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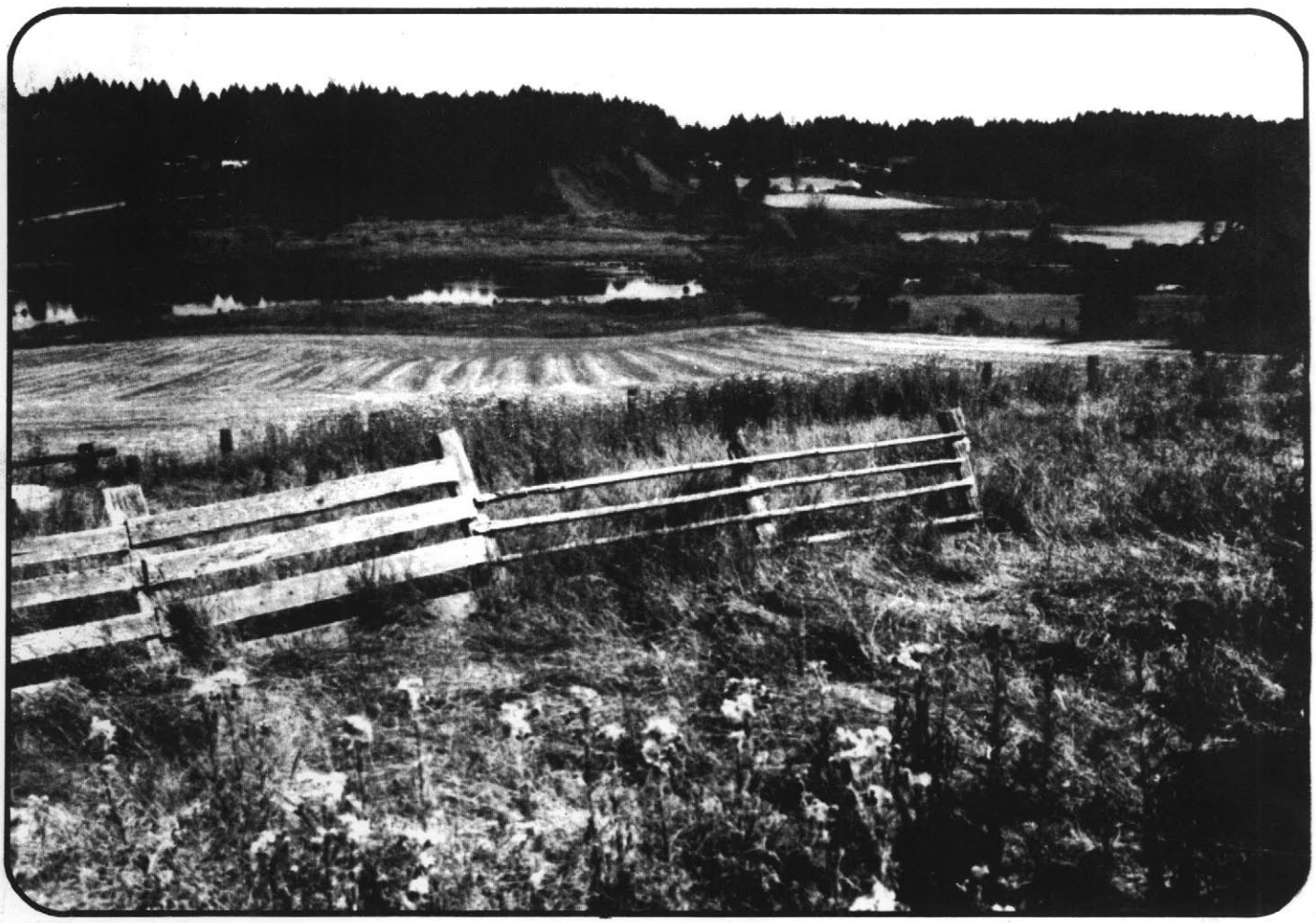
Ministry of Environment

