c.1

VEGETATIONAL COMPOSITION AND REGENERATION IN THREE FOREST ASSOCIATIONS AFTER LOGGING IN THE COASTAL WESTERN HEMLOCK ZONE

by

STEPHAN J. HOUSEKNECHT
B.Sc., Pennsylvania State University, 1972

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

in the Faculty
of
Forestry

We accept this thesis as conforming to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
June, 1976

Department of Forestry

The University of British Columbia
Vancouver, British Columbia, Canada

Date June 7, 1976

ABSTRACT

The study was initiated to determine the composition and structure of vegetation and natural tree regeneration invading logged areas within three major forest associations that were subjected to different site treatments in coastal British Columbia.

To accomplish the above objectives, 50 one-fortieth acre plots were established in logged areas ranging in age from 2 to 14 years following logging and the accompanying site treatment. The number of trees per acre by height class, rooting substratum of the coniferous trees, and qualitative coverage estimates of the trees, shrubs, herbs and mosses encountered on each plot were sampled. These data were grouped into associations and analyzed using the relevé method for the vegetation and analysis of variance to assess the role of natural regeneration in each association and treatment class. Distance to the seed source and the type of seed source were measured to provide adjacent stand information.

Environmental parameters such as slope, aspect, topographic position, seedbed type, parent material and depth, and altitude were measured to determine their significance in forming each association and their effect on natural regeneration.

The results of the study indicate that the three forest associations are identifiable in the early stages of secondary succession. The identification of the swordfern - western redcedar and salal - Douglas-fir associations was possible from vegetation characteristics alone. Identification of the moss - western hemlock association necessitated the use of physiographic position, soil depth, and vegetation.

Structurally, all associations contained the same average total cover, but differed considerably in species composition and layer dominance. The salal - Douglas-fir association had a very well developed shrub layer dominated by a low cover of *Gaultheria shallon*, a well developed moss layer dominated by *Hylocomium splendens*, and a poorly developed herb layer. The moss - western hemlock association followed a similar trend. The swordfern - western redcedar association was characterized by a well developed shrub layer dominated by *Rubus spectabilis*, a herb layer that was well-developed both in species composition and cover, and a poorly developed moss layer. It was found that factors such as the degree of disturbance, spacing of the planted trees, age, and parent material caused changes in structure and species composition within each association and between associations. In addition, site treatment, especially slashburning, affected the species composition by eliminating many of the low growing indicator species normally found in an association that had had no treatment. Slashburning decreased the number of species in the salal - Douglas-fir association the greatest, while in the swordfern - western redcedar association, this reduction was of a lesser extent.

The results of the statistical analysis indicate that associations coupled with site treatment are more important in determining the number and species of coniferous trees invading a logged site than the association type. Coniferous trees preferred the salal - Douglas-fir and moss - western hemlock associations that had no treatment or were piled and burned. Douglas-fir, western hemlock, and western redcedar were all decreased in numbers by slashburning.

The regeneration of deciduous trees was found to be more strongly controlled by the association type. The swordfern - western redcedar association was the favoured association.

All coniferous species preferred a mineral soil seedbed for germination, however, survival was low except for Douglas-fir. Western hemlock preferred a decaying wood substratum and western redcedar was found most often on rapidly decomposing organic matter in moist pockets.

The study indicated that an adequate number of coniferous trees existed in all associations and site treatments according to normal restocking standards. Western hemlock was the dominant tree species and generally occurred in an uneven clumped pattern. Douglas-fir and western redcedar were relatively poorly stocked in all associations and site treatment classes. Indications are that supplemental planting of Douglas-fir would be needed to reach a desirable level of stocking of Douglas-fir in all associations studied.

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDICES

ACKNOWLEDGEMENTS

I wish to acknowledge my indebtedness to the members of my committee: to Dr. J.V. Thirgood of the Faculty of Forestry, my advisor, who provided financial support and encouragement; to Dr. T. Ballard to the Department of Soil Science and Mr. J. Walters, Director of the University of British Columbia Research Forest, for their constructive reviews and criticisms of the manuscript.

I wish to express my thanks to Mr. I. Rockwell of the Mission Tree Farm who familiarized me with the area and allowed me to carry out my study there. I am indebted to Dr. A. Kozak, Faculty of Forestry, who provided invaluable aid in the statistical analyses and to Mrs. Lillian Kerr for assistance in computer programming. I wish also to thank Dr. V.C. Brink, Department of Plant Science, for assistance in identification of the difficult grasses. Special thanks also go to Janet Lee Urhahn, TERA Environmental Resource Analyst Limited, for help in the drafting of the figures and use of the facilities. Most particularly I wish to extend special thank to Mr. K. Klinka, Ph.D. candidate, Department of Botany, who guided me in the initial stages of the study and helped in the identification of vascular plants.

A large part of the success of this study goes to my wife, Donna, without whose spiritual help and assistance in the field work this thesis would not be possible. To her I am forever grateful.

I was supported during the study by the Canadian Forestry Service and the Department of Forestry of the University of British Columbia.

I. INTRODUCTION

The Coastal Western Hemlock Zone, identified by Krajina (1965), occupies a large area of coastal British Columbia. In this zone, the three major timber trees, namely Douglas-fir (*Pseudotsuga menziesii*),[1] western hemlock (*Tsuga heterophylla*), and western redcedar (*Thuja plicata*) attain their highest level of wood production. Empirical yield tables for natural stands in British Columbia show that the productivity of the coastal region may be two to three times that of good sites in the interior (Fligg 1960). Consequently, this zone is exceedingly valuable to the forest industry. Therefore, any practice that will promote faster regeneration and growth of the preferred species is of the utmost importance. Both the University of British Columbia Research Forest and the Mission Tree Farm, where this study was conducted, lie within the Coastal Western Hemlock Zone. This factor places a greater value on the results derived from the study. However, because of the time involved in field analysis, only the dry subzone was studied. But many of the conclusions and procedures for the dry subzone can be applied to the wet subzone.

---

[1] Scientific, common names and authors are contained in Appendix II.

Forests affected by human activity, that contain a number of age classes and successional stages, are frequently quite heterogeneous and unstable. Therefore, having some knowledge of the developmental patterns of vegetation after a disturbance greatly enhances the amount of information gained. Because of their longevity and diversity in structure and within time, forest successional patterns are difficult to define. Yet the dynamic processes during the initial stages of succession must be recognized if an effective system of forest classification is to be developed that is accurate and useful in the understanding of the regeneration characteristics of the tree species found in each forest association.

In recognition of a need for a more ecologically sound programme of silviculture and the division of the landscape into homogeneous units to provide for a better understanding as well as a more accurate one, regarding regeneration of trees and vegetation patterns after logging, the following study was undertaken. The objectives of this study were two-fold: to describe and interpret the vegetational composition and structure of logged openings in the initial stages of secondary succession, and to evaluate the role of natural tree regeneration in three forest associations within the dry subzone of the Coastal Western Hemlock Zone. It is hoped that differences in vegetation patterns and tree regeneration characteristics will be evident between the three forest associations that will provide added information for the management of logged over areas. To meet these objectives it was found advantageous to divide the thesis into two parts. Part I deals with the vegetation analysis and variations due to man's activities within the three associations studied, and Part II analyzes the seedling establishment within each association. In this way the objectives can be met in a more clear and easily understood manner.

II. LITERATURE REVIEW

In British Columbia, the most significant and complete ecosystematic classification was developed by Krajina (1959, 1965, 1969). This approach was adopted for this study. Krajina divided British Columbia into eleven biogeoclimatic zones, which were further subdivided into subzones. Basically his approach is founded on the concept devised by Jenny (1941, 1961) and Major (1951) which is that vegetation as well as soils is a product of climate, parent material, topography, organisms and time. It is this integration of ideas in the concept of the plant association (Krajina 1960) that makes this approach ecosystematic or holocoenotic.

Each biogeoclimatic zone is differentiated by the climate, the zonal soil, and the climatic climax plant community existing on a mesic habitat. The recognition of each subzone is based mainly on the amount of precipitation received and the associated vegetation changes. The name of the zone is derived from the name of the dominant self-regenerating plants in the overstory and in the understory. Although Krajina recognizes the mesic association as being the climatic climax community, he does distinguish between edaphic and topographic climaxes, in recognition of the concept of the polyclimax.

Previous studies of secondary succession following clearcutting have been aimed at obtaining a general knowledge of succession following logging (Isaac 1940, Morris 1958, Yerkes 1960). There has been little attempt to stratify the early successional stages into communities, based on existing vegetation and nearby mature communities. As a result only broad successional stages have been distinguished because of the variation due to age, fire intensity, site type and variables such as soil, elevation, and aspect. Dyrness (1973) outlined the typical successional stages after logging: (1) moss-liverwort, (2) annual weeds and short-lived perennials, and (3) shrubs and tree seedlings.

McMinn (1951) described the vegetation on a 20-year-old burn at the University of British Columbia Research Forest and distinguished a number of secondary vegetation types based on species composition and habitat. No evaluation of the previous stand was made. Also in this same area, Kellman (1969) studied the plant interrelationships during secondary succession. He noted that the prelogging species maintain themselves after logging and gradually re-establish dominance during succession whereas invader (pioneer) species respond initially to canopy removal and concentrate in the more severely disturbed sites.

Mueller-Dombois (1960) studied the early successional stages in eight associations that were described in their mature state by Krajina and Spilsbury (1953). Information on their environmental and vegetational aspects in early secondary succession was described and evaluated. He found that even after clearcutting and slashburning the original plant association was still evident. Bailey (1966), using a similar method, investigated plant succession in the southern Oregon Coast Range.

Bailey and Poulton (1968) classified 23-, 29- and 35-year-old secondary communities in northwest Oregon and related them to site type. The results revealed that seral vegetation developing after fire is classifiable and that communities exhibit consistent relationships to environmental factors.

Dyrness (1965, 1973) followed the early stages of plant succession after logging and burning in the western Cascades in Oregon. He documented vegetative changes for seven years on permanent milacre plots. The prelogging plant communities were described before logging. Differences in disturbance from logging and burning highly affected the successional trends. Areas disturbed by logging, but unburned, supported a diversity of residual and invader species; whereas burned areas were occupied mostly by invader species. He also found that the postlogging and the prelogging communities were distinguishable.

III. DESCRIPTION OF AREA STUDIED

The study was conducted on two areas: The University of British Columbia Research Forest, Haney, B.C. and the Mission Tree Farm located near Mission, B.C. Both areas are located on the southern fringe of the coast mountain range between Pitt and Harrison Lakes (Fig. 1). Figures 2 and 3 indicate the location of the study plots on the two forests. Both lie within the Coastal Western Hemlock Zone and are generally similar in climate, vegetation, and soil development. The topography is rugged with numerous rock outcroppings. The soil is mainly of glacial till origin and varies in depth from a few inches to three or more feet. The climate is characterized by mild wet winters and comparatively warm dry summers (Kendrew and Kerr 1955). Fire and logging history contribute to the major differences between the two areas.

1. The Coastal Western Hemlock Zone

The Coastal Western Hemlock Zone was identified by Krajina (1959, 1965, 1969) and has been studied by several investigators: Krajina and Spilsbury (1953), Orloci (1961, 1964), Mueller-Dombois (1960, 1965), Lesko (1961), Eis (1962), Kuramoto(1965), and Wade (1965). This zone is the most typical

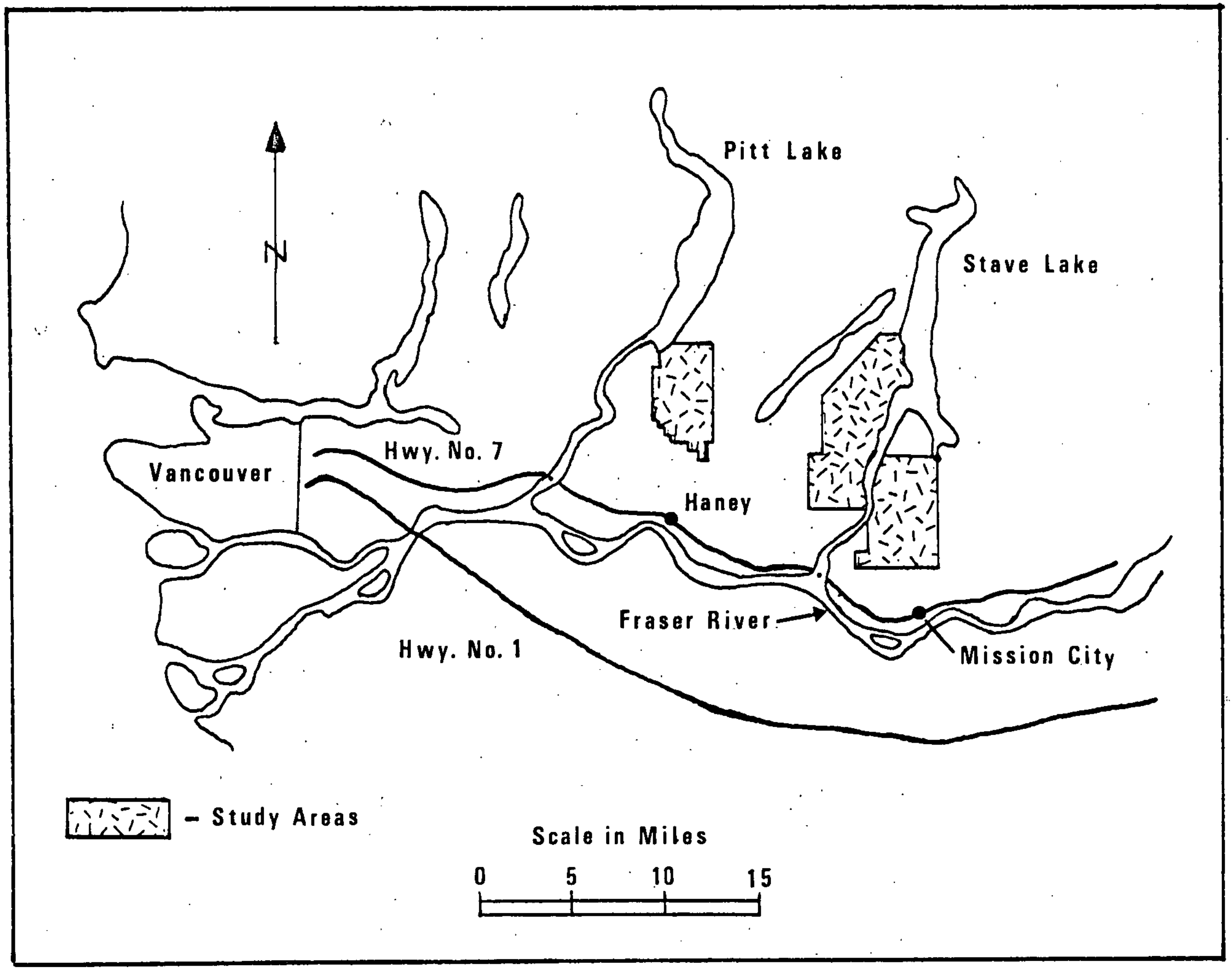

FIGURE 1 Map showing the location of the U.B.C. Research Forest and the Mission Tree Farm where the study was carried out.

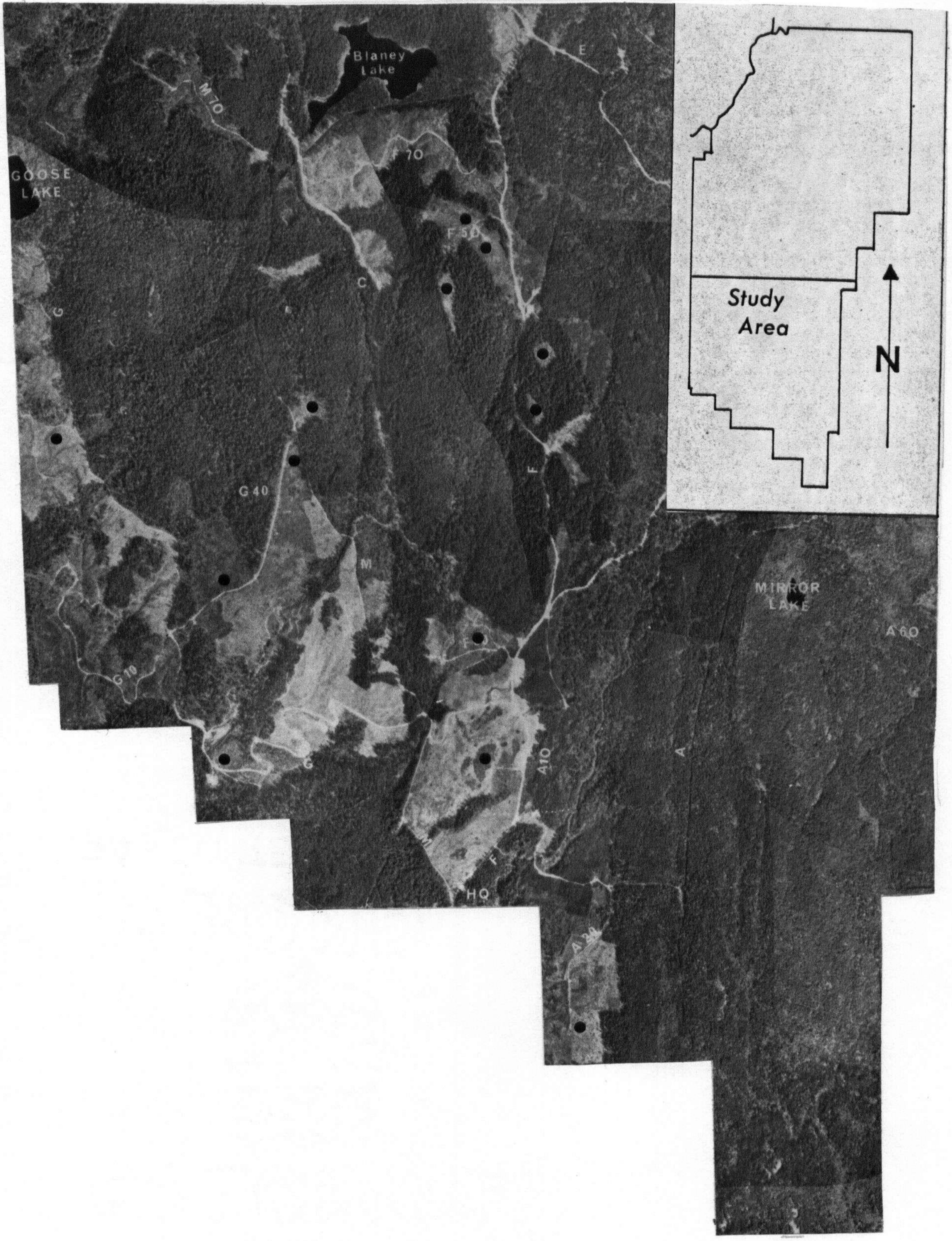

FIGURE 2 Photo-mosaic map of the University of British Columbia Research Forest, Haney, B.C. Dots indicate location of study plots. Approximate scale - 1:24,000.

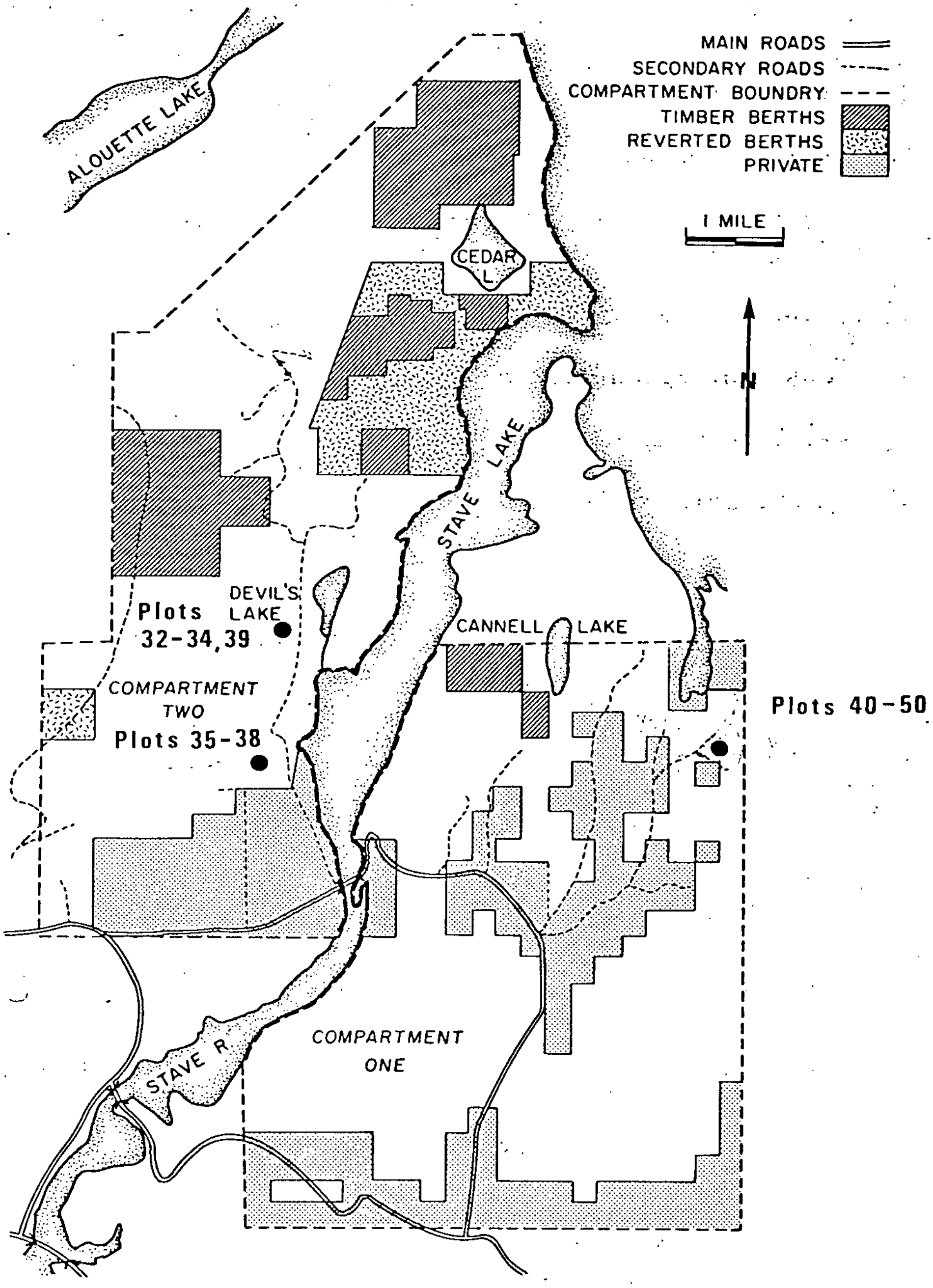

FIGURE 3 Map of Mission Tree Farm. Dots indicate location of study plots. Scale - 1:125,000.

of coastal British Columbia, beginning directly at the coast and extending inland on the slopes of the Coast and Cascade Mountains.

The Coastal Western Hemlock Zone is the wettest zone in British Columbia. The climate is characterized by an equable mesothermal climate (Cfb) and to some extent a milder Dfb climate, after Köppen (1936). Krajina (1969) summarized its attributes as follows: mean annual temperature: 5 - 9° C; annual range of temperature: 9 - 21° C; absolute maximum temperature: 26 - 40° C; absolute minimum temperature: -30 to -7° C; number of frost-free days: 120 - 250 days; annual total precipitation: 65 - 262 inches; annual snowfall: 5 - 295 inches; seasonal occurrence in percent of total precipitation: 30 - 45% in winter and 7 - 15% in summer; elevation: 0 - 3000 feet.

The zone is subdivided into two subzones based on precipitation. The annual total precipitation in the dry subzone ranges from 65 to 110 inches. The wet subzone is characterized by an annual total precipitation of 110 to 262 inches.

Since the study is only concerned with the drier subzone of the Coastal Western Hemlock Zone, only this subzone will be discussed further concerning soils and vegetation.

Soils

The zonal soils of the drier subzone were identified by Krajina (1969) as Humo-Ferric or Ferro-Humic Podzols. Zonal soils are those having well developed characteristics which directly and indirectly reflect the climate, without being influenced by extremes of parent material and drainage. Podzols generally have thick raw humus accumulations on the mineral soil surface. The thick accumulation of raw humus is the result of the cool temperatures of this zone and a predominance of fungal activity, with relatively little activity by bacteria and burrowing fauna. Fungi are promoted in an acid environment (Lutz and Chandler 1946; Buol, Hole and McCracken 1973), which is characteristic of coniferous litter (Ovington 1956). The heavy precipitation in this zone causes a strong leaching of the soil to take place, thus removing many of the minerals from the upper soil horizons to form an eluviated horizon under the organic layers and an illuviated horizon in the lower profile. Throughfall and stemflow precipitation also contribute to the leaching process and the cycling of nutrients in the forest environment (Madgewick and Ovington 1959; Tarrant *et al.* 1968).

Lesko (1961) found the soils to be very acid with pH ranging from 2.9 to 4.9 in the O horizons, 3.5 to 4.6 in the Ae horizon, 3.7 to 5.4 in the Ah horizon and 4.0 to 6.0 in the B horizon. He also noted the absence of an accumulation of calcium, magnesium, and potassium in the B horizon caused by the high precipitation promoting leaching.

The soils generally exhibit a coarse texture ranging from sandy loam to gravelly loamy sand. The soils are stony with the stones varying in size from gravel to large boulders.

Soil mapping of the study areas has been done by several investigators. Kowall (1967) mapped compartment 1 of the Mission Tree Farm and determined the capability of the soils for forestry purposes. Subsequently, the entire Mission Tree Farm, as well as the surrounding area, was mapped by Luttmerding and Sprout (1968) for the British Columbia Department of Agriculture. The University of British Columbia Research Forest has been preliminarily mapped by the soils division of the British Columbia Department of Agriculture in co-operation with Rowles and Lavkulich of the Department of Soil Science, University of British Columbia. In all cases the basic mapping unit was the soil series.

Vegetation

The study of the mature forest associations in the drier subzone of the Coastal Western Hemlock Zone has been done by Orloci (1961, 1964), Eis (1962) and Kojima (1972). The mature associations must be analyzed before the more unstable and ecologically diverse seral stages can be fully understood.

In this zone *Tsuga heterophylla*, *Pseudotsuga menziesii*, and *Thuja plicata* reach the most productive state. *Pseudotsuga menziesii* attain its best growth, sometimes reaching 300 feet in height and 12 feet in diameter (Krajina 1959). *Pseudotsuga menziesii* occurs as a pioneer tree (moderately shade intolerant) on all sites except the driest hygrotope. Consequently, it usually becomes established after fire or logging as secondary succession progresses. As the growth of the stand continues under the humid conditions, coniferous litter and dead trees begin to decay, advancing the process of podzolization and promoting raw humus formation causing the habitat to become more favorable to the establishment of *Tsuga heterophylla*. According to Krajina (1965), an abundance of acid mor humus greatly enhances the establishment of *Tsuga heterophylla*. *Tsuga heterophylla* is the climatic climax species on mesic habitats but is commonly found in all habitats throughout the Coastal Western Hemlock Zone.

Thuja plicata grows best on sites where seepage water is abundant. Because of the ample supply of nutrients and moisture on these sites, soil organisms are abundant, forming a mull humus which is favourable to the species. *Thuja plicata* usually becomes dominant in depressional receiving areas or alluvial habitats along streams.

Several deciduous trees are commonly found: *Acer macrophyllum*, *Prunus emarginata*, *Cornus nuttallii*, *Alnus rubra*, *Acer circinatum*, *Populus trichocarpa*, *Betula papyrifera*, and *Rhamnus purshiana*. All of these deciduous trees require a fairly moist and rich habitat to attain their peak productivity.

Pinus contorta and *Pinus monticola* occur infrequently. *Pinus monticola* is better adapted to montane areas but it is usually eliminated by the white pine blister rust before it achieves dominance. *Pinus contorta* is very shade intolerant and therefore acts primarily as an invader of open areas if a seed source is available.

2. Geological History of the Study Areas

The study areas were subjected to four glaciations: Seymour, Semiamu, Vashon, and a minor one that only glaciated the valleys, the Sumas (Armstrong 1957). The Vashon was the most important glaciation as far as the soils and present land features of the study area are concerned. During each glaciation the land was depressed relative to the sea. As the ice wasted, the ice previously resting on the sea floor thinned and floated, leaving glaciomarine stoney clay deposits below 500 feet elevation. Succeeding the ice melt, the land surface rose above the sea. Meltwater, produced from wasting glacial ice, created localized areas of glacial outwash deposits above 500 feet elevation.

The ice moved in a generally southerly direction forming a valley trend running north to south. The valleys are usually broad and U-shaped with steep sides.

The mountains are composed mainly of quartz diorite, granodiorite, or diorite. Volcanic or sedimentary rocks are found only locally and considered of minor importance (Geological Map of B.C., 1948). Within the study area, glacial drift is by far the most abundant material and underlies most of the terrain. The depth of the till varies from a thin veneer on the top of the slopes to deep plain deposits on the lower slopes. The till is derived from the mechanical abrasion of the ice against the rock strata and consists of two types, ablation till and basal till. Ablation till is material on and within the ice, and as the glacier melts it falls to the surface. Basal till is compacted under the weight of the glacier. This compacted material is relatively impermeable to roots and water. The basal till generally does not travel a great distance and therefore tends to reflect the crystal size and composition of the underlying bedrock.

IV. METHODS

1. Approach

The basic approach and methods initially developed by the phytosociologists of the Zürich-Montpellier school were followed in conducting this study. These have been discussed in detail by Braun-Blanquet (1932, 1951), Billings (1952), Poore (1955, 1956), Becking (1957), and Krajina (1933, 1959, 1960, 1965). Only a brief discussion is necessary here to clarify the methods adopted.

2. Selection of Plots

The sample plots were subjectively chosen so that each represented a uniform stand floristically as well as physiographically. Each plot is considered to be a sampling unit, which represents a complete sample of that particular ecosystem and can be characterized by a certain set of properties. Although it is apparent that no two plots are going to be identical in every detail, comparison of floristic and environmental data has disclosed analogous relationships in vegetation pattern and structure.

At the University of British Columbia Research Forest sample plots were tentatively selected using Klinka's preliminary ecosystem map of the Forest (1972). Final identification of the site type was made in the field utilizing position on slope, depth and type of parent material, residual vegetation and existing vegetation in the adjacent stands.

In the absence of a detailed ecological study at the Mission Tree Farm, a map could not be used to tentatively choose the location of the plots established there. The experience gained from the field work at the University of British Columbia Research Forest, as well as the previously mentioned indicators, were used to locate each plot at this forest.

When sampling was carried out in a cut-over area, more than one plot was usually laid out in one site type in an effort to sample variations in site preparation, burning intensity, and topographic position. Such variations will cause lesser vegetational dissimilarities as well as affecting tree growth and regeneration.

3. Plot Size

Each site type was described on a one-fortieth (1/40) acre square plot. At the beginning of the field work in the summer of 1973, one-tenth (1/10) acre plots were used. But it was found that even though the larger plot size could provide more information (Orloci 1964), it was very difficult to handle and time-consuming because of the complex nature of the vegetation in cut-over areas. Consequently, one-fortieth (1/40) acre plots were chosen.

4. Forest Association

The definition of a forest association adopted for this study is as follows:

> "A forest association has a definite uniform vegetation composition and physiognomy, and is associated with a certain set of environmental and physical factors. It is in a climax state and at equilibrium with the climate of the area."

Because of past fires and logging, numerous successional stages exist before the final climatic climax stage is reached. Although it is emphasized that these successional stages will eventually reach the final climax association, the reason for centering a classification on the more stable climax association is that it draws together several successional stages that will all develop into the same climax association. This reduces the size of the classification and increases its usefulness. For these reasons, the seral associations of this study have been identified and named according to the climax association to which they relate, since intrinsic characteristics such as soil, climate, parent material, and topography remain relatively unaltered, as does the independent biotic factor discussed by Jenny (1941).

5. Associations Examined

Three associations were selected to be sampled:

Salal - Douglas-fir (xeric) type

Moss - western hemlock (mesic) type

Swordfern - western redcedar (subhygric-
hygric) type

The non-forested ecosystem on rock, skunk cabbage - western redcedar and Devil's club - western redcedar associations were disregarded in this investigation because the area covered by these is small compared to the other associations and insignificant in terms of management potential.

6. Analytical Procedure

General Environmental Data

On all the plots examined, the following parameters were taken into consideration for analysis of the environment and plot history:

Physiography:

1. Altitude
2. Aspect
3. Topography
4. Micro-relief within plot
5. Slope gradient
6. Position on slope
7. Landform
8. Texture of parent material

Stand description:

9. Location
10. Setting size
11. Date logged
12. Date since last disturbance
13. Age of stand
14. Date planted
15. Type of treatment
16. Burning intensity
17. Distance to seed source
18. Distance to south edge
19. Type of seed source

Soil and organic layers:

20. Soil order
21. Depth of organic layers
22. Hygrotope
23. Percentage of plot covered by rock, slash, mineral soil, organic material, and decaying wood
24. Percentage of brush species overtopping or non-overtopping trees.

The scales used for each parameter are contained in Appendix I.

Vegetation Data Analysis

Vegetation in each plot was assessed with reference to the following aspects:

1. Estimate of percentage surface cover of each vegetation

layer defined according to life form and height:

Layer A: Tree layer - trees over 30 feet in height

Layer B: Shrub layer - B_1 - woody plants over 6 feet but less than 30 feet
    B_2 - woody plants less than 6 feet in height

Layer C: Herb layer - all herbaceous plants including creeping shrubs and commercial trees species less than 1 foot tall

Layer D: Moss layer - DH - Bryophytes growing on humus
    DW - Bryophytes growing on decaying wood
    DM - Bryophytes growing on mineral soil
    DR - Bryophytes growing on rock.

2. Each species is rated in terms of species significance and sociability in each respective vegetation layer according to the Domin-Krajina scale (1933). The scales employed are shown in Tables 1 and 2. Species significance was used to assess the abundance or dominance of a species in each plot, and sociability allows for an approximate estimate of a species tendency to grow in groups or singly. The significance and sociability estimates were done visually. The visual estimation approach has been adopted by most phytosociologists (Braun-Blanquet 1932, 1951; Krajina and Spilsbury 1953, Brayshaw 1955, Becking 1957, Orloci 1964, Bell 1964, Kojimi 1972) because of its efficiency and speed for most comparison purposes.

Table 1 Species significance scale (Domin - Krajina, 1933)

Class	Description
+	Solitary, very low dominance (0 - 1%)
1	Seldom, very low dominance (1 - 2%)
2	Very scattered, low dominance (2 - 3%)
3	Scattered, low dominance (3 - 5%)
4	Covering 5 - 10% of the plot
5	Covering 10 - 20% of the plot
6	Covering 20 - 33% of the plot
7	Covering 33 - 50% of the plot
8	Covering 50 - 75% of the plot
9	Covering more than 75% but less than 100% of the plot
10	Covering 100% of the plot

Table 2 Sociability scale (Krajina, 1933)

Class	Description
+	Sociability 0, individual plants
1	Groups, up to 4 x 4 cm^2
2	Groups, up to 25 x 25 cm^2
3	Groups, up to 50 x 50 cm^2
4	Groups, up to 1/3 - 3/4 m^2
5	Groups, up to 1 - 2 m^2
6	Groups, up to 5 m^2
7	Groups, up to 25 - 50 m^2
8	Groups, up to 100 m^2
9	Groups, up to 200 - 250 m^2
10	Groups, at least 500 m^2

Tree Data Analysis

Tree information was handled in a somewhat more detailed manner than the vegetational component.

The tree analysis consisted of a tally of all tree species present in one foot height classes (Table 3). Depending on the density of the stocking on a plot, it was divided into quarters or thirds and regeneration recorded in each section and then totalled for all sections in that plot. The number of trees recorded on each plot were then converted to a per acre basis for purpose of comparison.

On cut-over areas that had been planted, an attempt was made to separate and tally the planted trees from those of natural origin. This was done by comparing the height of the planted vs. naturally regenerated trees, by whorl counts, and by observing if the trees were in rows. This method worked well in all areas except those that were older and extremely dense in which the row effect of the planted trees was obscured.

Synthesis of Vegetation

The vegetation synthesis consists of a summation and analysis of the vegetation data collected. The data were then abstracted to form associations.

