. (1974).

3/ H.J.Andrews reference stand numbers. Vegetation plots 2 and 48 sample portions of reference stands 20 and 1, respectively.

to three meter tall understory Pseudotsuga. In 1978 United Electric thermographs were installed previous to budbreak by understory Pseudotsuga saplings and remained until the end of October. They recorded soil temperature at a depth of 20 cm and air temperature at one meter above the ground with a probe shielded from direct beam solar radiation. Temperature growth index (Cleary and Waring, 1969) was calculated from these data for the growing season. The growing season for reference stand 20 is defined as the period from budbreak of understory Pseudotsuga saplings to the first fall frost or October 15, whichever comes first. This definition has been used at the H.J. Andrews since 1973.[2/] The same definition was used for reference stands 5, 8, 44, 35, 24, and 43 except October 30, 30, 30, 20, 1, and 1, respectively, were used instead of October 15 to account for latitudinal changes in growing season length. The temperature growth index and plant moisture stress data locate the reference stands on the environmental grid (Waring et. al., 1972) used at H.J. Andrews (Zobel et. al., 1976).

Results

There is a general trend of greater moisture stress in Pseudotsuga in the south than in the north (Table 2). However, the higher elevations of the Detroit reference stands could account for the correlation of increasing stress with decreasing latitude. In both

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2/ Personal communication with Arthur W. McKee, Site Director, H.J. Andrews Experimental Ecological Reserve.

Table 2. Observed maximum predawn plant moisture stress (mean ± standard error when available) and temperature growth index. Moisture stress was measured on one to three meter tall understory *Pseudotsuga* (stands 24,43,1,20,34,35,5,8,44) and *Tsuga* (stands 43 and 2).

Area and approx. elevation (meters)	Reference stand	Climax Species	Plant Moisture Stress (bars) No. trees	1977	1978	Temperature growth index (1978 only)
Detroit (880 m)	24	*Pseudotsuga*	5	14.4 ± 1.0	9.9 ± 1.1	67
	43	*Tsuga* and *Pseudotsuga*	8	5.7 ± .6	9.3 ± 1.2	60
H.J. Andrews (500-700 m)	1	*Pseudotsuga*	6	15.5	16.0 ± .6	93
	20	*Pseudotsuga*	7	19.1 ± 1.5	14.3 ± 2.8	81
	2	*Tsuga*	5	6.4	7.6 ± .5	72
Blue River (900 m)	35	*Pseudotsuga*	4	16.7 ± 1.1	6.5 ± 1.9	74
	34	*Pseudotsuga*	4	15.7 ± 2.2	9.2 ± 1.6	NA 1/
Oakridge (600 m)	5	*Pseudotsuga*	4	22.3 ± 3.9	13.1 ± 2.0	99
	8	*Pseudotsuga*	5	18.4 ± .6	15.8 ± 1.7	96
	44	*Tsuga* and *Pseudotstuga*	6	14.3 ± 2.1	7.8 ± 1.9	90

1/ Data not available.

years trees on *Tsuga*-climax or -coclimax communities had significantly lower stresses than those on *Pseudotsuga*-climax communities in the same areas, except at Detroit in 1978.

Stresses were low in 1977 and 1978 partially because of significant August rains. Zobel et. al. (1976) found comparatively wide differences in moisture stress between communities in 1972 when H.J. Andrews reference stand oné showed 26 bars (Figure 9), 10 bars higher than in 1977 and 1978.

Temperature growth index shows a pattern similar to plant moisture stress for the year in which it was determined (Figure 10). All dry sites had higher temperature growth indices than the *Tsuga*-climax or -coclimax sites they were paired with. Temperature growth index was highest in the south and, with the exception of stand 35, decreased steadily with increasing latitude on the dry sites. However, the correlation of temperature growth index with latitude can be explained by its correlation with elevation (Figure 11).

Thermograph and moisture stress data summaries are given in Appendix 2.

Discussion

It is evident that the *Pseudotsuga*-climax sites are hotter and drier than the *Tsuga*-climax sites, as assessed by temperature growth index and plant moisture stress. However, the relationship of both of these indices to latitude is confounded by elevation. However, since in all seasons temperature decreases and precipitation increases with

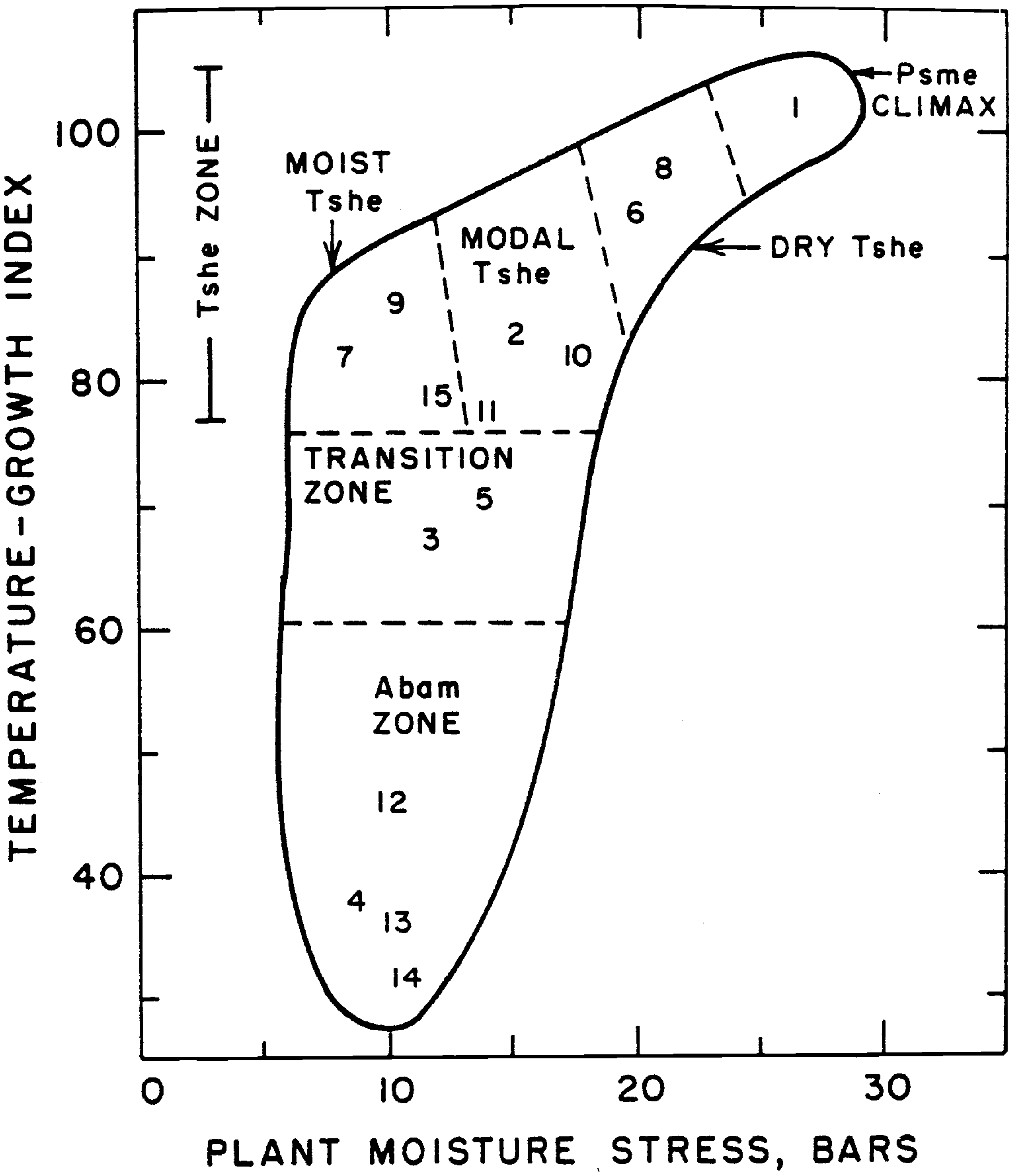

Figure 9. H.J. Andrews reference stands placed in the temperature growth index versus plant moisture stress environmental grid of Waring et al. (1972) using primarily 1972 data (figure 7 of Zobel et al. 1976). Reference stand 1 is in climax _Pseudotsuga_ (Psme). Tshe is _Tsuga heterophylla_, Abam is _Abies amabilis_.

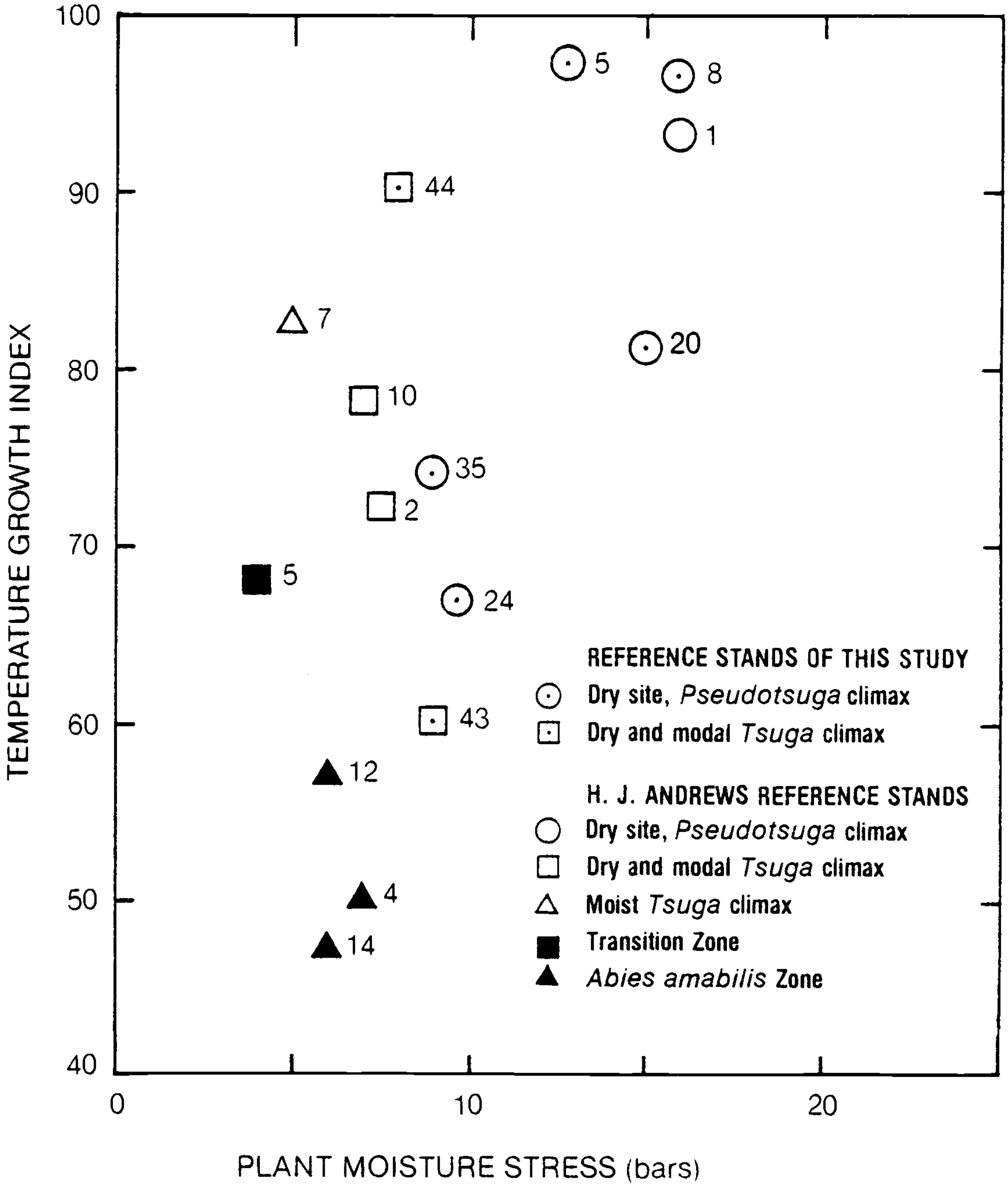

Figure 10. Reference stands placed in the environmental grid of Waring et al. (1972) using 1978 data.

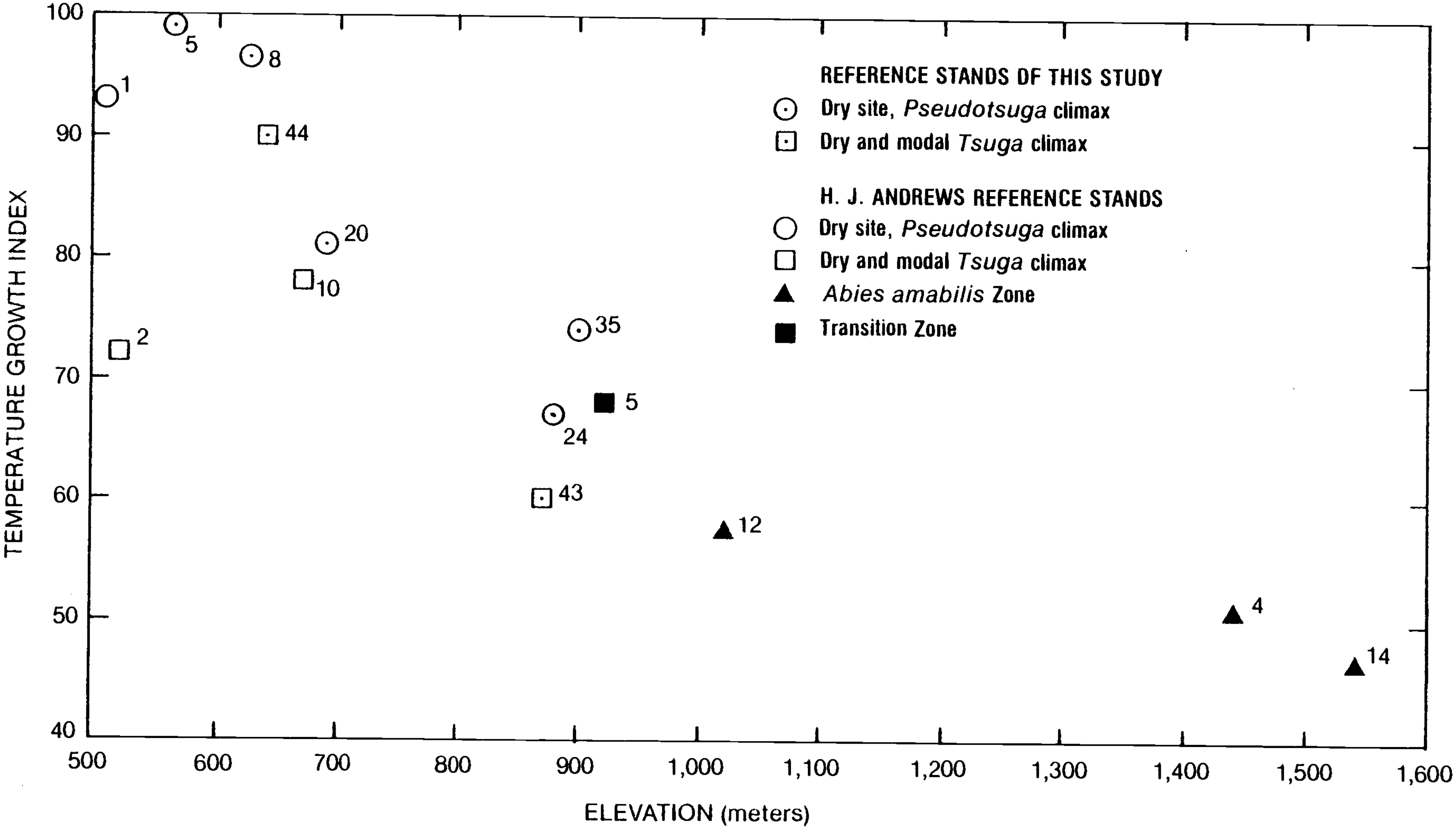

Figure 11. Temperature growth index versus elevation of reference stands using 1978 data.

latitude (Chapter 2), moisture stress and temperature growth index might be expected to decrease with latitude when other site variables are held constant.

The similar moisture stresses on stands 24 and 43 in 1978 can probably be explained by the generally low stresses that year which may make slightly dissimilar sites difficult to distinguish. In a like manner moisture stress on H.J. Andrews reference stands one and eight (same habitat type as plot 43) was similar in one moderate year and quite different in a dry year (Figure 12). The short record shows dry years (i.e., reference stand one moisture stress is over 25 bars) have been relatively uncommon (Figure 12). So short term studies which do not include moisture stress measurements in a dry year may result in poorer separation of sites.

Dry site communities occur over a fairly wide range of temperature growth index values (Table 2). The coldest of these is comparable to that of transition zone reference stand five (Figure 10). There is much overlap of dry site values with indexes of *Tsuga*-climax sites. However, there is no overlap in moisture stresses in either year's data. Moisture, at least as assessed by maximum predawn plant moisture stress, is more important in distinguishing these sites from *Tsuga*-climax sites than is temperature, at least as assessed by temperature growth index.

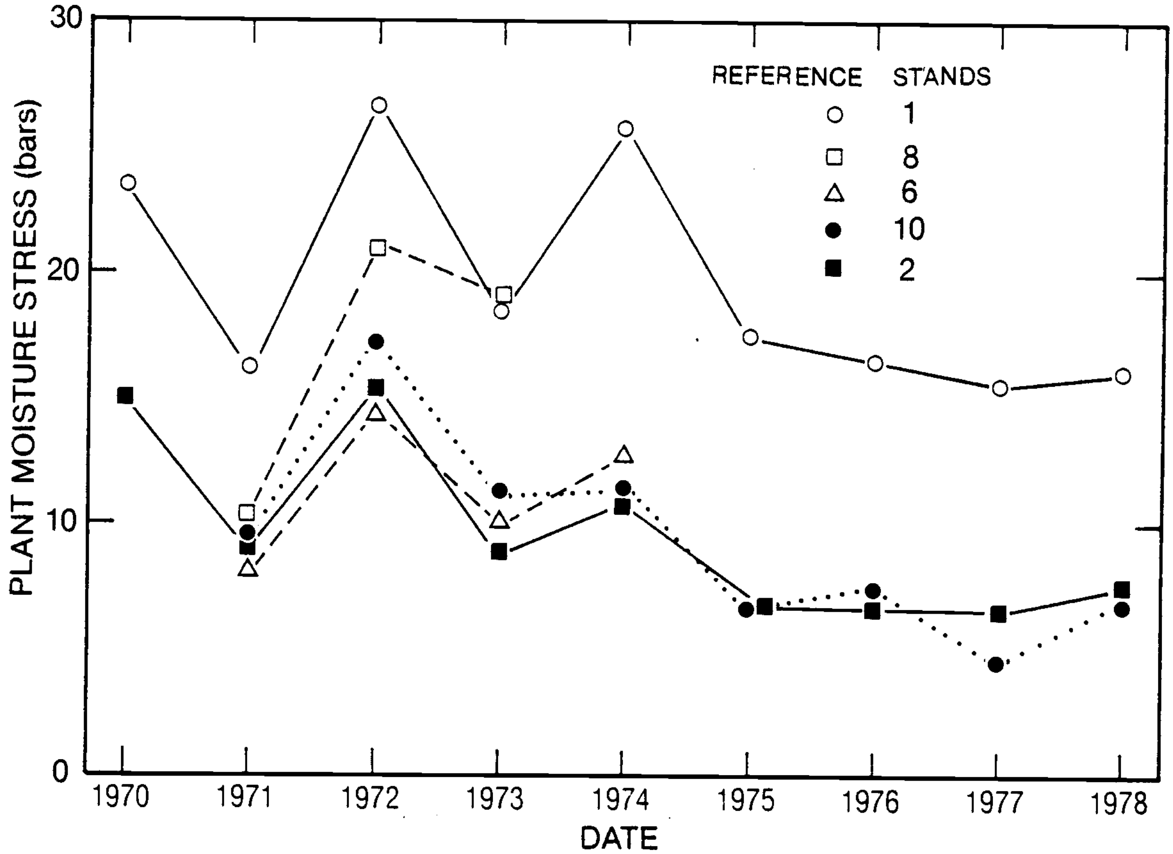

Figure 12. Yearly variation in plant moisture stress on dry and modal H.J. Andrews reference stands. Sources are: 1970-1972, Zobel et al. (1973); 1973-1976, Emmingham and Lundberg (1977); reference stand 8, 1973, computer printout titled "H.J.Andrews thermograph data, 1973" on file at U.S. For. Ser. For. Sci. Lab., Corvallis, Ore.; 1977, 1978 data collected by Bill Emmingham and Art McKee, respectively, and obtained from Fred Bierlmaier, H.J. Andrews Environmental Data Manager.

VEGETATION

Vegetative investigations of dry coniferous forest are reported in this chapter. These are: development of a community classification; characterization of the floristics, structure, soils, productivity and topographic and geographic locations of the communities; and and examination of fire history. Additional data on stand structure, soils and fire history are provided in Chapter 5. Height growth and some of its implications are discussed in Chapter 6.

Methods

This study differs from most northwestern plant community investigations in excluding most of the vegetation in the geographical range covered. In most studies (e.g., Mitchel, 1972; Dyrness et. al., 1974; Atzet, 1979; Franklin et. al., 1980) the geographic boundaries are set and then all or most of the included forest is studied. The dry coniferous forests had, however, already been segregated from the total range of forests in the vicinity of the H.J. Andrews Experimental Ecological Reserve (Dyrness et. al., 1974) because they are *Pseudotsuga*-climax according to their size class distributions, a feature of considerable interest. Since climax *Pseudotsuga* forests increase in southwestern Oregon (Franklin and Dyrness, 1973) and are nearly absent in the Washington Cascade Range, the study area was extended north and south of the H.J. Andrews to pick up some of this latitudinal variation.

Field Methods

The study type, herein called "dry site" or "dry coniferous forest," includes *Tsuga* zone (Franklin and Dyrness, 1973) communities which are usually greater than 100 years old, lack significant *Tsuga* reproduction, and do not fit into any *Tsuga* climax (or coclimax) habitat type of Dyrness et. al. (1974). This definition was used as a field guide in selecting dry site plots.

Office and field searches were both used to locate dry sites in the matrix of mesic forests. Initially three days were spent in the supervisors office of the Willamette National Forest in Eugene where color aerial photographs, other source documents and personnel were consulted. Many areas of mature forest on south- to west-facing slopes thought likely to support dry coniferous forest were delineated on maps. Additional potential sites were located throughout the field season by consulting the Total Resource Inventory files and knowledgeable personnel at ranger stations. Using these methods areas of potential dry site stands were located on all major drainages in the study area.

Plots were then located in dry coniferous forest avoiding ecotones to non-dry site vegetation. Typically in this region, vegetation plots are placed in areas of homogenous vegetation, soil and topography with no signs of recent man-caused or natural disturbance (Dyrness et. al., 1974; Mitchel and Moir, 1976; Bailey, 1966; Franklin et. al., 1980; Juday, 1976). This was not possible due to the typical fine-scale heterogeneity of dry site soils and vegetation and frequent occurrence of fire (discussed later). Several plots were also located in *Tsuga* climax stands especially in the Detroit Ranger District where recent fires (within last 100 years) and the cooler, wetter climate (Chapter 2) result in a small number of suitable dry site stands. In all, 73 plots were installed, 57 and 16, respectively, in sites interpreted as dry sites and *Tsuga* climax habitat.

.Circular plots of 500 or 1,000 m^2, uncorrected for slope, were used to sample vegetation. The larger plots were more frequently used in order to reduce the general tendency to overestimate basal area and obtain more representative stand tables (Daubenmire and Daubenmire, 1968). Occasionally 500 m^2 plots were used to avoid crossing ecotones or including more mesic vegetation. These large plots tended to average out the within-stand heterogeneity of dry sites. Smaller plots (e.g., 250 m^2 or less) could have been used to sample two or three significantly different plant assemblages in one contiguous piece of dry site. Causes and consequences of this variability are discussed later.

Information collected on the plots included: location, slope (percent), aspect (degrees) and elevation (meters), either from topographic maps or an altimeter, and estimated plant cover in percent for all vascular plant species (Franklin et. al., 1970). Cover of tree species included all unovertopped trees (sensu Smith, 1962), including those in reproductive size classes. Vascular plant species were recorded using the four- to six-character abbreviations of Garrison et. al. (1976). Life form (tree, shrub, herb, etc.) also follows Garrison et. al. (1976). A list of all vascular plant taxa encountered on the vegetation plots and their abbreviations is given in Appendix 1. Notes were taken on topographic location.

Trees taller than breast height (137 cm) were tallied by 10 cm size classes except diameters of trees greater than 120 cm were recorded individually. Tree regeneration (shorter than breast height) was tallied separately on a minimum of four, 12.5 m^2 circular plots (not corrected for slope) within the main plot. The primary rooting medium (mineral soil or rotten wood) was recorded for each tree and seedling.

Species alpha codes and cover were recorded on TP56 data set forms (Hawk et. al., 1979) which allowed keypunching directly into a non-positional format: species alpha code, cover; species alpha code, cover; etc.

At least two Pseudotsuga were selected as site trees (Husch, Miller and Beers, 1972) when suitable trees were available. More trees were selected when time allowed or when other coniferous species were an important canopy component. Site trees were increment cored at breast height and information for determining height was collected using an abney level. Core length to the pith (when present in the core) or to where the core passed the pith, sapwood thickness, and current incremental growth (rings/cm) were recorded before cores were sealed in plastic straws for transport to the lab and counting under a binocular microscope. Also, the angle between the core and the perpendicular to the rings at the end of the core, and the incremental growth rate (rings/cm) along the perpendicular were recorded on cores which did not pass the pith. Occasionally easily read cores were counted in the field.

One or two soil pits were dug on every plot. One pit was dug when relatively uniform tree stocking, understory vegetation, topography and soil surface indicated relatively uniform soils on the plot. Such uniformity was unusual, however. Where these features varied markedly from one part of the plot to another two soil pits were dug, one in each indicated soil type. Soil pits generally extended to one meter or bedrock. Since the major objective was description of the diagnostic horizons in a pedon (Soil Survey Staff, 1975), this depth guideline was often modified based on the exposed profile. Pit descriptions included local topography, forest floor, depth, texture, structure, consistency, coarse fragments, roots, charcoal, types of rock fragments and bedrock type (when observed).

Evidence of fires, such as charcoal on tree bark, was recorded and fire scars were increment cored and counted in the field with a hand lens or in the lab under a binocular microscope as needed. When trees are scarred they produce shock rings (Shigo and Marx, 1977) which can be identified by their darker appearance. Shock rings in _Pseudotsuga_ and _Tsuga_ become too faint to recognize only one or two cm from the scar. Thus scar dating by boring can require many corings. First the scar face is cored, giving a ring count which underestimates scar age. A second increment core is taken just outside the scar face to find the shock ring, which may be nonexistent, faint or easily identifiable; other wide, dark rings of unknown origin may be present. Successive cores are then taken in the scar face moving toward the outside of the scar until scar ages converge to the shock ring age. Often several attempts are necessary to find a reliable age of faint shock rings or those obscured by the heart rot that often develops behind scars. Typically four and as many as 12 cores were taken in one scar and some scars could not be aged. When this occurred scars on other trees were usually found and aged.

Laboratory Methods

Non-floristic data. The topographic position of each plot was characterized based on field notes and memory as one of the following. (1) Side ridge on one of the typically accordant ridges of the western Cascades (Figure 13). (2) Below the brow of a bench or ridge (Figure 14). (3) Recent landslide scar (Figure 15). (4) Side slope, generally smooth and not identifiable as one of the other positions. (5) Below a cliff face. (6) Bench with slope less than 30 percent. (7) Main ridge crest. (8) Draw with at most an intermittent stream. Other topographic positions are common but were not sampled in this study.

Cores with narrow rings were counted in the lab under a binocular microscope. The data needed for height calculations and the core data were then used as input to program Ageht (see Appendix 9) which calculated ages when extrapolation was necessary and calculated tree height when it was not already done in the field. Ageht assumes ring width decreases at a constant rate from the pith outward which is more realistic than assuming a constant ring width as is often done but is not identical to the commonly found exponential decrease in ring width with age (e.g., Fritts, 1976). This technique cannot account for early uncored periods of suppression.

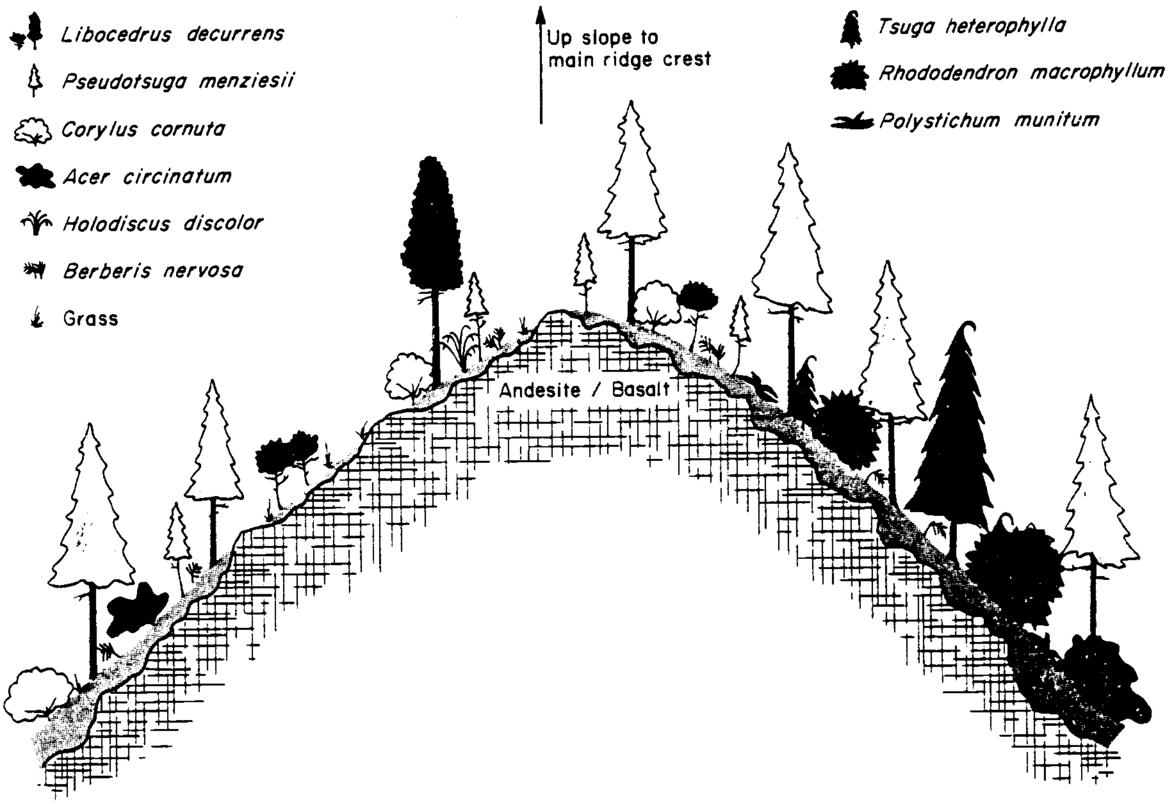

Figure 13. Dry coniferous forest on a south sloping side ridge.

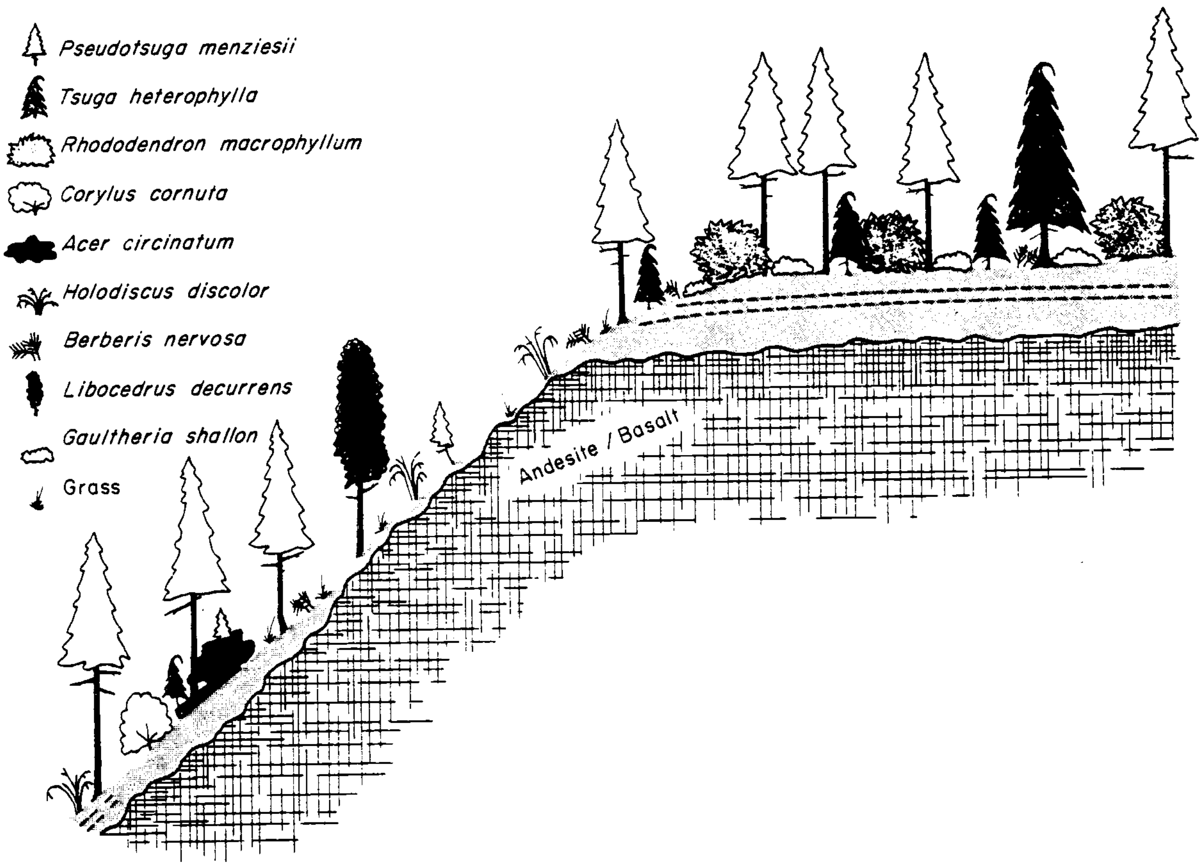

Figure 14. Dry coniferous forest on a south facing side slope below the brow of a bench.

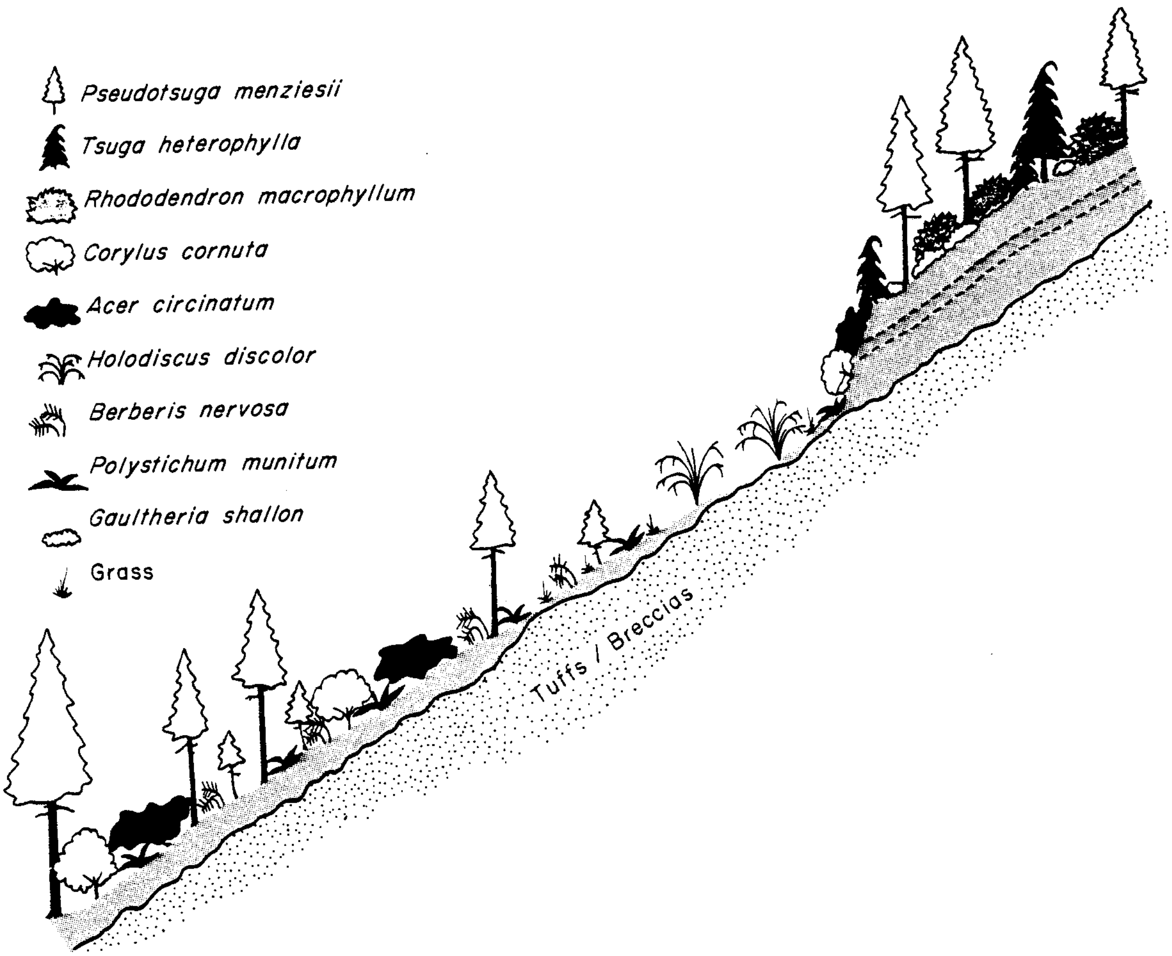

Figure 15. Dry site Pseudotsuga in a southwest facing land slide scar.

Site index was then estimated using the tables in Agricultural Technical Bulletin 201 (McArdle et. al., 1961). King's (1966) site index curves, though an improvement over those in Bulletin 201 because they are polymorphic and derived from sectioned tree data (Curtis, 1964; Jones, 1969), were not used because they are applicable only on trees up to 120 years old.

Soil profile descriptions generally allowed identification to soil order (Soil Survey Staff, 1975), though Ultisols were included in Alfisols since base saturation was not available.

Available soil water holding capacity (0.3 to 15 bars) was estimated for each pit.by program Sh2o (see Appendix 9). This program calculates the effective thickness of each horizon as the product of horizon thickness and 100 minus percent coarse fragments. Effective thickness times the available water capacity for that textural class (Table 3) gives horizon water holding capacity. Horizon capacities were summed to bedrock or a maximum of one meter and used to characterize the plots and communities.

Stand tables (sensu Husch et. al., 1972) and basal areas by tree species and rooting medium were compiled by program Stantab (see Appendix 9) using the tree tally data.

Several methods were used to estimate ages of past fires on the vegetation plots. The stand was assumed to have been initiated by one or more fires and this age called stand age or age of the oldest cohort, was estimated by the age of the oldest tree on the plot. Larger trees were aged with less accuracy because greater extrapolations were necessary in program Ageht. Fires occurring since stand initiation

Table 3. Available water-holding capacity by soil textural class. These are the median values from the Soil Conservation Service (1971).

Soil Textural Class	Available Water-holding Capacity (cm/cm)
Sand	.06
Loamy sand	.07
Sandy loam	.12
Loam	.17
Sandy clay loam	.15
Silt loam	.20
Silt [1/]	.20
Sandy clay	.16
Clay loam	.20
Silty clay loam	.20
Silty clay	.16
Clay	.15

1/ A value for silt was not given in the reference so the value for silt loam was used.

were usually aged from fire scars. Ten stands had trees with charred bark indicating a fire had occurred but no datable scars associated with that fire. In these stands the fire age was estimated as one-half of the previous fire age but not greater than 120 years. Fire ages in eight stands were based in marked diameter cohorts and the relationships of these cohorts to diamters of aged trees. Three of these ages were of large old-growth cohorts undatable due to heart rot. These methods are less accurate but only 10 and eight of 135 fire ages are based on char and marked diameter cohorts, respectively, while 89 and 28 fire ages are based on increment cored trees and fire scars, respectively.

The last major fire is the one estimated to have reinitiated 50 percent or more of the canopy based on field observations of stand structure and the stand tables. The effects of disturbances of this size were usually obvious so this age was not difficult to determine from the fire ages.

A fire interval is defined as the length of time between two consecutive fire dates on a plot. As many as four fires occurred per plot. The mean fire interval for a community is calculated as the arithmetic average of all fire intervals on plots in the community.

All ages have been corrected for sampling year and so are as of 1980.

Community classification

The TP56 species cover data sheets were keypunched and the cards run through program Cktp56 (see Appendix 9) which printed the punched data in a form very similar to the field sheets and so increased the accuracy and speed of keypunch verifying.

Two positionally formatted data sets were produced from this data using the program Simdat2 (see Appendix 9). The first (called "large") data set contained all vascular plant taxa present on three or more plots (131 taxa) and was used in program Aidn and for the species cover tables. In the second (called "small") data set, species which occurred in less than four or five plots or were thought to have little classificatory significance or both were excluded. This data set of 98 taxa was needed for analysis by computer programs with limited array sizes. Minor or difficult to distinguish species of the same genus were lumped in the construction of both data sets (see Appendix 5 for details of their construction). For example, covers of *Polypodium glycyrrhiza* and *Polypodium hesperium* were combined and labeled *Polypodium* in the second data set.

Development of the community classification followed seven procedures or steps. In general, there was much interaction between the ordination and classification techniques. Judgments were frequently required in choosing methods, defining communities and assigning borderline plots.

1. Two similarity and two dissimilarity measures were computed for each pair of plots using program Aidn.[3/] These values were consulted throughout the classification for purposes such as assigning

[3/] Aidn was designed by Dr. Scott Overton of the OSU Statistics Department and was obtained from Dr. David McIntyre of the Department of Botany and Plant Pathology at OSU.

borderline plots to community groups. The similarity measures in Aidn are analogous to covariance and product-moment correlation coefficient.[5/] The dissimilarity measures used are MacArthur's (1965) distance measure and euclidean distance using species cover proportion so that the sum of all covers on a plot equals 1.0 (Orloci, 1975).

2. Plots were divided based on the reproducing tree species as indicated by the diameter distributions (Daubenmire and Daubenmire, 1968). This was the primary criterion used in separating stands in which Pseudotsuga and Libocedrus are climax.

3. Several species of shrubs found on dry sites (e.g., Acer circinatum) are most abundant in moister habitats (Dyrness et. al., 1974). These shrubs were used in initial separation of the Pseudotsuga-climax plots along a complex gradient which probably includes moisture. A matrix of correlations (Kendall's tau, Daniel, 1978) facilitated separation of these shrubs from others presumably less strongly limited by moisture. A non-parametric correlation coefficient was used because many species have a skewed cover versus frequency distribution so errors were not expected to be normally distributed.

4. Species cover tables were constructed after steps 2 and 3 using program Order3 (see Appendix 9). This program computes average cover, constancy and importance for the species in each group and thus aided in characterizing groups and identifying plots which should be reassigned. Importance is the square root of the product of average cover (percent) and constancy (percent).

[5/] Personal communication with Dr. David McIntyre, June 23, 1980.

5. Polar ordinations (Cottam et. al., 1978) of all plots and dry site plots only were run to determine if groups based on steps 1 through 3 could be separated based on all the species present and to look for other possible groups. Program Ordiflex (Gauch, 1977) proved to be a versatile tool for this and other ordination techniques. Many runs were made using program and user chosen endstands and standardized and unstandardized data. Data standardizations included: (1) species maxima standardized to 100; (2) plot totals relativised to 100; (3) both (1) and (2). The third method is comparable to that of Bray and Curtis (1957).

6. Principal components analysis (Cooley and Lohnes, 1971; Pimentel, 1979) was also run as part of Ordiflex (Gauch, 1977) for the same purposes as polar ordination. The principal components subroutines in Ordiflex give species ordinations along with the plot ordinations. Thus plots and species locations can be examined along corresponding principal components. Principal components analysis has been found to distort coenoclines when the between plot diversity is very large (Gauch and Whittaker, 1972; Noy-Meir and Austin, 1970). This occurs primarily because species rarely distribute themselves linearly as assumed by principal components along extensive environmental gradients. However, dry coniferous forests occupy a narrow portion of the forested environments in the study area (Dyrness et. al., 1974). So it was hoped that between plot diversity would be low enough to use principal components effectively.

7. Reciprocal averaging (available in Ordiflex, Gauch, 1977) was used for the same reasons as PCA and Polar ordination. This technique

was recently introduced to phytosociology by Hill (1973), and has been found to result in less distortion than principal components and polar ordinations when used to ordinate simulated coenclines (Gauch et. al., 1977; Whittaker and Gauch, 1978).

Latitudinal and temporal species correlations. Correlations between species and latitude were examined by coding the areas numerically from north to south and using SPSS (Nie et. al., 1975) to compute the nonparametric correlation coefficient Kendall's tau (Daniel, 1978) between area code and species cover on the dry site plots only. The areas, coded 1 through 7, respectively, are Detroit Ranger District, upper McKenzie River Basin, H.J. Andrews Experimental Ecological Reserve, remainder of the McKenzie Ranger District, Blue River Ranger District (exclusive of the Andrews), Oakridge Ranger District and Rigdon Ranger District.

Correlations between species cover and time since last major disturbance were also investigated using Kendall's tau in SPSS. This was important because strong correlations between species critical to the community classification and time would imply a successional relationship between communities.

Plant Communities

The entities described here are called plant community types and not habitat types because most of the plots used in their descriptions have experienced a major disturbance within the last 160 years. Thus, though the potential climax tree species can often be inferred from size classes when growth habits of the species are known, the vegetation on most plots has probably not stabilized.

This classification was developed using plant cover data almost exclusively, so discernible differences in other community characteristics result from correlations with vascular plant abundance.

Community types with their abbreviations and member plots are in Table 4. Three types are associated with a Pseudotsuga and two with a Libocedrus climax. A key to the plant communities is in Appendix 3. Average cover and constancy of species found on three or more plots are listed by community in Table 5 and are listed for each plot in Appendix 6. It is evident that many species, even some with high constancy, have low cover. A long list of species with low covers is a common characteristic of dry coniferous communities.

Basal areas are higher than expected (Table 6). This is probably due in part to inadvertant placement of plots in areas with high stocking. Any such bias is probably consistent. Basal areas range widely and are highest in the Libocedrus communities. Mean Pseudotsuga 100 year site index (McArdle et. al., 1961) ranges from 35 to 42 m and the communities with higher sites also have higher basal areas.

Stand tables were used to infer climax species status instead of cover of reproductive size trees as is commonly done. In general, the 1,000 m^2 plots seemed to provide representative stand tables (Table 7, Appendix 7).

Variation in stand age, time since last major disturbance and mean interval between fires is large (Table 8) reflecting the varied fire histories of these stands.

Table 4. Dry site community types recognized with abbreviations, computer codes and member plots.

Community type name	Abbreviation	Computer Code	Member plots
Pseudotsuga menziesii/*Holodiscus discolor*/grass	Psme/Hodi/grass	PMHDGR	
Aspidotus densa phase	Psme/Hodi/grass Asde phase	PMHGA	15,27,35,65
Collomia heterophylla phase	Psme/Hodi/grass Cohe phase	PMHGC	8,9,10,12,16,24,30,41, 51,52,53,54,55,56,57, 62,63,68,72
Pseudotsuga menziesii/*Holodiscus discolor*-*Acer circinatum*	Psme/Hodi-Acci	PMHDAC	1,2,4,7,17,28,29,34,36, 42,48,58
Pseudotsuga menziesii/*Berberis aquifolium*/*Disporum*	Psme/Beaq/Dispo	PMBADI	5,13,14,49,60,64,66, 67,69
Libocedrus decurrens/*Whipplea modesta*	Lide/Whmo	LDWM	11,18,45,46,50,59,61
Libocedrus decurrens/*Chimaphila umbellata*	Lide/Chum	LDCU	3,32,47,71,73

Table 5. Cover and constancy by community of taxa in the large data set (see Appendix 5) occuring on three or more dry site plots. Cover is calculated as the average over all the plots in which a taxa occurs because this is the expected cover if the species is present. Genus epithets without species include all taxa in the genus not identified to species.

Taxa	Pseudotsuga/Holodiscus/grass: Aspidotis phase	Pseudotsuga/Holodiscus/grass: Collomia phase	Pseudotsuga/Holodiscus/grass: both phases	Pseudotsuga/Holodiscus-Acer	Pseudotsuga/Berberis/Disporum	Libocedrus/Whipplea	Libocedrus/Chimaphila
	(cover / constancy)						
Number of plots	4	19	23	12	9	7	5
Trees							
Abies procera	-	1/5	1/4	-	-	-	.1/20
Abies grandis	-	1/11	1/9	-	.6/22	.6/29	.1/40
Acer macrophyllum	-	3/53	3/43	4/50	3/44	5/14	1/60
Arbutus menziesii	12/50	2/42	4/43	8/25	10/44	.2/14	1/20
Castanopsis chrysophylla	-	.8/32	.8/26	.9/50	.2/22	-	.2/60
Libocedrus decurrens	12/75	9/53	10/57	4/50	7/56	29/86	34/100
Pinus lambertiana	.1/25	2/37	2/35	3/33	.4/33	.8/43	-
Pinus ponderosa	25/25	-	25/4	-	15/22	8/14	-
Pseudotsuga menziesii	67/100	69/100	69/100	71/100	76/100	62/100	52/100
Prunus	-	.1/11	.1/9	-	-	-	-
Quercus garryana	4/25	.6/11	2/13	2/8	.1/22	-	-
Taxus brevifolia	-	1/5	1/4	.2/17	-	-	.1/60
Tsuga heterophylla	-	3/11	3/9	1/17	-	-	2/20
Tall Shrubs							
Acer circinatum	.1/50	1/47	.9/48	7/92	5/22	.8/43	.7/60
Acer glabrum	-	6/5	6/4	-	-	-	-
Amelanchier alnifolia	.1/25	.3/37	.3/35	.2/42	2/33	-	.1/20

Table 5. continued.

Taxa	Pseudotsuga/Holodiscus/grass Aspidotis phase	Collomia phase	both phases	Pseudotsuga/ Holodiscus-Acer	Pseudotsuga/ Berberis/ Disporum	Libocedrus/ Whipplea	Libocedrus/ Chimaphila
	(cover / constancy)						
Arctostaphylos columbiana	-	6/11	6/8	6/8	-	-	1/20
Ceanothus integerrimus	.6/50	.2/11	.4/17	3/25	.2/11	.1/43	.1/20
Cornus nuttallii	.1/25	.3/32	.3/30	3/50	.5/33	.2/14	.4/60
Corylus cornuta v. californica	.2/50	2/79	1/74	6/100	3/78	1/43	2/60
Holodiscus discolor	4/75	6/89	5/84	4/83	5/100	3/86	3/40
Philadelphus lewisii	-	.5/16	.5/13	.3/8	.9/56	-	-
Rhamnus purshiana	.3/25	.3/16	.3/17	.6/50	.1/11	.1/14	.2/40
Rhus diversiloba	4/75	4/42	4/48	3/58	5/78	.3/14	-
Ribes cruentum	-	.2/16	.2/13	.2/8	-	-	.1/20
Rosa gymnocarpa	.7/50	.8/84	.8/78	.4/92	3/100	3/57	.3/80
Rubus parviflorus	-	.2/16	.2/13	3/17	.2/22	-	-
Vaccinium parvifolium	-	.2/32	.2/26	.5/42	.3/11	.2/43	.1/40
Vaccinium memranaceum	-	1/5	1/4	-	-	-	.3/20
Low Shrubs							
Berberis aquifolium	.5/100	.3/58	.4/65	.4/42	3/89	.3/57	.3/60
Berberis nervosa	.9/75	4/89	4/87	12/100	5/78	3/86	5/100
Chimaphila menziesii	.2/50	.3/63	.3/61	.3/67	.1/33	.3/43	.2/80
Chimaphila umbellata	-	.7/47	.7/39	.4/58	-	.5/43	3/100
Galtheria shallon	-	2/16	2/13	4/33	1/11	-	.1/20
Loniceria ciliosa	.2/25	.2/11	.2/13	.2/25	.9/33	.3/57	-
Loniceria hispidula	.1/25	1/32	.9/30	1/8	.2/33	-	-
Pachistima myrsinites	-	.3/21	.3/17	-	-	.2/43	.3/20
Rubus ursinus	.1/25	.6/74	.5/65	.6/92	2/89	.3/57	.3/80
Symphoricarpos mollis	.3/25	2/89	2/87	2/75	3/100	3/57	.2/40
Whipplea modesta	11/75	5/89	6/87	7/92	10/89	15/100	-

Table 5. continued.

Taxa	Pseudotsuga/Holodiscus/grass: Aspidotis phase	Pseudotsuga/Holodiscus/grass: Collomia phase	Pseudotsuga/Holodiscus/grass: both phases	Pseudotsuga/Holodiscus-Acer	Pseudotsuga/Berberis/Disporum	Libocedrus/Whipplea	Libocedrus/Chimaphila
	(cover / constancy)						
Herbs							
Achillea millefolium	.2/50	.1/5	.2/13	.2/8	-	-	-
Achlys triphylla	-	.5/37	.5/30	2/58	1/11	7/43	3/80
Adenocaulon bicolor	.3/25	.5/63	.5/57	.8/50	2/89	2/71	3/40
Allotropa virgata	-	.1/11	.1/9	.2/8	-	-	-
Anemone deltoidea	-	.3/5	.3/4	.2/33	-	.3/43	.3/40
Apocynum androsaemifolium	.5/25	.3/16	.4/26	.2/17	.3/78	.2/14	-
Arenaria macrophylla	.3/75	.4/84	.4/83	.5/67	.7/89	.6/100	2/60
Aspidotis densa	.2/50	-	.3/9	.1/8	-	.3/14	-
Aster radulinus	.8/75	.5/42	.5/48	.8/42	.3/78	2/29	.3/20
Boraginaceae	.3/25	-	.3/4	.3/8	-	.3/14	-
Brodiaea congesta	.2/50	-	.2/9	.5/25	-	.2/14	.1/20
Calochortus	.3/25	.1/5	.2/9	-	.3/22	.2/29	-
Campanula prenanthoides	.3/25	.5/16	.5/17	-	.3/22	.3/14	.2/20
Campanula scouleri	6/25	.4/74	.8/65	.7/33	.8/67	.6/71	2/60
Cirsium	.3/50	.2/5	.3/13	.1/17	-	.3/29	.1/20
Collomia heterophylla	.2/75	.5/79	.5/78	2/33	.3/56	.3/29	2/40
Comandra umbellata	-	-	-	.3/8	.3/11	-	.3/20
Corallorhiza	-	.2/16	.2/13	-	.3/11	-	-
Corallorhiza maculata	-	.2/16	.2/13	.1/8	.2/22	.1/43	.2/40
Cynoglossum grande	-	.2/16	.2/13	-	.8/67	.1/14	-
Disporum hookeri	-	.2/32	.2/26	.2/25	.2/22	.1/14	-
Disporum	.1/25	.3/16	.3/17	-	.3/78	1/14	-
Epilobium minutum	.3/50	.2/16	.2/22	.3/25	-	-	-
Fragaria vesca	2/100	.6/95	.8/96	.5/83	1/100	2/71	.3/80
Galium aparine	.3/25	.3/53	.3/48	.2/25	.3/56	.3/29	.1/20
Galium oreganum	-	-	-	.1/8	.2/22	-	.1/40
Galium triflorum	-	.3/47	.3/39	.3/58	.2/33	.5/43	.3/20
Goodyera oblongifolia	.2/75	.2/68	.2/70	.2/67	.3/89	.3/86	.4/100

Table 5. continued.