Soils of Southern Vancouver Island

MOE Technical Report 17



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MOE Technical Report 17

SOILS OF SOUTHERN VANCOUVER ISLAND

Report No. 44

British Columbia Soil Survey

J. R. Jungen, P. Ag.

SURVEYS AND RESOURCE MAPPING BRANCH

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PREFACE

Soils and their suitability for various purposes form an integral part of making decisions in land-use planning and management. A reconnaissance soil survey of Southern Vancouver Island (all or parts of N.T.S. map sheets 92B, 92C, 92F, 92G, and 92K) was undertaken between 1974 and 1976 to provide basic soils and biophysical information useful for a broad range of interpretations.

Four products have resulted from this survey. They are:

(1) this report which describes the soils and the environments in which they occur;

(2) soil maps, available at a scale of 1:100 000 and in manuscript form* at a scale of 1:50 000. These maps indicate the distribution of the soils described in this report as well as soil phases and topographic (slope) classes;

(3) terrain maps, available in manuscript form* at scales of 1:50 000 and 100 000 which indicate the distribution of surficial materials, surface expression, and modifying processes; and,

(4) land capability for agriculture maps, available in manuscript form* at a scale of 1:50 000. These are available only for map sheets which contain potential agricultural land. The classification is according to the Canada Land Inventory (1972) methodology. The availability map sheets are:

92B5; B11; B12; B13; B14
92C9; C16
92F1; F2; F7; F8; F10; F11; F14; F15
92G4;
92K3; K4; K5.

*Manuscript maps are available from MAPS-BC, Surveys and Resource Mapping Branch, Ministry of Environment, 553 Superior Street, Victoria, British Columbia, V8V 1X5.

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Assistance in soil mapping and classification was provided by I. Cotic, J. Senyk, and L. Lacelle.

Appreciation is also extended to V. Osborne and staff for providing the laboratory analysis; R. Blaney, M. Botting and staff for drafting the maps; D. Bush, Ministry of Agriculture and Food, for providing the cartography in this report; and to B. Webb for the word processing of the report.

The Vegetation Zonation section was written by A. Harcombe.

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HOW TO USE THE SOIL MAPS AND REPORT

The descriptions of the soils and the environments in which they occur are presented in this report and are related to the soil map through the soil map legend. The soil maps which indicate the location and extent of the various soils are enclosed at the back of this report at a scale of 1:100 000. Manuscript soil maps at a scale of 1:50 000 are also available from MAPS-B.C. The information content is the same on both sets of maps. Soil maps should be used in combination with the report at all times.

The soil maps indicate the extent and distribution of the various kinds of soil and identifies them by means of symbols. The map legend describes the symbols used to identify the different soils found on the map and which are described further in the report.

The mapping is of a reconnaissance nature and is intended to be used for overview planning purposes and for general management decisions. Detailed application will require further on-site inspection to confirm the exact soil association component present. The definitions of the soil association components are objective and will facilitate more detailed investigations.

General information about the map area is contained in Chapter 1, entitled "General Description of the Map Area". The individual soils are described in Chapter 3, entitled "Soil Association Descriptions". Information relating to the suitability (or limitations) of the soils for specific uses is presented in Chapter 4, "Derivations and Interpretations".

Detailed soil profile descriptions and laboratory data are not included in this report but are available, on request, from the British Columbia Soil Information System by contacting B.C.S.I.S., Surveys and Resource Mapping Branch, Ministry of Environment, Parliament Buildings, Victoria, British Columbia, V8V 1X5.

CHAPTER ONE
GENERAL DESCRIPTION OF THE MAP AREA

1.1 LOCATION

The map area is located in southwestern British Columbia (Figure 1) and contains that part of Vancouver Island between longitude 123°00' and 126°00'. The outer islands along the west coast of Vancouver Island and Hornby, Denman and Quadra islands near the east coast are also included.