When the plots were sampled they were grouped into tentative associations. All plots of the same tentative associations were grouped and species stratified by

Table 3 Regeneration height classes

Regeneration Class	Height (ft.)
0	under 1 foot in height
1	1-2
2	2-3
3	3-4
4	4-5
5	5-6
6	6-7
7	7-8
8	8-9
9	9-10
10	10-11
etc.	etc.

layer. For each species within an association, a presence, mean significance, and range of significance value were determined. The species were arranged within each vegetation layer in decreasing order, firstly by presence. If two or more species were alike in presence value, they were arranged according to highest mean significance values; and finally if two or more species were alike in both presence and mean significance, they were arranged alphabetically. This procedure was carried out using a computer method developed by Klinka (1974).

Once the synthesis tables were formed, they were manipulated until the final associations were abstracted. The "characteristic combination of species" (Braun-Blanquet 1932, Krajina 1933, Orloci 1961) was employed to typify an association. Only species that fell into one of the following classes were considered as having some diagnostic value for identifying the association:

1. Constant dominant species: a species which has high presence (80 - 100%) and high significance (mean species significance more than 5.0).
2. Constant species: a species which has high presence (70 - 80%) but low significance (mean species significance less than 5.0).
3. Important companion species: a species which does not belong to any of the above, but tends to associate more or less exclusively with a certain association.

Lesser Vegetation

The use of this classification places heavy emphasis on the role of lesser understory vegetation for identification of a particular association. Lesser vegetation is generally more sensitive to environmental differences and variation (Becking 1957, Daubenmire 1968, Dyrness and Youngberg 1958) than overstory species. First, the feeding roots of trees, shrubs, and various herbs are usually all located in the most fertile part of the soil profile (Kalela 1950, Coile 1952). Second, lesser vegetation ordinarily has a narrower ecological amplitude than overstory species, such as *Tsuga heterophylla* or *Pseudotsuga menziesii*. Third, after a major disturbance such as fire, lesser vegetation tends to sprout from rhizomes and continue the original vegetation pattern, although a change in structure may occur (Mueller-Dombois 1960). However, this may be masked by invading weed vegetation. Fourth, important indicative tree species tend to be preceded by short-lived seral species that do not truly indicate the effect of environment, but rather the availability of seed and their ability to capitalize on disturbed situations. This results in an unstable condition persisting for a number of years.

One problem in the use of lesser vegetation is the lack of knowledge about its distribution, habits, and tolerance in response to different treatments or disturbances (Rowe 1956).

V. RESULTS AND DISCUSSION

The vegetation has been analyzed as described in Chapter III, and the results recorded in Appendix I. The data are organized into three parts: general plot information, vegetation synthesis tables, and stand description. Within each association, the plots are ordered from left to right by treatment and age. The species in the vegetation synthesis tables are arranged vertically in the following order:

a) by strata

b) by decreasing presence within a stratum

c) by decreasing mean significance, where presence within a stratum is identical and

d) alphabetically, if presence and mean significance are identical.

The stand description section contains the number of trees per acre found on each plot by species and height class.

It should be realized that these associations are relatively broad in vegetative characteristics and could possibly be divided into a number of smaller units if mature associations were being dealt with rather than early successional ones. However, because of the heterogeneity of the vegetation at this stage of development, brought about by the severe alteration of the environment after clearcutting, the permanent vegetative characteristics have not had time to stabilize. Therefore extensive variability occurs within and between plots grouped in the same association, regardless of how far the divisive process is carried. This variability in vegetative features in the early successional stages causes difficulty in the identification and description of the early successional associations. This difficulty is aggravated by the occurrence of many short-lived annual plants and shade intolerant shrubs, trees and herbaceous plants that are not found in the mature associations and tend to cover up the more important plant species indicative of a particular association. This results in a greater use of environmental features to characterize each individual association. Water status and soil depth become two of the most important parameters for this purpose.

PART I - ASSOCIATION AND STRUCTURAL ANALYSIS

1. Floristic Features of the Three Seral Associations

Salal - Douglas-fir association

This association develops on relatively shallow soils over bedrock usually possessing a convex topography. It generally occupies ridgetops and upper slope positions. The slope gradient varies from 0 - 5 percent on ridges to 45 percent on neutral slopes (Figs. 4, 5, and 6). Appendix I, Parts I and II contains the data discussed in this section.

The characteristic combination of species for this association is:

Constant dominant species:

- *Gaultheria shallon*
- *Tsuga heterophylla*
- *Pteridium aquilinum*
- *Polytrichum juniperinum*

Constant species:

- *Betula papyrifera*
- *Vaccinium parvifolium*
- *Rubus spectabilis*
- *Epilobium angustifolium*
- *Blechnum spicant*
- *Rubus ursinus*
- *Pseudotsuga menziesii*

FIGURE 4 Plot 48 in the salal - Douglas-fir association was severely slashburned 2 years prior to examination. Note cover of *Pteridium aquilinum* and *Epilobium angustifolium*, and lack of any visible tree regeneration.

FIGURE 5 Plot 47, 7 years after piling and burning. Note poor regeneration and survival of planted Douglas-fir.

The A and B_1 layers are largely a function of the age of the stand. Early successional tree species reach these layers first as well as *Tsuga heterophylla* on unburned plots where it occurs as advanced regeneration. *Betula papyrifera*, *Salix sitchensis*, and *Tsuga heterophylla* are dominant species with *Prunus emarginata*, *Alnus rubra*, *Populus trichocarpa*, *Acer circinatum*, and *Thuja plicata* occurring sporadically. The B_2 layer is consistently dominated by *Gaultheria shallon*, accompanied by *Vaccinium parvifolium*, *Tsuga heterophylla*, *Rubus spectabilis*, and *Betula papyrifera*. As in the mature association, *Gaultheria shallon* is dominant but to a greater extent, forming a continuous carpet (Fig. 7) one to two feet tall. The extensive layer of *Gaultheria shallon* largely eliminates low growing herbs and tree regeneration or restricts their occurrence to moist pockets and exposed areas. Slash-burning did not seem to reduce *Gaultheria shallon* in significance but did cause a more pronounced patchy occurrence rather than a continuous layer. *Vaccinium parvifolium* is strongly associated with the amount of decayed wood present and decreases noticeably as the amount of decayed wood is decreased. *Rubus spectabilis* also had a relatively high dominance which is quite different from the mature association where it occurs only sporadically. This is due to the increased light and the mineralization of the organic layers brought about by clear-cutting. Other common shrubs in the B_2 layer are *Menziesia*

FIGURE 6 Plot 11 in the salal - Douglas-fir association illustrates the vegetation in an area that had no treatment after logging.

FIGURE 7 Heavy *Gaultheria shallon* cover forming on decaying wood after logging and no further treatment in the salal - Douglas-fir association.

ferruginea, Spiraea douglasii, Vaccinium ovalifolium, Rubus parviflorus, Vaccinium alaskaense, and *Rubus leucodermis.* All the tree species prevailing in the B_1 layer also occur in the B_2 layer, but usually with a higher constancy and significance.

The C layer is largely composed of tall weed vegetation present because of clearcutting, and numerous ferns, some of which are residual from the period before cutting. *Pteridium aquilinum, Epilobium angustifolium, Blechnum spicant, Anaphalis margaritacea,* and *Rubus ursinus* compose the major proportion of this layer. *Blechnum spicant, Polystichum munitum, Dryopteris austriaca,* and *Athyrium filix-femina* occur mostly in moist pockets that offer a most favorable habitat (Fig. 8). The development of these moist pockets is quite common after logging. They result from the logging operation and usually contain a high proportion of organic matter and are shaded by adjacent logging slash. Slashburning removes much of the adjacent slash and organic matter from the moist pockets, and destroys pre-existing plants, reducing their favourability to shade-loving species. Consequently, after slashburning the fern species are greatly reduced in significance. *Athyrium filix-femina* is completely eliminated. However, *Pteridium aquilinum* exhibits a different trend. It seems to be enhanced by any disturbance that takes place. On areas that were untreated, but where the logging operation exposed mineral soil, *Pteridium aquilinum* was present in high proportions also.

FIGURE 8 Moist pockets characteristic of logged areas. *Polystichum munitum*, *Blechnum spicant*, *Dryopteris austriaca* and *Hylocomium splendens* are prominent here.

Maini and Horton (1966) found regeneration of *Pteridium aquilinum* considerably stimulated by either scarification or burning, and the density significantly greater than on untreated soil.

Linnaea borealis covers significant areas of the ground in the unburned plots and can be considered a constant dominant species on these areas. Slashburning, however, effectively excludes *Linnaea borealis*.

The moss layer (D) is extensive (57%) after clearcutting. *Hylocomium splendens* and *Rhytidiadelphus loreus* are the dominant mosses on humus. *Eurhynchium oreganum*, which is important in the mature association, assumes a very minor role after clearcutting. On mineral soil *Polytrichum juniperinum* is consistently the most common. *Pogonatum contortum* and *Pohlia nutans* are largely restricted to unburned areas. These mosses are controlled by the degree in which the mineral soil is exposed in logging. The moss flora on decaying wood is restricted to unburned areas and consists of *Plagiothecium undulatum*, *Hylocomium splendens* and *Rhytidiadelphus loreus* as the most common, but they possess a relatively low significance value. The mosses on rock depend on the amount of rock exposed. This layer is normally not as well-developed as in the mature association, because the rock areas are sometimes covered with slash, mineral soil, and organic material during the logging operation, or if slashburning is carried out, the existing flora is partially destroyed.

The two most common mosses are *Rhacomitrium canescens* and *Rhacomitrium heterostichum*.

Tsuga heterophylla occurs most frequently and has a higher cover than either *Pseudotsuga menziesii* or *Thuja plicata* in all layers. *Tsuga heterophylla* is associated with decaying wood on which it reaches its best growth. It can also be found germinating on mineral soil. However the survival rate is exceedingly low and most germinants are eliminated in the first two seasons. Slashburning greatly decreases *Tsuga heterophylla* in significance. *Pseudotsuga menziesii* is less abundant than *Tsuga heterophylla* and is found almost exclusively growing on mineral soil. *Thuja plicata* is a common seedling but seldom reached the B_1 layer, unless it occurs as advanced regeneration on the unburned plots.

The structure of this association is comprised of a very well-developed shrub layer that restricts the development of a low growing herbaceous layer. Tall herbs and ferns are the only significant dominants. The moss layer is well-developed on humus and mineral soil, but relatively less developed on decaying wood and rock.

Moss - Western Hemlock Association

This association occurs on lower mountain slopes with moderate slope gradients (Figs. 9 and 10). It can also occupy relatively flat areas with deep soils that are well-

FIGURE 9 Plot 32 in the moss - western hemlock association, 8 years after logging and no treatment. *Tsuga heterophylla* is primary species.

FIGURE 10 Plot 33 in the moss - western hemlock association 8 years after logging, piling and burning, and planting of Douglas-fir at a 6x6 foot spacing.

drained. This association will ordinarily occupy an equivalent physiographic position on north exposures as that which the salal - Douglas-fir association does on south exposures (Figs. 11 and 12). Refer to Appendix I, Part I and II for the data discussed in this section.

The characteristic combination of species for this association is:

Constant dominant species:

Gaultheria shallon
Tsuga heterophylla
Rubus spectabilis
Pteridium aquilinum
Hylocomium splendens

Constant species:

Vaccinium parvifolium
Vaccinium alaskaense
Thuja plicata
Polystichum munitum
Blechnum spicant
Dryopteris austriaca
Rubus ursinus
Rhytidiadelphus loreus
Polytrichum juniperinum
Plagiothecium undulatum

The B_1 layer is dominated by *Tsuga heterophylla* and *Betula papyrifera*. *Acer circinatum*, *Salix sitchensis*,

FIGURE 11 Moss - western hemlock association (Plot 45) on a north exposure. Note amount of *Tsuga heterophylla*.

FIGURE 12. Salal - Douglas-fir association (Plot 41) 7 years after slashburning on a southwest exposure. Note amount of *Gaultheria shallon* and lack of any regeneration except for planted Douglas-fir.

and *Rhamnus purshiana* all frequently occur also. The B_2 layer is well developed and is dominated by a number of species, *Gaultheria shallon, Vaccinium parvifolium, Vaccinium alaskaense, Rubus spectabilis, Tsuga heterophylla,* and *Thuja plicata. Vaccinium ovalifolium, Sambucus racemosa, Spiraea douglasii, Menziesia ferruginea,* and *Rubus parviflorus* are commonly occurring shrubs.

As in the salal - Douglas-fir association, the C layer is highly influenced by the thick shrub layer and is composed mainly of tall herbs, ferns, and shade tolerant trees such as *Tsuga heterophylla* and *Thuja plicata. Blechnum spicant, Tsuga heterophylla, Pteridium aquilinum, Polystichum munitum, Dryopteris austriaca, Thuja plicata,* and *Rubus ursinus* are the dominant plants. Moist pockets account for a large proportion of the fern development. *Luzula parviflora, Tiarella trifoliata,* and *Trillium ovatum* begin to occur sporadically in this association as an increase in moisture and nutrient availability takes place.

The moss layer is well developed. The dominant mosses on humus are *Hylocomium splendens, Rhytidiadelphus loreus,* and *Plagiothecium undulatum.* All of them are characteristic of this association. *Eurhynchium oreganum* occurs frequently. The mosses on mineral soil consisted mainly of *Polytrichum juniperinum, Pogonatum contortum,* and *Pogonatum alpinum.* As stated earlier, this layer depends on the extent of microsites (exposed mineral soil) available after logging.

Plagiothecium undulatum, *Hylocomium splendens*, and *Rhytidiadelphus loreus* are the prominent mosses on decaying wood, although their significance is quite low. They usually form patches on logs, decaying wood, and less commonly on humus rather than a continuous layer. The patches are usually four to six feet in diameter and confined to micro-depressions, where they show the most vigor. Elsewhere, they are quite yellowish and less vigorous. This is especially true for *Hylocomium splendens*. On rocks, the moss layer was non-existent except for a solitary occurrence of *Rhacomitrium canescens*. As in the salal - Douglas-fir association, the degree to which the rock areas are disturbed is a determining factor.

In all layers, *Tsuga heterophylla* had the highest stocking of the three major coniferous trees. It was found growing on decayed wood and organic matter as well as on mineral soil. As in the salal - Douglas-fir association, *Tsuga heterophylla* was germinating readily on mineral soil which provided a favourable substratum for seed germination. However, in this association where precipitation is the major source of water, droughts are common, and elimination of *Tsuga heterophylla* occurs before it reaches a dominant position.

Thuja plicata also regenerates abundantly in this association, but very few seedlings become established. This is probably due to the high nutrient requirements of this species as well as the frequency of drought. The best survival, as distinct from maximum germination, existed in moist micro-depressions where very rapidly decomposing organic material formed a two to three inch deep layer. *Thuja plicata* occurs in all layers but decreases sharply in abundance toward the B_1 layer. In the B_1 and taller height classes of the B_2 layer it persists primarily as advanced regeneration.

Pseudotsuga menziesii was absent in micro-depressions and prevailed on mineral soil with sporadic occurrences on shallow organic matter and decaying wood. It was present in all layers. However, it was noticeably absent from a number of the Mission Tree Farm plots. This is apparently the result of age, seed source, and the planting density that will be discussed later. In order of abundance, *Tsuga heterophylla* was most prolific followed by *Thuja plicata* and *Pseudotsuga menziesii*.

The mature moss - western hemlock association is characterized by a lack of any shrub or herb species and a moss layer that forms a complete carpet over the ground. The major mosses are *Hylocomium splendens*, *Rhytidiadelphus loreus*, and *Plagiothecium undulatum*. These mosses are still present after logging. However, their significance is greatly reduced. In addition, there are a number of saprophytes that occur in the mature association, namely, *Hemitomes congestum*, *Corallorhiza maculata*, and *Monotropa lanuginosa*. These are completely absent after logging.

Probably the most outstanding feature of the moss -

western hemlock association after logging is the predominance of the shrub layer as well as numerous herbaceous plants. After logging, *Gaultheria shallon*, *Vaccinium parvifolium*, *Vaccinium alaskaense*, and *Rubus spectabilis* form a very well developed shrub layer. The average cover percent in the B_2 layer is 65%. *Gaultheria shallon* dominates the B_2 layer after logging. Aggressive weed species such as *Epilobium angustifolium*, *Anaphalis margaritacea*, and *Pteridium aquilinum* rapidly invade the site and mask many of the more useful identifying characteristic plants. Although the shrub and tall herb species tend to conceal the moss layer, it still forms a dominant part of the association.

Swordfern - Western Redcedar Association

This association is found at the base of slopes and in depressions where an adequate supply of seepage water is present. The parent material is mostly glacial till, marine deposits, and outwash. The parent material is usually deep and receives a large portion of its water supply from seepage water (Figs. 13, 14, 15, and 16). Appendix I, Part I and II contains the data discussed in this section.

The characteristic combination of species for this association is:

Constant dominant species:

Alnus rubra

Rubus spectabilis

FIGURE 13 Plot 2 exhibits the thick undergrowth of the swordfern - western redcedar association.

FIGURE 14 A successful plantation of Douglas-fir in the swordfern - western redcedar association (Plot 27).

FIGURE 15 Plot 8 in the swordfern - western redcedar association 5 years after logging and no treatment. Note the amount of deciduous tree regeneration and lack of any visible coniferous regeneration.

FIGURE 16 Thick deciduous undergrowth in swordfern - western redcedar association. Note the poor establishment of planted Douglas-fir (Plot 28).

Pteridium aquilinum

Polytrichum juniperinum

Constant species:

Spiraea douglasii

Rubus parviflorus

Tsuga heterophylla

Salix sitchensis

Polystichum munitum

Epilobium angustifolium

Anaphalis margaritacea

Blechnum spicant

Luzula parviflorus

Lactuca biennis

Dryopteris austriaca

Thuja plicata

Athyrium filix-femina

Important companion species:

Plagiomnium insigne

Mnium lycopodiodes

Viola sempervirens

Eurhynchium praelongum

Trientalis latifolia

Galium triflorum

The B_1 layer is dominated by *Alnus rubra, Salix sitchensis,* and *Populus trichocarpa.* On the areas that were planted, *Pseudotsuga menziesii* becomes an important dominant.

Tsuga heterophylla and natural *Pseudotsuga menziesii* occur frequently, but not in the proportion recorded in the previous two associations. On the older plots (004, 029, 007), *Rubus spectabilis* and *Rubus parviflorus* may reach a height of nine feet. Other companions in this layer are *Prunus emarginata, Acer circinatum, Salix scouleriana,* and *Betula papyrifera.* The B_2 layer is very well developed. *Rubus spectabilis, Spiraea douglasii, Rubus parviflorus, Tsuga heterophylla* and *Salix sitchensis* are the prevalent species. This layer is not defined by a few dominant species. It contains a large number of species that form a dominant portion of the B_2 layer. Other common associates are *Ribes sanguineum, Rubus leucodermis, Sambucus racemosa,* and *Rubus laciniatus. Oplopanax horridum* may occur in moist, shaded pockets. *Gaultheria shallon,* although quite common in this association, is localized on decaying wood, which composes very little of the total ground cover. *Vaccinium parvifolium* is also reduced in significance due to the lack of decaying wood.

The C layer is very well developed, even though the shrub layers were dense. The increased moisture and relatively higher nutrient availability undoubtedly accounts for the rich development of the C layer. *Polystichum munitum* is constantly present, as would be expected for this association and was little affected by logging. In fact, logging seemed to increase its occurrence in all of the associations studied. Mueller-Dombois (1960) also noted this occurrence.

Epilobium angustifolium and *Anaphalis margaritacea* are both highly dominant and reach their optimum in this association. As in the previous two associations, *Pteridium aquilinum* is also extremely prevalent. Other frequent companions in the C layer are *Blechnum spicant*, *Luzula parviflora*, *Lactuca biennis*, *Dryopteris austriaca*, *Athyrium filix-femina*, *Galium triflorum*, *Trientalis latifolia*, *Tiarella trifoliata*, *Viola sempervirens* and *Rubus ursinus*. *Agrostis scabra*, *Holcus lanatus*, *Hypochaeris radicata*, and *Festuca occidentalis* are all strongly indicative of the degree of disturbance. *Juncus effusus* and *Scirpus microcarpus* usually indicate moist depressions or high moisture status of the parent material. For example, plots 005, 030, and 031 are all located on glacio-marine deposits and are poorly drained. These plots contain large amounts of *Juncus effusus* and *Scirpus microcarpus* as well as a very rich flora of other species.

The moss layer is not well developed (average cover of 37%). *Eurhynchium oreganum* and *Eurhynchium praelongum* are the dominant mosses on humus; however, their presence and mean significance values are low. On moist habitats, *Plagiomnium insigne* and *Leucolepis menziesii* are commonly found. On mineral soil in exposed sunny habitats, *Polytrichum juniperinum* and *Ceratodon purpureus* occur as the dominant mosses. *Mnium lycopodiodes* is established on mineral soil in moist habitats shaded by slash or deciduous cover. In the plots examined, the moss flora on decaying wood is not well represented. This results from the lack of decaying wood or slash, because of prior treatment either by slash-burning or piling and burning. *Hylocomium splendens* is the most common but has a low presence and mean significance. Plot 008, the only untreated plot, showed a definite increase in the decaying wood mosses.

Tsuga heterophylla, as in the previous two associations, germinates well in this association and surpasses both *Thuja plicata* and *Pseudotsuga menziesii*. However very few seedlings ever constitute a significant portion of the upper shrub layer. Its relatively slow growth rate and the intense competition from the dense shrub and herb layers could account for this. *Thuja plicata* obtains its best growth in this association. It was found in all layers except the B_1 layer. Organic matter, in a state of rapid decomposition, provided the best survival rate. Maximum germination appeared to be on exposed mineral soil, but as in the other associations survival was low. *Pseudotsuga menziesii* was the least abundant of the three. It did occur in all layers, including the B_1, but very sporadically. Although this association provides the best sites for *Pseudotsuga menziesii*, competition from herbaceous and woody brush species is an important limiting factor here. Its shade intolerance destroys many new seedlings. Exposed mineral soil or a fine covering of organic matter provide the best habitat for germination.

The swordfern - western redcedar association differs considerably from the previous two associations. The shrub layer is highly developed and composed mainly of *Rubus parviflorus*, *Rubus spectabilis*, and *Spiraea douglasii*. In the previous associations, *Gaultheria shallon* and *Vaccinium parvifolium* were dominant shrubs. The rich development of the herb layer is the most outstanding characteristic of the swordfern - western redcedar association. This is caused by seepage water which largely controls the development of this association. The seepage water also permits a greater diversity of deciduous trees and shrubs to exist.

In the mature state both the shrub stratum and herb layer are greatly reduced by the canopy coverage. However this association still supports a greater diversity of species and a better developed C layer than the other associations.

The type of treatment seemed to have little effect on the vegetation in this association. The habitat is rapidly invaded by all the characteristic species found in the mature association. Slashburning may even enhance the development of the C layer by rapidly releasing nutrients stored in the organic matter. The abundance of seepage water also reduces the recovery time needed after treatment.

In addition to the previous mosses mentioned, *Hypnum circinale*, *Dicranum fuscescens*, and *Dicranum howellii* were present on decaying wood in all associations. However the significance was very low and restricted to small patches on decaying wood. Slashburning usually eliminated these mosses by reducing the amount of decaying wood.

2. Causes of Variation in Vegetational Composition and Structure Within the Three Seral Association

Variation in vegetation and structure between and within associations

All associations are structurally similar in average percent cover (Fig. 17). However variation did occur in species composition and layer dominance. Consequently, it is difficult to assess the cover values and their significance in each association without having an understanding of the species composition. For example, the shrub layer of the salal - Douglas-fir association is as equally well developed as in the richer swordfern - western redcedar association but possesses a completely different species composition. Therefore its ecological significance is different. This also applies to stratification within one layer. For instance, tall-growing invader herbs can mask those low growing herbs which are more indicative of the forest association. Variation caused by age and treatment is also evident and will be discussed later.

The salal - Douglas-fir and moss - western hemlock associations are both characterized by a well developed shrub layer composed of *Gaultheria shallon* and *Vaccinium parvifolium* and a herb layer consisting of tall herbs and *Pteridium aquilinum*. The swordfern - western redcedar association has an equally well developed shrub layer but is composed of *Rubus spectabilis*, *Rubus parviflorus*, and *Spiraea douglasii*.

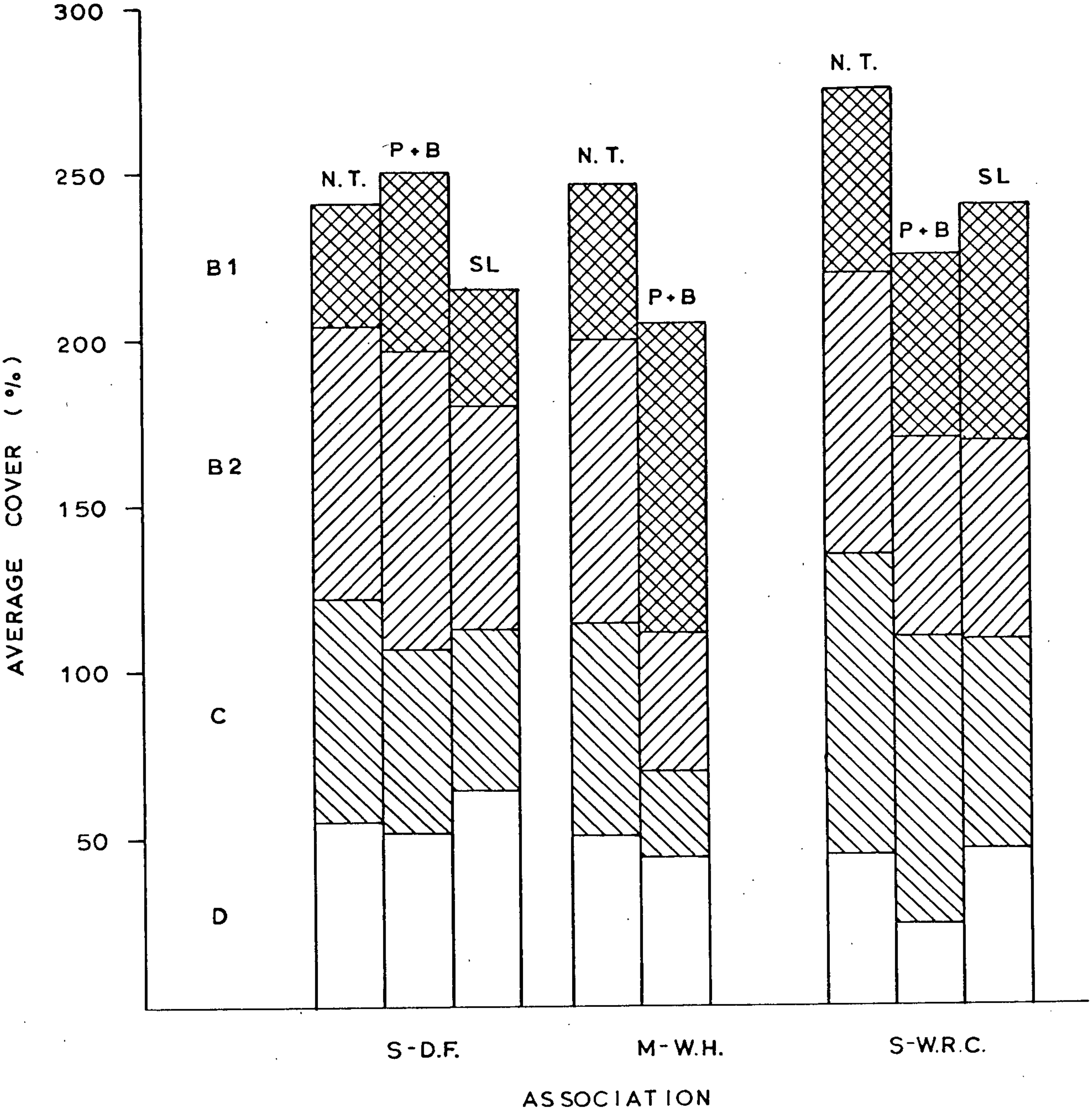

FIGURE 17 Average cover in percent of each layer by association and treatment.

In the swordfern - western redcedar association the herb layer consisted of a large number of low growing herbs as well as tall herbs such as *Epilobium angustifolium* and *Anaphalis margaritacea*. Although all associations had a very well developed shrub layer, the swordfern - western redcedar association offered a greater degree of competition to coniferous tree species because it was taller, denser, and more highly stratified.

A total of 148 species were encountered on the plots. The checklist is contained in Appendix II. Of these 148 species, 93 and 77 were identified on the salal - Douglas-fir and moss - western hemlock associations, respectively. In the swordfern - western redcedar association, 119 were identified. The greater number of species found in the latter association is the result of the rich habitat. The C layer is the major contributor. The large number of species encountered in the salal - Douglas-fir association as compared to the moss - western hemlock association was undoubtedly caused by a large number of plots being disturbed, thus allowing various grasses and mosses that are associated with mineral soil to become established.

Age is an important factor affecting the structure and species composition. Plots 004 and 029 in the swordfern - western redcedar association were 12 and 13 years old respectively. At this age in this association the shrub canopy is extremely dense (Fig. 18). This largely eliminates the well

FIGURE 18 Plot 4 in the swordfern - western redcedar association shows the thick development of *Rubus spectabilis* 14 years after logging and slashburning.

FIGURE 19 Plot 5 in the swordfern - western redcedar association on poorly-drained glacio-marine parent material. Note amount of *Juncus effusus* and *Alnus rubra* and lack of coniferous regeneration 4 years after logging and piling and burning.

developed C layer found on the younger plots. The moss layer is also affected. The mineral soil mosses are reduced in cover as a result of a build up of humus and a lack of light. Mosses such as *Plagiomnium insigne* and *Leucolepis menziesii* begin to occur as the canopy closes and a rapid mineralization of the mixed coniferous-deciduous litter takes place.

Unlike the University of British Columbia Research Forest which uses an 8 x 8 or 10 x 10 foot spacing, the Mission Tree Farm has an established policy to plant at a 6 x 6 foot spacing. This decreased spacing has a considerable influence on the understory vegetation. Plots 037 and 038 are located in the moss - western hemlock association at the Mission Tree Farm and were planted at a 6 x 6 foot spacing in 1959 or 1960. Figure 20 illustrates the resultant ground cover. The thick canopy has eliminated the shrub and the herb layers and the moss layer has been reduced to small patches. Age was also an important factor. At an earlier stand age the resultant effect would not have been as evident. The effect of close spacing is further illustrated in Figure 17. All the plots in the moss - western hemlock association that were piled and burned have been planted at a 6 x 6 foot spacing. The reduction in total cover and cover of each layer is well exemplified. A large proportion of the total cover consists of planted Douglas-fir in the B_1 layer.

FIGURE 20 Lack of ground cover under 6 x 6 foot spacing of Douglas-fir in Plot 37. Upper photograph shows several small western hemlock seedlings and coniferous litter. Lower photograph shows decaying stems of *Rubus spectabilis*.

Variation caused by treatment on the structure and general species composition of the three associations

Logging and the accompanying treatment of the area has a notable influence on the general species composition and structure. In the study it is difficult to assess the effects of treatment on the structure because of the mixture of age classes within each treatment. Figure 17 shows the slight variations that take place between treatments. These variations are probably caused by age differences. The salal - Douglas-fir association exhibited the only significant differences between no treatment and slashburning. Dyrness (1965, 1973) noted, however, a significant variation between treatments with regard to structure. He found that the cover on undisturbed plots was two to five times that found on the disturbed-unburned and lightly burned plots, respectively. Total cover on the severely burned plots consistently lagged behind the other plots. He also observed a substantially lower number of trees on the severely burned plots.

The type of treatment and the accompanying disturbance exert a more obvious influence on species composition. In all the associations that were untreated, the residual component species still exist and are supplemented by an influx of invader species depending on the amount of disturbance that has taken place. On habitats that have been burned, the residual component is largely destroyed.

In other words, species that were present in the mature stand are also present in the untreated cutover stand. At the same time, piling and burning does not affect the residual component as much as slashburning. Piling and burning allows species to be partially destroyed or untouched altogether. The residual component is, therefore, allowed to expand; whereas, slashburning usually destroys all the vegetation and a complete re-invasion of the site must take place. In most cases, the untreated habitats contained more species than treated areas.

The logged setting presents a heterogeneous habitat for species invasion, with a variety of individual microsites. The degree of disturbance and the associated extent of microsites created strongly control the number and the quantity of species entering a particular habitat. Plots 011 and 012 (Appendix I) illustrates this relationship, having a large number of sporadic species colonizing on favorable microsites. In most cases, these species possess little diagnostic value.

Slashburning reduces the number of species occurring on a site by diminishing the number of moist pockets, decaying wood, and residual component species. Exposed mineral soil is the major microsite available for colonization. Piling and burning does not have as adverse an effect on species composition as slashburning. This is well illustrated in the tables in Appendix I, Parts I and II.

The preceding factors are just a few of the major causes for variation between associations and within each association. Slope, aspect, elevation, and parent material all play an important role in influencing vegetational variation. The effect of parent material is especially noteworthy in plots 005, 029, 030 located in the swordfern - western redcedar association on glacio-marine parent material. The species composition is exceedingly rich, containing a large number of species not found on other parent materials as well as an influx of *Salix* spp. and *Alnus rubra* (Fig. 19). This is caused by the poorly drained conditions. *Juncus effusus* and *Scirpus microcarpus* are common associates.

Variation caused by treatment and association type on the individual species

Figures 21, 22, and 23 compare the effect of treatment on a number of selected species within each association along with the mean for the association. The number at the top of each bar is a presence value.