Taxa	Pseudotsuga/Holodiscus/grass: Aspidotis phase	Pseudotsuga/Holodiscus/grass: Collomia phase	Pseudotsuga/Holodiscus/grass: both phases	Pseudotsuga/ Holodiscus-Acer	Pseudotsuga/ Berberis/ Disporum	Libocedrus/ Whipplea	Libocedrus/ Chimaphila
	(cover / constancy)						
Habenaria unalascensis	.6/50	.2/21	.3/26	.1/33	.3/44	.1/14	.3/20
Hieracium albiflorum	.8/100	.4/100	.5/100	.6/100	.5/100	.7/100	1/100
Iris	.2/50	.3/47	.3/48	.2/58	.2/56	.2/57	.3/80
Lathyrus nevadensis	.3/25	.3/11	.3/13	.7/17	2/11	3/29	2/20
Lathyrus polyphyllus	-	9/26	9/22	7/17	5/33	-	-
Ligusticum apiifolium	-	-	-	-	.8/33	.3/14	-
Linnaea borealis	.2/25	1/37	1/35	3/50	.7/78	1/43	3/60
Lomatium martindalei	-	.6/11	.6/9	.2/17	-	-	-
Lotus micranthus	.1/25	.3/16	.3/17	.9/25	-	-	-
Lotus nevadensis	-	1/5	1/4	-	.1/11	-	.2/20
Lupinus latifolius	-	-	-	-	5/11	-	4/20
Madia madioides	.3/50	.5/53	.4/52	.4/42	.4/67	.3/43	-
Mimulus	-	.3/5	.3/4	10/8	-	.2/14	-
Monotropa uniflora	-	-	-	.2/17	-	.3/14	-
Montia	.2/50	.4/32	.3/35	-	.3/11	.3/29	-
Nemophila parviflora	.3/25	2/16	1/17	.3/17	.2/22	-	-
Osmorhiza chilensis	-	.2/21	.2/17	.2/25	.4/89	.1/14	-
Phlox adsurgens	-	-	-	-	.5/33	-	-
Polypodium glycyrrhiza	-	.3/5	.3/4	-	-	-	.2/40
Polypodium hesperium	.2/25	.1/16	.1/17	.3/8	-	-	.2/20
Polystichum lonchitis	.2/75	.2/42	.2/48	.2/42	.1/22	.3/29	.1/60
Polystichum munitum	2/75	1/42	2/48	3/58	2/33	3/14	1/40
Polystichum munitum var. imbricans	.3/25	.7/47	.7/43	.6/17	.1/11	.6/71	.3/40
Polystichum munitum var. munitum	-	.3/16	.3/13	1/17	2/22	4/29	.1/20
Psoralea physosides	-	.3/5	.3/4	-	.3/22	-	-
Pteridium aquilinium	.2/25	1/5	.6/9	.3/17	.3/67	.2/14	.6/40
Pyrola aphylla	.2/25	.2/47	.2/43	.2/33	.2/67	.2/29	.2/20
Pyrola picta	--	.3/32	.3/26	.2/17	-	-	.3/80

Table 5. continued.

Taxa	Pseudotsuga/Holodiscus/grass: Aspidotis phase	Pseudotsuga/Holodiscus/grass: Collomia phase	Pseudotsuga/Holodiscus/grass: both phases	Pseudotsuga/Holodiscus-Acer	Pseudotsuga/Berberis/Disporum	Libocedrus/Whipplea	Libocedrus/Chimaphila
	(cover / constancy)						
Satureja douglasii	.3/25	1/32	1/30	.3/25	.5/67	.3/71	.3/40
Sedum	.3/25	-	.3/4	.2/8	-	-	.3/20
Selaginella wallacei	.5/75	.3/5	.5/17	.3/8	-	.3/14	.7/40
Senecio	-	.4/11	.4/9	-	-	-	.2/20
Smilacina racemosa	-	-	-	.2/42	.3/11	.2/43	-
Smilacina stellata	-	.1/16	.1/13	.1/8	-	4/14	-
Synthyris reniforms	1/25	.7/26	.8/26	3/33	1/44	1/57	.1/20
Trientalis latifolia	.3/50	.7/84	.6/78	.8/92	.7/67	1/71	3/100
Trillium ovatum	-	.1/5	.1/4	.1/8	-	-	-
Vancouveria hexandra	.2/25	.2/16	.2/17	.2/42	.6/78	.3/43	-
Viola sempervirens	-	-	-	.7/33	.2/56	.3/29	.3/40
Vicia americana	.3/25	3/58	2/52	3/42	3/89	7/71	-
Xerophyllum tenax	-	.2/5	.2/4	-	.1/11	-	-
Grasses and Grass-Like Plants							
Bromus	-	4/5	4/4	.2/17	.3/11	-	-
Bromus vulgaris	3/50	1/68	1/65	1/58	1/89	5/86	.9/60
Danthonia	4/25	-	4/4	-	-	-	-
Elymus glaucus	1/75	.5/37	.8/43	.6/42	.8/33	.5/43	-
Festuca	1/25	3/21	2/22	-	1/11	-	-
Festuca californica	20/50	1/16	9/22	-	4/67	.3/29	-
Festuca occidentalis	-	1/68	1/57	2/67	3/67	2/86	.8/100
Festuca rubra	5/50	2/32	2/35	.3/8	2/22	-	.1/20
Festuca subuliflora	-	.3/16	.3/13	.3/17	.3/11	.7/29	.3/20
Koeleria cristata	.7/50	-	.7/9	-	-	-	-
Melica subulata	2/25	1/21	2/22	.7/17	.9/89	.6/29	-
Melica harfordii	3/100	.9/58	1/65	.6/42	.7/44	1/57	.2/60
Trisetum canescens	5/75	.4/47	2/52	1/33	.4/67	.9/43	.3/20
Carex	-	.2/21	.2/17	.2/8	4/33	.2/29	.2/40
Luzula campestris	.3/75	.3/68	.3/70	.2/56	.3/44	.1/14	.3/20

Table 6. Basal area and *Pseudotsuga* site index (McArdle et al. 1961) by community type. Standard deviations are given in parentheses.

Community type	Number of plots	Basal area (m^2/ha) *Pseudotsuga*	Basal area (m^2/ha) *Libocedrus*	Basal area (m^2/ha) All species	*Pseudotsuga* site index (m at 100 yrs)
Pseudotsuga/*Holodiscus*/grass					
Aspidotis phase	4	44 (22)	9 (12)	59 (13)	36 (6)
Collomia phase	19	55 (13)	5 (8)	63 (13)	35 (4)
both phases	23	53 (15)	6 (8)	62 (13)	35 (4)
Pseudotsuga/*Holodiscus*-*Acer*	12	61 (22)	1 (4)	65 (23)	37 (8)
Pseudotsuga/*Berberis*/*Disporum*	9	69 (28)	5 (9)	79 (32)	41 (3)
Libocedrus/*Whipplea*	7	59 (24)	24 (11)	85 (25)	38 (6)
Libocedrus/*Chimaphila*	5	64 (19)	29 (13)	95 (12)	42 (4)
All dry site plots	56	59 (21)	9 (13)	72 (23)	37 (6)
All *Tsuga*-climax plots	14	69 (33)	0 (0)	77 (30)	40 (6)

Table 7. Dry coniferous forest stand tables by community type. Species[1/] are subdivided by codes for live (L), dead (D), mineral soil rooted (M), and wood rooted (W). Reproduction (REPRO) includes only trees less than 137 cm tall. The 10 cm DBH size classes are identified by their upper diameter limits.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

ASPIDOTIS DENSA PHASE

* * AVERAGE VALUES FOR 4 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	365.4	189.0	166.7	56.9	29.8	5.8	6.2	12.6	21.5	11.9	9.2	5.6	0.0	0.0	326.2	44.2	4
LIDE	L	M	174.9	79.3	23.0	8.9	0.0	6.0	2.9	3.1	3.1	0.0	0.0	0.0	3.1	0.0	50.1	8.5	3
ABGR	L	M	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	.1	1
ARME	L	M	0.0	0.0	0.0	8.5	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	.7	2
PILA	L	M	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PIPO	L	M	0.0	8.2	2.7	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.7	0.0	8.2	4.5	1
QUGA	L	M	0.0	0.0	31.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	.6	1
LIVE TOTALS			602.0	276.4	226.8	74.3	32.8	11.8	9.1	15.6	24.6	14.6	9.2	5.6	5.8	0.0	430.4	58.6	
PSME	D	M	0.0	64.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	5.8	3.0	4
LIDE	D	M	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	D	M	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	.3	1
PIPO	D	M	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
QUGA	D	M	0.0	0.0	18.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8	.4	1

Table 7. continued.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

COLLOMIA HETEROPHYLLA PHASE

* * AVERAGE VALUES FOR 19 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	350.5	243.2	92.7	66.8	59.3	63.1	32.4	15.0	12.2	7.0	5.6	4.6	2.0	.7	361.3	55.3	19
LIDE	L	M	64.7	21.4	18.9	9.4	9.1	7.1	1.8	2.4	1.3	.6	0.0	0.0	0.0	0.0	50.8	5.2	13
TSHE	L	M	0.0	.6	.6	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.0	1
ABGR	L	M	0.0	6.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.1	5
ABPR	L	M	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	11.5	12.3	7.7	4.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	.5	8
ARME	L	M	0.0	5.9	4.7	1.9	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	.4	7
CACH	L	M	8.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	3
PILA	L	M	12.0	5.9	1.8	0.0	0.0	.6	0.0	1.3	0.0	1.3	0.0	0.0	0.0	0.0	5.0	1.3	8
PRUNU	L	M	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	1.2	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	.1	2
SALIX	L	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	0.0	0.0	0.0	2.0	0.0	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	.3	2
CADE	L	W	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	7.6	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.1	3
LIVE TOTALS			446.9	311.6	130.2	88.9	70.8	70.9	34.9	18.7	13.5	8.9	5.6	4.6	2.0	.7	449.6	63.3	
PSME	D	M	0.0	33.2	16.9	2.5	2.6	1.9	3.0	3.1	3.2	.7	2.5	0.0	.7	0.0	37.0	7.2	19
LIDE	D	M	0.0	7.1	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	4
ACMA	D	M	0.0	1.8	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	3
ARME	D	M	0.0	1.1	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	2
CACH	D	M	0.0	3.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	.1	3
QUGA	D	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	D	W	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

Table 7. continued.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

* * AVERAGE VALUES FOR 23 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	353.1	233.8	105.5	65.1	54.1	53.2	27.8	14.6	13.8	7.9	6.2	4.7	1.7	.5	355.2	53.4	23
LIDE	L	M	83.8	31.5	19.6	9.3	7.5	6.9	2.0	2.6	1.6	.5	0.0	0.0	.5	0.0	50.7	5.7	16
TSHE	L	M	0.0	.5	.5	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	1
ABGR	L	M	0.0	5.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	.1	6
ABPR	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	9.5	10.1	6.3	3.3	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	.4	8
ARME	L	M	0.0	4.8	3.9	3.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	.4	9
CACH	L	M	6.9	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	.1	3
PILA	L	M	20.6	4.9	1.5	0.0	0.0	.5	0.0	1.1	0.0	1.1	0.0	0.0	0.0	0.0	4.1	1.1	9
PIPO	L	M	0.0	1.4	.5	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	0.0	.5	0.0	1.4	.8	1
PRUNU	L	M	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	6.5	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	.2	3
SALIX	L	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	0.0	0.0	0.0	1.6	0.0	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	.2	2
CADE	L	W	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	6.3	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.1	3
LIVE TOTALS			473.9	305.5	147.0	86.4	64.2	60.6	30.4	18.2	15.5	9.9	6.2	4.7	2.7	.5	446.3	62.5	
PSME	D	M	0.0	36.7	14.4	2.0	2.1	1.6	2.5	2.6	2.7	.6	2.1	.5	.5	0.0	31.6	6.5	23
LIDE	D	M	0.0	7.3	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	5
ACMA	D	M	0.0	1.5	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	3
ARME	D	M	0.0	.9	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.0	2
CACH	D	M	0.0	2.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	.0	3
PILA	D	M	0.0	0.0	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.1	1
PIPO	D	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
QUGA	D	M	0.0	.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	.1	2
TSHE	D	W	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

Table 7. continued.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR-ACER CIRCINATUM COMMUNITY TYPE

* * AVERAGE VALUES FOR 12 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
				--------NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES--------															
PSME	L	M	176.6	165.4	70.8	76.8	60.5	48.4	27.2	21.3	13.2	8.3	6.1	7.2	1.1	2.9	343.9	61.4	12
LIDE	L	M	37.3	7.2	6.2	1.1	1.0	3.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	1.3	6
ACMA	L	M	39.8	13.2	4.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	.2	4
ARME	L	M	0.0	3.0	3.9	.9	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	.2	3
CACH	L	M	37.3	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
CONU	L	M	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	.0	1
PILA	L	M	3.1	0.0	1.1	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	.9	4.2	1.8	4
QUGA	L	M	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	1
TABR	L	M	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PSME	L	W	18.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
TSHE	L	W	0.0	2.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	.0	2
LIVE TOTALS			333.2	197.4	90.0	78.8	63.6	51.6	30.4	22.4	13.2	8.3	6.1	7.2	1.1	3.9	376.6	65.1	
PSME	D	M	1.0	20.0	19.6	7.9	2.1	2.2	3.9	1.0	0.0	0.0	1.1	0.0	3.2	0.0	46.9	6.8	12
LIDE	D	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	.9	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	.1	2
PSME	D	W	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

Table 7. continued.

PSEUDOTSUGA MENZIESII/BERBERIS AQUIFOLIUM/DISPORUM COMMUNITY TYPE

* * AVERAGE VALUES FOR 9 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
				NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES															
PSME	L	M	140.1	330.2	87.6	69.1	38.6	30.4	22.7	20.6	12.5	18.2	8.8	10.6	3.5	4.3	326.9	68.8	9
LIDE	L	M	63.2	43.5	46.3	11.7	4.3	3.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	68.6	4.9	5
ABGR	L	M	0.0	4.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	.1	2
ACMA	L	M	70.9	4.0	7.9	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	.3	2
ARME	L	M	22.9	24.5	15.1	5.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.1	.8	3
CACH	L	M	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	L	M	84.5	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	4
PIPO	L	M	0.0	0.0	0.0	1.1	2.3	2.3	1.1	1.1	2.3	1.1	0.0	1.1	0.0	0.0	12.5	3.9	2
PSME	L	W	16.6	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.3	2
LIVE TOTALS			398.0	413.7	159.0	90.4	46.4	35.6	27.2	21.8	14.7	19.3	8.8	11.8	3.5	5.5	444.2	79.1	
PSME	D	M	0.0	53.8	15.2	3.6	3.6	1.2	1.1	2.3	0.0	1.2	1.2	1.2	1.2	0.0	31.8	6.0	8
LIDE	D	M	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
ACMA	D	M	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	5.8	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	.3	3
CACH	D	M	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	D	M	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PIPO	D	M	0.0	0.0	1.1	1.1	1.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.1	5.7	2.7	2

Table 7. continued.

LIBOCEDRUS DECURRENS/WHIPPLEA MODESTA COMMUNITY TYPE

* * AVERAGE VALUES FOR 7 PLOTS. * *

SPP ALPHA CODE	CODES L M + + D M	REPRO NUM /HA	*-----NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES-----* 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L M	192.0	43.3	51.3	48.0	30.1	20.9	24.3	14.4	16.1	10.9	14.1	4.7	4.9	4.3	244.0	58.8	7
LIDE	L M	224.8	177.5	183.1	61.3	17.9	9.0	12.4	12.0	9.3	1.6	1.7	0.0	0.0	0.0	308.3	23.9	7
ABGR	L M	0.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L M	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	.5	1
ARME	L M	31.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PILA	L M	31.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.1	1.1	1
PIPO	L M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6	1.1	1
LIVE TOTALS		479.0	231.7	235.9	109.3	53.4	29.9	36.8	26.4	25.4	12.5	18.9	4.7	4.9	4.3	562.3	85.5	
PSME	D M	0.0	14.0	1.6	1.7	12.5	6.3	1.6	3.3	0.0	0.0	0.0	0.0	0.0	0.0	26.9	3.9	5
LIDE	D M	0.0	24.3	42.6	1.6	1.6	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.4	1.5	6
PILA	D M	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.3	1
PIPO	D M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	1.3	1

Table 7. continued.

LIBOCEDRUS DECURRENS/CHIMAPHILA UMBELLATA COMMUNITY TYPE

* * AVERAGE VALUES FOR 5 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	141.5	146.0	58.4	34.5	29.8	20.6	18.9	21.4	12.1	14.8	16.3	4.6	2.1	7.1	240.7	64.1	5
LIDE	L	M	1183.1	645.1	143.9	49.6	30.9	11.9	8.8	2.2	4.8	0.0	2.4	2.4	2.1	4.3	263.3	29.5	5
ABPR	L	M	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	0.0	0.0	5.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	.4	1
ARME	L	M	0.0	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	1
CACH	L	M	0.0	0.0	2.1	12.8	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	1.4	1
TSHE	L	W	0.0	5.1	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	1
THPL	L	W	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
LIVE TOTALS			1324.6	813.7	212.1	102.0	62.8	32.6	29.8	23.6	16.8	14.8	18.7	7.0	4.3	11.4	536.0	95.5	
PSME	D	M	0.0	91.7	13.2	0.0	0.0	2.4	2.4	0.0	0.0	0.0	0.0	0.0	2.4	0.0	20.5	4.1	4
LIDE	D	M	7.3	148.8	15.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	1.0	4
CACH	D	M	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	.0	1
PSME	D	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.6	1.8	1

Table 7. continued.

TSUGA HETEROPHYLLA CLIMAX OR COCLIMAX SITES

* * AVERAGE VALUES FOR 14 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	51.5	78.5	72.9	78.5	69.1	36.9	29.8	18.0	11.1	11.7	14.1	4.9	4.0	4.9	355.8	69.5	14
LIDE [1]	L	M	0.0	2.6	0.0	.8	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	.1	4
TSHE	L	M	136.7	53.0	17.2	8.3	1.7	8.3	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.1	3.6	12
ABAM	L	M	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	.1	1
ABGR	L	M	15.3	5.3	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	1
ABPR	L	M	15.3	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACGL	L	M	0.0	6.2	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	.1	1
ACMA	L	M	0.0	9.5	5.2	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	.2	5
ARME	L	M	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	.0	1
CACH	L	M	124.4	67.9	45.9	18.8	5.5	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.1	2.8	8
PILA	L	M	0.0	.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.0	1
PRUNU	L	M	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	.1	1
TABR	L	M	17.2	1.7	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	.1	2
THPL	L	M	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	17.9	12.7	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.1	2
TSHE	L	W	86.6	17.5	4.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	.2	4
ACMA	L	W	0.0	.8	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	1
LIVE TOTALS			464.8	259.1	158.8	109.6	78.6	46.0	34.4	18.0	11.1	11.7	14.1	4.9	4.0	4.9	496.1	76.9	
PSME	D	M	0.0	50.3	17.9	9.5	3.4	4.2	4.0	.8	3.9	0.0	.9	4.2	3.9	.8	53.4	14.3	14
TSHE	D	M	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ABGR	D	M	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	D	M	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
CACH	D	M	0.0	12.2	15.5	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	.4	6
PILA	D	M	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	.1	1
PSME	D	W	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

1/ The species alpha codes are: Psme = Pseudotsuga menziesii, Lide = Libocedrus decurrens, Tshe = Tsuga heterophylla, Abam = Abies amabilis, Abgr = Abies grandis, Abpr = Abies procera, Acgl = Acer glabrum, Acma = Acer macrophyllum, Arme = Arbutus menziesii, Cach = Castanopsis chrysophylla, Conu = Cornus nuttalii, Pila = Pinus lambertiana, Pipo = Pinus ponderosa, Prunu = Prunus spp., Quga = Quercus garryana, Salix = Salix spp., Tabr = Taxus brevifolia, Thpl = Thuja plicata.

Table 8. Summary of fire data on the vegetation plots by community type.

Community type	Number of plots	Number of fire intervals	Stand age (age of oldest cohort)	Time since last major fire	Mean interval[1/] between fires	Plots experiencing a major fire since initiation of oldest cohort	Plots burned since initiation of oldest cohort
			- - - - mean, (standard deviation), range		- - - - -	- - - - - - - - percent	- - - - - - - -
Pseudotsuga/ Holodiscus/grass							
Aspidotis phase	4	6	196 (104) 94-330	128 (52) 82-197	72 (41) 26-131	50	75
Collomia phase	19	12	198 (84) 75-337	133 (51) 63-266	107 (65) 34-217	47	58
both phases	23	18	198 (84) 75-337	132 (51) 63-266	96 (59) 26-217	48	61
Pseudotsuga/ Holodiscus-Acer	12	11	294 (151) 89-450	162 (89) 89-420	111 (68) 41-232	50	58
Pseudotsuga/ Berberis Disporum	9	9	226 (85) 96-323	184 (88) 96-322	118 (59) 27-207	33	78
Libocedrus/ Whipplea	7	7	244 (92) 135-414	194 (52) 135-294	94 (46) 53-186	29	71
Libocedrus/ Chimaphila	5	4	239 (95) 144-399	155 (57) 98-220	104 (86) 14-216	60	60
All dry site plots	56	50	232 (105) 75-450	156 (69) 63-420	103 (60) 14-232	45	64
All _Tsuga_-climax plots	14	5	221 (136) 74-450	150 (86) 74-401	144 (122) 40-284	21	43

1/ Intervals based on estimated ages of marked diameter cohorts (e.g., uncored large old-growth trees) are not included.

Pseudotsuga menziesii/Holodiscus discolor/grass Community Type

This community type has the widest distribution of all the dry types. It occurs in all the areas sampled and from 525 to 1,250 m in elevation. It occupies south- to west-facing, 42 to 80 percent slopes. Stands are usually on side ridges and below the brows of benches and main ridges but also occupy landslide scars, slopes below cliffs, main ridges and, in one instance, an ordinary side slope. Bedrock geology (Peck et. al., 1964) is about evenly split between the Little Butte Volcanic Series and the Sardine Formation, both of Tertiary age. However, several of the eastern most plots were on the Quaternary and Tertiary volcanics characteristic of the High Cascades. The bedrock observed on the plots includes andesites, breccias, basalts and diorite -- most of the parent materials in the area.

The majority of soils supporting this community are poorly developed and are classed as Inceptisols and Entisols though Alfisols were found on two plots (see description of typical profile in Appendix 8). Soil depths generally range from 20 to 250 cm and contain 20 to 70 (mean 43) percent coarse, fragments. Textures are usually loamy, occasionally coarser and rarely finer. The available water capacity is often low (two to 14, mean seven cm) in the top meter due to shallow profiles, large volumes of coarse fragments and occasionally, coarse textures.

Climax status for *Pseudotsuga* is indicated by its dominance in the understory (Table 7), although *Libocedrus* is coclimax in some stands (Appendix 7). Many other tree species occur but are less important (Tables 5 and 7). The tall shrub layer is generally depauperate except for _Holodiscus discolor_ and, occasionally, _Rhus diversiloba_. _Corylus cornuta_ and _Rosa gymnocarpa_ are common but generally have low cover. The most important low shrubs are _Berberis nervosa_, _Whipplea modesta_ and _Symphoricarpos mollis_. Common herbs are _Campanula scouleri_, _Collomia heterophylla_, _Fragaria vesca_, _Hieracium albiflorum_ and _Trientalis latifolia_ though each average less than one percent cover on the plots where they occur. _Lathyrus polyphyllus_ is an occasional strong dominant. The grasses _Bromus vularis_, _Festuca occidentalis_, _Melica harfordii_ and _Trisetum canesceus_ are most common and typically have higher covers (one to two percent) than most herbs.

The oldest cohort in these stands averages 198 years old but the average time since the last major fire was only 132 years (Table 8). This is the result of major fires (fires which initiated at least half of the canopy as judged from the stand tables in Appendix 7 and field observations) on 48 percent of the plots since stand initiation (initiation of the oldest cohort, Table 8). Thus the vegetation on most of these sites was judged floristically immature. This does not necessarily indicate that this community represents an early successional stage of other dry site communities. It may just occupy sites which burn more frequently. This is weakly indicated by the relatively short mean interval between fires of 96 years (Table 8).

Average basal area and site index are slightly lower than the other communities (Table 6). This is probably due in part to younger stands in this type (Table 8) which would have less basal area and result in a smaller over-estimate of site index. Errors in estimated site index are positively correlated with years beyond index age when

McArdle et. al.'s (1961) site curves are used on dry site Pseudotsuga (see Chapter 6).

Two phases of this community were recognized, the Aspidotis densa phase and the Collomia heterophylla phase (Table 4).

Aspidotis densa phase. The Asde phase can be called the dry phase of the driest Pseudotsuga community. It is recognized from two plots each in the central and southern portions of the Willamette National Forest. Elevationally, it does not extend as high as the Collomia phase (only to 900 m). Bedrock outcrops average 10 percent cover. Although Alfisols occur in two of four plots, they are probably not typical. In one of these what is probably a Xerorthent over shall bedrock is also present.

Libocedrus appears to be (Table 7) a significant climax component in three of the four stands. Floristicly the Aspidotis phase is distinguished from all other dry communities by higher constancies of Aspidotis densa, Selaginella wallacei, Brodiaea congesta, Circium and Danthonia. Both Selaginella and Aspidotis grow on rocks, though Aspidotis was found most commonly on thin, exposed soil. Brodiaea was found consistently on oak balds (which are not sampled) and much more rarely in the coniferous forest. Brodiaea and Aspidotus are important in two of the dry, non-forested associations of Hickman (1976). Thus this group (Aspidotus, Brodiaea and Selaginella) seems to indicate the dry and/or hot extreme of Pseudotsuga's range in this area. Sporadic occurrence of these species in other Pseudotsuga communities is probably due to drier local microhabitats. The Aspidotis phase also has greater grass cover and species richness than the Collomia phase and is more depauperate in shrubs except for Rhus, Berberis aquifolium and Whipplea modesta.

Collomia Heterophylla phase. This is the major phase of the Pseudotsuga/Holodiscus/grass community incorporating 19 of its 23 plots. Rock outcrops average only three to four percent. Also contrasting with the Aspidotis phase, Libocedrus is judged a significant climax component in only four out of 19 plots (Appendix 7). Acer macrophyllum, Holodiscus, Berberis nervosa, Symphoricarpos mollis, Adenocaulon bicolor, Campanula scouleri, Collomia, Trientalis latiofolia, Vicia americana, and Festuca occidentialis are more important than in the Aspidotis phase.

Pseudotsuga menziesii/Holododiscus discolor-Acer circinatum Community Type

This community is located mainly (nine of 12 plots) in the Blue River and McKenzie Districts (Figure 2). It is less common in the southern third of the study area with only two of 26 plots in the Oakridge and Rigdon districts in this type. The Pseudotsuga/Holodiscus-Acer type is found from 490 to 975 m in elevation on south to southwest facing 49 to 80 percent slopes. It usually occurs below the brows of ridges, on side slopes or, occasionally, on landslide scars or side ridges. The plots were divided about evenly between the Little Butte Volcanic Series, the High Cascades Volcanics and the Sardine Formation (Peck et. al., 1964). Bedrock is usually breccia and basalt or, less commonly, andesite and tuffs.

The poorly developed soils are usually Inceptisols and Entisols although one Alfisol was found (profile description in Appendix 8). Depth to bedrock ranges from 50 to over 250 cm. Most plots have coarse textured soils and the remainder are on loams and silt loams. Coarse fragments range from 23 to 80 (mean 52) percent. These three characteristics explain a low average water holding capacity of 6.6 cm (range 2.1 to 13.0 cm).

Pseudotsuga is climax on all but two plots. Libocedrus is a co-climax species on one of these and Acer macrophyllum dominates tree reproduction on the other (Appendix 7). In this instance the high Acer macrophyllum reproduction is probably a peculiarity of stand history and not indicative of climax status. Libocedrus is less abundant in all size classes in the Pseudotsuga/Holodiscus-Acer than in any other community (Table 7).

Though Holodiscus and Rhus are about as important in the Pseudotsuga/Holodiscus/Acer community as in most others, the greater importance of other shrubs is striking. Higher abundances of Acer circinatum, Corylus cornuta, Berberis nervosa, and Gaultheria shallon make this community structurally as well as floristically distinct from the other dry communities (Table 5). These species and Whipplea dominate the shrub layers. Common herbs include Achlys triphylla, Adenocaulon bicolor, Linnaea boreallis, Polystichum munitum and Trientalis latifolia (Table 5). Occasional dominat herbs include Lathyrus polyphyllus and Vicia americana. Grasses are less abundant than in most other communities (Table 5). Stand age, time since last major fire and the mean interval between fires are all larger than in Pseudotsuga/Holodiscus/

grass community; thus this community probably burns less frequently. The lower incidence of this community on ridges may partly explain this.

Basal area and site index in the Pseudotsuga/Holodiscus-Acer community are typical for these dry coniferous forests (Table 6).

Pseudotsuga menziessii/Berberis aquifolium/Disporum Community Type

This community type occurs only on the southern ranger districts (Oakridge and Rigdon). Plots range from 495 to 977 m in elevation. They are found on 20 to 67 percent south to west facing slopes. The Pseudotsuga/Berberis/Disporum community occurs on more stable landforms - ordinary side slopes and benches - than other dry types.

All plots are in areas mapped as the Little Butte Volcanic Series (Peck et. al., 1964). Bedrock as indicated by fragments in the soil was about equally divided between andesite, basalt, and breccia. Bedrock outcrops are quite rare (one percent cover on only one plot). Alfisols dominate (eight of nine plots) in contrast to soils associated with other dry conifer communities (see Appendix 8 for profile description). Soil profiles are generally deeper than in other communities, ranging from about 1.0 to over 2.5 m. Textures are generally loams and silt loams in the surface soil and silty clay loams and clay loams in the B horizon. Coarse fragments average only 27 (range 3 to 64) percent, another contrast with other dry conifer types. The estimated water holding capacity of 13 cm (range 7 to 19 cm) in one meter is higher than other communities due to greater soil depth, finer texture and less coarse fragments.

Diameter distributions indicate that Pseudotsuga is the climax tree species on five plots and is coclimax with Libocedrus on four plots (Table 7, Appendix 7). Libocedrus is more numerous in the zero to 20 cm diameter range on plots 60 and 66 but these plots are assigned to this community based on consideration of all floristic characters. Libocedrus saplings in both plots are in floristically distinct patches. Arbutus menziesii and Pinus ponderosa are occasionally important trees.

Holodiscus, Rhus, Corylus and Rosa gymnocarpa typically share dominance in the tall shrub layer (Table 5). Whipplea, Berberis nervosa, Symphoricarpos and Berberis aquifolium are the dominant low shrubs. Holodiscus, Philadelphus lewisii, Rhus, Rosa, Berberis aquifolium and Symphoricarpos each reach their greatest importance in this community. Community dominant herbs include Vicia americana, Fragaria vesca and Adenocaulon bicolor (Table 5). Relative lack of Polystichum munitum and greater importance as a group of Disporum, Adenocaulon, Cynoglossum grande, Pteridium aquilinum, Pyrola aphylla and Osmorhiza chilensis help distinguish the Pseudotsuga/Berberis/ Disporum type from other dry communities.

Stand age is typical while time since last major fire and mean interval between fires are slightly higher than most dry forests (Table 8).

Community productivity appears high for dry site forests (Table 6). Mean site index and basal area are 41 m and 79 m^2/ha, respectively. This is consistent with the more developed, deeper soils with greater available water-holding capacity on gentler, less exposed slopes.

Libocedrus decurrens/Whipplea modesta Community Type

Four of seven plots representative of this community are located in the Oakridge District with two in the Blue River and one in the Rigdon Districts. It occurs on a wide range of slopes (43 to 72 percent) facing south to west southwest. It is found on brows of ridges, side slopes, landslide scars, side ridges and benches. Plots occur on the Sardine Formation, Little Butte Volcanic Series and High Cascades volcanics of Peck et. al. (1964). Bedrock on the plots is primarily andesite and breccia with some basalt.

Soils are classified primarily as Entisols and Inceptisols except for one plot which had an Alfisol (see Appendix 8 for a description of a typical profile). Soil depth ranges from 50 to about 200 cm and coarse fragments average 26 (range 10 to 50) percent. Surface horizon textures are usually silt loam and loam (occasionally as coarse as sand) and B-horizon textures are similar with the exception of one silty clay loam. These characteristics combine for a wide range in estimated water-holding capacity of 4 - 16 cm (mean 10 cm).

Libocedrus is the primary climax tree on all plots though Pseudotsuga is coclimax on one plot and plays a minor role on another, based on size class distributions (Table 7, Appendix 7).

Shrub layer dominants are Holodiscus, Rosa, Whipplea, Berberis nervosa, Berberis aquifolium and Symphoricarpos (Table 5). Rhus is characteristically absent, in contrast to the Pseudotsuga communities. The herbaceous layer is variously dominated by Polystichum munitum, Achlys triphylla, Lathyrus nevadensis and Vicia americana. Bromus vulgaris and Festuca occidentalis are the most common grasses.

The mean time since the last major fire on the Libocedrus/Whipplea plots is high relative to the average dry site (Table 6). This partially explains the higher basal area in this type (Table 8). Total basal area and the proportion made up by Libocedrus are high relative to the Pseudotsuga communities. Pseudotsuga site index at 100 years is 38 m (Table 6).

Libocedurs decurrens/Chimaphila menziesii Community Type

The Libocedrus/Chimaphila community is the most geographically restricted occurring only in the upper McKenzie River drainage (i.e., north of Belknap Springs). Also, it predominates in this area; five of the six dry conifer plots in this area are assigned to the Libocedrus/Chimaphila type. Its restricted range may account for an elevation span of only 740 to 884 m. Slopes are 37 to 80 percent and aspect ranges from east to west. The Libocedrus/Chimaphila community is found primarily on side ridges but also occurs on the crests and just below the brows of main ridges.

All five plots in this community are on the volcanic rocks of the High Cascades and Boring Lava mapping unit of Peck et. al. (1964). Bedrock is andesite or basalt with some breccia on one plot.

The soils are typically Inceptisols though an Alfisol occurs on a portion of one plot. The average plot soil depth ranges from 46 to approximately 200 cm. Both surface and subsurface horizon textures are quite coarse in contrast to all dry communities but the Pseudotsuga/Holodiscus-Acer type. Sandy loams are most common with occasional loamy sands, silt loams and loams. Coarse fragments range from

23 to 44 (mean 31) percent. These characteristics combine to give an average estimated water-holding capacity of nine cm in the top 100 cm (range five to 11 cm).

Libocedrus dominates the reproductive tree size classes in the Lide/Chum community (Table 7) and *Pseudotsuga* always dominates the overstory (Table 5). Other common trees are *Acer macrophyllum*, *Castanopsis chrysophylla*, and *Taxus brevifolia* which occur with low covers. *Taxus* reaches its highest constancy in this community.

The tall shrub layer in the *Libocedrus/Chimaphila* plots is generally sparse. *Holodiscus*, *Rhus*, *Rosa*, *Symphoricarpos* and *Whipplea*, common dry site shrubs, reach their lowest importance here (Table 5). *Corylus*, *Berberis nervosa*, and *Chimaphilla umbellata* are dominant shrubs. *Trientalis latifolia* and *Pyrola picta* are characteristic herbs. *Trientalis* is the most common dominant herb and *Achlys*, *Adenocaulon*, *Campanula scouleri*, and *Linnaea* dominate occasionally. *Bromus vulgaris* and *Festuca occidentalis* are the most common grasses although grass cover is generally low.

Stand age, time since last major disturbance, and mean interval between fires are typical for dry sites (Table 8). Basal areas are the highest of the dry communities (Table 6, Appendix 7). These high values cannot be explained by older stand ages. *Libocedrus* makes up a relatively high proportion of the basal area, which is similar to the *Libocedrus/Whipplea* type.

Floristic Relationships

Shrub Correlation

Examination of the Kendall's tau correlation coefficients between shrub species in Pseudotsuga communities indicated the existence of two groups, the Acer circinatum group and the Holodiscus discolor group (Table 9). Species not shown did not have high similarities to species in either group or were not included because they were present in few plots or were not thought to have classificatory significance. The species in each group are positively correlated with each other, often significantlyso, and species in different groups are uncorrelated or usually negatively correlated. The Acer circinatum group shows much higher covers in the shrubby Pseudotsuga-Tsuga/Corylus habitat type in the H.J. Andrews than in the Pseudotsuga/Holodiscus habitat type (Dyrness et. al., 1974). Dyrness et. al. (1974) interpreted the Pseudotsuga/Holodiscus habitat type to be hotter and drier than the Pseudotsuga-Tsuga/Corylus (Figure 1) and this is supported by temperature and plant moisture stress measurements (Figure 9). Thus the species in the Acer circinatum group appear to be correlated with cooler and moister conditions in this portion of their ranges.

Presence of greater than 10 percent cover of this group is the primary tool used here to assign plots to Pseudotsuga/Holodiscus-Acer community (Table 5). This community is interpreted as being moister and cooler than the Pseudotsuga/Holodiscus grass community based on the known distributions of these species (see above discussion). Comparison of plant moisture stress on the adjacent reference stands 34

Table 9. Correlations (Kendall's tau (Daniel 1978)) between cover of selected shrubs in Pseudotsuga climax plots.

	Acer circinatum	Berberis nervosa	Galtheria shallon	Taxus brevifolia	Cornus nutalii	Corylus cornuta	Philadelphus lewisii	Holodiscus discolor	Rhus diversiloba	Rosa gymnocarpa	Berberis aquifolium
Acer circinatum group											
Acer circinatum											
Berberis nervosa	.201*										
Galtheria shallon	.145	.066									
Taxus brevifolia	.254**	.106	-.125								
Cornus nutalii	.093	.209*	-.013	.176*							
Corylus cornuta	.363**	.247*	.117	.089	.272**						
Holodiscus discolor group											
Philadelphus lewisii	-.108	.038	-.109	.083	.066	.235*					
Holodiscus discolor	-.135	-.004	-.223*	-.081	.077	.116	.261*				
Rhus diversiloba	-.114	.040	-.132	.007	-.119	.138	.355**	.187*			
Rosa gymnocarpa	-.203	.001	-.038	-.115	.044	.077	.210*	.384**	.238*		
Berberis aquifolium	-.268**	-.280**	-.251**	-.045	-.063	-.181*	.258**	.150	.054	.172	

* Significant at .05 level
** Significant at .01 level or lower

(*Pseudotsuga*/*Holodiscus*-*Acer* community) and 35 (*Pseudotsuga*/*Holodiscus*/grass community) (Table 1, Figure 8) is inconclusive due to August rains in 1977 and 1978 (Table 2).

Members of the Holodiscus group (Table 9) occur in all dry site communities (Table 5), and presence of several members of this group is an indication that a site is dry coniferous forest as defined here.

Polar Ordination of Plots

Plot distribution in a two-dimensional polar ordination field is illustrated in Figure 16. End stands on the X axis are plot 35 at zero and plot 43 and 100 and on the Y axis are plot 47 at zero and plot 64 at 100. Species cover values were not standardized in these ordinations so species with high ranges in cover are more important than those with low ranges in placing plots on the axes. The distance measure used was percent dissimilarity (Bray and Curtis, 1957).

The *Tsuga*- and *Libocedrus*-climax stands are well separated from most other communities (Figure 16). The *Pseudotsuga*/*Holodiscus*-*Acer* community is intermediate between the *Tsuga* climax plots and the *Pseudotsuga*/*Holodiscus*/grass community. This is a result of the decrease in the shrub species in the *Acer circinatum* group (Table 9) from the *Tsuga* climax stands through the *Pseudotsuga*/*Holodiscus*-*Acer* community to the *Pseudotsuga*/*Holodiscus*/grass community. The *Aspidotis* phase of the *Pseudotsuga*/*Holodiscus*/grass community is near the zero end of the first axis. Thus, inferences from the vegetation are that moisture increases and temperature decreases from left to right along the X axis.

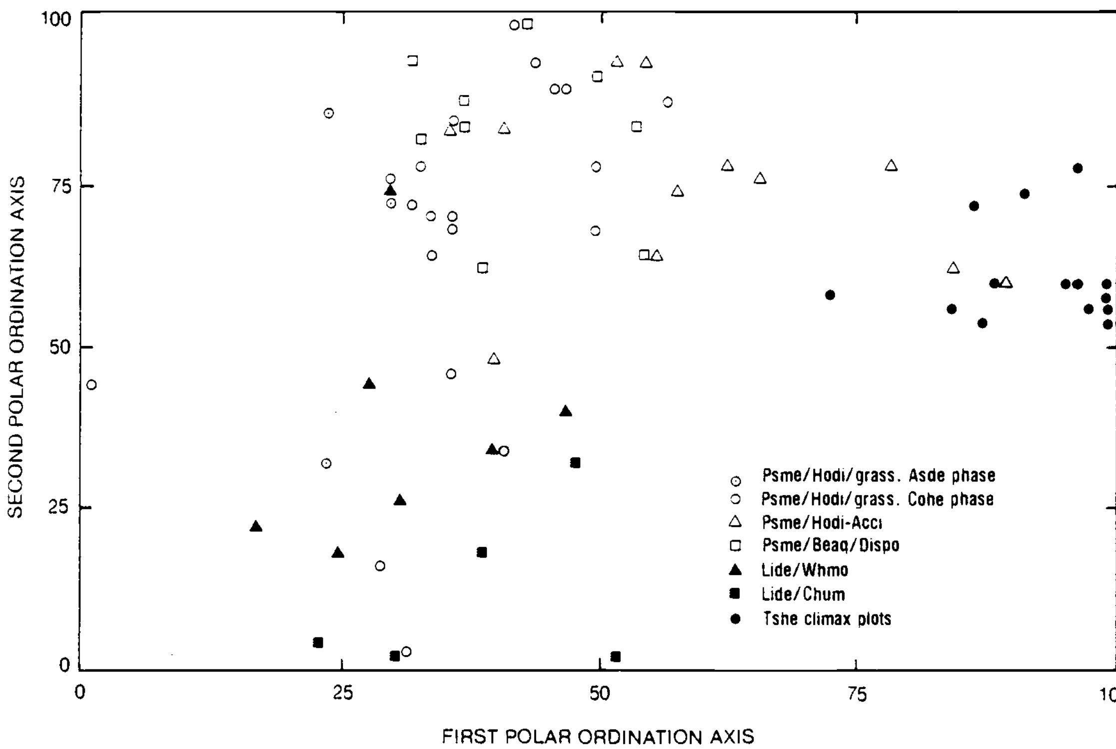

Figure 16. Polar ordination of dry site and mesic plots using unstandardized species cover data.

The Y axis separates the Libocedrus dominated plots from the other dry types based primarily on Libocedrus cover.

The lower part of the Y axis probably also reflects the greater importance of Trientalis and lesser importance of Rhus and Luzula campestris characteristic of the Libocedrus communities as a whole (Table 5). Environmental interpretation of this axis is difficult since little is known about the autecology of these species. Neither axis separates the Pseudotsuga/Berberis/Disporum community from the Pseudotsuga/Holodiscus/grass community.

Plotting of plant moisture stress and temperature growth index at reference stand positions in Figure 16 and the next ordination shows no notable trend in the ordination plane. This is probably due in part to the wide range in reference stand elevation (Chapter 3).

Many ordinations were run, but only two are reported here to conserve space. These two provide examples of the major trends in the data and the separations of communities for which the ordinations were found useful.

Principal Components Ordinations of Plots and Species

Principal components ordination of dry site plots separates the communities differently and illustrates different trends (Figure 17) than does polar ordination (Figure 16).

Figures 17 and 18 are from a centered (Noy-Meir, 1973) and standardized (mean set to zero, variance set to one) (Noy-Meir et. al., 1975) principal components analysis. The ordinations of plots (Figure 17) and species (Figure 18) were done simultaneously using the plot by plot correlation matrix in Ordiflex (Gauch, 1977).

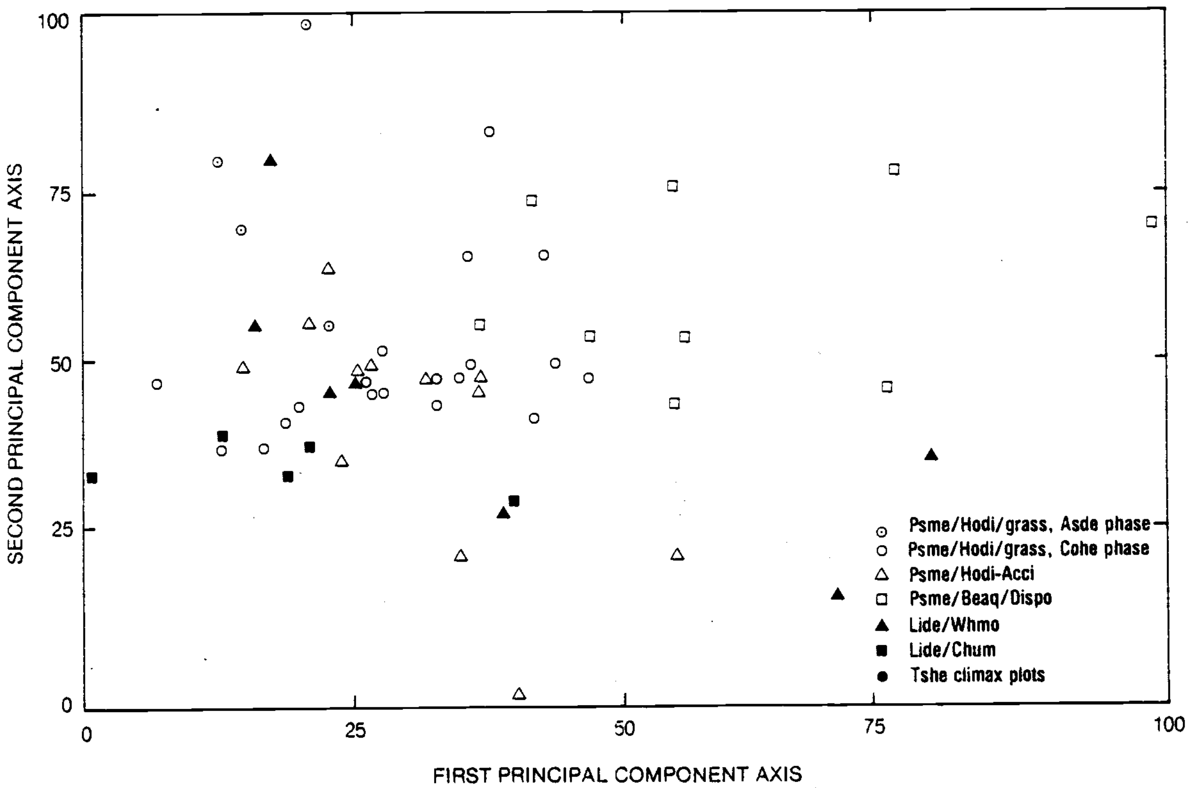

Figure 17. Principal components ordination of dry site plots using centered and standardized data.

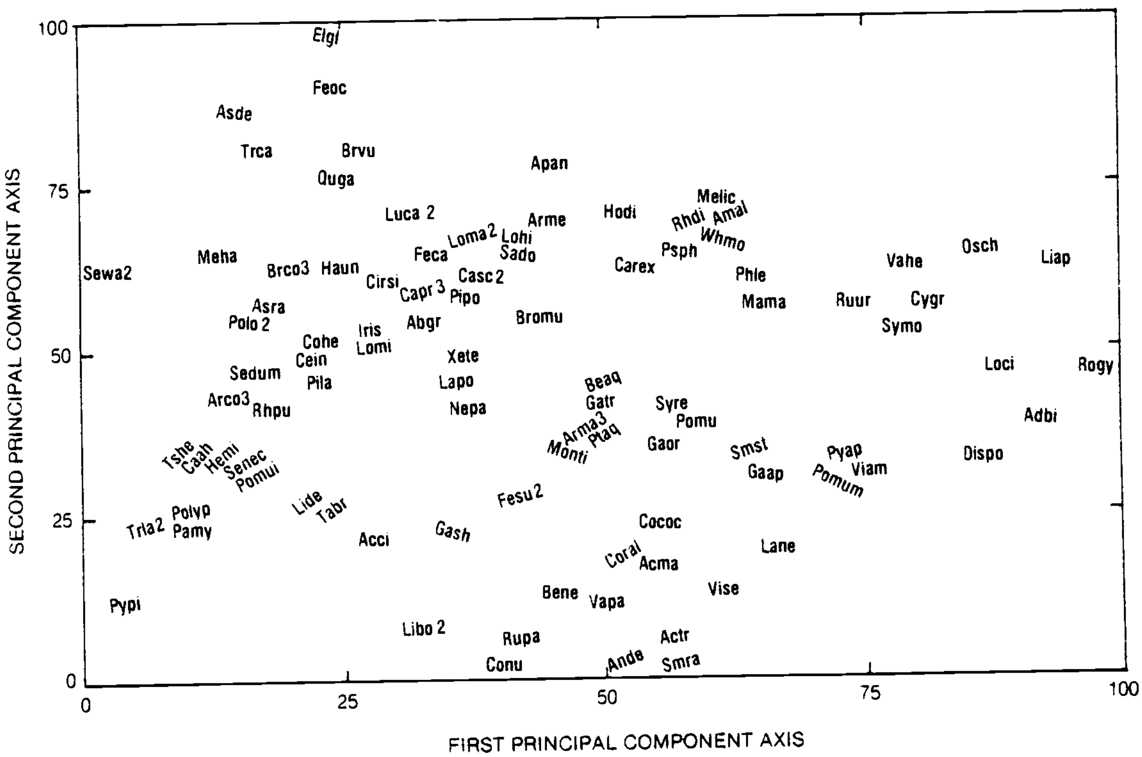

Figure 18. Principal components ordination of species using centered and standardized dry site plot data. Species names and abbreviations are listed in Appendix 1.

Typically, the first two or three components are the only interpretable ones and account for a large proportion of the total variance (Pielou, 1977).

The proportion of variance accounted for in several other studies ranges from 20 percent for two axes (Franklin et. al., 1980) to 40 percent for three axes (Orloci, 1966). However, the principal components analysis shown in Figures 17 and 18 accounted for only 13 (two axes) to 18 percent (three axes) of the variation in this data, which is typical of the other centered and standardized principal component analyses performed in this study. This result was not expected since a limited range of vegetation as defined by Dyrness et. al. (1974) was sampled. It is probably due to the wide geographic area studied. As a consequence interpretation of the ordinations is limited.

Several interpretations of the first principal component are possible. The _Aspidotis_ phase of the _Pseudotsuga_/_Holodiscus_/grass community is centered in the upper left and the _Libocedrus_/_Chimaphila_ community is centered below and to the left of the central plot cluster. The first component can in part be interpreted as a latitudinal gradient since the _Pseudotsuga_/_Berberis_/_Disporum_ community was found only in the Oakridge and Rigdon Districts. It can also be interpreted as a gradient of subsurface horizon textures. Most plots of the _Pseudotsuga_/_Berberis_/_Disporum_ type have clayey B horizons while the _Pseudotsuga_/_Holodiscus_/_Acer_ and _Libocedrus_/_Chimaphila_ communities characteristically have coarse textured soils and those of the _Pseudotsuga_/_Holodiscus_/grass are usually intermediate. Correlation of latitude with texture is expected since dry conifer forests occur on more mature soils in the south end of the study area. Plot by plot inspection of latitude and soil texture reveals exceptions to both of these interpretations.

Plots belonging to the Pseudotsuga/Holodiscus-Acer type and Aspidotus phase of the Pseudotsuga/Holodiscus/grass type dominate opposite ends of the second principal component (Figure 18). Thus this axis is probably correlated with increasing drought or temperature based on the interpretations of the species in these communities (see previous discussion). Again, the reference stand data did not help interpret this axis, probably due at least in part to the wide range in reference stand elevation.

Parallels between the principal component ordinations of plots (Figure 17) and of species (Figure 18) are readily apparent. Aspidotis densa (Asde), Selaginella wallacei (Sewa) and Brodiaea congesta (Brco 3), three characteristic species of the Aspidotis phase of the Pseudotsuga/Holodiscus/grass community are in the same corner of the ordination field (Figure 18) as are the plots of this phase (Figure 17). The other species in this vicinity are the grasses Elymus glaucus (Elgl), Festuca occidentalis (Foec), Trisetum canescens (Trca), Bromus vulgaris (Brvu) and Melica harfordii (Meha), and Quercus garryana (Quga), most of which also reach their greatest abundances in the Aspidotus phase (Table 5). Disporum (Dispo), Ligusticum apiifolium (Liap), Cynoglossum grande (Cygr), and Osmorhiza chilensis (Osch) occur in the upper right of Figure 18. These species are characteristic of the Pseudotsuga/Berberis/Disporum community which occurs in the same area in Figure 17. Pyrola picta and Trientalis latifolia which are most abundant in the *Libocedrus/Chimaphila* community are placed by the species ordinations in the lower left of Figure 18, similar to the placement of this community by the samples ordination (Figure 17). But note that neither species of *Chimaphila* (both characteristic of this community) are present because they were not thought to have classificatory significance and so not included in the small data set (see earlier discussion of methods and Appendix 5). *A priori* judgments of ecological significance are often used to reduce large data sets to manageable size but may lead to omission of significant species if not made on a sound basis.

The general correspondence of ordination positions of communities and their characteristic or dominant species is continued for the other communities. This use of principal components analysis was helpful in identifying species characteristic of the communities.

The *Acer circinatum* and *Holodiscus discolor* shrub groups (Table 9) are in different parts of this field (Figure 18). The *Acer* group (Tabr, Acci, Gash, Conu, Bene, Cococ) are in the lower center region and four species in the *Holodiscus* group (Hodi, Rhdi, Phle, Beaq) are in the upper center (Figure 18). *Rosa gymnocarpa* (Rogy), also in the *Holodiscus* group (Table 9), is an exception, being disjunct from both groups at the far right. The juxtaposition of the *Holodiscus* group with the *Acer* group supports the interpretation of the Y axis as reflecting increasing drought or temperature.

Latitudinal and Temporal Species Correlations

Species correlations with latitude are a pronounced structural

Table 10. Correlation (Kendall's tau, Daniel 1978) of species cover with area and tabulation of species importance by area for dry site plots in the small data set. Importance calculations employed cover averaged over all dry site plots in each area.