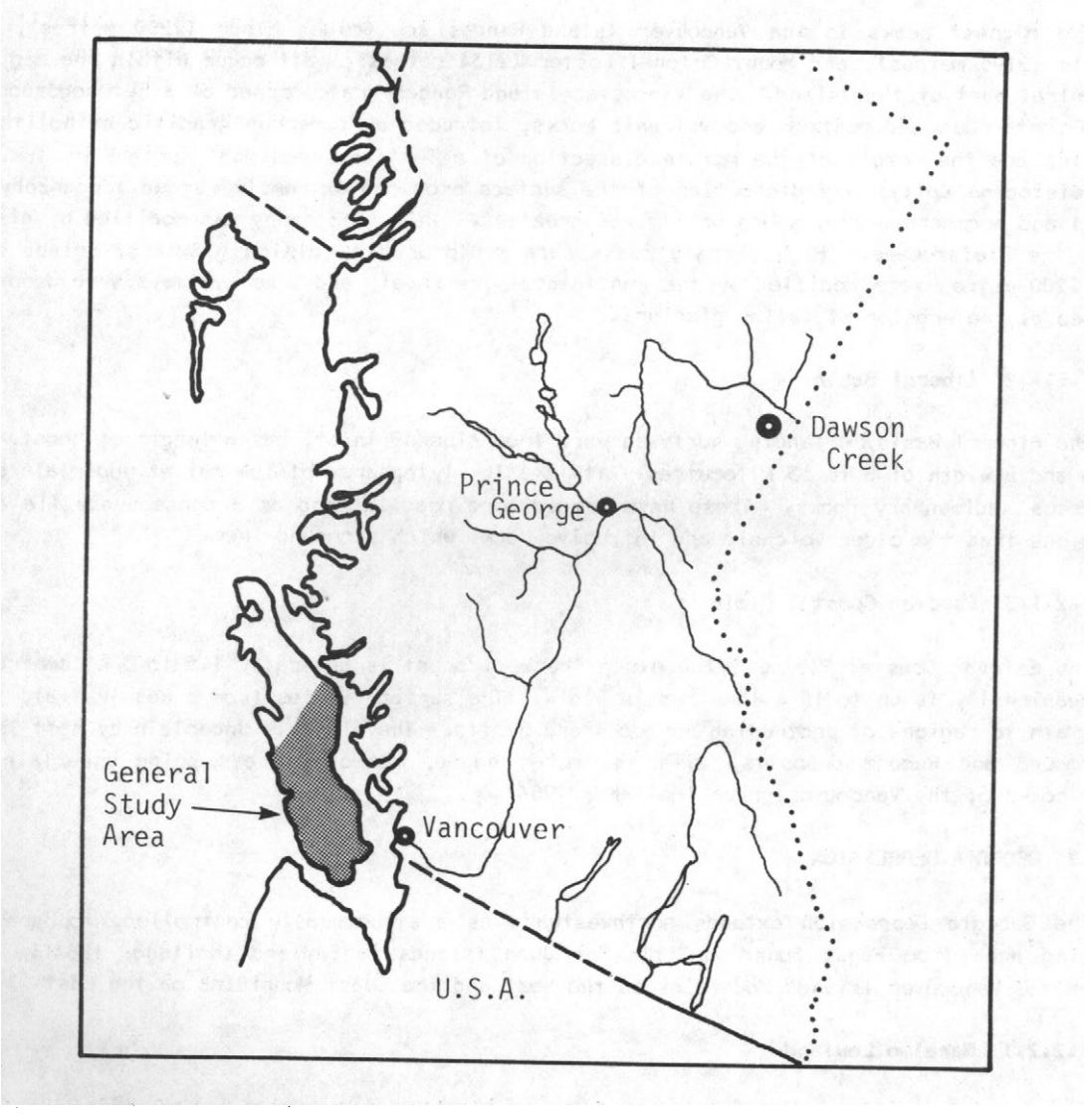


Figure 1. Location of the map area.