It appears from the figures that most species occur in all associations but increase toward a higher mean significance and presence in certain associations. Moisture regime and lack of decaying wood as a growing medium seemed to be the important controlling factors. In addition, a large number of shade intolerant plants occur under all site conditions after logging, exhibiting no preferential trends. These

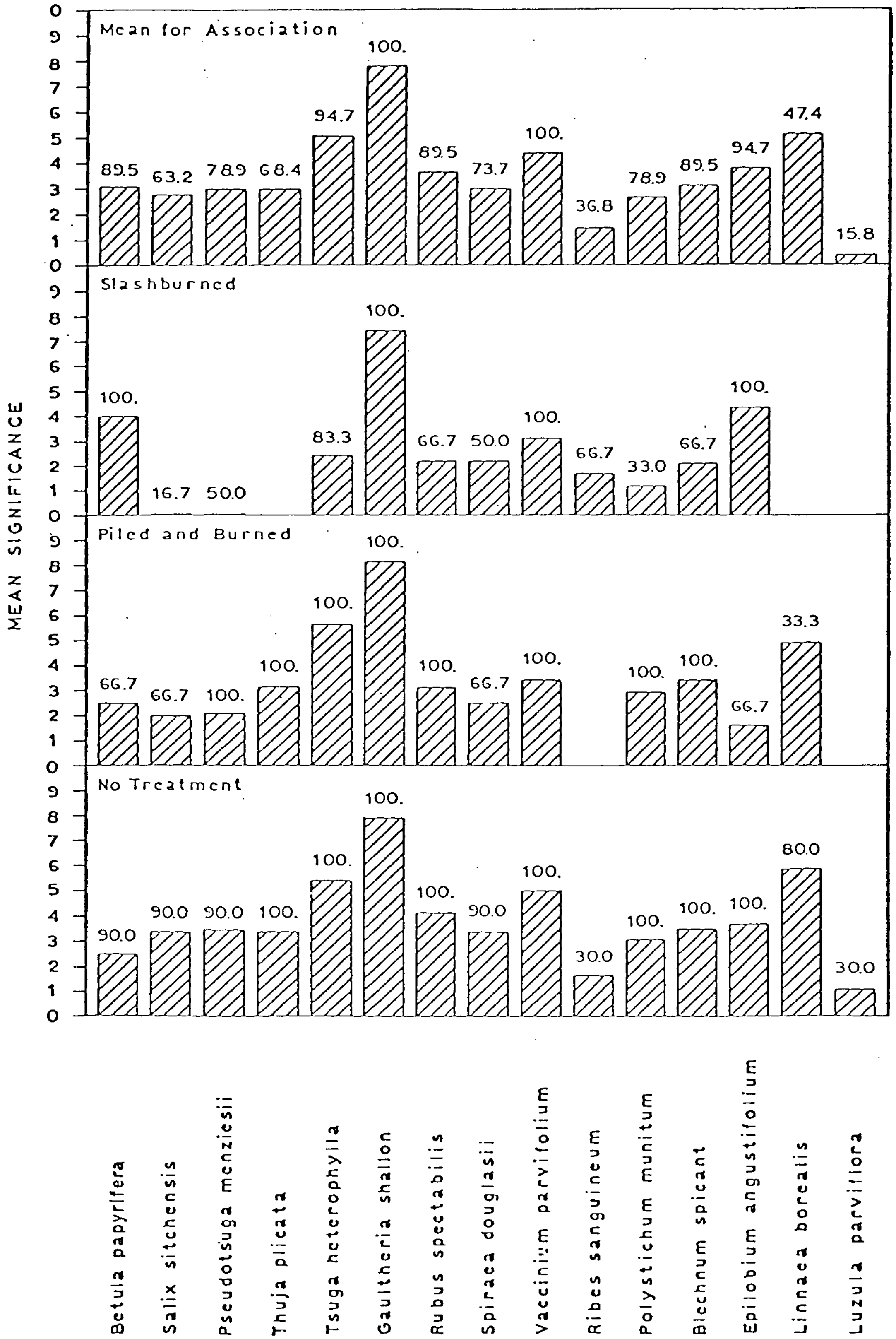

Figure 21 Mean significance and presence of fifteen selected species in the salal - Douglas-fir association

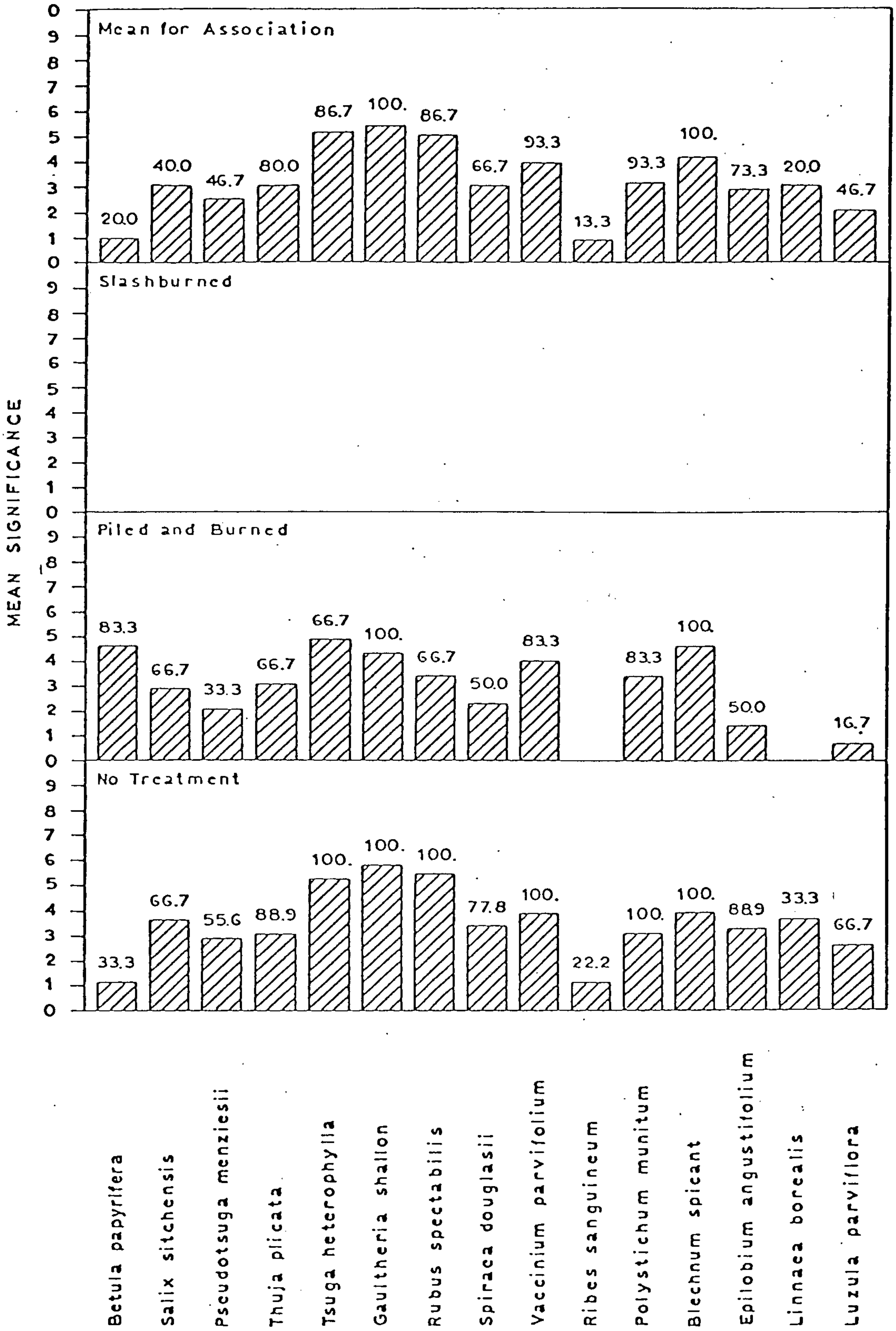

Figure 22 Mean significance and presence of fifteen selected species in the moss - western hemlock association

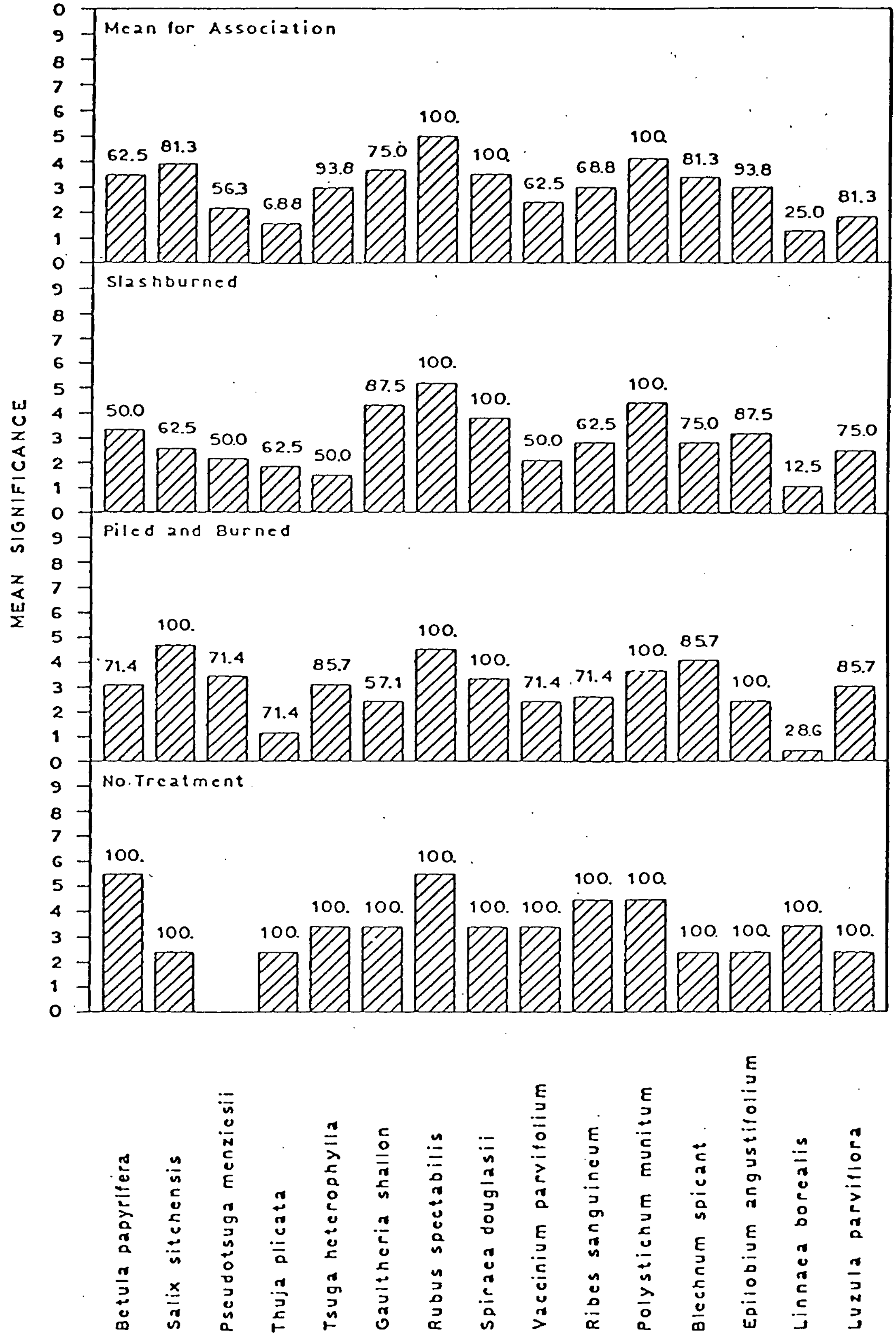

Figure 23 Mean significance and presence of fifteen selected species in the swordfern - western redcedar association

species are responding to increased light conditions due to the lack of the forest canopy. Very few species showed a definite site specificity. These species mostly occurred in the rich swordfern - western redcedar association. For example, species exhibiting an increasing mean significance toward the swordfern - western redcedar association are:

Salix sitchensis
Rubus spectabilis
Polystichum munitum

Species showing an opposite trend are:

Tsuga heterophylla
Gaultheria shallon
Vaccinium parvifolium
Linnaea borealis

Truly ubiquitous species:

Epilobium angustifolium
Betula papyrifera
Spiraea douglasii

The expansion in the normal habitat of a species appears to be characteristic of cutover areas. It results from the increase in light, moisture, mineralization of organic layers, and the creation of micro-habitats. All these features allow the plants to expand their normal range as other favorable habitats are created, as well as inhibiting plants that do not respond to these factors.

Figure 21 of the salal - Douglas-fir association shows that slashburning influences the selected species the greatest. *Salix sitchensis*, *Thuja plicata*, *Linnaea borealis*, and *Luzula parviflora* were completely eliminated, while *Blechnum spicant*, *Polystichum munitum*, and *Tsuga heterophylla* were greatly reduced in both presence and mean significance. *Gaultheria shallon* exhibited no identifiable difference between treatments. *Betula papyrifera* showed the only notable increase with slashburning. Although not shown in Figure 21, *Ceratodon purpureus* and *Polytrichum juniperinum* also exhibit an increase with slashburning.

The influence of fire on the moss - western hemlock association (Fig. 22) is more difficult to evaluate since no plots were slashburned. The differences between no treatment and piled and burned are minimal. All species appear to decrease slightly in both presence and mean significance. This is probably due to the close spacing of the planted trees rather than treatment differences.

The swordfern - western redcedar association (Fig. 23) reflects a similar trend with respect to treatment, as did the salal - Douglas-fir association. However the effect is not as great and the number of species affected is less. This undoubtedly reflects the richness of the habitat and the resulting increased response rate in vegetative development.

The mean presence for each association is given at the top of each figure. These values can be compared with each other as a visual technique in identifying each species response to particular habitats of fifteen species given.

Summary

Vegetational variation after logging is influenced mainly by the accompanying human alterations to the site. The variation in vegetation is influenced most directly by the degree of site disturbance to the habitat, type of treatment, spacing of planted trees, amount of light exposure due to clearcutting, age of stand as well as the abiotic factor of moisture regime between associations. Of lesser importance are slope, aspect, and parent material. However, the relationships of these and other abiotic factors may be masked by the impact of the human-related disturbances after clearcutting.

PART II - SEEDLING ESTABLISHMENT WITHIN THE THREE SERAL ASSOCIATIONS

1. Seedling Establishment of Coniferous and Deciduous Trees

The number of seedlings per acre was evaluated on the 1/40th acre plots. The results for each plot are recorded in Appendix I,Part III. The subjectively chosen plots were selected to represent general stocking and spatial distribution of the seedlings for that particular site as well as being representative of the vegetation for the association. Because of the variability in regeneration characteristics, the exact quantitative relationships cannot be observed by use of a subjective sampling system. However, trends and qualitative relationships are well represented with regard to associations and treatments. The results are compared by examining the actual number of trees per acre in each association and treatment.

Table 4 presents the average number of trees per acre that occur in the three associations by treatment for all the tree species encountered on the plots. The standard deviation is also included where it is considered important.

The calculation of the trees per acre is a summation of all age classes. Tables 5 and 6 represent the number of trees per acre by age class for coniferous and deciduous trees. It is apparent that not enough observations were available to make any comparisons between age classes. Therefore, a

Table 4 Distribution of trees in numbers of trees per acre by association and treatment

ASSOCIATION	SALAL - D.F.				MOSS - W.H.			SWORDFERN - W.R.C.			
TREATMENT	NONE	P&B	SL	MEAN	NONE	P&B	MEAN	NONE	P&B	SL	MEAN
NO. OF PLOTS	10	3	6	19	9	6	15	1	7	8	16
WESTERN HEMLOCK *	3849 ±2327	6667 ±5286	448 ±479	3220 ±3262	5110 ±1717	3701 ±2928	4547 ±2291	900 -	889 ±820	636 ±797	763 ±764
WESTERN REDCEDAR	957 ±1350	907 ±845	33 ±53	657 ±1087	889 ±549	860 ±798	877 ±632	1030 -	267 ±237	303 ±329	333 ±329
NATURAL DOUGLAS-FIR	505 ±345	160 ±160	53 ±65	308 ±330	244 ±342	127 ±178	197 ±286	- -	167 ±111	95 ±77	121 ±100
PAPER BIRCH	121	467	620	333	78	333	180	2300	1027	630	908
VINE MAPLE	79	213	33	86	576	693	623	430	244	350	309
CASCARA	35	27	13	27	209	127	176	90	3	11	13
BITTER CHERRY	94	-	53	66	87	7	55	740	366	185	299
BLACK COTTONWOOD	30	13	13	22	42	47	44	60	1581	65	728
RED ALDER	14	-	7	10	28	7	20	120	910	269	540
WILLOW SPP.	473	120	73	291	634	193	458	60	4204	770	2228
BIG-LEAF MAPLE	-	-	-	-	-	-	-	30	-	35	19
PACIFIC DOGWOOD	5	-	-	3	-	13	5	80	-	20	15

*Standard deviation about the mean

Table 4 continued

ASSOCIATION	SALAL - D.F.				MOSS - W.H.			SWORDFERN - W.R.C.			
TREATMENT	NONE	P&B	SL	MEAN	NONE	P&B	MEAN	NONE	P&B	SL	MEAN
NO. OF PLOTS	10	3	6	19	9	6	15	1	7	8	16
PLANTED DOUGLAS-FIR	-	1147	1060	516	-	1160	464	-	540	382	379
LODGEPOLE PINE	-	-	13	4	-	-	-	-	-	-	-
PACIFIC SILVER FIR	-	-	-	-	-	7	3	-	-	-	-
SITKA SPRUCE	-	-	-	-	4	-	3	-	-	-	-
CONIFEROUS TREES	5311	7733	547	4189	6248	4695	5626	1930	1323	1035	1217
	±3495	±6085	±558	±4186	±1995	±3824	±2847	-	±1059	±1111	±1040
DECIDUOUS TREES	851	840	813	837	1655	1420	1561	3910	8335	2335	5059
	±695	±349	±878	±685	±851	±639	±758	-	±5981	±1417	±4930

Table 5 Number of deciduous trees per acre

	AGE CLASS (yrs.)					
ASSOCIATION	0-2	3-4	5-7	8-10	11-12	13-15
SALAL - D.F.						
No Treatment	-	-	-	910.0	792.0	-
Slashburned	120.0	-	952.0	-	-	-
Piled & Burned	-	-	840.0	-	-	-
Total	120.0	-	1792.0	910.0	792.0	-
MOSS - W.H.						
No Treatment	-	1410.0	-	1460.0	-	2360.0
Slashburned	-	-	-	-	-	-
Piled & Burned	-	-	-	1090.0	-	1920.0
Total	-	1410.0	-	2550.0	-	4280.0
SWORDFERN - W.R.C.						
No Treatment	-	-	3910.0	-	-	-
Slashburned	-	-	4160.0	1680.0	-	1820.0
Piled & Burned	-	13900.0	4593.0	2870.0	-	-
Total	-	13900.0	12663.0	4550.0	-	1820.0

Table 6   Number of coniferous trees per acre

	AGE CLASS (yrs.)					
ASSOCIATION	0-2	3-4	5-7	8-10	11-12	13-15
SALAL - D.F.						
No Treatment	-	-	-	4618.0	6004.0	-
Slashburned	280.0	-	600.0	-	-	-
Piled & Burned	-	-	7733.0	-	-	-
Total	280.0	-	8333.0	4618.0	6004.0	-
MOSS - W.H.						
No Treatment	-	4840.0	-	6378.0	-	6560.0
Slashburned	-	-	-	-	-	-
Piled & Burned	-	-	-	4220.0	-	5644.0
Total	-	4840.0	-	10598.0	-	12204.0
SWORDFERN - W.R.C.						
No Treatment	-	-	1930.0	-	-	-
Slashburned	-	-	2180.0	883.0	-	195.0
Piled & Burned	-	1073.0	1933.0	240.0	-	-
Total	-	1073.0	6043.0	1123.0	-	195.0

summation of all age classes was the only valid means of comparison.

The first and most apparent characteristic is the high degree of variation in trees per acre for western hemlock, western redcedar, and Douglas-fir. This is largely the result of the sampling method and to a lesser extent the summation of age classes. Since the sampling was carried out on large, selectively located plots, errors due to clumping of western hemlock regeneration and uneven distribution of other coniferous species are likely. In the case of western hemlock, the clumped pattern is very noticeable in the field and follows a negative binomial distribution (Smith and Ker 1957). MacBean (1941) found dense bodies of slash and thick ground-cover important factors in restricting seedling establishment. Accordingly, any sampling method that uses a small number of large plots will not sample enough of the variation to accurately estimate the number of trees per acre or their spatial distribution. Therefore, a large within-plot standard deviation is incurred, as the plot encompasses varying distributions of seedbeds and types of seedbeds within a large plot area.

Although statistical analysis is difficult due to the large standard deviation, trends are noticeable between association and treatment and deserve further analysis to determine if there are significant differences. In order to analyze the relationships, analysis of covariance was initially employed, but analysis of variance was chosen for the final analysis of the data (Wine 1964).

The analysis of covariance was initially used rather than an analysis of variance because of possible effects age could have on the results since the age of each stand was not held constant. By means of an analysis of covariance, the effect of age was removed from the other variables and the means adjusted accordingly. However upon examining the regression equations obtained from the analysis of covariance, it was found that age contributed little to the variation in number of trees per acre. Therefore, analysis of variance would produce as adequate results as analysis of covariance. Consequently, analysis of variance was used in the final analysis of the data.

The following analysis of variance table was constructed to analyze the results:

Source of Variation	Degrees of Freedom
Associations	2
Treatments within associations	5
Error	42
TOTAL	49

This table corresponds to the nested design (Hicks 1964). A nested design was used rather than a two-way classification because a nested design allows an unequal number of observations to occur within the sources of variation. A two-way classification loses orthogonality if an unequal number of observations is present (Hicks 1964). Also in the nested design, the number of levels of the nested factor i.e. treatment, need not be the same for all levels of the other factor i.e. association. This is the case in this experiment, since no slashburned plots exist for the moss - western hemlock association.

A Barlett's test of homogeneity of variance was carried out on the raw data to see if the variances were homogeneous, a basic assumption of analysis of variance. It was found that the variances were not homogeneous. Therefore, a logarithmic transformation was done and the transformed data tested for homogenity of the variance. The variances were then found to be homogeneous.

Duncan's multiple range test was employed to rank the means if they were found significant in the analysis of variance. The mean value is the number of trees per acre for that particular association and treatment. After all association and treatment means were ranked, the means were arranged diagramatically in declining order of their mean values from left to right. The grouping of mean values that are similar at the 5 percent level of significance is shown by an underline. The following symbols were used to indicate the association and treatment for the Duncan's multiple range tests:

S-NT	Salal - Douglas-fir association - no treatment

S-P&B	Salal - Douglas-fir association - piled & burned
S-S	Salal - Douglas-fir association - slashburned
M-NT	Moss - western hemlock association - no treatment
M-P&B	Moss - western hemlock association - piled & burned
Sw-NT	Swordfern - western redcedar association - no treatment
Sw-P&B	Swordfern - western redcedar association - piled & burned
Sw-S	Swordfern - western redcedar association - slashburned

1) <u>Western hemlock</u>: The analysis of variance indicates that a highly significant difference in mean number of trees per acre exists for treatments within an association with an F-value of 6.43 (Table III - 1 in Appendix III). No significant difference was found to exist between individual associations. In other words, the effect of treatment coupled with association was more important in explaining the differences in number of trees per acre than were associations alone. Duncan's multiple range test shows the following relations among treatments within an association for western hemlock:

S-S	Sw-S	Sw-P&B	Sw-NT	M-P&B	S-NT	S-P&B	M-NT
306.1	343.2	577.2	900.5	2624.2	3257.6	3832.6	4864.1

The salal - Douglas-fir association - slashburned and swordfern - western redcedar association - slashburned and piled and burned were significantly different from the other groups, except for the swordfern - western redcedar association - no treatment, which was not significantly different from either group. The S-S, Sw-S, and Sw-P&B also contain the least number of trees per acre. Consequently, it is evident that both slashburning and the swordfern - western redcedar association have a noticeable effect on western hemlock. Slashburning undoubtedly removes the much-needed organic matter and decaying wood that is important to the establishment of western hemlock. The removal of organic matter and decaying wood also alters the moisture and nutrient status of the upper soil layers. The same is true for the swordfern - western redcedar association, where rapid mineralization reduces the organic matter quickly. The other group consists of the salal - Douglas-fir and moss - western hemlock associations where the slash was either piled and burned or had no treatment. This group contained the highest number of western hemlock trees per acre. Here the abundance of organic matter and decaying wood accounted for the large amount of western hemlock. This same trend is illustrated for the number of established 2) western hemlock per acre. Table III - 8 indicates that treatments within associations is highly significant again. The following, Duncan's multiple range test, illustrate this analogous trend:

---

2) One foot or greater in height

Sw-P&B	S-S	Sw-S	Sw-NT	M-P&B	S-NT	S-P&B	M-NT
98.8	140.1	175.1	380.5	1809.7	2340.5	3038.1	3429.3

2) Western redcedar: The analysis of variance indicates that treatments within associations is highly significant with a value of F = 5.34 (Table III - 2). Associations alone were not significant. Duncan's multiple range test exhibits the relation among treatments within associations for western redcedar:

S-S	Sw-S	Sw-P&B	M-NT	S-NT	S-P&B	M-P&B	Sw-NT
2.9	98.9	101.2	399.2	530.2	557.9	586.4	1030.6

Western redcedar, as stated earlier, thrives well on habitats that are moist and supply an abundant source of nutrients. After clearcutting, these habitats are usually found in moist microdepressions created during the logging operation in the salal - Dougals-fir association and moss - western hemlock association. However, because of the higher moisture status of the soils in the swordfern - western redcedar association, these habitats are more universal and are not always confined to microdepressions. Statistically, western redcedar does not appear to have a preference as far as germination is concerned. The Duncan's multiple range test shows that there are no significant differences between all treatment and association combinations except for the salal - Douglas-fir association - slashburned which had the lowest number of western redcedar trees per acre. Although the mean number of trees per acre for western redcedar is not significantly different, the trend is an increasing number of trees per acre on the salal - Douglas-fir and moss - western hemlock associations that have not been exposed to slashburning. This is further illustrated when examining the number of established western redcedar trees per acre. The analysis of variance in Table III - 9 indicates that the means for treatments within associations are significant at the 1 percent level. The following Duncan's multiple range test illustrates the relationships among means:

S-S	Sw-P&B	Sw-S	Sw-NT	M-NT	S-NT	M-P&B	S-P&B
0.0	5.8	14.2	110.5	220.2	255.8	403.4	422.6

Established western redcedar exhibits two definite groups, those within the swordfern - western redcedar association except for no treatment and the salal - Douglas-fir association - slashburned, and the remaining salal - Douglas-fir and moss - western hemlock associations that have either been piled and burned or had no treatment. It is felt that this is due partially to the occurrence of advanced regeneration of western redcedar on areas that have not been heavily disturbed. But more likely an important factor is the lack of competition from deciduous trees and herbaceous plants in the salal - Douglas-fir and moss - western hemlock associations. In the swordfern - western redcedar association, the competition is intense.

3) Douglas-fir: The analysis of variance Table III - 3 denotes that there is a significant difference between means at the 1 percent level for treatments within associations. The F-value is 3.58. The Duncan's multiple range test shows the following relationships among means:

Sw-NT	S-S	M-P&B	M-NT	Sw-S	Sw-P&B	S-P&B	S-NT
0.0	7.1	18.7	30.4	47.2	137.2	139.6	367.8

The salal - Douglas-fir association - no treatment was found to be significantly different from the swordfern - western redcedar association - no treatment, salal - Douglas-fir association - slashburned, moss - western hemlock association - piled and burned, and moss - western hemlock association - no treatment. The same is true for the number of established Douglas-fir trees per acre as the following Duncan's multiple range test indicates:

Sw-NT	S-S	M-P&B	Sw-S	M-NT	Sw-P&B	S-P&B	S-NT
0.0	4.5	16.9	26.7	28.5	42.3	115.9	300.5
———	———	———	———	———	———	———	
			———	———	———	———	———

The data indicates that Douglas-fir has no preference with repect to association or treatment, except for salal - Douglas-fir association - no treatment which totaled the highest number of trees per acre. This could be caused by a coincidence with an excellent seed year, distance to seed source or some other type of extraneous factor. This observation is contrary to that of Bever (1954) who observed an increased number of Douglas-fir seedlings on areas that had been slashburned. However, Vogl and Ryder (1969) found a significant decrease in Douglas-fir stocking on burned sites, while Lavender *et al.* (1956) found stocking of Douglas-fir on unburned plots exceeded that on burned plots. Consequently, many opinions exist. Undoubtedly this is caused by the many variations in sites, degrees of disturbance, and other important environmental controls that differ among various studies. In any case, the data in this study indicate that supplemental planting of Douglas-fir is needed in all associations and treatments to achieve an adequate stocking level of Douglas-fir.

4) Coniferous trees: This category includes mainly western hemlock, western redcedar, and Douglas-fir. The analysis of variance Table III - 4 shows a highly significant value of F = 7.42. Duncan's multiple range test shows the relations among means:

S-S	Sw-S	Sw-P&B	Sw-NT	M-P&B	S-NT	S-P&B	M-NT
373.1	627.9	942.5	1930.6	3336.6	4423.8	4701.1	5993.8
———	———	———	———				
			———	———	———	———	———

It is evident from the Duncan's multiple range tests that coniferous trees (as a category) follow a pattern identical to that of western hemlock. This results from western hemlock making up the major portion of the coniferous trees, while other tree species only add a small proportion. Consequently, the response of coniferous trees is identical to that of western hemlock and the effect of the other tree species is not shown.

5) Total number of naturally regenerated trees: This group contains all deciduous and coniferous trees minus the planted stock (Douglas-fir). The analysis of variance Table III - 5

expresses a significant difference for treatments within associations at the 1 percent level. Associations themselves demonstrated no significant difference. The following Duncan's multiple range test expresses the relationship among treatments within associations:

S-S	Sw-S	M-P&B	S-NT	Sw-NT	S-P&B	M-NT	Sw-P&B
941.7	2867.5	4846.2	5228.8	5841.2	6050.6	7571.8	8081.6

Three distinct groups are visible. Salal - Douglas-fir association - slashburned, which had the lowest number of trees per acre, swordfern - western redcedar association - slashburned, and together moss - western hemlock association - no treatment and swordfern - western redcedar association - piled and burned. It is clear that the slashburning had a definite effect on regeneration of both coniferous and deciduous trees in the salal - Douglas-fir association. This is not true for the swordfern - western redcedar association that was slashburned. The effect of slashburning was not as great in this association because of the rapid colonization by deciduous trees largely concealing the influence of slashburning on coniferous regeneration. The preceding tests indicate that slashburning reduces the number of trees per acre in all associations, although it is not always a statistically significant reduction. The effect of slashburning was not as severe in the swordfern - western redcedar association as in the salal - Douglas-fir association because of the superior moisture conditions and possible increase in the nutrient supply from lateral seepage. In a greenhouse study, Jablanczy (1964) found that the swordfern - western redcedar association could benefit from slashburning by accelerating mineralization. Slashburning in this association caused the least damage. The salal - Douglas-fir association suffered the most because there is no supplemental nutrient supply from seepage water and much of the nutrient supply must normally be derived from the humus, and the latter may be partially or completely destroyed by burning. The reason for the moss - western hemlock association - no treatment and swordfern - western redcedar association - piled and burned containing the highest number of trees per acre is directly opposite. The major portion of the moss - western hemlock association - no treatment is made up of coniferous trees, which was shown previously, while the swordfern - western redcedar association - piled and burned is composed largely of deciduous trees, and coniferous trees only make up a small percentage of the total number. This will be further illustrated in the following section.

6) <u>Deciduous trees</u>: The analysis of variance Table III-6 indicates that associations are significantly different at the 1 percent level with an F-value of 12.52. Treatments within associations exhibited no significant difference, unlike that of the other tree species. Duncan's multiple range test expresses the following relationships among associations:

S	M	Sw
566.8	1392.8	3503.5
———	———	
	———	———

The salal - Douglas-fir association and swordfern - western redcedar association were significantly different from each other. The moss - western hemlock association fell in between these two associations. This conclusion is what would be expected, since the deciduous trees seem to respond to changes in moisture status of the soil. Therefore, because of the high moisture status of the swordfern - western redcedar association, it contains a higher number of deciduous trees per acre than the salal - Douglas fir association which has a low moisture status most of the year. The moss - western hemlock association is intermediate in moisture status between the other two associations.

In general, the Duncan's multiple range tests indicate that all coniferous tree species prefer areas that have been either piled and burned or had no treatment in the salal - Douglas-fir and moss - western hemlock associations. Slashburning reduces the number of trees present. The swordfern - western redcedar association probably presents just as good an environment for regeneration, but early invasion of the site by deciduous trees, as well as herbaceous plants, limits the establishment of coniferous trees. Figure 24 illustrates diagramatically the role of western hemlock, western redcedar, Douglas-fir, coniferous trees, and deciduous trees in each of the associations studied. The behavior of coniferous and deciduous trees in each individual association is further illustrated in Figures 25, 26, and 27. The number of trees per acre for coniferous and deciduous trees by one-foot height classes is given. An attempt was made to stratify the three associations by age class and treatment to add more comparability to the graphs. This was accomplished for salal - Douglas-fir and moss - western hemlock associations. However, since no comparable age class or treatment existed for the swordfern - western redcedar association, the closest combination was chosen. This was age class 5 - 7 and treatment piled and burned. It is felt that this should provide an acceptable comparison since Duncan's multiple range tests showed that the number of trees per acre did not vary significantly between no treatment and piled and burned.

The comparison between graphs indicates that the number of deciduous trees increases rapidly from the salal -

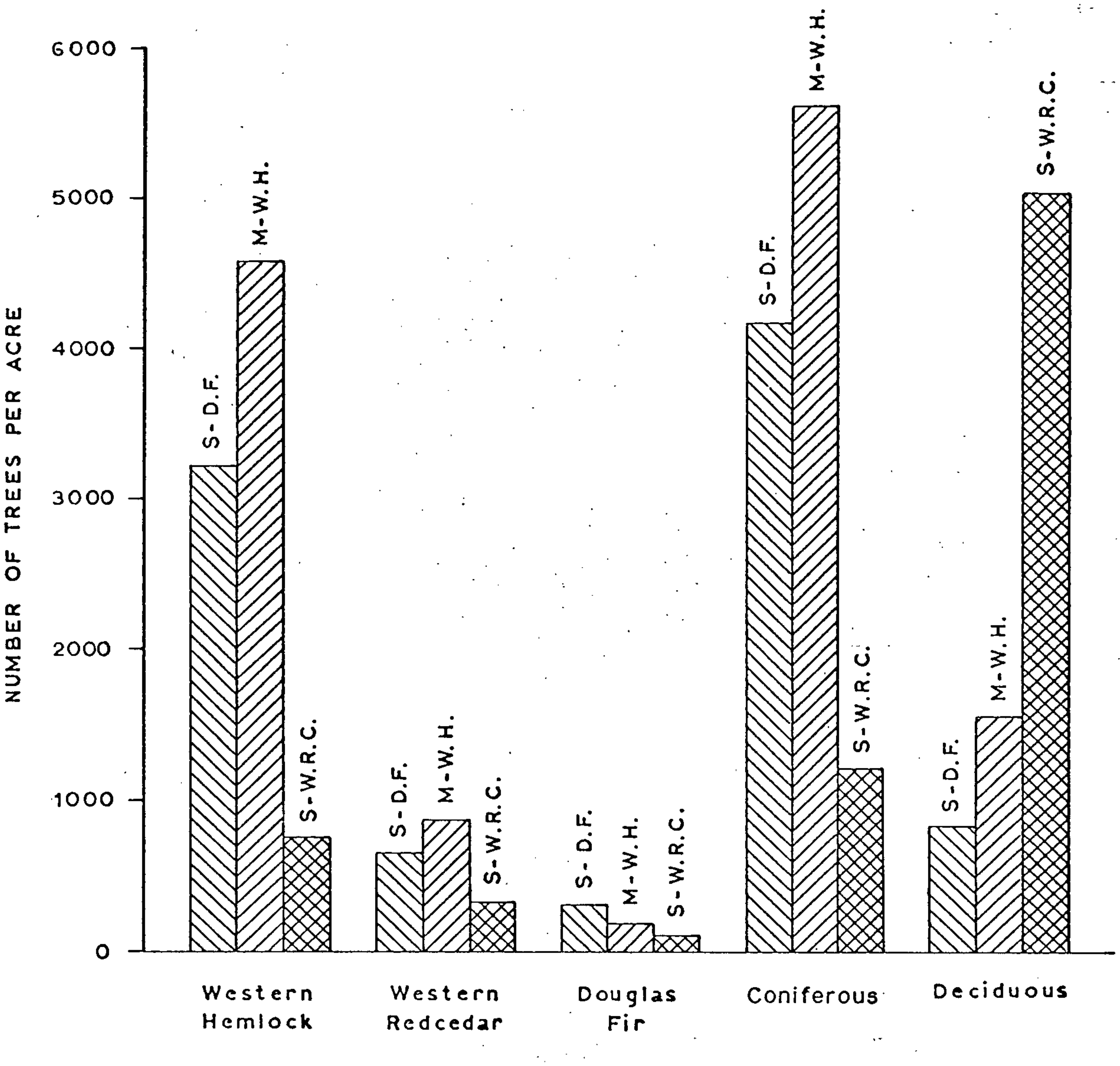

Figure 24 Number of trees per acre of three tree species and two groups of species for individual associations

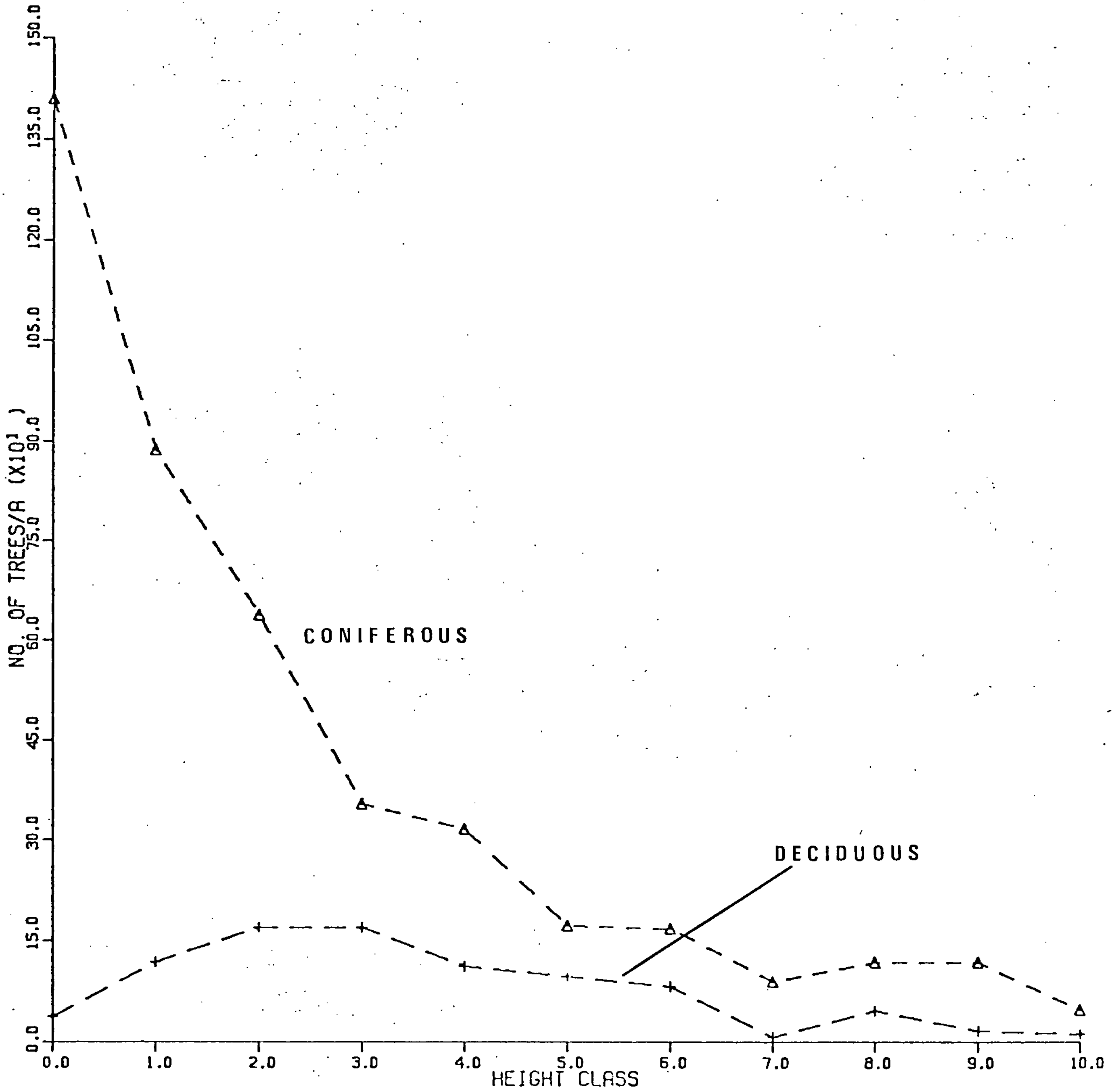

FIGURE 25 The number of trees per acre by height class of coniferous and deciduous trees for the salal - Douglas-fir association, age class 8 - 10, and no treatment.