Taxa	Correlation coeffecient[1/]	Detroit Ranger District	Upper McKenzie basin	H.J. Andrews Exp. Ecol. Res.	Lower McKenzie basin (main fork)	Blue River Ranger District	Oakridge Ranger District	Rigdon Ranger District
Disporum	.637***	0	0	0	2	0	5	5
Festuca californica	.534***	0	0	0	0	1	2	20
Arbutus menziesii	.447***	0	2	1	0	5	10	19
Philadelphus lewisii	.392***	0	0	0	0	0	2	4
Lonicera hispidula	.385***	0	0	0	0	0	4	3
Campanula prenanthoides	.382***	0	1	0	0	0	0	4
Cynoglossum grande	.368***	0	0	0	0	0	3	2
Pinus lambertiana	.352***	0	0	2	0	7	2	8
Osmorhiza chilensis	.350***	1	0	0	0	1	3	3
Pinus ponderosa	.337***	0	0	0	0	0	0	13
Rhus diversiloba	.313***	0	0	13	5	3	13	13
Apocynum androseamifolium	.303***	1	0	1	0	2	1	4
Holodiscus discolor	.299***	21	5	13	14	12	26	20
Berberis aquifolium	.291***	3	3	1	3	5	9	7
Madia madioides	.281***	1	0	5	0	1	4	5
Vicia americana	.261**	0	0	12	0	9	15	9
Melica subuliflora	.253**	0	0	4	0	2	3	7
Adenocaulon bicolor	.234*	5	5	3	0	3	14	5
Psoralea physodes	.237*	0	0	0	0	0	0	1
Synthyris reniformis	.203*	0	1	8	0	0	5	5
Aster radulinus	.186*	0	3	3	3	6	2	5
Arenaria macrophylla	.173	4	7	4	3	5	8	6
Ligusticum apiifolium	.170	0	0	0	0	0	2	1
Phlox adsurgens[2/]	NA	0	0	0	0	0	0	2

Table 10. continued.

Taxa	Correlation coeffecient[1/]	Detroit Ranger District	Upper McKenzie basin	H.J. Andrews Exp. Ecol. Res.	Lower McKenzie basin	Blue River Ranger District	Oakridge Ranger District	Rigdon Ranger District
Rhamnus purshiana	-.391***	4	2	3	2	2	0	0
Trientalis latifolia	-.366***	12	17	8	5	6	7	4
Pyrola picta	-.350***	0	4	1	3	1	0	0
Tsuga heterophylla	-.369***	5	2	3	0	0	0	0
Polypodium	-.301***	2	1	2	0	0	0	0
Senecio	-.258**	1	1	1	0	0	0	0
Acer circinatum	-.255**	3	8	20	24	12	9	1
Taxus brevifolia	-.244**	0	2	2	0	0	0	0
Rubus ursinus	-.225*	7	5	7	11	5	8	4
Heuchera micrantha	-.224*	0	4	0	0	0	0	0
Cornus nuttallii	-.212*	7	5	3	12	1	3	2
Pachistima myrsinites	-.208*	0	2	1	2	1	0	0
Arctostaphylos columbiana	-.198*	9	2	0	0	4	0	0
Amelanchier alnifolia	-.185*	5	1	3	0	1	0	4
Galtheria shallon	-.170	7	1	2	17	0	2	1
Castanopsis chrysophylla	-.143	4	3	3	2	2	1	1
Acer macrophyllum	-.122	19	6	9	11	1	9	4
Berberis nervosa	-.117	25	18	30	19	19	24	14
Corylus cornuta v. californica	-.060	25	10	15	12	10	11	10
Libocedrus decurrens	-.010	9	57	3	7	25	31	19
Chimaphila umbellata[2/]	NA	3	18	5	0	2	2	1

1/ Correlations passing a two-tailed test of significance at the .005 (***), .01 (**) and .05 (*) level in SPSS (nie et al. 1975) are indicated.

2/ From large data set (see Appendix 5).

feature of the vegetation data (Table 10). The abundance of many species varies significantly from north to south within the Willamette National Forest. If ranger districts closer to the Willamette Valley (Sweet Home and Lowell) had been included additional variation would have been introduced (Juday, 1976).

Naturally, most species attaining greatest importance in the Pseudotsuga/Berberis/Disporum community (Table 5) are inversely correlated with latitude (Table 10). Similarly, species characteristic of the Libocedrus/Chimaphila type (e.g., Chimaphila umbellata) have high importance in the upper McKenzie Basin.

Less than 160 years has been elapsed since the last major fire on approximately half of the dry site plots (Table 8). Very few old undisturbed dry site stands were found. Two-thirds of the stands sampled, and virtually all of those over 300 years old, had been reburned at least once (Table 8). Consequently, some plots may represent relatively early successional stages and not primarily environmental differences. Correlations between species cover and time since last major disturbance were calculated to explore this complication (Table 11).

Very few of the species characteristic of the different communities are correlated with time since the last major disturbance (Table 11). Festuca subuliflora, which finds its greatest abundance in the Libocedrus/Whipplea community, is more common in older stands. Libocedurs cover is also correlated with increasing time since disturbance. Both of these correlations probably relate to the greater mean age of the Libocedrus/Whipplea plots (Table 8).

Table 11. Correlation (Kendall's tau (Daniels 1978)) of species cover with time since last major fire. Only correlations passing a two-tailed test of significance at the .005 (***), .01 (**), or .05 (*) level in SPSS (Nie et al. 1975) are given. Dry site plots in the small data set were used.

Species	Correlation
Festuca subuliflora	.281***
Arenaria macrophylla	.281***
Linnaea borealis	.267***
Corallorhiza spp	.256**
Polystichum lonchitis	.210*
Libocedrus decurrens	.205*
Adenocaulon bicolor	.198*
Smilacinia stellata	-.298***
Trillium ovatum	-.232*
Arctostaphyllos columbiana	-.230*
Rubus ursinus	-.186*

Composition appears to be less affected by time since last major fire than by geographic location in these dry conifer stands. A better classification could certainly be developed if more mature vegetation was available. However, this analysis indicates the present classification is probably not greatly influenced by the youth of many of these stands.

General Discussion

The communities described fit fairly well into the Pseudotsuga/Holodiscus habitat type on the H.J. Andrews. Dyrness et. al. (1974) include several plots in which Libocedrus is judged climax or coclimax. Most of their plots could be assigned to the Pseudotsuga/Holodiscus-Acer community, although some have affinities to the Pseudotsuga/Holodiscus/grass type and the Libocedrus types.

Significant intergradation exists among the communities. This is evidenced by the lack of high constancy, high fidelity character species and overlap of community distributions on the ordination planes (Figures 16 and 17).

The large plot size, geographic variation (e.g., in climate, Chapter 2; and flora, Table 10), and youth of some stands probably contributes to the variation within communities and so to the overlap between them. The common occurrence of dry sites as isolated patches in a matrix of Tsuga-climax forest probably increases between stand variability. Lack of a well-defined break between dry site and non-dry site vegetation based on presence of Tsuga primarily in the Rigdon District also probably contributed to this. In this district

Tsuga is much less common and is replaced on some mesic sites by another tolerant species (Minore, 1979) *Abies grandis* (and its intergrades with *Abies concolor*). Several stands with *Abies grandis* reproduction were encountered but not sampled. Restriction of future studies of a single habitat type to a limited geographic area where other habitat types have been (or are currently being) defined will reduce geographic variation and improve study type definition.

Much dry coniferous forest can be viewed as being in an immature stage of primary succession. This relationship is best illustrated by the dry forests in landslide scars (Figure 15) which usually occur in draws. Thin, young soils support dry forest in draws that will usually support more mesic forest when soils mature and deepen. The convex land forms characteristic of most dry sites have soils often kept perpetually young by erosion. In the H.J. Andrews Forest south-facing convex land forms gentle enough to maintain deeper, more mature soils usually are in the *Tsuga heterophylla/Castanopsis chrysophylla* or other relatively mesic habitat type. Hack and Goodlet (1960) found the same correspondence between relatively xerophytic vegetation and thin, young soils on convex land forms in the Appalachinas.

The temporal distribution of fires on the dry site plots illustrates several points (Figure 19). Older fires are more difficult to detect because their traces are erased by subsequent fires and time. The lack of fires on the vegetation plots during the last 60 years probably reflects initiation of a fire suppression policy in 1915 (Burke, 1979) as well as attempts to sample only relatively mature stands. A marked peak in dated fires occurs between 110 and 140 years

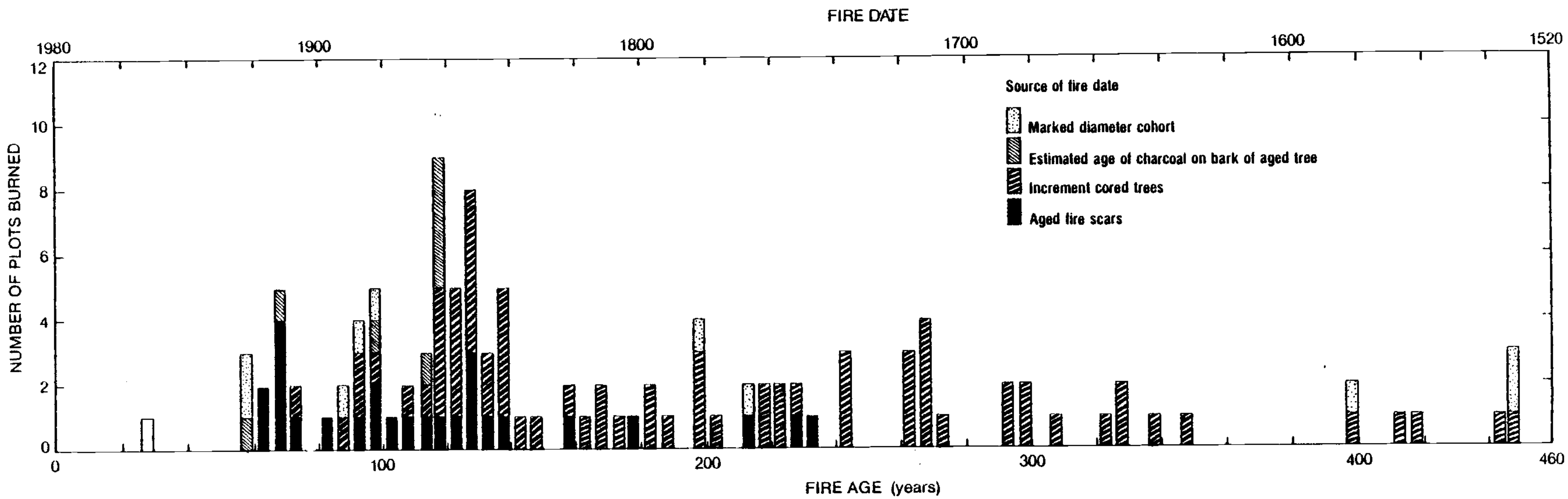

Figure 19. Histogram of dates of fires on dry site plots by five year age classes.

ago (Figure 19). This coincides with the 135 year-old forests on Wildcat Mountain and on the Mount Hood National Forest.[5/]

The concentration of ages between 260 and 275 years ago coincides with the ca. 1703 fire episode of Mount Rainier National Park (Hemstrom, 1979) and a drier than normal Pacific Northwest winter identified by Blasing and Fritz (1976) based on interpretation of tree ring records. The peak in fire scar dates between 60 and 75 years ago corresponds with the 1914 and 1919-1921 peaks in lightning caused fires in the central portion of the Willamette National Forest (Burke, 1979).

The mean interval between fires, an index of fire frequency, has two primary sources of error. Fires with signs obliterated by subsequent fires or time are not included which probably results in an overestimate of mean interval between fires. Omission of stands which have not burned leads to an underestimate of mean interval between fires. Though these errors have opposite effects the net result is probably an underestimate so interpretation is limited.

These dry coniferous forests apparently burn naturally at intermediate intervals and intensities compared to other Pacific Northwest forests. _Pinus ponderosa_ - _Abies concolor_ forests on the eastern slope of the Oregon Cascades have a mean interval between fires of nine to 42 years and contain evidence of many (mean 10 per plot) fires, indicating most fires killed a small portion of the stand (McNeil, 1976). Hemstrom (1979) estimated the natural fire rotation in the relatively moist forests surrounding Mount Ranier to be 465 years (range 213 to

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[5/] Personal observations and personal communications with Jerry F. Franklin.

1033) and characterized the fires as catastrophic (stand destroying). The mean interval between fires on dry sites of 103 years (Table 8) is intermediate compared to these values. Most dry site stands have had at least one non-catastrophic fire since initiation of the oldest cohort which only destroyed part of this cohort (Table 8). So, although fires on dry sites are more likely to be catastrophic than in east side Pinus ponderosa, they are less likely to be catastrophic than at Mount Ranier.

Reciprocal averaging results are uninterpretable and so were not used in the classification process. This technique gave very skewed distributions of plots and species in the ordination planes. The species ordinations were dominated by those species with the most skewed distributions (i.e., low cover on most plots but higher cover on one or a few plots). Elimination of such species from early ordination attempts resulted in only minor improvement since the routine found different species with only slightly less skewed distributions. This failure of reciprocal averaging is in contrast to its warm reception by others (Gauch et. al., 1977; Whittaker and Gauch, 1978).

STAND STRUCTURE AND DEVELOPMENTAL HISTORY

Most of the researchers who have identified climax Pseudotsuga vegetation types in western Oregon inferred successional trends from size distributions (Thilenius, 1964; Merkel, 1951; Bailey, 1966; Corliss and Dyrness, 1965; Juday, 1976; Anderson, 1967; Mitchel, 1972; Dyrness et. al., 1974). Cole (1977) examined ages and found early -an-caused fires and recent fire suppression changed the structure and composition of southern Willamette Valley forests.

The size distribution in dry coniferous forests is characterized by large numbers of small over-topped trees in the reproductive size classes with an exponential decline in stem density into the larger size classes which have few individuals (Table 7, Appendix 7). This contrasts with the typically bell-shaped diameter distribution of Pseudotsuga on mesic sites (Appendix 7). Possible causes include: (1) slow restocking of the site following destruction of the previous stand; (2) regeneration during several distinct periods in the history of the stand; and (3) widely differing tree growth rates.

Reconnaissance indicates spatial variation in stem density and understory vegetation is a striking attribute of many dry site stands. In some instances pockets of poor stocking were on obvious areas of thin soil though in other areas correlations were not obvious. Variability in soil factors is known to influence tree distribution and growth (Mader, 1963). These factors include texture and rooting depth (Wilde, 1958). Small landslides are disturbance events common to the study area (Swanson and James, 1974; 1975) which can strongly influence microtopography, soil depth and other soil properties since the overall shallow soils make these sites sensitive to removal or addition of soil. Thus an investigation of relations between stocking variability soil factors seems appropriate for dry site stands.

Objectives and Hypotheses

The goal in this part of the study is to examine stand structure, successional trends and mechanisms and site history. This is met by fulfilling the following objectives: (1) Examine the relationships of soil depth, estimated water-holding capacity, and microtopography to stem density, basal area, sapwood basal area and number of roots. (2) Examine the age structure of each tree species to investigate regeneration through time. (3) Investigate evidence of fire, windthrow, and other indicators of disturbance history. (4) Look for evidence of a possible previous stand such as logs, stumps, charcoal, and windthrow mounds and pits.

In addition, the following hypotheses guided work not covered by the objectives or focused on particular questions.

1. Trees require more than 50 years to fully reoccupy dry sites after a catastrophic disturbance.

The conventional wisdom (based on typical Pseudotsuga) is that dense Pseudotsuga regeneration occupies a disturbed site quickly (within 20 to 30 years) (Isaac, 1943). However, recent studies in this area have shown that 90 (Figure 20) to 150 years (Franklin et. al., 1976) were required on some mesic sites in past centuries. Regeneration may

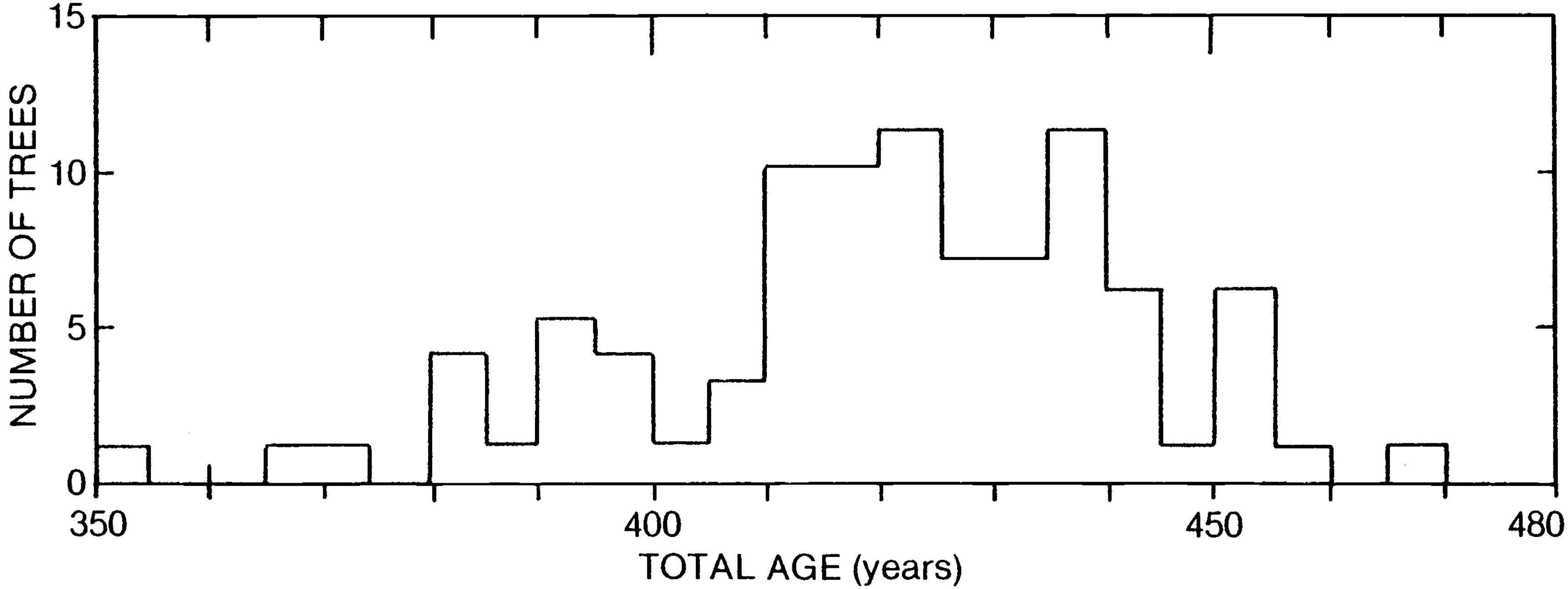

Figure 20. Age structure of Pseudotsuga in a transition zone stand on the H. J. Andrews Experimental Ecological Reserve (by J.E. Means). (From "An old-growth douglas-fir stand analysis," talk given at the 50th annual meeting, Northwest Scientific Association, Monmouth, Oregon, 1977.)

take even longer on the severe sites under study. Regeneration time can be estimated from the age structure.

2. *Pseudotsuga* and *Libocedrus* are climax in dry coniferous forests so they replace themselves as openings occur in the canopy (Whittaker, 1975).

3. Gap phase replacement (Watt, 1947; Bray, 1956) is an important mechanism for regeneration in mature stands.

Although the study type is called climax *Pseudotsuga* (Dyrness et. al., 1974), the successional roles of *Pseudotsuga* and its associates have not been investigated. The key to its successional status is the success of its reproduction in competition with other trees in canopy gaps created by tree mortality. Only relatively old stands which have had significant natural mortality and resultant regeneration can be used to test this hypothesis.

4. Patchy tree distribution is due in part to variation on soil properties so increased stocking is correlated with deeper, less rocky soils on concave landforms.

A small absolute change (40-80 cm) can cause a large relative change (50-100 percent) in soil depth on these shallow sites which probably has a significant impact on tree survival and growth. Relationships between the stocking indices and the soil characteristics are used to test this hypothesis.

5. Dry coniferous forests are not first generation forests. It is possible that some of these stands may be first generation forests on sites which previously supported drier vegetation such as oak savanna (Hickman, 1976). Stumps, logs, charcoal or rootthrow mounds

can be evidence of previous stands. However, reconnaissance of some sites reveals few such signs.

Methods

Data for this portion of the study came mostly from two intensive plots though vegetation plot data are also employed. Intensive plot 1 is 3/4 ha added during 1976 to reference stand 1 in the H.J. Andrews Experimental Ecological Reserve and does not include the old reference stand. It was chosen primarily because of the previous research done on Andrews reference stand 1 (Hawk et. al., 1978). This plot is primarily in the Pseudotsuga/Holodiscus-Acer community type but also includes some areas of both phsaes of the Pseudotsuga/Holodiscus/grass type and possible minor areas of moister habitat types of Dyrness et. al. (1974). Vegetation plot 48 is in this intensive plot. This intensive plot sweeps around a side ridge which has steep slopes (Table 12).

Intensive plot 2 is a 50 x 100 m ½ hectare plot seven km north of the town of Oakridge (Figure 8). This plot was chosen because it showed little sign of major disturbance since the oldest trees were initiated, though this assumption was subsequently proved wrong. Intensive plot 2 includes areas of Libocedrus/Whipplea, and Pseudotsuga/Berberis/Disporum types with lesser amounts of the Pseudotsuga/Holodiscus-Acer type. Vegetation plots 60 and 61 are in this intensive plot. It is at 930 m elevation on moderate slopes (Table 12) with three small side ridges running through it, increasing its variability.

Table 12. Topography, bedrock and soils on the intensive plots. Ranges and minor inclusions are given in parentheses.

	Intensive Plot 1	Intensive Plot 2
Elevation (m)	500	930
Slope (%)	72 (45-92)	55 (45-65)
Aspect (degrees)	200 (160-237)	230 (195-260)
Bedrock	Andesite, Breccia	Andesite, (Breccia)
Soils characteristics		
Soil Orders[1/]	Inceptisols (Alfisols, Entisols)	Alfisols, Inceptisols Entisols
Depth (cm)	132 (11-ca. 250)	90 (8-ca.250)
Coarse particles (%)	54 (43-64)	25 (11-59)
Textures: A horizon	silt loam (loam, sandy loam)	loam, silt loam
B horizon	silt loam, (loam, sandy loam, silty clay loam, clay loam)	clay loam, silt loam (silty clay loam, loam)
Available water-holding capacity to 100 cm (cm)	6.3 (1.1-9.9)	7.8 (1.3-15.8)

1/ Soil taxonomy follows Soil Survey Staff (1975).

Field Methods

A slope corrected grid system was installed with metal stakes at 25 m intervals. Mapping objects at a scale of five m to one inch was facilitated with string placed at five m intervals. Probable mapping accuracy is ± one m for two-thirds of the objects mapped. All trees greater than 10 cm (15 cm in plot 1) diameter at breast height (137 cm) were mapped and inventoried (species and diameter were determined). All trees taller than 137 cm (greater than five cm dbh in plot 1) were mapped and inventoried on one quarter of the 25 x 25 m quadrants in both plots. All mapped trees were numbered on the map and on the ground using metal tags. The areal extent of all rootthrow mounds and pits was mapped. Lower diameter limits on intensive plot 1 were slightly different because original mapping and tree tallying was done by the H.J. Andrews vegetation crew.

All canopy gaps created by death of identifiable trees were mapped and young trees (less than 137 cm tall, up to five cm dbh in plot 1) occurring in these gaps were tallied. A live tree or group of trees was selected which matched in size and microenvironment (as indicated by vegetation and topography) those which died and a similar sampling of smaller trees conducted.

Fire and mechanical scars were dated when not too rotten using the same technique as on vegetation plots.

Plots were thoroughly searched for evidence of a previous stand, such as stumps and logs larger than the largest living trees and old rootthrow mounds.

Seven and eight soil pits were described in intensive plots 1 and 2, respectively, chosen to cover the range of basal areas estimated with a 40 factor (ft^2/ac) prism. They were widely spaced so that few individual trees were shared in prism tallies from different pits. This made the stocking indices at each pit as independent as possible. Profile descriptions followed the vegetation plot soil pit methods. In addition, roots were tallied in a 25 cm wide face on the uphill side of each pit for its full depth by three diameter size classes: fine, 2mm - 1 cm; medium, 1 cm - 4 cm; coarse, greater than 4 cm. Depth to bedrock was estimated to 250 cm in four pits (three in plot 1, one in plot 2) over 150 cm deep. Basal area was determined at each pit with an English units 40 factor prism (Husch et. al., 1972) and the tag numbers of the trees in the tally were recorded.

All trees greater than 50 cm dbh and a randomly selected 35 percent sample of those below this size were increment-cored at breast height. Two cores were taken on the opposite side of the tree and the same information taken as on the vegetation plot site trees. This included bark and sapwood thickness on both cores and core age when easily counted. Other cores were returned to the lab in plastic straws.

Laboratory Methods

Increment cores with rings too narrow to count in the field were counted in the lab under a binocular microscope. Then ages (when extrapolation beyond the end of the core was needed) and heights were estimated by program Ageht (Appendix 9).

Stem density at each soil pit was estimated by tallying on the maps all trees less than 15 cm DBH in scale circles of 100 m^2 and 314 m^2 by species.

The two sizes of fixed radius plots and the prism tally provided three estimates of basal area per hectare at each pit.

Sapwood basal area (SBA) at breast height was estimated for both cores on each tree using the formula SBA - 3.14159 $(DIB^2 - DIS^2)/4$

where DIB = diameter inside bark, and

DIS = diameter inside sapwood,

and the average of these two estimates was used as the sapwood basal area for the tree. For each species at each intensive plot regressions of the general form $\ln(SBA) = b_o + b_1 \, DBH + b_2 \ln(DBH)$ were fit by least squares (Draper and Smith, 1966) using SIPS (Rowe et. al., 1978). The regressions were used to estimate sapwood basal area of uncored trees as needed.

The two fixed radius plots and the prism tally gave three estimates of sapwood basal area per hectare at each pit. The sapwood basal area per hectare represented by each tree in the prism tally was calculated as (Husch, Miller and Beers, 1972, pp. 276-281):

$$SBA(cm^2/ha) = SBA(cm^2) \cdot \frac{10,000(m^2/ha)}{PA}$$

where PA (plot area for that tree in m^2) = BA · 43,560 (ft^2/ac)/BAF

where BA = individual tree basal area in m^2

BAF = prism basal area factor in ft^2/ac

For the 40 factor prism (ft^2/ac) used here this simplifies to

$$SBA(cm^2/ha) = SBA(cm^2) \cdot 116,900(cm^2/ha)/DBH^2(cm^2)$$

These values were summed for the prism tally estimate of sapwood basal area per hectare at each pit.

Available water-holding capacity was calculated to a depth of 100 cm and to bedrock for each soil pit using program Sh20 (see Appendix 9) in the same manner as used for the vegetation plot data.

The product-moment correlation coefficient (Snedecor and Cochran, 1967) and the nonparametric correlation coefficient Kendall's tau (Daniel, 1978) were calculated between stocking indices at each soil pit (stem density, basal area, sapwood basal area, and number of roots) and the soil characteristics (depth, percent coarse fragments, effective depth, available water-holding capacity, microtopography) for each intensive plot and for the pooled data from both plots using SPSS (Nie et. al., 1975). The level of significance was calculated using a one-tailed test, reflecting the hypothesis.

Regeneration density was calculated from the tree counts in canopy gaps and under the paired tree canopies on a per hectare basis for each condition, then on a per hectare of forest basis. This was combined with the diameter tally of larger trees to give the diameter distribution. Stocking of zero to five cm DBH trees in intensive plot 2 was taken from the regeneration tallies and the tree tally on vegetation plot 48.

Ideally, age structures are obtained by aging all trees. When only a sample of trees are aged, and ages of the remainder estimated from regressions of age on diameter (as is often done), the detail in the age structure is reduced because the relationship between diameter and age is generally quite poor (Harper, 1977; Blum, 1961). To illustrate, ages of uncored Pseudotsuga in plot 2 could have been estimated by the regression of age on diameter in Figure 21. If so, all 50 to 80 cm trees would have been assigned ages between 170 and 220 years, though most trees in this diameter range are not of this age.

The method used here to estimate ages of uncored trees preserves detail in the distribution of the available ages by assigning each uncored tree the age of a cored tree of similar diameter. All cored trees were grouped by 10 cm diameter class as were all uncored trees. Then each uncored tree was assigned the age of a cored tree in its diameter class until all ages in a given diameter class had been used once. Ages in each diameter class were used again in the same order until all unaged trees had been assigned ages from cored trees in their respective diameter classes.

General Characteristics

The greater basal area of Libocedrus and total basal area on intensive plot 2 (Table 13) are consistant with the average values for the community types represented (Table 6). Both of these features are probably in part due to the greater average age (Figures 24 and 25). Site index is substantially higher on plot 2 than plot 1, though it is quite variable on both plots (Table 13). Diameter distributions on both intensive plots have the classical reverse-J shape (Figures 22 and 23) characteristic though not indicative of an all-aged stand (Whittaker, 1975; Harper, 1977). The overstory of both stands is dominated by Pseudotsuga. Understories are dominated by Pseudotsuga

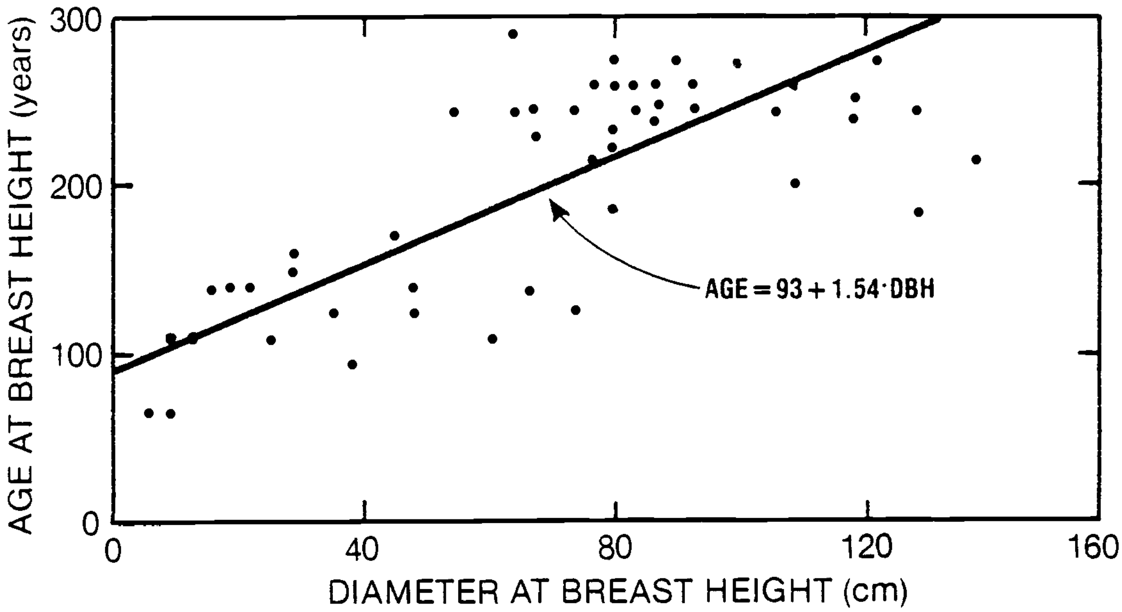

Figure 21. Diameter versus age relationship of Pseudotsuga on intensive plot 2. Accuracy of point placement is slightly limited because this figure is based on a computer line printer figure. The regression line was fit by least squares.

Table 13. Basal area and *Pseudotsuga* site index (McArdle et al. 1961) on the intensive plots.

	Intensive plot 1	Intensive plot 2
Basal area (m^2/ha)		
Pseudotsuga menziesii	59.4	66.7
Libocedrus decurrens	0.0	24.1
Acer macrophyllum	1.3	1.3
Other species 1/	.7	-
Total	61.4	92.1
Site index (m)	34	43
(mean and range)	(23-42)	(33-52)

1/ On plot 1 only, in order of decreasing basal area: *Taxus brevifolia*, *Tsuga heterophylla*, *Arbutus menziesii*.

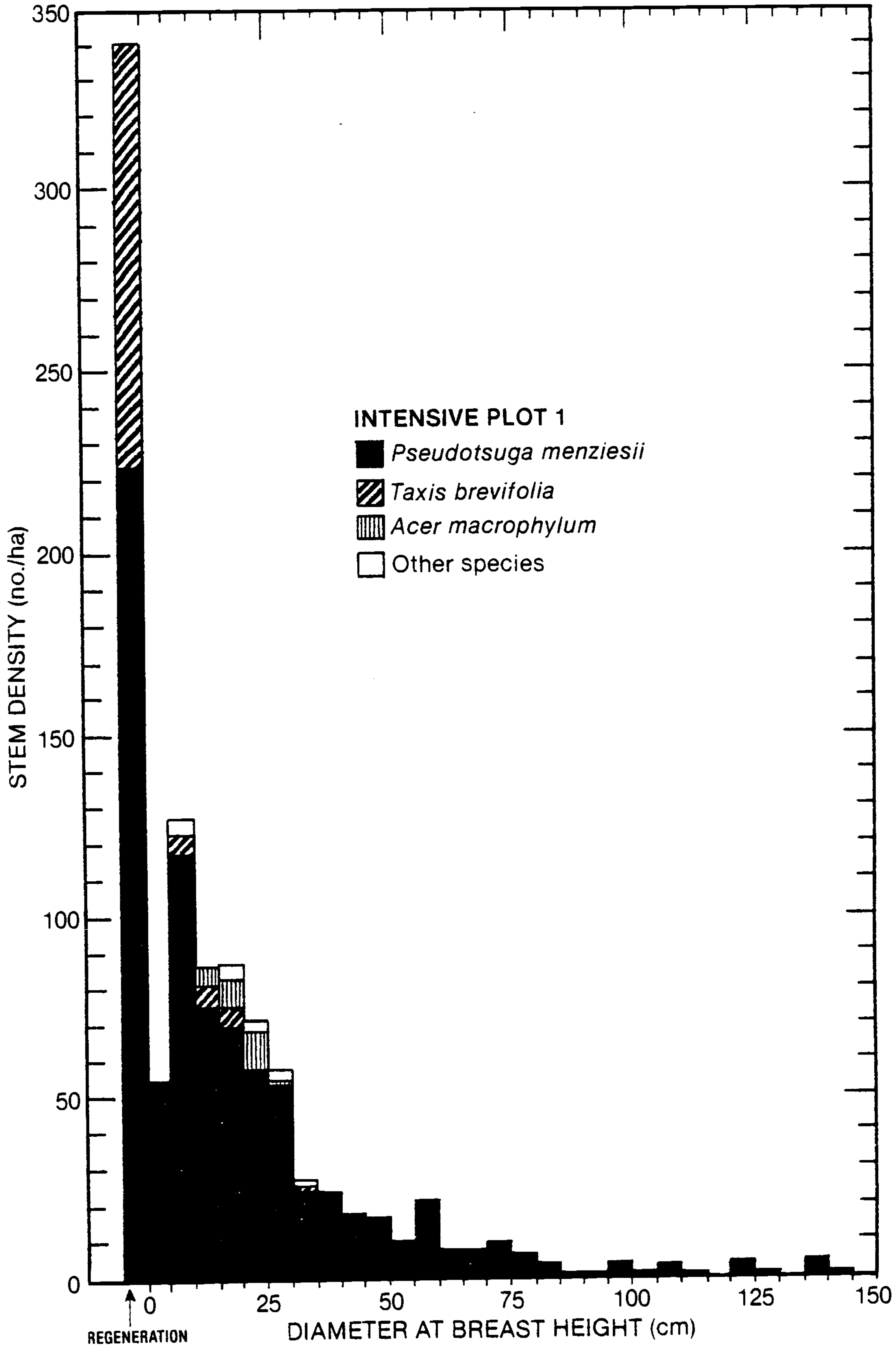

Figure 22. Diameter distribution in intensive plot 1, including regeneration.

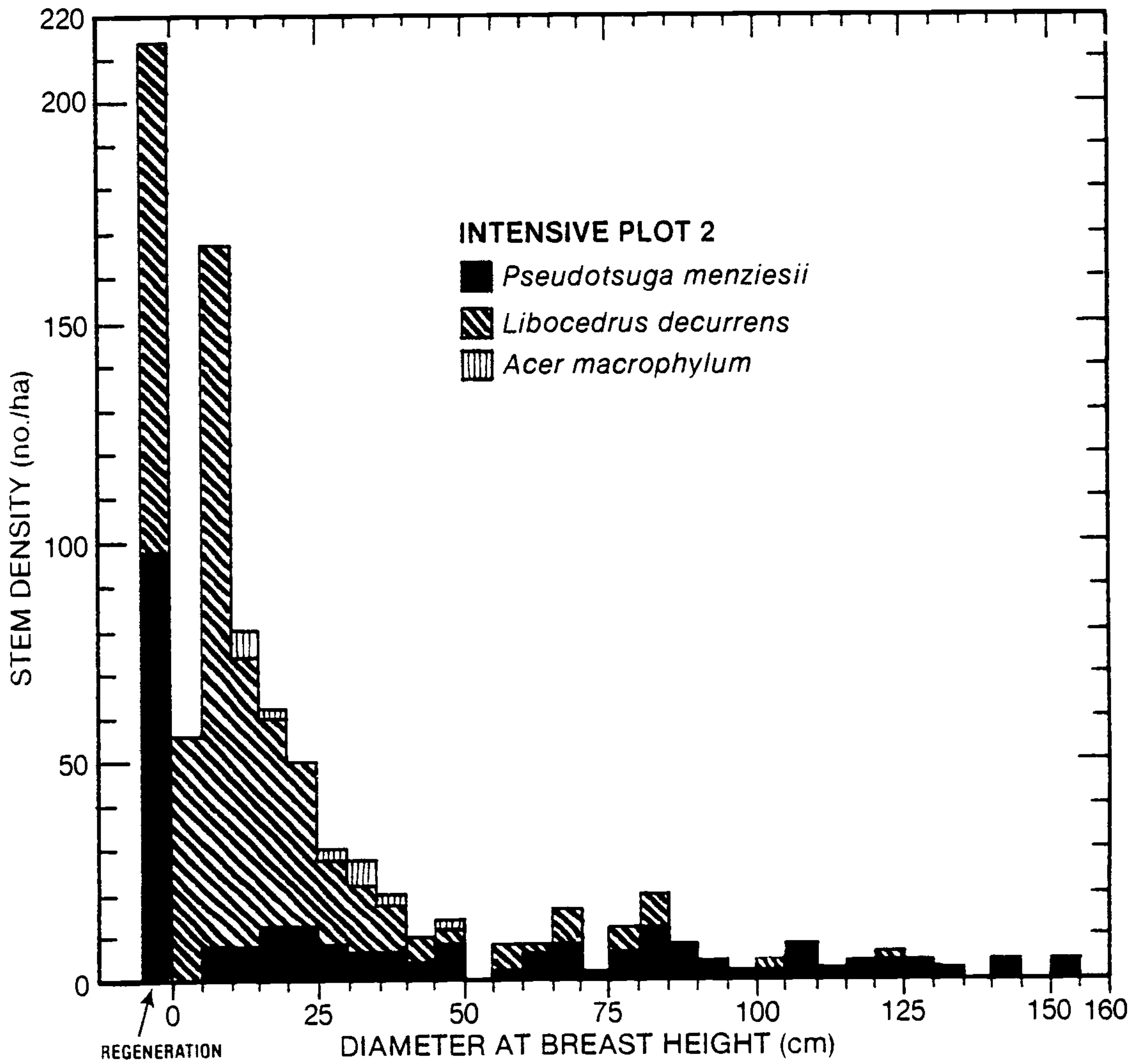

Figure 23. Diameter distribution in intensive plot 2, including regeneration.

and *Libocedrus* on plots 1 and 2, respectively. The numerous, small *Taxus* on plot 1 are not surprising for a *Pseudotsuga/Holodiscus-Acer* stand.

Age Structure and Stand History

The age structure of intensive plot 1 (Figure 24) is not nearly as smooth as a reverse-J shape curve as its diameter distribution (Figure 22). This is partially due to the fact that only a couple of the trees were cored as indicated by the dotted line. But the major peaks are due to the history of tree establishment. All ages and dates in the intensive plots are as of mid-summer, 1978, when the increment coring was done.

There are three major cohorts (Figure 24). A broad age cohort (or perhaps several indistinguishable cohorts) established between 230 and 410 years ago now compose the large diameter, rounded- or broken-topped dominants. Rot, often entering behind fire scars, prevented aging a larger sample of these trees.

A more distinct age cohort was established 140 to 190 years ago. Most of these trees apparently became established following a fire 195 years ago (Figure 24) although the fire age is based on only one scar.

The youngest cohort is 50 to 140 years old. This cohort followed a fire approximately 138 years ago dated by 17 scars spanning a range of three years. This fire correlates with fires which initiated the widespread 135-year-old age class in the Pacific Northwest.[6/]

[6/] Personal communication with Jerry F. Franklin.

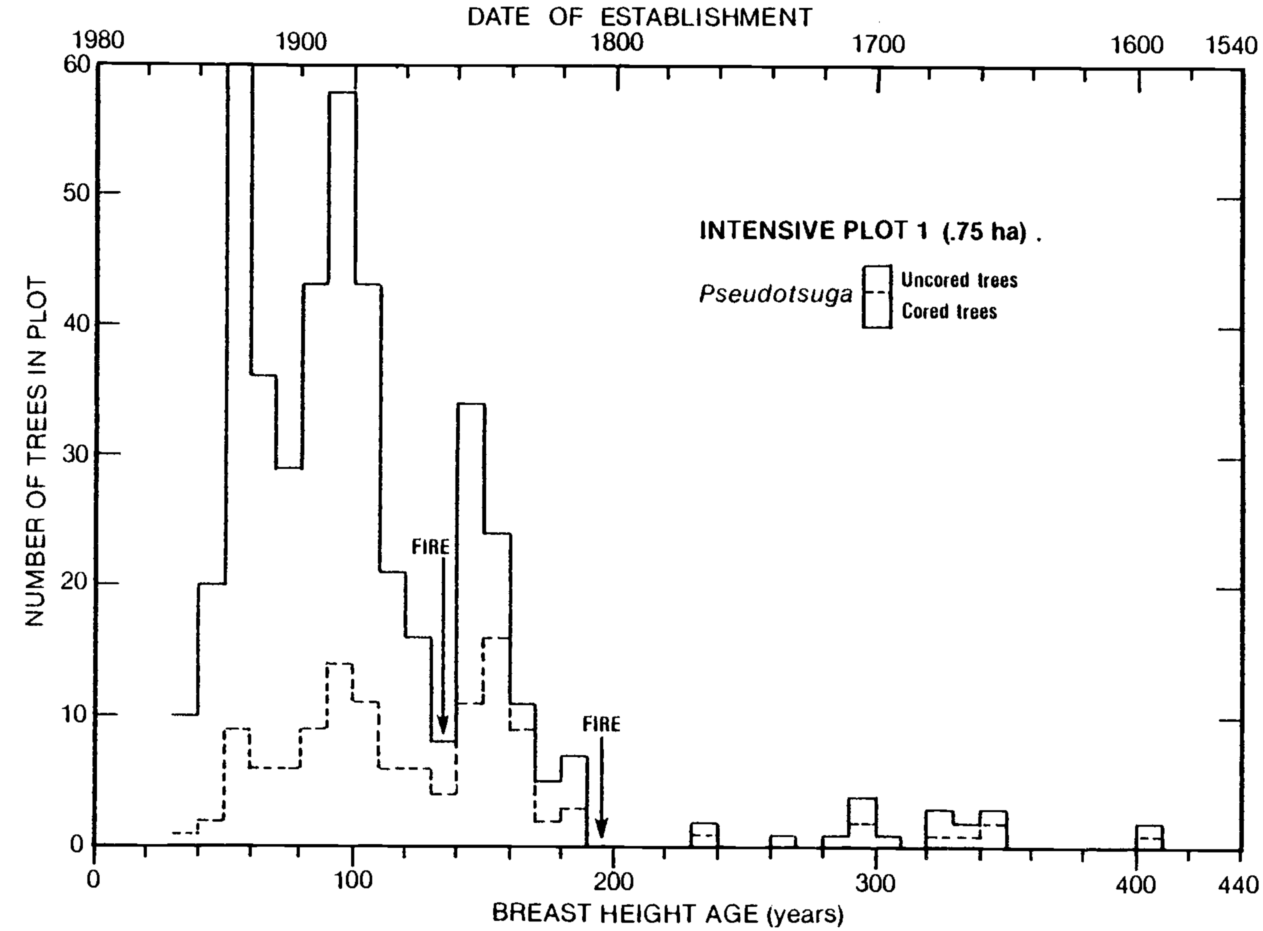

Figure 24. Age distribution of Pseudotsuga and fire scar dates in intensive plot 1. Ages of all trees above the dotted line (when present) are estimated as described in the text.

Both fires probably killed a significant proportion of the canopy trees providing space for the large numbers of trees which have now reached the canopy.

The age structure of intensive plot 2 is also unlike its diameter distribution (Figure 25). This plot has more dominants over 200 years old than intensive plot 1. The oldest cohort consists of only four trees 420 to 470 years old (Figure 25). Although older than the oldest trees aged in intensive plot 1, it is still within the broad "450 year-old" age class identified elsewhere on the H.J. Andrews (Franklin et. al., 1976; Figure 20).

The next cohort was established 180 to 300 years ago following two or more fires (Figure 25). Both of the fire ages between 300 and 340 years old come from a large Libocedrus with a rotten center. Problems in finding shock rings and aging the scar make these fire ages questionable. The date of initiation of this cohort corresponds appropriately to the ca. 1688 fire episode at Mount Ranier National Park (Hemstrom, 1979).

The youngest cohort is 40 to 170 years old (Figure 25). All Libocedrus in this cohort were established following a fire dated 138 years ago. However, one third of the Pseudotsuga in this cohort are older than this fire. This could result from several causes.

The stand map shows all of the trees with charred bark on the top and slopes of the main side ridge running through the plot. This pattern indicates that fires can be very localized in dry site forests. Thus the fire in 1840 may have killed all the young Libocedrus but did not burn the portion of the stand occupied by the 140 to 165 year-old Pseudotsuga.

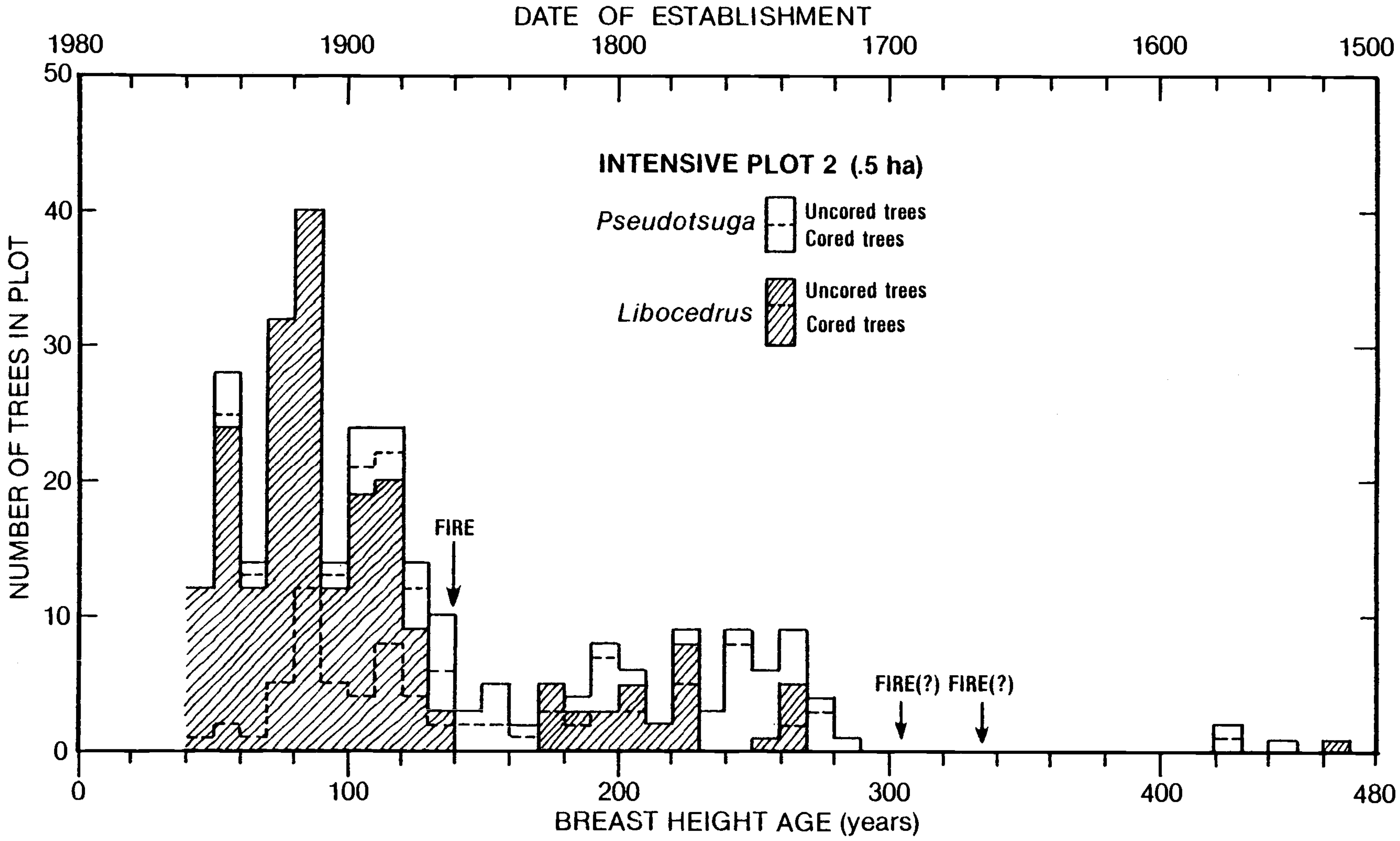

Figure 25. Age distributions of Pseudotsuga and Libocedrus and fire scar dates in intensive plot 2. Ages of all trees above the dotted lines (when present) are estimated as described in the text. Fires followed by question marks are based on fire scars which were difficult to count.

The occurrence of a fire ca. 170 years ago is a distinct possibility. Assuming this and that the 138 year-old fire did not cover the whole stand three compatible hypotheses can explain the differences in the age distributions between Libocedrus and Pseudotsuga in the youngest cohort (Figure 25). Libocedrus may grow more slowly under a partial canopy than Pseudotsuga so that breast height ages of the Libocedrus in this cohort are less. Second, Libocedrus regeneration may have been 30 years behind Pseudotsuga due to climatic factors or lack of good Libocedrus seed crops. Third, the area burned 165 years ago may not have been favorable for Libocedrus establishment.

An alternative hypothesis is that there has been essentially continuous regeneration since the fires 300 + years ago. Thus Pseudotsuga regeneration was established over 230 years and Libocedrus is still regenerating (Figure 25). However, given the moderately distinct age cohorts, a fire scar aged at 138 years, and known common occurrence of non-catastrophic fires in intensive plot 1 and vegetation plots (Table 8) this seems unlikely.

Old rootthrow mounds and pits and logs indicate the present stands are not the first on the intensive plots. Rootthrow mounds and pits are present in all stages, from fresh with a decay class 1 log (Fogel et. al., 1973) to those with decay class 5 logs or no log present. Some pit and mound pairs are barely identifiable as such. A depression is evident in some mounds where the log has completely rotted away.

Though major fires burned both intensive plots ca. 135 years ago, very little dead wood remains. Many trees must have died in that fire to allow establishment of the large number of younger trees now present. This implies decomposition of tree boles on these warm sites is probably quite rapid. Large logs probably retain enough water to allow rapid decomposition well into the warm summer. Their moisture retention ability is indicated by the predominant occurrence of *Tsuga heterophylla* on rotten wood when it is found on dry sites (Table 7, Appendix 7).

Detailed stand investigations such as this can yield much information on stand development (Stephens, 1955a: Henry and Swan, 1973; Oliver and Stephens, 1977). However, this method has limitations (Harper, 1977) so only broad age cohorts are interpreted. Trees were cored at breast height (137 cm) so ages are not total ages. Historical information (e.g., scars, tree centers) is lost with time and subsequent disturbances (Henry and Swan, 1973). The biggest problem in investigating stand history using age structures is estimating mortality (Harper, 1977) so the above interpretations of size of disturbances and number of trees killed, based on amount of regeneration following the disturbance, are necessarily qualitative.

Regeneration

Regeneration density is much greater in canopy gaps than under canopies (Table 14). However, gaps cover very little of the area in the intensive plots so regeneration under tree canopies is much more common in the forest as a whole.

The tallest trees found in gaps were 60 and 130 cm in intensive plots 1 and 2, respectively. The tallest trees found under the

Table 14. Regeneration in gaps and under canopies on the intensive plots.

Species	Regeneration density		Number per hectare of forest	
	Number per 100 m^2 of gap	Number per 100 m^2 of canopy	In gaps	Under canopy
Intensive plot 1				
Pseudotsuga menzieii	8.4	1.7	32	191
Taxus brevifolia	0.4	1.0	1	115
Arbutus menziesii	0.4	0	1	0
All species	9.1	2.7	35	306
Intensive plot 2				
Pseudotsuga menziesii	13.6	0.8	22	76
Libocedrus decurrens	1.2	1.2	2	114
All species	14.8	1.9	24	190

canopies were less than 35 cm in both plots. The lack of trees between 35 and 137 cm height in areas sampled beneath canopies was also generally observed in the stands. This indicates that these seedlings rarely reach breast height and probably attain canopy height much more rarely than seedlings occurring in gaps despite their larger numbers.

Regeneration following fires, discussed above, probably results in many more canopy dominants than regeneration either in gaps or under canopies. This inference is based on the large number of trees currently in the canopy which were initiated in this manner.

Two factors probably limit the importance of reproduction in small canopy gaps. Although gaps probably occur more often (e.g., in one hectare stands) they cover much less area than most fires. Also, up until age 100 or more, gaps created by death of single trees or small groups are probably closed by neighboring trees. Most gaps mapped were of this size.

This study was designed to examine the importance to reproduction of one to several tree-sized gaps described by Bray (1956). However, in his discussion, Watt (1947, p. 13) allows that "there are exceptional factors of rare or sporadic occurrence, such as storms, fire, drought, epidemics, which create a gape phase of exceptional dimensions." This very broad definition of the gap phase easily includes all regeneration on dry sites (and most other forests) and so is not used as the basis for a hypothesis.

Soil Characteristics and Stocking Indices

On the average, soils on intensive plot 1 are less mature, deeper, and higher in coarse fragments than those in plot 2. However, there is overlap in these features, especially depth. Soil depth is correlated with the stocking indices as expected in both intensive plots (Tables 15 and 16; Figure 26). The same is true for effective depth and available water-holding capacity (Figure 27) which are highly correlated with soil depth. Stocking is usually insignificantly correlated with coarse fragments. Thus the range of rock fragments on these plots apparently have less effect on stocking than does soil depth.

Fixed area plots provided estimates of basal area and sapwood basal area more highly correlated with soil characteristics than those from prism plots. This is due to the inclusion of remote, large diameter trees in prism tallies and so poor estimation of stocking near the pit.

The range in soil characteristics and stocking (which the soil pits were chosen to cover) is generally quite large (Table 12; Figures 26, 27 and 28). The above-ground stocking indices span a larger range in plot 2 than in plot 1. The higher incidence of significant correlations in intensive plot 2 is probably due to this feature, the slightly larger sample size in plot 2, and the better developed stocking in plot 2 indicated by the larger number of older trees.

The relationship of roots counted to pit depth is linear with the exception of one high value (Figure 28) which occurred in a pit

Table 15. Product-moment correlation coefficients between stocking indices and soil characteristics for the seven soil pits on intensive plot 1. Significance at the .05 (*), .01(**), and .005(***) levels using a one-tailed test is indicated.