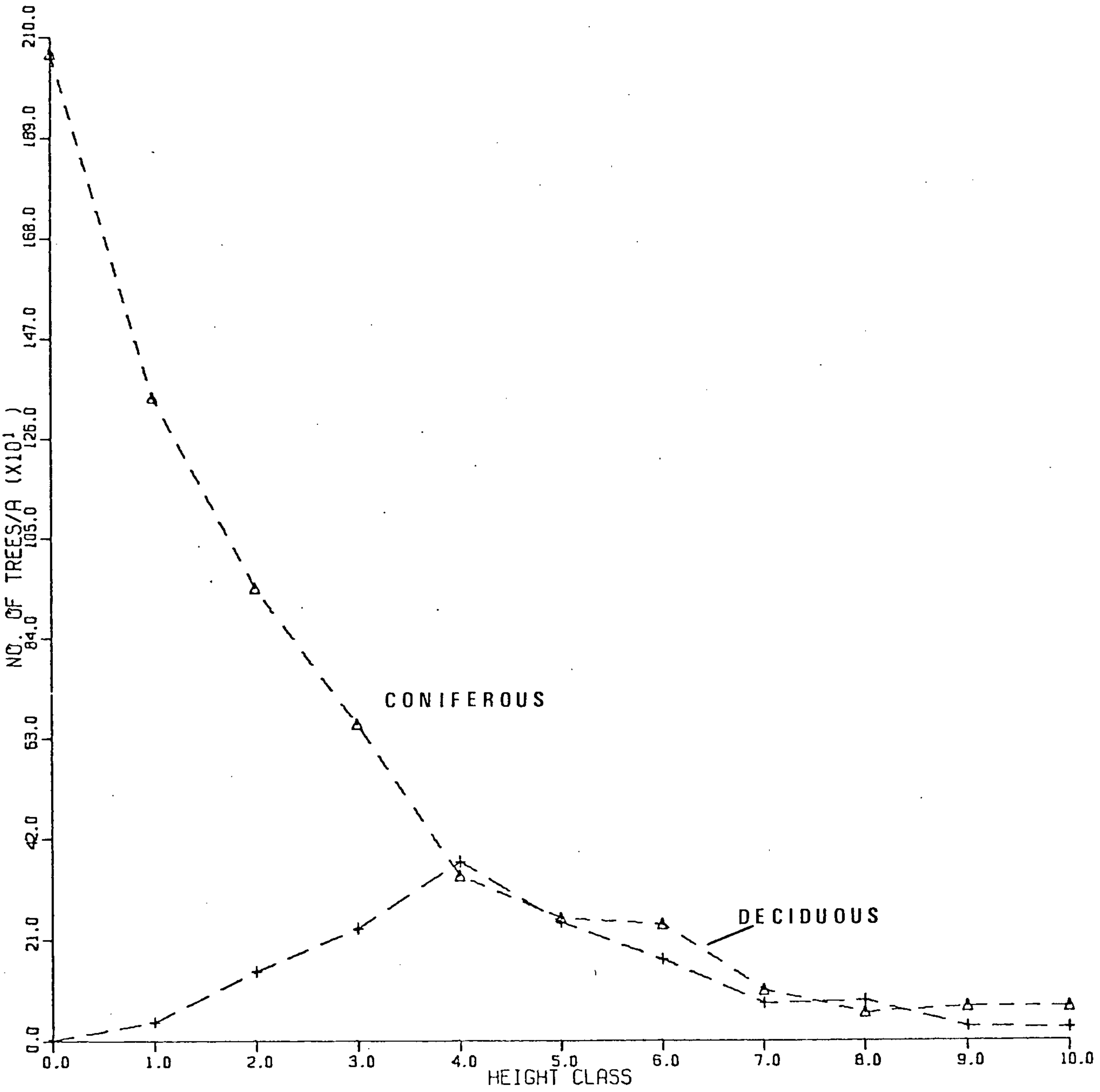

FIGURE 26 The number of trees per acre by height class of coniferous and deciduous trees for the moss - western hemlock association, age class 8 - 10, and no treatment.

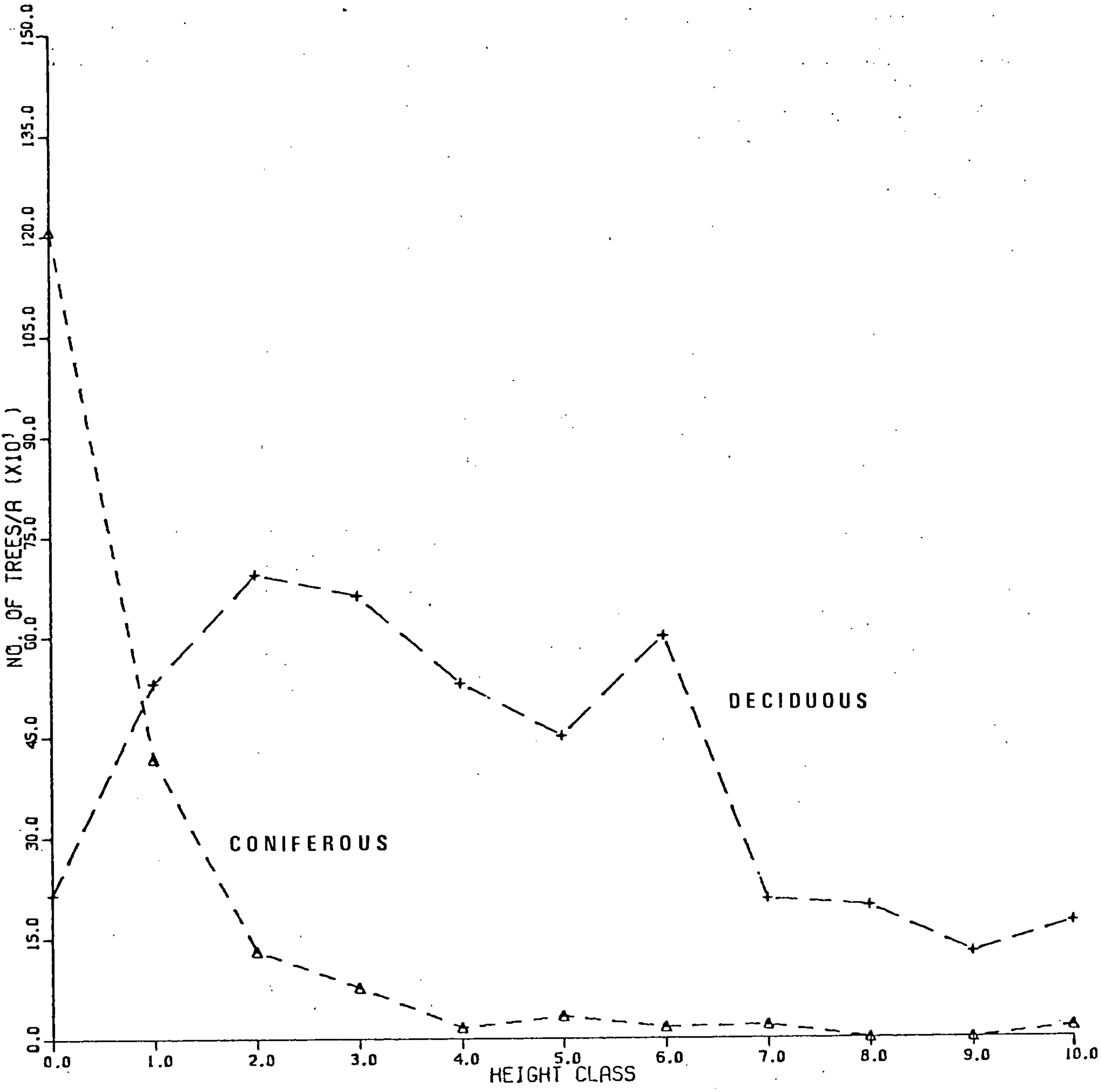

FIGURE 27 The number of trees per acre by height class of coniferous and deciduous trees for the swordfern - western redcedar association, age class 5 - 7, and piled and burned.

Douglas-fir association to the swordfern - western redcedar association. The number of coniferous trees per acre is highest for the moss - western hemlock association and decreases toward each of other associations, especially the swordfern - western redcedar association.

Within each association there is a similar trend, as the height of the trees increased, the number of coniferous trees per acre decreased, while the number of deciduous trees per acre increased. If height is considered an approximate index of tree age, then as height increases so does age. With this analogy in mind, it is apparent that the number of coniferous trees per acre rapidly decreases with age. The rapid mortality in the early stages of development is mainly due to mortality of the young seedlings resulting from factors such as drought, exposure, rodents, and other environmental conditions. In the swordfern - western redcedar association (Fig. 27), this process is accelerated because of competition from a heavy cover of deciduous trees. The steepness of the curve for coniferous trees and the low constant level reached for the swordfern - western redcedar association exhibits the competition effect.

The number of deciduous trees per acre increases to a peak with height (age) in each association then begins to drop off. The regeneration of deciduous trees is controlled by the removal of the canopy and initial regeneration of deciduous trees occurs directly after the canopy is removed, then decreases to a very slow rate. On the graphs, this is shown by the peak in the deciduous trees curve which is considered close to the initial date of establishment. On the left the more recent regeneration is encountered.

The preference of coniferous trees for areas that have been either piled and burned or had no treatment is believed to be caused primarily by seedbed conditons. Isaac (1943) felt this was due to more available seed in the duff that was not destroyed by burning rather than the superior seedbed conditions on unburned areas. Mueller-Dombois (1960) also found this to be true. The moisture-holding capacity of a compact organic layer is also much greater than the mineral soil, thereby preventing drying out of the seed (Isaac and Hopkins 1937). Hatch and Lotan (1969) observed better Douglas-fir regeneration on undisturbed seedbeds and attributed it to the conservation of soil moisture, the reduction in herbaceous vegetation, and the protection of seed from rodents and birds.

Shade is another important factor in the early establishment of coniferous trees. Slash left after the logging operation provides beneficial shade for seedling establishment and survival. The diffuse light and shading from direct sunlight reduces seedling mortality caused by moisture loss from the surface layers, and prevents direct heat injury to the seedlings. Minore (1971) and Strothman (1972) both found that dead shade derived from slash, benefited Douglas-fir seedlings. Shade derived from living brush species complicates the shading effect, with competition to the regeneration for available moisture and nutrients.

Slashburning may affect a site in many ways. The main factors affecting the regeneration of coniferous trees which may be modified by slashburning are soil, temperature, air temperature at the soil surface, soil moisture-holding capacity, nutrient availability, amount of mycorrhizae present in the soil, and soil pH. There is much controversy and conflicting information as to whether these factors are beneficial or not to the regeneration of coniferous trees. In any case, the results of this study indicate that in all associations, slashburning decreased the number of trees per acre present for all tree species. Although the areas that were piled and burned or had no treatment contained an adequate number of coniferous trees per acre, western hemlock made up the major portion of the regeneration. Furthermore, most of the regeneration was spotty and not well distributed.

Since western hemlock was the most abundant conifer in all associations and treatments, environmental factors had the least effect on it. Western hemlock's prolific seed-bearing habits, wind disseminated seed, ability to withstand a wide variety of seedbed conditions, and its capability to exist under a forest canopy for long periods of time and grow as advanced regeneration after the canopy is opened, accounted for its abundance in all associations. Douglas-fir, on the other hand, bears seed crops at very sporadic intervals, usually 5 to 7 years between heavy crops (Fowells 1965). The seed is also relatively large and is freely eaten by rodents and birds. These factors limit the amount of seed available for germination and establishment. The relative shade intolerance of this species also prevents it from becoming established as advanced regeneration. Western redcedar, even though it is a prolific seed producer and rodent depredations are minor, has a very low regeneration success rate. Advanced regeneration of western redcedar appeared to be an important means of regeneration in areas receiving no treatment. An investigation of the correlation matrix in Appendix IV indicates that the size of the setting and distance to seed source had correlation coefficients of -0.23305 and -0.28355, respectively, for western redcedar. These are relatively high compared to the remaining environmental parameters sampled for western redcedar. Isaac (1930) in his seed release studies noted a dispersion distance of 400 feet when western redcedar seed was released from an elevation of 150 feet. Therefore in large clearcuts, distance from seed source is a limiting factor as it is for western hemlock and Douglas-fir. However, the seed flight of these two species is much greater as compared with that of western redcedar. In addition, the amount of adjacent western redcedar seed source was limited in most cases to approximately 5 - 10 percent of the total. Consequently, although western redcedar is a prolific seed producer, not many seed trees were present to produce seed.

Western redcedar's rich edaphic requirements are probably the greatest limiting factor to its establishment. Unlike western hemlock it cannot withstand a wide variety of nutrient and moisture conditions within the seedbed environment.

Many other environmental factors such as slope, aspect, position on slope, and altitude can cause localized variations in the number of seedlings per acre and variations in the results obtained from different studies. Most observations and attempts at trying to define the complex natural factors affecting regeneration have had only limited success. The wide sources of variation and complex interrelationships cause problems in analysis of the individual factors. If the factors are subjected to a multiple regression analysis, the amount of variation accounted for can change with different combinations of variables and certain variables that cannot be quantified or measured easily are left out, although they could contribute to a major portion of the variation. The results of one study may not be directly extrapolated to other areas, since the degree in which one factor is important can change from area to area.

Therefore, because of the problems and inaccuracies involved in interpreting a complex analysis of the natural factors affecting regeneration, only a simple correlation matrix is presented in Appendix IV for the correlations observed in this study between the number of trees per acre for the individual tree species and the environmental factors measured in the field. No attempt will be made to analyze each factor. A Summary Table 7 of the correlation coefficients (r) with a value greater than .30 for the coniferous tree species and deciduous tree groups will be presented. These factors are considered relatively important in determining the regeneration potential of a logged opening.

One environmental parameter, namely, distance to the south edge, exhibited a relatively high negative correlation with western redcedar (-.34609), western hemlock (-.41738) and Douglas-fir (-.29726). The distance to the south edge represents a relative measurement of the time a site is exposed to bright sunlight. In other words, the smaller the setting or more northernly the exposure, the less time direct sunlight will be on the site. The negative correlation coefficients seemed to indicate that tree regeneration prefers to be shaded during some part of day.

2. Seedbed Characteristics of Coniferous Trees

In all associations the three coniferous species investigated, *Tsuga heterophlla* (western hemlock), *Thuja*

Table 7 Factors with a correlation coefficient of ± .30 or greater

WESTERN HEMLOCK	WESTERN REDCEDAR	DOUGLAS-FIR	DECIDUOUS
Altitude (.3396)[*]	Distance to south edge (-.3461)	Altitude (.6533)	Position on slope (.4712)
Age of stand (.4140)		Position on slope (-.4281)	Age of stand (-.3916)
Distance to seed source (-.3982)		Setting size (-.4015)	Depth of organic matter (-.3565)
Distance to south edge (-.4174)		% of douglas-fir seed source (.5033)	% of plot-rock (-.3018)
% of plot-slash (.3698)		% of western hemlock seed source (-.4601)	% of plot-slash (-.4378)
			% of plot mineral soil (.6381)

[*] Correlation coefficient

plicata (western redcedar), and *Pseudotsuga menziesii* (Douglas-fir), all preferred mineral soil over other types of seedbeds for germination (Figs. 28 and 29). With the exception of Douglas-fir, survival was extremely poor.

Western hemlock survived best on decaying wood. The decaying wood substratum met western hemlock's low nutritional requirement and furnished an ammonium source of nitrogen (Krajina 1969). The ability of decaying wood to conserve moisture is also important to western hemlock's survival. Osborn (1968) maintained that mineral soil provides an adequate seedbed if there is no competition and soil moisture is good. Under decaying wood conditions, western hemlock grows best because its competitors will not grow on this substratum. If this substratum is not available, such as after slashburning, western hemlock is greatly decreased in numbers. In some cases, western hemlock appeared to be growing very well on mineral soil, but further examination indicated a buried decaying wood source was present and thus sustaining the hemlock seedling (Fig. 31). In most cases, western hemlock occurred in clumps rather than being randomly distributed (Fig. 33). This growth pattern follows the negative binomial or clumped distribution that Smith and Ker (1957) noted for this species. Although the plots indicated the area had an ample supply to western hemlock regeneration, the amount of area occupied by trees was low due to the clumpy nature of the regeneration. The clumpy

FIGURE 28 Western redcedar and western hemlock seedlings germinating on mineral soil seedbed.

FIGURE 29 Douglas-fir seedling germinating on typical mineral soil seedbed.

behavior is brought about by unsatisfactory seedbed conditions and conditioning of the microsite under an established hemlock to favor its further regeneration (Osborn 1968).

Another important factor restricting regeneration, not only of western hemlock but of all species, was the effect of competing vegetation. In the study area, *Pteridium aquilinum* (bracken fern) was the major competitor. Besides heavy canopy and root competition, the matting of the fronds on the ground is particularly destructive to regenerating trees (Fig. 30).

Western redcedar survived best on rapidly decomposing organic matter in shaded moist pockets. Western redcedar was not found on decaying wood or thick organic matter at all. Its rich edaphic requirements restricted it to habitats rich in nutrients and where nitrification provided a readily available source of nitrates (Krajina 1969).

On areas that were not slashburned, advanced regeneration was a prevalent means of western redcedar establishment. After logging, adventitious roots can develop on limbs that have been buried or covered with soil during the logging operation (Fig. 32). These limbs then have the ability to become erect self-sustaining trees. Schmidt (1955) observed this type of cedar regeneration in old growth coastal forests. Western redcedar constituted a very small portion of the regenerating stand and very few made it to the four foot height class in any of the associations, as can

FIGURE 30 Effectiveness of *Pteridium aquilinum* (bracken fern) fronds in restricting tree regeneration.

FIGURE 31 *Tsuga heterophylla* growing on a buried source of decaying wood.


Compliments of your friendly LINK HARDWARE STORE

FIGURE 32 Adventitious roots forming on a western redcedar branch following logging.

FIGURE 33 Typical clumped habit of western hemlock regeneration following logging.

be seen from the plot data in Appendix I, Part III. This could be attributed to a high mortality rate and a slow growth rate. Western redcedar did not assume a clumped pattern as did western hemlock, but grew as widely scattered individuals.

In the summer of 1974, 181 naturally regenerating Douglas-fir trees were investigated in terms of the type of substratum they were growing on. The results are presented below:

Table 8 Number of Douglas-fir seedlings on three types of seedbeds

ASSOCIATION	MINERAL SOIL	DECAYING WOOD	ORGANIC MATTER	TOTAL
Salal - D.F.	65	15	1	81
% of total	80	19	1	45
Moss - W.H.	54	14	3	71
% of total	76	20	4	39
Swordfern - W.R.C.	27	1	1	29
% of total	93	3	3	16
TOTAL	146	30	5	181
% of total	81	17	3	

Germination on mineral soil was the highest, followed by decaying wood and organic matter, respectively. The fact that Douglas-fir germinates best on mineral soil is widely accepted (Isaac 1939, Garman 1955, Fowells 1965). Nevertheless, many young Douglas-fir seedlings were found growing vigorously on decaying wood (Fig. 34). In many cases, it was observed that due to the logging operation mineral soil may have been thrown on top of logs providing a suitable seedbed for Douglas-fir germination. The decaying wood below also provided available moisture. Furthermore, if the seedlings were able to extend their rooting systems either through the decaying wood or around it in order to reach mineral soil, they were then capable of sustaining themselves and growing as well as seedlings established on mineral soil.

The major factors controlling germination appeared to be within-site variations (microsite) resulting from the logging operation. The number of microsites created that are available for germination depends on the logging method and treatment thereafter. Important micro-environmental factors were the amount of shade, soil surface temperatures, available soil surface moisture, type of seedbed, and speed in which the organic layers decomposed. Macro-environmental controls such as local climate, elevation, landform, and depth of parent material less closely control the germination process. In other words, unsatisfactory seedbed conditions such as dense shade, heavy accumulations of undecaying slash,

FIGURE 34 *Pseudotsuga menziesii* (Douglas-fir) growing well on decaying wood of downed western redcedar tree.

thick layers of organic matter and a desiccated soil surface condition were the primary factors affecting seed germination. While the above factors are important in controlling seed germination, the type of seed source and distance to the seed source are important in determining the amount of seed available. Loss of seed due to rodents and birds could be important but were not identified in this study.

VI. SUMMARY AND CONCLUSION

The results of this study have shown that the forest associations in their initial stages of secondary succession are identifiable in the field although vegetation indicators alone are not enough and must be coupled with physiographic information. The knowledge of the vegetative relationships that exists in the individual forest associations is important to the proper "ecological" management of a site. Silvicultural prescriptions should be developed for each association. Information on the ecology of the different tree species and the effect of different treatments on each association should be the basis for the silvicultural prescriptions and choice of the most ecologically suitable species for planting. Furthermore, certain associations may not require planting and natural regeneration may be safely relied on to stock the site, providing environmental factors such as seed years, distance to seed source, and type of seed source are favorable. In other words, the allocation of silvicultural prescriptions requires not merely identification of the forest association, but realization of the complex interacting environmental factors on planted and natural regeneration. These should be evaluated before logging as well as after, so a suitable environment can be created for each association. Since man is an active environmental factor, his activities are controlling factors and affect the development of the forest. Therefore, his activities should be guided by the natural controlling factors of the site as much as possible.

The differentiation between associations is distinct between the extremes, namely the salal - Douglas-fir association and swordfern - western redcedar association. The distinction between these two associations could be made by vegetative characteristics alone. The swordfern - western redcedar association possesses a highly diverse group of species indicating its high moisture and nutrient regimes. Structurally, both the shrub and especially the herb strata are very well developed. The moss layer is relatively poorly developed. The salal - Douglas-fir association, on the other hand, has very few species. The shrub and moss strata are well-developed, but the herb stratum is almost lacking. Physiographically, the swordfern - western redcedar association occupies lower slopes and depressions, whereas the salal - Douglas-fir association occupies upper slopes and ridge tops. Unfortunately, the distinction between the salal - Douglas-fir association and the moss - western hemlock association is not clear. Vegetatively, no differences arise in species composition. However, the shrub stratum of the salal -

Douglas-fir association contains more *Gaultheria shallon*, while the moss stratum of the moss - western hemlock association is better developed and the B_2 layer has a higher presence and significance of *Vaccinium alaskaense*. Unfortunately, these changes are slight to an untrained observer. The major means by which these two associations can be divided is by physiographic position and depth to an impervious layer. The salal - Douglas-fir association occupies the top of ridges or the upper slopes. The parent material usually is shallow ablation till over bedrock. The moss - western hemlock association invariably occurs on upper slopes on north-facing aspects and moves gradually down in slope position to the mid-slope position on south-facing aspects. However, on areas near the transition zone into the Coastal Western Hemlock wetter subzone, the increased rainfall causes the moss - western hemlock association to occupy flat areas on ridge tops where slight depressions exist. The moisture regime is slightly greater and the parent material is deeper in these depressions. Here, the salal - Douglas-fir association is found on adjacent rocky ridges or steep slopes with a shallow soil.

On the cutover associations, a classification that takes into consideration only the presence or the absence of species is not sufficient to classify the various associations after logging. Mueller-Dombois (1960) also noted this for the Coastal Douglas-fir Zone. This is brought about by an increase in favorable habitats of the individual species and invasion of the site by short-lived pioneer vegetation responding only to increased light. These tall pioneer herbs have no indicative significance. Very few of the truly indicative forest species are destroyed by logging. Only after a severe slashburn are they reduced to a negligible amount and further covered by weed vegetation.

The creation of microsites or microdepressions is a common phenomenon after logging and accounts for much of the variation between homogeneous associations.

Structurally, all associations contained the same total average cover. All associations were quickly invaded by tall herbs such as *Epilobium angustifolium* and *Anaphalis margaritacea*, although the salal - Douglas-fir and moss - western hemlock associations were invaded to a lesser extent. The shrub layers were all well-developed. The shrub layer of the swordfern - western redcedar association consisted of mainly *Rubus spectabilis*, whereas the salal - Douglas-fir and moss - western hemlock association's shrub layers were dominated by *Gaultheria shallon*. The herb layer reacted differently. In the rich swordfern - western redcedar association, the herb layer was well developed. But in the salal - Douglas-fir and moss - western hemlock associations, the low thick cover of *Gaultheria shallon* largely restricted the herb layer to tall weedy invading herbs rather than low growing herbs. The moss layer was just the opposite. In the swordfern - western redcedar association it was poorly developed, while the salal - Douglas-fir and moss - western hemlock associations had well-developed moss layers. It was found that the degree and type of disturbance, extent of microsites created, spacing of planted trees, age, and parent material brought about changes in both structure and species composition in each association.

Douglas-fir, western hemlock, and western redcedar all germinated best on mineral soil seedbeds, but survival was very poor, except for Douglas-fir. Western hemlock grew best on decaying wood, while western redcedar preferred rapidly decaying organic matter in moist pockets. Advanced regeneration was an important means of regeneration of western hemlock and western redcedar. Douglas-fir survived well on mineral soil and was not affected by drought as much as the other two species. Douglas-fir was also found growing well on decaying wood.

The results of the statistical analysis indicate that treatments within associations had a definite effect on the number and type of coniferous trees per acre. Associations alone were not significant. The number of deciduous trees per acre, on the other hand, were less affected by the type of treatment and responded more to the association type, with the swordfern - western redcedar association being the preferred type. The salal - Douglas-fir association - slashburned and the swordfern - western redcedar association - slashburned or piled and burned significantly reduced the number of trees per acre of Douglas-fir, western hemlock, and western redcedar in most cases. Although not statistically significant, slashburning did not affect the swordfern - western redcedar association as much as the salal - Douglas-fir association. The preference of coniferous trees for areas that have had no treatment is presumed to be caused mainly by a higher amount of available seed present that was not destroyed by burning, a greater variety of seedbed types favorable to all species, and shading of slash. All coniferous tree species preferred areas that were either piled and burned or had no treatment in the salal - Douglas-fir and moss - western hemlock associations. The swordfern - western redcedar association undoubtedly provided an equally suitable habitat to regeneration, but early invasion of this rich habitat by deciduous trees and herbaceous plants, limits the establishment of coniferous trees.

The distribution of western hemlock followed a negative binomial or clumped distribution and in most cases the regeneration was not well distributed over the logged areas. The indications of this study are that supplemental planting of Douglas-fir would be needed to obtain a satisfactory number of Douglas-fir trees and an even distribution of them on all associations, although the salal - Douglas-fir association provided the best habitat.

Graphs, comparing the number of trees per acre versus height class (age), indicate that as height class increases the number of coniferous trees per acre rapidly decreases, while the number of deciduous trees per acre increases. The reduction in the number of coniferous trees per acre was the greatest in the swordfern - western redcedar association, where intense competition from deciduous trees and herbaceous plants restricted establishment.

The many complex interrelated environmental factors are hard to analyze by statistical means because of a multitude of localized variations and the number of available observations. Consequently, only the correlation coefficients of the more important factors affecting each tree species is presented in Table 7, whereas a complete list is contained in Appendix IV.

VII. LITERATURE CITED

Armstrong, J.E. 1957. Surficial geology of New Westminster map-area, British Columbia. Canada Dept. of Mines and Technical Surveys. Paper 57-5.

Bailey, A.W. 1966. Forest associations and secondary plant succession in the southern Oregon Coast Range. Ph.D. thesis. Oregon State University. 166 pp.

Bailey, A.W. and C.E. Poulton. 1968. Plant communities and environmental interrelationships in a portion of the Tillamook burn, northwestern Oregon. Ecology 49(1):1-12.

Becking, R.W. 1957. The Zürich-Montpellier school of Phytosociology. Bot. Rev. 23:411-488.

Bell, M.A.M. 1964. Phytocoenoses in the dry subzone of the Interior Western Hemlock zone of British Columbia. Ph.D. thesis. Dept. of Biol. and Botany, Univ. of British Columbia. 246 pp.

Bever, D.N. 1954. Evaluation of factors affecting natural reproduction of forest trees in central western Oregon. Oregon State Board of Forestry Res. Bull. 3.

Billings. W.D. 1952. The environmental complex in relation to plant growth and distribution. Quar. Rev. Biol. 27(3):251-265.

Braun-Blanquet, J. 1932. Plant sociology: the study of plant communities. Trans., revised and ed. by G.D. Fuller and M.S. Conrad). McGraw-Hill, New York. 439 pp.

________________. 1951. Pflanzensoziologie. 2 Aufl. Springer Verlag, wein.

Brayshaw, T.C. 1955. An ecological classification of the ponderosa pine stands in the southern interior of British Columbia. Ph.D. thesis. Dept. of Biol. and Botany, Univ. of British Columbia. 240 pp.

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

Coile, T.S. 1952. Soil and the growth of forests. Adv. Agron. 4:329-398.

Daubenmire, R.H. 1968. Plant communities: A textbook of synecology. Harper and Row, Publishers, New York. 300 pp.

Dyrness, C.T. 1965. The effects of logging and slashburning on understory vegetation in the H.J. Andrews Experimental Forest. U.S.D.A. Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Note. No. 31.

____________. 1973. Early stages of plant succession following logging and burning in the western Cascades of Oregon. Ecology 54(1):57-69.

Dyrness, C.T. and C.T. Youngberg. 1958. Soil-vegetation relationships in the central Oregon pumice region. First North Amer. Forest Soils Conf. pp. 57-66.

Eis, S. 1962. Statistical analysis of several methods for estimation of forest habitats and tree growth near Vancouver, B.C. Faculty of Forestry, Univ. of British Columbia. Forestry Bull. No. 4.

Fligg, D.M. 1960. Empirical Yield Tables. British Columbia Forest Service. Survey Note No. 6.

Fowells, H.A. 1965. Silvics of forest trees of the United States. U.S.D.A., Forest Service, Agr. Handbook No. 271.

Fulton, R.J. 1972. Landform classification. British Columbia Dept. of Agriculture. 8 p., Appendix, 6 pp., (Mimeo).

Garman, E.H. 1955. Regeneration problems and their silvicultural significance in the coastal forests of British Columbia. Dept. of Lands and Forests, British Columbia Forest Service. Tech. Publ. T. 41.

Hatch, C.R. and J.E. Lotan. 1969. Natural regeneration of Douglas-fir in central Montana. U.S.D.A. Forest Service. Intermountain Forest and Range Experiment Station. Res. Note INT-85.

Hicks, C.R. 1964. Fundamental concepts in the design of experiments. Holt, Rinehart and Winston, New York. 293 pp.

Isaac, L.A. 1930. Seed flight in the Douglas-fir Region. Jour. of Forestry. 28:492-499.

__________. 1939. Factors affecting establishment of Douglas-fir seedlings. U.S.D.A. Washington, D.C. Circular No. 486.

__________. 1940. Mortality of Douglas-fir seed trees on cutover land. U.S.D.A. Forest Service. Pacific Northwest Forest Exp. St. Res. Note 31.

Isaac, L.A. 1943. Reproductive habits of Douglas-fir. Charles Lathrop Pack For. Found., Washington, D.C. 107 pp.

Isaac, L.A. and H.G. Hopkins. 1937. The forest soil of the Douglas-fir regions and changes wrought upon it by logging and slashburning. Ecology 18(2):264-279.

Jablanczy, A. 1964. Influence of slashburning on the establishment and initial growth of seedlings of Douglas-fir, western hemlock and western redcedar. Ph.D. thesis. Dept. of Biol. and Botany, University of British Columbia. 194 pp.

Jenny, H. 1941. Factors of soil formation. McGraw-Hill Book Co., New York. 289 pp.

________. 1961. Derivations of state factor equations of soil and ecosystems. Soil Sci. Soc. Proc. 25:385-388.

Kalela, E.K. 1950. Manniloiden Ja Kuusikoiden Juurisuhteista I. (on the horizontal roots in pine and spruce Stand 1). Acta For. Fennica 57:7-79.

Kellman, M.C. 1969. Plant species interrelationships in a secondary succession in coastal British Columbia. Syesis 2:201-212.

Kendrew, W.G. and D. Kerr. 1955. The climate of British Columbia and the Yukon Territories. Dept. of Transport, Meteorological Div., Queen's Printer, Ottawa. pp. 1-222.

Klinka, K. 1972. Preliminary ecosystem map of the University of British Columbia Research Forest.

Kojima, S. 1972. Phytogeocoenoses of the Coastal Western Hemlock Zone in Strathcona Provincial Park, B.C., Canada. Dept. of Botany, U.B.C. Ph.D. thesis. 322 pp.

Köppen, W. 1936. Das geografische System der Klimate. Vol. 1, Part C.

Kowall, R. C. 1967. Soils and soil capability classification for forestry of the Mission Tree Farm. M.Sc. thesis. Dept. of Soil Science, Univ. of British Columbia. 106 pp.

Krajina, V.J. 1933. Die Pflanzengesellschaften des Mlynica-tales in den Vysoke tatry (Hohe tatra). Botan. Centralb. 50:774-957; 51:1-224.

____________. 1959. Bioclimatic zones in British Columbia. Univ. of British Columbia. Botanical Series No. 1:1-47.

Krajina, V.J. 1960. Can we find a common platform for the different schools of forest type classifications? Sylva Fenn. No. 105:50-55.

____________. 1965. Biogeoclimatic zones and biogeocoenoses of British Columbia. Ecol. of Western North America 1:1-17.

____________., Ed. 1969. Ecology of forest trees in British Columbia. Ecol. of Western North America 2(1):1-147.

Krajina, V.J. and R.H. Spilsbury. 1953. Forest associations on the east coast of Vancouver Island. Forestry Handbook for British Columbia. Univ. of British Columbia. pp. 142-145.

Kuramoto, R.T. 1965. Plant associations and succession in the vegetation of the sand dunes of Long Beach, Vancouver Island. M.Sc. thesis. Dept. of Biol. and Botany, Univ. of British Columbia. 87 pp.

Lavender, D.P. *et al.* 1956. Natural regeneration on staggered settings. Oregon State Board of Forestry Res. Bull. 10.

Lesko, O.L. 1961. Ecological study of soils in the Coastal Western Hemlock zone. M.Sc. thesis. Dept of Biol. and Botany, Univ. of British Columbia. 141 pp.

Luttmerding, H.A. and P.N. Sprout. 1968. Soil survey of Mission area. British Columbia Dept. of Agriculture. Preliminary Report No. 9 of the Lower Fraser Valley Soil Survey.

Lutz, H.J. and R.F. Chandler. 1946. Forest soils. John Wiley and Sons, Inc., New York. 514 pp.

MacBean, A.P. 1941. A study of the factors affecting the reproduction of western hemlock and its associates in the Quatsino Region, Vancouver Island. British Columbia Dept. of Lands and Forests Branch. Tech. Publ. No. T. 25.

Madgewick, H.A.I. and Ovington, J.D. 1959. The chemical composition of precipitation in adjacent forest and open plots. Forestry 32:14-22.

Major, J. 1951. A functional factorial approach to plant ecology. Ecology 32:392-412.

McMinn, R. G. 1951. The vegetation of a burn near Blaney Lake, British Columbia. Ecology 32(1):135-140.

Minore, D. 1971. Shade benefits Douglas-fir in southwestern Oregon cutover area. Tree Planter's Notes 22(1):22-23.

Morris, W.G. 1958. Influence of slashburning on regeneration, other plant cover, and fire hazard in the Douglas-fir region. (A Progress Report). Pacific Northwest Forest and Range Experiment Station. Research Paper No. 29.

Mueller-Dombois, D. 1960. The Douglas-fir forest associations on Vancouver Island in their initial stages of forest succession. Ph.D. thesis. Dept. of Biol. and Botany, Univ. of British Columbia. 570 pp.

_________________. 1965. Initial stages of secondary succession in the Coastal Douglas-fir zone of British Columbia. pp. 35-37 in Ecology of Western North America, Vol. 1.

National Soil Survey Committee. 1958. Outline for the classification of Canadian Soils as of Nov. 1958. Mimeo.

Orloci, L. 1961. Forest types of the Coastal Western Hemlock zone. M.Sc. thesis. Dept.of Biol. and Botany, Univ. of British Columbia. 206 pp.

_________. 1964. Vegetational and environmental variations in the eco-systems of the Coastal Western Hemlock Zone. Ph.D. thesis. Dept. of Biol. and Botany, Univ. of British Columbia. 199 pp.

Ovington, J.D. 1953-1955. Studies of the development of woodland conditions under different forest trees. 1953. I. Soil Ph.J. Ecol. 41:13-34. 1954. II. The forest floor. J. Ecol. 42:71-80; 1955. The ground flora. J. Ecol. 43:1-21.

_____________. 1956. The form, weights and productivity of tree species grown in close stands. New Phytol. 55.

Osborn, J.E. 1968. Influence of stocking and density upon growth and yield of trees and stands of western hemlock. Ph.D. thesis. Faculty of Forestry, Univ. of British Columbia. 396 pp.

Poore, M.E.D. 1955. The use of phytosociological methods in ecological investigations. I. The Braun-Blanquet system. J. Ecol. 43:226-244.

____________. 1956. The use of phytosociological methods in ecological investigations. IV. General discussion of phytosociological problems. J. Ecol. 44:28-50.

Rowe, J.S. 1956. Uses of undergrowth plant species in forestry. Ecology 37:461-473.

Schmidt, R.L. 1955. Some aspects of western redcedar regeneration in the coastal forests of British Columbia. British Columbia Forest Service. Research Note No. 29.

Smith, J.H.G. and J.W. Ker. 1956. Some distributions encountered in sampling forest stands. Forest Science 3(2):137-144.

Strothman, R.O. 1972. Douglas-fir in northern California: Effects of shade on germination, survival and growth. U.S.D.A. Forest Service. Pacific Southwest Forest and Range Experiment Station. Res. Paper PSW-84.

Tarrant, R.F. *et al.* 1968. Nutrient cycling by throughfall and stemflow precipitation in three coastal Oregon forest types. U.S.D.A. Forest Service. Pacific Northwest Forest and Range Experiment Station. Res. Paper PNW-54.

Vogl, R.J. and C. Ryder. 1969. Effect of slashburning on conifer reproduction in Montana's Mission Range. Northwest Sci. 43: 135-147.

Wade, L.K. 1965. Vegetation and history of the *Sphagnum* bogs of the Tofino area, Vancouver Island. M.Sc. thesis. Dept. of Biol. and Botany, Univ. of British Columbia. 125 pp.

Wine, R.L. 1964. Statistics for scientists and engineers. Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 667 pp.

Yerkes, V.P. 1960. Occurrence of shrubs and herbaceous vegetation after clearcutting old-growth Douglas-fir in the Oregon Cascades. U.S.D.A. Forest Service, Pacific Northwest Forest and Range Experiment Station. Res. Paper No. 34.

APPENDIX I

PART I. General Environment Tables
PART II. Vegetation Synthesis Tables
PART III. Tree and Stand Description

EXPLANATION AND LEGEND FOR THE SYNTHESIS TABLES

(1) ASPECT indicates compass readings from north in degrees.

(2) TOPOGRAPHY refers to the shape of the land profile on a mesoscale and is described as follows:

Topography Class	Description
N	Neutral (uniform slope)
CC	Concave
CV	Convex
F	Flat

(3) MICRORELIEF pertains to the land surface shape within the sample plot (microscale) and is evaluated by a descriptive scale as follows:

Microrelief	Description
N	Neutral (smooth)
H	Hummocky, irregular - very irregular microtopography with a number of sharply rising ridges or mounds running through the plot.
U	Undulating - a slightly wavy microtopography, less severe than hummocky.
F	Flat
O	Outcrop

(4) SLOPE GRADIENT is the average inclination of the sample plot.

(5) POSITION ON SLOPE is the location of the sample plot in relation to the land surface and is described as follows:

Position on Slope	Description
0	Peak, ridge sloping in several directions
1	Just below the peak or ridge sloping in one direction
2	Further from peak or edge of terrace
3	Upper slope
4	Upper part of mid-slope
5	Lower part of mid-slope
6	Lower slope
7	Slopes near bottom of depression
8	Flat bottom of the valley or depression itself

(6) LANDFORM describes the type and the origin of the parent material and is evaluated as follows:

Land Form Symbol	Description[*]
MP	Deep morainal deposit (loose till over compacted basal till): materials thick enough to cover irregularities of underlying bedrock; relatively flat to gently sloping; slopes less than 30%.
MB	Morainal blanket (loose till over compacted basal till bedrock controlled): a thick till cover, more than 3 feet, usually covering irregularities of underlying bedrock; slopes range from 0 to 50%.
MV	Morainal veneer (loose till over bedrock): till less than 3 feet overlying bedrock; materials too thin to mask underlying bedrock irregularities; slopes range from 0 to 50%.
GF	Glacio-fluvial deposits: sand, silt, gravel, and minor coarser material deposited by meltwater from the wasting glacier; relatively flat and usually deposited in thick stratified layers; material masks all features of underlying bedrock or material of another genetic category; slopes less than 10%.
GW	Glacio-marine deposits: sand, silt, clay and minor coarser fragments deposited under the influence of a marine environment; usually poorly drained and relatively flat in topography.

---

[*] Fulton, R.J. 1972. Landform Classification. B. C. Department of Agriculture. 8 p., Appendix 6 p., (Mimeo).

Land Form Symbol	Description*
CV	Colluvial veneer: a thin, less than 3 feet heterogeneous mixture of materials, deposited by mass wasting processes; materials too thin to cover irregularities of underlying bedrock; slopes range from 30 to 50%.

(7) TEXTURE OF PARENT MATERIAL - see table below:

Texture of Parent Material (Symbol)	Description*
B	Bouldery - abundance of material classed as boulder in size (greater than 10 in.); not encountered in study area.
G	Gravelly - dominantly gravel and coarse sand sized material (.4 - 10 in.).
S	Sandy - dominantly granule and sand sized material (.4 - .05 mm.).
Si	Silty - dominantly fine sand and silt sized (.25 - .005 mm.).

(8) LOCATION - UBCF - University of British Columbia Research Forest

MTF - Mission Tree Farm

---

[*] Fulton, R.J. 1972. Landform Classification. B.C. Department of Agriculture. 8 p., Appendix 6 p., (Mimeo).

(9) TYPE OF TREATMENT - NONE - No treatment
SL - Slashburned
P&B - Piled and burned

(10) BURNING INTENSITY - L - bark on stumps lightly blackened.
N - bark on stump blackened as well as the wood being scorched or blackened.
S - wood on stumps hollowed out by fire.

(11) HYGROTOPE - pertains to the moisutre regime classes of the soils and is approximately equal to the soil drainage classes proposed by Leskiw (1973). The symbols employed for the hygrotope classes are as follows (after Krajina, 1969):

X	Xeric
SX	Subxeric
M	Mesic
SHG	Subhygric (with temporary seepage)
HG	Hygric (with permanent seepage, mostly 30 cm to 60 cm below the soil surface)

(12) ROCK, SLASH, MINERAL SOIL, AND ORGANIC MATERIAL refers to the area in percent of each item on the sample plot.

(13) % OF BRUSH SPECIES, OVERTOPPING TREES OR NOT OVERTOPPING TREES refers to the percentage of herbaceous and noncommercial tree species overtopping or not overtopping

the commercial tree species, i.e. Douglas-fir, western hemlock, and western redcedar.

(14)STRATUM COVERAGE indicates the total area covered by each vegetative stratum. The strata are denoted as A(tree layer), B(shrub layer), C(herb layer), and D (moss layer). The B layer is separated into B_1(woody vegetation 6' - 30') and B_2 (woody vegetation 1' - 6'). The C layer also contains commercial tree species under 1 foot in height and creeping shrubs. The D layer is separated into mosses on humus (DH), mosses on decaying wood (DW), mosses on rock (DR), and mosses on mineral soil(DM).

(15)SOIL ORDER was extracted from existing soil association maps and may be prone to errors. It was included merely to give an idea of the type of soil to be expected and not to provide positive proof of the soil order or subgroup. The first four letters of each soil order were used on the synthesis tables.

(16)PRESENCE (P) was calculated using the following formula:

$$P = \frac{\text{number of occurrences of a species}}{\text{total number of relevés in that particular association}} \times 100$$

(17)MEAN SIGNIFICANCE (MS) was calculated by taking the mean of each significance class, then transforming it back to the original scale of species significance. The number to the left of the decimal in the mean significance column refers to the species significance class, while the number to the right of the decimal refers to the tenth of that particular species significance class the species falls in.

(18) <u>RANGE OF SIGNIFICANCE</u> (RS) is simply the difference between the lowest and highest significance encountered for a particular species.

PART I. General Environment Tables

VEGETATION-ENVIRONMENT TABLE - PART I - GENERAL PLOT INFORMATION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.	048	040	041	042	043	044	046	047	050	010	015	016	017	020	011	012	013	014	021
PHYSIOGRAPHY																			
ALTITUDE (FT.)	560	610	600	645	630	650	420	500	580	1243	553	540	545	1210	1308	1300	1023	1085	1060
ASPECT	35	30	100	25	120	FLAT	290	0	250	35	90	110	FLAT	140	160	180	120	220	160
TOPOGRAPHY	CV	CV	CV	CV	CV	CV	CV	CV	N	CV	CV	CV	CV	CV	CV	CV	CV	CV	CV
MICRORELIEF (WITHIN PLOT)	U	F	F	U	F	F	F	H	U	0	0	0	H	F	0	H	0	F	U
SLOPE GRADIENT (%)	35	15	45	30	20	0-5	20	40	45	15	15	25	0-5	20	5	15	10	5	10
POSITION ON SLOPE	1	1	1	1	1	0	1	1	3	0	1	1	0	1	0	1	0	0	1
LANDFORM	MV	MV	MV	MV	MV	MV	MV	MV	MB	MV	MV	MV	MV	MV	MV	MV	MV	MV	MV
TEXTURE OF PARENT MATERIAL	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
STAND DESCRIPTION																			
LOCATION	MTF	MTF	MTF	MTF	MTF	MTF	MTF	MTF	MTF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF
SETTING SIZE (A.)	350	200	200	200	200	200	100	100	100	10.0	7.0	7.0	7.0	10.0	5.0	5.0	4.0	2.5	2.5
DATE LOGGED	1970	1968	1968	1968	1968	1968	1964	1964	1964	1965	1965	1965	1965	1965	1962	1962	1962	1962	1962
DATE SINCE LAST DISTURBANCE	1970	1968	1968	1968	1968	1968	1964	1964	1964	1965	1965	1965	1965	1965	1962	1962	1962	1962	1962
AGE OF STAND (YRS.)	2	6	6	6	6	6	10	10	10	8	8	9	9	9	11	11	11	11	12
DATE PLANTED	1971	1969	1969	1969	1969	1969	1965	1965	1965										
TYPE OF TREATMENT	SL	SL	SL	SL	SL	SL	P&B	P&B	P&B	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
BURNING INTENSITY	N	S	S	L	L	N													
DISTANCE TO SEED SOURCE (FT.)	1000	1500	1600	900	1300	1000	350	100	1700	150	500	500	800	120	50	50	70	50	75
DISTANCE TO SOUTH EDGE (FT.)	1500	5000	5000	6000	6000	5000	350	100	5000	250	500	500	800	120	200	250	70	60	75
TYPE OF SEED SOURCE(%)																			
DOUGLAS-FIR	30	30	30	30	30	30	20	30	30	80	60	60	60	60	80	80	70	70	70
WESTERN HEMLOCK	60	60	60	60	60	60	60	60	60	15	30	30	30	35	15	15	20	20	25
REDCEDAR	10	10	10	10	10	10	20	10	10	5	10	10	10	5	5	5	10	10	5
SOIL & ORGANIC LAYERS																			
SOIL ORDER (CSSC 1970)	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	FOLS	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ
DEPTH OF ORGANIC LAYERS (IN.)	<1.0	<1.0	<1.0	1.5	<1.0	<1.0	<1.0	2.0	1.5	2.0	2.5	5.0	3.0	2.0	1.0	2.0	1.5	1.5	3.0
HYGROTOPE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
% OF PLOT COVERED BY:																			
ROCK	0	10	10	10	5	20	30	0	5	10	20	20	0	10	15	15	10	20	5
SLASH	30	30	30	30	30	10	20	30	40	70	70	75	65	40	60	70	40	40	50
MINERAL SOIL	55	40	40	30	30	45	20	5	0	<1	0	0	<5	30	15	<1	10	10	15
ORGANIC MATERIAL	15	20	20	30	25	25	30	65	55	20	10	5	30	20	10	40	40	30	30
VEGETATION																			
% OF BRUSH SPECIES:																			
(A) OVERTOPPING TREES	10	20	10	40	30	10	30	10	20	20	40	20	20	20	50	40	60	60	60
(B) NOT OVERTOPPING TREES	90	80	90	60	70	90	70	90	80	80	60	80	80	80	50	60	40	40	40
STRATA COVERAGE(%)																			
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	5
B1	5	60	75	30	20	20	30	40	90	40	55	20	50	20	20	40	30	30	60
B2	50	30	90	85	75	80	85	95	90	90	80	95	95	70	90	90	75	85	50
C	35	70	20	60	85	20	30	50	85	70	70	45	70	60	80	65	80	80	50
D	80	50	40	70	75	70	85	35	35	60	60	80	40	70	40	45	40	80	30

VEGETATION-ENVIRONMENT TABLE - PART I - GENERAL PLOT INFORMATION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.	003	009	018	019	022	032	039	035	036	033	034	037	038	045	049				
PHYSIOGRAPHY																			
ALTITUDE (FT.)	850	1238	1200	1190	1190	480	500	700	650	540	500	675	690	450	400				
ASPECT	260	40	30	340	150	90	145	FLAT	FLAT	FLAT	150	FLAT	295	10	0				
TOPOGRAPHY	N	CV	CV	CV	CV	CC	CC	CC	CC	CC	CC	CC	CC	N	CC				
MICRORELIEF (WITHIN PLOT)	N	H	H	U	U	U	U	F	U	F	U	F	F	H	U				
SLOPE GRADIENT (%)	30	8	20	10	15	5	15	0-5	0-5	0-5	30	0-5	10	35	30				
POSITION ON SLOPE	5	3	2	3	3	6	6	7	7	6	6	8	7	5	7				
LANDFORM	MVCV	MV	MV	MV	MV	MP	MP	MP	MP	MP	MP	MP	MP	MB	MB				
TEXTURE OF PARENT MATERIAL	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
STAND DESCRIPTION																			
LOCATION	UBCF	UBCF	UBCF	UBCF	UBCF	MTF	MTF	MTF	MTF	MTF	MTF	MTF	MTF	MTF	MTF				
SETTING SIZE (A.)	4.5	10.0	10.0	10.0	10.0	110	110	80	80	110	110	80	80	100	100				
DATE LOGGED	1970	1965	1965	1965	1965	1966	1966	1959	1959	1966	1966	1959	1959	1964	1964				
DATE SINCE LAST DISTURBANCE	1970	1965	1965	1965	1965	1966	1966	1960	1960	1966	1966	1960	1960	1964	1964				
AGE OF STAND (YRS.)	3	8	9	9	9	8	8	14	14	8	8	14	14	10	10				
DATE PLANTED										1967	1967	1960	1960	1965	1965				
TYPE OF TREATMENT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	P&B	P&B	P&B	P&B	P&B	P&B				
BURNING INTENSITY																			
DISTANCE TO SEED SOURCE (FT.)	150	100	200	150	150	50	25	125	100	150	200	250	300	300	500				
DISTANCE TO SOUTH EDGE (FT.)	200	200	300	150	200	1000	50	200	200	600	550	900	900	300	500				
TYPE OF SEED SOURCE(%)																			
DOUGLAS-FIR	25	80	55	55	60	10	10	5	5	10	10	5	5	20	30				
WESTERN HEMLOCK	50	15	35	35	35	70	70	90	90	70	70	90	90	60	60				
REDCEDAR	25	5	10	10	5	20	20	5	5	20	20	5	5	20	10				
SOIL & ORGANIC LAYERS																			
SOIL ORDER (CSSC 1970)	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ				
DEPTH OF ORGANIC LAYERS (IN.)	2.5	1.0	4.0	2.0	2.0	2.0	2.0	1.5	2.0	1.5	2.0	2.5	2.0	2.0	1.5				
HYGROTOPE	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M				
% OF PLOT COVERED BY:																			
ROCK	0	<5	5	5	0	0	0	0	0	0	0	0	0	0	0				
SLASH	60	60	80	60	35	60	65	60	60	20	35	45	40	60	30				
MINERAL SOIL	2	<1	5	10	20	5	0	5	5	0	0	0	0	0	15				
ORGANIC MATERIAL	38	30	10	25	45	35	35	35	35	80	65	55	60	40	55				
VEGETATION																			
% OF BRUSH SPECIES:																			
(A) OVERTOPPING TREES	5	40	30	50	40	70	60	70	90	10	10	20	20	20	30				
(B) NOT OVERTOPPING TREES	95	60	70	50	60	30	40	30	10	90	90	80	80	80	70				
STRATA COVERAGE(%)																			
A	0	0	0	0	0	0	0	15	0	50	10	40	30	0	0				
B1	40	30	60	30	40	25	25	80	90	90	95	90	95	95	95				
B2	80	85	85	90	65	95	95	65	70	25	25	20	35	85	60				
C	90	50	65	65	90	40	90	40	40	30	20	10	10	25	60				
D	5	70	50	65	80	60	45	30	50	40	20	20	20	90	70				

VEGETATION-ENVIRONMENT TABLE - PART I - GENERAL PLOT INFORMATION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.	005	030	031	001	006	023	007	008	027	028	002	024	025	026	004	029			
PHYSIOGRAPHY																			
ALTITUDE (FT.)	397	405	410	758	580	730	470	198	147	210	505	535	580	500	360	400			
ASPECT	45	0	FLAT	220	270	200	FLAT	230	FLAT	270	200	220	180	310	280	270			
TOPOGRAPHY	F	CC	CC	N	N	CC	F	N	CC	CC	CC	CC	CC	CC	CC	CC			
MICRORELIEF (WITHIN PLOT)	N	F	U	N	N	F	U	U	F	F	N	H	U	F	N	F			
SLOPE GRADIENT (%)	<5	10	0-5	12	15	0-5	FLAT	20	0-5	10	5	15	10	10	10	10			
POSITION ON SLOPE	8	8	8	6	6	8	9	7	9	7	8	7	7	9	8	8			
LANDFORM	GW	GW	GW	MP	MP	MP	GF	GF	GF	GF	MB	MB	MB	GF	MP	MP			
TEXTURE OF PARENT MATERIAL	SI	SI	SI	G	G	G	S	G	G	G	G	G	G	S	G	G			
STAND DESCRIPTION																			
LOCATION	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF	UBCF			
SETTING SIZE (A.)	36.0	36.0	36.0	36.0	36.0	36.0	32.0	4.5	4.5	4.5	18.7	18.7	18.7	18.7	64.0	64.0			
DATE LOGGED	1970	1970	1970	1967	1967	1967	1965	1968	1968	1968	1964	1964	1964	1964	1959	1959			
DATE SINCE LAST DISTURBANCE	1970	1970	1970	1967	1967	1967	1965	1968	1968	1968	1965	1965	1965	1965	1960	1960			
AGE OF STAND (YRS.)	3	4	4	6	6	7	8	5	6	6	8	9	9	9	13	14			
DATE PLANTED	1971	1971	1971	1967	1967	1967	1967				1965	1965	1965	1965	1960	1960			
TYPE OF TREATMENT	P&B	P&B	P&B	P&B	P&B	P&B	P&B	NONE	SL	SL	SL	SL	SL	SL	SL	SL			
BURNING INTENSITY									N	S	N	N	N	N	N	N			
DISTANCE TO SEED SOURCE (FT.)	225	250	100	150	100	200	550	400	100	300	200	250	150	400	300	300			
DISTANCE TO SOUTH EDGE (FT.)	450	500	400	250	1200	1000	1000	450	600	700	900	1000	1200	1000	600	2000			
TYPE OF SEED SOURCE(%)																			
DOUGLAS-FIR	60	60	60	70	70	70	60	10	10	10	30	30	30	30	65	60			
WESTERN HEMLOCK	25	25	25	20	20	20	30	50	50	50	60	60	60	60	25	25			
REDCEDAR	15	15	15	10	10	10	10	40	40	40	10	10	10	10	10	15			
SOIL & ORGANIC LAYERS																			
SOIL ORDER (CSSC 1970)	GLEY	GLEY	GLEY	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ	PODZ			
DEPTH OF ORGANIC LAYERS (IN.)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.5	1.0	<1.0	1.0	1.0	2.5	1.0	1.5	1.5			
HYGROTOPE	HG	HG	HG	SHG	SHG	SHG	HG	SHG	SHG	SHG	SHG	SHG	SHG	HG	HG	HG			
% OF PLOT COVERED BY:																			
ROCK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
SLASH	10	5	20	10	20	5	30	60	30	30	30	40	30	30	10	20			
MINERAL SOIL	85	75	60	30	<5	50	<5	<5	10	10	<5	10	5	20	<5	5			
ORGANIC MATERIAL	5	20	20	60	95	45	65	40	60	60	55	50	65	50	85	75			
VEGETATION																			
% OF BRUSH SPECIES:																			
(A) OVERTOPPING TREES	10	50	80	5	5	20	5	95	80	60	15	30	70	10	30	20			
(B) NOT OVERTOPPING TREES	90	50	20	95	95	80	95	5	20	40	85	70	30	90	70	80			
STRATA COVERAGE(%)																			
A	0	0	0	0	0	0	35	0	0	0	0	0	0	0	35	50			
B1	15	25	40	85	80	50	90	55	30	50	80	80	50	90	95	95			
B2	65	40	70	50	75	60	60	85	60	70	70	80	40	70	15	80			
C	90	85	95	60	80	95	95	90	95	90	70	90	100	30	10	10			
D	30	20	20	15	15	30	40	45	70	80	10	60	20	60	25	50			

PART II. Vegetation Synthesis Tables

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SALAL - DOUGLAS-FIR ASSOCIATION

PLOT NUMBER		048	040	041	042	043	044	046	047	050	010	015	016	017	020	011	012	013	014	021			
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
A																							
1	ALNUS RUBRA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.+	+.+	10.5	1.9	+-5
B1																							
2	BETULA PAPYRIFERA	.	2.+	3.+	4.+	3.+	2.+	2.+	3.+	4.+	.	2.+	.	3.1	1.+	3.+	+.+	3.+	2.+	.	78.9	3.0	+-4
3	TSUGA HETEROPHYLLA	.	.	.	.	.	.	3.+	4.+	4.1	6.1	5.1	6.1	6.1	3.1	4.1	6.1	7.1	5.1	5.1	68.4	5.1	3-7
4	SALIX SITCHENSIS	.	.	+.+	.	.	.	+.+	.	+.+	+.+	1.+	.	+.+	1.1	2.+	4.5	.	2.+	.	52.6	1.5	+-4
5	PSEUDOTSUGA MENZIESII (ART.)	+.+	7.+	7.+	3.+	4.+	5.+	5.+	5.+	8.+	.	.	.	.	.	.	.	.	.	.	47.4	5.0	+-8
6	PSEUDOTSUGA MENZIESII (NAT.)	.	.	.	.	.	.	.	.	.	+.+	2.+	.	5.+	3.+	+.+	2.+	3.+	+.+	.	42.1	2.3	+-5
7	THUJA PLICATA	.	.	.	.	.	.	.	.	.	4.1	+.+	4.1	.	.	2.+	4.+	3.+	.	.	31.6	2.3	+-4
	ALNUS RUBRA	.	+.+	.	.	.	.	.	.	.	.	.	.	.	.	2.+	+.+	+.+	4.+	2.+	31.6	1.4	+-4
8	PRUNUS EMARGINATA	.	.	.	+.+	.	.	.	.	.	.	3.+	.	2.+	.	2.+	2.+	.	.	.	26.3	1.1	+-3
9	ACER CIRCINATUM	.	2.1	.	.	.	.	.	.	3.+	.	.	.	3.1	.	.	.	.	3.1	.	21.1	1.4	2-3
10	POPULUS TRICHOCARPA	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	3.+	.	.	.	10.5	+.4	+-3
11	CORNUS NUTTALLII	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.+	.	.	.	5.3	+.4	3-3
12	RHAMNUS PURSHIANA	.	.	.	.	.	.	.	.	.	.	3.+	.	.	.	.	.	.	.	.	5.3	+.4	3-3
13	SALIX SCOULERIANA	.	3.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.3	+.4	3-3
14	ACER MACROPHYLLUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	5.3	+.0	+-+
B2																							
15	GAULTHERIA SHALLON	6.5	5.4	9.7	6.4	5.3	8.5	7.3	8.6	8.6	8.7	4.5	9.6	9.5	6.4	7.6	7.7	8.7	7.7	6.5	100.0	7.8	4-9
16	VACCINIUM PARVIFOLIUM	3.+	2.+	2.+	2.+	3.+	3.+	3.+	3.+	3.+	3.+	5.+	5.1	5.1	3.1	3.+	4.1	5.+	5.+	3.1	100.0	4.4	2-5
	TSUGA HETEROPHYLLA	.	2.1	2.+	3.+	2.+	2.+	6.+	6.1	3.+	5.1	5.+	5.1	4.1	4.1	5.1	5.1	5.1	6.1	5.1	94.7	5.1	2-6
17	RUBUS SPECTABILIS	.	.	2.1	3.4	2.1	2.+	3.1	2.+	3.1	4.1	5.1	4.1	3.1	3.1	4.1	4.1	3.+	3.+	2.1	89.5	3.7	2-5
	BETULA PAPYRIFERA	1.+	1.+	3.+	5.+	4.+	+.+	3.+	2.+	.	2.+	3.+	.	2.+	2.+	2.+	2.+	3.+	2.+	+.+	89.5	3.1	+-5
	PSEUDOTSUGA MENZIESII (NAT.)	.	.	.	+.+	+.+	+.+	2.+	1.+	2.+	3.+	2.+	1.+	.	3.+	3.+	3.+	4.+	4.+	4.+	78.9	3.0	+-4
18	MENZIESIA FERRUGINEA	2.+	.	.	1.+	2.+	.	3.1	3.1	3.+	3.+	3.+	5.1	4.1	2.1	.	.	3.+	3.+	2.1	73.7	3.2	1-5
19	SPIRAEA DOUGLASII	.	.	1.1	.	3.4	3.1	3.1	2.1	.	3.1	4.1	.	2.1	2.1	4.1	3.+	3.+	3.+	2.1	73.7	3.0	1-4
	THUJA PLICATA	.	.	.	.	.	.	3.+	3.+	2.+	2.+	4.1	3.1	2.+	4.1	2.+	4.+	3.+	2.+	+.+	68.4	3.0	+-4
20	VACCINIUM OVALIFOLIUM	.	.	.	2.+	.	.	2.+	3.+	.	2.1	4.1	4.1	4.1	3.1	.	3.1	2.+	3.1	2.1	63.2	3.0	2-4
	SALIX SITCHENSIS	.	.	.	.	1.+	.	2.+	2.+	.	3.1	.	+.+	+.+	4.1	4.1	4.5	3.+	3.+	+.+	63.2	2.8	+-4
21	RUBUS PARVIFLORUS	.	.	1.+	3.4	3.1	3.5	2.1	2.+	.	.	3.1	.	1.+	2.1	.	2.1	.	2.+	2.1	63.2	2.2	1-3
	PRUNUS EMARGINATA	.	+.+	1.+	2.+	.	+.+	.	.	.	.	4.+	.	+.+	1.+	2.+	3.+	+.+	.	.	52.6	1.7	+-4
	PSEUDOTSUGA MENZIESII (ART.)	5.+	3.+	4.+	5.+	5.+	2.+	5.+	4.+	2.+	.	.	.	.	.	.	.	.	.	.	47.4	3.9	2-5
22	RUBUS LEUCODERMIS	.	.	.	4.1	3.1	2.1	.	.	.	2.+	2.1	2.1	.	.	.	2.1	.	1.+	.	42.1	2.0	1-4
23	VACCINIUM ALASKAENSE	.	.	.	2.+	.	.	2.+	3.+	.	2.1	.	.	.	2.+	.	2.+	2.+	2.1	.	42.1	1.6	2-3
	ACER CIRCINATUM	.	2.1	.	.	1.1	.	.	3.4	.	.	3.1	.	4.5	.	.	.	+.+	2.1	.	36.8	1.9	+-4
24	RIBES SANGUINEUM	.	.	+.+	1.+	1.1	3.+	.	.	.	.	.	2.1	.	.	3.1	3.1	.	.	.	36.8	1.5	+-3
	RHAMNUS PURSHIANA	.	.	.	1.+	.	.	.	+.+	+.+	2.+	3.+	.	2.+	+.+	.	.	.	.	.	36.8	1.1	+-3
	POPULUS TRICHOCARPA	.	.	.	.	1.+	.	+.+	.	+.+	.	.	.	.	1.+	.	3.+	.	.	.	26.3	+.8	+-3
25	SAMBUCUS RACEMOSA	.	.	.	.	.	.	.	.	.	.	2.+	.	.	.	2.+	2.+	.	.	.	15.8	+.6	2-2
26	RUBUS LACINIATUS	.	.	.	.	.	2.+	.	.	.	.	2.1	.	.	.	.	.	.	1.+	.	15.8	+.4	1-2
	CORNUS NUTTALLII	.	.	.	.	.	.	.	.	.	.	2.+	.	.	.	.	1.+	.	+.+	.	15.8	+.1	+-2
	SALIX SCOULERIANA	.	.	.	1.+	.	+.+	.	.	.	1.+	.	.	.	.	.	.	.	.	.	15.8	+.0	+-1
27	RIBES LACUSTRE	.	.	.	+.+	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	10.5	+.0	+-1
28	HOLODISCUS DISCOLOR	.	+.+	.	.	.	.	.	.	+.+	.	.	.	.	.	.	.	.	.	.	10.5	+.0	+-+
29	TAXUS BREVIFOLIA	.	.	.	.	.	.	.	+.+	.	.	.	.	+.+	.	.	.	.	.	.	10.5	+.0	+-+
30	BERBERIS NERVOSA	.	.	.	.	.	.	.	.	3.+	.	.	.	.	.	.	.	.	.	.	5.3	+.4	3-3
31	LEDUM GROENLANDICUM	.	.	.	.	.	.	.	.	.	.	.	.	.	2.1	.	.	.	.	.	5.3	+.0	2-2

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SALAL - DOUGLAS-FIR ASSOCIATION

PLOT NUMBER		048	040	041	042	043	044	046	047	050	010	015	016	017	020	011	012	013	014	021			
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
32	SALIX LASIANDRA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.1	.	.	.	5.3	+.0	2-2
33	BERBERIS AQUIFOLIUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	.	.	5.3	+.0	1-1
34	PYRUS FUSCA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.1	.	5.3	+.0	1-1
	ALNUS RUBRA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	5.3	+.0	+-+
35	ROSA GYMNOCARPA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	5.3	+.0	+-+
36	SORBUS AUCUPARIA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	.	5.3	+.0	+-+
C																							
37	PTERIDIUM AQUILINUM	5.5	7.5	2.1	5.1	8.6	5.1	4.1	5.1	6.4	5.6	5.5	.	7.6	5.1	8.7	7.7	7.6	7.6	6.5	94.7	6.3	2-8
38	EPILOBIUM AUGUSTIFOLIUM	3.1	3.1	3.1	4.+	3.+	5.5	1.1	.	2.+	5.5	3.+	3.1	3.1	3.+	3.1	3.1	3.1	2.1	1.+	94.7	3.8	1-5
	TSUGA HETEROPHYLLA	1.+	+.+	.	2.+	2.+	1.+	3.+	3.+	.	3.+	3.1	2.+	1.+	3.1	5.1	4.1	4.1	4.1	3.+	89.5	3.4	+-5
39	BLECHNUM SPICANT	2.+	.	.	2.+	3.+	1.+	4.1	2.+	2.+	2.+	3.+	3.+	2.+	4.1	3.+	3.+	2.+	3.+	4.+	89.5	3.2	1-4
40	RUBUS URSINUS	.	2.1	4.4	.	3.1	3.1	.	1.1	4.5	3.1	4.1	3.1	2.+	1.1	3.1	4.4	4.1	4.5	2.1	84.2	3.4	1-4
41	ANAPHALIS MARGARITACEA	3.1	3.3	4.4	3.1	2.1	2.1	1.1	.	.	3.4	3.4	2.1	.	5.4	3.4	4.5	2.1	2.1	.	78.9	3.3	1-5
42	POLYSTICHUM MUNITUM	.	.	.	2.+	2.+	.	3.+	2.+	2.1	3.+	2.+	3.+	3.+	2.+	2.+	3.+	2.+	3.+	3.+	78.9	2.7	2-3
43	DRYOPTERIS AUSTRIACA	.	.	.	1.+	1.+	1.1	2.+	1.1	.	3.+	2.+	2.1	2.+	2.+	2.1	3.+	3.+	3.+	2.+	78.9	2.3	1-3
	THUJA PLICATA	1.+	.	.	1.+	.	.	2.+	1.+	.	2.1	2.+	2.+	.	3.1	3.+	3.+	3.+	3.+	1.+	68.4	2.3	1-3
	PSEUDOTSUGA MENZIESII (NAT.)	.	.	.	+.+	1.+	+.+	1.+	.	.	2.+	+.+	.	.	1.+	3.+	1.+	2.+	3.+	2.+	63.2	1.6	+-3
44	LINNAEA BOREALIS	.	.	.	.	.	.	.	.	6.5	7.6	7.7	5.4	8.5	5.4	5.6	.	5.5	5.5	.	47.4	5.2	5-8
45	ATHYRIUM FILIX-FEMINA	.	.	.	.	.	.	.	.	.	1.+	2.+	.	1.+	1.+	2.+	3.+	1.+	2.+	1.+	47.4	1.4	1-3
46	LYCOPODIUM CLAVATUM	.	.	.	1.1	1.1	.	4.4	.	2.2	.	2.1	.	.	2.1	2.2	2.1	.	.	.	42.1	1.8	1-4
47	CORNUS CANADENSIS	.	3.3	3.3	.	.	.	.	.	4.4	.	3.3	.	.	.	2.3	.	.	4.4	.	31.6	2.3	2-4
48	HOLCUS LANATUS	.	.	.	.	.	.	.	.	.	.	2.+	.	.	1.1	.	2.1	2.+	3.+	.	26.3	1.2	1-3
49	JUNCUS EFFUSUS	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	1.2	2.3	2.+	2.1	.	26.3	1.0	1-2
50	HYPOCHAERIS RADICATA	.	.	.	.	2.+	.	.	.	.	.	.	1.+	.	.	.	.	2.+	1.1	.	21.1	+.6	1-2
51	LACTUCA BIENNIS	.	.	.	.	1.+	.	.	.	.	+.+	.	.	.	.	2.+	2.+	.	.	.	21.1	+.5	+-2
52	LUZULA PARVIFLORA	.	.	.	.	.	.	.	.	.	2.3	2.2	.	.	.	.	.	.	.	1.+	15.8	+.4	1-2
53	SOLIDAGO CANADENSIS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	2.+	2.+	.	.	15.8	+.4	1-2
54	AGROSTIS SCABRA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.2	2.1	.	.	.	10.5	+.8	2-3
55	CALAMAGROSTIS CANADENSIS	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	3.4	.	.	.	.	10.5	+.6	1-3
56	SCIRPUS MICRUCARPUS	.	3.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	.	.	10.5	+.6	1-3
57	HIERACIUM ALBIFLORUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.+	2.+	.	.	.	10.5	+.2	2-2
58	SENECIO SYLVATICUS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	1.+	.	10.5	+.0	1-1
59	TRILLIUM OVATUM	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	+.+	.	.	.	10.5	+.0	+-+
60	CAREX AQUATILIS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.+	.	5.3	+.4	3-3
61	EPILOBIUM WATSONII	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.+	.	.	.	.	5.3	+.4	3-3
62	SCIRPUS CYPERINUS	.	.	.	.	.	3.+	.	.	.	.	.	.	.	.	.	.	.	.	.	5.3	+.4	3-3
63	CAREX HENDERSONII	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.2	.	.	.	.	5.3	+.0	2-2
64	TIARELLA TRIFOLIATA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.+	.	.	.	.	5.3	+.0	2-2
65	TRISETUM CERNUUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.+	.	.	5.3	+.0	2-2
66	CAREX INTERIOR	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.3	+.0	1-1
67	CIRSIUM ARVENSE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	.	.	.	5.3	+.0	1-1
68	FESTUCA OCCIDENTALIS	.	.	.	.	.	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	5.3	+.0	1-1
69	GOODYERA OBLONGIFOLIA	.	.	.	.	.	.	.	.	.	.	1.+	.	.	.	.	.	.	.	.	5.3	+.0	1-1
	PSEUDOTSUGA MENZIESII (ART.)	+.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.3	+.0	+-+
70	URTICA DIOICA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	.	5.3	+.0	+-+
DH																							
71	HYLOCOMIUM SPLENDENS	.	2.2	.	3.3	5.4	2.2	4.3	4.3	3.3	4.3	5.3	5.4	4.4	.	4.3	.	.	2.1	.	68.4	4.0	2-5
72	RHYTIDIADELPHUS LOREUS	.	1.2	.	2.2	3.3	.	3.3	4.3	3.3	2.2	3.3	2.2	2.2	.	.	.	.	1.1	.	57.9	2.4	1-4