Stocking Indices	Soil Characteristics							
	Depth		Coarse fragments	Effective depth		Available water-holding capacity		Micro-topography
	of pit	to bedrock		to 100 cm	to bedrock	to 100 cm	to bedrock	
Stem Densities								
In 100 m^2 plot Pseudotsuga	.646	.472	-.419	.517	.408	.528	.384	-.517
In 314 m^2 plot Pseudotsuga	.792*	.718*	-.375	.619	.657	.594	.642	-.411
Basal Areas								
with 40 Factor prism	.268	.213	.568	-.127	.160	-.252	.1047	-.080
in 100 m^2 plot	.672*	.830*	.143	.375	.816	.230	.798*	-.028
in 314 m^2 plot	.204	.361	.534	-.132	.810	-.296	.331	.327
Sapwood Basal Areas								
with 40 factor prism	-.014	.154	.062	-.064	.164	-.094	.177	.577
in 100 m^2 plot	.767*	.692*	-.016	.406	.619	.312	.576	-.291
in 314 m^2 plot	.584	.584	.393	.152	.589	-.032	.539	-.042
Roots (all sizes)	.985***							

Table 16. Product-moment correlation coefficients between stocking indices and soil characteristics from the eight soil pits on intensive plot 2. Roots were counted at five soil plots. Significance at the .05 (*), 101 (**), and .005 (***) levels using a one-tailed test is indicated.

Stocking Indices	Soil Characteristics							
	Depth to pit	Depth to bedrock	Coarse fragments	Effective depth to 100 cm	Effective depth to bedrock	Available water-holding capacity to 100 cm	Available water-holding capacity to bedrock	Micro-topography
Stem Densities								
In 100 m^2 plot								
Pseudotsuga	.759*	.793**	.076	.890***	.880***	.882***	.876***	-.441
Libocedrus	.332	.217	.342	.248	.135	.271	.237	-.114
All species	.787*	.776*	.192	.872***	.822**	.874***	.856***	-.429
In 314 m^2 plot								
Pseudotsuga	.757*	.748*	.016	.888***	.827**	.872***	.855***	-.702*
Libocedrus	.452	.357	.701*	.223	.174	.271	.246	.057
All species	.855***	.784*	.545	.759*	.693*	.786*	.759*	-.442
Basal areas								
with 40 factor prism	.591	.464	.425	.595	.437	.609	.565	.072
in 100 m^2 plot	.948***	.990***	.384	.839**	.933***	.874***	.910***	-.453
in 314 m^2 plot	.957***	.960***	.377	.853***	.902***	.887***	.915***	-.464
Sapwood basal area								
with 40 factor prism	.575	.524	.516	.565	.485	.585	.540	.089
in 100 m^2 plot	.987***	.955***	.524	.883***	.869***	.910***	.901***	-.573
in 314 m^2 plot	.967***	.891***	.609	.823**	.768*	.855***	.834**	-.554
Roots (all sizes)	.824*	-	-	-	-	-	-	-

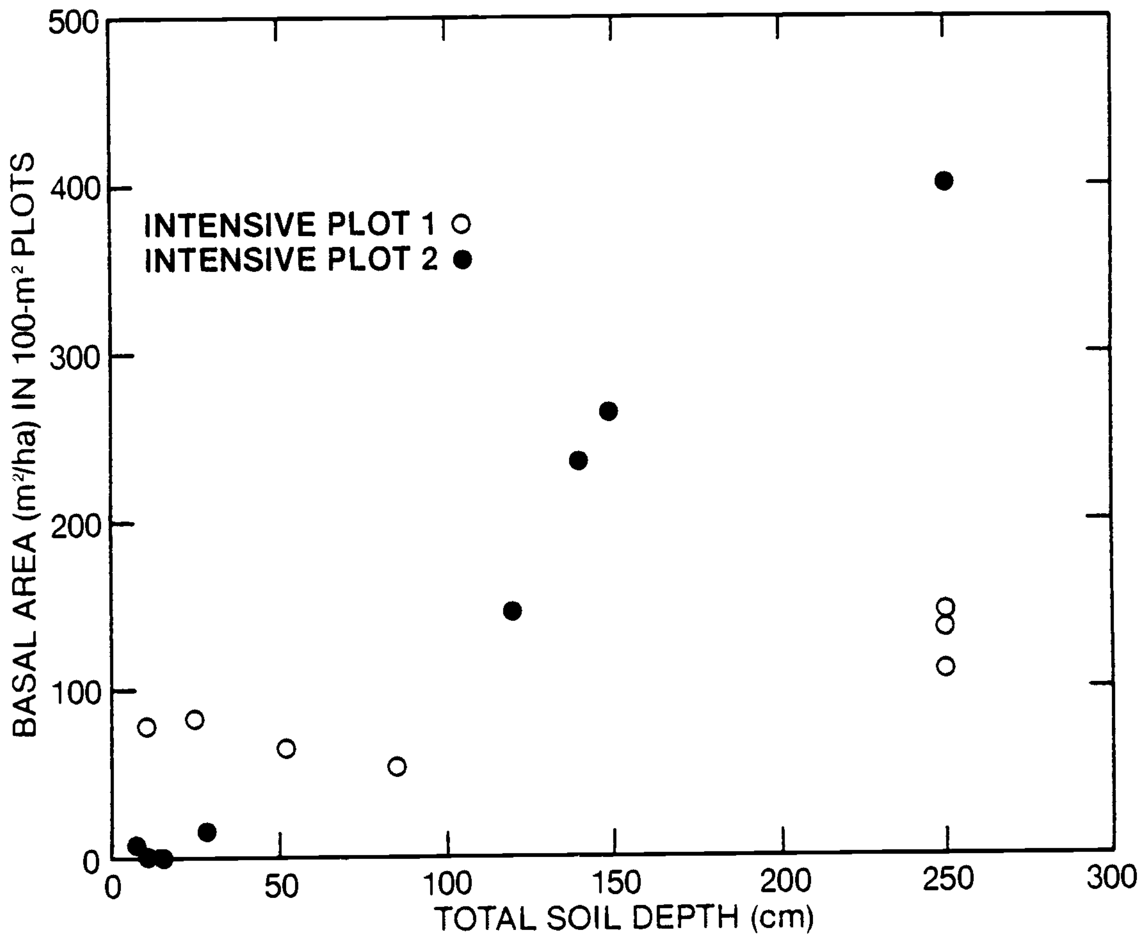

Figure 26. Basal area in the 100 m^2 plots versus total soil depth on the intensive plots.

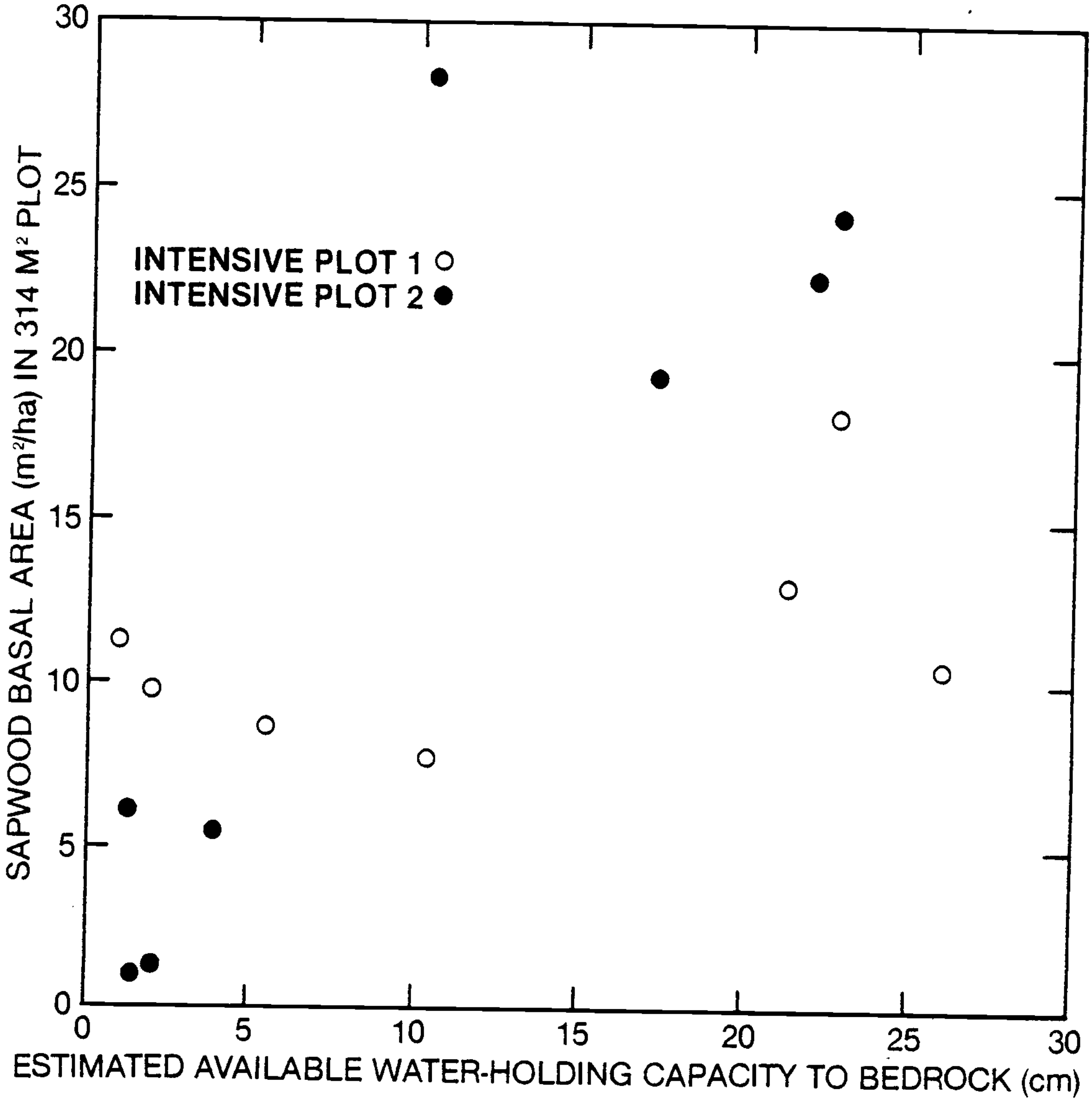

Figure 27. Sapwood basal area in the 314 m^2 plots versus estimated available water-holding capacity to bedrock on the intensive plots.

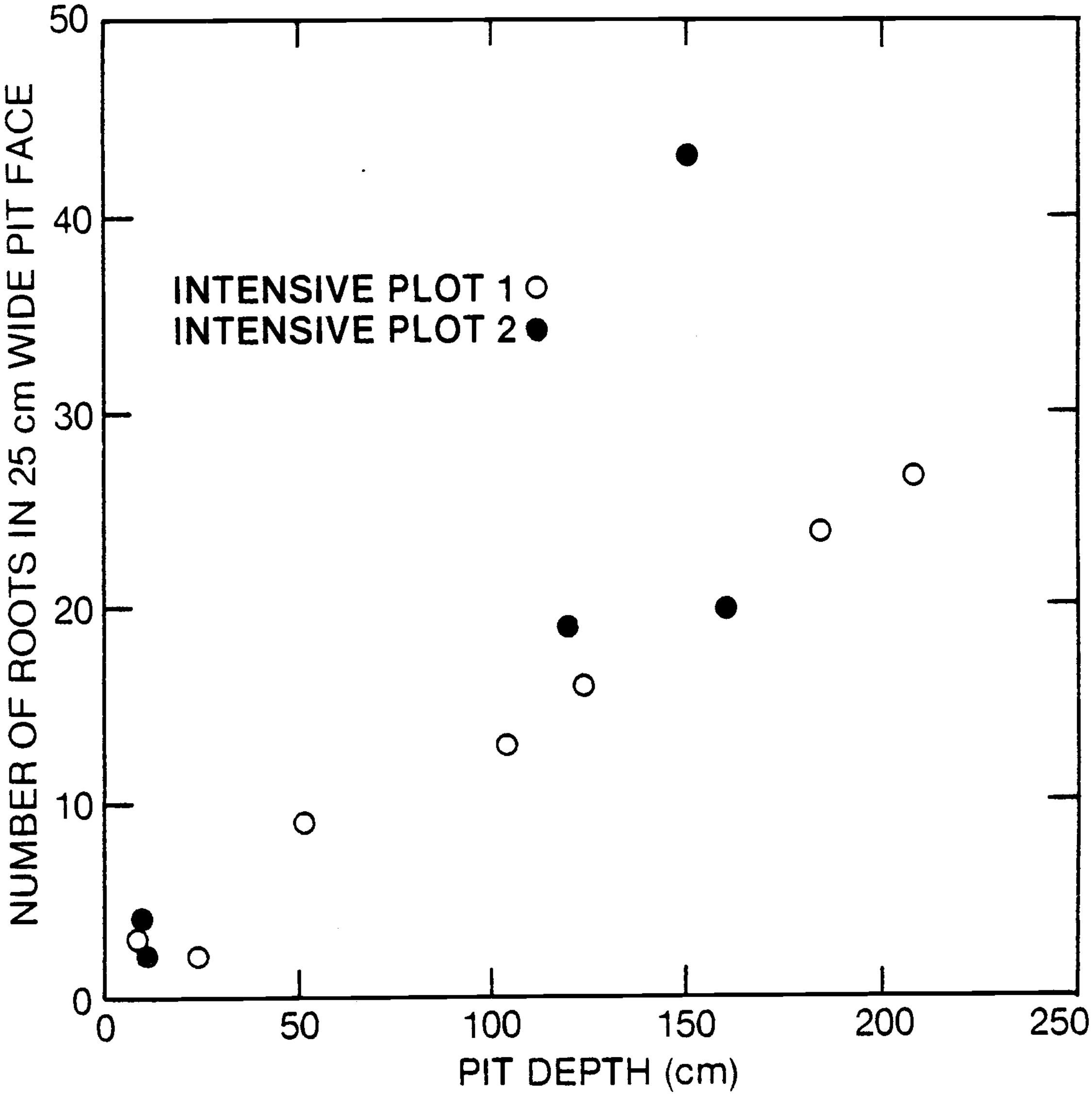

Figure 28. Number of root ends counted in a 25 cm wide vertical portion of the soil profile versus pit depth.

with an abnormally thick A horizon (59 cm) where the roots were concentrated. This indicates the ratio of root density to soil volume is constant with depth and over a wide range of rock content for roots greater than two mm diameter. This is consistent with the general lack of correlation between coarse fragments and stocking.

Extrapolation of the soil-stocking relationships beyond these intensive plots is risky on statistical grounds since only two stands were sampled. Nevertheless, these relationships are in general expected or easily interpreted and so can probably serve elsewhere as working hypotheses.

Synthesis and Conclusions

A general overview of the typical pattern of dry-site stand development can be developed from the intensive plot studies and the vegetation plot data. First, these stands are probably initiated by a large catastrophic fire or fires like most of the surrounding forest (Franklin et. al., 1976; Figure 20). An alternative hypothesis is that they are burned only by fires which kill a portion of the canopy. Some of the oldest trees would be killed by the fires but most would be weakened by decay through fire scars and die from rootthrow, stem break and other causes.

The second process is the repeated occurrence of fires which kill a portion of the canopy trees. These fires may be limited to less than one tenth hectare or cover many hectares. Any portion of the canopy may be killed. Intervals between these fires vary considerably

(Table 2). Several closely spaced fires may initiate a single age cohort.

The third process is regeneration establishment in the newly available growing space. This may proceed for over 150 years following the fire though the probability of younger trees reaching the canopy decreases with time. The shortest regeneration time observed is 60 years between the two-aged fires in intensive plot 1 but judging by the continuity of tree ages this period was truncated by the 133 year old fire.

Due primarily to the large amount of canopy space opened up by some fires, regeneration under the canopy and in gaps made by root-throw or breakage of one or more trees is of little importance.

The poor relationship between tree age and diameter is made worse by the long time for regeneration establishment. This results in stands which often have a smooth reverse-J shape diameter distribution. This is not the result of continuous tree establishment under the canopy gaps as occurs elsewhere (Bray, 1956).

Site occupancy increases with soil depth and related soil characteristics (Tables 15 and 16). The variability in these soil factors which can occur within a small area (Table 12; Figures 26 and 27) can make vegetation sampling and interpretation of these samples difficult. One of the reasons soils are so variable is that most dry site communities are on convex and geomorphically active areas. Such sites generally have thin soils in which a change in bedrock depth of one meter can result in a two- or three-fold difference in soil depth.

Nature regenerates these stands with a "partial cut" and then establishes trees over the next 60 to 150 years. This scenario has two main management implications. First, shelterwood or single-tree or group-selection system (sensu Smith, 1962) will most closely mimic the natural system. Currently, the most commonly used *Pseudotsuga* silvicultural system includes clear cutting as the regeneration cut (Williamson, 1973). This is due in part to early failures with selection cuts on mesic sites (Munger, 1950) where partial cuts result in *Tsuga*-dominated stands. This problem will not occur in the dry coniferous forests studied here.

Second, regeneration may require a considerable period of time no matter what silvicultural system is used. Clear cutting will result in significant regeneration problems on most of these hot, dry sites. Foresters in the Blue River, Oakridge and Rigdon districts indicate slow regeneration is common on some of these sites and the most extreme sites may not restock after five or more plantings. Under the selection system the site is continually occupied with growing stock and rapid regeneration is not critical.

Further management implications are given in Chapters 6 and 7.

HEIGHT GROWTH

Pseudotsuga menziesii has a different height growth curve form in the upper slope forests of the western Cascades (Curtis et. al., 1974b) than it has in lowland and coastal forests (McArdle et. al., 1961). Near the cool upper elevational limits of its range Pseudotsuga starts more slowly and sustains height growth to an older age than it does in the lowlands. It seems logical that Pseudotsuga at the hot, dry extreme of its range might also have a height growth curve form different from that of mesic lowland sites. Pinus ponderosa has been found to have a different height growth curve form on different habitat types (Daubenmire, 1961, 1976) as has Tsuga mertensiana (Johnson, 1980).

The following hypothesis guides this portion of the study: The form of the height growth curve of dominant and codominant Pseudotsuga in dry coniferous forests differs significantly from that of Pseudotsuga on mesic sites and site index curves in Bulletin 201 (McArdle et. al., 1961) are, therefore, inapplicable.

Different height growth curve forms result in different site index curve forms (Curtis et. al., 1974a). The actual curve forms of the trees sampled to estimate site index must match those used in site index curve construction or serious errors in estimated site index and volume productivity can result (Herman and Franklin, 1976).

Other site curves are available for westside Pseudotsuga (King, 1966) but they were developed from young trees and can only be used for trees up to 120 years old. Recently developed curves for

Pseudotsuga east of the Cascade crest (Cochran, 1979a) extend to only 100 years. These are not useful in estimating site index in the older stands common in these sites (Table 8).

Methods

Field Methods

Stem dissection plots were located throughout the study area, except the Detroit District where dry sites are rare. The trees selected for stem dissection were in or near vegetation plots so that each dissection site could later be assigned to a plant community.

Several criteria were used for tree selection. Candidate trees were dominants or strong codominants with straight boles showing no signs of past top breakage. Unhealthy crowns, flat or deformed tops, or several (or one large) conks were causes for rejection. Candidates were increment cored at breast height. Trees showing periods of suppressed radial growth or significant rot were not used. These criteria resulted in rejection of 70 to 90 percent of the dominant and strong codominant trees over 200 years old and of 30 to 70 percent of trees between 100 and 200 years old. Effects of past fires (fire scars and resultant butt rot), top breakage, and disease obviously increase with age. Reduced radial growth commonly caused rejection which is not surprising considering current canopy trees often came in under a partial canopy (see Chapter 5).

When sufficient acceptable trees were available several were cut at each location. This allows assessment of the potential bias in site curves due to changes in the tallest tree on the plot through time

(Dahms, 1963). When the tallest four to six trees on the plot are selected this potential bias can also be eliminated from the site index curves using the methods of Cochran (1979a, 1979b).

Stem dissection was performed on 40 trees, 20 each in 1977 and 1978. The stem dissection process generally followed that of Herman et. al. (1975). A professional sawyer was hired to fall and buck the large trees. In most cases cross-section disks were taken at stump height, breast height (137 cm above ground level) and at two meter intervals above breast height. Ground level is defined as midslope on the side of the tree. Diameter outside bark was measured circumferentially before the disks were cut. Four inside bark diamters and four inside sapwood diamters were measured after the disks were cut.

During the first year full disks were taken back to the Forestry Sciences Laboratory in Corvallis and radii (radial sections including the pith) cut from them to reduce storage space.

In the second year one diamter was cut from uniform disks in the field. As a general rule full stump disks and often breast height disks were taken to the lab because their radial growth is often irregular and several radii must be measured to characterize it.

Laboratory Methods

Narrow rings were counted with a variable magnification binocular microscope. Radii were prepared with a belt sander or a "Surform" plane depending on whether the wood was dry or moist, respectively. Narrow ring sequences were best counted on smooth sanded surfaces. Standing water improved counting in all cases though it was difficult to sustain on some radii. Ring clarity was not improved with the dyes used (bromocrecial green, methyl orange, floroglucinol (Patterson, 1959)).

Height growth curves were constructed for each tree. Occasionally these curves showed anomalies such as abrupt changes in height growth rate which were often the result of inaccurate initial ring counts. Counts of multiple radii usually cleared up these anomalies. Several trees showed suppressed height growth, usually early in life, or had isolated periods of relatively slow height growth probably indicating significant top breakage. Primarily for these reasons, seven trees were eliminated from further consideration, except for illustrative purposes.

Actual site index (total tree height at 100 years total age) was then compared with that estimated using Bulletin 201 (McArdle et. al., 1961).

Results

Trees were cut in all community types (Table 17). This is fortuitous since the community classification was constructed after the trees were cut. The Rigdon District, where dry sites are most extensive, was sampled most heavily. Individual trees vary widely in age, height, and predicted site index (Table 18).

The height growth curves have a moderately wide range of forms (Figure 29). Some trees, generally those with higher actual site index showed pronounced convexity. Tree 5 on plot 47 had this type of curve form which is similar to the curves of McArdle et. al. (1969).

Table 17. Location, community type and elevation of stem dissection plots.

Plot	number of trees cut	Ranger District	Drainage	Community type	Elevation (m)
3	3	McKenzie	Upper McKenzie River	Libocedrus/Chimaphila	853
20[1/]	3	Blue River	Lookout Creek	Pseudotsuga/Holodiscus-Acer	689
35	4	Blue River	Starr Creek	Pseudotsuga/Holodiscus/grass and Pseudotsuga/Holodiscus-Acer	899
41	2	McKenzie	Deer Creek	Libocedrus/Chimaphila	777
45	6	Blue River	Augusta Creek	Libocedrus/Whipplea	930
47	4	McKenzie	Upper McKenzie River	Libocedrus/Chimaphila and Pseudotsuga/Holodiscus-Acer	792
62	2	Rigdon	Hills Creek Reservoir	Pseudotsuga/Holodiscus/grass Collomia phase	525
63	2	Rigdon	Hills Creek Reservoir	Pseudotsuga/Holodiscus/grass Collomia phase	550
64	2	Rigdon	Middle fork of Willamette River	Pseudotsuga/Berberis/Disporum	632
65	1	Rigdon	Middle fork of Willamette River	Pseudotsuga/Holodiscus/grass Aspidotus phase	712
67	3	Rigdon	Pine Creek	Pseudotsuga/Berberis/Disporum	765
68	1	Rigdon	Pine Creek	Pseudotsuga/Holodiscus/grass Collomia phase	814
69	1	Rigdon	Youngs Creek	Pseudotsuga/Berberis/Disporum	977
70	4	Oakridge	North fork of middle fork of Willamette River	Pseudotsuga/Holodiscus-Acer	775

Table 17. continued

71	2	McKenzie	Deer Creek	*Libocedrus/Chimaphila*	740
73	1	McKenzie	Upper McKenzie River	*Libocedrus/Chimaphila*	853

1/ H.J. Andrews Experimental Ecological Reserve reference stand 20.

Table 18. Comparison of actual height of 34 dry site *Pseudotsuga* with site index (predicted height at 100 years) using the site curves of McArdle et al. (1961).

Plot	Tree	Diameter at Breast Height (cm)	Breast height age	Total age 1/	Total height	Height at 100 years	Predicted height at 100 years	Error in predicted height
				(meters)				
3	1	80.3	134	142	44.7	33.9	39.6	.7
20	2	79.0	110	118	44.5	43.2	42.7	- .5
20	5	56.7	107	115	41.1	39.6	39.6	0
20	6	64.5	117	125	44.6	41.5	39.6	1.9
35	1	88.4	97	105	51.3	50.3	50.3	0
35	4	92.7	113	121	51.2	47.8	47.2	- .5
35	6	91.5	110	118	50.8	47.1	47.2	.2
41	1	96.4	266	274	48.1	30.1	38.1	7.1
41	2	109.3	245	253	54.2	32.9	44.2	11.3
45	2	83.3	117	125	48.1	43.0	44.2	1.2
45	4	84.9	196	204	48.4	30.3	41.2	10.9
45	5	65.1	123	131	45.0	30.4	32.0	1.6
45	6	68.5	121	129	46.0	39.9	42.7	2.8
45	7	66.5	121	129	43.0	37.4	39.6	2.2
47	5	112.8	207	215	52.3	38.6	42.8	4.1
62	1	81.5	248	256	54.4	37.4	44.2	6.8
62	2	105.6	256	264	55.2	39.4	44.2	4.8
63	1	78.2	260	268	43.6	27.8	33.5	5.7
63	2	103.7	258	266	51.3	37.6	41.2	3.5
64	6	84.5	255	263	48.8	29.4	39.6	10.2
64	7	82.2	250	258	47.8	29.0	38.1	9.1
65	1	84.5	206	214	37.0	26.3	30.5	4.2
67	1	74.7	281	289	52.0	33.6	41.2	7.6
67	2	84.2	280	288	51.6	33.6	41.2	7.6
67	3	79.5	284	292	55.0	38.1	42.7	4.6

Table 18. continued.

68	1	74.4	281	289	45.3	32.0	36.6	4.6
69	1	86.3	134	142	44.9	37.9	41.2	3.3
70	1	116.6	255	263	55.7	34.3	44.2	9.9
70	2	107.1	230	238	56.7	38.0	45.7	7.7
70	3	89.2	118	226	49.2	30.6	41.2	10.6
70	4	87.1	224	232	51.2	29.8	42.7	12.9
71	1[2]	143.0	379	387	58.4	19.3	44.2	24.9
71	2	84.4	176	184	47.3	37.4	40.5	3.1
73	7	95.9	134	142	50.5	43.4	45.7	2.4

1/ Calculated as breast height age plus eight years, as is done when site index is estimated (McArdle et al., 1961).

2/ Shows significant height growth suppression. This tree is included for illustrative purposes only (figure 29).

The average or typical curve form is represented by tree 2 from plot 67 (Figure 29). The Bulletin 201 curves overestimate the site of this tree by 7.6 m which is not unusual for a 289 year old tree in this data set (Table 18). Tree 1 from plot 71 has an almost linear height growth curve not typical of these trees. Its height growth was probably suppressed early in life, but this did not prevent it from becoming the oldest and largest tree cut (Table 18).

When appropriate site index curves are used, the accuracy of site estimates decrease as distance from the index age increases (Curtis et. al., 1974a and 1974b) but the estimates should still be unbiased. However, when tree growth and site curve forms do not match, site index estimates are biased and the error increases farther from the index age (Figure 30).

Note that height growth suppression causes some of the largest differences between estimated site index and actual site index (tree height at 100 years) (Figure 3). This does not necessarily imply that site index has been overestimated by this amount because it would probably have been higher if these trees had not been suppressed.

Several causes for the difference between dry site and McArdle et. al.'s (1961) Pseudotsuga site curves are possible. McArdle's curves may inaccurately reflect height growth on mesic westside sites. The guide curve method used by McArdle relies on the assumption that average site quality is constant over the range of stand ages (Curtis, 1964). If average site index of the older stands sampled was lower the site curves would have excessive curvature and overestimates of site would result. Comparison of curves based on stem analyses with

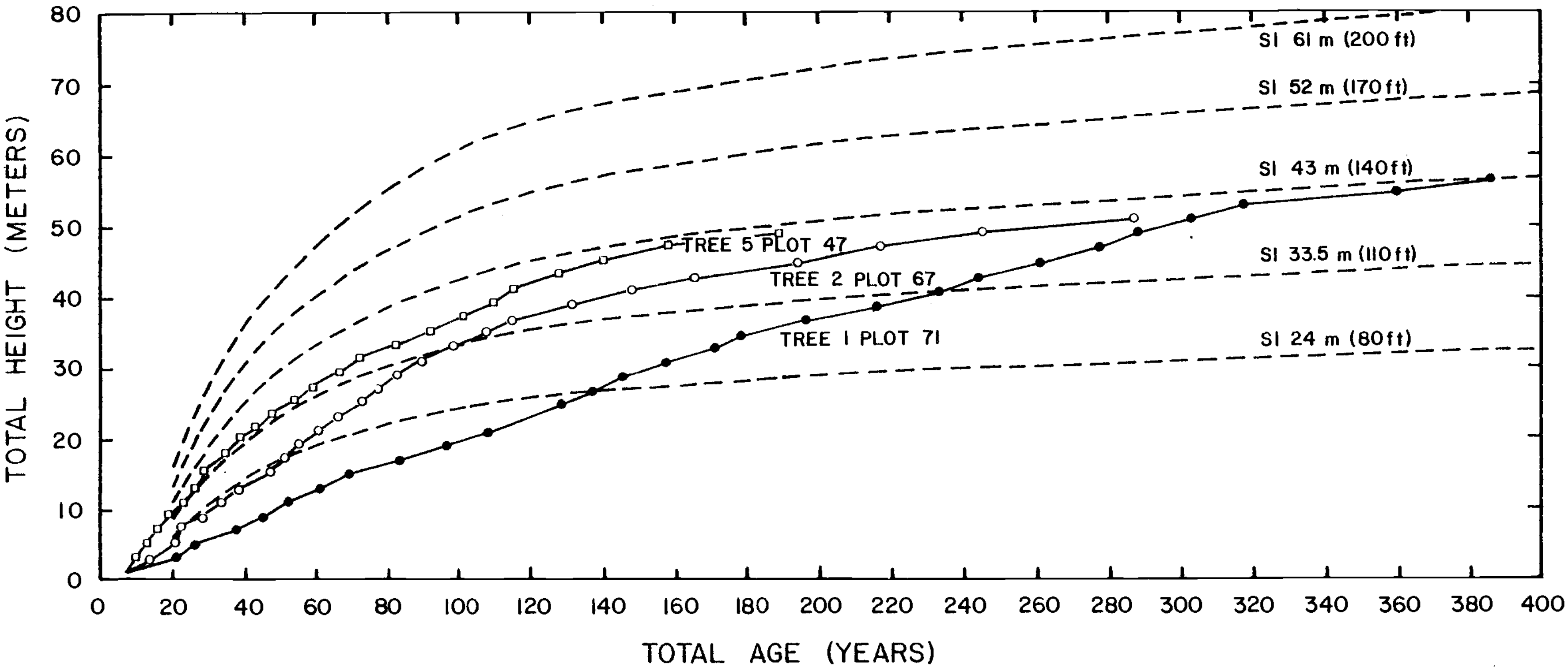

Figure 29. Height growth curves of three dry site <u>Pseudotsuga</u> trees (solid lines) compared with the site index/height growth curves of McArdle et al. (1961) (dashed lines).

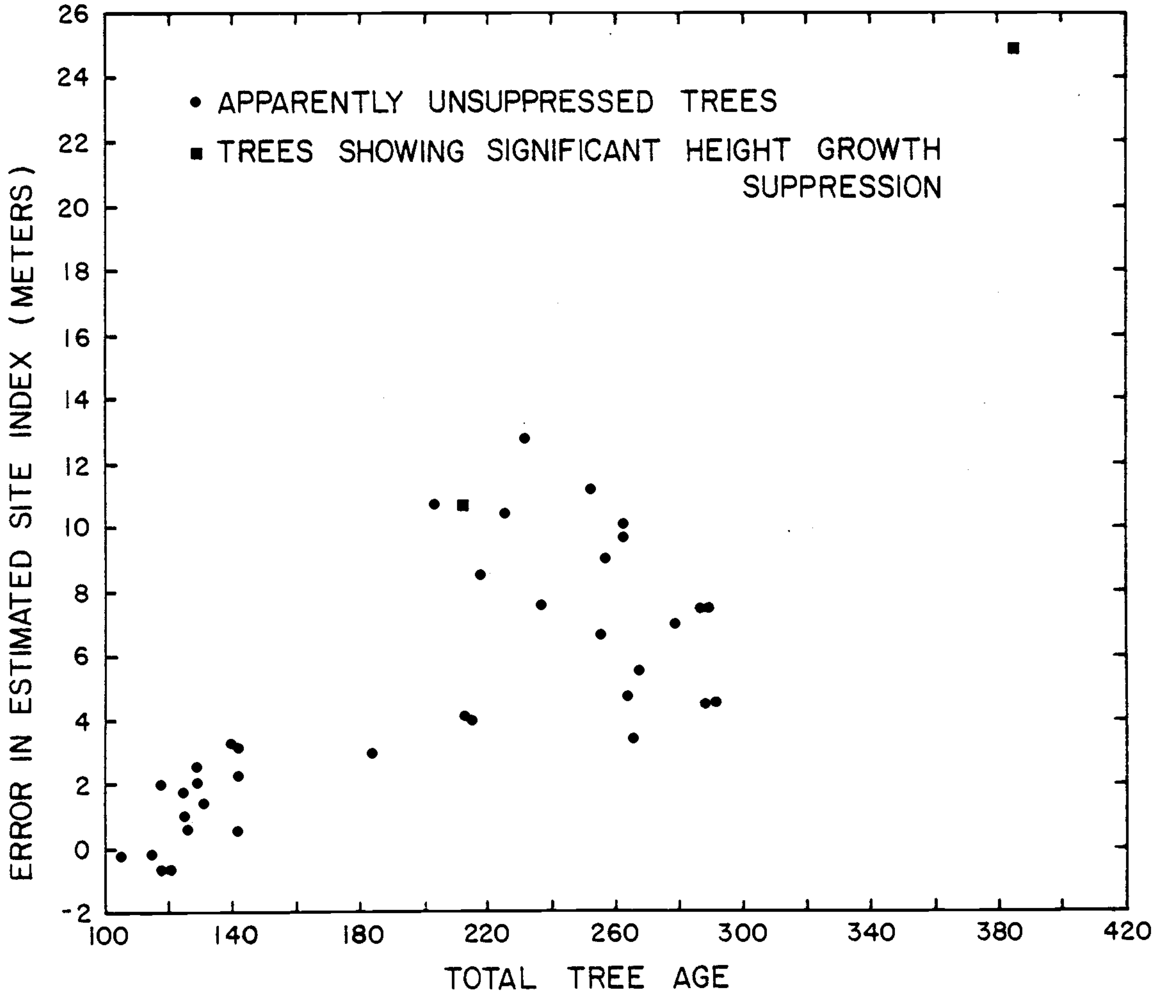

Figure 30. Error in estimated site index versus total tree age for the stem dissection trees showing increase in error with increasing tree age.

McArdle's indicates that McArdle's curves do have greater curvature than height growth curves of primarily mesic, westside Pseudotsuga (King, 1966). Environmental causes are also possible. The relatively severe environment on dry sites may limit the early rapid phase of growth compared to mesic sites. Later in life the lower stocking in some dry site stands (relative to mesic sites) may result in less reduction in height growth by competition than on mesic sites.

Management Implications

The average site index (base age 100 years) of the vegetation plots is 37 m as estimated with the curves of McArdle et. al. (1961). Based on dissected trees older than 150 years, the average overestimate of site index from figure 30 using McArdle's curves is approximately seven m. Under these conditions total yield of a pure Pseudotsuga stand at age 100 would be overestimated by 38 to 84 percent depending on the volume units and scale rules used (Tabld 19). Scale rules with high merchantibility limits give larger overestimates because the stand with the lower site index has proportionately more volume in smaller trees.

The long regeneration period of dry sites (60 to 130 years; see Chapter 5) results in a reverse-J shape diameter distribution (Table 7; Figures 22 and 23) and a partially stocked stand at 100 years. These factors probably cause normal yield tables (e.g., McArdle et. al., 1961), which assume stands are fully stocked and have a bell-shape diameter distribution, to overestimate productivity more than shown in Table 19.

Table 19. Errors in estimated total yield and other stand characteristics caused by the most commonly occuring over-estimate of site index (7 m) using Bulletin 201 (McArdle et al. 1961) on dry coniferous forest in the study area. Stand characteristics are taken from Bulletin 201 at age 100 for site indices 100 and 120.

Stand Characteristic	Actual Value	Estimated Value	Error (percent difference)
Height at 100 years (m)	30	37	20
Site index (ft)	100	120	20
Trees in all size classes:			
Trees per hectare	768	591	-23
DBH of average tree (cm)	29	36	22
Basal area (m^2/ha)	53	60	14
Net cubic yield (m^3/ha)	533	735	38
Trees greater than 7 inch (1718 cm) DBH:			
Net cubic yield (m^3/ha)	525	734	40
Net yield International 1/8 inch kerf (bdft/ac)	46700	70600	51
Trees greater than 12 inch (30.5 cm) DBH:			
Net cubic yield (m^3/ha)	374	639	71
Net yield International 1/8 inch kerf, minimum 5 inch (12.5 cm) top (bdft/ac)	35400	63100	78
Net yield International 1/4 inch kerf, minimum 8 inch (20.3 cm) top (bdft/ac)	26500	4800	81
Net yield Scribner, 8 inch (20.3 cm) top, 16 foot (4.9 m) logs (bdft/ac)	22800	42000	84

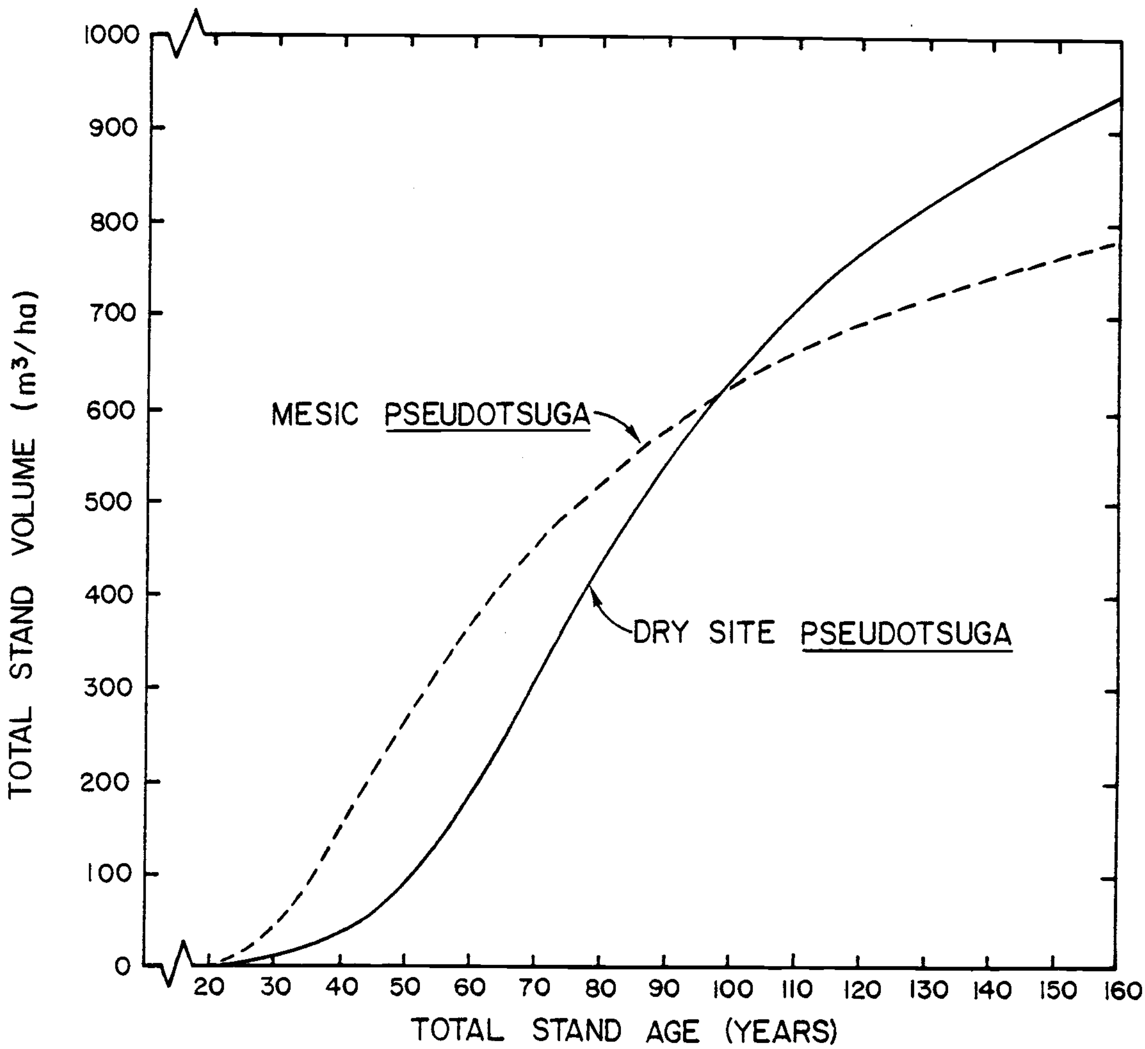

Figure 31. Live stand volume versus age for mesic and dry site *Pseudotsuga* both with site index 33.5 m. See text for explanation.

The different height growth pattern also probably results in a different pattern of volume growth. Though direct measurements of volume growth are not available, inferences can be made from the height growth patterns (e.g., Curtis et. al., 1974b). The relationships of height to age and volume to age in Bulletin 201 (McArdle et. al, 1961) were combined to obtain the relationship between height and volume for site index 110 ft (33.5 m). Then the time course of stand volume was estimated from the height growth of a typical stem dissection tree from this study (tree 2 on plot 67) to approximate that of dry site Pseudotsuga (Figure 31). Mean annual increments calculated from this data and taken directly from McArdle's data for Tsuga climax (mesic Pseudotsuga) forests are shown in Figure 32.

This method of calculating mean annual increment for dry site Pseudotsuga assumes its stand volume is related to height of dominants as in "normal" stands. This assumption is probably not true due to slower initial establishment, different diamter structure and occasionally low stocking on dry sites. However, violations of the assumption can be qualitatively assessed and it allows a comparison.

The dry site stand volume exceeds that of its more mesic counterpart after the index age (Figure 31). This is due to the continued rapid height growth rate of the dry site trees (Figure 29). Two other conclusions result from this height growth pattern.

Maximum mean annual increment of these stands is of similar magnitude but occurs 40 years later in the dry site stand (Figure 32). The slower initial establishment, different diameter distribution, and occasional lower stocking of dry stie stands probably postpones

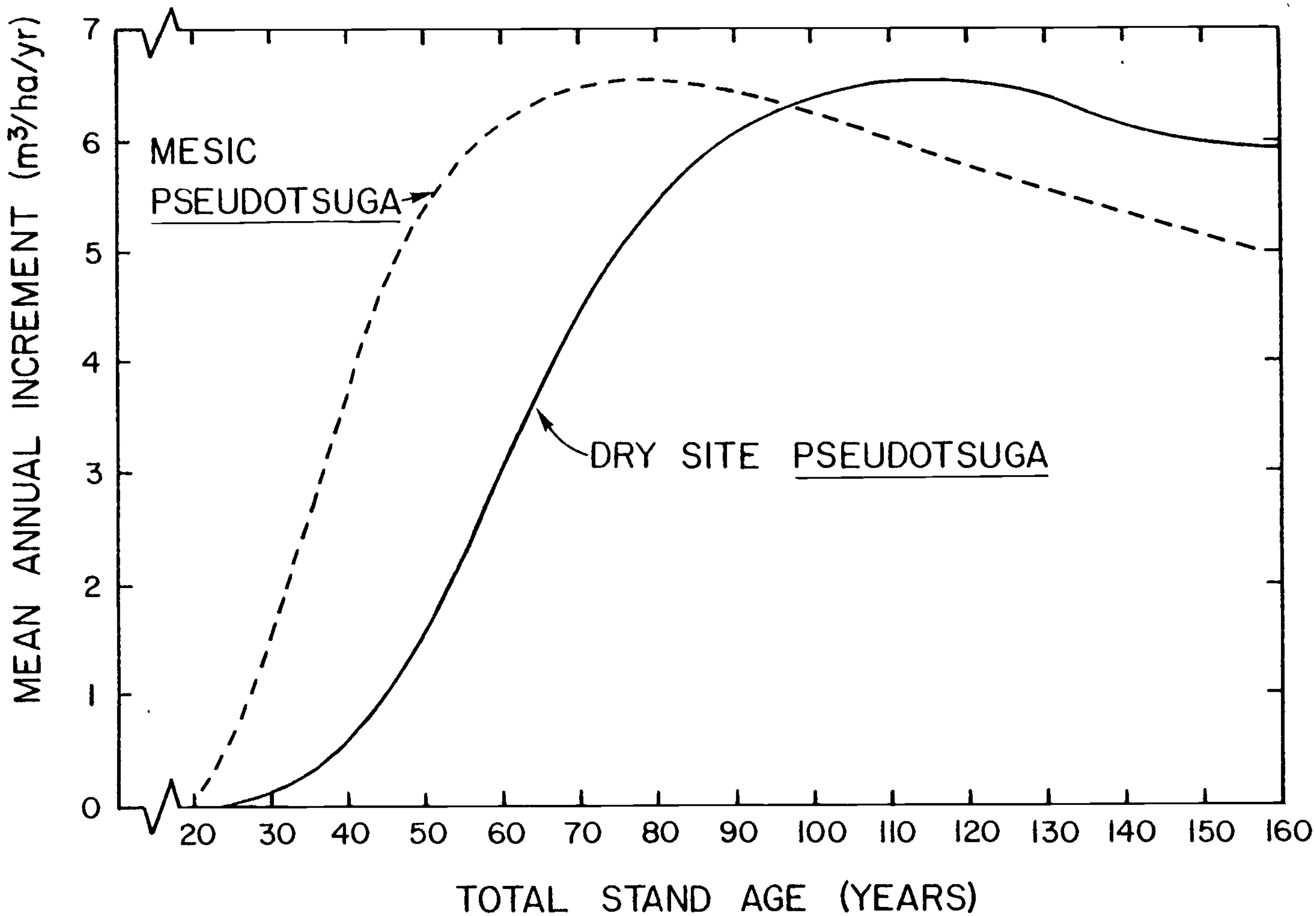

Figure 32. Mean annual increment versus stand age for mesic and dry site Pseudotsuga both with site index 33.5 m. See text for explanation.

maximum mean annual increment even further than indicated here and may also reduce it. Thus rotations on dry sites should be longer than on mesic sites of the same site indices if high volume productivity is a management goal.

The second conclusion is that McArdle et. al.'s (1961) yield tables are not applicable to these dry coniferous forests even if site index estimates are obtained. The different volume growth curves for stands of the same site index illustrate this point (Figures 31 and 32).

The trend of later culmination of mean annual increment on sites with environmental limitations to tree growth becomes even more evident near the limits of aborescent vegetation. Height and basal area growth rates of _Pinus monophylla_ - _Juniperous osteosperma_ stands in Nevada and eastern California are unrelated to age, stocking or basal area in "closed" stands (Meeuwig, 1979). Instead, basal area growth rate and maximum height are apparently site dependent. _Tsuga mertensiana_ dominated forests in the High Cascades of Oregon provide another example (Herman and Franklin, 1976; Johnson, 1980). Height growth patterns of _Tsuga mertensiana_ show much less curvature than _Tsuga heterophylla_ so an analysis similar to the above would show much later culmination of mean annual increment.

SYNTHESIS

The Pacific Northwest is a region of Pseudotsuga menziesii-dominated forests. A very narrow strip of coastal Picea-Tsuga forest and montane and subalpine forests above about 1,300 m are the only significant forested exceptions west of the Cascades. It is both the ecologically and economically dominant species in this region. Pseudotsuga plays these roles due to an unequalled combination of characteristics (Minore, 1979). Under many conditions this long-lived, thick-barked species seeds in rapidly following infrequent catastrophic fires (Isaac, 1943). Its fast-growing progeny dominate subsequent stands. Although it is usually the dominant it is rarely the climax species (Munger, 1940). Tsuga heterophylla and many of Pseudotsuga's other associates are more tolerante (Minore, 1979) and reproduce and grow well under its shade while its own progeny do not (Munger, 1940). Tsuga is the climax species in most of this area though Abies amabilis occupies this role at higher elevations (Franklin and Dyrness, 1973).

Within the matrix of relatively mesic Tsuga-climax sites are patches of hotter and drier habitat where Tsuga is virtually absent and Pseudotsuga or another conifer is climax (Dyrness et. al., 1974). Leaf areas and canopy densities are less than on the mesic sites (Gholz et. al., 1976) which is one reason Pseudotsuga can reproduce under these canopies.

Occurrence of dry sites is determined more by moisture than by temperature. Dry site moisture stresses are consistently higher than those of Tsuga climax sites but overlap in temperature is great (Chapter 3).

Dry site forests show much compositional variety within the Willamette National Forest. Some variability is due to geographical (especially latitudinal) variation in flora (Chapter 4). Dry sites are much more extensive in the south - occurring on more mature soils and gentler land forms. Much of the latitudinal variation in flora and greater extent of dry sites in the south is due to reduced preicitation, higher temperature (Chapter 2) and higher evaporative demand (Waring et. al., 1978) with decreasing latitude.

One important feature of dry site forests is their diversity in composition, structure and productivity. In some respects, it is greater than any other forest type. A small change in environment can make a large difference in community structure and species composition at the hot, dry extreme of coniferous forest growth. As an example, in intensive plot 2 basal area of one m radius plots ranged from three to 153 m^2/ha while the vegetation ranged from grass and annual herbs to heavy low shrubs and lush perennial herbs. This is in part due to soil characteristics and topography. As a consequence there is much variability within the community types described here.

Dry coniferous forest commonly occurs on south-facing, steep, convex land forms where thin, poorly developed soils are often apparently perpetuated by erosion. It also occupies gentler land forms, especially in the Oakridge and Rigdon Districts where the Pseudotsuga/Berberis/Disporum community occurs on gentle slopes with well-developed soils.

Fire is the primary initiator of stands and of younger age classes. Stands initiated following a catastrophic fire are burned at intervals that average 100 years by fires that kill only part of the overstory. This initiates a new age cohort. This process can lead to three or more cohorts in one stand producing an uneven-aged structure that is in striking contrast to the often even-aged structure of Pseudotsuga on more mesic sites.

Regeneration is slow following these disturbances. Though hard evidence is lacking regeneration is probably slower following complete stand destruction than under partial shade which follows a less destructive fire. Such shade offers respite from high evaporative demands and temperatures.

Height growth of dry site Pseudotsuga is initially slower but sustained to a greater age than that of Pseudotsuga on more mesic sites. Volume and biomass growth should be similarly affected. Several other forests which occur near the environmental limits of arborescent growth appear to have similar trends of biomass accretion.

The patterns of natural stand development discussed above have important management implications. A selection or shelterwood silvicultural system approximates the natural functioning of these ecosystems closer than clear cutting. The partial overstory will buffer extremes of temperature and evaporative demand and so benefit regeneration. It will also utilize the growing space during the regeneration process which is quite long in natural stands. Slow reproduction can be accelerated on some dry sites (e.g., the Pseudotsuga/Berberis/Disporum type) but on the most extreme sites (e.g., the Aspidotis phase of the Pseudotsuga/Holodiscus/grass type) this will be difficult.

The number of entries should be minimized on dry sites on steep, easily-eroded, convex land forms. Thus the selection systems, at least with frequent cuttings, should probably not be used on these dry sites. Longer rotations will also lessen management-induced erosion. Soil loss from these thin soils may have a greater effect on vegetative growth than loss from deeper soils.

Some dry coniferous forests may not be appropriate for timber management, due to the low productivity, high erosion hazard, difficult regeneration problems and relatively high values of the other resources. Other values which may be important include scenery - ridges are often easily visible - and wildlife - animal trails and deer bedding sites are very common.

Maximum mean annual increment occurs later on dry sites than on mesic sites of similar site index based only on the difference in height growth curves. Typically slow regeneration, even when these sites are planted, will further retard maximum mean annual increment. So if high volume productivity is a management goal, rotations must be longer than on mesic sites. Intermediate cuttings will reduce age of mean annual increment. But their utility for this will be restricted when regeneration is slow and stocking remains low for a significant part of the rotation.

Due to more linear height growth curves and inverse J-shape diameter distribution on dry sites McArdle et. al.'s (1961) site index curves and yield tables are not applicable.

This information on composition, structure and the functioning of dry forests comes in large part from studying old communities which have relatively stable vegetation and long histories contained in ages, scars, and boles. The primeval forest is valuable for this type of basic forest research.

BIBLIOGRAPHY

Anderson, Howard George. 1967. The phytosociology of some vine maple communities in the Mary's Peak watershed. M.S. thesis, Oregon State University, Corvallis. 118 p.

Atzet, Thomas. 1979. Description and classification of the forests of the upper Illinois River drainage of southwestern Oregon. Ph.D. thesis, Oregon State University, Corvallis. 211 p.

Bailey, Arthur Wesley. 1966. Forest associations and secondary plant succession in the southern Oregon Coast Range. Ph.D. thesis, Oregon State University, Corvallis. 164 p.

Baldwin, Ewart M. 1976. Geogology of Oregon, Revised Edition. Kendell/Hunt Pub. Co., Dubuque, Iowa. 147 p.

Becking, Rudolf Willem. 1954. Site indicators and forest type classification of the Douglas-fir region in western Washington and Oregon. Ph.D. thesis, University of Washingtin Seattle, 159 p.

Blasing, T.J. and H.C. Fritz. 1976. Reconstructing past climatic anomalies in the North Pacific and Western North America from tree-ring data. Quat. Res. 6:563-579.

Blum, B.M. 1961. Age-size relationships in all-aged northern hardwoods. USDA For. Serv. Res. Note. No. 125, Northeastern For. Exp. Stn., Upper Darby, Penn. 3 p.

Bray, J.R., and J.T. Curtis. 1957. An ordination of the upland forest communities of southern Wisconsin. Ecol. Monogr. 27(4): 325-349.

Brown, R.B. and R.B. Parsons. 1973. Soils of the reference stands --Oregon IBP. Coniferous Forest Biome Internal Report 128. 76 p. University of Washington, Seattle.

Bruce, David, Donald J. DeMars and Donald L. Reukema. 1977. Douglas-fir managed yield simulator -- DFIT user's guide. USDA For. Serv. Gen. Tech. Rep. PNW-57, Pac. Northw. For. & Range Exp. Stn., Portland, Oregon. 26 p.

Buol, S.W., F.D. Hole and R.J. McCraken. 1973. Soil genesis and classification. Iowa State University Press, Ames. 360 p.

Burke, Constance J. 1979. Historic fires in the central western Cascades, Oregon. M.S. thesis, Oregon State Univ., Corvallis. 130 p.

Cleary, B.B. and R.H. Waring. 1969. Temperature: its analysis for the interpretation of plant growth and distribution. Can. J. Bot. 47:167-173.

Cochran, P.H. 1979a. Site index and height growth curves for Douglas-fir in managed, even-aged stands east of the Cascades in Oregon and Washington. USDA For. Serv. Res. Pap. PNW-251, Pac. Northw. For. & Range Exp. Sta., Portland, Oregon 16 p.

Cochran, P.H. 1979b. Site index and height growth curves for managed, even-aged stands of white or grand fir east of the Cascades Oregon and Washington. USDA For. Serv. Res. Pap. PNW-252, Pac. Northw. For. & Range Exp. Sta., Portland, Ore. 13 p.

Cole, David. 1977. Ecosystem dynamics in the coniferous forest of the Willamette Valley, Oregon, USA. Jour. Biogeography 4:181-192.

Cooley, W.W. and P.R. Lohnes. 1971. Multivariate Data Analysis. Wiley, New York. 364 p.

Corliss, J.F. and C.T. Dyrness. 1965. A detailed soil-vegetation survey of the Alsea area in the Oregon Coast Range. In C.T. Youngberg, ed. Forest Soil Relationships in North America, Oregon State University Press, Corvallis, pp. 457-483.

Cottam, Grant, F. Glenn Goff and R.H. Whittaker. 1978. Wisconsin comparative ordination. In Ordination of plant communities. Ch. 7, pp. 185-213. R.H. Whittaker, ed. Dr. W. Junk bv, The Hague, The Netherlands.

Curtis, Robert O. 1964. A stem-analysis approach to site index curves. For. Sci. 10(2):241-256.

Curtis, R.D., F.R. Herman, and D.J. DeMars. 1974. Height growth and site index of Douglas-fir in high-elevation forests of the Oregon-Washington Cascades. For. Sci. 20(4):307-315.

Curtis, Robert O., Donald J. DeMars, and Francis R. Hermon. 1974a. Which dependent variable in site index-height-age regressions? For. Sci. 20(1):74-87.

Dahms, Walter G. 1963. Correction for a possible bias in development of site index curves from sectional tree data. J. For. 61(1):25-27.

Daniel, Wayne W. 1978. Applied nonparametric statistics. Haughton, Mittlin, Boston. 510 p.

Daubenmire, R. 1961. Vegetative indicators of height growth in ponderosa pine. For. Sci. 7(1):24-34.

Daubenmire, R. 1968. Plant communities. Harper & Row, New York. 300 p.

Daubenmire, R. 1976. The use of vegetation in assessing the productivity of forest lands. Bot. Rev. 42:115-143.

Daubenmire, R., and J.B. Daubenmire. 1968. Forest Vegetation of Eastern Washington and Northern Idaho. Wash. Agr. Exp. Sta., Washington State University, Pullman, 104 p.

Day, R.J. 1972. Stand structure, succession, and use of southern Alberta's Rocky Mountain forest. Ecol. 53(3):472-478.

Draper, N.R. and H. Smith. 1966. Applied regression analysis. John Wiley & Sons, Inc., New York. 407 p.

Dyrness, C.T., J.F. Franklin and W.H. Moir. 1974. A preliminary classification of forest communities in the central portion of the western Cascades of Oregon. Coniferous For. Biome Bull. No. 4, U.S./IBP, University of Washington, Seattle, Washington. 123 p.

Emmingham, W.H. and G.A. Lundberg. 1977. Climatic and physiological data summaries for the H.J. Andrews reference stand network. Internal Rep. No. 166, U.S.I.B.P., Coniferous For. Biome, University of Washington, Seattle, 109 p.

Fogel, R., M. Ogawe and J.M. Trappe. 1973. Terrestrial decomposition; a synopsis. Coniferous For. Biome Internal Rep. 135, U.S.I.B.P., University of Washington, Seattle, 12 p.

Franklin, J.F. and C.T. Dyrness. 1973. Natural vegetation of Oregon and Washington. USDA For. Serv. Gen. Tech. Rep. PNW-8, Pac. Northw. For. and Range Exp. Stn., Portland, Oregon, 417 p.

Franklin, J.F., C.T. Dyrness, and W.H. Moir. 1970. A reconnaissance method for forest site classifciation. Shinrin Richi (Japan) 12 (1):1-14.

Franklin, J.F., L.J. Dempster, and R.H. Waring, eds. 1972. Proceeding - Research on Coniferous Forest Ecosystems - a Symposium. 322 p.

Franklin, J.F., W.H. Moir, M.A. Hemstrom and S. Greene. 1980. Forest ecosystems of Mount Rainier National Park. Review draft of Pac. Northw. For. & Range Exp. Sta. Res. Pap., Corvallis, Oregon 221 p.

Franklin, J.F., F. Swanson, P. Morrison, J. Means and C. Woods. 1976. Establishment of old-growth Douglas-Fir stands: some new perspectives. Talk presented at Annu. Meet. of Northwest Scientific Assoc. Mar. 25-27, 1976; Cheney, Washington.

Fritts, H.C. 1971. Dendroclimatology and denroecology. Quaternary Res. 1(4):419-449.

Fritts, H.C. 1976. Tree Rings and Climate. Academic Press, New York, 567 p.

Garrison, G.A., J.M. Skovlin, C.E. Poulton and A.H. Winward. 1976. Northwest plant names and symbols for ecosystem inventory and analysis. Fourth edition. USDA For. Serv. Gen. Tech. Rep. PNW-46, Pac. Northw. For. $ Range Exp. Sta., Portland, Oregon. 263 p.

Gauch, H.G., Jr., and R.H. Whittaker. 1972. Comparison of ordination techniques. Ecol. 53(5):868-875.

Gauch, H.G., Jr., R.H. Whittaker and T.R. Wentworth. 1977. A comparative study of reciprocal averaging and other ordination techniques. J. Ecol. 65(1):157-174.

Gholz, Henry L., Franklin K. Fitz and R.H. Waring. 1976. Leaf area differences associated with old-growth forest communities in the western Oregon Cascades. Can. J. For. Res. 6(1):49-57.

Grier, C.C. and R.S. Logan. 1977. Old growth Douglas-fir communities of a western Oregon watershed: biomass distribution and production budgets. (Ecol. Monogr.) 74(4):371-373.

Hack, John T. and J.C. Goodlet. 1960. Geomorphology and forest ecology of a mountain region in the Central Appalachians. U.S. Geol. Surv. Prof. Pap. 347, 66 p.

Hanley, D.P., W.C. Schmidt, and G.M. Blake. 1975. Stand structure and successional status of two spruce-fir forests in southern Utah. USDA For. Serv. Res. Paper INT-176, Intermountain For. and Range Exp. Sta., Ogden, Utah. 16 p.

Harper, John L. 1977. Population biology of plants. Academic Press, New York, 892 p.

Hawk, G.M., J.F. Franklin, W.A. McKee and R.B. Brown. 1978. H.J. Andrews Experimental Forest reference stand system: establishment and use history. Conif. For. Biome Bull. No. 12, U.S.I.B.P., Coll. For. Res., Univ. of Washington, Seattle. 79 p.

Hawk, G.M., Mark Klopsch, Ted Thomas, Joe Means and Al Brown. 1979. Vegetation survey crew manual. Unpublished manuscript on file at the Forestry Sciences Laboratory, Corvallis, Oregon.

Heilman, Paul E., Harry W. Anderson and David M. Baumgartner (eds.). 1979. Forest soils of the Douglas-fir region. Washington State Univ., Coop. Exten. Serv., Pullman, Washington. 298 p.

Hemstrom, Miles Arthur. 1979. A recent disturbance history of forest ecosystems at Mount Rainier National Park. Ph.D. Thesis, Oregon State University, Corvallis, 67 p.

Henry, J.D. and J.M.A. Swan. 1974. Reconstructing forest history from live and dead plant material--an approach to the study of forest succession in southwest New Hampshire. Ecol. 55(4):772-783.

Herman, F.R., D.J. DeMars, and R.F. Woollard. 1975. Field and computer techniques for stem analysis of coniferous forest trees. USDA For. Serv. Res. Pap. PNW-194, Pac. Northw. For. and Range Exp. Stn., Portland, Oregon. 51 p.

Herman, F.R. and J.F. Franklin. 1976. Errors from application of western hemlock site curves to mountain hemlock. USDA For. Serv. Res. Note PNW-276. Pac. Northw. For. & Range Exp. Sta., Portland, Oregon. 6 p.

Hickman, James C. 1968. Disjuction and endemism in the flora of the central Western Cascades of Oregon: an historical and ecological approach to plant distributions. Ph.D. thesis, University of Oregon, Eugene. 334 p.

Hickman, James C. 1976. Non-forest vegetation of the central Western Cascade mountains of Oregon. Northw. Sci. 50(3):145-155.

Hill, M.O. 1973. Reciprocal averaging: an eigenvector method of ordination. J. Ecol. 61(1):237-249.

Hitchocock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle 730 p.

Husch, B., C.I. Miller and T.W. Beers. 1972. Forest measuration. Wiley, New York. 410 p.

Isaac, Lea. 1943. Reproductive habits of Douglas-fir. The Charles Lathrop Pack Forestry Foundation. 107 p.

Johnson, Greg P. 1980. Site index equations for mountain hemlock on three habitat types in the central Oregon Cascades. M.S. thesis, Oregon State University, Corvallis. (in preparation)

Jones, John R. 1966. Review and comparison of site evaluation methods. USDA For. Serv. Res. Pap. RM-51, Rocky Mtn. For. & Range Exp. Ta., For Collins, Colorado 27 p.

Juday, G.P. 1976. The location, composition, and structure of old-growth forests of the Oregon Coast Range. Ph.D. thesis, Oregon State University, Corvallis. 206 p.

King, J.E. 1966. Site curves for Douglas-fir in the Pacific Northwest. Weyerhaeuser For. Pap. 8, Weyerhaeuser Co., Centralia, Washington. 49 p.

Krajina, V.J. 1965. Biogeoclimatic zones and classification of British Columbia. Ecol. West. North. Am. 1:1-17. Publ by Dept. Botany, University of British Columbia.

Leak, W.B. 1975. Age distribution in virgin red spruce and northern hardwoods. Ecol. 56(6):1451-1454.

Legard, H.A. and LeRoy C. Meyer. 1973. Willamette National Forest Soil Resource Inventory. Pacific Northwest Region, USDA For. Serv. 167 p.

Little, E.L., Jr. 1979. Checklist of United States trees. Agric. Handb. No. 541. USDA For. Serv., Washington, D.C. 375 p.

MacArthur, R.H. 1965. Patterns of species diversity. Biol. Rev. 40:510-533.

Mader, D.L. 1963. Soil variability--a serious problem in soil-site studies in the Northeast. Soil Sci. Soc. Amer. Proc. 27(6):707-709.

McArdle, R.E., W.H. Meyer, and D. Bruce. 1961. The yield of Douglas-fir in the Pacific Northwest. USDA Tech. Bull. 201 (rev.). 74 p.

McKee, B. 1972. Cascadia. McGraw-Hill, New York. 394 p.

McNiel, R.C. 1976. Vegetation and fire history of a ponderosa pine-white fir forest in Crater Lake National Park. M.S. thesis, Oregon State University, Corvallis. 1971 p.

Meeuwig, R.O. 1979. Growth characteristics of Pinyon-Juniper stands in the western Great Basin. USDA For. Serv. Res. Pap. INT-238. Intermt. For. & Range Exp. Sta., Ogden, Utah. 22 p.

Merkle, J. 1951. An analysis of the plant communities of Mary's Peak, western Oregon. Ecol. 32:618-640.

Minore, D. 1979. Comparative autecological characteristics of northwestern tree species--a literature review. USDA Gen. Tech. Rep. PNW-87, Pac. Northw. For. & Range Exp. Sta., Portland, Oregon. 72 p.

Mitchel, R.F. 1979. Soil formation, classification and morphology. In P.E. Heilman, H.W. Anderson and D.M. Baumgartner (eds.) Forest soils of the Douglas-fir region. Washington State University Coop. Ext. Serv., Pullman, Washington. p. 157-172.

Mitchell, R.J. 1972. An analysis of the vegetation of Abbott Creek Natural Area, Oregon. Ph.D. thesis, Oregon State University, Corvallis 131 p.

Mitchell, R. and W. Moir. 1976. Vegetation of the Abbot Creek Research Natural Area, Oregon. Northw. Sci. 50(1):42-58.

Munger, T.T. 1940. The cycle from Douglas-fir to hemlock. Ecol. 21 (3):451-459.

Munger. T.T. 1950. A look at selective cutting in Douglas-fir. J. For. 48(2):97-99.

Nie, Norman H., C. Hadlai Hull, J.G. Jenkins, K. Steinbreener and D.H. Bent. 1975. SPSS Statistical package for the Social Sciences 4/5 p.

Noy-Meir, I. and M.P. Austin. 1970. Principal component ordination and simulated vegetation data. Ecol. 51(3):551-552.

Noy-Meier, I., D. Walker and W.T. Williams. 1975. Data transformations in ecological ordination. II. On the meaning of data standardization. J. Ecol. 63(3):779-800.

Oliver, C.D. and E.P. Stephens. 1977. Reconstruction of a mixed-species forest in central New England. Ecol. 58(3):562-572.

Orloci, L. 1966. Geometric models in ecology: I. the theory and application of some ordination methods. J. Ecol. 54(1):193-215.

Orloci. L. 1975. Multivariate analysis in vegetation research. Dr. W. Junk bv. The Hague, The Netherlands. 276 p.

Pacific Northwest River Basins Commission, Meteorology Committee. 1969. Climatological Handbook, Columiba Basin States. Vol. 1., Temperature, Parts A and B, 540 p. plus appendices. Vol. II, Precipitation, 262 p. plus appendices. Vancouver, Washington.

Packee, E.C. 1976. An ecological approach toward yield optimization through species allocation. Ph.D. thesis, University Minnesota. 740 pp.

Patterson, A.E. 1959. Distinguishing annual rings in diffuse-porous tree species. J. For. 57(2):126.

Peck, D.L., A.B. Griggs, H.G. Schlicker, F.G. Wells and H.M. Dale. 1964. Geology of the central and northern parts of the western Cascade Range in Oregon. Geol. Surv. Prof. Pap. 449, U.S. Gov't. Printing Off., Washington, D.C. 56 p.

Pielou, E.C. 1977. Mathematical Ecology. Wiley, New York. 385. p.

Pimental, R.A. 1979. Morphometrics, the multivariate analysis of biological data. Kendall/Hunt, Dubuque, Iowa. 276 p.

Rowe, K., R. Brenne, J. Barnes and K. Ewert. 1978. Statistical interactive programming system (SIPS) command reference manual Cyber-NOS version. Dept. of Statistics, Oregon State University, Corvallis 103 p.

Shigo, A.L. and H.G. Marx. 1977. Compartmentalization of decay in trees. USDA For. Serv. Agr. Info. Bull. 405, Washington, D.C. 73 p.

Smith, D.M. 1962. The practice of silviculture. Seventh edition. John Wiley & Sons, Inc., New York. 578 p.

Snedecor, G.W. and W.G. Cochran. 1967. Statistical Methods. Iowa State University Press, Ames, Iowa 593 p.

Soil Survey Staff. 1975. Soil Taxonomy. Agric. Handb. No. 436, Soil Conservation Service, U.S. Dept. Agr., 754 p.

Stephens, E.P. 1955a. The Historical developmental method of determining forest trends. Ph.D. thesis, Harvard University, Cambridge, Massachusetts.

Stephens, E.P. 1955b. Research in the biological aspects of forest production. J. For. 53(3):183-186.

Stubblefield, G. and C.D. Oliver. 1978. Silvicultural implications of the reconstruction of mixed alder/conifer stands. In utilization and management of red alder. USDA For. Serv. Gen. Tech. Rep. PNW-70, Pac. Northw. For. & Range Exp. Sta., Portland, Oregon, p. 307-320.

Swanson, F.J. and M.E. James. 1975. Geomorphic history of the lower Blue River-Lookout Creek Area, Western Cascades, Oregon. Northwest Sci. 49(1):1-11.

Tesch, S.D. 1975. The composition and dynamics of the tree strata within an old growth Douglas-fir forest in western Montana. M.S. thesis, University of Montana, Missoula. 141 p.

Thilenius, J. F. 1963. Synecology of the white-oak (Quercus garryana Douglas) woodlands of the Willamette Valley, Oregon. Ph.D. thesis, Ore.State Univ., Corvallis. 151 p.

U.S. Weather Bureau River Forcast Center. 1964. Mean annual precipitation, 1930-1957, state of Oregon. Pub. by Soil Cons. Serv., U.S. Dept. Agric. in coop. with U.S. Weather Bureau, Portland, Ore., U.S. Dept. Comm. map, 1 leaf.

Volland, L. A. and M. Connelly. 1978. Computer analysis of ecological data: methods and programs. USDA For. Serv. R6-ECOL-79-003. 22 chap. and append., individual pagination. Pac. Northw. Region, Portland, Ore.

Waring, R. H. 1969. Forest plants of the Eastern Siskiyous: their environmental and vegetational distribution. Northwest Sci. 43(1): 1-17.

Waring, R. H. and B. D. Cleary. 1967. Plant moisture stress: evaluation by pressure bomb. Sci. 155:1248-1254.

Waring, R. H., W. H. Emmingham, H. L. Gholz and C. C. Grier. 1978. Variation in maximum leaf area of conifer forests in Oregon and its ecological significance. For. Sci. 24(1): 131-140.

Waring, R. H., W. H. Emmingham and S. W. Running. 1975. Environmental limits of an endemic spruce, Picea breweriana. Can. J. Bot. 53(15): 1599-1613.

Waring, R. H. and J. F. Franklin. 1979. Evergreen coniferous forests of the Pacific Northwest. Sci. 204: 1380-1386.

Waring, R. H., K. L. Reed, and W. H. Emmingham. 1972. An environmental grid for classifying coniferous forest ecosystems. In Proceedings-Research on Coniferous Forest Ecosystems-A Symposium. Bellingham, Wash., 1972. Pac. Northwest For. & Range Exp. Sta., U.S. For Serv., Portland, Ore.

Watt, A. S. 1947. Pattern and process in the plant community. J. Ecol. 35(1): 1-22.

Whittaker, R. H. 1975. Communities and ecosystems. MacMillan Publ. Co., New York. 385 p.

Whittaker, R. H. and H. G. Gauch, Jr. 1978. Evaluation of ordination of plant communities. Ch. 10, p. 277-336. Robert H. Whittaker, ed. Dr. W. Junk bv, the Hague, the Netherlands.

Wierman, C.A. and C.D. Oliver. 1978. Crown stratification by species in even-aged Douglas-fir/western hemlock stands of coastal Washington. Can. J. For. Res. 9(1):1-9.

Wilde, S.A. 1958. Forest Soils. The Ronald Press Co., New York 537 p.

Willamette National Forest. 1973. Soil resource inventory, Atlas of maps and interpretive tables. U.S. For. Ser., Pacific Northwest Region, Eugene, Oregon. 49 unnumbered pages (to accompany Legard and Meyer, 1973).

Williamson, R.L. 1973. Coastal Douglas-fir. In U.S. Department of Agr., For. Serv. Silvicultural Systems for the major forest types of the U.S., U.S. Department of Agriculture Handb. No. 445 p. 8-10.

Willis, G.L. and M.S. Coffman. 1975. Composition, structure, and dynamics of climax stands of eastern hemlock and sugar maple in the Huron Mountains, Michigan. Ford For. Center Tech. Bull. No. 13, Dept. For., Mich. Techn. University, Houghton, Mich. 43 p.

Zobel, D.B., G.M. Hawk, M.A. McKee and C.T. Dyrness. 1973. Variation in plant moisture stress associated with forest communities in the H.J. Andrews Experimental Forest. Internal Rep. No. 78, U.S. I.B.P., Coniferous Forest Biome, University of Washington, Seattle 15 p.

Zobel, D.B., A. McKee, G.M. Hawk, and C.T. Dyrness. 1976. Relationships of environment to composition, structure, and diversity of forest communities of the central western Cascades of Oregon. Ecol. Mono. 46(2):135-156.

ADDENDUM TO BILIOGRAPHY

Peck, Morton Eaton. 1961. A manual of the higher plants of Oregon. Second edition. Binfords and Mert. 936 p.

APPENDICES

APPENDIX I

SPECIES NAMES AND ABBREVIATIONS

This is a complete listing of all taxa identified on the vegetation plots. Names of trees follow Little (1979) and names of all other taxa follow Hitchcock and Cronquist (1973) except for a few uncommon taxa which follow Peck (1961). Abbreviations follow Garrison et. al. (1976).

Abbreviation	Scientific Name	Common Name
Trees		
Abam	Abies amabilis	silver fir
Abpr	Abies procera	noble fir
Abgr	Abies grandis	grand fir
Abgrc	Abies grandis/concolor[1/]	
Acma	Acer macrophyllum	bigleaf maple
Arme	Arbutus menziesii	madrone
Cach	Castanopsis chrysophylla	golden chinquapin
Lide	Libocedrus decurrens	Incense-cedar
Pila	Pinus lambertiana	sugar pine
Pipo	Pinus ponderosa	ponderosa pine
Psme	Pseudotsuga menziesii	Douglas-fir
Prunu	Prunus spp.	cherry
Prem	Prunus emarginata	bitter cherry
Quga	Quercus garryana	Oregon white oakd
Tabr	Taxus brevifolia	pacific yew
Thpl	Thuja plicata	western red-cedar
Tshe	Tsuga heterophylla	western hemlock
Tall Shrubs		
Acci	Acer circinatum	vine maple
Acgl	Acer glabrum	rockymountain maple
Amal	Amelanchier alnifolia	serviceberry
Arco 3	Arctostaphylos columbiana	hairy manzanita
Cach	Castanopsis chrysophylla	golden chinquapin
Cein	Ceanothus integerrimus	deerbrush
Cesa	Ceanothus sanguineus	redstem ceanothus
Conu	Cornus nuttalli	pacific dogwood
Costo	Cornus stolonifera v. occidentalis	red-osier dogwood
Cococ	Corylus cornuta v. californica	California hazel
Gafr	Garrya fremontii	Freemont silktassel

1/ Intergrade between Abies grandis and Abies concolor (white fir).

Abbreviation	Scientific Name	Common Name
Hodi	Holodiscus discolor	oceanspray
Osce	Osmaronia cerasiformis	Indian plumb
Phle	Philadelphus lewisii	Lewis mockorange
Rhpu	Rhamnus purshiana	cascara buckthorn
Rhma	Rhododendron macrophyllum	pacific rhododendron
Rhdi	Rhus diversiloba	poison oak
Ribes	Ribes spp.	currant, goosebeery
Ricr	Ribes cruentum	shinyleaf gooseberry
Rosa	Rosa spp.	rose
Rogy	Rosa gymnocarpa	baldhip rose
Rupa	Rubus parviflorus	western thimbleberry
Salix	Salix spp.	willow
Vapa	Vaccinium parvilfolium	red huckleberry
Vame	Vaccinium membranaceum	thin-leaved huckle-berry
Low Shrubs		
Beaq	Berberis aquifolium	shining Oregon grape
Bene	Berberis nervosa	Cascade Oregon grape
Chme	Chimaphila menziesii	little prince's-pine
Chum	Chimaphila umbellata	common prince's-pine
Gaov	Galtheria ovatifolia	Oregon wintergreen
Gash	Galtheria shallon	salal
Loci	Lonicera ciliosa	trumpet honeysuckle
Lohi	Lonicera hispidula	hairy honeysuckle
Pamy	Pachistima myrsinites	myrtle boxwood
Rula	Rubus lasiococcus	dwarf bramble
Runi	Rubus nivalis	snow bramble
Ruur	Rubus ursinus	Pacific blackberry
Symo	Symphoricarpos mollis	creeping snowberry
Whmo	Whipplea modesta	modest whipplevine
Herbs		
Acmi	Achillea millefolium	western yarrow
Actr	Achyls triphylla	vanillaleaf
Adbi	Adenocaulon bicolor	trailplant
Adpe	Adiantum pedatum	maidenheir fern
Alvi	Allotropa virgata	candystick
Anemo	Anenome spp.	windflower
Ande	Anemone deltoidea	threeleaf anemone
Anly 2	Anemone lyallii	lyall anemone
Anor	Anemone oregana	Oregon anemone
Anten	Antenaria spp.	pussytoes
Apan	Apocynum androsaemifolium	spreading dogbane
Arca 3	Aralia californica	elk clover
Arma 3	Arenaria macrophylla	bigleaf sandwart
Arnic	Arnica spp.	arnica
Asca 3	Asarum caudatum	British Columbia wildginger

Abrreviation	Scientific Name	Common Name
Asde	Aspidotis densa	podfern
Asra	Aster radulinus	roughleaved aster
Borag	Boraginaceae spp.	Borage family
Brass	Brassicaceae spp.	mustard family
Brco 3	Brodiaea congesta	northern saitas
Brho	Brodiaea howellii	Howell's brodia
Cabu 2	Calypso bulbosa	fairy-slipper
Caloc	Calochortus spp.	thistle
Capr 3	Campanula prenanthoides	California harebell
Casc 2	Campanula scouleri	varied-leaf collomia
Cirsi	Cirsium spp.	thistle
Copa	Collinsia parviflora	small-flowered blue-eyed Mary
Cohe	Collomia heterophylla	varied-leaf collomia
Coum	Comandra umbellata	bastard toad-flax
Compo	Compositae spp.	aster family
Cony	Convolvus nyctagineus	night-blooming morning glory
Coral	Corallorhiza spp.	coral-root
Coma 3	Corallorhiza maculata	spotted coral-root
Come	Corallorhiza mentensiana	western coral-root
Coca	Cornus canadensis	bunchberry dogwood
Cram	Cryptantha ambiqua	obscure cryptantha
Cygr	Cynoglossum grande	Pacific hound's-tongue
Daca 4	Daucus carota	wild carrot, Queen Anne's lace
Dispo	Disporum spp.	fairybells
Diho	Disporum hookeri	Hooker's fairy bells
Ebau	Eburophyton austiniae	phantom-orchid
Epan	Epilobium angustifolium	firewood
Epmi	Epilobium minutum	small-flowered willow-weed
Epwa	Epilobium watsonii	Watson's willow-weed
Eriog	Eriogonum spp.	wild buckwheat
Erla	Eriophyllum lanatum	wooly eriophyllum
Erar 2	Erysimum arenicola	wallflower
Frve	Fragaria vesca	woods strawberry
Gaap	Galium aparine	goose grass
Gaor	Galium oreganum	Oregon bedstraw
Gatr	Galium triflorum	sweetscented bedstraw
Gica	Galia capitata	bluefield gilia
Goob	Goodyera oblongifolia	rattlesnake-plantain
Haun	Habenaria unalascensis	Alaska rein-orchid
Heuch	Heuchera spp.	alumroot
Hemi	Heuchera micrantha	small-flowered alum-root
Hial	Hieracium albiflorum	white-flowered hawk-weed
Hype	Hypericum perforatum	St. John's-wort

Abbreviation	Scientific Name	Common Name
Hymo	Hypopitys monotropa	fringed pinesape
Iris	Iris spp.	iris
Irch	Iris chrysophylla	slender-tubed iris
Irte	Iris tenax	Oregon iris
Lamu	Lactuca muralis	wall lettuce
Lathy	Lathyrus spp.	peavine
Lane	Lathyrus nevadensis	peavine
Lapo	Lathyrus polyphyllus	Pacific peavine
Legum	Leguminosae spp.	pea family
Liap	Liugsticum apiifolium	celery-leaved licorice-root
Lilia	Liliaceae spp.	lily family
Liwa	Lilium washingtonianum	Washington lily
Libo 2	Linnaea borealis	twinflower
Loma 2	Lomatium martindalei	few-flowered lomatium
Locr	Lotus crassifolius	big deervetch
Lomi	Lotus micranthus	smell-flowered deer-vetch
Lone 2	Lotus nevadensis	Nevada deervetch
Lopu	Lotus purshiana	Spanish-clover
Lupin	Lupinus spp.	Lupine
Lula	Lupinus latifolius	broadleaf lupine
Mama	Madia madioides	woodland tarweel
Mimul	Mimulus spp.	monkey-flower
Mial	Mimulus alsinoides	checkweed money-flower
Migu	Mimulus guttatus	yellow monkey-flower
Moun 2	Monotropa uniflora	indian pipe
Monti	Montia spp.	montia
Mope	Montia perfoliata	miner's lettuce
Mosi	Montia sibirica	western spring beauty
Nepa	Nemophila parviflora	small-flowered nemophila
Orchi	Orchidaceae spp.	orchid family
Osch	Osmorhiza chilensis	mountain sweet-cicely
Oxsu	Oxalis suksdorfii	western yellow oxalis
Pera	Pedicularis racemosa	leafy lousewort
Penst	Penstemon spp.	penstemon
Phlox	Phlox spp.	phlox
Phad	Phlox adsurgens	periwinkle penstemon
Polyp	Polypodium spp.	licorice fern
Pogl 4	Polypodium glycyrrhiza	licorice fern
Pohe 2	Polystichium hesperium	
Polo 2	Polystichium lonchitis	mountain holly-fern
Pomu	Polystichium munitum	sword-fern
Pomui	Polystichium munitum v. imbricans	imbricate sword-fern
Pomum	Polystichium munitum v. munitum	common sword-fern

Abbreviation	Scientific Name	Common Name
Prvu	Prunella vulgaris	common selfheal
Psph	Psoralea physodes	California scarf-pea
Ptaq	Pteridium aquilinum	bracken fern
Ptan	Pterospora andromedea	pinedrops
Pyrol	Pyrola spp.	wintergreen
Pyap	Pyrola aphylla	leafless pyrola
Pypi	Pyrola picta	whitevein pyrola
Pyse	Pyrola secunda	one-sided pyrola
Sapr	Sagina procumbens	procumbent pearlwort
Sado	Satureja douglasii	yerba buena
Saxif	Saxifragaceae spp.	Saxifrage family
Scrop	Scrophulariaceae	Figwort family
Sedum	Sedum spp.	stonecrop
Sesp	Sedum spathulifolium	spatula-leaf stonecrop
Sewa 2	Selaginella wallacei	Wallace's selaginella
Senec	Senecio spp.	groundsel
Sewe	Senecio neowebsteri[2/]	Olympia mountain butterweed
Sesy	Senecio sylvaticus	woodland groundsel
Sevu	Senecio vulgaris	common groundsel
Sica 2	Silene campanulata	slender campion
Sime	Silene menziesii	Menzies' silene
Smra	Smilacina racemosa	western solomon-plume
Smst	Smilacina stellata	stary solomon-plume
Stach	Stachys spp.	hedge-nettle
Stri	Stacys rigida	rigid hedge-nettle
Syre	Synthyris reinformis	snow-queen
Tiun	Tiarella unifoliata	coolwort foamflower
Trla 2	Trientalis latifolia	star flower
Trmi	Trifolium microcephalum	small-head clover
Trva	Trifolium variegatum	white-tip clover
Trill	Trillium spp.	wake-robin
Trov	Trillium ovatum	western trillium
Umbel	Umbelliferae sp..	parsely family
Vahe	Vancouveria hexandra	inside-out-flower
Vise	Viola sempervirens	everygreen violet
Viam	Vicia americana	American vetch
Xete	Xerophyllum tenax	bear-grass
Grasses		
Agdi	Agrostis diegoensis	thin bentgrass
Bromu	Bromus spp.	brome
Brvu	Bromus vulgaris	Columbia brome
Cyec	Cynosurus echinatus	hodgehog dogtail
Daca	Danthonia californica	California fescue
Dasp	Danthonia spicata	common wild oatgrass

[2/] Far from its known ange but a specimen most closely matched this species in Hitchcock and Cronquist (1973).

Abbreviation	Scientific Name	Common Name
Elgl	*Elymus glaucus*	blue wildrye
Festu	*Festuca* spp.	fescue
Feca	*Festuca californica*	California fescue
Feoc	*Festuca occidentalis*	western fescue
Feru	*Festuca rubra*	red fescue
Fesu 2	*Festuca subuliflora*	crinkle awn fescue
Kocr	*Koeleria cristata*	prairie Junegrass
Melic	*Melica spp.*	oniongrass
Meha	*Melica harfordii*	Harford's melica
Mesu	*Melica subulata*	Alaska onion grass
Poa	*Poa* spp.	bluegrass
Trca	*Trisetum canescens*	tall trisetum
Grass-like plants		
Carex	*Carex* spp.	sedge
Cape 5	*Carex pennsylvanica*	long stolon sedge
Luca 2	*Luzula campestris*	field woodrush

APPENDIX 2

REFERENCE STAND DATA SUMMARIES

The locations and physical characteristics of reference stands and methods of data collection are given in Chapter 3 (figure 8, table 1). In the plant moisture stress tables the dates are for the morning the pressure bombing was done. Species abbreviations are defined in Appendix 1. Asterisks in the computer generated thermograph data summarizations indicate values with more than five missing observations in the month.

1977 Predawn plant moisture stress (bar) on the reference stands. Heavy rain (ca. 2.0cm) the night of 770823 prevented sampling most reference stands in late August.

Reference stand number	Species (number of trees)	Date (month, day) 0810	0811	0812	0823
24	Psme(5)	14.8			14.4
	Tshe(4)	9.4			11.9
43	Psme(3)				16.6
	Tshe(5)				10.9
	Lide(1)				11.9
20	Psme(7)		19.1		
34	Psme(4)		15.7		
	Abgr(1)		11		
	Lide(1)		13		
35	Psme(4)		16.7		
	Abgr(1)		9		
	Lide(1)		18		
5	Psme(4)			22.3	
	Lide(2)			10.7	
8	Psme(5)			18.5	
	Lide(1)			16.5	
	Quga(1)			8.0	
44	Psme(4)			14.3	
	Tshe(2)			16.5	

1978 Predawn plant moisture stress (bar) on the reference stands. August rain resulted in lower stresses at two of three reference stands sampled in late August.

Reference Stand number	Species (number of trees)	Date (month,day) 0712	0713	0714	0802	0803	0804	0823
24	Psme (5)	6.1					9.9	
	Tshe (4)	4.8					6.6	
43	Psme (3)	5.7					9.3	
	Tshe (5)	4.5					5.6	
	Lide (1)	4.6					5.6	
20	Psme (7)		9.2			14.9		8.0
34	Psme (4)		8.2			7.1		9.2
	Abgr (2)		7.6			5.6		7.6
	Lide (3)		4.6			5.6		5.9
35	Psme (5)		9.1			8.1		6.5
	Abgr (1)		5.4			7.3		6.5
	Lide (1)		5.1			6.3		5.4
5	Psme (6)			8.2	13.1			
	Lide (3)			6.6	7.0			
8	Psme (7)			9.4	15.8			
	Lide (1)			9.2	13.3			
	Quga (1)			4.4	7.5			
44	Psme (3)			6.8	7.8			
	Tshe (3)			5.2	6.6			
	Lide (1)			5.4	6.8			

1978 growing season plant moisture stress for seven *Pseudotsuga* in reference stand 20 on the H.J. Andrews

Date (month, day)	Stress (bar)
0713	9.2
0803	14.9
0823	8.0
0913	4.6
1006	9.2
1025	12.5
1025	14.3[1/]

[1/] Data for six trees from Art McKee, H.J. Andrews Exp. Ecol. Res. Site Director, on other dates in this year.

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 5

DATA YEAR 1978

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
5	27	11.8	8.6	16.6	4.6	29.6	.2	21.6	9.9	12.0	8.0
6	30	16.9	12.4	22.7	9.1	35.9	5.7	22.7	13.5	15.0	12.0
7	31	18.9	15.1	25.6	10.6	38.1	5.6	23.6	15.6	18.0	14.0
8	31	18.8	15.9	24.1	11.6	40.8	7.7	23.4	15.9	19.0	14.0
9	30	14.3	11.0	18.3	8.1	28.2	3.6	18.6	13.4	16.0	12.0
10	31	14.4	10.2	20.0	5.9	30.2	-1.1	23.6	13.6	15.0	11.0
11	14	4.1*	3.7*	9.5*	-1.3*	15.7*	-7.4*	15.0*	9.4*	11.0*	6.0*
	194	15.1	11.6	20.5	7.7	40.8	-7.4	23.6	13.4	19.0	6.0

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 8

DATA YEAR 1978

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
4	18	7.6*	5.3*	10.3*	3.2*	17.8*	.1*	13.4*	6.6*	8.0*	5.0*
5	31	10.3	7.5	14.7	3.4	26.6	-1.5	21.5	8.4	12.0	6.0
6	30	15.5	11.5	20.4	8.2	33.4	4.3	21.1	12.7	15.0	10.0
7	31	18.1	14.2	23.3	9.3	37.8	3.3	23.4	15.5	18.0	13.0
8	31	18.9	14.9	23.7	11.0	40.5	6.6	24.5	15.9	20.0	13.0
9	30	13.5	10.9	18.3	7.3	28.2	1.6	21.1	13.3	16.0	11.0
10	31	14.4	10.7	20.7	6.1	31.1	.1	23.8	13.3	15.0	10.0
11	14	6.1*	3.8*	11.1*	-.6*	19.2*	-6.6*	16.5*	8.0*	10.0*	4.0*
	216	13.9	10.6	18.9	6.8	40.5	-6.6	24.5	12.3	20.0	4.0

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 20

DATA YEAR 1978

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
5	20	10.8*	8.3*	14.3*	5.0*	27.3*	1.8*	16.5*	8.6*	11.0*	7.0*
6	30	15.7	12.3	20.2	9.0	30.7	5.1	18.9	11.9	14.0	10.0
7	31	19.8	15.7	25.3	11.5	36.9	6.5	20.5	12.2	15.0	10.0
8	31	18.4	15.5	23.0	11.8	40.2	7.4	20.5	14.5	18.0	12.0
9	30	13.7	11.0	17.1	8.3	27.2	3.9	18.0	13.2	18.0	10.0
10	31	13.2	10.6	18.4	6.5	27.3	-1.3	17.3	12.3	14.0	9.0
11	14	4.6*	1.3*	6.7*	-1.9*	15.8*	-7.4*	12.5*	8.1*	10.0*	5.0*
	187	14.7	11.6	19.1	8.1	40.2	-7.4	20.5	12.0	18.0	5.0

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 24

DATA YEAR 1978

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
5	14	9.7*	7.5*	14.3*	4.1*	24.9*	-.1*	18.8*	7.1*	9.0*	5.0*
6	30	15.0	12.5	21.1	8.4	33.6	3.9	21.6	11.5	15.0	10.0
7	31	18.8	14.1	25.6	9.9	37.3	5.3	23.6	13.4	18.0	11.0
8	31	18.0	14.2	23.2	10.6	40.9	5.3	25.9	15.5	20.0	12.0
9	30	11.7	9.3	15.9	6.5	26.6	1.6	18.9	11.6	15.0	8.0
10	23	14.7*	10.4*	20.4*	6.3*	25.4*	1.1*	19.1*	12.3*	13.0*	11.0*
	159	15.2	11.7	20.7	9.1	40.9	-.1	25.9	12.5	20.0	5.0

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 35

DATA YEAR 1978

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
5	20	8.1*	5.7*	11.9*	2.7*	23.8*	-1.3*	16.5*	8.1*	10.0*	7.0*
6	30	13.3	10.4	18.0	6.9	29.6	2.2	17.5	11.7	13.0	10.0
7	31	17.6	14.1	22.9	10.2	34.1	5.1	17.3	14.6	17.0	12.0
8	31	17.1	13.8	21.3	10.6	38.6	5.3	18.9	14.8	18.0	12.0
9	30	12.6	9.7	16.2	7.2	28.0	2.2	18.9	12.3	14.0	10.0
10	25	15.4*	12.2*	20.4*	9.3*	28.0*	5.1*	17.1*	13.7*	14.0*	13.0*
	167	14.3	11.3	18.3	7.9	38.6	-1.3	18.9	12.8	18.0	7.0

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 43

DATA YEAR 1979

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
5	14	9.7*	7.0*	12.9*	3.6*	24.3*	-.8*	16.5*	7.1*	9.0*	6.0*
6	30	14.5	12.2	20.1	3.3	32.3	3.6	19.5	10.3	12.0	9.0
7	31	17.7	14.3	24.5	9.9	36.0	4.7	21.6	12.8	15.0	10.0
8	31	15.6	13.3	21.5	10.2	38.7	5.3	23.4	13.5	17.0	11.0
9	30	11.1	9.4	14.5	6.5	23.9	.9	15.0	11.1	13.0	9.0
10	22	13.3*	10.9*	18.3*	6.4*	23.5*	.7*	15.7*	11.7*	12.0*	10.0*
	158	14.2	11.7	19.3	3.0	38.7	-.3	23.4	11.5	17.0	6.0

DRY CONIFEROUS FOREST

THERMOGRAPH DATA SUMMARY

REFERENCE STAND 44

DATA YEAR 1978

MON	NO. DAY	DAY MEAN AIR TEMP (C)	NIGHT MEAN AIR TEMP (C)	MEAN MAX AIR TEMP (C)	MEAN MIN AIR TEMP (C)	ABS MAX AIR TEMP (C)	ABS MIN AIR TEMP (C)	ABS RANGE AIR TEMP (C)	MEAN SOIL TEMP (C)	ABS MAX SOIL TEMP (C)	ABS MIN SOIL TEMP (C)
5	27	11.2	8.5	15.9	4.2	26.6	-.8	20.3	9.0	11.0	7.0
6	30	15.9	12.8	20.9	9.0	34.1	5.7	20.2	11.9	13.0	10.0
7	31	13.1	13.8	23.8	9.7	36.5	4.8	23.4	14.0	16.0	12.0
8	31	14.1	14.3	22.9	10.5	40.3	5.9	23.2	14.3	17.0	13.0
9	30	13.6	10.9	17.6	7.8	27.3	2.7	18.4	13.2	15.0	11.0
10	31	13.1	10.7	19.2	6.1	29.1	-1.1	22.0	12.7	14.0	10.0
11	14	4.2*	2.1*	8.5*	-2.1*	17.0*	-9.0*	14.5*	9.4*	11.0*	7.0*
	194	14.3	11.2	19.3	7.2	40.3	-9.0	23.4	12.4	17.0	7.0

APPENDIX 3

KEY TO THE PLANT COMMUNITY TYPES

This key is designed to work on dry coniferous communities greater than approximately 100 years in age in the area of this study. This includes the Detroit, McKenzie, Blue River, Oakridge and Rigdon Ranger Districts on the Willamette National Forest in Oregon. Dry coniferous communities are defined as lacking significant *Tsuga* of any size class and not identifiable as any habitat type of Dyrness et al. (1974) other than their *Pseudotsuga/ Holodiscus* type. This last requirement excludes mesic sites young enough to have no *Tsuga* reproduction. *Abies grandis* (or *concolor*) is apparently climax in some moderately dry ecosystems, primarily in the southern end of the study area. These communities are also excluded from the definition of dry coniferous forest.

Ideally, plant community definitions and keys are tested in the field and revised several times before use. These have not been field tested but the key does correctly classify all the plots in this data set (Appendix 6). In an effort to assure its reliability much information is included in the key which may prove to be unnecessary following more thorough testing.

A. Libocedrus decurrens dominates reproductive size classes . . . . B

AA. Pseudotsuga menziesii dominates reproductive size classes C

B. Chimaphila umbellata and Chimaphila menziesii almost always present; Taxus brevifolia and Cornus nutallii usually present; Whipplea modesta and Lonicera ciliosa almost never present.
Libocedrus/Chimaphila community

BB. Whipplea almost always present and usually more than 4% cover; Lonicera ciliosa often present; Chimaphila, Taxus and Cornus usually absent. Libocedrus/Whipplea community

C. Disporum spp., Apocynum androsaemifolium, Osmorhiza chilensis, Vancouveria hexandra and Melica subulata almost always present; Philadelphus lewisii, Cynoglossum grande, Pteridium aquilinum, Satureja douglasii, and Festuca californica usually present
Pseudotsuga/Berberis/Disporum community

CC. Disporum, Philadelphus, Cynoglossum, Pteridium aquilinum, and Festuca californica rare; Apocynum, Osmorhiza, Satureja, Vancouveria and Melica subulata uncommon . . . . D

D. Acer circinatum, Corylus cornuta, Cornus, Taxus, Berberis nervosa and Gaultheria shallon have greater than 10% cover as a group;
Pseudotsuga/Holodiscus-Acer community

DD. Cover of the above group of shrub species less than or equal to 10%.
Pseudotsuga/Holodiscus/grass community . . . . E

E. Aster radulinus, Selaginella wallacei and Elymus glaucus, usually present; Achillea millifolium, Aspidotus densa, Brodia conjesta, Cirsium spp., Epilobium minutum and Koeleria cristata common to occassional, Danthonia spp. occassional; Chimaphila umbellata and Festuca occidentalis rare.
Aspidotis phase

EE. Festuca occidentalis and Chimaphila umbellata common; Achillea, Aspidotis, Brodia, Cirsium, Selaginella, Danthonia, Koeleria and Epilobium minutum rare.
Collomia phase

APPENDIX 4

PLOT LOCATION AND PHYSICAL CHARACTERISTICS

Soil orders follow the Soil Survey Staff (1975). Water holding capacities were calculated by program Sh2o (see Appendix 9).

Plot#	Location (based on the Willamette Meridian) Section	Township (south)	Range (east)	Elevation (meters)	Slope (%)	Aspect (deg.)	Soil order Pit 1	Soil order Pit 2	Water holding capacity (mm) Pit 1	Water holding capacity (mm) Pit 2
1	NW¼ 31	15	5	689	65	212	Inceptisol	Inceptisol	39	59
2	NE¼ 31	15	5	689	85	180	Inceptisol	Entisol	12	37
3	SE¼ 31	15	6	853	69	108	Alfisol	Inceptisol	77	90
4	SE¼ 11	21	3	594	75	180	Entisol		215	17
5	SE¼ 11	21	3	564	25	210	Alfisol	Alfisol	153	69
6	NE¼ 9	22	5	1021	62	180	Inceptisol		72	
7	NW¼ 27	22	5	975	81	205	Entisol		21	
8	NE¼ 24	21	3	625	63	260	Inceptisol	Inceptisol	55	45
9	SW¼ NE¼ 29	20	3	610	70	250	Entisol		53	
10	NW¼ NW¼ 32	20	3	808	45	202	Incpetisol		117	

Plot#	Location (based on the Willamette Meridian) Section	Township (south)	Range (east)	Elevation (meters)	Slope (%)	Aspect (deg.)	Soil order Pit 1	Soil order Pit 2	Water holding capacity (mm) Pit 1	Water holding capacity (mm) Pit 2
11	SW¼ 4	25	4	1113	43	225	Inceptisol		155	
12	NE¼ 5	25	4	945	73	180	Inceptisol		108	
13	SW¼ 27	23	3	732	36	270	Alfisol		128	
14	SW¼ SE¼ 21	23	3	663	24	202	Alfisol		190	
15	SE¼ SW¼ 34	22	3	526	72	225	Entisol	Alfisol	25	87
16	SW¼ SW¼ 28	20	4	975	54	270	Entisol		33	
17	NW¼ 8	21	5	960	80	225	Entisol		26	
18	NE¼ NW¼ 4	21	5	777	70	247	Inceptisol	Entisol	43	9
19	NW¼ SW¼ 7	9	7	1249	43	225	Inceptisol		104	
20	SE¼ SW¼ 14	9	6	884	8	247	Alfisol		95	
21	SW¼ SW¼ 14	9	6	815	57	180	Alfisol		89	
22	SE¼ NW¼ 14	10	6	853	63	200	Inceptisol		64	
23	SW¼ NE¼ 34	9	7	1082	67	200	Entisol	Entisol	47	13
24	SW¼ 27	9	6	884	68	225	Inceptisol		84	
25	SW¼ 27	8	4	594	62	225	Entisol	Entisol	12	18

Plot#	Location (based on the Willamette Meridian) Section			Township (south)	Range (east)	Elevation (meters)	Slope (%)	Aspect (deg.)	Soil order Pit 1	Soil order Pit 2	Water holding capacity (mm) Pit 1	Water holding capacity (mm) Pit 2
26		NW¼	5	9	4	701	72	225	Inceptisol		54	
27		NE¼	35	18	5	610	76	226	Inceptisol	Inceptisol	43	94
28	N¼	NE¼	35	18	5	914	50	225	Inceptisol		33	
29		SW¼	29	18	6	846	50	205	Inceptisol	Inceptisol	80	26
30	NW¼	SE¼	5	16	6	1250	74	225	Inceptisol	Inceptisol	101	62
31	NE¼	SE¼	27	15	6	838	38	225	Inceptisol	Inceptisol	151	155
32		SE¼	27	15	6	884	68	205	Inceptisol		107	
33		SE¼	11	18	5	1082	75	112	Inceptisol		79	
34		NW¼	22	18	5	899	75	225	Inceptisol		59	
35		NW¼	22	18	5	899	60	185	Inceptisol	Entisol	48	29
36		NE¼	23	10	6	701	65	180	Inceptisol		98	
37		SW¼	35	8	4	792	67	225	Inceptisol	Inceptisol	68	44
38		SW¼	35	8	4	625	80	270	Entisol		5	
39		SW¼	7	10	6	686	48	240	Inceptisol		179	
40		SE¼	10	9	7	1143	72	246	Inceptisol		101	

Plot#	Location (based on the Willamette Meridian) Section			Township (south)	Range (east)	Elevation (meters)	Slope (%)	Aspect (deg.)	Soil order Pit 1	Soil order Pit 2	Water holding capacity (mm) Pit 1	Water holding capacity (mm) Pit 2
41		NW¼	14	15	6	777	82	215	Inceptisol	Inceptisol	47	41
42		NW¼	14	16	5	488	80	190	Inceptisol		132	
43		SW¼	27	9	6	869	65	172	Inceptisol		107	
44		NE¼	24	21	3	640	75	315	Alfisol	Inceptisol	193	182
45		SW¼	26	18	5	930	72	240	Inceptisol		159	
46	SE¼	NE¼	11	18	5	869	65	170	Alfisol	Alfisol	64	80
47	NW¼	SW¼	1	15	6	792	37	267	Inceptisol		93	
48	NW¼	SW¼	6	16	5	492	49	227	Alfisol	Inceptisol	56	93
49	NW¼	NW¼	11	21	3	610	67	254	Alfisol		180	
50	NW¼	NE¼	33	19	6	957	30	165	Entisol		74	
51	SW¼	SW¼	6	10	6	732	68	212	Entisol		53	
52	NW¼	NW¼	7	10	6	716	80	268	Entisol		55	
53	SW¼	SE¼	23	15	5	1097	58	270	Entisol		49	
54	SE¼	NE¼	14	18	5	847	72	260	Entisol	Entisol	71	92
55	NE¼	NE¼	14	18	5	823	67	220	Inceptisol		100	

Plot#	Location (based on the Willamette Meridian) Section			Township (south)	Range (east)	Elevation (meters)	Slope (%)	Aspect (deg.)	Soil order Pit 1	Soil order Pit 2	Water holding capacity (mm) Pit 1	Water holding capacity (mm) Pit 2
56	SW¼	SW¼	29	15	5	586	77	157	Entisol	Entisol	86	52
57	SW¼	SW¼	29	15	5	560	55	215	Entisol	Entisol	39	4
58	NE¼	NW¼	28	15	5	683	74	186	Inceptisol	Inceptisol	106	18
59	NW¼	SE¼	20	20	3	910	58	205	Alfisol	Entisol	180	18
60	NW¼	SE¼	20	20	3	930	50	230	Alfisol	Alfisol	158	40
61	NW¼	SE¼	20	20	3	930	60	200	Inceptisol	Entisol	88	13
62	SE¼	NE¼	2	22	3	525	55	204	Inceptisol		147	
63	SE¼	NE¼	2	22	3	550	42	243	Inceptisol	Inceptisol	110	28
64	NE¼	SE¼	21	23	3	632	34	204	Alfisol	Alfisol	147	128
65	SE¼	SE¼	21	23	3	712	43	204	Alfisol		117	
66	SE¼	SE¼	11	21	3	495	32	240	Alfisol		120	
67	NW¼	SE¼	27	23	3	765	22	240	Inceptisol		73	
68	SW¼	SW¼	22	23	3	814	63	283	Inceptisol		9	
69	SW¼	NE¼	2	24	3	977	20	210	Alfisol		124	

Plot#	Location (based of the Willamette Meridian) Section			Township (south)	Range (east)	Elevation (meters)	Slope (%)	Aspect (deg.)	Soil order Pit 1	Soil order Pit 2	Water holding capacity (mm) Pit 1	Water holding capacity (mm) Pit 2
70	NE¼	NW¼	34	19	5	775	73	266	Inceptisol	Inceptisol	44	41
71	SW¼	SW¼	11	15	6	740	80	205	Inceptisol	Entisol	88	96
72	SW¼	SE¼	23	15	5	1045	80	198	Entisol		98	
73	SW¼	SE¼	11	15	6	853	46	130	Inceptisol	Inceptisol	79	28

APPENDIX 5

CONSTRUCTION OF SPECIES COVER DATA SETS

This appendix describes the construction of large and small species cover data sets from the field data sheets. It assumes knowledge of the associated methods in Chapter 4.

Trace values were recorded in the field as .1 to .9 when, respectively, 1 to 9 or more individuals of a species were present on a plot and cover was less than 0.5%. These trace values were changed on the data in TP56 format as follows:

field value:	.1	.2	.3	.4	.5	.6	.7	.8	.9
lab value :	.1	.1	.1	.2	.2	.2	.2	.2	.3

This was done so that sums of traces (as described below) would give realistic estimates of combined cover. This is important because many species have covers of less than two or three percent on dry sites.

Construction of the Large Data Set

The large data set was constructed in positional format from the TP56 format data using program Simdat2 (Appendix 9). It is limited to the 131 species which occur on three or more vegetation plots. All the species in this data set which occur on three or more dry site plots are listed in table 5. When this data set was constructed the covers of the taxa on each line were summed and given the name of the taxon on the left.

Abies grandis	*Abies concolor*
Prunus	*Prunus emarginata*
Lupinus latifolia	*Lupinus*
Heuchera micrantha	*Heuchera*
Iris	*Iris chrysophylla*, *I. tenax*
Mimulus	*Mimulus alsinoides*, *M. guttatus*
Montia	*Montia perfoliata*, *M. siberica*
Phlox adsurgens	*Phlox*
Sedum	*Sedum spathulifolium*
Senecio	*Senecio sylvaticus*, *S. vulgaris*, *S. websteri*
Melica subulata	*Melica* (all bulbous *Melicas*)
Carex	*Carex pennsylvanica*
Danthonia	*Danthonia californica*, *D. spicata*

Taxa were pooled for these reasons:

1. They were felt to be ecologically equivalent (*Mimulus*, *Danthonia*). These taxa were present on very few plots.

2. They are not taxonomically distinct (*Abies*).

3. Problems were encountered in distinguishing closely related taxa because features necessary for identification were not present in some locations or at some times during the field season (*Prunus*, *Iris*, *Mimulus*, *Montia*, *Sedum*, *Senecio*, *Carex*).

4. Although some individuals were not identified to species all identified plants were of the species listed and unidentified individuals were thought to probably be that species (*Lupinus*, *Heuchera*, *Phlox*, *Melica*).

Construction of the Small Data Set

The small data set was constructed in positional format from the TP56 format data using program Simdat2 (Appendix 9). It was limited to 98 species so it could be used in computer programs with limited array sizes (e.g. Ordiflex, Gauch 1977). Taxa occuring on less than four or five plots, taxa originally thought not to have ecological significance (e.g. Chimaphila umbellata), and Pseudotsuga were not included. Taxa pooled in the large data set were pooled in the small data set. The following taxa were also pooled.