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SALAL - DOUGLAS-FIR ASSOCIATION

ST NO.	SPECIES	048	040	041	042	043	044	046	047	050	010	015	016	017	020	011	012	013	014	021	P	MS	RS
73	PLAGIOTHECIUM UNDULATUM	.	.	.	.	.	.	.	1.1	1.2	1.1	1.1	1.2	.	.	.	.	.	.	.	26.3	+.4	1-1
74	EURHYNCHIUM OREGANUM	.	.	.	.	4.3	.	.	.	3.2	.	.	.	.	.	2.3	.	.	.	3.3	21.1	1.7	2-4
75	ISOTHECIUM STOLONIFERUM	.	.	.	.	.	.	.	.	.	.	.	2.2	2.1	.	.	.	.	.	.	10.5	+.2	2-2
76	RHYTIDIADELPHUS TRIQUETRUS	.	.	.	.	1.1	.	.	1.1	.	.	.	.	.	.	.	.	.	.	.	10.5	+.0	1-1
77	SPHAGNUM PALUSTRE	.	.	.	.	.	.	.	.	.	.	.	3.2	.	.	.	.	.	.	.	5.3	+.4	3-3
78	AULACOMNIUM ANDROGYNUM	.	.	.	.	.	.	.	.	.	.	.	.	.	2.2	.	.	.	.	.	5.3	+.0	2-2
DM																							
79	POLYTRICHUM JUNIPERINUM	9.7	4.4	8.6	7.4	7.5	7.5	6.3	4.4	2.2	3.2	5.4	2.2	.	4.4	4.3	3.3	3.3	6.3	.	89.5	5.7	2-9
80	POGONATUM CONTORTUM	.	.	.	.	.	.	3.3	.	.	2.2	.	.	3.2	2.3	4.3	2.2	3.3	3.3	2.1	47.4	2.3	2-4
81	POHLIA NUTANS	.	.	.	.	.	.	.	.	.	.	2.2	2.3	1.2	2.2	2.2	.	2.3	3.3	.	36.8	1.4	1-3
82	CERATODON PURPUREUS	4.2	5.4	.	3.2	.	2.2	.	.	.	.	.	.	.	2.2	.	.	3.2	.	.	31.6	2.7	2-5
83	POGONATUM ALPINUM	.	2.2	.	.	.	.	.	.	.	3.3	.	.	.	.	4.3	.	4.3	4.3	2.1	31.6	2.4	2-4
84	EURHYNCHIUM PRAELONGUM	.	.	.	.	.	.	.	.	.	2.2	.	.	.	.	.	2.3	.	.	3.2	15.8	1.0	2-3
85	OLIGOTRICHUM ALIGERUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.3	.	2.2	.	.	10.5	+.8	2-3
86	DITRICHUM HETEROMALLUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.2	.	2.1	.	.	10.5	+.2	2-2
87	DICRANELLA HETEROMALLA	.	.	.	.	.	.	.	.	.	2.2	.	.	.	1.2	.	.	.	.	.	10.5	+.0	1-2
88	POLYTRICHUM COMMUNE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.3	.	.	.	5.3	+.4	3-3
	AULACOMNIUM ANDROGYNUM	1.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.3	+.0	1-1
89	DICRANUM TAURICUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.2	.	5.3	+.0	1-1
DW																							
	PLAGIOTHECIUM UNDULATUM	.	.	.	.	.	.	.	1.1	1.2	3.2	3.2	2.1	3.3	2.1	2.2	1.1	1.1	1.1	2.1	63.2	2.0	1-3
	HYLOCOMIUM SPLENDENS	.	.	.	.	.	.	3.2	.	.	3.3	2.2	2.2	2.2	2.2	1.1	.	1.1	1.1	1.1	52.6	1.7	1-3
	RHYTIDIADELPHUS LOREUS	.	.	.	.	.	.	1.1	.	.	4.3	2.2	3.3	2.2	1.1	3.3	1.1	.	1.1	.	47.4	2.0	1-4
	EURHYNCHIUM OREGANUM	.	.	.	.	.	.	.	.	1.2	2.2	.	.	.	2.1	.	.	.	.	.	15.8	+.4	1-2
90	RHIZOMNIUM GLABRESCENS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.1	5.3	+.0	1-1
DR																							
91	RHACOMITRIUM CANESCENS	.	.	.	.	.	.	1.1	2.2	1.1	.	.	.	.	3.2	2.2	3.2	.	3.3	.	36.8	1.6	1-3
92	RHACOMITRIUM HETEROSTICHUM	.	.	.	.	.	.	2.2	2.2	.	2.3	.	.	.	2.1	.	4.3	4.4	.	.	31.6	2.0	2-4
	POHLIA NUTANS	.	.	.	.	.	.	.	.	.	.	.	.	.	4.4	.	.	.	.	.	5.3	1.1	4-4
93	BARBULA SP.	.	.	.	.	.	.	.	.	.	.	2.1	.	.	.	.	.	.	.	.	5.3	+.0	2-2
	DITRICHUM HETEROMALLUM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.2	.	.	5.3	+.0	2-2

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
MOSS - WESTERN HEMLOCK ASSOCIATION

PLOT NUMBER		003	009	018	019	022	032	039	035	036	033	034	037	038	045	049							
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
A																							
1	PSEUDOTSUGA MENZIESII (ART.)	.	.	.	.	.	.	.	.	.	6.+	4.+	7.+	6.+	.	.	.	.	.	.	26.7	4.4	4-7
2	ALNUS RUBRA	.	.	.	.	.	.	.	4.1	.	+.+	.	.	.	.	.	.	.	.	.	13.3	1.3	+-4
3	SALIX SCOULERIANA	.	.	.	.	.	.	.	.	.	3.+	.	2.+	.	.	.	.	.	.	.	13.3	1.0	2-3
4	TSUGA HETEROPHYLLA	.	.	.	.	.	.	.	.	.	.	.	4.+	.	.	.	.	.	.	.	6.7	1.2	4-4
B1																							
	TSUGA HETEROPHYLLA	7.5	6.1	7.1	5.1	5.1	6.1	5.1	7.1	7.1	4.+	3.+	6.+	[illegible].1	7.1	8.+	.	.	.	.	100.0	6.6	3-8
5	BETULA PAPYRIFERA	2.+	.	+.+	.	.	+.+	.	4.+	3.+	5.+	4.+	.	3.+	4.+	5.+	.	.	.	.	66.7	3.7	+-5
6	ACER CIRCINATUM	5.6	.	.	.	.	+.+	3.3	4.5	6.5	.	4.4	4.5	4.5	.	6.6	.	.	.	.	60.0	4.4	+-6
7	SALIX SITCHENSIS	1.+	3.1	4.1	4.1	.	.	.	2.+	.	.	2.1	.	4.+	3.+	+.+	.	.	.	.	60.0	3.0	+-4
8	RHAMNUS PURSHIANA	.	.	.	.	.	.	3.+	4.+	5.+	+.+	2.+	5.+	3.+	.	+.+	.	.	.	.	53.3	3.4	+-5
	PSEUDOTSUGA MENZIESII (ART.)	.	.	.	.	.	.	.	.	.	8.+	8.+	8.+	9.+	8.+	8.+	.	.	.	.	40.0	6.2	8-9
9	THUJA PLICATA	3.1	.	.	.	.	.	.	3.+	3.+	.	+.+	3.+	5.1	.	.	.	.	.	.	40.0	2.9	+-5
	SALIX SCOULERIANA	.	.	.	.	3.+	.	.	3.+	.	+.+	2.1	3.1	.	.	.	.	.	.	.	33.3	1.7	+-3
10	PSEUDOTSUGA MENZIESII (NAT.)	.	+.+	.	2.+	4.+	.	.	.	+.+	.	.	.	+.+	.	.	.	.	.	.	33.3	1.4	+-4
	ALNUS RUBRA	2.1	3.1	+.+	.	.	.	.	2.+	+.+	.	.	.	.	.	.	.	.	.	.	33.3	1.2	+-3
11	RUBUS SPECTABILIS	.	.	.	.	.	.	.	.	.	8.6	7.6	4.1	4.1	.	.	.	.	.	.	26.7	4.5	4-8
12	POPULUS TRICHOCARPA	.	.	.	.	.	.	.	2.+	.	.	+.+	.	3.+	.	+.+	.	.	.	.	26.7	1.0	+-3
13	VACCINIUM PARVIFOLIUM	.	.	.	.	.	.	.	4.+	.	4.+	5.1	.	.	.	.	.	.	.	.	20.0	2.9	4-5
14	SPIRAEA DOUGLASII	.	.	.	.	.	.	.	4.1	.	3.4	.	.	2.1	.	.	.	.	.	.	20.0	1.7	2-4
15	PRJNUS EMARGINATA	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	.	13.3	+.0	+-2
16	CORNUS NUTTALLII	.	.	.	.	.	.	.	.	.	3.+	.	.	.	.	.	.	.	.	.	6.7	+.6	3-3
B2																							
17	GAULTHERIA SHALLON	4.6	6.5	7.4	4.4	5.4	6.5	6.4	6.5	5.5	3.1	4.4	2.1	3.1	4.3	5.3	.	.	.	.	100.0	5.4	2-7
	VACCINIUM PARVIFOLIUM	3.+	4.+	4.1	4.1	3.1	3.+	3.+	3.+	3.1	3.1	.	1.1	3.+	5.1	4.+	.	.	.	.	93.3	4.0	1-5
18	VACCINIUM ALASKAENSE	.	2.+	3.+	2.+	2.+	2.+	4.1	3.1	4.1	3.+	2.+	2.+	2.+	2.+	2.+	.	.	.	.	93.3	3.1	2-4
	TSJGA HETEROPHYLLA	6.5	5.1	5.1	6.1	4.1	5.1	4.1	4.1	4.1	.	.	3.+	5.1	6.1	4.1	.	.	.	.	86.7	5.2	3-6
	RUBUS SPECTABILIS	3.5	4.4	6.1	5.4	4.1	7.6	6.5	4.4	5.4	.	3.3	.	2.+	4.1	4.5	.	.	.	.	86.7	5.1	2-7
	THUJA PLICATA	2.1	3.+	3.+	3.+	3.1	2.+	.	3.+	3.+	.	.	2.+	3.+	4.+	3.+	.	.	.	.	80.0	3.1	2-4
19	VACCINIUM OVALIFOLIUM	.	3.+	4.1	3.1	2.1	2.+	.	2.+	2.+	.	2.+	.	2.+	2.+	2.+	.	.	.	.	73.3	2.6	2-4
20	SAMBUCUS RACEMOSA	1.+	1.+	+.+	1.+	.	2.+	1.+	.	.	3.1	3.1	3.1	.	1.+	1.+	.	.	.	.	73.3	2.0	+-3
	SPIRAEA DOUGLASII	3.+	3.1	3.1	3.1	4.1	.	.	2.1	4.1	.	.	.	2.1	3.1	3.1	.	.	.	.	66.7	3.1	2-4
21	MENZIESIA FERRUGINEA	+.+	.	3.1	2.+	.	3.+	4.+	3.1	3.+	.	.	.	.	5.1	4.+	.	.	.	.	60.0	3.3	+-5
22	RUBUS PARVIFLORUS	2.1	1.+	.	3.1	2.+	2.1	.	.	1.1	.	.	.	.	3.1	3.4	.	.	.	.	53.3	2.0	1-3
	PSEUDOTSUGA MENZIESII (NAT.)	3.+	3.+	3.+	4.+	2.1	.	.	.	.	.	.	.	.	3.+	3.+	.	.	.	.	46.7	2.6	2-4
	SALIX SITCHENSIS	2.1	4.1	4.1	5.1	3.1	+.+	.	.	.	.	.	.	.	.	.	.	.	.	.	40.0	3.1	+-5
	ACER CIRCINATUM	5.6	.	.	.	+.+	4.4	3.3	.	2.+	.	.	2.1	.	.	.	.	.	.	.	40.0	2.9	+-5
	PRUNUS EMARGINATA	4.+	2.+	.	1.+	3.+	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	33.3	1.8	1-4
	POPULUS TRICHOCARPA	4.+	.	+.+	+.+	+.+	.	.	+.+	.	.	.	.	.	.	.	.	.	.	.	33.3	1.3	+-4
23	RUBUS LEUCODERMIS	.	2.+	2.+	2.+	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	26.7	1.1	2-2
	SALIX SCOULERIANA	.	.	2.+	.	1.+	.	.	+.+	.	.	.	.	.	+.+	.	.	.	.	.	26.7	+.3	+-2
	BETULA PAPYRIFERA	2.+	2.+	.	.	.	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	20.0	1.0	2-2
	RHAMNUS PURSHIANA	.	+.+	.	.	.	+.+	2.+	.	.	.	.	.	.	.	.	.	.	.	.	20.0	+.1	+-2
24	RIBES SANGUINEUM	3.+	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13.3	+.9	1-3
25	PICEA SITCHENSIS	.	.	+.+	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	.	.	13.3	+.0	+-+
	PSEUDOTSUGA MENZIESII (ART.)	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	+.+	.	.	.	.	13.3	+.0	+-+
26	BERBERIS AQUIFOLIUM	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
MOSS - WESTERN HEMLOCK ASSOCIATION

PLOT NUMBER		003	009	018	019	022	032	039	035	036	033	034	037	038	045	049							
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
27	RUBUS LACINIATUS	.	.	.	.	.	.	1.1	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
28	TAXUS BREVIFOLIA	.	+.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	+-+
C																							
29	BLECHNUM SPICANT	3.+	3.+	3.+	3.1	3.+	4.+	4.1	4.1	3.1	4.1	3.1	2.1	2.+	4.1	6.4	.	.	.	.	100.0	4.2	2-6
	TSUGA HETEROPHYLLA	3.+	3.1	3.1	3.1	3.+	3.+	3.+	3.+	2.+	2.+	2.+	2.+	3.+	3.+	2.+	.	.	.	.	100.0	3.2	2-3
30	PTERIDIUM AQUILINUM	8.7	5.6	4.+	4.+	5.5	2.+	6.5	4.1	4.1	2.+	2.+	1.+	.	2.+	2.1	.	.	.	.	93.3	5.0	1-8
31	POLYSTICHUM MUNITUM	3.+	2.+	2.+	2.+	2.+	2.+	4.+	3.+	2.+	3.1	4.1	3.1	?.+	.	3.1	.	.	.	.	93.3	3.2	2-4
32	DRYOPTERIS AUSTRIACA	2.+	2.+	2.+	2.+	2.+	3.+	4.+	2.1	3.1	3.+	2.1	2.1	2.+	.	2.1	.	.	.	.	93.3	3.0	2-4
	THUJA PLICATA	3.+	3.+	1.+	2.+	2.1	2.+	.	2.+	1.+	.	1.+	+.+	2.+	2.+	1.+	.	.	.	.	86.7	2.2	+-3
33	RUBUS URSINUS	3.4	4.4	3.+	2.+	3.1	5.4	4.1	3.1	5.4	.	2.+	.	.	2.1	3.1	.	.	.	.	80.0	3.9	2-5
34	EPILOBIUM AUGUSTIFOLIUM	2.1	4.5	4.+	.	2.+	2.+	2.+	3.1	3.1	.	1.+	.	.	2.+	2.1	.	.	.	.	73.3	2.9	1-4
35	ATHYRIUM FILIX-FEMINA	1.+	2.+	2.+	2.+	1.+	1.+	1.+	.	.	.	.	.	.	.	1.1	.	.	.	.	53.3	1.3	1-2
36	LUZULA PARVIFLORA	.	2.3	2.+	3.+	2.+	4.+	.	.	1.1	.	.	.	.	.	2.1	.	.	.	.	46.7	2.1	1-4
37	ANAPHALIS MARGARITACEA	2.1	3.4	3.+	.	3.3	.	.	2.+	.	.	.	.	.	.	3.1	.	.	.	.	40.0	2.1	2-3
38	TIARELLA TRIFOLIATA	.	.	4.1	3.1	.	.	.	.	.	3.1	.	2.1	.	.	3.3	.	.	.	.	33.3	2.2	2-4
39	LYCOPODIUM CLAVATUM	.	.	1.1	.	3.3	3.1	.	3.3	.	.	.	.	.	3.1	.	.	.	.	.	33.3	1.9	1-3
	PSEUDOTSUGA MENZIESII (NAT.)	.	2.+	.	2.+	+.+	.	.	.	.	.	.	.	.	1.+	+.+	.	.	.	.	33.3	+.8	+-2
40	TRILLIUM OVATUM	+.+	.	.	.	.	.	.	.	.	.	+.+	+.+	.	+.+	.	.	.	.	.	26.7	+.0	+-+
41	LINNAEA BOREALIS	.	5.6	5.4	3.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20.0	3.1	3-5
42	TRISETUM CERNUUM	.	.	.	.	1.+	3.1	.	.	.	1.+	.	.	.	.	.	.	.	.	.	20.0	1.0	1-3
43	CAREX DEWEYANA	2.2	.	.	.	2.1	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	20.0	1.0	2-2
44	CORNUS CANADENSIS	.	.	.	.	3.3	.	3.1	.	.	.	.	.	.	.	.	.	.	.	.	13.3	1.2	3-3
45	GALIUM TRIFLORUM	2.2	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13.3	+.2	1-2
46	LACTUCA BIENNIS	.	1.+	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13.3	+.0	1-1
47	POA PRATENSIS	.	.	3.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.6	3-3
48	VIOLA SEMPERVIRENS	3.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.6	3-3
49	CALAMAGROSTIS CANADENSIS	.	2.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2
50	CAREX INTERIOR	.	2.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2
51	HYPERICUM PERFORATUM	.	.	.	.	.	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2
52	POA PALUSTRIS	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2
53	TRIENTALIS LATIFOLIA	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2
54	DICENTRA FORMOSA	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
55	GYMNOCARPIUM DRYOPTERIS	.	.	.	1.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
56	EQUISETUM ARVENSE	+.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	+-+
DH																							
57	RHYTIDIADELPHUS LOREUS	3.3	2.2	2.2	2.3	2.3	3.2	3.2	2.2	2.2	2.2	2.2	3.2	2.2	4.3	4.3	.	.	.	.	100.0	3.2	2-4
58	HYLOCOMIUM SPLENDENS	3.3	5.5	5.4	3.3	.	4.3	4.4	4.4	5.4	6.4	3.3	3.2	3.2	5.4	5.3	.	.	.	.	93.3	5.0	3-6
59	PLAGIOTHECIUM UNDULATUM	2.2	.	.	.	.	.	1.1	.	.	2.2	1.1	2.2	.	3.3	3.2	.	.	.	.	46.7	1.8	1-3
60	EURHYNCHIUM OREGANUM	1.1	.	.	.	.	.	2.2	1.2	2.2	.	.	1.1	2.2	.	.	.	.	.	.	40.0	1.2	1-2
61	EURHYNCHIUM PRAELONGUM	.	.	.	.	.	.	.	.	.	.	.	2.2	.	.	.	.	.	.	.	6.7	+.0	2-2
62	ISOPTERYGIUM ELEGANS	.	.	.	.	.	.	.	.	.	.	.	1.1	.	.	.	.	.	.	.	6.7	+.0	1-1
63	ISOTHECIUM STOLONIFERUM	.	.	.	.	.	.	.	.	.	1.1	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
DM																							
64	POLYTRICHUM JUNIPERINUM	2.2	5.3	5.5	3.3	4.4	3.4	2.2	3.4	.	2.3	2.2	2.2	.	5.3	4.3	.	.	.	.	86.7	4.1	2-5
65	POGONATUM CONTORTUM	.	3.3	.	3.3	.	3.3	.	2.2	.	.	2.2	2.2	2.2	5.3	3.3	.	.	.	.	60.0	3.1	2-5
66	POGONATUM ALPINUM	.	.	2.2	4.4	2.3	.	2.2	3.3	2.2	2.2	.	.	.	2.2	.	.	.	.	.	53.3	2.2	2-4
67	POHLIA NUTANS	.	.	.	3.3	1.1	.	.	.	.	.	.	.	.	2.2	.	.	.	.	.	20.0	1.1	1-3

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
MOSS - WESTERN HEMLOCK ASSOCIATION

ST	NO.	SPECIES \ PLOT NUMBER	003	009	018	019	022	032	039	035	036	033	034	037	038	045	049					P	MS	RS
	68	DICRANELLA HETERONALLA	.	.	1.1	1.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13.3	+.0	1-1
	69	POLYTRICHUM COMMUNE	.	3.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.6	3-3
	70	CERATODON PURPUREUS	.	.	.	.	.	.	.	.	.	.	.	.	.	2.2	.	.	.	.	.	6.7	+.0	2-2
		EURHYNCHIUM PRAELONGUM	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	2-2
	71	AULACOMNIUM ANDROGYNUM	.	.	.	.	1.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
	72	DITRICHUM HETEROMALLUM	.	.	1.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
		ISOTHECIUM STOLONIFERUM	.	.	.	.	.	.	.	.	.	.	.	.	.	1.1	.	.	.	.	.	6.7	+.0	1-1
	73	POGONATUM URNIGERUM	.	.	.	.	.	.	.	1.1	.	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
DW																								
		PLAGIOTHECIUM UNDULATUM	1.1	3.3	2.2	2.2	3.3	2.2	2.2	1.2	2.2	2.2	2.1	2.2	1.2	1.1	.	.	.	.	.	93.3	2.3	1-3
		HYLOCOMIUM SPLENDENS	2.1	2.2	3.2	2.3	2.1	2.3	1.2	2.3	2.2	.	.	.	2.2	2.2	.	.	.	.	.	73.3	2.1	1-3
		RHYTIDIADELPHUS LOREUS	2.2	2.1	3.2	2.2	1.1	2.1	2.2	.	.	.	.	.	.	2.2	.	.	.	.	.	53.3	1.8	1-3
		EURHYNCHIUM OREGANUM	.	.	1.1	.	.	.	.	.	.	3.2	2.1	1.1	1.1	.	2.2	.	.	.	.	40.0	1.3	1-3
	74	RHIZOMNIUM GLABRESCENS	.	.	.	.	.	.	.	.	.	.	.	2.2	2.2	.	.	.	.	.	.	13.3	+.5	2-2
	75	PLAGIOMNIUM INSIGNE	.	.	.	.	.	.	.	.	.	.	1.1	.	.	.	.	.	.	.	.	6.7	+.0	1-1
	76	RHYTIDIADELPHUS TRIQUETRUS	.	.	.	.	.	.	.	.	1.1	.	.	.	.	.	.	.	.	.	.	6.7	+.0	1-1
DR																								
	77	RHACOMITRIUM CANESCENS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.1	.	.	.	.	6.7	+.0	1-1

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SWORDFERN - WESTERN REDCEDAR ASSOCIATION

PLOT NUMBER		005	030	031	001	006	023	007	008	027	028	002	024	025	026	004	029						
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
A																							
1	ALNUS RUBRA	.	.	.	.	.	.	5.1	.	.	.	.	.	.	.	2.+	4.1	.	.	.	18.8	2.5	2-5
2	PSEUDOTSUGA MENZIESII (ART.)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.+	5.+	.	.	.	12.5	3.2	5-6
3	SALIX SITCHENSIS	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.+	6.1	.	.	.	12.5	2.8	3-6
4	SALIX SCOULERIANA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.+	.	.	.	.	6.3	+.0	2-2
5	PRUNUS EMARGINATA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.+	.	.	.	.	6.3	+.0	1-1
6	POPULUS TRICHOCARPA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	6.3	+.0	+-+
B1																							
	ALNUS RUBRA	5.1	6.1	6.1	6.1	3.1	5.+	4.1	3.+	4.1	+.+	3.1	6.1	6.1	4.1	4.1	+.+	.	.	.	100.0	5.2	+-6
	SALIX SITCHENSIS	.	.	+.+	3.1	5.5	2.1	6.1	2.+	.	.	6.6	3.1	4.1	4.1	6.1	5.1	.	.	.	75.0	4.8	+-6
	PSEUDOTSUGA MENZIESII (ART.)	.	.	+.+	8.+	7.+	6.+	7.+	.	.	.	7.+	7.+	5.+	9.+	5.+	6.+	.	.	.	68.8	6.0	+-9
	POPULUS TRICHOCARPA	.	.	2.+	.	3.+	4.+	4.+	2.+	.	+.+	2.+	.	.	2.1	4.+	+.+	.	.	.	62.5	2.8	+-4
7	TSUGA HETEROPHYLLA	.	.	.	3.1	.	3.1	.	2.1	.	.	+.+	.	3.1	.	2.+	+.+	.	.	.	43.8	1.8	+-3
	PRUNUS EMARGINATA	.	.	.	.	.	1.+	3.+	3.+	+.+	.	.	.	+.+	.	1.+	3.1	.	.	.	43.8	1.6	+-3
8	PSEUDOTSUGA MENZIESII (NAT.)	.	.	.	.	+.+	.	3.+	.	2.+	.	+.+	+.+	.	1.+	.	+.+	.	.	.	43.8	1.1	+-3
9	ACER CIRCINATUM	.	.	.	.	+.+	.	5.5	5.7	.	5.5	4.5	.	.	.	.	.	.	.	.	31.3	3.5	+-5
	SALIX SCOULERIANA	.	.	.	.	.	2.1	3.1	.	.	.	.	.	.	2.1	2.1	3.1	.	.	.	31.3	1.5	2-3
10	BETULA PAPYRIFERA	.	.	.	.	.	.	6.+	4.1	4.1	6.5	.	.	.	.	.	.	.	.	.	25.0	3.8	4-6
11	RUBUS SPECTABILIS	.	.	.	.	.	.	5.5	.	.	.	.	.	.	.	9.8	5.6	.	.	.	18.8	4.5	5-9
12	RHAMNUS PURSHIANA	.	.	.	.	.	.	2.+	2.+	.	.	.	.	.	.	+.+	.	.	.	.	18.8	+.5	+-2
13	RUBUS PARVIFLORUS	.	.	.	.	.	.	3.1	.	.	.	.	.	.	.	5.1	.	.	.	.	12.5	2.2	3-5
14	CORNUS NUTTALLII	.	.	.	.	.	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
15	PICEA SITCHENSIS	.	.	.	.	.	.	.	.	.	.	2.+	.	.	.	.	.	.	.	.	6.3	+.0	2-2
16	SAMBUCUS RACEMOSA	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.+	.	.	.	.	6.3	+.0	2-2
17	RUBUS DISCOLOR	.	.	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
B2																							
	RUBUS SPECTABILIS	3.1	5.3	4.4	4.6	3.1	4.1	4.5	5.1	4.1	4.1	5.6	4.3	5.5	7.5	4.6	3.4	.	.	.	100.0	5.0	3-7
18	SPIRAEA DOUGLASII	3.1	3.3	3.3	1.+	3.1	3.1	3.1	3.1	3.1	2.1	2.+	3.+	3.1	5.4	3.1	2.1	.	.	.	100.0	3.5	1-5
	RUBUS PARVIFLORUS	4.1	4.1	5.4	1.1	4.1	3.1	3.1	4.1	3.1	3.1	3.1	3.1	4.1	.	3.1	4.1	.	.	.	93.8	4.0	1-5
	TSUGA HETEROPHYLLA	.	3.+	2.1	4.1	1.+	3.+	2.+	3.1	3.1	2.+	1.+	3.+	2.+	3.1	+.+	+.+	.	.	.	93.8	3.0	+-4
	SALIX SITCHENSIS	4.4	4.1	3.1	4.1	6.6	3.1	2.+	2.+	1.+	2.1	3.4	4.1	.	2.+	.	.	.	.	.	81.3	3.9	1-6
	ACER CIRCINATUM	3.3	1.1	3.4	1.+	3.3	.	4.5	5.6	3.1	4.3	2.1	6.6	.	.	1.+	.	.	.	.	75.0	3.9	1-6
19	GAULTHERIA SHALLON	.	.	.	3.5	1.1	3.1	3.3	3.3	4.1	4.3	2.3	6.6	4.4	1.1	.	1.1	.	.	.	75.0	3.7	1-6
	PRUNUS EMARGINATA	3.+	3.1	2.+	2.+	3.1	2.+	2.+	5.+	2.+	3.+	2.+	3.+	.	.	.	.	.	.	.	75.0	3.1	2-5
	POPULUS TRICHOCARPA	5.1	4.1	4.1	2.+	3.1	5.1	2.+	2.+	2.1	.	.	.	.	+.+	+.+	.	.	.	.	68.8	3.5	+-5
20	RIBES SANGUINEUM	3.+	3.+	2.1	1.+	3.+	.	.	4.1	4.1	3.1	1.+	1.+	3.1	.	.	.	.	.	.	68.8	3.0	1-4
21	RUBUS LEUCODERMIS	3.1	2.1	3.3	.	2.1	2.1	2.1	3.1	2.1	3.1	.	2.1	2.1	.	.	.	.	.	.	68.8	2.4	2-3
22	THUJA PLICATA	.	+.+	.	1.+	2.+	+.+	1.+	2.+	2.1	.	.	+.+	1.+	3.1	2.+	.	.	.	.	68.8	1.6	+-3
	BETULA PAPYRIFERA	.	4.+	4.+	.	+.+	+.+	3.+	5.1	4.1	5.+	.	+.+	+.+	.	.	.	.	.	.	62.5	3.5	+-5
	SAMBUCUS RACEMOSA	2.+	4.1	2.1	.	2.+	.	2.+	3.1	.	2.+	.	.	2.+	1.+	.	3.1	.	.	.	62.5	2.4	1-4
23	VACCINIUM PARVIFOLIUM	1.+	.	.	1.+	1.+	2.+	4.+	3.+	2.1	.	3.+	3.+	.	.	1.+	.	.	.	.	62.5	2.4	1-4
	PSEUDOTSUGA MENZIESII (NAT.)	2.+	.	1.+	3.+	2.+	3.+	.	.	.	.	3.+	3.+	3.+	+.+	.	.	.	.	.	56.3	2.2	+-3
	ALNUS RUBRA	5.1	4.1	.	4.1	4.1	4.+	.	2.+	.	.	.	3.+	2.1	.	.	.	.	.	.	50.0	3.4	2-5
24	RUBUS LACINIATUS	.	1.+	.	.	2.+	1.+	2.+	2.+	.	2.1	.	+.+	1.+	.	.	.	.	.	.	50.0	1.3	+-2
	PSEUDOTSUGA MENZIESII (ART.)	4.+	4.+	3.+	2.+	.	+.+	.	.	.	.	.	.	+.+	.	.	.	.	.	.	37.5	2.2	+-4
	SALIX SCOULERIANA	3.1	2.1	3.1	.	.	2.1	.	.	2.1	.	.	1.+	.	.	.	.	.	.	.	37.5	1.6	1-3
25	SALIX LASIANDRA	2.1	2.1	2.+	3.1	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	31.3	1.4	2-3

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SWORDFERN - WESTERN REDCEDAR ASSOCIATION