Corallorhiza	Corallorhiza maculata, C. mertensiana
Disporum	Disporum hookeri
Polypodium	Polypodium glycyrrhiza, P. hesperium
Festuca occidentalis	Festuca rubra, Festuca (small, narrow-leaved bunch grasses only)

Taxa were pooled because:

1. They were thought to be ecologically similar and accurate identification of some plants was not possible because samples were lost before they were identified in the lab (Polypodium, Festuca).

2. Problems were encountered in identifying closely related taxa because flowers were not present late in the summer (Corallorhiza, Disporum).

APPENDIX 6

SPECIES COVER DATA

These tables present cover of all species present on three or more plots, i.e. they present the large vegetation data set (Appendix 5). Tables were produced from the large data set by program Order 2 (Appendix 9). Species abbreviations are given in Appendix 1 and follow Garrison et al. (1976). They are prefixed by a number indicating life form as follows:

1 = grass, 2 = sedge or rush, 3 = herb, 4 = shrub, 5 = tree.

Plots are grouped by community. The community summaries include: average cover over the plots in which a species occurs (COV2), constancy (CONS), number of plots in which a species occurs (OCUR), and species importance (IMPO). Importance is calculated as

$$\text{IMPO} = \sqrt{\text{COV2} \cdot \text{CONS}}$$

Plots 38 and 40 are not included because as outliers they were not included in the classification. Plot 70 is not included because it was taken in a highly disturbed partial cut stand to document conditions where four trees were dissected.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

ASPIDOTIS DENSA PHASE

	PLOTS	15	27	35	65	COV2	CONS	OCUR	IMPO
1	5ABAM					0.0	0.	0.	0.
2	5ABPR					0.0	0.	0.	0.
3	5ABGR					0.0	0.	0.	0.
4	5ACMA	1				0.0	0.	0.	0.
5	5ARME	20	0		4	12.0	50.	2.	24.
6	5CACH					0.0	0.	0.	0.
7	5LIDE	15		5	15	11.7	75.	3.	31.
8	5PILA	.1				.1	25.	1.	2.
9	5PIPO				25	25.0	25.	1.	25.
10	5PSME	70	85	52	60	66.8	100.	4.	82.
11	5PRUNU					0.0	0.	0.	0.
12	5JUGA		4			4.0	25.	1.	1.
13	5TABR					0.0	0.	0.	0.
14	5TSHE					0.0	0.	0.	0.
15	4ACCI			.1	.1	.1	50.	2.	2.
16	4ACGL					0.0	0.	0.	0.
17	4AMAL		.1			.1	25.	1.	2.
18	4ARCO 3		0			0.0	0.	0.	0.
19	4CEIN			1	.1	.6	50.	2.	5.
20	4CONU			.1		.1	25.	1.	2.
21	4COCOC	.2		.1		.2	50.	2.	3.
22	4HODI	5	6		.1	3.7	75.	3.	17.
23	4PHLE	0				0.0	0.	0.	0.
24	4RHPU			.3		.3	25.	1.	3.
25	4RHMA					0.0	0.	0.	0.
26	4RHDI	4	3		1	4.3	75.	3.	16.
27	4RICR					0.0	0.	0.	0.
28	4RCGY	.3	1			.7	50.	2.	5.
29	4RUPA					0.0	0.	0.	0.
30	4VAPA					0.0	0.	0.	0.
31	4VAME					0.0	0.	0.	0.
32	4BEAQ	.3	.3	1	.3	.5	100.	4.	7.
33	4BENE	2	0	.3	.3	.9	75.	3.	5.
34	4CHME	.1		.3		.2	50.	2.	3.
35	4CHUM					0.0	0.	0.	0.
36	4GASH					0.0	0.	0.	0.
37	4LOCI			.2		.2	25.	1.	2.
38	4LOMI	.1				.1	25.	1.	2.
39	4PAMY					0.0	0.	0.	0.
40	4RUNI					0.0	0.	0.	0.
41	4RUUR			.1		.1	25.	1.	2.
42	4SYMO		.3	.3	.3	.3	75.	3.	5.
43	4WHMO	2	30	2		11.3	75.	3.	23.
44	3ACMI		.3		.1	.2	50.	2.	3.
45	3ACTR					0.0	0.	0.	0.
46	3ADBI	.3				.3	25.	1.	3.
47	3ALVI					0.0	0.	0.	0.
48	3ANDE					0.0	0.	0.	0.
49	3APAN		.3	1	.2	.5	75.	3.	5.
50	3ARMA 3	.2	.3	.3		.3	75.	3.	4.
51	3ASDE		.3	.3		.3	50.	2.	4.
52	3ASRA	1		1	.3	.6	75.	3.	5.
53	3BORAG				.3	.3	25.	1.	3.
54	3BRCO 3		.2		.1	.2	50.	2.	3.
55	3CALOG				.3	.3	25.	1.	3.
56	3CAPR 3	.3				.3	25.	1.	3.
57	3CASC 2		6			6.0	25.	1.	12.
58	3CIRSI			.3	.3	.3	50.	2.	4.
59	3COHE	.2	.2		.3	.2	75.	3.	4.
60	3COUM					0.0	0.	0.	0.
61	3CORAL					0.0	0.	0.	0.
62	3COMA 3					0.0	0.	0.	0.
63	3CYGR				0	0.0	0.	0.	0.
64	3DIHO					0.0	0.	0.	0.
65	3DISPO				.1	.1	25.	1.	2.
66	3EPMI		.3		.2	.3	50.	2.	4.
67	3FRVE	.2	5	1	.3	1.6	100.	4.	13.
68	3GAAP				.3	.3	25.	1.	3.
69	3GAOR					0.0	0.	0.	0.
70	3GATR					0.0	0.	0.	0.
71	3GOOB		.1	.3	.2	.2	75.	3.	4.
72	3HAUN			1	.1	.6	50.	2.	5.
73	3HEMI					0.0	0.	0.	0.
74	3HIAL	1	1	1	.2	.8	100.	4.	9.
75	3IRIS	.1			.3	.2	50.	2.	3.

	PLOTS		15	27	35	65	COV2	CONS	COOR	IMPO
76	3LANE			.3			.3	25.	1.	3.
77	3LAPO						0.0	0.	0.	0.
78	3LIAP						0.0	0.	0.	0.
79	3LIBO	2			.2		.2	25.	1.	2.
80	3LOMA	2					0.0	0.	0.	0.
81	3LOMI					.1	.1	25.	1.	2.
82	3LONE	2					0.0	0.	0.	0.
83	3LULA						0.0	0.	0.	0.
84	3MAMA		.3			.3	.3	50.	2.	4.
85	3MIMUL						0.0	0.	0.	0.
86	3MOUN	2					0.0	0.	0.	0.
87	3MONTI			.2		.1	.2	50.	2.	3.
88	3NEPA					.3	.3	25.	1.	3.
89	3OSCH						0.0	0.	0.	0.
90	3PENSI						0.0	0.	0.	0.
91	3PHAD						0.0	0.	0.	0.
92	3POGL	4					0.0	0.	0.	0.
93	3POME	2				.2	.2	25.	1.	2.
94	3POLO	2	.2	.2	.3		.2	75.	3.	4.
95	3POMU		1	3	1		1.7	75.	3.	11.
96	3POMUL					.3	.3	25.	1.	3.
97	3POMUM						0.0	0.	0.	0.
98	3PSPH						0.0	0.	0.	0.
99	3PTAQ					.2	.2	25.	1.	2.
100	3PTAN						0.0	0.	0.	0.
101	3PYAP		.2				.2	25.	1.	2.
102	3PYPI						0.0	0.	0.	0.
103	3SADO					.3	.3	25.	1.	3.
104	3SEDUM		.3				.3	25.	1.	3.
105	3SEWA	2	1	.3	.3		.5	75.	3.	5.
106	3SENEL						0.0	0.	0.	0.
107	3SMRA						0.0	0.	0.	0.
108	3SMST						0.0	0.	0.	0.
109	3SYRE		1				1.0	25.	1.	5.
110	3TRLA	2			.3	.2	.3	50.	2.	4.
111	3TROV						0.0	0.	0.	0.
112	3UNKN					.1	.1	25.	1.	2.
113	3VAME				.2		.2	25.	1.	2.
114	3VISE						0.0	0.	0.	0.
115	3VIAM			.3			.3	25.	1.	3.
116	3XETE						0.0	0.	0.	0.
117	1BROMU						0.0	0.	0.	0.
118	1BRVU		.3	5			2.7	50.	2.	12.
119	1DANTH			4			4.0	25.	1.	10.
120	1ELGL			3	1	.3	1.4	75.	3.	11.
121	1FESTU					1	1.0	25.	1.	5.
122	1FECA		40			.3	20.2	50.	2.	32.
123	1FECO						0.0	0.	0.	0.
124	1FERU		1	5			3.0	50.	2.	15.
125	1FESU	2					0.0	0.	0.	0.
126	1KOCR			.3	1		.7	50.	2.	5.
127	1MESU			2			2.0	25.	1.	7.
128	1MEMA		9	1	1	.3	6.0	100.	4.	17.
129	1TRCA			5	9	.3	4.8	75.	3.	19.
130	2CAREX						0.0	0.	0.	0.
131	2LUCA	2	.3	.3		.3	.3	75.	3.	5.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

COLLOMIA HETEROPHYLLA PHASE

	PLOTS	8	9	10	12	16	24	30	41	51	52	53	54	55	56	57	62	63	68	72	COV2	CONS	OCUR	IMPO
1	5ABAM																				0.0	0.	0.	0.
2	5ABPR							1													1.0	5.	1.	2.
3	5ABGR							1				0	0	0					1		1.0	11.	2.	3.
4	5ACMA	.1	2	6	.2		1			3	0				6		2		.3	7	2.8	53.	10.	12.
5	5ARME	4	3	2	.1	2							0				.1	6	2		2.4	42.	8.	10.
6	5CACH						3		.3				1				.2		.3	.1	.8	32.	6.	5.
7	5LIDE		15	1	3	0	6	2	25			6	2	16			20	2		0	9.2	53.	10.	22.
8	5PILA				3	.1							0	4	.1		1	3	.3		1.6	37.	7.	6.
9	5PIPO																				0.0	0.	0.	0.
10	5PSME	76	50	70	75	70	50	65	60	75	85	75	60	60	70	78	70	75	55	70	68.9	100.	19.	83.
11	5PRUNU	.1								.1											.1	11.	2.	1.
12	5QUGA	.1	.1	0										3							.6	11.	2.	2.
13	5TABR																			1	1.0	5.	1.	2.
14	5TSHE						4		0			0								1	2.5	11.	2.	5.
15	4ACCI						1	2	4			.1	1	.3	1	.3				.3	1.1	47.	9.	7.
16	4ACGL							6													6.0	5.	1.	6.
17	4AMAL					.2	.2			1	.3				.1	.2				.1	.3	37.	7.	3.
18	4ARCO 3						12						.3								6.2	11.	2.	8.
19	4CEIN								3				.1						.2		.2	11.	2.	1.
20	4CONU								1	.3	.1		.1			.1			.3		.3	32.	6.	3.
21	4COCOC	3	3				.3	1	1	1		1	4	.3	2	.3	6	.3	.3	.2	1.6	79.	15.	11.
22	4HODI	5	40	6	1	1	.3	4		16	5	.1	1		3	2	.3	4	6	.3	5.7	89.	17.	23.
23	4PHLE																.3	.3	1		.5	16.	3.	3.
24	4RHPU						.2		.3	.3											.3	16.	3.	2.
25	4RHMA																				0.0	0.	0.	0.
26	4RHDI	3	8	4	2										.3		10	2	2		3.9	42.	8.	13.
27	4RICR	.1				.3												.3			.2	16.	3.	2.
28	4RDGY	2	1	1	.2	.3		.3	.3	1	5	.1			.3	.3	.2	1	.2	.3	.6	84.	16.	8.
29	4RUPA								.3										.2	.2	.2	16.	3.	2.
30	4VAPA		.2			.1			.1							.3	.3			.2	.2	32.	6.	3.
31	4VAME								1												1.0	5.	1.	2.
32	4BEAQ	.3		.3	1		.2	.3	.2		.1			.2				.3	.3	.3	.3	56.	11.	4.
33	4BENE	5	3	5	9	2	.3			5	10	3	1	5	3	3	4	5	4	.3	4.0	85.	17.	19.
34	4CHME	.1				.3		.3	.3	.2		.3		.3	.2	.2	.3	.3		.3	.3	63.	12.	4.
35	4CHUM					.3	.3		3		.3	.3		.1		.2			.1	2	.7	47.	9.	6.
36	4GASH					3	2								1						2.0	16.	3.	6.
37	4LOCI					.1									.2						.2	11.	2.	1.
38	4LOHI	1	3	.3													1	.3	.3		1.0	32.	6.	6.
39	4PAMY							.2	.3			.3								.3	.3	21.	4.	2.
40	4RONI																				0.0	0.	0.	0.
41	4RUUR	1			.2	.3	.3	2	.3	.3	1	.3	.3		1	.3			.3	.3	.6	74.	14.	6.
42	4SYMO	5	4	1	1	.2	.3	5	.1	5	15		.1	.3	1	1	1		1	.3	2.4	89.	17.	15.
43	4WHMO	6	9	3	2	1	1			4	20	10	6	.3	6	4	4	2	2	6	5.2	89.	17.	22.
44	3ACMI					.1															.1	5.	1.	1.
45	3ACTR			.3	1				.3	.2			.2	.3					1		.5	37.	7.	4.
46	3ADBI	1	.3	2	.3					.2	.3		.3	.3			.3	.3	1	.1	.5	63.	12.	6.
47	3ALVI						.1			.1											.1	11.	2.	1.
48	3ANDE									.3											.3	5.	1.	1.
49	3APAN	.2			.3															.3	.3	16.	3.	2.
50	3ARMA 3	1	1	.3	.3			.3	.3	.3	.3	.3	.3	.3		.3	.3	.3	.3	.3	.4	84.	16.	6.
51	3ASDE																				0.0	0.	0.	0.
52	3ASRA		.3	.2	1			.3	1				.3						.3	.3	.5	42.	8.	4.
53	33ORAG																				0.0	0.	0.	0.
54	33RCO 3																				0.0	0.	0.	0.
55	3CALOC		.1																		.1	5.	1.	1.
56	3CAPR 3				.2												.3		1		.5	16.	3.	3.
57	3CASC 2			.3	.3	.3		.1	.3		.3	.3	.3	1	.3		.3	.3	.3	.3	.4	74.	14.	5.
58	3CIRSI		.2																		.2	5.	1.	1.
59	3COHE	.2		.3	.2	.3		.3		2	2	.3	.3		.3	.3	.3	.3	.3	.2	.5	79.	15.	6.
60	3COUM																				0.0	0.	0.	0.

	PLOTS	8	9	10	12	16	24	30	41	51	52	53	54	55	56	57	62	63	65	72	COV2	CONS	OCUR	IMPO
61	3CORAL										.1	.3								.1	.2	16.	3.	2.
62	3CUMA 3			.2				.3									.2				.2	16.	3.	2.
63	3CYGR		.2	0	.2														.1		.2	16.	3.	2.
64	3DIHO	.1	.1	.3	.3	.1											.2				.2	32.	6.	2.
65	3DISPU																.3	.3	.3		.3	16.	3.	2.
66	3EPMI					.2						.1	.3								.2	16.	3.	2.
67	3FRVE	.3	5	.2	.3	.3		.2	.1	.3	.2	.3	.3	.3	.3	.3	1	.3	.3	.2	.6	95.	18.	7.
68	3GAAP		.1	.2						.3	.2		.3		.3	.3	.6	.3		.3	.3	53.	16.	4.
69	3GAOR																				0.0	0.	0.	0.
70	3GATR	1.3	.1	.3	.3	.1		.2			.3		.2	.3							.3	47.	9.	4.
71	3GOOB	.2	.3	.3	.2	.2		.2	.3	.3	.3	.3	.1	.3			.2				.2	64.	13.	4.
72	3HAUN					0	.3		.2		.1			.3							.2	21.	4.	2.
73	3HEMI																				0.0	0.	0.	0.
74	3HIAL	1	.3	1	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	1	.4	100.	19.	6.
75	3IRIS		1						.3			.1	.3	.3			.3	.2	.1	.3	.3	47.	9.	4.
76	3LANE		.3					.2													.3	11.	2.	2.
77	3LAPO	.1	1	2							0		.3		40						8.7	26.	5.	15.
78	3LIAP																				0.0	0.	0.	0.
79	3LIBO 2				.2		.3		2								5	1	.3	.3	1.3	37.	7.	7.
80	3LUMA 2	.2	1																		.6	11.	2.	3.
81	3LOMI			.3									.3				.3				.3	16.	3.	2.
82	3LONE 2					1															1.0	5.	1.	2.
83	3LULA																				0.0	0.	0.	0.
84	3MAMA	.3		2	.3					.3			.3		.3	.3	.3	.3	.3		.5	53.	10.	5.
85	3MIMUL															.3					.3	5.	1.	1.
86	3MCUN 2																				0.0	0.	0.	0.
87	3MONTA			.1						.1	.3			1			.3	.3			.4	32.	6.	3.
88	3NEPA									4	.3							.3			1.5	16.	3.	5.
89	3OSCH	.3	.1	.2															.3		.2	21.	4.	2.
90	3PENST											.3									.3	5.	1.	1.
91	3PHAO																				0.0	0.	0.	0.
92	3POGL 4							0				.3									.3	5.	1.	1.
93	3POHE 2									.1	.1					.1					.1	16.	3.	1.
94	3POLO 2		.1	.3			.2		.1	.2		.1				.3			.3		.2	42.	8.	3.
95	3POMU	2	1	6	.3	.2		.3	.2									1			1.4	42.	8.	8.
96	3POMUL									.3	.3	1		1	1	1	.3		1	.3	.7	47.	9.	6.
97	3POMUM										.3					.3			.3		.3	16.	3.	2.
98	3PSPH					.3															.3	5.	1.	1.
99	3PTAQ					1															1.0	5.	1.	2.
100	3PTAN																				0.0	0.	0.	0.
101	3PYAP	.2			.2	.3			.1	.1	.2					.3	.3	.3			.2	47.	9.	3.
102	3PYPI							.3	.3			.1	.3	.3						.2	.3	32.	6.	3.
103	3SADO	.3	7						.3				.3			.3				.3	1.4	32.	6.	7.
104	3SEDUM																				0.0	0.	0.	0.
105	3SEWA 2		.3																		.3	5.	1.	1.
106	3SENEC									.1		.6									.4	11.	2.	2.
107	3SMRA																				0.0	0.	0.	0.
108	3SMST				.1	.1		.2													.1	16.	3.	1.
109	3SYRE		1		1										1				.3	.3	.7	26.	5.	4.
110	3TRLA 2	.3	.3	.2	.2		3		1	.3	1		1	1	1	.3	.2	.3	.3	.3	.7	84.	16.	8.
111	3TROV							.1													.1	5.	1.	1.
112	3UNKN																.3				.3	5.	1.	1.
113	3VAHE							.1			.3		.2								.2	16.	3.	2.
114	3VISE																				0.0	0.	0.	0.
115	3VIAM		4	10	.3								8	1	.3	.3	.3	1	3	.3	2.6	58.	11.	12.
116	3XETE							.2													.2	5.	1.	1.
117	1BROMU	4																			4.0	5.	1.	5.
118	1BRVU	1	3	1	.3					.2	2		2	.3	2	.3		.3	4	.3	1.3	68.	13.	9.
119	1DANTH																				0.0	0.	0.	0.
120	1ELGL	1	1			.3						.3			.3	.3				.1	.5	37.	7.	4.
121	1FESTU						9			.3	.3							.3			2.5	21.	4.	7.
122	1FECA																3	.3	.2		1.2	16.	3.	4.
123	1FEOC	.1		1	.3	.3			.2			.3	.3	.3	6	2	.3		4	1	1.2	66.	13.	9.
124	1FERU	3	5	.3	.3												.3	1			1.7	32.	6.	7.
125	1FESU 2			.3										.3			.3				.3	16.	3.	2.
126	1KOCR																				0.0	0.	0.	0.
127	1MESU														.3			.3	4	1	1.4	21.	4.	5.
128	1MEHA	.3								.3	.3	1	.3	.3	2	.3	.3	.3		5	.9	58.	11.	7.
129	1TRCA									.3	.3	.2	1	1		.3	.3		.3	.3	.4	47.	9.	5.
130	2CAREX						.1	.3	.2				.1								.2	21.	4.	2.
131	2LUCA 2	.3	.3	.1				.3		.1	.1		.3	.3	.3		.3	.3	.3	.3	.3	60.	13.	4.

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR-ACER CIRCINATUM COMMUNITY TYPE

PLOTS	1	2	4	7	17	28	29	34	36	42	48	55	COV2	CONS	OCUR	IMPO
1 5ABAM													0.0	0.	0.	0.
2 5ABPR													0.0	0.	0.	0.
3 5ABGR													0.0	0.	0.	0.
4 5ACMA		1	0	1				1	15	5		1	4.0	50.	6.	14.
5 5ARME	1		0		4	10				0	0		7.7	25.	3.	14.
6 5CACH		3		1	.1	1				.1		.1	.9	50.	6.	7.
7 5LIDE	1	0			15	.2	0	5	1			3	4.4	50.	6.	15.
8 5PILA	.1	1			2	10							3.3	33.	4.	10.
9 5PIPO													0.0	0.	0.	0.
10 5PSME	89	53	45	65	60	60	85	80	82	80	65	82	70.5	100.	12.	84.
11 5PRUNU							0						0.0	0.	0.	0.
12 5QUGA		2				0							2.0	8.	1.	4.
13 5TABR	.1			.3						0		0	.2	17.	2.	2.
14 5TSHE									0		.1	2	1.1	17.	2.	4.
15 4ACCI	16	16	3	8	4	6	4	7		10	.1	1	6.8	92.	11.	25.
16 4ACGL													0.0	0.	0.	0.
17 4AMAL	.2		.2			.2	.3				.2		.2	42.	5.	3.
18 4ARCO 3						6							6.0	8.	1.	7.
19 4CEIN		2			.3	8							3.4	25.	3.	9.
20 4CONU	.1			7			.3		2	6	3		3.1	50.	6.	12.
21 4COCOC	3	6	3	6	5	.3	3	3	33	2	5	.3	5.8	100.	12.	24.
22 4HODI		1	8	14	4	2	2	3		.1	2	.1	3.6	83.	10.	17.
23 4PHLE				.3									.3	8.	1.	2.
24 4RHPU		3	.1					.3	.2	.1		.1	.6	50.	6.	6.
25 4RHMA													0.0	0.	0.	0.
26 4RHDI	4	1	5	.3						1	11	.3	3.2	58.	7.	14.
27 4RICR					.2								.2	8.	1.	1.
28 4ROGY	.3	.3	.3	.1	.2	.3	1		1	.3	.3	.3	.4	92.	11.	6.
29 4RUPA				4					1				2.5	17.	2.	6.
30 4VAPA	.1			1						.3	1	.3	.5	42.	5.	5.
31 4VAME													0.0	0.	0.	0.
32 4BEAQ			.2	.2			1	.3	.3				.4	42.	5.	4.
33 4BENE	10	10	8	20	3	5	4	20	10	15	3	4	12.3	100.	12.	35.
34 4CHME	.3	.3	.3	.2				.3	.2		.1	.3	.3	67.	8.	4.
35 4CHUM	.1	1		.3	.3	.3		.3				.3	.4	58.	7.	5.
36 4GASH					2				2	12		1	4.3	33.	4.	12.
37 4LOCI					.3				.2	.1			.2	25.	3.	2.
38 4LOHI					1								1.0	8.	1.	3.
39 4PAMY													0.0	0.	0.	0.
40 4RUNI							.2						.2	8.	1.	1.
41 4RUUR	.3	1	1	.3	.3	1	1	.3	.3	.3		.3	.6	92.	11.	7.
42 4SYMO	1			.2		7	6	1	4	1	.3	1	2.4	75.	9.	13.
43 4HHMO	12	10	7	7	2	6	1	5	1		15	2	6.5	92.	11.	24.
44 3ACMI							.2						.2	8.	1.	1.
45 3ACTR	.3			.3	3	1			3	.3	.3		1.0	58.	7.	10.
46 3ADBI	.3	2		.2	.3	1			1				.8	50.	6.	6.
47 3ALVI	.2												.2	8.	1.	1.
48 3ANDE				.3		.2	.2		.1				.2	33.	4.	3.
49 3APAN			.1						.3				.2	17.	2.	2.
50 3ARMA 3				1	.3	.3	.3	.3	.3		.3	1	.5	67.	8.	6.
51 3ASDE								.1					.1	8.	1.	1.
52 3ASRA		1	.3			.3	2					.3	.8	42.	5.	6.
53 3BORAG											.3		.3	8.	1.	2.
54 3BRCO 3		.2	1								.2		.5	25.	3.	3.
55 3CALOC													0.0	0.	0.	0.
56 3CAPR 3													0.0	0.	0.	0.
57 3CASC 2				1	.3	1					.3		.7	33.	4.	5.
58 3CIRSI			.1			.1							.1	17.	2.	1.
59 3COHE	1	.3	5			.1							1.6	33.	4.	7.
60 3COUM						.3							.3	8.	1.	2.
61 3CORAL													0.0	0.	0.	0.
62 3COMA 3				.1									.1	8.	1.	1.
63 3CYGR													0.0	0.	0.	0.
64 3DIMO				.3	[illegible]					.2			.2	25.	3.	2.
65 3DISPO													0.0	0.	0.	0.
66 3EPMI		.3	.2								.3		.3	25.	3.	3.
67 3FRVE	.3	1	1			.3	1	.3	.3	.3	.3	.3	.3	83.	10.	7.
68 3GAAP	.1								.2		.2		.2	25.	3.	2.
69 3GAOR											.1		.1	8.	1.	1.
70 3GATR	.2			.3			.2	.3	.3	.2	.3		.3	58.	7.	4.
71 3GOOB	.3					.2	.3	.2	.3	.2	.1	.3	.2	67.	8.	4.
72 3HAUN					.2	.1				.1	.1		.1	33.	4.	2.
73 3HEMI													0.0	0.	0.	0.
74 3HIAL	1	1	1	.3	1	1	.3	.3	.2	.3	.3	.3	.6	100.	12.	8.
75 3IRIS	.3		.3		.2	.1			.1		.1	.1	.2	58.	7.	3.

	PLOTS	1	2	4	7	17	26	29	34	35	42	46	56	COV2	CONS	DOUR	IMPO
76	3LANE											1	.3	.7	17.	2.	3.
77	3LAPO		0			10							4	7.0	17.	2.	11.
78	3LIAP													0.0	0.	0.	0.
79	3LIBO 2				10	.3	.3			.3	1	6		3.0	50.	6.	12.
80	3LOMA 2	.3	.1											.2	17.	2.	2.
81	3LOMI		.3	2								.3		.9	25.	3.	5.
82	3LONE 2													0.0	0.	0.	0.
83	3LULA													0.0	0.	0.	0.
84	3MAMA	.3	.3	1								.1	.3	.4	42.	5.	4.
85	3MIMUL			10										10.0	6.	1.	9.
86	3MOUN 2				.1					.3				.2	17.	2.	2.
87	3MONTI													0.0	0.	0.	0.
88	3NEPA		.2									.3		.3	17.	2.	2.
89	3OSCH							.2	.2	.3				.2	25.	3.	2.
90	3PENSI													0.0	0.	0.	0.
91	3PHAO													0.0	0.	0.	0.
92	3POGL 4													0.0	0.	0.	0.
93	3POME 2												.3	.3	8.	1.	2.
94	3POLO 2				.2	.2			.2	.2			.3	.2	42.	5.	3.
95	3POHU	3		1	2	2		1		13	1			3.3	56.	7.	14.
96	3POMUI											.1	1	.6	17.	2.	3.
97	3POMUM											2	.3	1.2	17.	2.	4.
98	3PSPH													0.0	0.	0.	0.
99	3PTAQ									.3	.3			.3	17.	2.	2.
100	3PTAN													0.0	0.	0.	0.
101	3PYAP				.2				.2	.1		.1		.2	33.	4.	2.
102	3PYPI		.1		.2									.2	17.	2.	2.
103	3SADO							.3		.2	.3			.3	25.	3.	3.
104	3SEDUM					.2								.2	8.	1.	1.
105	3SEWA 2		.3											.3	8.	1.	2.
106	3SENEC													0.0	0.	0.	0.
107	3SMRA	.2	.1		.2						.3		.1	.2	42.	5.	3.
108	3SMST										.1			.1	8.	1.	1.
109	3SYRE	8				.3						1	1	2.6	33.	4.	9.
110	3TRLA 2	.3	4	.2	.2	.3	1		.3	1	1	.3	.3	.8	92.	11.	9.
111	3TROV										.1			.1	8.	1.	1.
112	3UNKN													0.0	0.	0.	0.
113	3WAHE	.3						.2		.1	.2	.3		.2	42.	5.	3.
114	3VISE	.3			.3					2	.3			.7	33.	4.	5.
115	3VIAM	1	10	4					.2				2	3.4	42.	5.	12.
116	3XETE													0.0	0.	0.	0.
117	1BROMU			.3						.1				.2	17.	2.	2.
118	1BRVU		2	.3			1		1		.2	3	.3	1.1	58.	7.	6.
119	1DANTH													0.0	0.	0.	0.
120	1ELGL	.2		1			.3	.3	1					.6	42.	5.	5.
121	1FESTU													0.0	0.	0.	0.
122	1FECA													0.0	0.	0.	0.
123	1FEOC	3	6	.3		.3	3				.2	4	.3	2.1	67.	8.	12.
124	1FERU						.3							.3	8.	1.	2.
125	1FESU 2						.2			.3				.3	17.	2.	2.
126	1KOCR													0.0	0.	0.	0.
127	1MESU											.3	1	.7	17.	2.	3.
128	1MEHA						.3	.3	1		.3	1		.6	42.	5.	5.
129	1TRCA						1		.3		.2	3		1.1	33.	4.	6.
130	2CAREX										.2			.2	8.	1.	1.
131	2LUCA 2	.3	.3	.2			.3				.1	.3	.1	.2	58.	7.	4.

LIBOCEDRUS DECURRENS/WHIPPLEA MODESTA COMMUNITY TYPE

	PLOTS	11	16	45	46	50	59	61	COV2	CONS	COUR	IMPO
1	5ABAM								0.0	0.	0.	0.
2	5ABPR								0.0	0.	0.	0.
3	5ABGR	1			.1				.5	29.	2.	4.
4	5ACMA					[illegible]		5	5.1	14.	1.	6.
5	5ARME	.2							.2	14.	1.	2.
6	5CACH								0.0	0.	0.	0.
7	5LIDE	15	15	55	6	20	26	50	29.2	86.	6.	50.
8	5PILA	2		6	.1			.3	.6	43.	3.	6.
9	5PIPO	8							8.0	14.	1.	11.
10	5PSME	50	70	35	56	80	60	50	61.6	100.	7.	78.
11	5PRUNU								0.0	0.	0.	0.
12	5QUGA								0.0	0.	0.	0.
13	5TABR		0						0.0	0.	0.	0.
14	5TSME				0				0.0	0.	0.	0.
15	4ACCI					.1	.3	2	.6	43.	3.	6.
16	4ACGL								0.0	0.	0.	0.
17	4AMAL								0.0	0.	0.	0.
18	4ARCO 3								0.0	0.	0.	0.
19	4CEIN	.1		.1	.2				.1	43.	3.	2.
20	4CCNU					.2			.2	14.	1.	2.
21	4COCOC				.2	.1		3	1.1	43.	3.	7.
22	4HODI		4	5	2	3	3	2	3.2	56.	6.	16.
23	4PHLE								0.0	0.	0.	0.
24	4RHPU				.1				.1	14.	1.	1.
25	4RHMA				0				0.0	0.	0.	0.
26	4RHDI							.3	.3	14.	1.	2.
27	4RICR								0.0	0.	0.	0.
28	4RDGY	.2		.1			4	3	3.3	57.	4.	14.
29	4RUPA								0.0	0.	0.	0.
30	4VAPA				.1		.1	.3	.2	43.	3.	3.
31	4VAME								0.0	0.	0.	0.
32	4BEAQ	.3		.3	.3		.1		.3	57.	4.	4.
33	4BENE	.3	3	.3	1	1	10		2.6	86.	6.	15.
34	4CHME				.2	.3	.3		.3	43.	3.	3.
35	4CHUM	.2			.2	1			.5	43.	3.	4.
36	4GASH								0.0	0.	0.	0.
37	4LOCI			.1		.3	.3	.3	.3	57.	4.	4.
38	4LCHI								0.0	0.	0.	0.
39	4PAMY			.1	.2	.3			.2	43.	3.	3.
40	4RUNI								0.0	0.	0.	0.
41	4RUUR			.3	.3	.2		.3	.3	57.	4.	4.
42	4SYMO		.3		2		.1	6	2.6	57.	4.	12.
43	4WHMO	2	40	14	4	31	4	14	15.4	100.	7.	39.
44	3ACMI								0.0	0.	0.	0.
45	3ACTR				1	4	15		6.7	43.	3.	17.
46	3ADBI		.3		.2	3	4	1	1.7	71.	5.	11.
47	3ALVI								0.0	0.	0.	0.
48	3ANCE					.3	.2	.3	.3	43.	3.	3.
49	3APAN	.2							.2	14.	1.	2.
50	3ARMA 3	1	.3	.3	.3	.3	1	1	.6	100.	7.	6.
51	3ASCE		.3						.3	14.	1.	2.
52	3ASPA			3			.3		1.7	29.	2.	7.
53	3BORAJ							.3	.3	14.	1.	2.
54	3BRCO 3		.2						.2	14.	1.	2.
55	3CALOC						.1	.3	.2	29.	2.	2.
56	3CAPR 3	.3							.3	14.	1.	2.
57	3CASC 2		1		.3	.3	.3	1	.6	71.	5.	6.
58	3CIRSI			.3				.3	.3	29.	2.	3.
59	3COME	.2	.3						.3	29.	2.	3.
60	3COUM								0.0	0.	0.	0.
61	3CORAL								0.0	0.	0.	0.
62	3COMA 3	.1				.1	.1		.1	43.	3.	2.
63	3CYGR							.1	.1	14.	1.	1.
64	3DIMO	.1							.1	14.	1.	1.
65	3DISPO						1		1.0	14.	1.	4.
66	3EPMI								0.0	0.	0.	0.
67	3FRVE		1	1	1		2	3	1.6	71.	5.	11.
68	3GAAP					.3	.3		.3	29.	2.	3.
69	3GAOR								0.0	0.	0.	0.
70	3GATR		1				.3	.3	.3	43.	3.	5.
71	3GOOB	.2	.3	.3		.3	.3	.3	.3	86.	6.	5.
72	3HAUN					.1			.1	14.	1.	1.
73	3HEMI	[illegible]							0.0	0.	0.	0.
74	3HIAL	.3	1	.3	1	1	1	.3	.7	100.	7.	8.
75	3IRIS			.3	.3	.2		.1	.2	57.	4.	4.

PLOTS		11	18	45	46	52	59	61	COV2	CONS	OCUR	IMPO
76	3LANE						5	.3	2.7	29.	2.	9.
77	3LAPO								0.0	0.	0.	0.
78	3LIAP							.3	.3	14.	1.	2.
79	3LIBO 2	.1				3	.3		1.1	43.	3.	7.
80	3LOMA 2								0.0	0.	0.	0.
81	3LOMI								0.0	0.	0.	0.
82	3LONE 2								0.0	0.	0.	0.
83	3LULA								0.0	0.	0.	0.
84	3MAMA				.3		.3	.3	.3	43.	3.	4.
85	3MIMUL		.2						.2	14.	1.	2.
86	3MOUN 2					.3			.3	14.	1.	2.
87	3MONTI						.3	.2	.3	29.	2.	3.
88	3NEPA								0.0	0.	0.	0.
89	3OSCH							.1	.1	14.	1.	1.
90	3PENST								0.0	0.	0.	0.
91	3PHAO								0.0	0.	0.	0.
92	3POGL 4								0.0	0.	0.	0.
93	3POME 2								0.0	0.	0.	0.
94	3POLO 2		.3	.3					.3	29.	2.	3.
95	3POMU		3						3.0	14.	1.	7.
96	3POMUI			1	1	.2	.3	.3	.8	71.	5.	6.
97	3POMUM						.3	8	4.2	29.	2.	11.
98	3PSPH								0.0	0.	0.	0.
99	3PTAQ				.2				.2	14.	1.	2.
100	3PTAN	.2							.2	14.	1.	2.
101	3PYAP				.1			.3	.2	29.	2.	2.
102	3PYPI								0.0	0.	0.	0.
103	3SADO		.3	.3	.3	.3		.3	.3	71.	5.	5.
104	3SEDUM								0.0	0.	0.	0.
105	3SEWA 2		.3						.3	14.	1.	2.
106	3SENEC								0.0	0.	0.	0.
107	3SMRA					.3	.3	.1	.2	43.	3.	3.
108	3SMST							4	4.0	14.	1.	6.
109	3SYRE	1		.1			1	3	1.3	57.	4.	9.
110	3TRLA 2	1	1		2	.2	2		1.2	71.	5.	9.
111	3TROV								0.0	0.	0.	0.
112	3UNKN			.1					.1	14.	1.	1.
113	3VAME					.3	.3	.3	.3	43.	3.	4.
114	3VISE					.3		.3	.3	29.	2.	3.
115	3VIAM	2		1	.3		18	15	7.3	71.	5.	23.
116	3XETE								0.0	0.	0.	0.
117	1BROMU								0.0	0.	0.	0.
118	1BRVU		23	8	3	.1	.3	.3	5.3	86.	6.	21.
119	1DANTH								0.0	0.	0.	0.
120	1ELGL		1	.3	.3				.5	43.	3.	5.
121	1FESTU								0.0	0.	0.	0.
122	1FECA	.3			.3				.3	29.	2.	3.
123	1FEOC	.3	13	.3	.3		.3	.3	1.9	86.	6.	13.
124	1FEKU								0.0	0.	0.	0.
125	1FESU 2		.3			1			.7	29.	2.	4.
126	1KOCR								0.0	0.	0.	0.
127	1MESU				.2			1	.6	29.	2.	4.
128	1MEHA		3	1	.3		.3		1.2	57.	4.	6.
129	1TRCA		2	.3	.3				.9	43.	3.	6.
130	2CAREX			.1				.3	.2	29.	2.	2.
131	2LUCA 2						.1		.1	14.	1.	1.

PSEUDOTSUGA MENZIESII/BERBERIS AQUIFOLIUM/DISPORUM COMMUNITY TYPE

	PLOTS	5	13	14	49	60	64	66	67	69	COV2	CONS	OCUR	IMPO
1	5ABAM										0.0	0.	0.	0.
2	5ABPR										0.0	0.	0.	0.
3	5ABGR						.1		1		.6	22.	2.	3.
4	5ACMA	.1	1		10				.1		2.8	44.	4.	11.
5	5ARME			5	.2		20	15			10.1	44.	4.	21.
6	5CACH							.3	.1		.2	22.	2.	2.
7	5LIDE	3			.2	10		20		3	7.2	56.	5.	20.
8	5PILA		.2	1					.1		.4	33.	3.	4.
9	5PIPO		3	10						20	15.0	22.	2.	18.
10	5PSME	85	66	80	75	85	60	60	80	75	76.2	100.	9.	87.
11	5PRUNU										0.0	0.	0.	0.
12	5QUGA	.1						.1			.1	22.	2.	1.
13	5TABR										0.0	0.	0.	0.
14	5TSHE										0.0	0.	0.	0.
15	4ACCI				10		.3				5.2	22.	2.	11.
16	4ACGL										0.0	0.	0.	0.
17	4AMAL			1			4		8	2	2.3	33.	3.	9.
18	4ARCO 3										0.0	0.	0.	0.
19	4CEIN						.2				.2	11.	1.	1.
20	4CONU		.1					.1	.3		.5	33.	3.	4.
21	4COCO	2	1		3		8	2	3	.3	2.8	78.	7.	15.
22	4HODI	6	12	1	5	1	7	1	7	7	5.2	100.	9.	23.
23	4PHLE	1			1		.2	.1	2		.9	56.	5.	7.
24	4RHPU		.1								.1	11.	1.	1.
25	4RHMA										0.0	0.	0.	0.
26	4RHDI	4	.1	.1	10		4	15	.3		4.8	78.	7.	19.
27	4RICR										0.0	0.	0.	0.
28	4ROGY	3	1	3	6	2	6	.3	2	1	3.0	100.	9.	17.
29	4RUPA		.2		.2						.2	22.	2.	2.
30	4VAPA	.3									.3	11.	1.	2.
31	4VAME										0.0	0.	0.	0.
32	4BEAQ	.3	1	.2	20		.3	.3	1	2	3.1	89.	8.	17.
33	4BENE	14	.3		.3	5	1	15	1		5.2	78.	7.	20.
34	4CHME	.1	.1						.2		.1	33.	3.	2.
35	4CHUM										0.0	0.	0.	0.
36	4GASH						1				.1	11.	1.	3.
37	4LOCI	2			.3	.3					.9	33.	3.	5.
38	4LOHI				.2			.3	.1		.2	33.	3.	3.
39	4PAMY										0.0	0.	0.	0.
40	4RUNI										0.0	0.	0.	0.
41	4RUUR	12	.3	2	.3		.3	.3	.3	.3	2.0	89.	8.	13.
42	4SYMO	8	3	1	.3	4	4	3	1	3	3.4	100.	9.	18.
43	4HHMO	45		3	6	15	4	3	1	.3	9.7	89.	8.	29.
44	3ACMI										0.0	0.	0.	0.
45	3ACTR		1								1.0	11.	1.	3.
46	3ADBI	10	1	.2	.3	5	.2	.3	1		2.3	89.	8.	14.
47	3ALVI										0.0	0.	0.	0.
48	3ANCE										0.0	0.	0.	0.
49	3APAN	.1	.3	.2	.3		.3		.1	1	.3	78.	7.	5.
50	3APMA 3	1	.3		.3	1	.3	.3	1	1	.7	89.	8.	6.
51	3ASCE										0.0	0.	0.	0.
52	3ASRA		.3		.3	.3	.3	.3	.3	.3	.3	78.	7.	5.
53	3BORAG										0.0	0.	0.	0.
54	3BRCO 3										0.0	0.	0.	0.
55	3CALO					.3		.2			.3	22.	2.	2.
56	3CAPR 3			.3						.3	.3	22.	2.	3.
57	3CASC 2	1	1			2		.3	.3	.3	.8	67.	6.	7.
58	3CIRSI										0.0	0.	0.	0.
59	3COHE		.2	.2			.3		.3	.3	.3	56.	5.	4.
60	3COUM							.3			.3	11.	1.	2.
61	3CORAL									.3	.3	11.	1.	2.
62	3COMA 3		.1		.2						.2	22.	2.	2.
63	3CYGR	1				1	.3	2	.1	.2	.8	67.	6.	7.
64	3DIHO		.2	.2							.2	22.	2.	2.
65	3DISPO	.2			.3	.3	.3	.3	.3	.3	.3	78.	7.	5.
66	3EPMI										0.0	0.	0.	0.
67	3FRVE	1	.3	.3	1	2	1	2	.3	1	1.0	100.	9.	10.
68	3GAAP				.3	.3	.3	.3		.1	.3	56.	5.	4.
69	3GAOR		.1			.3					.2	22.	2.	2.
70	3GATR		.3		.1			.3			.2	33.	3.	3.
71	3GOOB	.3		.2	.2	.3	.3	.3	.3	.3	.3	89.	8.	5.
72	3HAUN	.3		.3			.1			.3	.3	44.	4.	3.
73	3HEMI										0.0	0.	0.	0.
74	3HIAL	.3	1	1	.3	.3	.3	.3	.3	.3	.5	100.	9.	7.
75	3IRIS			.2	.3		.3	.2	.1		.2	56.	5.	3.

	PLOTS	5	13	14	49	60	64	66	67	69	COV2	CONS	OCUR	IMPO
76	3LANE					2					2.0	11.	1.	5.
77	3LAPO				.3	1		15			5.4	33.	3.	13.
78	3LIAP	1				.3	1				.8	33.	3.	5.
79	3LIBO 2	.3	.3	.2			.2	3	.3	.3	.7	78.	7.	7.
80	3LOMA 2										0.0	0.	0.	0.
81	3LOMI										0.0	0.	0.	0.
82	3LONE 2						.1				.1	11.	1.	1.
83	3LULA						5				5.0	11.	1.	7.
84	3MAMA	1	.3				.3	.3	.3	.3	.4	67.	6.	5.
85	3MIMUL										0.0	0.	0.	0.
86	3MGUN 2										0.0	0.	0.	0.
87	3MONTI					.3					.3	11.	1.	2.
88	3NEPA	.1					.3				.2	22.	2.	2.
89	3OSCH	1	1	.2	.1		.3	.3	.1	.3	.4	89.	8.	6.
90	3PENST										0.0	0.	0.	0.
91	3PHAO						1		.3	.3	.5	33.	3.	4.
92	3POGL 4										0.0	0.	0.	0.
93	3POHE 2										0.0	0.	0.	0.
94	3POLO 2	.1					.1				.1	22.	2.	1.
95	3POMU	5	.1	.2							1.8	33.	3.	6.
96	3POMUI								.1		.1	11.	1.	1.
97	3POMUM					3		.3			1.7	22.	2.	6.
98	3PSPH						.3			.3	.3	22.	2.	3.
99	3PTAQ	.3		.2	.3		.2	.3		.3	.3	67.	6.	4.
100	3PTAN									.1	.1	11.	1.	1.
101	3PYAP	.2	.2	.2		.3	.1	.1			.2	67.	6.	3.
102	3PYPI										0.0	0.	0.	0.
103	3SAOO		.3	.3	.3	.3		1		1	.5	67.	6.	6.
104	3SEDUM										0.0	0.	0.	0.
105	3SEMA 2										0.0	0.	0.	0.
106	3SENEL										0.3	0.	0.	0.
107	3SHRA				.3						.3	11.	1.	2.
108	3SMST										0.0	0.	0.	0.
109	3SYRE					3	.3		1	1	1.3	44.	4.	8.
110	3TRLA 2	.2	.2			2	.3	1		.3	.7	67.	6.	7.
111	3TROV										0.0	0.	0.	0.
112	3JNKN						.3				.3	11.	1.	2.
113	3VAME		.3		.3	.3	1	.3	1	1	.6	78.	7.	7.
114	3VISE		.3			.3	.2	.3		.1	.2	56.	5.	4.
115	3VIAM		.3	.3	.3	15	3	4	.1	1	3.0	89.	8.	16.
116	3XETE									.1	.1	11.	1.	1.
117	1BROMU					.3					.3	11.	1.	2.
118	1BRVU	2	.3	.3	1		2	2	3	.3	1.4	89.	8.	11.
119	1DANTH										0.0	0.	0.	0.
120	1ELGL	.3					.1		2		.8	33.	3.	5.
121	1FESTU					1					1.0	11.	1.	3.
122	1FECA	3		.3			3	3	.3	12	3.6	67.	6.	15.
123	1FEOC		1	1	.3			.2	9	5	2.8	67.	6.	14.
124	1FERU	3					.3				1.7	22.	2.	6.
125	1FESU 2							.3			.3	11.	1.	2.
126	1KOCR										0.0	0.	0.	0.
127	1MESU		.3	.2	.3	2	3	.3	1	.3	.9	67.	6.	9.
128	1MEHA				.2	.3	.3		2		.7	44.	4.	6.
129	1TRCA		1		.3		.2	.3	.3	.3	.4	67.	6.	5.
130	2CAREX			.3			2			11	4.4	33.	3.	12.
131	2JUCA 2		.3			.3	.3		.3		.3	44.	4.	4.

LIBOCEDRUS DECURRENS/CHIMAPHILA UMBELLATA COMMUNITY TYPE

	PLOTS	3	32	47	71	73	COV2	CONS	OCUR	IMPO
1	5ABAM						0.0	0.	0.	0.
2	5ABPR			.1			.1	20.	1.	1.
3	5ABGR			.1	.1		.1	40.	2.	2.
4	5ACMA		2		2	.1	1.4	60.	3.	9.
5	5ARME				1		1.0	20.	1.	4.
6	5CACH			.1	.3	.1	.2	60.	3.	3.
7	5LIDE	60	15	40	35	20	34.0	100.	5.	58.
8	5PILA						0.0	0.	0.	0.
9	5PIPO						0.0	0.	0.	0.
10	5PSME	25	65	60	50	60	52.0	100.	5.	72.
11	5PRUNU						0.0	0.	0.	0.
12	5QUGA						0.0	0.	0.	0.
13	5TABR			.1	.1	.1	.1	60.	3.	2.
14	5TSME				2	0	2.0	20.	1.	6.
15	4ACCI			.1	2	.1	.7	60.	3.	7.
16	4ACGL						0.0	0.	0.	0.
17	4AMAL				.1		.1	20.	1.	1.
18	4ARCO 3				1		1.0	20.	1.	4.
19	4CEIN				.1		.1	20.	1.	1.
20	4CONU			.1	1	.1	.4	60.	3.	5.
21	4COCOL			.1	7	.2	2.4	60.	3.	12.
22	4HODI		4		1		2.5	40.	2.	10.
23	4PHLE	0					0.0	0.	0.	0.
24	4RHPU	.1				.2	.2	40.	2.	2.
25	4RHMA						0.0	0.	0.	0.
26	4RHDI						0.0	0.	0.	0.
27	4RICR	.1					.1	20.	1.	1.
28	4ROGY	.2	.3		.3	.2	.3	80.	4.	4.
29	4RUPA						0.0	0.	0.	0.
30	4VAPA			.1	.1		.1	40.	2.	2.
31	4VAME				.3		.3	20.	1.	2.
32	4BEAQ	.3			.3	.3	.3	60.	3.	4.
33	4BENE	11	10	.2	1	1	4.6	100.	5.	22.
34	4CHME	.3	.1	.1		.3	.2	80.	4.	4.
35	4CHUM	.3	3	10	.3	2	3.1	100.	5.	18.
36	4GASH	.1					.1	20.	1.	1.
37	4LOCI						0.0	0.	0.	0.
38	4LCHI						0.0	0.	0.	0.
39	4PAMY				.3		.3	20.	1.	2.
40	4RUNI					.1	.1	20.	1.	1.
41	4RUUR	.3		.3	.3	.3	.3	80.	4.	5.
42	4SYMO				.3	.1	.2	40.	2.	3.
43	4WHMO						0.0	0.	0.	0.
44	3ALMI						0.0	0.	0.	0.
45	3ALTR		11	.3	.3	.2	3.0	80.	4.	15.
46	3ADBI		5			.1	2.6	40.	2.	10.
47	3ALVI						0.0	0.	0.	0.
48	3ANDE		.2			.3	.3	40.	2.	3.
49	3APAN						0.0	0.	0.	0.
50	3ARMA 3	3	.3		1		1.4	60.	3.	9.
51	3ASDE						0.0	0.	0.	0.
52	3ASRA					.3	.3	20.	1.	2.
53	3BORAG						0.0	0.	0.	0.
54	3BRCO 3	.1					.1	20.	1.	1.
55	3CALOG						0.0	0.	0.	0.
56	3CAPR 3	.2					.2	20.	1.	2.
57	3CASC 2	2	3		.3		1.8	60.	3.	10.
58	3CIRSI				.1		.1	20.	1.	1.
59	3COHE	2	.3				1.2	40.	2.	7.
60	3COUM				.3		.3	20.	1.	2.
61	3CORAL						0.0	0.	0.	0.
62	3COMA 3	.1	.3				.2	40.	2.	3.
63	3CYGR						0.0	0.	0.	0.
64	3DIHO						0.0	0.	0.	0.
65	3DISPO						0.0	0.	0.	0.
66	3EPMI						0.0	0.	0.	0.
67	3FRVE	.3	.3		.3	.3	.3	80.	4.	5.
68	3GAAP					.1	.1	20.	1.	1.
69	3GAOR			.1		.1	.1	40.	2.	2.
70	3GATR		.3				.3	20.	1.	2.
71	3GOOB	1	.3	.3	.1	.3	.4	100.	5.	5.
72	3HAUN	.3					.3	20.	1.	2.
73	3HEMI	3			.1		1.6	40.	2.	8.
74	3HIAL	3	1	.3	.3	.3	1.0	100.	5.	10.
75	3IRIS		.1	.3	.3	.3	.3	80.	4.	4.

PLOTS	3	32	47	71	73	COV2	CONS	OCUR	IMPO
76 3LANE		2				2.0	20.	1.	6.
77 3LAPO						0.0	0.	0.	0.
78 3LIAP						0.0	0.	0.	0.
79 3LIBO 2	7		1	.2		2.7	60.	3.	13.
80 3LOMA 2						0.0	0.	0.	0.
81 3LOMI						0.0	0.	0.	0.
82 3LONE 2				.2		.2	20.	1.	2.
83 3LULA				4		4.0	20.	1.	9.
84 3MAMA						0.0	0.	0.	0.
85 3MIMU						0.0	0.	0.	0.
86 3MOUN 2						0.0	0.	0.	0.
87 3MONT						0.0	0.	0.	0.
68 3NEFA						0.0	0.	0.	0.
69 3OSCH						0.0	0.	0.	0.
90 3PENST						0.0	0.	0.	0.
91 3PHAO						0.0	0.	0.	0.
92 3POGL 4	.2				.2	.2	40.	2.	3.
93 3POME 2					.2	.2	20.	1.	2.
94 3POLO 2	.1	.2			.1	.1	60.	3.	3.
95 3POMU	.3	2				1.2	40.	2.	7.
96 3POMU				.3	.3	.3	40.	2.	3.
97 3POMUM					.1	.1	20.	1.	1.
98 3PSPH						0.0	0.	0.	0.
99 3PTAQ			1		.2	.8	40.	2.	5.
100 3PTAN						0.0	0.	0.	0.
101 3PYAP		.2				.2	20.	1.	2.
102 3PYPI	.3	.2	.3		.3	.3	80.	4.	5.
103 3SAOO		.3			.3	.3	40.	2.	3.
104 3SEDUM				.3		.3	20.	1.	2.
105 3SEMA 2	1			.3		.7	40.	2.	5.
106 3SENEC	.2					.2	20.	1.	2.
107 3SMRA						0.0	0.	0.	0.
108 3SMST						0.0	0.	0.	0.
109 3SYRE				.1		.1	20.	1.	1.
110 3TRLA 2	10	.3	3	2	2	3.5	100.	5.	19.
111 3TROW						0.0	0.	0.	0.
112 3UNKN						0.0	0.	0.	0.
113 3VAME						0.0	0.	0.	0.
114 3VISE		.3			.3	.3	40.	2.	3.
115 3WIAM						0.0	0.	0.	0.
116 3XETE						0.0	0.	0.	0.
117 1BROMU						0.0	0.	0.	0.
118 1BRVU	.3	2		.3		.9	60.	3.	7.
119 1DANTH						0.0	0.	0.	0.
120 1E G						0.0	0.	0.	0.
121 1FESTU						0.0	0.	0.	0.
122 1FECA						0.0	0.	0.	0.
123 1FEOC	2	.3	.3	.3	1	.8	100.	5.	9.
124 1FERU		.1				.1	20.	1.	1.
125 1FESU 2		.3				.3	20.	1.	2.
126 1KOCR						0.0	0.	0.	0.
127 1MESU						0.0	0.	0.	0.
128 1MEMA	.3	.1		.3		.2	60.	3.	3.
129 1TRCA		.3				.3	20.	1.	2.
130 2CAREX				.2	.2	.2	40.	2.	3.
131 2LUCA 2	.3					.3	20.	1.	2.

TSUGA HETEROPHYLLA CLIMAX OR COCLIMAX SITES

	PLOTS	6	19	20	21	22	23	25	26	31	33	37	39	43	44	COV%	CONS	OCUR	IMPO
1	5ABAM			1						.1	0					.6	14.	2.	3.
2	5ABPR									1						1.0	7.	1.	3.
3	5ABGR	.1								3						1.6	14.	2.	5.
4	5ACMA	2					.3						6	.3	24	5.7	36.	5.	14.
5	5ARME								1							1.0	7.	1.	3.
6	5CACH		50	1	12			12	8	5		2	.2	10		0.0	64.	9.	26.
7	5LIDE						1			5						3.0	14.	2.	7.
8	5PILA															0.0	0.	0.	0.
9	5PIPO															0.0	0.	0.	0.
10	5PSME	86	55	40	75	93	85	70	85	75	85	75	80	50	70	73.3	100.	14.	86.
11	5PRUNU		2						.1							1.1	14.	2.	4.
12	5QUGA															0.0	0.	0.	0.
13	5TABR						.3									.3	7.	1.	1.
14	5TSHE	1	.2	35	5	0	12	1	1			5	4	35	4	9.4	79.	11.	27.
15	4ACCI	25	8		30	2	8	2	33	10	35	22		7	40	18.5	86.	12.	40.
16	4ACGL		8				.3				2					3.4	21.	3.	9.
17	4AMAL	.1						1	.3							.5	21.	3.	3.
18	4ARCO 3															0.0	0.	0.	0.
19	4CEIN															0.0	0.	0.	0.
20	4CONU				.3	.2				3	.3		30		1	5.8	43.	6.	16.
21	4COCOC	6	1		1	3	5	.2	.3	.3	.3		.3		5	2.0	79.	11.	13.
22	4HODI	6					2	1	1						15	5.4	36.	5.	14.
23	4PHLE															0.0	0.	0.	0.
24	4RHPU					.3		.1	.2		.2					.2	29.	4.	2.
25	4RHMA			95								3				49.0	14.	2.	26.
26	4RHDI															0.0	0.	0.	0.
27	4RICR															0.0	0.	0.	0.
28	4ROGY	2	3		.3	1	3	.3	.3	.1	.3		.3	.3	1	1.0	86.	12.	9.
29	4RUPA					1		3	1		.2		.3		4	1.6	43.	6.	8.
30	4VAPA		1							.3	.2	.3			.2	.4	36.	5.	4.
31	4VAME										.2					.2	7.	1.	1.
32	4BEAQ				.3	.3	.3									.3	21.	3.	3.
33	4BENE	70	25	8	8	80	28	3	12		45	2	70	45	35	30.7	93.	13.	53.
34	4CHME	.2	.2			.3		.3			.2	.2	.3	.2		.2	57.	8.	4.
35	4CHUM	.2	2		2		4			8	1			1		2.6	50.	7.	11.
36	4GASH			15				24	25	60		65	3	12		29.1	50.	7.	38.
37	4LOCI								.2						.1	.2	14.	2.	1.
38	4_OHI															0.0	0.	0.	0.
39	4PAMY		.3					.2	.1		.2					.2	29.	4.	2.
40	4RUNI															0.0	0.	0.	0.
41	4RUUR	1	.3				.3	.3	.2	.3	.3	.1	.3	.3	.3	.3	79.	11.	5.
42	4SYMO	3	.3		.3	.3	.3			4			1	.3	.3	1.1	64.	9.	8.
43	4WHMO	3				.3	6				1		.1	.3	4	2.1	50.	7.	10.
44	3ACMI															0.0	0.	0.	0.
45	3ACTR	2	.3		.3	.3	17			25	1			.3	2	5.4	64.	9.	19.
46	3ADBI	.3				1				8				.2	1	2.1	36.	5.	9.
47	3ALVI							.3								.3	7.	1.	1.
48	3ANDE	.2	.2		.2	.3	.1		.2	.3	.3			.3	.1	.2	71.	10.	4.
49	3APAN				.3								.3	.3		.3	21.	3.	3.
50	3ARMA 3	.3				1	.3	.3			.3		.1	.3	.3	.4	57.	8.	5.
51	3ASDE															0.0	0.	0.	0.
52	3ASRA															0.0	0.	0.	0.
53	3BORAG															0.0	0.	0.	0.
54	3BRCO 3															0.0	0.	0.	0.
55	3CALOC															0.0	0.	0.	0.
56	3CAPR 3															0.0	0.	0.	0.
57	3CASC 2						.3	.3	.3	.2	.3			.3	.2	.3	50.	7.	4.
58	3CIRSI															0.0	0.	0.	0.
59	3COHE															0.0	0.	0.	0.
60	3COUM															0.0	0.	0.	0.

	PLOTS	6	19	20	21	22	23	25	26	31	33	37	39	43	44	COV2	CONS	OCUR	IMPO
61	3CORAL							.2								.2	7.	1.	1.
62	3COMA 3	.3									.1			.2		.2	21.	3.	2.
63	3CYGR															0.0	0.	0.	0.
64	3DIMO	.2											.3			.3	14.	2.	2.
65	3DISPO														.3	.3	7.	1.	1.
66	3EPMI															0.0	0.	0.	0.
67	3FRVE	.2				.2	.3			.3					.3	.3	36.	5.	3.
68	3GAAP															0.0	0.	0.	0.
69	3GAOR					.1					.3				.3	.2	21.	3.	2.
70	3GATR	2				2				.3	.3		.3		.3	.9	43.	6.	6.
71	3GOOB				.2	.3		.1	.1	.2	.3	.1	.3			.2	57.	8.	3.
72	3HAUN															0.0	0.	0.	0.
73	3HEMI															0.0	0.	0.	0.
74	3HIAL	.3			.3	.3	1	.3	.3	.3	.3				1	.5	64.	9.	5.
75	3IRIS									.3			.1			.2	14.	2.	2.
76	3LANE															0.0	0.	0.	0.
77	3LAFO													1		1.0	7.	1.	3.
78	3LIAP															0.0	0.	0.	0.
79	3LIBO 2	1		.3		.3	2		.3	25	.3		.3	1	3	3.4	71.	10.	15.
80	3LGMA 2															0.0	0.	0.	0.
81	3LOMI															0.0	0.	0.	0.
82	3LONE 2															0.0	0.	0.	0.
83	3LULA															0.0	0.	0.	0.
84	3MAMA															0.0	0.	0.	0.
85	3MIMUL															0.0	0.	0.	0.
86	3MOUN 2						.3									.3	7.	1.	1.
87	3MUNT.	.3														.3	7.	1.	1.
88	3NEPA															0.0	0.	0.	0.
89	3OSCH					.3				12			.2		.2	3.2	29.	4.	10.
90	3PENSI															0.0	0.	0.	0.
91	3PHAD															0.0	0.	0.	0.
92	3PDGL 4															0.0	0.	0.	0.
93	3POME 2															0.0	0.	0.	0.
94	3PCLO 2					.1			.1		.2	.2	.2			.2	36.	5.	2.
95	3PCMU	.2				5		.2	.2		3	.2		.3		1.3	50.	7.	8.
96	3PDMU.															0.0	0.	0.	0.
97	3PCMUM														7	7.0	7.	1.	7.
98	3PSPH															0.0	0.	0.	0.
99	3PTAQ		.3		4	.3		7	.2		.3	.2	.3		1	1.5	64.	9.	10.
100	3PTAN				0		.1									.1	7.	1.	1.
101	3PYAP	.2							.1	.3						.2	21.	3.	2.
102	3PYPI	.3	.3		.3		.2		.1	.2	.2					.2	50.	7.	3.
103	3SADO															0.0	0.	0.	0.
104	3SEDUM															0.0	0.	0.	0.
105	3SEWA 2															0.0	0.	0.	0.
106	3SENEC	.1														.1	7.	1.	1.
107	3SMRA	.2														.2	7.	1.	1.
108	3SMST	.3							.1							.2	14.	2.	2.
109	3SYRE	.1														.1	7.	1.	1.
110	3TRLA 2	.3			.3	1	1	.3	.3	.2		.3	.3	.3		.4	71.	10.	6.
111	3TROV					.3			.3		.1		.1			.2	29.	4.	2.
112	3UNKN															0.0	0.	0.	0.
113	3VAME									.3	.3		.2	.1	.3	.2	36.	5.	3.
114	3VISE		.3		.3	4	.3	.3	.3	.3	5	.3	3	.3	.3	1.2	86.	12.	10.
115	3VIAM												.2			.2	7.	1.	1.
116	3XETE			2				.2	.2			1				.9	29.	4.	5.
117	1BROMU															0.0	0.	0.	0.
118	1BRVU	.2					.3			.1					1	.4	29.	4.	3.
119	1DANTH															0.0	0.	0.	0.
120	1ELGL							.1								.1	7.	1.	1.
121	1FEETU															0.0	0.	0.	0.
122	1FECA															0.0	0.	0.	0.
123	1FECO	.2						.3								.3	14.	2.	2.
124	1FE-U															0.0	0.	0.	0.
125	1FESU 2						.3			.2					.3	.3	21.	3.	2.
126	1KOCR															0.0	0.	0.	0.
127	1MESU									.3						.3	7.	1.	1.
128	1MEMA										.3			.3		.3	14.	2.	2.
129	1TRCA							.3								.3	7.	1.	1.
130	2CAREX															0.0	0.	0.	0.
131	2LULA 2															0.0	0.	0.	0.

APPENDIX 7

STAND TABLES

Stand tables produced by program Stantab (Appendix9) are presented for each plot and are summarized by community. The species alpha codes are given in Appendix 1 and follow Garrison et al. (1976). Species are subdivided by CODES for live (L), dead (D), mineral soil rooted (M), and wood rooted (W).

Individual Plot Tables

The headings of the individual plot stand tables contain general plot information and some items relevant mainly to data set structure. Some of the plot data may need explanation. The AREA ID codes, given in Hawk et al. (1979), are prefixed by the letter O for Oregon the next three letters are abbreviations defined as follows:

DET	Detroit Ranger District
MKU	upper McKenzie River drainage, i.e. above Belknap Springs
MK	remainder of McKenzie District
HJA	H.J. Andrews Exp. Ecol. Res.
BR	remainder of Blue River District
OAK	Oakridge District
RIG	Rigdon District

Plot type is either full standard (FS) or half standard (HS) (Hawk et al. 1979). They are 1000 m^2 and 500 m^2 respectively, and size is the only difference between them.

Landform is a 6 character code depicting geomorphic, hydrologic, and topographic characteristics of the plot (Hawk et al. 1979):

Character 1: Primary ridge position

T = topslope

M = midslope

B = bottom slope

Character 2: geomorphic unit (general lie of the land)

R = ridgetop 0-4 degrees (0-7%) slope

C = creep slope, 4-45 degree (7-100%) slope, usually the edge of the ridge or a bench.

F = fall face, greater than or equal to 45 deg (100%) slope. Includes cliffs, scarps and very steep slopes.

T = upper transport slope, usually 25-35 deg (47-70%) but up to 45 deg (100%) slope. Includes areas of active transport of surface materials (slides, slumps or creep). It is located on the upper third of the transport slope.

M = middle transport slope. Same as T but on middle third of transport slope.

B = bottom transport slope. Same as T but on lower third of transport slope.

D = colluvial top slope, 5 - 25 deg (9-47%) slope. Colluvial or depositional area, including surfaces of inclined slump benches and terrain of gentle relief. It occurs on the upper one third of the colluvial slope.

E = colluvial midslope. Same as D but on middle third of colluvial slope.

G = colluvial bottom slope. Same as D but on bottom third of colluvial slope.

A = alluvial toeslope, includes areas of gentle relief where alluvial deposition of sediments is or has recently occured to form terraces or plains.

S = stream channels, including the bed and walls of present streams, rivers or annually wet oxbows of nearby streams.

Character 3: primary hydrologic feature of the plot

D = "dry", no visible annual or perennial streams in or near the plot. (Near = 3 plot radii from plot center. Use 1/2 ave dimension of rectangular plot.)

A = annual stream channels in or near plot. Water need not be present during dry season.

P = perennial stream present. Water must be present all year long.

S = seeps common, indicated by local groups of riparian plants.

W = standing water present in or near plot. This may be a lake, pond, marsh, bog or water within 25 cm of surface in soil pit.

Character 4: secondary hydrologic feature code, includes features described under character 3 above which occur as inclusions of greater than 20%.

Character 5: describes topography in the horizontal (across slope) plane.

C = extreme concavity

B = slight concavity

S = smooth terrain

R = rolling terrain with both concavity and convexity

V = slight convexity

W = extreme convexity

Character 6: describes topography in the vertical (up - down slope) plane with the same character 5 codes.

The HABITAT codes are the plant community computer codes in table 4:

PMHDGR	*Pseudotsuga/Holodiscus*/grass community
PMHGA	*Aspidotis* phase
PMHGC	*Collomia* phase
PMHDAC	*Pseudotsuga/Holodiscus-Acer*
PMBADI	*Pseudotsuga/Berberis/Disporum*
LDWM	*Libocedrus/Whipplea*
LDCU	*Libocedrus/Chimaphila*

Since all vegetation plots were uncorrected for slope the slope correction factor shown was calculated from the slope (5) as

Slope c.f. = 1.0 / (cos (arctan (slope/100.0)))

The plot size conversion factor is the number of plots needed to equal one hectare of area. The product of these (both conversion factors combined) was multiplied by the tree tallies and gave numbers per hectare.

Several headings on the individual plot stand tables may also need explanation:

1. Under reproduction: REPRO LT 137CM

   a. The size of the area sampled in square meters is labeled — SAMP AREA (M2)

   b. The number of trees actually tallied is labeled — TALY

   c. Regeneration density in number per hectare is labeled — NUM /HA

2. The actual measured diameters (cm) of trees greater than 120 cm DBH is given as well as the number of these trees per hectare (NUM /HA)

3. The total number of stems greater than 10 cm DBH is given on a per hectare basis (TOTAL STEMS GT10CM /HA)

Summary Tables

Average values and sample standard errors are provided for each community and for the *Tsuga*-climax or coclimax plots. Sample standard errors (standard error of the mean) are calculated as

$$SE = \sqrt{\frac{\left(SXX - \left(\frac{SX \cdot SX}{n}\right)\right) \Big/ (n - 1)}{n}}$$

where $SXX = \sum_{i=1}^{n} (X^2_i)$

and $SX = \sum_{i=1}^{n} X_i$

DECK ID TP56 1   STUDY ID DRYD   PLOT   15   AREA ID ORIG   ESTABLISHMENT DATE 770720

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 526   SLOPE (%) 72.   ASPECT 225

LANDFORM TIDDSS   HABITAT PMHGA

SLOPE CORRECTION FACTOR 1.23223   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.3223

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	2	493	173	62	37	74	0	25	0	12	0	0	0	0	0	0	0	0	0	0	209	22
CADE	L	M	50	0	0	12	37	25	0	12	0	12	12	0	0	0	12	0	0	0	0	0	0	111	26
ARME	L	M	50	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2
PILA	L	M	50	1	246	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	3	739	185	99	74	86	12	25	12	25	0	0	0	12	0	0	0	0	0	0	345	51
PSME	D	M	50	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	12	11
PILA	D	M	50	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1

DECK ID TP56 1   STUDY ID DRYD   PLOT   27   AREA ID OBR   ESTABLISHMENT DATE 770801

PLOT TYPE HS   PLOT AREA (SQ M) 500.0   ELEVATION (M) 610   SLOPE (%) 76.   ASPECT 225

LANDFORM TTDDCB   HABITAT PMHGA

SLOPE CORRECTION FACTOR 1.25603   PLOT SIZE CONVERSION FACTOR 20.00000   BOTH CONV. FACTORS COMBINED = 25.1205

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	2	502	25	126	25	0	0	0	50	50	25	25	0	0	0	0	0	0	0	0	301	75
QUGA	L	M	50	0	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	2
LIVE TOTALS			50	2	502	25	251	25	0	0	0	50	50	25	25	0	0	0	0	0	0	0	0	427	78
PSME	D	M	50	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QUGA	D	M	50	0	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	1

DECK ID TP56 1   STUDY ID DRYD   PLOT 35   AREA ID OBR   ESTABLISHMENT DATE 770830

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 899   SLOPE (%) 60.   ASPECT 185

LANDFORM TIDDSS   HABITAT PMHGA

SLOPE CORRECTION FACTOR 1.16619   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.6619

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	2	466	47	12	35	23	23	0	0	23	12	12	12	0	0	0	0	0	0	0	152	44
CADE	L	M	50	3	700	0	12	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	35	5
ABGR	L	M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
LIVE TOTALS			50	5	1166	47	35	35	23	35	12	0	23	12	12	12	0	0	0	0	0	0	0	198	49
PSME	D	M	50	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 65   AREA ID ORIG   ESTABLISHMENT DATE 790620

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 712   SLOPE (%) 43.   ASPECT 204

LANDFORM MODDVV   HABITAT PMHGA

SLOPE CORRECTION FACTOR 1.08853   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.8853

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	512	468	131	22	0	0	0	0	11	0	11	0	0	0	0	0	0	0	642	36
CADE	L	M	50	0	0	305	44	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54	3
ARME	L	M	50	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	1
PIPO	L	M	50	0	0	33	11	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	33	18
LIVE TOTALS			50	0	0	849	522	163	22	0	0	0	0	22	0	11	11	0	0	0	0	0	0	751	57
PSME	D	M	50	0	0	185	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
CADE	D	M	50	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PIPO	D	M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

ASPIDOTIS DENSA PHASE

* * AVERAGE VALUES FOR 4 PLOTS. * *

SPP ALPHA CODE	CODES L M + + D W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L M	365.4	189.0	166.7	56.9	29.8	5.8	6.2	12.6	21.5	11.9	9.2	5.6	0.0	0.0	326.2	44.2	4
LIDE I	L M	174.9	79.3	23.0	8.9	0.0	6.0	2.9	3.1	3.1	0.0	0.0	0.0	3.1	0.0	50.1	8.5	3
ABGR	L M	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	.1	1
ARME	L M	0.0	0.0	0.0	8.5	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	.7	2
PILA	L M	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PIPO	L M	0.0	8.2	2.7	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.7	0.0	8.2	4.5	1
QUGA	L M	0.0	0.0	31.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	.6	1
LIVE TOTALS		602.0	276.4	226.8	74.3	32.8	11.8	9.1	15.6	24.6	14.6	9.2	5.6	5.8	0.0	430.4	58.6	
PSME	D M	0.0	64.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	5.8	3.0	4
LIDE I	D M	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	D M	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	.3	1
PIPO	D M	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
QUGA	D M	0.0	0.0	18.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8	.4	1

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

ASPIDOTIS DENSA PHASE

* * STANDARD ERRORS FOR 4 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	122.1	112.3	103.1	24.7	15.7	5.8	6.2	12.6	10.7	5.1	6.0	3.3	0.0	0.0	109.8	11.2	4
CADE	L	M	174.9	75.2	10.3	5.8	0.0	3.5	2.9	3.1	3.1	0.0	0.0	0.0	3.1	0.0	23.2	6.1	3
ABGR	L	M	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	.1	1
ARME	L	M	0.0	0.0	0.0	5.3	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	.5	2
PILA	L	M	61.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PIPO	L	M	0.0	8.2	2.7	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.7	0.0	8.2	4.5	1
QUGA	L	M	0.0	0.0	31.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	.6	1
LIVE TOTALS			243.2	194.1	108.5	31.5	18.6	8.2	5.9	11.9	10.3	5.7	6.0	3.3	3.4	0.0	116.9	6.6	
PSME	D	M	0.0	41.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	3.4	2.6	4
CADE	D	M	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	D	M	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	.3	1
PIPO	D	M	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
QUGA	D	M	0.0	0.0	18.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8	.4	1

DECK ID TP56 1 STUDY ID DRYD PLOT 8 AREA ID OOAK ESTABLISHMENT DATE 770715

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 625 SLOPE (%) 63. ASPECT 260

LANDFORM TTDDVW HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.18191 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.8191

SPP ALPHA CODE	CODES L M + + D W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	4	946	47	130	165	142	71	0	0	0	0	0	12	0	0	0	0	0	0	0	520	47
CADE	L M	50	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L M	50	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1
PRUNU	L M	50	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QUGA	L M	50	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0
LIVE TOTALS		50	4	946	118	154	189	142	71	0	0	0	0	0	12	0	0	0	0	0	0	0	567	49
PSME	D M	50	0	0	59	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	1
ARME	D M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
QUGA	D M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 9 AREA ID OOAK ESTABLISHMENT DATE 770715

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 610 SLOPE (%) 70. ASPECT 250

LANDFORM MMDDWR HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.22066 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.2066

SPP ALPHA CODE	CODES L M + + D W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	3	732	85	134	24	12	12	12	24	24	0	12	0	0	0	0	0	0	0	0	256	38
CADE	L M	50	1	244	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12	2
ACMA	L M	50	0	0	12	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	2
ARME	L M	50	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
LIVE TOTALS		50	4	977	110	134	49	24	24	12	24	24	0	12	0	0	0	0	0	0	0	0	305	42
PSME	D M	50	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	12	9

DECK ID TP56 1 STUDY ID DRYD PLOT 10 AREA ID DOAK ESTABLISHMENT DATE 770718

PLOT TYPE HS PLOT AREA (SQ M) 500.0 ELEVATION (M) 808 SLOPE (%) 45. ASPECT 262

LANDFORM TTDDWR HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.09659 PLOT SIZE CONVERSION FACTOR 20.00000 BOTH CONV. FACTORS COMBINED = 21.9317

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	219	241	0	0	44	110	66	66	22	0	0	0	0	0	0	0	0	0	0	307	70
CADE	L	M	50	1	219	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACMA	L	M	50	1	219	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	50	0	0	44	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	2
QUGA	L	M	50	0	0	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	2
LIVE TOTALS			50	3	656	307	0	44	66	110	66	66	22	0	0	0	0	0	0	0	0	0	0	373	75
PSME	D	M	50	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	1
ACMA	D	M	50	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 12 AREA ID DRIG ESTABLISHMENT DATE 770719

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 945 SLOPE (%) 73. ASPECT 180

LANDFORM TTDDSS HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.23810 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.3810

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	37	62	62	87	25	12	0	0	0	12	0	12	135	0	0	0	0	12	285	59
CADE	L	M	50	1	248	12	25	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2
ACMA	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	L	M	50	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	12	4
LIVE TOTALS			50	1	248	62	87	74	99	25	12	12	0	0	12	0	12	135	0	0	0	0	12	347	66
PSME	D	M	50	0	0	12	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	1
CADE	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT   16   AREA ID DOAK   ESTABLISHMENT DATE 770721

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M)   975   SLOPE (%)   54.   ASPECT 270

LANDFORM TCDDRS   HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.13649   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.3649

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	68	102	91	80	114	57	0	0	23	0	0	0	0	0	0	0	0	0	466	60
CADE	L	M	50	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
ARME	L	M	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	L	M	50	1	227	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2
LIVE TOTALS			50	1	227	68	102	102	80	125	57	0	0	23	0	0	0	0	0	0	0	0	0	489	62
PSME	D	M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	D	M	50	0	0	34	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	1

DECK ID TP56 1   STUDY ID DRYD   PLOT   24   AREA ID DDET   ESTABLISHMENT DATE 770728

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M)   884   SLOPE (%)   68.   ASPECT 225

LANDFORM TCDDRS   HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.20930   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.0930

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	2	484	786	351	97	85	0	0	24	24	12	0	0	0	0	0	0	0	0	0	593	49
CADE	L	M	50	0	0	85	60	24	12	35	0	12	12	0	0	0	0	0	0	0	0	0	0	157	19
TSHE	L	M	50	0	0	12	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1
ACMA	L	M	50	0	0	60	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
CACH	L	M	50	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
PILA	L	M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
PSME	L	W	50	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
TSHE	L	W	50	0	0	48	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
LIVE TOTALS			50	2	484	1004	460	157	97	36	0	36	36	12	0	0	0	0	0	0	0	0	0	834	71
PSME	D	M	50	0	0	48	0	0	0	12	0	0	0	0	12	0	0	0	0	0	0	0	0	24	11
ACMA	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 30 AREA ID DMK ESTABLISHMENT DATE 770803

PLOT TYPE HS PLOT AREA (SQ M) 500.0 ELEVATION (M) 1250 SLOPE (%) 74. ASPECT 225

LANDFORM TCDDSS HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.24403 PLOT SIZE CONVERSION FACTOR 20.00000 BOTH CONV. FACTORS COMBINED = 24.8805

SPP ALPHA CODE	CODES L+D M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	0	0	0	25	124	124	199	25	50	0	0	0	0	0	0	0	0	0	0	0	547	74
CADE	L M	50	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2
ABGR	L M	50	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
ABPR	L M	50	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS		50	0	0	25	50	124	149	199	25	50	0	0	0	0	0	0	0	0	0	0	0	597	77
PSME	D M	50	0	0	124	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1

DECK ID TP56 1 STUDY ID DRYD PLOT 41 AREA ID DMKU ESTABLISHMENT DATE 770818

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 777 SLOPE (%) 82. ASPECT 215

LANDFORM MTDDSS HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.29321 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.9321

SPP ALPHA CODE	CODES L+D M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	0	0	233	65	65	39	26	39	0	0	26	0	13	13	0	0	0	0	0	0	285	62
CADE	L M	50	2	517	65	39	26	26	39	0	0	13	0	0	0	0	0	0	0	0	0	0	142	17
LIVE TOTALS		50	2	517	297	103	91	65	65	39	0	13	26	0	13	13	0	0	0	0	0	0	427	79
PSME	D M	50	0	0	39	0	13	13	0	0	0	13	0	0	0	0	0	0	0	0	0	0	39	8
CADE	D M	50	0	0	39	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 51   AREA ID ODET   ESTABLISHMENT DATE 770717

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 732   SLOPE (%) 66.   ASPECT 212

LANDFORM MTDDBS   HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.20930   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.0930

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH: MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	12	24	73	60	133	73	0	24	0	0	0	0	0	0	0	0	0	0	387	60
ACMA	L	M	50	0	0	12	24	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	1
PRUNU	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	0	0	36	48	85	60	133	73	0	24	0	0	0	0	0	0	0	0	0	0	423	61
PSME	D	M	50	0	0	12	24	12	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	4

DECK ID TP56 1   STUDY ID DRYD   PLOT 52   AREA ID ODET   ESTABLISHMENT DATE 780718

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 716   SLOPE (%) 80.   ASPECT 268

LANDFORM MTDDSS   HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.28062   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.8062

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH: MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	13	26	26	90	166	77	26	0	0	0	0	0	0	0	0	0	0	0	410	64
PSME	L	W	50	0	0	0	0	26	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	38	4
LIVE TOTALS			50	0	0	13	26	51	90	166	90	26	0	0	0	0	0	0	0	0	0	0	0	448	69
PSME	D	M	50	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0

DECK ID TP56 1 STUDY ID DRYD PLOT 53 AREA ID O4JA ESTABLISHMENT DATE 780719

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 1097 SLOPE (%) 58. ASPECT 270

LANDFORM TCDDRR HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.15603 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.5603

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	23	46	81	104	116	92	35	0	0	0	0	0	0	0	0	0	0	0	474	68
CADE	L	M	50	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ABGR	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CADE	L	W	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L	W	50	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	0	0	127	46	81	104	116	92	35	0	0	0	0	0	0	0	0	0	0	0	474	68
PSME	D	M	50	0	0	23	23	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	35	9
TSHE	D	W	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 54 AREA ID OBK ESTABLISHMENT DATE 780720

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 847 SLOPE (%) 72. ASPECT 260

LANDFORM THJDVV HABITAT FMHGC

SLOPE CORRECTION FACTOR 1.23223 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.3223

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	3	739	653	99	0	0	12	25	12	37	0	0	0	0	0	0	0	0	0	0	185	33
CADE	L	M	50	0	0	12	25	12	49	25	0	0	0	0	0	0	0	0	0	0	0	0	0	111	10
ABGR	L	M	50	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	L	M	50	0	0	12	12	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	2
PILA	L	M	50	0	0	0	0	0	0	0	0	12	0	12	0	0	0	0	0	0	0	0	0	25	11
SALIX	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	3	739	739	136	37	49	37	25	25	37	12	0	0	0	0	0	0	0	0	0	357	56
PSME	D	M	50	0	0	62	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
CADE	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 55 AREA ID OBR ESTABLISHMENT DATE 780720

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 823 SLOPE (%) 67. ASPECT 220

LANDFORM TBDDSR HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.20370 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.0370

SPP ALPHA CODE	CODES L+D M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	0	0	169	36	36	36	12	36	24	0	12	12	12	0	0	0	0	0	0	0	217	51
CADE	L M	50	0	0	60	106	48	36	12	12	12	0	12	0	0	0	0	0	0	0	0	0	241	24
ABGR	L M	50	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	L M	50	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12	7
LIVE TOTALS		50	0	0	277	144	84	72	24	48	36	0	36	12	12	0	0	0	0	0	0	0	469	82
PSME	D M	50	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CADE	D M	50	0	0	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 56 AREA ID OHJA ESTABLISHMENT DATE 790613

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 586 SLOPE (%) 77. ASPECT 157

LANDFORM TTLDVS HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.26210 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.6210

SPP ALPHA CODE	CODES L+D M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	0	0	101	114	189	50	38	13	0	0	0	0	25	0	0	0	0	0	0	0	429	48
ACMA	L M	50	0	0	0	38	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	1
LIVE TOTALS		50	0	0	101	151	202	50	38	13	0	0	0	0	25	0	0	0	0	0	0	0	480	50
PSME	D M	50	0	0	38	25	0	0	0	0	0	13	0	0	0	13	0	0	0	0	0	0	50	19

DECK ID TP56 1 STUDY ID DRYD PLOT 57 AREA ID OHJA ESTABLISHMENT DATE 790613

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 560 SLOPE (%) 55. ASPECT 215

LANDFORM MTDDRR HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.14127 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.4127

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	REPRO LT 137CM TALY	REPRO LT 137CM NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	91	114	148	103	34	11	0	11	0	0	0	0	0	0	0	0	0	0	422	34
LIVE TOTALS			50	0	0	91	114	148	103	34	11	0	11	0	0	0	0	0	0	0	0	0	0	422	34
PSME	D	M	50	0	0	57	11	0	11	0	11	11	0	0	0	0	0	0	0	0	0	0	0	46	8

DECK ID TP56 1 STUDY ID DRYD PLOT 62 AREA ID ORIG ESTABLISHMENT DATE 790613

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 525 SLOPE (%) 55. ASPECT 204

LANDFORM MTDDVS HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.14127 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.4127

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	REPRO LT 137CM TALY	REPRO LT 137CM NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	5	1141	1084	114	0	0	0	23	0	11	23	11	0	0	0	0	0	0	0	0	183	38
CADE	L	M	50	0	0	114	103	34	11	11	23	11	0	0	0	0	0	0	0	0	0	0	0	194	16
ACMA	L	M	50	0	0	11	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	1
PILA	L	M	50	0	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	5	1141	1255	262	34	11	11	46	11	11	23	11	0	0	0	0	0	0	0	0	422	56
PSME	D	M	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 63   AREA ID ORIG   ESTABLISHMENT DATE 790619

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 550   SLOPE (%) 42.   ASPECT 243

LANDFORM MRDDWS   HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.08462   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.8462

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH: MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	3	651	618	65	11	33	43	43	11	54	0	11	0	0	0	0	0	0	0	0	271	60
CADE	L	M	50	0	0	0	0	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	22	4
ARME	L	M	50	0	0	43	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	1
PILA	L	M	50	0	0	43	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	1
LIVE TOTALS			50	3	651	705	152	22	33	43	43	22	54	0	11	0	0	0	0	0	0	0	0	380	66
PSME	D	M	50	0	0	33	0	0	0	0	22	0	11	0	0	0	0	0	0	0	0	0	0	33	10
ARME	D	M	50	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 68   AREA ID ORIG   ESTABLISHMENT DATE 790724

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 814   SLOPE (%) 63.   ASPECT 283

LANDFORM MTCDSV   HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.18191   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.8191

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH: MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	75	10	1576	154	24	0	0	12	12	0	24	12	47	12	0	0	0	0	0	0	0	142	67
ABGR	L	M	75	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	75	0	0	12	24	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	2
CACH	L	M	75	1	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	L	M	75	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			75	11	1733	213	47	0	12	12	12	0	24	12	47	12	0	0	0	0	0	0	0	177	69
PSME	D	M	75	0	0	0	0	0	0	24	12	35	12	0	12	0	0	0	0	0	0	0	0	95	32

DECK ID TP56 1 STUDY ID DRYO PLOT 72 AREA ID OHJA ESTABLISHMENT DATE 790829

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 1045 SLOPE (%) 80. ASPECT 198

LANDFORM TTJJVV HABITAT PMHGC

SLOPE CORRECTION FACTOR 1.28062 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.8062

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	75	1	171	205	231	77	38	77	0	13	0	26	0	13	13	0	0	0	0	0	0	467	69
ACMA	L	M	75	0	0	102	26	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	3
TABR	L	M	75	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L	W	75	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			75	1	171	371	256	115	38	77	0	13	0	26	0	13	13	0	0	0	0	0	0	551	72
PSME	D	M	75	0	0	77	102	0	0	0	13	13	13	13	0	0	0	0	0	0	0	0	0	154	23
ACMA	D	M	75	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

COLLOMIA HETEROPHYLLA PHASE

** AVERAGE VALUES FOR 19 PLOTS. **

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	350.5	243.2	92.7	66.8	59.3	63.1	32.4	15.0	12.2	7.0	5.6	4.6	2.0	.7	361.3	55.3	19
LIDE	L	M	64.7	21.4	18.9	9.4	9.1	7.1	1.8	2.4	1.3	.6	0.0	0.0	0.0	0.0	50.8	5.2	13
TSHE	L	M	0.0	.6	.6	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.0	1
ABGR	L	M	0.0	6.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.1	5
ABPR	L	M	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	11.5	12.3	7.7	4.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	.5	8
ARME	L	M	0.0	5.9	4.7	1.9	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	.4	7
CACH	L	M	8.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	3
PILA	L	M	12.0	5.9	1.8	0.0	0.0	.6	0.0	1.3	0.0	1.3	0.0	0.0	0.0	0.0	5.0	1.3	8
PRUNU	L	M	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	1.2	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	.1	2
SALIX	L	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	0.0	0.0	0.0	2.0	0.0	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	.3	2
CADE	L	W	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	7.6	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.1	3
LIVE TOTALS			446.9	311.6	130.2	88.9	70.8	70.9	34.9	18.7	13.5	8.9	5.6	4.6	2.0	.7	449.6	63.3	
PSME	D	M	0.0	33.2	16.9	2.5	2.6	1.9	3.0	3.1	3.2	.7	2.5	0.0	.7	0.0	37.0	7.2	19
LIDE	D	M	0.0	7.1	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	4
ACMA	D	M	0.0	1.8	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	3
ARME	D	M	0.0	1.1	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	2
CACH	D	M	0.0	3.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	.1	3
QUGA	D	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	D	W	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

COLLOMIA HETEROPHYLLA PHASE

* * STANDARD ERRORS FOR 19 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	110.3	70.9	19.1	13.5	9.8	13.8	6.5	4.4	3.6	2.3	2.6	1.7	1.1	.7	31.1	3.0	19
CADE	L	M	32.3	7.8	8.0	3.2	3.4	2.9	1.3	1.1	.9	.6	0.0	0.0	0.0	0.0	17.7	1.6	13
TSHE	L	M	0.0	.6	.6	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.0	1
ABGR	L	M	0.0	3.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.0	5
ABPR	L	M	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	11.5	6.0	3.3	2.2	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	.2	8
ARME	L	M	0.0	3.2	3.6	1.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	.2	7
CACH	L	M	8.3	.9	.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	.1	3
PILA	L	M	12.0	3.4	1.3	0.0	0.0	.6	0.0	.9	0.0	.9	0.0	0.0	0.0	0.0	1.9	.7	8
PRUNU	L	M	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	1.2	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	2
SALIX	L	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	0.0	0.0	0.0	1.5	0.0	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	.2	2
CADE	L	W	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	4.2	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	3
LIVE TOTALS			113.5	81.9	24.3	12.9	9.0	12.7	6.8	4.4	3.7	2.8	2.6	1.7	1.1	.7	30.8	3.0	
PSME	D	M	0.0	7.6	5.8	1.4	1.5	1.4	1.5	2.0	1.3	.7	1.1	0.0	.7	0.0	8.4	2.1	19
CADE	D	M	0.0	4.2	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	4
ACMA	D	M	0.0	1.3	0.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	3
ARME	D	M	0.0	1.1	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	2
CACH	D	M	0.0	1.9	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	.1	3
QUGA	D	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	D	W	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

** AVERAGE VALUES FOR 23 PLOTS. **

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	353.1	233.8	105.5	65.1	54.1	53.2	27.8	14.6	13.8	7.9	6.2	4.7	1.7	.5	355.2	53.4	23
LIDE	L	M	83.8	31.5	19.6	9.3	7.5	6.9	2.0	2.6	1.6	.5	0.0	0.0	.5	0.0	50.7	5.7	16
TSHE	L	M	0.0	.5	.5	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	1
ABGR	L	M	0.0	5.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	.1	6
ABPR	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	9.5	10.1	6.3	3.3	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	.4	8
ARME	L	M	0.0	4.8	3.9	3.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	.4	9
CACH	L	M	6.9	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	.1	3
PILA	L	M	20.6	4.9	1.5	0.0	0.0	.5	0.0	1.1	0.0	1.1	0.0	0.0	0.0	0.0	4.1	1.1	9
PIPO	L	M	0.0	1.4	.5	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	0.0	.5	0.0	1.4	.8	1
PRUNU	L	M	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	6.5	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	.2	3
SALIX	L	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	0.0	0.0	0.0	1.6	0.0	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	.2	2
CADE	L	W	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	6.3	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.1	3
LIVE TOTALS			473.9	305.5	147.0	86.4	64.2	60.6	30.4	18.2	15.5	9.9	6.2	4.7	2.7	.5	446.3	62.5	
PSME	D	M	0.0	36.7	14.4	2.0	2.1	1.6	2.5	2.6	2.7	.6	2.1	.5	.5	0.0	31.6	6.5	23
LIDE	D	M	0.0	7.3	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	5
ACMA	D	M	0.0	1.5	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	3
ARME	D	M	0.0	.9	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.0	2
CACH	D	M	0.0	2.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	.0	3
PILA	D	M	0.0	0.0	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.1	1
PIPO	D	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
QUGA	D	M	0.0	.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	.1	2
TSHE	D	W	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR/GRASS COMMUNITY TYPE

* * STANDARD ERRORS FOR 23 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	92.6	61.0	23.1	11.7	8.7	12.3	5.8	4.1	3.5	2.1	2.4	1.5	.9	.5	30.8	3.1	23
CADE	L	M	36.9	14.0	6.8	2.6	2.9	2.4	1.2	1.0	.9	.5	0.0	0.0	.5	0.0	15.0	1.8	16
TSHE	L	M	0.0	.5	.5	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	1
ABGR	L	M	0.0	2.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	.0	6
ABPR	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	9.5	5.0	2.8	1.8	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	.2	8
ARME	L	M	0.0	2.7	3.0	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	.2	9
CACH	L	M	6.9	.7	.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.1	3
PILA	L	M	14.2	2.8	1.1	0.0	0.0	.5	0.0	.7	0.0	.7	0.0	0.0	0.0	0.0	1.6	.6	9
PIPO	L	M	0.0	1.4	.5	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	0.0	.5	0.0	1.4	.8	1
PRUNU	L	M	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	5.5	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	.1	3
SALIK	L	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	0.0	0.0	0.0	1.2	0.0	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.2	2
CADE	L	W	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	3.5	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.0	3
LIVE TOTALS			101.3	73.8	27.2	11.7	8.5	11.5	6.1	4.1	3.6	2.5	2.4	1.5	1.1	.5	31.1	2.7	
PSME	D	M	0.0	9.3	4.9	1.2	1.2	1.1	1.2	1.7	1.1	.6	1.0	.5	.5	0.0	7.4	1.8	23
CADE	D	M	0.0	3.7	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	5
ACMA	D	M	0.0	1.1	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	3
ARME	D	M	0.0	.9	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.0	2
CACH	D	M	0.0	1.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	.0	3
PILA	D	M	0.0	0.0	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	.1	1
PIPO	D	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
QUGA	D	M	0.0	.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	.1	2
TSHE	D	W	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

DECK ID TP56 1 STUDY ID DRYD PLOT 1 AREA ID OHJA ESTABLISHMENT DATE 770623

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 689 SLOPE (%) 65. ASPECT 212

LANDFORM TCDDSW HABITAT PHHDAC

SLOPE CORRECTION FACTOR 1.19269 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.9269

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO SAMP AREA (M2)	REPRO LT 137CM TALY	REPRO LT 137CM NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	1000	7	83	83	119	262	143	83	48	36	0	0	0	0	0	0	0	0	0	0	0	692	67
CADE	L	M	1000	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	1000	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
PILA	L	M	1000	2	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			1000	9	107	107	131	262	143	83	48	36	0	0	0	0	0	0	0	0	0	0	0	704	67
PSME	D	M	1000	0	0	12	24	12	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	60	8

DECK ID TP56 1 STUDY ID DRYD PLOT 2 AREA ID OHJA ESTABLISHMENT DATE 770623

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 689 SLOPE (%) 85. ASPECT 160

LANDFORM HTDDSS HABITAT PHHDAC

SLOPE CORRECTION FACTOR 1.31244 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 13.1244

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO SAMP AREA (M2)	REPRO LT 137CM TALY	REPRO LT 137CM NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	1000	15	197	551	92	144	66	39	13	0	13	0	13	0	13	0	0	0	0	0	0	394	56
PILA	L	M	1000	1	13	0	13	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	26	5
QUGA	L	M	1000	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
LIVE TOTALS			1000	16	210	551	118	144	66	39	13	13	13	0	13	0	13	0	0	0	0	0	0	433	61
PSME	D	M	1000	0	0	92	52	13	0	13	0	0	0	0	0	0	26	0	0	0	0	0	0	105	31

DECK ID TP56 1   STUDY ID DRYD   PLOT 4   AREA ID DHJA   ESTABLISHMENT DATE 770701
PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 594   SLOPE (%) 75.   ASPECT 183
LANDFORM MTDSBC   HABITAT PMHDAC
SLOPE CORRECTION FACTOR 1.25000   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.5000

SPP ALPHA CODE	CODES L + D	CODES M + M	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120------*	*--TREES GT 120CM DBH--* *--MEASURED DIAMS				--*	NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	1000	8	100	50	100	50	37	12	0	0	0	0	12	0	0	0	0	0	0	0	0	212	19
LIVE TOTALS			1000	8	100	50	100	50	37	12	0	0	0	0	12	0	0	0	0	0	0	0	0	212	19
PSME	D	M	1000	1	12	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 7   AREA ID DDAK   ESTABLISHMENT DATE 770714
PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 975   SLOPE (%) 81.   ASPECT 205
LANDFORM MTDDSS   HABITAT PMHDAC
SLOPE CORRECTION FACTOR 1.28690   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.8690

SPP ALPHA CODE	CODES L + D	CODES M + M	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120------*	*--TREES GT 120CM DBH--* *--MEASURED DIAMS				--*	NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	2	515	103	26	77	26	51	51	64	26	0	0	13	0	0	0	0	0	0	0	335	72
ACMA	L	M	50	0	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	2	515	142	26	77	26	51	51	64	26	0	0	13	0	0	0	0	0	0	0	335	72
PSME	D	M	50	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1

DECK ID TP56 1   STUDY ID ORYD   PLOT 17   AREA ID OOAK   ESTABLISHMENT DATE 770721

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 960   SLOPE (%) 80.   ASPECT 225

LANDFORM MMDDSV   HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.28062   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.8062

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	371	38	13	13	0	0	13	26	38	13	26	0	0	0	0	0	0	0	179	73
CADE	L	M	50	0	0	0	0	13	0	38	26	0	0	0	0	0	0	0	0	0	0	0	0	77	13
ARME	L	M	50	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
PILA	L	M	50	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	13	3
LIVE TOTALS			50	0	0	384	51	26	13	38	38	13	26	38	13	26	0	0	0	0	0	0	0	282	89
PSME	D	M	50	0	0	0	0	0	0	0	13	0	0	0	13	0	0	0	0	0	0	0	0	26	12
CADE	D	M	50	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID ORYD   PLOT 28   AREA ID OBR   ESTABLISHMENT DATE 770802

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 914   SLOPE (%) 50.   ASPECT 225

LANDFORM TCDDWV   HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.11803   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.1803

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	224	559	56	11	0	0	11	11	34	0	11	0	0	125	155	0	0	0	22	157	68
CADE	L	M	50	2	447	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	50	0	0	11	22	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	2
CACH	L	M	50	2	447	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	L	M	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	0	0	0	0	11	11	14
LIVE TOTALS			50	5	1118	648	78	22	11	0	11	11	34	0	11	0	0	125	155	125	0	0	34	212	84
PSME	D	M	50	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
ARME	D	M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID ORYO PLOT 29 AREA ID OBR ESTABLISHMENT DATE 770802

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 846 SLOPE (%) 50. ASPECT 205

LANDFORM BBDDSS HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.11803 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.1803

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	REPRO TALY	REPRO NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	34	45	112	101	78	11	0	0	0	0	0	0	0	0	0	0	0	380	53
LIVE TOTALS			50	0	0	0	34	45	112	101	78	11	0	0	0	0	0	0	0	0	0	0	0	380	53
PSME	D	M	50	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
ARME	D	M	50	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1

DECK ID TP56 1 STUDY ID ORYO PLOT 34 AREA ID OBR ESTABLISHMENT DATE 770805

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 899 SLOPE (%) 75. ASPECT 225

LANDFORM TTDDBS HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.25000 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.5000

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	REPRO TALY	REPRO NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	4	1000	12	37	62	150	51	50	25	0	12	0	12	0	0	0	0	0	0	0	400	65
CADE	L	M	50	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
LIVE TOTALS			50	4	1000	12	62	62	150	50	50	25	0	12	0	12	0	0	0	0	0	0	0	425	66
PSME	D	M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0

DECK ID TP56 1 STUDY ID DRYO PLOT 36 AREA ID DDET ESTABLISHMENT DATE 770815

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 701 SLOPE (%) 65. ASPECT 180

LANDFORM NMODSS HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.19269 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.9269

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	12	12	12	12	12	36	36	36	24	36	0	0	0	0	0	0	0	227	103
CADE	L	M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
ACMA	L	M	50	2	477	119	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1
LIVE TOTALS			50	2	477	119	48	12	12	12	12	36	36	36	24	36	0	0	0	0	0	0	0	262	104
PSME	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYO PLOT 42 AREA ID OMK ESTABLISHMENT DATE 770818

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 486 SLOPE (%) 80. ASPECT 190

LANDFORM BMODSS HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.28062 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.8062

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	115	77	115	51	115	0	0	0	13	0	0	0	185	0	0	0	0	13	384	73
ACMA	L	M	50	0	0	0	13	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	2
TSHE	L	M	50	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	0	0	128	90	115	64	115	0	0	0	13	0	0	0	185	0	0	0	0	13	410	75
PSME	D	M	50	0	0	26	64	13	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	90	4

DECK ID TP56 1   STUDY ID DRYD   PLOT   48   AREA ID OHJA   ESTABLISHMENT DATE 780613

PLOT TYPE HS   PLOT AREA (SQ M) 500.0   ELEVATION (M) 492   SLOPE (%) 49.   ASPECT 227

LANDFORM BCUDWB   HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.11360   PLOT SIZE CONVERSION FACTOR 20.00000   BOTH CONV. FACTORS COMBINED = 22.2720

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	89	134	67	67	67	0	22	0	0	0	0	0	0	0	0	0	0	0	356	31
CONU	L	M	50	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
PSME	L	W	50	1	223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	1	223	89	156	67	67	67	0	22	0	0	0	0	0	0	0	0	0	0	0	379	32
PSME	D	M	50	0	0	0	22	45	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	89	8
PSME	D	W	50	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT   58   AREA ID OHJA   ESTABLISHMENT DATE 790614

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 683   SLOPE (%) 74.   ASPECT 165

LANDFORM TMDDRS   HABITAT PMHDAC

SLOPE CORRECTION FACTOR 1.24403   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.4403

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	50	124	62	50	50	62	37	25	0	0	0	0	0	0	0	0	0	0	411	57
CADE	L	M	50	0	0	75	37	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2
ACMA	L	M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
TABR	L	M	50	1	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L	W	50	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
LIVE TOTALS			50	1	249	137	187	62	62	50	62	37	25	0	0	0	0	0	0	0	0	0	0	485	60
PSME	D	M	50	0	0	62	37	0	25	0	0	0	0	0	0	0	12	0	0	0	0	0	0	75	16

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR-ACER CIRCINATUM COMMUNITY TYPE

* * AVERAGE VALUES FOR 12 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	176.6	165.4	70.8	76.8	60.5	48.4	27.2	21.3	13.2	8.3	6.1	7.2	1.1	2.9	343.9	61.4	12
LIDE	L	M	37.3	7.2	6.2	1.1	1.0	3.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	1.3	6
ACMA	L	M	39.8	13.2	4.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	.2	4
ARME	L	M	0.0	3.0	3.9	.9	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	.2	3
CACH	L	M	37.3	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
CONU	L	M	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	.0	1
PILA	L	M	3.1	0.0	1.1	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	.9	4.2	1.8	4
QUGA	L	M	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	1
TABR	L	M	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PSME	L	W	18.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
TSHE	L	W	0.0	2.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	.0	2
LIVE TOTALS			333.2	197.4	90.0	78.8	63.6	51.6	30.4	22.4	13.2	8.3	6.1	7.2	1.1	3.9	376.6	65.1	
PSME	D	M	1.0	20.0	19.6	7.9	2.1	2.2	3.9	1.0	0.0	0.0	1.1	0.0	3.2	0.0	40.9	6.8	12
LIDE	D	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	.9	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	.1	2
PSME	D	W	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

PSEUDOTSUGA MENZIESII/HOLODISCUS DISCOLOR-ACER CIRCINATUM COMMUNITY TYPE

* * STANDARD ERRORS FOR 12 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	*----NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120 ----*	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	86.9	59.7	12.2	20.5	14.5	11.1	8.3	5.6	4.3	4.1	2.4	3.5	1.1	2.1	41.5	6.2	12
CADE	L	M	37.3	6.2	3.6	1.1	1.0	3.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	1.1	6
ACMA	L	M	39.8	10.2	2.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	.1	4
ARME	L	M	0.0	1.6	2.2	.9	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	.2	3
CACH	L	M	37.3	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
CONU	L	M	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	.0	1
PILA	L	M	2.2	0.0	1.1	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	.9	2.4	1.2	4
QUGA	L	M	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.0	1
TABR	L	M	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PSME	L	W	18.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
TSHE	L	W	0.0	1.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	.0	2
LIVE TOTALS			109.7	61.3	14.5	19.9	14.1	10.2	7.9	5.4	4.3	4.1	2.4	3.5	1.1	2.9	39.2	6.6	
PSME	D	M	1.0	8.4	6.2	3.8	2.1	1.5	2.2	1.0	0.0	0.0	1.1	0.0	2.3	0.0	11.4	2.7	12
CADE	D	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	.9	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	.0	2
PSME	D	W	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

DECK ID TP56 1   STUDY ID DRYD   PLOT 5   AREA ID DOAK   ESTABLISHMENT DATE 770713

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 564   SLOPE (%) 25.   ASPECT 210

LANDFORM BEDDSV   HABITAT PMBADI

SLOPE CORRECTION FACTOR 1.03078   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.3078

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	REPRO LT 137CM TALY	REPRO LT 137CM NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	0	0	0	0	52	103	93	93	82	62	0	10	0	0	0	0	0	0	0	0	0	495	77
CADE	L	M	0	0	0	21	31	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	2
LIVE TOTALS			0	0	0	21	82	124	93	93	82	62	0	10	0	0	0	0	0	0	0	0	0	546	78
PSME	D	M	0	0	0	0	31	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	2
CADE	D	M	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 13   AREA ID DRIG   ESTABLISHMENT DATE 770720

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 732   SLOPE (%) 36.   ASPECT 270

LANDFORM MEDDSC   HABITAT PMBADI

SLOPE CORRECTION FACTOR 1.06283   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.6283

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	REPRO LT 137CM TALY	REPRO LT 137CM NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	213	43	96	74	21	53	0	21	0	32	0	0	0	0	0	0	0	0	0	298	42
ACMA	L	M	50	3	638	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
PILA	L	M	50	1	213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	5	1063	43	106	74	21	53	0	21	0	32	0	0	0	0	0	0	0	0	0	308	42
PSME	D	M	50	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	11	9
PIPO	D	M	50	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	11	4

DECK ID TP56 1   STUDY ID DRYO   PLOT   14   AREA ID ORIG   ESTABLISHMENT DATE 770720

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 663   SLOPE (%) 24.   ASPECT 202

LANDFORM TCODSB   HABITAT PMBADI

SLOPE CORRECTION FACTOR 1.02840   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.2840

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	206	463	401	267	51	0	0	0	10	0	10	0	0	0	0	0	0	0	0	740	40
ARME	L	M	50	1	206	0	51	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	2
PILA	L	M	50	2	411	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PIPO	L	M	50	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	0	0	0	0	21	15
LIVE TOTALS			50	4	823	473	452	288	51	0	0	0	10	10	10	10	0	0	0	0	0	0	0	833	57
PSME	D	M	50	0	0	226	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	1
ARME	D	M	50	0	0	21	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103	2

DECK ID TP56 1   STUDY ID DRYO   PLOT   49   AREA ID GOAK   ESTABLISHMENT DATE 760627

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 610   SLOPE (%) 67.   ASPECT 254

LANDFORM TTCDSS   HABITAT PMBADI

SLOPE CORRECTION FACTOR 1.20370   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.0370

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	12	36	60	48	60	12	12	0	0	0	0	0	0	0	0	0	0	241	40
CADE	L	M	50	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
ACMA	L	M	50	0	0	36	60	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	3
PSME	L	W	50	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	3
LIVE TOTALS			50	0	0	48	84	60	60	48	72	12	12	0	0	0	0	0	0	0	0	0	0	349	45
PSME	D	M	50	0	0	0	24	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	2
ACMA	D	M	50	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 60 AREA ID DOAK ESTABLISHMENT DATE 790618

PLOT TYPE GS PLOT AREA (SQ M) 625.0 ELEVATION (M) 930 SLOPE (%) 50. ASPECT 230

LANDFORM TBDDBS HABITAT PMBADI

SLOPE CORRECTION FACTOR 1.11803 PLOT SIZE CONVERSION FACTOR 16.00000 BOTH CONV. FACTORS COMBINED = 17.8885

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	75	1	149	0	0	18	18	18	0	18	18	18	18	54	0	126	0	0	0	0	18	197	111
CADE	L	M	75	1	149	107	268	54	18	18	18	0	0	0	0	0	0	0	0	0	0	0	0	376	17
PSME	L	W	75	1	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			75	3	447	107	268	72	36	36	18	18	18	18	18	54	0	126	0	0	0	0	18	572	129