PLOT NUMBER		005	030	031	001	006	023	007	008	027	028	C02	024	025	026	004	029						
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
26	ACER MACROPHYLLUM	.	.	.	.	.	.	.	2.+	2.+	2.+	+.+	.	.	.	.	.	.	.	.	25.0	+.9	+-2
	RHAMNUS PURSHIANA	.	.	.	.	.	.	1.+	2.+	2.+	.	.	.	.	.	.	.	.	.	.	18.8	+.6	1-2
	CORNUS NUTTALLII	.	.	.	.	.	.	.	2.1	.	2.+	.	.	.	.	.	.	.	.	.	12.5	+.4	2-2
27	OPLOPANAX HORRIDUM	.	.	.	.	.	.	.	.	.	.	1.+	.	.	2.1	.	.	.	.	.	12.5	+.1	1-2
28	LONICERA INVOLUCRATA	.	.	.	.	.	.	.	.	1.1	.	.	.	.	.	+.+	.	.	.	.	12.5	+.0	+-1
29	PYRUS FUSCA	.	.	.	.	.	.	+.+	.	.	.	.	+.+	.	.	.	.	.	.	.	12.5	+.0	+-+
30	MENZIESIA FERRUGINEA	.	.	.	.	.	.	2.+	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
31	ACTAEA RUBRA	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
32	ROSA GYMNOCARPA	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
33	HOLODISCUS DISCULOR	.	+.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	+-+
34	POPULUS TREMULOIDES	.	+.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	+-+
C																							
35	POLYSTICHUM MUNITUM	3.1	3.+	3.1	4.+	3.+	2.+	4.+	4.+	5.4	2.+	3.+	3.+	5.+	3.+	3.+	4.+	.	.	.	100.0	4.2	2-5
36	EPILOBIUM AUGUSTIFOLIUM	3.1	2.+	2.+	1.+	1.+	2.+	2.1	2.+	3.1	3.+	3.1	4.1	3.1	1.+	1.+	.	.	.	.	93.8	3.0	1-4
37	ANAPHALIS MARGARITACEA	4.4	4.4	3.3	3.5	3.4	3.3	3.+	2.1	3.1	3.1	3.4	2.1	2.1	1.+	.	.	.	.	.	87.5	3.2	1-4
	TSUGA HETEROPHYLLA	3.1	2.+	2.+	3.+	2.+	2.+	1.+	3.+	2.1	2.+	2.1	.	.	3.1	2.+	+.+	.	.	.	87.5	2.5	+-3
38	PTERIDIUM AQUILINUM	2.1	3.1	3.1	6.6	4.5	8.6	5.5	6.6	8.6	6.5	2.1	5.4	9.7	.	.	.	.	.	.	81.3	5.8	2-9
39	BLECHNUM SPICANT	2.+	2.+	2.+	.	3.+	2.+	6.1	2.+	1.+	.	2.+	3.1	.	4.+	2.+	2.+	.	.	.	81.3	3.4	1-6
40	LUZULA PARVIFLORA	3.+	3.+	2.+	.	3.+	2.1	3.+	2.2	2.+	2.+	.	1.1	.	4.1	1.+	2.+	.	.	.	81.3	2.8	1-4
41	LACTUCA BIENNIS	2.+	3.1	2.1	3.1	2.+	2.+	.	3.+	3.1	3.1	1.+	1.+	.	.	2.+	1.+	.	.	.	81.3	2.5	1-3
42	DRYOPTERIS AUSTRIACA	3.+	.	2.+	1.+	2.+	1.+	1.+	3.+	.	.	2.+	2.+	3.+	2.+	1.+	2.+	.	.	.	81.3	2.3	1-3
	THUJA PLICATA	.	2.+	2.+	2.+	2.1	2.+	2.+	3.+	3.+	2.+	.	1.+	1.+	2.+	1.+	.	.	.	.	81.3	2.2	1-3
43	ATHYRIUM FILIX-FEMINA	2.+	2.1	2.+	1.+	1.+	1.+	2.+	.	.	2.+	1.+	1.+	.	2.+	1.+	2.+	.	.	.	81.3	1.8	1-2
44	RUBUS URSINUS	.	.	1.+	5.5	2.1	3.1	5.6	5.1	5.5	5.4	3.4	5.1	4.4	2.1	.	.	.	.	.	75.0	4.5	1-5
45	GALIUM TRIFLORUM	7.7	4.2	5.4	.	3.3	3.3	.	3.3	2.1	.	1.+	.	3.1	2.+	.	1.+	.	.	.	68.8	4.0	1-7
46	HOLCUS LANATUS	2.1	3.3	1.+	.	.	3.1	.	2.2	4.3	4.3	2.3	2.+	1.+	1.+	.	.	.	.	.	68.8	2.7	1-4
47	TRIENTALIS LATIFOLIA	.	3.1	3.1	2.+	2.1	2.+	.	3.3	3.1	4.1	.	2.+	2.1	.	.	1.+	.	.	.	68.8	2.7	1-4
48	TIARELLA TRIFOLIATA	3.2	.	3.1	1.1	2.1	4.3	3.3	2.+	.	.	1.1	2.+	.	1.+	2.1	.	.	.	.	68.8	2.5	1-4
49	HYPOCHAERIS RADICATA	2.+	4.+	3.1	3.+	4.1	2.+	.	2.+	2.+	4.1	.	.	.	.	.	.	.	.	.	56.3	3.0	2-4
50	EPILOBIUM WATSONII	2.+	2.+	2.+	.	2.+	.	.	2.+	2.1	1.1	1.+	.	.	.	1.+	.	.	.	.	56.3	1.5	1-2
51	VIOLA SEMPERVIRENS	.	3.3	.	1.1	.	2.2	.	2.2	3.1	2.2	2.1	.	.	2.2	.	.	.	.	.	50.0	1.9	1-3
	PSEUDOTSUGA MENZIESII (NAT.)	2.+	1.+	+.+	3.+	2.+	+.+	.	.	.	+.+	.	+.+	.	.	.	.	.	.	.	50.0	1.2	+-3
52	CIRSIUM ARVENSE	3.+	4.1	.	.	2.+	1.+	.	.	1.+	2.+	1.+	.	.	.	.	.	.	.	.	43.8	2.0	1-4
53	SOLIDAGO CANADENSIS	.	3.4	.	.	2.1	1.+	.	.	1.1	1.+	3.3	1.1	.	.	.	.	.	.	.	43.8	1.5	1-3
54	JUNCUS EFFUSUS	6.1	4.+	6.4	.	4.1	4.3	.	.	.	1.+	.	.	.	.	.	.	.	.	.	37.5	4.0	1-6
55	AGROSTIS SCABRA	3.5	4.1	2.+	.	.	.	.	2.+	2.1	.	.	2.1	.	.	.	.	.	.	.	37.5	2.0	2-4
56	EQUISETUM ARVENSE	5.5	.	7.6	1.+	.	2.1	.	.	.	.	.	.	.	.	1.+	.	.	.	.	31.3	3.5	1-7
57	CIRSIUM VULGARE	4.1	+.+	4.+	.	.	.	.	.	.	.	.	.	.	+.+	.	.	.	.	.	25.0	1.9	+-4
58	FESTUCA OCCIDENTALIS	.	3.+	1.1	.	.	.	.	.	.	.	.	3.3	2.1	.	.	.	.	.	.	25.0	1.3	1-3
59	LINNAEA BOREALIS	.	.	.	1.1	.	1.+	.	3.3	3.4	.	.	.	.	.	.	.	.	.	.	25.0	1.3	1-3
60	CIRCAEA ALPINA	1.1	.	.	.	.	.	2.2	.	.	.	2.1	.	.	.	.	+.+	.	.	.	25.0	+.7	+-2
61	GALIUM TRIFIDIUM	.	.	.	.	.	1.1	.	.	.	1.1	.	.	.	.	2.1	1.1	.	.	.	25.0	+.6	1-2
62	SCIRPUS MICROCARPUS	5.4	2.+	4.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18.8	2.5	2-5
63	DICENTRA FORMOSA	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	2.+	4.3	.	.	.	18.8	1.4	1-4
64	CAREX ROSSII	.	2.+	.	.	.	.	.	3.3	.	3.1	.	.	.	.	.	.	.	.	.	18.8	1.3	2-3
65	CORNUS CANADENSIS	.	.	.	3.1	.	.	3.3	.	.	.	2.3	.	.	.	.	.	.	.	.	18.8	1.3	2-3
66	CALAMAGROSTIS CANADENSIS	.	2.1	.	.	.	3.1	.	2.3	.	.	.	.	.	.	.	.	.	.	.	18.8	1.1	2-3
67	TRISETUM CERNUUM	.	2.+	2.+	.	.	.	.	.	.	2.+	.	.	.	.	.	.	.	.	.	18.8	+.9	2-2
68	CAREX DEWEYANA	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	1.+	1.+	.	.	.	18.8	+.1	1-1

VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SWORDFERN - WESTERN REDCEDAR ASSOCIATION

PLOT NUMBER		005	030	031	001	C06	023	007	008	027	028	002	024	025	026	004	029						
ST NO.	SPECIES	SPECIES SIGNIFICANCE AND SOCIABILITY																			P	MS	RS
69	SENECIO SYLVATICUS	1.+	.	1.+	.	.	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	18.8	+.1	1-1
70	CAREX HENDERSONII	.	.	.	.	.	.	3.+	.	.	.	1.1	.	.	.	.	.	.	.	.	12.5	+.8	1-3
71	VERONICA AMERICANA	1.1	.	3.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12.5	+.8	1-3
72	DIGITALIS PURPUREA	.	.	.	2.1	.	.	.	.	.	.	.	2.+	.	.	.	.	.	.	.	12.5	+.4	2-2
73	AGROSTIS EXARATA	1.+	.	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12.5	+.1	1-2
74	CAREX INTERIOR	2.+	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12.5	+.1	1-2
75	EQUISETUM PALUSTRE	1.1	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	12.5	+.1	1-2
76	PHALARIS ARUNDINACEA	.	1.+	.	.	.	.	2.+	.	.	.	.	.	.	.	.	.	.	.	.	12.5	+.1	1-2
77	RUMEX ACETOSELLA	.	.	.	.	.	.	.	2.3	.	1.1	.	.	.	.	.	.	.	.	.	12.5	+.1	1-2
78	TRILLIUM OVATUM	.	.	.	.	.	.	.	.	2.1	.	.	.	.	.	.	+.+	.	.	.	12.5	+.0	+-2
79	LYCOPODIUM CLAVATUM	.	.	.	.	.	.	.	.	.	.	1.1	1.+	.	.	.	.	.	.	.	12.5	+.0	1-1
80	CAREX AQUATILIS	.	.	.	.	.	.	.	3.3	.	.	.	.	.	.	.	.	.	.	.	6.3	+.5	3-3
81	GEUM MACROPHYLLUM	.	.	.	.	3.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.5	3-3
82	ACHLYS TRIPHYLLA	.	.	.	.	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
83	CREPIS CAPILLARIS	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
84	DANTHONIA SPICATA	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
85	JUNCUS ENSIFOLIUS	.	.	.	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
86	JUNCUS TENUIS	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
87	OENANTHE SARMENTOSA	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
88	POA PALUSTRIS	.	.	.	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
89	SCIRPUS CYPERINUS	.	.	.	.	2.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
90	VIOLA TRICOLOR	.	.	.	.	2.1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
91	CAREX MERTENSII	.	.	.	.	.	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
92	ERIGERON ANNUUS	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
93	LUZULA CAMPESTRIS	.	.	.	.	.	.	.	.	.	1.+	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
94	VERONICA SERPYLLIFOLIA	.	.	.	.	.	.	.	1.2	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
95	LYSICHITUM AMERICANUM	.	.	.	.	.	.	+.+	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	+-+
96	MONTIA SIBIRICA	.	.	.	.	.	.	.	.	+.+	.	.	.	.	.	.	.	.	.	.	6.3	+.0	+-+
DH																							
97	EURHYNCHIUM OREGANUM	.	.	1.2	.	.	2.1	2.2	1.2	3.2	3.3	.	2.1	2.1	3.3	.	4.3	.	.	.	62.5	2.4	1-4
98	EURHYNCHIUM PRAELONGUM	.	1.1	.	.	2.2	.	3.3	.	1.1	.	1.2	.	.	2.2	3.2	.	.	.	.	43.8	1.6	1-3
99	PLAGIOMNIUM INSIGNE	.	.	.	.	2.2	.	.	.	.	.	1.2	.	.	.	2.3	6.5	.	.	.	25.0	2.8	1-6
100	RHYTIDIADELPHUS LOREUS	.	.	.	.	.	1.1	1.1	1.1	.	.	.	.	.	.	.	.	.	.	.	18.8	+.1	1-1
101	LEUCOLEPIS MENZIESII	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.2	2.2	.	.	.	12.5	+.4	2-2
102	CLADOPODIUM CRISPIFOLIUM	.	.	.	.	1.2	.	.	.	.	.	.	.	.	.	2.2	.	.	.	.	12.5	+.1	1-2
103	HYLOCOMIUM SPLENDENS	.	.	.	.	.	.	1.1	.	.	.	.	.	.	1.1	.	.	.	.	.	12.5	+.0	1-1
104	ISOTHECIUM STOLONIFERUM	.	.	.	.	1.2	.	.	.	1.1	.	.	.	.	.	.	.	.	.	.	12.5	+.0	1-1
105	RHIZOMNIUM GLABRESCENS	.	.	.	3.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.5	3-3
106	ISOPTERYGIUM ELEGANS	.	.	.	2.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2
107	MNIUM SPINULOSUM	.	.	.	.	1.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	1-1
DM																							
108	POLYTRICHUM JUNIPERINUM	3.3	4.3	7.4	4.4	4.3	5.4	3.4	4.4	4.3	8.5	3.3	8.6	3.3	3.2	.	.	.	.	.	87.5	5.3	3-8
109	CERATODON PURPUREUS	3.3	.	2.2	2.2	2.1	3.2	.	2.2	.	.	2.2	2.2	.	.	.	.	.	.	.	50.0	2.0	2-3
110	MNIUM LYCOPODIOIDES	.	2.2	.	.	3.2	4.3	.	2.2	2.2	.	.	.	.	4.3	3.4	.	.	.	.	43.8	2.5	2-4
111	POGONATUM CONTORTUM	4.3	2.2	.	.	2.2	.	3.3	.	3.3	.	.	.	.	2.1	2.2	.	.	.	.	43.8	2.2	2-4
	EURHYNCHIUM PRAELONGUM	2.1	3.3	2.2	1.1	.	.	.	1.1	1.1	.	1.1	.	.	.	.	.	.	.	.	43.8	1.4	1-3
112	POGONATUM ALPINUM	.	.	.	.	.	.	.	3.3	.	.	2.3	.	.	2.1	.	.	.	.	.	18.8	1.1	2-3
113	DITRICHUM HETEROMALLUM	.	.	.	.	2.2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.3	+.0	2-2

```
VEGETATION-ENVIRONMENT TABLE - PART II - RELEVE TABLES
COASTAL WESTERN HEMLOCK ZONE, DRY SUBZONE
SWORDFERN - WESTERN REDCEDAR ASSOCIATION                                                                                      PAGE  4

-------------------------------------------------------------------------------------------------------------------------------------
PLOT NUMBER                                  |005|030|031|001|C06|023|007|008|027|028|002|024|025|026|004|029|   |   |   |
-------------------------------------------------------------------------------------------------------------------------------------
ST NO.   SPECIES                                                     SPECIES SIGNIFICANCE AND SOCIABILITY                 P    MS  RS
-------------------------------------------------------------------------------------------------------------------------------------

  114 OLIGOTRICHUM ALIGERUM                  |2.3| . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |   6.3 +.0 2-2
      PLAGIOMNIUM INSIGNE                    | . | . | . | . | . | . | . | . | . | . | . | . | . |2.1| . | . | . | . | . |   6.3 +.0 2-2
  115 POLYTRICHUM COMMUNE                    | . | . |2.2| . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |   6.3 +.0 2-2
  116 DICRANELLA HETEROMALLA                 | . | . |1.1| . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |   6.3 +.0 1-1
  117 LEPTOBRYUM PYRIFORME                   | . | . | . | . |1.2| . | . | . | . | . | . | . | . | . | . | . | . | . | . |   6.3 +.0 1-1
      LEUCOLEPIS MENZIESII                   | . | . | . | . | . | . | . | . | . | . | . | . | . |1.1| . | . | . | . | . |   6.3 +.0 1-1
  118 POHLIA NUTANS                          | . | . | . | . | . | . | . | . | . | . |1.1| . | . | . | . | . | . | . | . |   6.3 +.0 1-1
DW                                           -----------------------------------------------------------------------------
      HYLOCOMIUM SPLENDENS                   | . | . | . | . | . | . |2.2|3.3|3.2|2.2| . | . |3.3| . | . | . | . | . | . |  31.3 1.7 2-3
  119 PLAGIOTHECIUM UNDULATUM                | . | . | . | . | . | . |1.2|1.1| . | . | . | . |1.1| . | . |1.1| . | . | . |  25.0 +.3 1-1
      EURHYNCHIUM OREGANUM                   | . | . | . | . | . | . | . |2.3| . | . | . | . | . | . | . | . | . | . | . |   6.3 +.0 2-2
      RHYTIDIADELPHUS LOREUS                 | . | . | . | . | . | . | . |2.1| . | . | . | . | . | . | . | . | . | . | . |   6.3 +.0 2-2
                                             -----------------------------------------------------------------------------
EXECUTION TERMINATED


$SIGNOFF
```

PART III. Tree and Stand Description

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 1

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1260	810	200	40		10	10	10			50									
WESTERN REDCEDAR	210	50																		
NATURAL DOUGLAS-FIR	110	120	80	20		20														
PAPER BIRCH																				
VINE MAPLE	50	40			20			10												
CASCARA																				
BITTER CHERRY	70	20	230	130																
BLACK COTTONWOOD		90	100	100	30															
RED ALDER	30	50	90	40	70	60	20	20	30	10										
WILLOW SPP.		20	160	290	160	290	100	90	20	10	10									
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR					10	10	40	70	50	40	40	20	130	30	80	50	20	10	50	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1730	1200	860	620	290	390	170	200	100	60	100	20	130	30	80	50	20	10	50	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					2390
WESTERN REDCEDAR																					260
NATURAL DOUGLAS-FIR																					350
PAPER BIRCH																					
VINE MAPLE																					120
CASCARA																					
BITTER CHERRY																					450
BLACK COTTONWOOD																					320
RED ALDER																					420
WILLOW SPP.																					1150
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	20		10																		680
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	20		10																		6140

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 2

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	60	40									10									
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR		30	40	30	10		10													
PAPER BIRCH																				
VINE MAPLE		40	20	40	10	50	10	30		10	10									
CASCARA																				
BITTER CHERRY				30	10															
BLACK COTTONWOOD										10	20					10				
RED ALDER											20					20	10		10	
WILLOW SPP.			30	80	60	90	140	140	160	120	160		50	10	50					
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR										30	30	30	70	10	60	40	10	10	20	10
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	60	110	90	180	90	140	160	170	160	170	250	30	120	20	110	70	20	10	30	10

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					110
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					120
PAPER BIRCH																					
VINE MAPLE																					220
CASCARA																					
BITTER CHERRY																					40
BLACK COTTONWOOD																					40
RED ALDER	30																				90
WILLOW SPP.																					1090
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	30																				350
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	60																				2060

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 3

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	810	790	390	420	280	400	180	140	40	40	20									
WESTERN REDCEDAR	690	280	80	10	10				20	20										
NATURAL DOUGLAS-FIR	10	130	50	20	10															
PAPER BIRCH				20				10		10										
VINE MAPLE	90	100	40	50	70	30	20	40	10			40								
CASCARA																				
BITTER CHERRY	20	30	100	60	40	40	10	10		10					10					
BLACK COTTONWOOD		50	40	10																
RED ALDER									10											
WILLOW SPP.	40	50	120	90	60	50			20											
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1660	1430	820	680	470	520	210	200	100	80	20	40			10					

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					3510
WESTERN REDCEDAR																					1110
NATURAL DOUGLAS-FIR																					220
PAPER BIRCH																					40
VINE MAPLE																					490
CASCARA																					
BITTER CHERRY																					330
BLACK COTTONWOOD																					100
RED ALDER	10																				20
WILLOW SPP.																					430
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	10																				6250

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 4

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	100				10								10							
WESTERN REDCEDAR	50	20																		
NATURAL DOUGLAS-FIR																				
PAPER BIRCH																				
VINE MAPLE					20															
CASCARA													10							
BITTER CHERRY																10				
BLACK COTTONWOOD							10				10						20	10		
RED ALDER									10											
WILLOW SPP.									20				40	10	10	30	90	30	60	30
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR													10					30	20	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	150	20			30		10		30		10		70	10	10	40	110	70	80	30

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					120
WESTERN REDCEDAR																					70
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					
VINE MAPLE																					20
CASCARA																					10
BITTER CHERRY		10	10	10						20	10	10									80
BLACK COTTONWOOD	10			20		10					10	10				10					120
RED ALDER					10	20	20		30	30	10		30	10			40		10		220
WILLOW SPP.	70	30	40	50	30	10	30	50	30	10	20	40	30	30	20	20					830
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	30		30					10		20	20	10	20		40		20				260
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	110	40	80	80	40	40	50	60	60	80	70	70	80	40	60	30	60		10		1730

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 5

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	350																			
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR	50	20																		
PAPER BIRCH																				
VINE MAPLE	20	70	10																	
CASCARA																				
BITTER CHERRY	20	90	10																	
BLACK COTTONWOOD	220	770	410	30																
RED ALDER	390	790	460	40	50	60	50	60	50		20									
WILLOW SPP.	1460	2330	2080	1050	30	10														
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR		90	190	90	10															
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	2510	4160	3160	1210	90	70	50	60	50		20									

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					350
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					70
PAPER BIRCH																					
VINE MAPLE																					100
CASCARA																					
BITTER CHERRY																					120
BLACK COTTONWOOD																					1430
RED ALDER																					1970
WILLOW SPP.																					6960
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					380
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					11380

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 6

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	220	10			10															
WESTERN REDCEDAR	180																			
NATURAL DOUGLAS-FIR	80	20	30	10		30		10												
PAPER BIRCH			10																	
VINE MAPLE		10	60	60		10	10	10												
CASCARA																				
BITTER CHERRY		20	100	90	30		10													
BLACK COTTONWOOD	10	50	40	90	130	70	10	10	20	20			10	10						
RED ALDER		40	50	40	50	30	40	20		20	20	10						10		
WILLOW SPP.		210	160	260	260	390	450	220	280	200	210	30	60	30	20	40	10	10		
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR									10		40	50	30	70	70	60	70	50	50	10
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	490	360	450	550	480	530	520	270	310	240	270	90	100	110	90	100	80	70	50	10

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					240
WESTERN REDCEDAR																					180
NATURAL DOUGLAS-FIR																					180
PAPER BIRCH																					10
VINE MAPLE																					160
CASCARA																					
BITTER CHERRY																					250
BLACK COTTONWOOD																					470
RED ALDER	20																				350
WILLOW SPP.																					2840
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	40	20	10	10																	590
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	60	20	10	10																	5270

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NC.: 7

NC. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	40	50	20	10																
WESTERN REDCEDAR	50	10		10																
NATURAL DOUGLAS-FIR									10	10		20	10							
PAPER BIRCH			20	20	60	60	120	80	60	60	180	90	120	20	10	40	30	10		
VINE MAPLE		10	30	10	20	70	140	180	40	70	50	20	10							
CASCARA					10							10								
BITTER CHERRY			10		10	10				20	10	10	10		20					
BLACK COTTONWOOD			10				10	30	10	10	10	20	20	10	10	10				10
RED ALDER									10		30		10	30	30	20	10			
WILLOW SPP.			30	10	10	20			20	40	70	20	90	70	70	80	50	30	10	20
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR														10	40	30	20	40	30	30
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	90	70	120	60	110	160	270	290	150	210	350	190	270	140	180	180	110	80	40	60

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					120
WESTERN REDCEDAR																					70
NATURAL DOUGLAS-FIR																					50
PAPER BIRCH																					980
VINE MAPLE																					650
CASCARA																					20
BITTER CHERRY																					100
BLACK COTTONWOOD	10																				170
RED ALDER					10		10			10		10	10								190
WILLOW SPP.	70	10	20			20															760
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	40	30	20	10	20	20	30	30	10												410
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	120	40	40	10	30	40	40	30	10	10		10	10								3520

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 8

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	520	260	60	30													20		10	
WESTERN REDCEDAR	920	110																		
NATURAL DOUGLAS-FIR																				
PAPER BIRCH	50	80	270	380	410	240	410	190	120	70	60	10	10							
VINE MAPLE		40	120	70	80	30	20	10	40	10	10									
CASCARA	10	10	10	10	10		20	10				10								
BITTER CHERRY	90	170	130	120	60	40	70	30	10			10		10						
BLACK COTTONWOOD		10	20	10		10		10												
RED ALDER			20		10		10		10				10	20	10	20			10	
WILLOW SPP.			10				20						20	10						
BIG-LEAF MAPLE		20	10																	
PACIFIC DOGWOOD		10	10	20					10			10	20							
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1590	710	660	640	570	320	550	250	190	80	70	40	60	40	10	20	20		20	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					900
WESTERN REDCEDAR																					1030
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					2300
VINE MAPLE																					430
CASCARA																					90
BITTER CHERRY																					740
BLACK COTTONWOOD																					60
RED ALDER																					120
WILLOW SPP.																					60
BIG-LEAF MAPLE																					30
PACIFIC DOGWOOD																					80
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					5840

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTICN
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 9

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1050	700	550	450	380	200	230	60	100	20	60	40	50	10			10		10	
WESTERN REDCEDAR	390	190	90	20																
NATURAL DOUGLAS-FIR	30	20	10	40	60		10					10								
PAPER BIRCH				10		10														
VINE MAPLE	10																			
CASCARA																				
BITTER CHERRY			10																	
BLACK COTTONWOOD																				
RED ALDER									10				10			10				
WILLOW SPP.		60	210	130	180	50	30	10	40	10	30		10							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1480	970	870	650	620	260	270	70	150	30	90	50	70	10		10	10		10	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	20	10	10																		3960
WESTERN REDCEDAR																					690
NATURAL DOUGLAS-FIR																					180
PAPER BIRCH																					20
VINE MAPLE																					10
CASCARA																					
BITTER CHERRY																					10
BLACK COTTONWOOD																					
RED ALDER	10																				40
WILLOW SPP.																					760
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	30	10	10																		5670

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 10

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	430	280	180	110	170	190	40	50	40	20	30	50	30	20	20	30	10	40	20	
WESTERN REDCEDAR	80	40	20				10	30	30	10			20		10					
NATURAL DOUGLAS-FIR	40	20	30	10	30		10						10							
PAPER BIRCH				10		10	10													
VINE MAPLE																				
CASCARA		40	10																	
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.		10	60	50	20	10			10											
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	550	390	300	180	220	210	70	80	80	30	30	50	60	20	30	30	10	40	20	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					1760
WESTERN REDCEDAR																					250
NATURAL DOUGLAS-FIR																					150
PAPER BIRCH																					30
VINE MAPLE																					
CASCARA																					50
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					160
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					2400

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NC.: 11

NC. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	4820	1760	590	230	110	40	30	10	10			20		20	30	10				
WESTERN REDCEDAR	480	150	20				10	10					10							
NATURAL DOUGLAS-FIR	280	210	110	30	20	10							10							
PAPER BIRCH	10	20		20		10			10											
VINE MAPLE																				
CASCARA																				
BITTER CHERRY	10	80	50	20			10													
BLACK COTTONWOOD																				
RED ALDER								10	10											
WILLOW SPP.	270	310	110	10							10									
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	5870	2530	880	310	130	60	50	30	30		10	20	20	20	30	10				

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	10	10																			7700
WESTERN REDCEDAR																					680
NATURAL DOUGLAS-FIR																					670
PAPER BIRCH																					70
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					170
BLACK COTTONWOOD																					
RED ALDER																					20
WILLOW SPP.																					710
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	10	10																			10020

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 12

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	750	460	250	220	140	50	130	40	50	20	10	10	30	60	10	50	30	20	40	20
WESTERN REDCEDAR	370	160	100	110	30	20	30	30	10		20					10				
NATURAL DOUGLAS-FIR	30	50	50	60	50		10	10	20		10									
PAPER BIRCH				10	10	10		10												
VINE MAPLE																				
CASCARA																				
BITTER CHERRY		30	40	20	10	10	10	10												
BLACK COTTONWOOD		10		20	20		30	10				10								
RED ALDER																				
WILLOW SPP.	50	110	70	100	100	120	180	50	20	30	10									
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD					10		20		20											
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1200	820	510	540	370	210	410	160	120	50	50	20	30	60	10	60	30	20	40	20

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	10			10																	2410
WESTERN REDCEDAR																					890
NATURAL DOUGLAS-FIR																					290
PAPER BIRCH																					40
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					130
BLACK COTTONWOOD																					100
RED ALDER																					
WILLOW SPP.																					840
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					50
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	10			10																	4750

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 13

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1520	1080	420	260	210	220	480	190	140	100	280	60	210	130	130	170	80	40		20
WESTERN REDCEDAR	430	130	30	10	10	40	20	50	50	20	10	20	10	10						
NATURAL DOUGLAS-FIR	130	300	140	100	80	60	30	10					10							
PAPER BIRCH		70	40	50	30	20	20	10	20	10		10								
VINE MAPLE						10														
CASCARA																				
BITTER CHERRY						10														
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.	190	390	90	40	20		10													
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	2270	1970	720	460	350	360	560	260	210	130	290	90	230	140	130	170	80	40		20

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					5740
WESTERN REDCEDAR																					840
NATURAL DOUGLAS-FIR																					860
PAPER BIRCH																					280
VINE MAPLE																					10
CASCARA																					
BITTER CHERRY																					10
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					740
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					8480

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 14

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	780	410	510	360	260	160	310	70	50	20	30	50	70	20	20					
WESTERN REDCEDAR	270	40			10															
NATURAL DOUGLAS-FIR	200	160	310	140	30			10												
PAPER BIRCH		40					10				10									
VINE MAPLE		20	30	10	20	10		10	20		20									
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.		160	130	20	30					20	10	20								
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1250	830	980	530	350	170	320	90	70	40	70	70	70	20	20					

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	10																				3130
WESTERN REDCEDAR																					320
NATURAL DOUGLAS-FIR																					850
PAPER BIRCH																					60
VINE MAPLE																					140
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					390
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	10																				4890

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 15

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	250	370	240	250	250	60	100	40	30	20	50	50	70	30	10	10		10	30	10
WESTERN REDCEDAR	120	190	100	110	50	10		10												
NATURAL DOUGLAS-FIR	10	10	20	10					10	20			10	10		10				
PAPER BIRCH			30	10	20		40					10		10			10			
VINE MAPLE		10	20		20	10	20													
CASCARA	20	10	30	30		20	20		10		10	10	10	10						
BITTER CHERRY	10	40	90	70	40		40		10	40	10									
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.			10		20							10	10							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	410	630	540	480	400	100	220	50	60	80	70	80	100	60	10	20	10	10	30	10

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	20	10	20			10	10														1950
WESTERN REDCEDAR																					590
NATURAL DOUGLAS-FIR																					110
PAPER BIRCH																					130
VINE MAPLE																					80
CASCARA																					180
BITTER CHERRY																					350
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					50
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	20	10	20			10	10														3440

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 16

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	440	160	280	240	160	160	160	80	80	120	120		120	80	40	40		40	80	80
WESTERN REDCEDAR	400	160	40	40		80	80	40	80	120						40				
NATURAL DOUGLAS-FIR			40			40														
PAPER BIRCH																				
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.									40											
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	840	320	360	280	160	280	240	120	200	240	120		120	80	40	80		40	80	80

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK		80																			2560
WESTERN REDCEDAR																					1080
NATURAL DOUGLAS-FIR																					80
PAPER BIRCH																					
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS		80																			3760

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 17

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	120	240	80	80	240		120	40	200	80			120						40	
WESTERN REDCEDAR		80	40																	
NATURAL DOUGLAS-FIR									40	120	40		80		40					
PAPER BIRCH				40		40			40							40				
VINE MAPLE		80		40	280	80	40				40									
CASCARA							80													
BITTER CHERRY			40										80							
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.				40						40										
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	120	400	160	200	520	120	240	40	280	240	80		280		40	40			40	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					1360
WESTERN REDCEDAR																					120
NATURAL DOUGLAS-FIR																					320
PAPER BIRCH																					160
VINE MAPLE																					560
CASCARA																					80
BITTER CHERRY																					120
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					80
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					2800

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 18

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	960	640	680	520	240	200	200	200	80	120	120	80	120	40						
WESTERN REDCEDAR	160	440																		
NATURAL DOUGLAS-FIR			40	40	40	40	40													
PAPER BIRCH									40											
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD					40															
RED ALDER																40				
WILLOW SPP.			80	160	80	280	80	80		40						40				
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE			40																	
NO. OF TREES/HT. CLASS	1120	1080	840	720	400	520	320	280	120	160	120	80	120	40		80				

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	40																				4240
WESTERN REDCEDAR																					600
NATURAL DOUGLAS-FIR																					200
PAPER BIRCH																					40
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					40
RED ALDER																					40
WILLOW SPP.																					840
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					40
NO. OF TREES/HT. CLASS	40																				6040

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 19

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	2560	1520	1040	800	400	280	320	80		160	40					40	40			
WESTERN REDCEDAR	960	200	80																	
NATURAL DOUGLAS-FIR	240	80	160	200	80	200	80													
PAPER BIRCH																				
VINE MAPLE																				
CASCARA																				
BITTER CHERRY		40	40	40																
BLACK COTTONWOOD				40																
RED ALDER																				
WILLOW SPP.			40	400	600	560	520	240	360	120			40							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	3760	1840	1360	1480	1080	1040	920	320	360	280	40		40			40	40			

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					7280
WESTERN REDCEDAR																					1240
NATURAL DOUGLAS-FIR																					1040
PAPER BIRCH																					
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					120
BLACK COTTONWOOD																					40
RED ALDER																					
WILLOW SPP.																					2880
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					12600

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 20

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	2400	1440	1360	640	600	320	200	80	80	40			40							
WESTERN REDCEDAR	2600	1200	600	240	40															
NATURAL DOUGLAS-FIR	160	240	160	40	40		120	80		40										
PAPER BIRCH			120	80		80	40	40	40											
VINE MAPLE																				
CASCARA				40																
BITTER CHERRY		80	40	40																
BLACK COTTONWOOD		80	40			40	40													
RED ALDER																				
WILLOW SPP.	160	240	360	400	160	200	80		80											
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	5320	3280	2680	1480	840	640	480	200	200	80			40							

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					7200
WESTERN REDCEDAR																					4680
NATURAL DOUGLAS-FIR																					880
PAPER BIRCH																					400
VINE MAPLE																					
CASCARA																					40
BITTER CHERRY																					160
BLACK COTTONWOOD																					200
RED ALDER																					
WILLOW SPP.																					1680
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					15240

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 21

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1040	1200	560	400	240	240	240	200	200	120		120	40		80					
WESTERN REDCEDAR	80	40																		
NATURAL DOUGLAS-FIR	240	240	280	40	40															
PAPER BIRCH		40																		
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER		40									40									
WILLOW SPP.		40																		
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1360	1600	840	440	280	240	240	200	200	120	40	120	40		80					

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					4680
WESTERN REDCEDAR																					120
NATURAL DOUGLAS-FIR																					840
PAPER BIRCH																					40
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER	40																				120
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	40																				5840

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 22

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1320	680	280	200	120	120	160	80	40	40			120							
WESTERN REDCEDAR	320	440	240	80	40															
NATURAL DOUGLAS-FIR	40	40			40		80	80		40	80	40	40							
PAPER BIRCH																				
VINE MAPLE			40																	
CASCARA																				
BITTER CHERRY		80	80	40	40															
BLACK COTTONWOOD					40															
RED ALDER																				
WILLOW SPP.			40	40	40	120		80	40		40		40							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1680	1240	680	360	320	240	240	240	80	80	120	40	200							

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK				40		40	40	40													3320
WESTERN REDCEDAR																					1120
NATURAL DOUGLAS-FIR			40																		520
PAPER BIRCH																					
VINE MAPLE																					40
CASCARA																					
BITTER CHERRY																					240
BLACK COTTONWOOD																					40
RED ALDER																					
WILLOW SPP.	40																				480
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	40		40	40		40	40	40													5760

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 23

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	880	200			40	40	40	40												
WESTERN REDCEDAR	640		40																	
NATURAL DOUGLAS-FIR	40	40	40	160																
PAPER BIRCH						40							40							
VINE MAPLE																				
CASCARA																				
BITTER CHERRY		80	80	40			80													
BLACK COTTONWOOD		80	200	200	440	120	440	120	120			40	80							
RED ALDER	40	80	120	120	200	80	200	80	80	120	240	40	40		40	40				
WILLOW SPP.	440	800	680	520	200	160	440	40	40		40		120							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR						40	40	80	80	40	40	80	200		40	40	40			
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	2040	1280	1160	1040	880	480	1240	360	320	160	320	160	480		80	80	40			

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					1240
WESTERN REDCEDAR																					680
NATURAL DOUGLAS-FIR																					280
PAPER BIRCH																					80
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					280
BLACK COTTONWOOD																					1840
RED ALDER						40															1560
WILLOW SPP.																					3480
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					720
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS						40															10160

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 24

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK		40	40	40	40		40		40		40									
WESTERN REDCEDAR	160	40																		
NATURAL DOUGLAS-FIR	40	40	40		80		40													
PAPER BIRCH							40													
VINE MAPLE		40	80	80	160		1080		40											
CASCARA																				
BITTER CHERRY				80	120		40			40										
BLACK COTTONWOOD																				
RED ALDER							80			40	200				120	160		120		
WILLOW SPP.					80	120	40	40	80	80										
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR								40			40					40	40			
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	200	160	160	200	480	120	1360	80	160	160	280				120	200	40	120		

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					280
WESTERN REDCEDAR																					200
NATURAL DOUGLAS-FIR																					240
PAPER BIRCH																					40
VINE MAPLE																					1480
CASCARA																					
BITTER CHERRY																					280
BLACK COTTONWOOD																					
RED ALDER			40																		760
WILLOW SPP.																					440
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	40			40	40	40															320
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	40		40	40	40	40															4040

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 25

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK		40			40					40	40		80							
WESTERN REDCEDAR	80	40																		
NATURAL DOUGLAS-FIR		40	80	40																
PAPER BIRCH				40										40						
VINE MAPLE																				
CASCARA																				
BITTER CHERRY														40		40				
BLACK COTTONWOOD																				
RED ALDER					40		40				120	40	40		40	40			40	
WILLOW SPP.											80	80	40							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR					40						80	40					40			
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	80	120	80	80	120		40			40	320	160	160	80	40	80	40		40	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	20																				260
WESTERN REDCEDAR																					120
NATURAL DOUGLAS-FIR																					160
PAPER BIRCH																					80
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					80
BLACK COTTONWOOD																					
RED ALDER	40			40																	480
WILLOW SPP.																					200
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	40																				240
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	100			40																	1620

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 26

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1040	160		80	40		40													
WESTERN REDCEDAR	560	40																		
NATURAL DOUGLAS-FIR							40				40									
PAPER BIRCH																				
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD						40		40			40									
RED ALDER													40	40	40	40				
WILLOW SPP.	40					40		80	120	80	200	40	120	40		120	40		40	
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR														40			80		120	40
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1640	200		80	40	80	80	120	120	80	280	40	160	120	40	160	120		160	40