DECK ID TP56 1 STUDY ID DRYD PLOT 64 AREA ID DRIG ESTABLISHMENT DATE 790620

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 632 SLOPE (%) 34. ASPECT 204

LANDFORM MDDDSS HABITAT PMBADI

SLOPE CORRECTION FACTOR 1.05622 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 10.5622

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	211	665	95	11	53	11	11	21	11	32	0	21	0	0	0	0	0	0	0	264	63
ARME	L	M	50	0	0	21	53	21	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	3
PILA	L	M	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	1	211	687	148	32	63	11	11	21	11	32	0	21	0	0	0	0	0	0	0	349	66
PSME	D	M	50	0	0	74	11	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2
ARME	D	M	50	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
PILA	D	M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID ORYD PLOT 66 AREA ID OOAK ESTABLISHMENT DATE 790621

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 495 SLOPE (%) 32. ASPECT 248

LANDFORM BEDDVV HABITAT PMHADI

SLOPE CORRECTION FACTOR 1.04995 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 10.4995

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	210	189	0	0	0	0	0	21	10	10	10	21	31	150	0	0	0	0	10	115	95
CADE	L	M	50	2	420	241	105	21	21	10	0	0	0	0	0	0	0	140	0	0	0	0	10	168	24
ARME	L	M	50	0	0	199	31	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	2
CACH	L	M	50	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	3	630	651	136	31	21	10	0	21	10	10	10	21	31	150	140	0	0	0	21	325	121
PSME	D	M	50	0	0	21	0	0	0	0	0	21	0	10	10	0	10	0	0	0	0	0	0	52	31
CADE	D	M	50	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	D	M	50	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	D	M	50	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID ORYD PLOT 67 AREA ID ORIG ESTABLISHMENT DATE 790723

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 765 SLOPE (%) 22. ASPECT 240

LANDFORM MDDDSW HABITAT PMHADI

SLOPE CORRECTION FACTOR 1.02391 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 10.2391

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	75	0	0	225	41	31	10	31	31	20	20	41	41	0	0	134	0	0	0	0	10	276	99
ABGR	L	M	75	0	0	31	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	1
PILA	L	M	75	1	137	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			75	1	137	287	61	31	10	31	31	20	20	41	41	0	0	134	0	0	0	0	10	297	100
PSME	D	M	75	0	0	20	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	20	3

DECK ID TP5b 1 STUDY ID ORYD PLOT 69 AREA ID ORIG ESTABLISHMENT DATE 790724

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 977 SLOPE (%) 20. ASPECT 213

LANDFORM MDDDSV HABITAT PMHADI

SLOPE CORRECTION FACTOR 1.01980 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 10.1980

SPP ALPHA CODE	CODES L/D	CODES M/W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	75	2	272	1387	92	62	41	20	20	10	31	20	0	0	0	0	0	0	0	0	0	316	52
CADE	L	M	75	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1
ABGR	L	M	75	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PIPO	L	M	75	0	0	0	0	10	20	20	10	10	20	0	0	0	0	0	0	0	0	0	0	92	21
LIVE TOTALS			75	2	272	1407	92	102	61	41	31	20	51	20	0	0	0	0	0	0	0	0	0	418	73
PSME	D	M	75	0	0	143	51	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	3
PIPD	D	M	75	0	0	0	10	10	10	0	0	0	0	0	0	0	0	153	0	0	0	0	10	41	20

PSEUDOTSUGA MENZIESII/BERBERIS AQUIFOLIUM/DISPORUM COMMUNITY TYPE

** AVERAGE VALUES FOR 9 PLOTS. **

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	140.1	330.2	87.6	69.1	38.6	30.4	22.7	20.6	12.5	18.2	8.8	10.6	3.5	4.3	326.9	68.8	9
LIDE	L	M	63.2	43.5	46.3	11.7	4.3	3.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	68.6	4.9	5
ABGR	L	M	0.0	4.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	.1	2
ACMA	L	M	70.9	4.0	7.9	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	.3	2
ARME	L	M	22.9	24.5	15.1	5.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.1	.8	3
CACH	L	M	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	L	M	84.5	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	4
PIPO	L	M	0.0	0.0	0.0	1.1	2.3	2.3	1.1	1.1	2.3	1.1	0.0	1.1	0.0	0.0	12.5	3.9	2
PSME	L	W	16.6	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.3	2
LIVE TOTALS			398.0	413.7	159.0	90.4	46.4	35.9	27.2	21.8	14.7	19.3	8.8	11.8	3.5	5.5	444.2	79.1	
PSME	D	M	0.0	53.8	15.2	3.6	3.6	1.2	1.1	2.3	0.0	1.2	1.2	1.2	1.2	0.0	31.8	6.0	8
LIDE	D	M	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
ACMA	D	M	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	5.8	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	.3	3
CACH	D	M	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	D	M	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PIPO	D	M	0.0	0.0	1.1	1.1	1.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.1	5.7	2.7	2

PSEUDOTSUGA MENZIESII/BERBERIS AQUIFOLIUM/DISPORUM COMMUNITY TYPE

* * STANDARD ERRORS FOR 9 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
				---NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES---															
PSME	L	M	36.5	153.1	41.3	27.4	9.7	10.0	10.0	5.7	3.2	4.8	4.6	6.2	3.5	2.3	61.9	9.3	9
CADE	L	M	47.5	27.3	30.0	6.0	2.9	2.2	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	42.5	3.0	5
ABGR	L	M	0.0	3.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	.1	2
ACMA	L	M	70.9	4.0	6.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	.3	2
ARME	L	M	22.9	22.0	7.8	3.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	.4	3
CACH	L	M	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	L	M	46.4	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	4
PIPO	L	M	0.0	0.0	0.0	1.1	2.3	2.3	1.1	1.1	2.3	1.1	0.0	1.1	0.0	0.0	10.2	2.7	2
PSME	L	W	16.6	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.3	2
LIVE TOTALS			124.4	151.7	42.0	26.9	8.8	9.4	10.3	5.5	5.1	4.4	4.6	6.0	3.5	2.9	59.1	10.5	
PSME	D	M	0.0	26.8	6.0	1.6	1.8	1.2	1.1	2.3	0.0	1.2	1.2	1.2	1.2	3.0	7.2	3.3	8
CADE	D	M	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
ACMA	D	M	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	3.1	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	.2	3
CACH	D	M	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PILA	D	M	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PIPO	D	M	0.0	0.0	1.1	1.1	1.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.1	4.5	2.3	2

DECK ID TP56 1   STUDY ID DRYD   PLOT   11   AREA ID DRIG   ESTABLISHMENT DATE 770719

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 1113   SLOPE (%) 43.   ASPECT 225

LANDFORM MEDOVV   HABITAT   LDWM

SLOPE CORRECTION FACTOR 1.08853   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.8853

SPP ALPHA CODE	CODES L + D	M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*						NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	261	272	239	44	11	0	0	11	0	0	0	0	0	0	0	0	0	0	577	29
CADE	L	M	50	1	218	566	44	22	11	11	22	11	11	11	0	0	0	0	0	0	0	0	0	142	27
ABGR	L	M	50	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	50	1	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	L	M	50	1	218	0	11	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	22	8
PIPO	L	M	50	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	11	8
LIVE TOTALS			50	3	653	903	327	261	54	22	22	11	22	11	22	0	0	0	0	0	0	0	0	751	72
PSME	D	M	50	0	0	98	11	0	11	0	11	11	0	0	0	0	0	0	0	0	0	0	0	44	8
CADE	D	M	50	0	0	87	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
PIPO	D	M	50	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	11	9

DECK ID TP56 1   STUDY ID DRYD   PLOT   12   AREA ID DOAK   ESTABLISHMENT DATE 770720

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 777   SLOPE (%) 70.   ASPECT 247

LANDFORM MMDDSC   HABITAT   LDWM

SLOPE CORRECTION FACTOR 1.22066   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.2066

SPP ALPHA CODE	CODES L + D	M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*						NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	244	0	0	0	37	12	12	24	12	24	0	0	12	0	0	0	0	0	0	134	49
CADE	L	M	50	0	0	122	61	0	24	0	12	0	12	0	12	0	0	0	0	0	0	0	0	122	21
LIVE TOTALS			50	1	244	122	61	0	61	12	24	24	24	24	12	0	12	0	0	0	0	0	0	256	70
PSME	D	M	50	0	0	0	0	0	0	12	0	12	0	0	0	0	0	0	0	0	0	0	0	24	6
CADE	D	M	50	0	0	24	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0

DECK ID TP56 1   STUDY ID DRYO   PLOT   45   AREA ID OBR   ESTABLISHMENT DATE 770831

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 930   SLOPE (%) 72.   ASPECT 240

LANDFORM TTDDSS   HABITAT   LDWH

SLOPE CORRECTION FACTOR 1.23223   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.3223

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	12	12	12	12	12	0	25	12	12	12	12	0	0	0	0	0	0	0	123	44
CADE	L	M	50	1	246	49	49	86	49	0	12	25	12	0	0	0	0	0	0	0	0	0	0	234	27
LIVE TOTALS			50	1	246	62	62	99	62	12	12	49	25	12	12	12	0	0	0	0	0	0	0	357	71
CADE	D	M	50	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1

DECK ID TP56 1   STUDY ID DRYO   PLOT   46   AREA ID OBR   ESTABLISHMENT DATE 770831

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 869   SLOPE (%) 65.   ASPECT 170

LANDFORM NTDDRR   HABITAT   LDWH

SLOPE CORRECTION FACTOR 1.19269   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.9269

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	239	0	0	36	48	72	95	12	36	0	0	0	0	0	0	0	0	0	0	298	61
CADE	L	M	50	4	954	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
LIVE TOTALS			50	5	1193	12	0	48	48	72	95	12	36	0	0	0	0	0	0	0	0	0	0	310	61
PSME	D	M	50	0	0	0	0	12	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	3
CADE	D	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PILA	D	M	50	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12	2

DECK ID TP56 1 STUDY ID DRYO PLOT 58 AREA ID DOAK ESTABLISHMENT DATE 780713

PLOT TYPE HS PLOT AREA (SQ M) 500.0 ELEVATION (M) 957 SLOPE (%) 30. ASPECT 165

LANDFORM BGJDSS HABITAT LDWM

SLOPE CORRECTION FACTOR 1.04403 PLOT SIZE CONVERSION FACTOR 20.00000 BOTH CONV. FACTORS COMBINED = 20.8806

SPP ALPHA CODE	CODES L M + + D W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	2	418	0	0	0	0	21	63	21	42	21	42	21	0	0	0	0	0	0	0	230	104
CADE	L M	50	0	0	21	919	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1128	29
LIVE TOTALS		50	2	418	21	919	209	0	21	63	21	42	21	42	21	0	0	0	0	0	0	0	1357	132
PSME	D M	50	0	0	0	0	0	42	21	0	0	0	0	0	0	0	0	0	0	0	0	0	63	7
CADE	D M	50	0	0	0	251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251	5

DECK ID TP56 1 STUDY ID DRYO PLOT 59 AREA ID DOAK ESTABLISHMENT DATE 790618

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 910 SLOPE (%) 46. ASPECT 205

LANDFORM TTDDWV HABITAT LDWM

SLOPE CORRECTION FACTOR 1.10923 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.0923

SPP ALPHA CODE	CODES L M + + D W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	2	444	11	0	11	33	0	0	0	0	0	44	0	22	130	0	0	0	0	11	122	73
CADE	L M	50	0	0	155	22	44	22	33	22	11	11	0	0	0	0	0	0	0	0	0	0	166	25
LIVE TOTALS		50	2	444	166	22	55	55	33	22	11	11	0	44	0	22	130	0	0	0	0	11	288	98
PSME	D M	50	0	0	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	22	3
CADE	D M	50	0	0	22	0	11	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	33	4

DECK ID TP56 1 STUDY ID DRYG PLOT 61 AREA ID OUAK ESTABLISHMENT DATE 790618

PLOT TYPE GS PLOT AREA (SQ M) 625.0 ELEVATION (M) 930 SLOPE (%) 60. ASPECT 200

LANDFORM TTCDSV HABITAT LOWM

SLOPE CORRECTION FACTOR 1.16619 PLOT SIZE CONVERSION FACTOR 16.00000 BOTH CONV. FACTORS COMBINED = 18.6590

SPP ALPHA CODE	CODES L M + + D W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	75	0	0	19	75	37	37	19	0	19	0	19	0	0	0	130	0	0	0	0	19	224	52
CADE	L M	75	1	155	317	187	56	19	19	19	37	19	0	0	0	0	0	0	0	0	0	0	355	38
ACMA	L M	75	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	4
LIVE TOTALS		75	1	155	336	261	93	93	37	19	56	19	19	0	0	0	130	0	0	0	0	19	616	93

LIBOCEDRUS DECURRENS/WHIPPLEA MODESTA COMMUNITY TYPE

** AVERAGE VALUES FOR 7 PLOTS. **

SPP ALPHA CODE	CODES L M + + D W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L M	192.0	43.3	51.3	48.0	30.1	20.9	24.3	14.4	16.1	10.9	14.1	4.7	4.9	4.3	244.0	58.8	7
LIDE	L M	224.8	177.5	183.1	61.3	17.9	9.0	12.4	12.0	9.3	1.6	1.7	0.0	0.0	0.0	308.3	23.9	7
ABGR	L M	0.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L M	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	.5	1
ARME	L M	31.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PILA	L M	31.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.1	1.1	1
PIPO	L M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6	1.1	1
LIVE TOTALS		479.0	231.7	235.9	109.3	53.4	29.9	36.8	26.4	25.4	12.5	18.9	4.7	4.9	4.3	562.3	85.5	
PSME	D M	0.0	14.0	1.6	1.7	12.5	6.3	1.6	3.3	0.0	0.0	0.0	0.0	0.0	0.0	26.9	3.9	5
LIDE	D M	0.0	24.3	42.6	1.6	1.6	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.4	1.5	6
PILA	D M	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.3	1
PIPO	D M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	1.3	1

LIBOCEDRUS DECURRENS/WHIPPLEA MODESTA COMMUNITY TYPE

* * STANDARD ERRORS FOR 7 PLOTS. * *

SPP ALPHA CODE	CODES L + D	M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	74.0	36.4	38.2	32.4	6.6	8.8	14.7	4.0	6.2	4.1	7.7	3.2	3.4	2.9	60.9	9.1	7
CADE	L	M	128.1	76.0	124.7	26.9	6.4	4.9	3.6	5.4	2.6	1.6	1.7	0.0	0.0	0.0	142.2	4.3	7
ABGR	L	M	0.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	.5	1
ARME	L	M	31.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
PILA	L	M	31.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.1	1.1	1
PIPO	L	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6	1.1	1
LIVE TOTALS			134.4	119.5	123.2	35.2	10.5	7.6	11.6	7.1	3.9	3.7	6.9	3.2	3.4	2.9	150.0	9.3	
PSME	D	M	0.0	14.0	1.6	1.7	5.9	3.2	1.6	2.1	0.0	0.0	0.0	0.0	0.0	0.0	8.6	1.3	5
CADE	D	M	0.0	11.2	34.8	1.6	1.6	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.2	.8	6
PILA	D	M	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.3	1
PIPO	D	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	1.3	1

DECK ID TP56 1   STUDY ID ORYO   PLOT 3   AREA ID OMKU   ESTABLISHMENT DATE 770630

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 853   SLOPE (%) 69.   ASPECT 108

LANDFORM MMODWV   HABITAT LOCU

SLOPE CORRECTION FACTOR 1.21495   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.1495

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	1000	5	61	12	36	30	24	24	49	49	0	24	12	0	0	0	0	0	0	0	0	255	59
CADE	L	M	1000	88	1069	900	61	24	49	49	0	0	0	0	12	0	0	0	0	0	0	0	0	194	27
LIVE TOTALS			1000	93	1130	972	97	61	73	73	49	49	0	24	24	0	0	0	0	0	0	0	0	450	87
PSME	D	M	1000	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	24	2
CADE	D	M	1000	3	36	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID ORYO   PLOT 32   AREA ID OMKU   ESTABLISHMENT DATE 770804

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 884   SLOPE (%) 68.   ASPECT 205

LANDFORM MMODVS   HABITAT LOCU

SLOPE CORRECTION FACTOR 1.20930   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.0930

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	24	36	24	24	0	36	0	24	36	12	0	135	0	0	0	0	12	230	88
CADE	L	M	50	1	242	726	48	48	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	109	17
LIVE TOTALS			50	1	242	726	73	85	24	24	0	36	0	24	36	24	0	135	0	0	0	0	12	339	105
PSME	D	M	50	0	0	0	0	0	0	0	12	0	0	0	0	0	12	0	0	0	0	0	0	24	15
CADE	D	M	50	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 47 AREA ID OMKU ESTABLISHMENT DATE 770921

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 792 SLOPE (%) 37. ASPECT 267

LANDFORM TCDDSV HABITAT LOCU

SLOPE CORRECTION FACTOR 1.06626 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 10.6626

SPP ALPHA CODE	CODES L/D M/W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	50	2	427	480	160	32	11	11	0	0	0	0	0	0	11	145	0	0	0	0	11	235	38
CADE	L M	50	5	1066	544	235	21	11	0	0	0	0	0	0	0	11	125	135	0	0	0	21	299	48
ABPR	L M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	L M	50	0	0	0	11	64	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	96	7
LIVE TOTALS		50	7	1493	1034	405	117	32	11	11	0	0	0	0	0	21	145	125	135	0	0	32	629	94
PSME	D M	50	0	0	458	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	2
CADE	D M	50	0	0	490	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	3
CACH	D M	50	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0

DECK ID TP56 1 STUDY ID DRYD PLOT 71 AREA ID OMKU ESTABLISHMENT DATE 790823

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 740 SLOPE (%) 80. ASPECT 205

LANDFORM MTDDVB HABITAT LOCU

SLOPE CORRECTION FACTOR 1.28062 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.8062

SPP ALPHA CODE	CODES L/D M/W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L M	100	0	0	128	38	13	13	0	13	0	38	26	0	0	0	143	0	0	0	0	13	154	58
CADE	L M	100	7	896	666	166	77	51	0	0	0	13	0	0	0	0	0	0	0	0	0	0	307	21
ACMA	L M	100	0	0	0	26	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	2
ARME	L M	100	0	0	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L W	100	0	0	26	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
THPL	L W	100	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS		100	7	896	896	243	115	64	0	13	0	51	26	0	0	0	143	0	0	0	0	13	525	81
PSME	D W	100	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	13	9

DECK ID TP56 1 STUDY ID DRYD PLOT 73 AREA ID OMKU ESTABLISHMENT DATE 790830

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 853 SLOPE (%) 46. ASPECT 138

LANDFORM TRDDWV HABITAT LOCO

SLOPE CORRECTION FACTOR 1.10073 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.0073

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	100	2	220	110	33	55	77	44	33	22	22	0	33	11	0	0	0	0	0	0	0	330	77
CADE	L	M	100	24	2642	330	209	77	44	11	44	11	11	0	0	0	0	0	0	0	0	0	0	407	35
LIVE TOTALS			100	26	2862	440	242	132	121	55	77	33	33	0	33	11	0	0	0	0	0	0	0	737	111
PSME	D	M	100	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
CADE	D	M	100	0	0	132	33	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	2

LIBOCEDRUS DECURRENS/CHIMAPHILA UMBELLATA COMMUNITY TYPE

* * AVERAGE VALUES FOR 5 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	141.5	146.0	58.4	34.5	29.8	20.6	18.9	21.4	12.1	14.8	16.3	4.6	2.1	7.1	240.7	64.1	5
LIDE	L	M	1183.1	645.1	143.9	49.6	30.9	11.9	8.8	2.2	4.8	0.0	2.4	2.4	2.1	4.3	263.3	29.5	5
ABPR	L	M	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	0.0	0.0	5.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	.4	1
ARME	L	M	0.0	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	1
CACH	L	M	0.0	0.0	2.1	12.8	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	1.4	1
TSHE	L	W	0.0	5.1	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	1
THPL	L	W	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
LIVE TOTALS			1324.6	813.7	212.1	102.0	62.8	32.6	29.8	23.6	16.8	14.8	18.7	7.0	4.3	11.4	536.0	95.5	
PSME	D	M	0.0	91.7	13.2	0.0	0.0	2.4	2.4	0.0	0.0	0.0	0.0	0.0	2.4	0.0	20.5	4.1	4
LIDE	D	M	7.3	148.8	15.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	1.0	4
CACH	D	M	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	.0	1
PSME	D	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.6	1.8	1

LIBOCEDRUS DECURRENS/CHIMAPHILA UMBELLATA COMMUNITY TYPE

* * STANDARD ERRORS FOR 5 PLOTS. * *

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	81.8	87.3	25.5	6.7	12.1	7.4	9.6	9.7	7.8	6.1	7.8	2.8	2.1	2.9	28.2	8.5	5
CADE	L	M	395.1	103.8	38.1	12.1	10.6	9.4	8.8	2.2	2.9	0.0	2.4	2.4	2.1	4.3	51.2	5.6	5
ABPR	L	M	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	L	M	0.0	0.0	5.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	.4	1
ARME	L	M	0.0	12.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	1
CACH	L	M	0.0	0.0	2.1	12.8	2.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	1.4	1
TSHE	L	W	0.0	5.1	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	1
THPL	L	W	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
LIVE TOTALS			435.0	106.7	59.3	12.9	17.2	13.7	14.4	10.0	10.7	6.1	7.9	4.8	4.3	5.9	69.2	5.5	
PSME	D	M	0.0	91.7	6.2	0.0	0.0	2.4	2.4	0.0	0.0	0.0	0.0	0.0	2.4	0.0	5.4	2.9	4
CADE	D	M	7.3	88.7	9.4	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	.5	4
CACH	D	M	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	.0	1
PSME	D	W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.6	1.8	1

* * * * * AVERAGE VALUES FOR 56 PLOTS. * * * * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	243.6	203.0	84.2	63.4	48.0	41.6	25.6	17.6	13.6	10.6	6.7	6.2	2.4	2.7	324.5	59.5	56
CADE	L	M	186.3	101.8	52.6	18.2	9.1	6.3	4.0	2.8	2.3	.4	.4	.2	.4	.6	97.4	9.1	39
TSHE	L	M	0.0	.2	.2	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.0	1
ABGR	L	M	0.0	4.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	.0	9
ABPR	L	M	0.0	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
ACMA	L	M	23.8	7.6	5.2	2.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	.4	16
ARME	L	M	7.6	7.7	4.8	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	.4	17
CACH	L	M	10.8	2.2	.6	1.6	.2	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.2	6
CONU	L	M	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.0	1
PILA	L	M	26.6	2.7	1.0	0.0	0.0	.2	.2	.7	0.0	.4	.2	0.0	0.0	.2	3.0	1.0	18
PIPO	L	M	0.0	.6	.2	.2	.4	.4	.2	.2	.4	.4	.2	.2	.2	0.0	2.8	1.1	4
PRUNU	L	M	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	2.9	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	.1	4
SALIX	L	M	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	4.4	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
PSME	L	W	6.6	0.0	0.0	.7	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.1	5
CADE	L	W	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	3.5	.5	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.0	6
THPL	L	W	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
LIVE TOTALS			509.7	336.5	153.7	89.9	59.9	48.5	30.7	21.2	16.3	11.8	9.5	6.6	3.0	3.5	454.6	71.9	
PSME	D	M	.2	38.8	13.9	3.3	3.5	2.3	2.5	2.1	1.1	.4	1.3	.4	1.3	0.0	32.1	5.9	52
CADE	D	M	.7	20.4	6.9	.4	.2	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	.3	18
ACMA	D	M	0.0	1.0	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	.0	4
ARME	D	M	0.0	1.5	2.2	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	.1	7
CACH	D	M	0.0	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	.0	5
PILA	D	M	0.0	.2	0.0	0.0	.2	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.1	3
PIPO	D	M	0.0	.2	.2	.2	.2	0.0	0.0	.2	0.0	0.0	0.0	.2	0.0	.2	1.1	.6	4
QUGA	D	M	0.0	.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.0	2
PSME	D	W	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	0.0	0.0	.2	.2	2
TSHE	D	W	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

* * * * * STANDARD ERRORS FOR 56 PLOTS. * * * * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	*----NUMBER OF TREES/HA BY 10 CM CBH SIZE CLASSES----* 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	45.4	38.7	12.9	8.7	5.3	6.1	3.8	2.4	2.0	1.7	1.8	1.4	.9	.8	20.2	2.8	56
CADE	L	M	58.5	27.8	17.9	4.6	2.1	1.6	1.2	.9	.7	.3	.3	.2	.3	.4	23.8	1.7	39
TSHE	L	M	0.0	.2	.2	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.0	1
ABGR	L	M	0.0	1.8	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	.0	9
ABPR	L	M	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
ACMA	L	M	14.5	3.1	1.7	1.0	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	.1	16
ARME	L	M	5.3	3.8	1.9	.8	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	.1	17
CACH	L	M	8.4	1.5	.4	1.2	.2	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	.1	6
CONU	L	M	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.0	1
PILA	L	M	10.7	1.3	.5	0.0	0.0	.2	.2	.4	0.0	.3	.2	0.0	0.0	.2	.9	.4	18
PIPO	L	M	0.0	.6	.2	.2	.4	.4	.2	.2	.4	.3	.2	.2	.2	0.0	1.8	.6	4
PRUNU	L	M	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
QUGA	L	M	0.0	0.0	2.3	.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	.1	4
SALIX	L	M	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TABR	L	M	4.4	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	2
PSME	L	W	4.7	0.0	0.0	.5	0.0	0.0	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	.1	5
CADE	L	W	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
TSHE	L	W	0.0	1.6	.3	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	.0	6
THPL	L	W	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
LIVE TOTALS			72.7	48.5	20.9	8.7	5.2	5.8	3.8	2.5	2.2	1.7	1.8	1.5	.9	1.1	26.5	3.1	
PSME	D	M	.2	10.0	2.7	1.0	1.1	.8	.8	.8	.5	.3	.5	.3	.6	0.0	4.2	1.1	52
CADE	D	M	.7	9.3	4.6	.3	.2	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	.1	18
ACMA	D	M	0.0	.6	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	.0	4
ARME	D	M	0.0	.7	1.9	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	.0	7
CACH	D	M	0.0	.7	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	5
PILA	D	M	0.0	.2	0.0	0.0	.2	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	.0	3
PIPO	D	M	0.0	.2	.2	.2	.2	0.0	0.0	.2	0.0	0.0	0.0	.2	0.0	.2	.8	.4	4
QUGA	D	M	0.0	.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	.0	2
PSME	D	W	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	0.0	0.0	.2	.2	2
TSHE	D	W	0.0	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

DECK ID TP56 1 STUDY ID DRYD PLOT 6 AREA ID DOAK ESTABLISHMENT DATE 770714

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 1021 SLOPE (%) 62. ASPECT 180

LANDFORM ITDDSV HABITAT TAACBN

SLOPE CORRECTION FACTOR 1.17661 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.7661

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	2	471	0	59	106	94	35	35	35	24	12	0	0	0	155	0	0	0	0	12	412	81
TSHE	L	M	50	0	0	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACMA	L	M	50	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	2	471	82	59	106	94	35	35	35	24	12	0	0	0	155	0	0	0	0	12	412	81
PSME	D	M	50	0	0	24	35	35	12	0	0	0	0	0	0	0	0	125	0	0	0	0	12	94	18
TSHE	D	M	50	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID DRYD PLOT 19 AREA ID ODET ESTABLISHMENT DATE 770725

PLOT TYPE MS PLOT AREA (SQ M) 500.0 ELEVATION (M) 1249 SLOPE (%) 43. ASPECT 225

LANDFORM MEDDVC HABITAT THCC

SLOPE CORRECTION FACTOR 1.08853 PLOT SIZE CONVERSION FACTOR 20.00000 BOTH CONV. FACTORS COMBINED = 21.7706

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	0	44	22	44	44	0	0	0	0	0	0	0	0	0	0	0	0	152	22
TSHE	L	M	50	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACGL	L	M	50	0	0	87	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	2
CACH	L	M	50	8	1742	348	218	218	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	501	23
PRUNU	L	M	50	0	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	1
LIVE TOTALS			50	8	1742	457	327	261	87	44	44	0	0	0	0	0	0	0	0	0	0	0	0	762	48
PSME	D	M	50	0	0	0	0	0	0	22	0	0	44	0	0	22	44	0	0	0	0	0	0	131	87
CACH	D	M	50	0	0	65	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	2

DECK ID TP56 1   STUDY ID ORYD   PLOT   20   AREA ID ODET   ESTABLISHMENT DATE 770726

PLOT TYPE HS   PLOT AREA (SQ M)   500.0   ELEVATION (M)   884   SLOPE (%)   8.   ASPECT 247

LANDFORM TRODVS   HABITAT THRNGS

SLOPE CORRECTION FACTOR 1.00319   PLOT SIZE CONVERSION FACTOR 20.00000   BOTH CONV. FACTORS COMBINED = 20.0639

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	0	0	0	20	40	0	60	20	0	0	0	0	0	0	0	0	0	140	51
TSHE	L	M	50	6	1204	301	120	80	0	80	40	0	0	0	0	0	0	0	0	0	0	0	0	321	30
ABAM	L	M	50	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2
CACH	L	M	50	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
LIVE TOTALS			50	6	1204	321	140	80	20	100	80	0	60	20	0	0	0	0	0	0	0	0	0	502	84
PSME	D	M	50	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	20	5
PILA	D	M	50	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2

DECK ID TP56 1   STUDY ID ORYD   PLOT   21   AREA ID ODET   ESTABLISHMENT DATE 770727

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M)   815   SLOPE (%)   57.   ASPECT 180

LANDFORM TTODVS   HABITAT   THCC

SLOPE CORRECTION FACTOR 1.15104   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.5104

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	23	150	173	115	81	46	0	0	0	0	0	0	158	0	0	0	0	12	576	70
TSHE	L	M	50	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	L	M	50	0	0	12	104	23	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	150	6
LIVE TOTALS			50	0	0	69	253	196	127	92	46	0	0	0	0	0	0	158	0	0	0	0	12	725	76
PSME	D	M	50	0	0	127	58	0	0	0	0	0	12	0	0	0	12	0	0	0	0	0	0	81	19
CACH	D	M	50	0	0	23	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	1

DECK ID TP56 1   STUDY ID DRYO   PLOT 22   AREA ID ODET   ESTABLISHMENT DATE 770727

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 853   SLOPE (%) 65.   ASPECT 200

LANDFORM MMODSS   HABITAT THPM

SLOPE CORRECTION FACTOR 1.19269   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.9269

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	12	12	24	48	36	72	48	12	12	24	12	0	145	0	0	0	0	12	310	104
LIVE TOTALS			50	0	0	12	12	24	48	36	72	48	12	12	24	12	0	145	0	0	0	0	12	310	104
PSME	D	M	50	0	0	0	12	0	24	0	0	0	0	0	12	0	0	0	0	0	0	0	0	48	11

DECK ID TP56 1   STUDY ID DRYO   PLOT 23   AREA ID ODET   ESTABLISHMENT DATE 770728

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 1082   SLOPE (%) 67.   ASPECT 200

LANDFORM MMODVV   HABITAT THACPM

SLOPE CORRECTION FACTOR 1.20370   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.0370

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	0	0	0	12	60	12	48	12	24	60	12	12	0	0	0	0	0	0	253	115
CADE	L	M	50	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
TSHE	L	M	50	0	0	72	12	24	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	60	6
ACMA	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TABR	L	M	50	1	241	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	1	241	108	12	24	36	60	24	48	12	24	60	12	12	0	0	0	0	0	0	325	122
PSME	D	M	50	0	0	0	0	12	12	24	12	0	0	0	0	0	0	0	0	0	0	0	0	60	9

DECK ID TP56 1 STUDY ID ORYD PLOT 25 AREA ID ODET ESTABLISHMENT DATE 770728

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 594 SLOPE (%) 62. ASPECT 225

LANDFORM MMDDSS HABITAT THCC

SLOPE CORRECTION FACTOR 1.17661 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.7661

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO SAMP AREA (M2)	LT 137CM TALY	LT 137CM NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	165	141	106	235	35	0	0	0	0	0	0	0	0	0	0	0	0	0	518	38
TSHE	L	M	50	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	L	M	50	0	0	412	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	3
LIVE TOTALS			50	0	0	600	235	106	235	35	0	0	0	0	0	0	0	0	0	0	0	0	0	612	41
PSME	D	M	50	0	0	71	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	24	3
CACH	D	M	50	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1 STUDY ID ORYD PLOT 26 AREA ID ODET ESTABLISHMENT DATE 770728

PLOT TYPE MS PLOT AREA (SQ M) 500.0 ELEVATION (M) 701 SLOPE (%) 72. ASPECT 225

LANDFORM MTDDSS HABITAT THRMGS

SLOPE CORRECTION FACTOR 1.23223 PLOT SIZE CONVERSION FACTOR 20.00000 BOTH CONV. FACTORS COMBINED = 24.6447

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO SAMP AREA (M2)	LT 137CM TALY	LT 137CM NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	271	444	345	222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1010	49
TSHE	L	M	50	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARME	L	M	50	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
CACH	L	M	50	0	0	123	148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148	3
TSHE	L	W	50	1	246	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	1	246	419	616	345	222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1183	53
PSME	D	M	50	0	0	197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ARME	D	M	50	0	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	D	M	50	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1

DECK ID TP56 1   STUDY ID DRYD   PLOT 31   AREA ID DMKU   ESTABLISHMENT DATE 770804

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 838   SLOPE (%) 36.   ASPECT 225

LANDFORM MCDDVS   HABITAT PMTHCC

SLOPE CORRECTION FACTOR 1.06977   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 10.6977

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	32	0	21	0	21	0	0	11	11	53	32	32	125	135	0	0	0	21	233	143
CADE	L	M	50	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
ABGR	L	M	50	1	214	75	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
ABPR	L	M	50	1	214	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	L	M	50	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
LIVE TOTALS			50	2	428	118	11	43	0	21	0	0	11	11	53	32	32	125	135	0	0	0	21	235	145
PSME	D	M	50	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
ABGR	D	M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 33   AREA ID DBR   ESTABLISHMENT DATE 770805

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 1082   SLOPE (%) 75.   ASPECT 112

LANDFORM MMDDBS   HABITAT TAACBN

SLOPE CORRECTION FACTOR 1.25000   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 12.5000

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	1	250	0	0	12	37	25	12	0	25	37	12	12	0	0	0	0	0	0	0	175	64
TSHE	L	M	50	1	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSME	L	W	50	1	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L	W	50	1	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVE TOTALS			50	4	1000	0	0	12	37	25	12	0	25	37	12	12	0	0	0	0	0	0	0	175	64
PSME	D	M	50	0	0	0	0	12	0	12	0	0	0	0	0	12	0	0	0	0	0	0	0	37	13

DECK ID TP56 1 STUDY ID DRYD PLOT 37 AREA ID DDET ESTABLISHMENT DATE 770816

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 792 SLOPE (%) 67. ASPECT 225

LANDFORM MMDDVS HABITAT THRMGS

SLOPE CORRECTION FACTOR 1.20370 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 12.0370

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	12	24	84	36	60	120	48	12	0	0	0	0	0	0	0	0	0	0	385	68
TSHE	L	M	50	0	0	72	48	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	2
CACH	L	M	50	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
PILA	L	M	50	0	0	12	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1
LIVE TOTALS			50	0	0	96	108	96	36	60	120	48	12	0	0	0	0	0	0	0	0	0	0	481	71
PSME	D	M	50	0	0	36	12	24	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	48	4

DECK ID TP56 1 STUDY ID DRYD PLOT 39 AREA ID DDET ESTABLISHMENT DATE 770817

PLOT TYPE FS PLOT AREA (SQ M) 1000.0 ELEVATION (M) 686 SLOPE (%) 48. ASPECT 240

LANDFORM MEDDSS HABITAT THRMBN

SLOPE CORRECTION FACTOR 1.10923 PLOT SIZE CONVERSION FACTOR 10.00000 BOTH CONV. FACTORS COMBINED = 11.0923

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	*-----NUM STEMS/HA BY 10CM DBH SIZE CLASSES------* 0.1-10	20	30	40	50	60	70	80	90	100	110	120	*--TREES GT 120CM DBH--* *--MEASURED DIAMS--*					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	166	55	0	0	0	11	22	0	22	22	0	0	0	0	0	0	0	0	133	40
TSHE	L	M	50	1	222	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACMA	L	M	50	0	0	11	22	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	1
THPL	L	M	50	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PSME	L	W	50	0	0	177	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
TSHE	L	W	50	0	0	78	44	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	2
ACMA	L	W	50	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
LIVE TOTALS			50	1	222	477	144	22	0	0	11	22	0	22	22	0	0	0	0	0	0	0	0	244	44
PSME	D	M	50	0	0	55	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	11	4
ACMA	D	M	50	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	D	M	50	0	0	11	33	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	1
PSME	D	W	50	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECK ID TP56 1   STUDY ID DRYD   PLOT 43   AREA ID DDET   ESTABLISHMENT DATE 770822

PLOT TYPE FS   PLOT AREA (SQ M) 1000.0   ELEVATION (M) 869   SLOPE (%) 65.   ASPECT 172

LANDFORM TBADBS   HABITAT PMTHCC

SLOPE CORRECTION FACTOR 1.19269   PLOT SIZE CONVERSION FACTOR 10.00000   BOTH CONV. FACTORS COMBINED = 11.9269

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	143	36	83	72	24	0	0	0	0	0	0	12	135	0	0	0	0	12	239	46
CADE	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L	M	50	1	239	48	36	0	12	35	12	0	0	0	0	0	0	0	0	0	0	0	0	95	11
ACMA	L	M	50	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CACH	L	M	50	0	0	36	48	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	2
TABR	L	M	50	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
TSHE	L	W	50	3	716	167	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	1
LIVE TOTALS			50	4	954	417	131	119	83	60	12	0	0	0	0	0	12	135	0	0	0	0	12	429	60
PSME	D	M	50	0	0	119	36	24	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	83	23
CACH	D	M	50	0	0	24	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	1

DECK ID TP56 1   STUDY ID DRYD   PLOT 44   AREA ID DOAK   ESTABLISHMENT DATE 770822

PLOT TYPE HS   PLOT AREA (SQ M) 500.0   ELEVATION (M) 640   SLOPE (%) 75.   ASPECT 315

LANDFORM MBDDSS   HABITAT PMTHCC

SLOPE CORRECTION FACTOR 1.25000   PLOT SIZE CONVERSION FACTOR 20.00000   BOTH CONV. FACTORS COMBINED = 25.0000

SPP ALPHA CODE	CODES L+D	CODES M+W	REPRO LT 137CM SAMP AREA (M2)	TALY	NUM /HA	NUM STEMS/HA BY 10CM DBH SIZE CLASSES 0.1-10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM DBH MEASURED DIAMS					NUM /HA	TOTAL STEMS GT10CM /HA	TOTAL BASAL AREA M2/HA
PSME	L	M	50	0	0	275	100	100	75	75	25	50	0	25	25	0	0	0	0	0	0	0	0	475	82
CADE	L	M	50	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TSHE	L	M	50	0	0	75	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1
ACMA	L	M	50	0	0	75	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	1
LIVE TOTALS			50	0	0	450	175	100	75	75	25	50	0	25	25	0	0	0	0	0	0	0	0	550	84
PSME	D	M	50	0	0	75	75	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3

TSUGA HETEROPHYLLA CLIMAX OR COCLIMAX SITES

AVERAGE VALUES FOR 14 PLOTS.

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES: 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	51.5	78.5	72.9	78.5	69.1	36.9	29.8	18.0	11.1	11.7	14.1	4.9	4.0	4.9	355.8	69.5	14
LIDE	L	M	0.0	2.6	0.0	.8	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	.1	4
TSHE	L	M	136.7	53.0	17.2	8.3	1.7	8.3	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.1	3.6	12
ABAM	L	M	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	.1	1
ABGR	L	M	15.3	5.3	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	1
ABPR	L	M	15.3	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACGL	L	M	0.0	6.2	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	.1	1
ACMA	L	M	0.0	9.5	5.2	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	.2	5
ARME	L	M	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	.0	1
CACH	L	M	124.4	67.9	45.9	18.8	5.5	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.1	2.8	8
PILA	L	M	0.0	.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.0	1
PRUNU	L	M	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	.1	1
TABR	L	M	17.2	1.7	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	.1	2
THPL	L	M	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	17.9	12.7	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.1	2
TSHE	L	W	86.6	17.5	4.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	.2	4
ACMA	L	W	0.0	.8	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	1
LIVE TOTALS			464.8	259.1	158.6	109.6	78.6	46.0	34.4	18.0	11.1	11.7	14.1	4.9	4.0	4.9	496.1	76.9	
PSME	D	M	0.0	50.3	17.9	9.5	3.4	4.2	4.0	.8	3.9	0.0	.9	4.2	3.9	.8	53.4	14.3	14
TSHE	D	M	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ABGR	D	M	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	D	M	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
CACH	D	M	0.0	12.2	15.5	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	.4	6
PILA	D	M	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	.1	1
PSME	D	W	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

TSUGA HETEROPHYLLA CLIMAX OR COCLIMAX SITES

* * STANDARD ERRORS FOR 14 PLOTS. * *

SPP ALPHA CODE	CODES L + D	CODES M + W	REPRO NUM /HA	NUMBER OF TREES/HA BY 10 CM DBH SIZE CLASSES 10	20	30	40	50	60	70	80	90	100	110	120	TREES GT 120CM /HA	TOTAL TREES GT10CM /HA	TOTAL BASAL AREA M2/HA	NUMBR OF OCCUR
PSME	L	M	36.8	27.7	31.7	24.8	20.4	6.7	9.1	6.0	4.5	3.3	5.5	2.5	2.5	1.9	63.8	8.9	14
CADE	L	M	0.0	1.9	0.0	.8	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	.1	4
TSHE	L	M	86.3	20.4	9.0	5.8	1.2	5.1	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.1	2.2	12
ABAM	L	M	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	.1	1
ABGR	L	M	15.3	5.3	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	1
ABPR	L	M	15.3	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACGL	L	M	0.0	6.2	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	.1	1
ACMA	L	M	0.0	5.4	3.8	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	.1	5
ARME	L	M	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	.0	1
CACH	L	M	124.4	36.6	18.5	15.4	4.7	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.1	1.6	8
PILA	L	M	0.0	.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	.0	1
PRUNJ	L	M	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	.1	1
TABR	L	M	17.2	1.7	0.0	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	.0	2
THPL	L	M	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
PSME	L	W	17.9	12.7	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.1	2
TSHE	L	W	54.0	12.8	3.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	.2	4
ACMA	L	W	0.0	.8	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	.0	1
LIVE TOTALS			147.2	55.4	44.3	26.0	19.6	8.2	9.5	6.0	4.5	3.3	5.5	2.5	2.5	1.9	71.2	6.0	
PSME	D	M	0.0	16.5	6.4	3.4	1.9	2.3	1.8	.8	3.2	0.0	.9	2.3	3.2	.8	10.6	5.9	14
TSHE	D	M	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ABGR	D	M	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ACMA	D	M	0.0	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
ARME	D	M	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1
CACH	D	M	0.0	5.0	6.4	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	.2	6
PILA	D	M	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	.1	1
PSME	D	W	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	1

APPENDIX 8

SOIL PROFILE DESCRIPTIONS

Six soil profiles are described that are chosen to typify as much as possible the communities and phases in Chapter 4. They illustrate the information included in the vegetation plot soil pit descriptions. Information on soil reaction and color using Monsell color charts was not taken. The soil colors in these descriptions are therefore qualitative and subjective. Plot location, elevation, slope, and aspect and estimated water holding capacity (see Chapter 4 for estimation proceedures) are given in Appendix 4. Soils are classified to the taxonomic level (Soil Survey Staff 1975) appropriate to the data available. Horizon nomenclature and descriptive terms follow Soil Survey Staff (1975). Some taxonomic distinctions and the reference to volcanic ash in the parent material are based on literature interpretations (Brown and Parsons 1973, Mitchel 1979).

Plot 35 *Pseudotsuga/Holodiscus*/grass community
Aspidotis phase

Pit 1

Classification: Ochrept.
Topography: Below the brow of a ridge, convex in vertical direction.
Parent Material: Basalt and probably volcanic ash.

Colors are for moist soil

O	1-0 cm. Needles, twigs; undecomposed to slightly so.
A	0-15cm. Dark brown sandy loam; weak fine crumb structure; nonsticky, nonplastic; many fine, common medium roots; 15% gravel; clear smooth boundary.
C1	15-40 cm. Dark brown sandy loam; weak medium subangular blocky structure; nonsticky, nonplastic; common fine, many medium roots; 20% gravel, 10% cobbles; gradual wavy boundary.
C2	40-61 cm. Dark brown sandy loam; weak medium subangular blocky structure; nonsticky, nonplastic; common fine, common medium, many coarse roots; 35% gravel, 30% cobbles; abrupt wavy boundary.
R	61+ cm Weathered basalt, not saprolitic.

Plot 63 <u>Pseudotsuga</u>/<u>Holodiscus</u>/grass community
<u>Collomia</u> phase

Pit 1

Classification: Ochrept.
Topography: On a main ridge, convex.
Parent material: Breccia and probably volcanic ash.

Colors are for moist soil.

O	0.5-0 cm. Needles, twigs, grass, cones, bark.
A1	0-10 cm. Dark brown loam; moderate medium crumb structure; slightly sticky, slightly plastic; few fine, few medium roots; much animal activity and krotavinas; 20% gravel; clear smooth boundary.
AB	10-35 cm. Dark brown to dark yellowish brown loam; moderate medium crumb structure; slightly sticky, slightly plastic; common fine, common medium, common coarse roots; much animal activity and krotavinas; slight increase in clay; A and B mixed by animals; 20% gravel, 5% cobbles; gradual smooth boundary.
B	35-70 cm. Dark yellowish brown loam; weak medium subangular blocky structure; sticky, slightly plastic; common fine, few medium roots; slight increase in clay; 15% gravel, 20% cobbles; gradual smooth boundary.
C	70-110 cm. Dark yellowish brown loam; weak fine subangular blocky structure; slightly sticky, nonplastic; few fine, few medium roots; 10% gravel, 25% cobbles, 20% stones; abrupt wavy boundary.
R	110 + cm Moderately weathered and fractured breccia.

Plot 64 <u>Pseudotsuga/Berberis/Disporum</u> community

Pit 2

Classification: Udalf.
Topography: Gently sloping bench, smooth.
Parent material: Rock fragments in soil are reccia

Colors are for moist soil.

O 3-0 cm. Needles, twigs, moss, grass litter.

A1 0-5 cm. Dark brown loam; weak coarse crumb breaking to weak fine crumb; slightly sticky, nonplastic, very friable; many fine, many medium roots; 10% gravel; clear wavy boundary.

A3 5-40 cm. Dark yellowish brown loam; weak medium subangular blocky structure; slightly sticky, slightly plastic, very friable; many fine, many medium, many coarse roots; 15% gravel, 10% cobbles; diffuse wavy boundary.

B1 40-80 cm. Dark yellowish brown clay loam; moderate medium subangular blocky structure; slightly sticky, slightly plastic, friable; common fine, common medium; 30% gravel, 10% cobbles; 50% of coarse fragments are very saprolitic; diffuse irregular boundary.

B2t 80-150+ cm. Dark yellowish brown clay loam; weak coarse subangular blocky breaking to moderate fine subangular blocky structure; sticky, plastic, friable; few fine roots; Argillic horizon; thick clay skins on gravel surfaces; 35% gravel, 20% cobbles; 70% of coarse fragments are very saprolitic.

Plot 34 <u>Pseudotsuga/Holodiscus-Acer</u> community

Pit 1

Classification: Dystrochrept.
Topography: In a convex position at the head of a small draw; probably on old landslide scar.
Parent material: Andesitic colluvium and probably volcanic ash.

Colors are for dry soil.

O 3-0 cm. Needles, twigs, branches.

A 0-20 cm. Light brown sandy loam; weak medium crumb structure; nonsticky, nonplastic; many fine, common medium roots; 30% gravel, 10% cobbles; gradual smooth boundary.

C1 20-50 cm. Light yellowish brown sandy loam; weak medium subangular blocky structure; slightly sticky, nonplastic; many fine, common medium roots; 25% gravel, 35% cobbles; gradual wavy boundary.

C2 50-85+ cm. Light yellowish brown sandy loam; weak medium subangular blocky structure; slightly sticky, nonplastic; common medium roots; 25% gravel, 40% cobbles.

Plot 64 Pseudotsuga/Berberis/Disporum community

Pit 2

Classification: Udalf.
Topography: Gently sloping bench, smooth.
Parent material: Rock fragments in soil are breccia

Colors are for moist soil.

0	3-0 cm. Needles, twigs, moss, grass litter.
A1	0-5 cm. Dark brown loam; weak coarse crumb breaking to weak fine crumb; slightly sticky, nonplastic, very friable; many fine, many medium roots; 10% gravel; clear wavy boundary.
A3	5-40 cm. Dark yellowish brown loam; weak medium subangular blocky structure; slightly sticky, slightly plastic, very friable; many fine, many medium, many coarse roots; 15% gravel, 10% cobbles; diffuse wavy boundary.
B1	40-80 cm. Dark yellowish brown clay loam; moderate medium subangular blocky structure; slightly sticky, slightly plastic, friable; common fine, common medium; 30% gravel, 10% cobbles; 50% of coarse fragments are very saprolitic; diffuse irregular boundary.
B2t	80-150+ cm. Dark yellowish brown clay loam; weak coarse subangular blocky breaking to moderate fine subangular blocky structure; sticky, plastic, friable; few fine roots; Argillic horizon; thick clay skins on gravel surfaces; 35% gravel, 20% cobbles; 70% of coarse fragments are very saprolitic.

Plot 45 Libocedrus/Whipplea community

Pit 1

Classification: Umbrept.
Topography: Below the brow of a main ridge, smooth slope.
Parent material: Basaltic/andesitic colluvium with some volcanic ash.

O	2-0 cm. Needles, cones and twigs.
A1	0-25 cm. Very dark brown loam (moist); weak fine crumb structure; slightly sticky, slightly plastic; many fine, few medium roots; 5% gravel; clear smooth boundary.
AC	25-45 cm. Dark brown loam (moist); weak fine subangular blocky structure; slightly sticky, nonplastic; many fine, common medium roots; 5% gravel; diffuse wavy boundary.
C1	45-85 cm. Brown loam (dry); weak fine subangular blocky structure; slightly sticky, nonplastic; common medium, many coarse roots; 10% gravel; diffuse smooth boundary.
C2	85-95 cm. Brown loam (dry); weak fine subangular blocky structure; slightly sticky, nonplastic; few coarse roots; 20% gravel; diffuse smooth boundary.
C3	95-100+ cm. Light brown (dry); weak fine subangular blocky structure; slightly sticky, nonplastic; few coarse roots; 35% gravel.

Plot 73 <u>Libocedrus/Chimaphila</u> community

Pit 1

Classification: Ochrept.
Topography: On a main ridge convex.
Parent material: Breccia, some andesite.

01 4-2.5 cm. Needles, twigs, cones, bark.

02 2.5-0cm. Partially decomposed needles, twigs, cones, bark; 60% is mildly hydrophobic; 60% has grey color due to abundant hyphae.

A1 0-5 cm. Dark brown (moist) sandy loam, grayish brown (dry); weak medium crumb structure due mainly to roots and hyphae; nonsticky, nonplastic; many fine, few medium roots; 10% gravel; clear wavy boundary.

A3 5-20 cm. Yellowish brown sandy loam (dry); weak fine subangular blocky structure due to roots and hyphae; nonsticky, nonplastic; many fine, few medium roots; 10% gravel, 20% cobbles; diffuse wavy boundary.

C1 20-55 cm. Yellowish brown sandy loam (dry); structure same as A3; nonsticky, nonplastic; many fine, common medium, common coarse roots; 15% gravel, 15% cobbles, 5% stones; diffuse wavy boundary.

C2 55-77 cm. Yellowish brown sandy loam (dry); structure same as A3; nonsticky, nonplastic; common fine, few medium roots; 15% gravel, 20% cobbles, 25% stones; diffuse wavy boundary.

C3 77-85+ cm. Yellowish brown sandy loam (dry); structure same as A3; nonsticky, nonplastic; few fine, few medium roots; 10% gravel, 15% cobbles,60% stones.

APPENDIX 9

COMPUTER PROGRAMS

This appendix contains brief overviews of the computer programs thought to be of interest to others. Information needed for running the programs is usually available in internal comment statements. Running these programs will often require knowledge of fortran and the operating system of the computer used.

Program Ageht

Ageht (440 lines of code) calculates tree heights and ages from field data in TP56 format (Hawk et al. 1979). Tree heights are calculated in any consistent set of units from slope distance and percent slope to the top and to the bottom of the tree (Husch et al. 1972). The eye height of the person sighting on the tree is taken into consideration. This is only important when the person's eye height is more than 30 percent of the tree height. It is an easily changed internal constant.

Ages are calculated when extrapolations beyond the end of the core are necessary. Data needed are: bark thickness, length of the wooden core, core ring count, rate of growth at the inner end of the core along a radius from the pith, the angle between the core and this radius, and rate of growth in the youngest centimeter of core. Ageht assumes the pith is at the geometric center of the tree and that ring width decreases constantly from the pith outward. Two estimates of number of rings beyond the core tip are made. The average is added to the core count to estimate age at breast height.

Cktp56

Cktp56 (330 lines of code) reads in TP56 format data (Hawk et al. 1979) and prints it out in a form similar to the field data forms. This makes keypunch verifying faster and more accurate and provides a convenient listing of the punched data deck.

Order 3

Order 3 (460 lines of code) uses data in positional format (e.g. as produced by Simdat2) to print species cover tables like those in Appendix 6. It is based on program Order by Volland and Connally (1978). Species and plots can be output in any order desired. Average cover can be calculated as the mean over all plots or over the plots in which the species occurs. The arrays and all parameters dependent on array dimensions are variably dimensioned in the subroutines. Thus various sizes of species by plot data matrices are easy to accommodate by changing array dimensions and four variables in the main program.

Sh20

This program (215 lines of code) calculates effective depth and available water holding capacity for each horizon to the pit depth, to a selected depth (100 cm in this study) and to bedrock depth (if it is non-zero). For each horizon it requires the following data in TP56 format (Hawk et al. 1979) : thickness, percent coarse particles, and texture. Calculations are described in Chapter 4.

Simdat2

Program Simdat2 (525 lines of code) converts TP56 format data (Hawk et al. 1979) to positional format. Most programs which analyze species cover data require it to be positionally formatted. Simdat2 was written by Al Brown (formerly with the Department of Forest Science at Oregon State University) and was slightly modified for this study. This program was used in construction of the large and small vegetation data sets (Appendix 5). The species and their order in the output data can be determined by the user. Also, Simdat2 allows species to be pooled as described in Appendix 5. Output includes the positionally formatted data, its format, and a list of species ordered as they occur in that data.

Stantab

Stantab (610 lines of code) produces stand tables for each plot and summary tables of averages and standard errors by community. It uses input data in TP56 format. See Appendix 7 for further information on the program and examples of output.