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					1360
WESTERN REDCEDAR																					600
NATURAL DOUGLAS-FIR																					80
PAPER BIRCH																					
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					120
RED ALDER	40						40														240
WILLOW SPP.	80																				1040
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	200	40	40	40	40	80															720
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	320	40	40	40	40	80	40														4160

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 27

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	440	720	680	400	40	40														
WESTERN REDCEDAR	800	120																		
NATURAL DOUGLAS-FIR							80													
PAPER BIRCH	40	80	440	360	240	200	280	40	80	40										
VINE MAPLE			120	120																
CASCARA		40				40														
BITTER CHERRY		40	40	40						40										
BLACK COTTONWOOD			120	40																
RED ALDER											40		80			40				
WILLOW SPP.		40	240	80	40															
BIG-LEAF MAPLE		40	80	40																
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1280	1080	1720	1080	320	280	360	40	80	80	40		80			40				

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					2320
WESTERN REDCEDAR																					920
NATURAL DOUGLAS-FIR																					80
PAPER BIRCH																					1800
VINE MAPLE																					240
CASCARA																					80
BITTER CHERRY																					160
BLACK COTTONWOOD																					160
RED ALDER																					160
WILLOW SPP.																					400
BIG-LEAF MAPLE																					160
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					6480

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 28

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	280	240																		
WESTERN REDCEDAR	480																			
NATURAL DOUGLAS-FIR	40																			
PAPER BIRCH	280	440	520	440	480	200	80		40	40			200			400				
VINE MAPLE				80	120	120	520													
CASCARA																				
BITTER CHERRY	40	200	280	160		40														
BLACK COTTONWOOD							40													
RED ALDER									40											
WILLOW SPP.		80	40																	
BIG-LEAF MAPLE	120																			
PACIFIC DOGWOOD		80	80																	
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1240	1040	920	680	600	360	640		80	40			200			400				

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					520
WESTERN REDCEDAR																					480
NATURAL DOUGLAS-FIR																					40
PAPER BIRCH																					3120
VINE MAPLE																					840
CASCARA																					
BITTER CHERRY																					720
BLACK COTTONWOOD																					40
RED ALDER																					40
WILLOW SPP.																					120
BIG-LEAF MAPLE																					120
PACIFIC DOGWOOD																					160
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					6200

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 29

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	40								40											
WESTERN REDCEDAR		40																		
NATURAL DOUGLAS-FIR									40											
PAPER BIRCH																				
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																			40	
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.															40	160	120	200	160	
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																	40		40	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	40	40							80						40	160	160	200	240	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK							40														120
WESTERN REDCEDAR																					40
NATURAL DOUGLAS-FIR																					40
PAPER BIRCH																					
VINE MAPLE																					
CASCARA																					
BITTER CHERRY	80																				120
BLACK COTTONWOOD		40																			40
RED ALDER						40											40	80			160
WILLOW SPP.	200	120	200	160	160	280		80			120		40								2040
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR		40	40			40	40						40			40			80		400
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	280	200	240	160	160	360	80	80			120		80			40	40	80	80		2960

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 30

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	360	760	240																	
WESTERN REDCEDAR	440	40																		
NATURAL DOUGLAS-FIR	120																			
PAPER BIRCH	400	1800	1920	200																
VINE MAPLE		80																		
CASCARA																				
BITTER CHERRY	160	560	520	40																
BLACK COTTONWOOD	640	1960	2160	440	80	40														
RED ALDER		40	80	120	80	40	80	80	120		120		80	160						
WILLOW SPP.	280	2440	2680	1040	320	80														
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR			120	280	280	80														
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	2400	7680	7720	2120	760	240	80	80	120		120		80	160						

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					1360
WESTERN REDCEDAR																					480
NATURAL DOUGLAS-FIR																					120
PAPER BIRCH																					4320
VINE MAPLE																					80
CASCARA																					
BITTER CHERRY																					1280
BLACK COTTONWOOD																					5320
RED ALDER																					1000
WILLOW SPP.																					6840
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					760
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					21560

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: SWORDFERN - WESTERN REDCEDAR

PLOT NO.: 31

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	240	280																		
WESTERN REDCEDAR	200																			
NATURAL DOUGLAS-FIR	40	40		40																
PAPER BIRCH	160	120	760	680	80															
VINE MAPLE					600															
CASCARA																				
BITTER CHERRY			80																	
BLACK COTTONWOOD		80	520	480	240	80	120													
RED ALDER							160		80	80	80	160	160	160						
WILLOW SPP.	160	840	1640	1840	1560	720	480	120			40									
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR				40	40	120	40													
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	800	1360	3000	3080	2520	920	800	120	80	80	120	160	160	160						

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					520
WESTERN REDCEDAR																					200
NATURAL DOUGLAS-FIR																					120
PAPER BIRCH																					1800
VINE MAPLE																					600
CASCARA																					
BITTER CHERRY																					80
BLACK COTTONWOOD																					1520
RED ALDER																					880
WILLOW SPP.																					7400
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					240
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					13360

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 32

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	2040	1680	1280	920	520	280	240	120	80	40	80		80			40	40		80	
WESTERN REDCEDAR	360	120	120	40																
NATURAL DOUGLAS-FIR																				
PAPER BIRCH						40	80					40								
VINE MAPLE			280	440	840	160	40													
CASCARA								40												
BITTER CHERRY					80															
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.					40															
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	2400	1800	1680	1400	1480	480	360	160	80	40	80	40	80			40	40		80	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					7520
WESTERN REDCEDAR																					640
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					160
VINE MAPLE																					1760
CASCARA																					40
BITTER CHERRY																					80
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					10240

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - U.B.C.R.F.
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 33

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	400		160	80												40	40			40
WESTERN REDCEDAR			80	80																
NATURAL DOUGLAS-FIR				40																
PAPER BIRCH																40		40		
VINE MAPLE																				
CASCARA																	40			
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.																40				
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	400		240	200												120	80	40		40

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK														40							800
WESTERN REDCEDAR																					160
NATURAL DOUGLAS-FIR																					40
PAPER BIRCH	80	40			40		40														280
VINE MAPLE																					
CASCARA																					40
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																				40	40
WILLOW SPP.																40			40		120
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD	80																				80
PLANTED DOUGLAS-FIR	160	200	120	120	160	40	40		80	120	160	40	160								1400
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	320	240	120	120	200	40	80		80	120	160	40	160	40		40			40	40	2960

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 34

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	240	120	40	40	80	40	120	80					80							
WESTERN REDCEDAR	120	120	80	40							40									
NATURAL DOUGLAS-FIR																				
PAPER BIRCH													80			80	40		40	
VINE MAPLE						40	160	80	40		40		80							
CASCARA											40		40							
BITTER CHERRY																				
BLACK COTTONWOOD											40									
RED ALDER																				
WILLOW SPP.											40		120	40					80	
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																240			160	40
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	360	240	120	80	80	80	280	160	40		200		400	40		320	40		280	40

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					840
WESTERN REDCEDAR																					400
NATURAL DOUGLAS-FIR																					
PAPER BIRCH	40																				280
VINE MAPLE																					440
CASCARA																					80
BITTER CHERRY																					
BLACK COTTONWOOD																					40
RED ALDER																					
WILLOW SPP.																					280
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	200	80	80	80	40	80	120	80	80		80	40	80								1480
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	240	80	80	80	40	80	120	80	80		80	40	80								3840

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 35

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	2280	1240	640	400	440	160	120	240	80	160	80	200	360	80	80	40	40		80	
WESTERN REDCEDAR	720	560	320	160	80			40	40						40					
NATURAL DOUGLAS-FIR																				
PAPER BIRCH									40				40	40		40	40			
VINE MAPLE								40	400											
CASCARA									40	40	40		200	80	40	40	40	40	40	
BITTER CHERRY																				
BLACK COTTONWOOD					40		40						40				40			
RED ALDER												80								
WILLOW SPP.						40	40		80			80		40						
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	3000	1800	960	560	560	200	200	320	680	200	120	360	640	240	160	120	160	40	120	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	40		40																		6800
WESTERN REDCEDAR																					1960
NATURAL DOUGLAS-FIR																					
PAPER BIRCH					40	40															280
VINE MAPLE																					440
CASCARA																					600
BITTER CHERRY																					
BLACK COTTONWOOD																					160
RED ALDER													40			40					160
WILLOW SPP.																					280
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	40		40		40	40							40			40					10680

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 36

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	760	600	360	200	40		80	200	200	40	240	80	280	120	160	40			80	
WESTERN REDCEDAR	80	160	40	40	80	80	40		40	80										
NATURAL DOUGLAS-FIR															40					
PAPER BIRCH															40	80				
VINE MAPLE		160	120	80	40		120	80	80	160	520	120	160	40	40					
CASCARA								40		40	40		160	80	160	120	80	80	80	
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.																				
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	840	920	520	320	160	80	240	320	320	320	800	200	600	240	440	240	80	80	160	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	40	40	40		40		40														3680
WESTERN REDCEDAR																					640
NATURAL DOUGLAS-FIR																					40
PAPER BIRCH				40																	160
VINE MAPLE																					1720
CASCARA			40																		920
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	40	40	80	40	40		40														7160

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 37

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	480	320	160		120	40	120		40	40	160		120		40	160	80		120	40
WESTERN REDCEDAR	40				80	40	40				40					80				
NATURAL DOUGLAS-FIR																				
PAPER BIRCH																				
VINE MAPLE							80						80		800	80				
CASCARA															80	120			120	40
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.																				
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																40			40	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	520	320	160		200	80	240		40	40	200		200		920	480	80		280	80

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	80	40	80		40	80	40				80					8					2488
WESTERN REDCEDAR																					320
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					
VINE MAPLE																					1040
CASCARA	40				40	40															480
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.					40						40		80								160
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	160	40	40		80	80	40	40	40	40	160		120			40	40				1000
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	280	80	120		200	200	80	40	40	40	280		200			48	40				5488

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 38

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	2960	1400	640	400	240	160	320	40	80		120		120	40	80		40		160	
WESTERN REDCEDAR	600	120	40	80			200		80		120		200			80				
NATURAL DOUGLAS-FIR													40							
PAPER BIRCH																				
VINE MAPLE									80		240		440		320	280			120	
CASCARA											40						40			
BITTER CHERRY																				
BLACK COTTONWOOD																			80	
RED ALDER																				
WILLOW SPP.												40	40		40	120			40	
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																160	40		40	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	3560	1520	680	480	240	160	520	40	240		520	40	840	40	440	640	120		440	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	40					40		40													6920
WESTERN REDCEDAR																					1520
NATURAL DOUGLAS-FIR																					40
PAPER BIRCH					40	40															80
VINE MAPLE																					1480
CASCARA	40																				120
BITTER CHERRY																					
BLACK COTTONWOOD		40					40	40													200
RED ALDER																					
WILLOW SPP.																					280
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR	40	80	80		120	80	40	80	40	40	80					160					1080
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	120	120	80		160	160	80	160	40	40	80					160					11720

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 39

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1960	1320	1040	640	120	200	80		40		40		40		40	80	40		40	
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR																				
PAPER BIRCH																				
VINE MAPLE			40	80	240	160	200													
CASCARA		40				80	40				80		80							
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.																				
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR																				
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1960	1360	1080	720	360	440	320		40		120		120		40	80	40		40	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					5680
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					
VINE MAPLE																					720
CASCARA																					320
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					6720

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 40

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	40	40	240	40																
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR																				
PAPER BIRCH				80			40		80											
VINE MAPLE			40				80													
CASCARA																				
BITTER CHERRY				40																
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.							40		80		40									
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR				120	40			80	80	360	120	240	80							
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	40	40	280	280	40		160	80	240	360	160	240	80							

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					360
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					200
VINE MAPLE																					120
CASCARA																					
BITTER CHERRY																					40
BLACK COTTONWOOD																					
RED ALDER	40																				40
WILLOW SPP.																					160
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					1120
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	40																				2040

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 41

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK			40	40																
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR																				
PAPER BIRCH					80	80	120													
VINE MAPLE																				
CASCARA																				
BITTER CHERRY				40	40															
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.							40													
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR				120	120	120	280	240	440	240	40	80								
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS			40	200	240	200	440	240	440	240	40	80								

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					80
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					280
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					80
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					1680
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					2160

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 42

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	840	80	120	240	80	40														
WESTERN REDCEDAR	120																			
NATURAL DOUGLAS-FIR	40	40																		
PAPER BIRCH	80	80	120	120	440	400	480	80	160	120	40									
VINE MAPLE																				
CASCARA		40	40																	
BITTER CHERRY			40	40	40		40													
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.				40		40														
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR			40	200	120	240	120	80	40											
LODGEPOLE PINE				40																
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1080	240	360	680	680	720	640	160	200	120	40									

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					1400
WESTERN REDCEDAR																					120
NATURAL DOUGLAS-FIR																					80
PAPER BIRCH																					2120
VINE MAPLE																					
CASCARA																					80
BITTER CHERRY																					160
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					80
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					840
LODGEPOLE PINE																					40
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					4920

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 43

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	280		40	40																
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR	120	40																		
PAPER BIRCH		160	40	120	120	120	160				40		120							
VINE MAPLE					80															
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD			40			40														
RED ALDER																				
WILLOW SPP.			40			40				40										
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR			80		240	240	120	40	80			40								
LODGEPOLE PINE			40																	
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	400	200	280	160	440	440	280	40	80	40	40	40	120							

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					360
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					160
PAPER BIRCH																					880
VINE MAPLE																					80
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					80
RED ALDER																					
WILLOW SPP.																					120
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					840
LODGEPOLE PINE																					40
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					2560

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 44

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	120	120		40																
WESTERN REDCEDAR																				
NATURAL DOUGLAS-FIR	40	40																		
PAPER BIRCH				40			80													
VINE MAPLE																				
CASCARA																				
BITTER CHERRY				40																
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.			40																	
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR		40	40				160	80	120	80	80									
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	160	200	80	120			240	80	120	80	80									

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					280
WESTERN REDCEDAR																					
NATURAL DOUGLAS-FIR																					80
PAPER BIRCH																					120
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					40
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					600
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					1160

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 45

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1320	1080	960	600	560	560	880	360	280	320	200		160	160		40		40		
WESTERN REDCEDAR	840	720	240	200	120	40														
NATURAL DOUGLAS-FIR	160	160	40	40	40															
PAPER BIRCH		40			40		80		160	80	120		120						40	
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.			40				80					40	80		40					
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR					40		160	80	120	40	80	40	360	40	40	40	40			
LODGEPOLE PINE																				
PACIFIC SILVER FIR			40																	
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	2320	2000	1320	840	800	600	1200	440	560	440	400	80	720	200	80	80	40	40	40	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					7520
WESTERN REDCEDAR																					2160
NATURAL DOUGLAS-FIR																					440
PAPER BIRCH																					680
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					280
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					1080
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					40
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					12200

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 46

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	2880	2240	2400	1200	800	240	360	80	40		40									
WESTERN REDCEDAR	880	760	40	80	40															
NATURAL DOUGLAS-FIR	120	40	80		40															
PAPER BIRCH			40	40	160	40	40			40										
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD			40																	
RED ALDER																				
WILLOW SPP.				80		80	40													
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR			120	240	200	360	280	40	40	40	40		40							
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	3880	3040	2720	1640	1240	720	720	120	80	80	80		40							

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					10280
WESTERN REDCEDAR																					1800
NATURAL DOUGLAS-FIR																					280
PAPER BIRCH																					360
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					40
RED ALDER																					
WILLOW SPP.																					200
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					1400
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					14360

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 47

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	1840	1880	1040	800	920	840	800	280	440	120	80		40	40						
WESTERN REDCEDAR	120	320	240	80		40														
NATURAL DOUGLAS-FIR		80																		
PAPER BIRCH					80	80	80	120	80	80			80	40						
VINE MAPLE					280	160														
CASCARA				40																
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.			80		40															
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR		80	120	160	160		160	200	40	80	40		40							
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1960	2360	1480	1080	1480	1120	1040	600	560	280	120		160	80						

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					9120
WESTERN REDCEDAR																					800
NATURAL DOUGLAS-FIR																					80
PAPER BIRCH																					640
VINE MAPLE																					440
CASCARA																					40
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					120
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					1080
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					12320

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL - DOUGLAS-FIR

PLOT NO.: 48

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	160	40																		
WESTERN REDCEDAR	80																			
NATURAL DOUGLAS-FIR																				
PAPER BIRCH	40				80															
VINE MAPLE																				
CASCARA																				
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.																				
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR	40	80	120	160	520	280	80													
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	320	120	120	160	600	280	80													

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					200
WESTERN REDCEDAR																					80
NATURAL DOUGLAS-FIR																					
PAPER BIRCH																					120
VINE MAPLE																					
CASCARA																					
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					1280
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					1680

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: MOSS - WESTERN HEMLOCK

PLOT NO.: 49

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	680	520	560	240	200	160	400	40	160				160		120	80	40			
WESTERN REDCEDAR	320	200	40	40																
NATURAL DOUGLAS-FIR	40	40	40	40		80														
PAPER BIRCH							40	120	80	40	80		160		80		40		40	
VINE MAPLE										1200										
CASCARA										40										
BITTER CHERRY													40							
BLACK COTTONWOOD								40												
RED ALDER																				
WILLOW SPP.													40							
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR						40			40	160			240	120	120	40	40		80	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	1040	760	640	320	200	280	440	200	280	1440	80		640	120	320	120	120		120	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK	160	80			40																3640
WESTERN REDCEDAR																					600
NATURAL DOUGLAS-FIR																					240
PAPER BIRCH																					680
VINE MAPLE																					1200
CASCARA																					40
BITTER CHERRY																					40
BLACK COTTONWOOD																					40
RED ALDER																					
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR					40																920
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS	160	80			80																7440

VEGETATION-ENVIRONMENT TABLE - PART III - STAND AND TREE DESCRIPTION
COASTAL WESTERN HEMLOCK ZONE - DRY SUBZONE - MISSION TREE FARM
FOREST ASSOCIATION: SALAL-DOUGLAS-FIR

PLOT NO.: 50

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
WESTERN HEMLOCK	80		80	40	40	40	40		40	80	80		80							
WESTERN REDCEDAR		40	40		40															
NATURAL DOUGLAS-FIR		80			40															
PAPER BIRCH									80				120		160		40			
VINE MAPLE											200									
CASCARA						40														
BITTER CHERRY																				
BLACK COTTONWOOD																				
RED ALDER																				
WILLOW SPP.											40									
BIG-LEAF MAPLE																				
PACIFIC DOGWOOD																				
PLANTED DOUGLAS-FIR					40	40	40	40	40	120	80	40	120	40	120	80	40		120	
LODGEPOLE PINE																				
PACIFIC SILVER FIR																				
SITKA SPRUCE																				
NO. OF TREES/HT. CLASS	80	120	120	40	160	120	80	40	160	200	400	40	320	40	280	80	80		120	

NO. OF TREES/ACRE/HEIGHT CLASS

SPECIES	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	TOTAL
WESTERN HEMLOCK																					600
WESTERN REDCEDAR																					120
NATURAL DOUGLAS-FIR																					120
PAPER BIRCH																					400
VINE MAPLE																					200
CASCARA																					40
BITTER CHERRY																					
BLACK COTTONWOOD																					
RED ALDER																					
WILLOW SPP.																					40
BIG-LEAF MAPLE																					
PACIFIC DOGWOOD																					
PLANTED DOUGLAS-FIR																					960
LODGEPOLE PINE																					
PACIFIC SILVER FIR																					
SITKA SPRUCE																					
NO. OF TREES/HT. CLASS																					2480

APPENDIX II

Checklist of Species found in the Seral Associations

This checklist contains the species discussed in the text and vegetation synthesis tables. The nomenclature and identification of the species is according to the following manuals.

Hitchcock, C.L., A. Cronquist, M. Owenby and J. W. Thompson. 1955-1969. Vascular plants of the Pacific Northwest. Part 5, Compositae, 343 p.; Part 4, Ericaceae to Campanulaceae, 510 p.; Part 3, Saxifragaceae to Ericaceae, 614 p.; Part 2, Salicaceae to Saxifragaceae, 579 p.; Part 1, Vascular cryptograms, Gymnosperms and Monocotyledons, 914 p.

Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest - an illustrated manual. University of Washington Press, Seattle and London. 730 p.

Hubbard, W.A. 1969. The grasses of British Columbia. British Columbia Provincial Museum. Dept. of Recreation and Conservation, Victoria. Handbook No. 9 205 p.

Lawton, E. 1971. Moss flora of the Pacific Northwest. The Hattori Bot. Lab., Nichinan, Miyazaki, Japan. 362 p. + 195 pl.

Schofield, W. B. 1969. A selectively annotated checklist of British Columbia mosses. Syesis 1:156-162.

_______________. 1969. Some common mosses of British Columbia. British Columbia Provincial Museum. Dept. of Recreation and Conservation, Victoria. Handbook No. 28. 262 p.

Szczawinski, A. F. 1970. The Heather family of British Columbia. Second edition. British Columbia Provincial Museum. Dept. of Recreation and Conservation, Victoria. Handbook No. 19. 205 p.

Taylor, T.M.C. 1966. Vascular flora of British Columbia, a preliminary checklist. Botany Dept., Univ. of British Columbia. 31 p.

_______________. 1971. The ferns and fern-allies of British Columbia. British Columbia Provincial Museum. Dept. of Recreation and Conservation, Victoria. Handbook No. 12. 172 p.

Scientific and Common Names to the Tree Species

Scientific Name	Common Name
Abies amabilis (Dougl.) Forbes	Pacific silver fir
Acer circinatum Pursh	Vine maple
Acer macrophyllum Pursh	Big-leaf maple
Alnus rubra Bong.	Red alder
Betula papyrifera Marsh.	Paper birch
Cornus nuttallii Aud.	Pacific dogwood
Picea sitchensis (Bong.) Carr.	Sitka spruce
Pinus contorta Dougl.	Lodgepole pine
Populus tremuloides Michx.	Quaking aspen
Populus trichocarpa T. & G.	Black cottonwood
Prunus emarginata (Dougl.) Walp.	Bitter cherry
Pseudotsuga menziesii (Mirb.) Franco	Douglas-fir
Rhamnus purshiana DC.	Cascara
Salix lasiandra Benth.	Pacific willow
Salix scouleriana Barratt	Scouler willow
Salix sitchensis Sanson	Sitka willow
Taxus brevifolia Nutt.	Western yew
Thuja plicata Donn	Western redcedar
Tsuga heterophylla (Raf.) Sarg.	Western hemlock

Vascular Plants

Aceraceae

Acer circinatum Pursh
Acer macrophyllum Pursh

Araceae

Lysichitum americanum Hultén & St. John

Araliaceae

Oplopanax horridum (Smith) Miq.

Berberidaceae

Achlys triphylla (Smith) DC.
Berberis aquifolium Pursh
Berberis nervosa Pursh

Betulaceae

Alnus rubra Bong.
Betula papyrifera Marsh.

Caprifoliaceae

Linnaea borealis L.
Lonicera involucrata (Rich.) Banks
Sambucus racemosa L.

Compositae

Anaphalis margaritacea (L.) B. & H.
Cirsium arvense (L.) Scop.
Cirsium vulgare (Savi) Tenore
Crepis capillaris (L.) Wallr.
Erigeron annuus (L.) Pers.
Hieracium albiflorum Hook.
Hypochaeris radicata L.
Lactuca biennis (Moench) Fern.

Senecio sylvaticus L.
Solidago canadensis L.

Cornaceae

Cornus canadensis L.
Cornus nuttallii Aud.

Cupressaceae

Thuja plicata Donn

Cyperaceae

Carex aquatilis Wahl.
Carex deweyana Schw.
Carex hendersonii Bailey
Carex interior Bailey
Carex mertensii Prescott
Carex rossii Boott
Scirpus cyperinus (L.) Kunth
Scirpus microcarpus Presl

Equisetaceae

Equisetum arvense L.
Equisetum palustre L.

Ericaceae

Gaultheria shallon Pursh.
Ledum groenlandicum Oeder
Menziesia ferruginea Smith
Vaccinium alaskaense Howell
Vaccinium ovalifolium Smith
Vaccinium parvifolium Smith

Fumariaceae

Dicentra formosa (Andr.) Walp.

Gramineae

Agrostis exarata Trin.
Agrostis scabra Willd.
Calamagrostis canadensis (Michx.) Beauv.
Danthonia spicata (L.) Beauv.
Festuca occidentalis Hook.
Holcus lanatus L.
Phalaris arundinacea L.
Poa palustris L.
Poa pratensis L.
Trisetum cernuum Trin.

Grossulariaceae

Ribes lacustre (Pres.) Poir.
Ribes sanguineum Pursh

Hypericaceae

Hypericum perforatum L.

Juncaceae

Juncus effusus L.
Juncus ensifolius Wikst.
Juncus tenuis Willd.
Luzula campestris (L.) DC.
Luzula parviflora (Ehrh.) Desv.

Liliaceae

Trillium ovatum Pursh

Lycopodiaceae

Lycopodium clavatum L.

Onagraceae

Circaea alpina L.
Epilobium angustifolium L.
Epilobium watsonii Barbey

Orchidaceae

Goodyera oblongifolia Raf.

Pinaceae

Abies amabilis (Dougl.) Forbes
Picea sitchensis (Bong.) Carr.
Pinus contorta Dougl.
Pseudotsuga menziesii (Mirb.) Franco
Tsuga heterophylla (Raf.) Sarg.

Polygonaceae

Rumex acetosella L.

Polypodiaceae

Athyrium filix-femina (L.) Roth.
Blechnum spicant (L.) Roth.
Dryopteris austriaca (Jacq.) Woynar
Gymnocarpium dryopteris (L.) Newm.
Polystichum munitum (Kaulf.) Presl
Pteridium aquilinum (L.) Kuhn

Portulacaceae

Montia sibirica (L.) Howell

Primulaceae

Trientalis latifolia Hook.

Ranunculaceae

Actaea rubra (Ait.) Willd.

Rhamnaceae

Rhamnus purshiana DC.

Rosaceae

Geum macrophyllum Willd.

Holodiscus discolor (Pursh) Maxim.
Prunus emarginata (Dougl.) Walp.
Pyrus fusca Raf.
Rosa gymnocarpa Nutt.
Rubus discolor Weihe & Nees
Rubus laciniatus Willd.
Rubus leucodermis Dougl.
Rubus parviflorus Nutt.
Rubus spectabilis Pursh
Rubus ursinus Cham. & Schlecht.
Sorbus aucuparia L.
Spiraea douglasii Hook.

Rubiaceae

Galium trifidum L.
Galium triflorum Michx.

Salicaceae

Populus tremuloides Michx.
Populus trichocarpa T. & G.
Salix lasiandra Benth.
Salix scouleriana Barratt
Salix sitchensis Sanson

Saxifragaceae

Tiarella trifoliata L.

Scrophulariaceae

Veronica americana Schwein.
Veronica serpyllifolia L.

Taxaceae

Taxus brevifolia Nutt.

Umbelliferae

Oenanthe sarmentosa Presl

Urticaceae

Urtica dioica L.

Violaceae

Viola sempervirens Greene

Bryophytes

Aulacomniaceae

Aulacomnium androgynum (Hedw.) Schwaegr.

Brachytheciaceae

Eurhynchium oreganum (Sull.) Jaeg.
Eurhynchium praelongum (Turn.) Dix.
Isothecium stoloniferum Brid.

Bryaceae

Leptobryum pyriforme (Hedw.) Wils.
Pohlia nutans (Hedw.) Lindb.

Dicranaceae

Dicranella heteromalla (Hedw.) Schimp.
Dicranoweisia cirrata (Hedw.) Lindb.
Dicranum fuscescens Turn.
Dicranum howellii Ren. & Card.
Dicranum tauricum Sapehin

Ditrichaceae

Ceratodon purpureus (Hedw.) Brid.
Ditrichum heteromallum (Hedw.) Britt.

Grimmiaceae

Rhacomitrium canescens (Hedw.) Brid.
Rhacomitrium heterostichum (Hedw.) Brid.

Hylocomiaceae

Hylocomium splendens (Hedw.) B.S.G.

Mniaceae

Leucolepis menziesii (Hook.) Steer
Mnium lycopodioides Schwaegr.

Mnium spinulosum B.S.G.
Plagiomnium insigne (Mitt.) Koponen
Rhizomnium glabrescens (Kindb.) Koponen

Plagiotheciaceae

Isopterygium elegans (Brid.) Lindb.
Plagiothecium undulatum (Hedw.) B.S.G.

Polytrichaceae

Oligotrichum aligerum Mitt.
Pogonatum alpinum (Hedw.) Roehl.
Pogonatum contortum (Menz. ex Brid.) Lesq.
Pogonatum urnigerum (Hedw.) P. Beauv.
Polytrichum commune Hedw.
Polytrichum juniperinum Hedw.

Pottiaceae

Barbula sp. (Hedw.)

Rhytidiaceae

Rhytidiadelphus loreus (Hedw.) Warnst.
Rhytidiadelphus triquetrus (Hedw.) Warnst.

Sphagnaceae

Sphagnum palustre L.

Thuidiaceae

Claopodium crispifolium (Hook.) Ren. & Card.

APPENDIX III

Analysis of Variance Tables

Table III-1. Western hemlock.

Source of Variation	d.f.	S.S.	M.S.	F
Associations	2	6.6474	3.3237	3.31 N.S.
Treatments/associations	5	5.0200	1.0040	6.43 **
Error	42	6.5544	0.15606	
TOTAL	49	18.222		

Table III-2. Western redcedar.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	4.2059	2.1030	0.47 N.S.
Treatments/associations	5	22.146	4.4291	5.34 **
Error	42	34.832	0.82934	
TOTAL	49	61.184		

Table III-3. Douglas-fir.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	2.6443	1.3222	0.40 N.S.
Treatments/associations	5	16.593	3.3185	3.58 **
Error	42	38.931	0.92694	
TOTAL	49	58.168		

Table III-4. Coniferous trees.

Source of Variation	d.f.	S.S,	M.S.	F
Association	2	4.6070	2.3035	2.18 N.S.
Treatments/associations	5	5.2935	1.0587	7.42 **
Error	42	5.59920	0.14267	
TOTAL	49	15.893		

Table III-5. Total number of naturally regenerated trees.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	0.81854	0.40927	0.62 N.S.
Treatment/associations	5	3.2757	0.65514	7.63 **
Error	42	3.6046	0.085824	
TOTAL	49	7.6988		

Table III-6. Deciduous trees.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	5.4443	2.7221	12.52 **
Treatment/associations	5	1.0874	0.21748	1.70 N.S.
Error	42	5.3853	0.12822	
TOTAL	49	11.917		

Table III-7. Established Western hemlock.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	13.091	6.5454	4.59 N.S.
Treatment/associations	5	7.1340	1.4268	4.19 **
Error	42	14.299	0.34045	
TOTAL	49	34.524		

Table III-8. Established Western redcedar.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	15.623	7.8116	1.17 N.S.
Treatment/associations	5	33.266	6.6532	11.75 **
Error	42	23.777	0.56611	
TOTAL	49	72.666		

Table III-9. Established Douglas-fir.

Source of Variation	d.f.	S.S.	M.S.	F
Association	2	2.4094	1.2047	0.37 N.S.
Treatment/associations	5	16.112	3.2224	3.17 **
Error	42	42.682	1.0162	
TOTAL	49	61.203		

Explanation of symbols used:

d.f. - degrees of freedom
S.S. - sum of squares
M.S. - mean square
F - F-ration
N.S. - not significant
** - significant at the 1% level
* - significant at the 5% level

APPENDIX IV

Correlation Coefficients for Environmental Features

```
DATA SUMMARY OF TREE SPECIES AND ENVIRONMENTAL VARIABLES

CORRELATION MATRIX

ROW  X 1   HEMLOCK
    1.00000
ROW  X 2   CEDAR
    0.63350    1.00000
ROW  X 3   DOUG-FIR
    0.44256    0.40542    1.00000
ROW  X 4   CONIFERS
    0.97999    0.76565    0.52362    1.00000
ROW  X 5   TOTAL
    0.63027    0.57609    0.33846    0.66198    1.00000
ROW  X 6   DECIDUOS
   -0.19872   -0.04542   -0.10395   -0.17805    0.61968    1.00000
ROW  X 7   ALTITUDE
    0.33959    0.26374    0.65327    0.38251    0.08238   -0.29239    1.00000
ROW  X 8   ASPECT
   -0.00295    0.05552    0.22696    0.02688   -0.09346   -0.15084    0.06257    1.00000
ROW  X 9   SLOPE
    0.06086    0.10729   -0.11386    0.06527   -0.14516   -0.25893   -0.08796    0.05488    1.00000
ROW  X10   POSTONSL
   -0.26362   -0.10893   -0.42812   -0.26970    0.14376    0.47116   -0.56336    0.06249   -0.35154    1.00000
ROW  X11   SETTSIZE
   -0.13555   -0.23305   -0.40147   -0.19147   -0.29579   -0.18785   -0.26815   -0.22219    0.43949   -0.20760    1.00000
ROW  X12   AGE
    0.41400    0.21768    0.20612    0.39710    0.01847   -0.39157    0.24602    0.11346   -0.19100    0.00288   -0.23567    1.00000
ROW  X13   DISTOSS
   -0.39824   -0.28355   -0.29059   -0.40536   -0.46455   -0.18542   -0.22671    0.00526    0.50318   -0.34388    0.64013   -0.25777    1.00000
ROW  X14   DISTOSOU
   -0.41738   -0.34609   -0.29726   -0.43488   -0.45355   -0.14006   -0.17372    0.00922    0.34179   -0.27136    0.65537   -0.23741    0.86343
    1.00000
ROW  X15   SSDF
   -0.08914   -0.05623    0.50333   -0.04590    0.06898    0.13863    0.56335    0.07191   -0.19446   -0.34002   -0.42967   -0.02984   -0.17013
   -0.19847    1.00000
ROW  X16   SSWH
    0.13831    0.06283   -0.46005    0.09022   -0.10445   -0.23160   -0.39988   -0.11941    0.19963    0.24615    0.50859    0.19286    0.22257
    0.25651   -0.94042    1.00000
ROW  X17   SSWRC
   -0.10210   -0.00045   -0.26392   -0.10233    0.07225    0.20201   -0.59662    0.10287    0.04463    0.34754   -0.07814   -0.41800   -0.08645
   -0.09261   -0.45518    0.12532    1.00000
ROW  X18   DEPOFOM
    0.28091    0.19110    0.13682    0.27956   -0.04860   -0.35655    0.37582   -0.16052    0.07918   -0.28901   -0.34296    0.33578   -0.22629
   -0.31842    0.15347   -0.08947   -0.21350    1.00000
ROW  X19   %ROCK
    0.24024    0.16451    0.29123    0.25243   -0.02853   -0.30178    0.30881    0.09114    0.08057   -0.70100    0.04050    0.07264    0.20784
    0.18530    0.26430   -0.22372   -0.18536    0.13362    1.00000
ROW  X20   %SLASH
    0.36982    0.24480    0.12052    0.36180   -0.04488   -0.43778    0.34575   -0.13645    0.10528   -0.33002   -0.25808    0.27179   -0.13348
   -0.27629   -0.05918    0.08679   -0.05460    0.72398    0.14409    1.00000
ROW  X21   %MS
   -0.23860   -0.10235    0.01814   -0.21314    0.31607    0.63815   -0.02508   -0.16680   -0.05089   -0.02109    0.28363   -0.56578    0.22645
    0.24060    0.25647   -0.25341   -0.08472   -0.46381    0.04537   -0.56695    1.00000
ROW  X22   %OM
   -0.18175   -0.16559   -0.22013   -0.20078   -0.23592   -0.09948   -0.38484    0.26718   -0.06455    0.55192   -0.07811    0.25754   -0.19465
   -0.07541   -0.25113    0.20231    0.20296   -0.24237   -0.51011   -0.38955   -0.47412    1.00000
ROW  X23   %OVERBR
    0.20233    0.08099    0.13900    0.19122    0.30600    0.20150   -0.02490   -0.08825   -0.34203    0.12194   -0.26927    0.15040   -0.32078
   -0.24074   -0.14579    0.04760    0.30077    0.06748   -0.02743    0.28846   -0.08371   -0.16561    1.00000
```

```
ROW  X24   %NOTOVER
 -0.20233  -0.08099  -0.13900  -0.19122  -0.30600  -0.20150   0.02490   0.08825   0.34203  -0.12194   0.26927  -0.15040   0.32078
  0.24074   0.14579  -0.04760  -0.30077  -0.06748   0.02743  -0.28846   0.08371   0.16561  -1.00000   1.00000
```