1.2 PHYSIOGRAPHY (Plate 1)

1.2.1 VANCOUVER ISLAND MOUNTAINS

All of Vancouver Island except for narrow strips of lowland along the eastern and northern coasts, is included within the Vancouver Island Mountains (Holland, 1964). The Vancouver Island Mountains which are part of the Insular Mountains, consist of the Vancouver Island Ranges, the Alberni Basin and the Estevan Coastal Plain (Plate 2).

1.2.1.1 Vancouver Island Ranges

The highest peaks in the Vancouver Island Ranges are Golden Hinde (2200 metres), Elkhorn Mountain (2195 metres), and Mount Colonel Foster (2134 metres); all occur within the map area in the central part of the Island. The Vancouver Island Ranges are composed of a heterogeneous group of pre-Cretaceous sedimentary and volcanic rocks, intruded by numerous granitic batholiths. The mountains are the result of the mature dissection of a Tertiary erosional surface of low relief. Pre-Pleistocene uplift and dissection of the surface produced extremely rugged topography in the central and northern areas, where uplift was greatest. This topography was modified by glaciation during the Pleistocene. High serrate peaks were sculptured by alpine glaciers, upland surfaces below 1200 metres were modified by the continental ice sheet, and lower valleys were deepened and modified by the erosion of valley glaciers.

1.2.1.2 Alberni Basin

The Alberni Basin, extending northwestward from Alberni Inlet, has a length of about 40 kilometres and a width of 8 to 13 kilometres. It is a low-lying area of low relief underlain by Upper Cretaceous sedimentary rocks. These have eroded more readily, and as a consequence lie at lower elevations than the older volcanic and intrusive rocks which surround them.

1.2.1.3 Estevan Coastal Plain

The Estevan Coastal Plain, lying along the west coast is generally 1.5 to 3 kilometres wide, but occasionally is up to 13 kilometres in width. The surface varies from a nearly flat, featureless plain to regions of protruding hummocks and bluffs. The plain is underlain by soft Tertiary, Pleistocene and Recent deposits, with the more rugged, hummocky areas being underlain by the harder rocks of the Vancouver group (Holland, 1964).

1.2.2 GEORGIA DEPRESSION

The Georgia Depression extends northwestward as a structurally controlled, topographically low-lying area from Puget Sound and the San Juan Islands to Sayward (Holland, 1964). It lies between the Vancouver Islands Mountains on the west and the Coast Mountains on the east.

1.2.2.1 Nanaimo Lowland

The Nanaimo Lowland lies below 600 metres elevation and extends along the east coast of Vancouver Island from Sayward to Jordan River (Plate 2). The Gulf Islands are included in the Lowland. The Lowland is bounded on the eastern side by the Georgia Depression and on the west by

Plate 1. Satellite photo of southern Vancouver Island.

Plate 2. Oblique westward view showing the typical low relief of the Nanaimo Lowlands with the Vancouver Island Ranges in the background.

the Vancouver Island Mountains. It is largely underlain by sedimentary rocks of Upper Cretaceous age.

The Lowland consists of undulating topography and sharp ridge-like crests separated by narrow valleys. The moderate relief areas are characteristically underlain by deep unconsolidated deposits while the ridge-and-trough areas are the result of differential bedrock weathering; the ridges are underlain by hard, relatively resistant sandstone and conglomerate and the valleys are underlain by shales or follow along fault zones.

1.3 BEDROCK GEOLOGY

The bedrock geology of the area has been mapped and described by Muller (1971). A complex variety occurs including rocks of volcanic, intrusive, sedimentary and metamorphic origins. Sedimentary (mainly sandstone and conglomerate) predominate in the Nanaimo Lowland while volcanic rocks are most dominant within the Vancouver Island Ranges.

Bedrock groupings are frequently primary divisions in developing broad stratifications of soils because soils developed in parent materials derived from different bedrock often exhibit considerable variation in physical and chemical properties. In terms of this report, the bedrock in the map area has been grouped into seven classes:

(i) intrusive rocks
(ii) extrusive (volcanic) rocks
(iii) sandstone and conglomerate rocks
(iv) schist rocks
(v) siltstone and shale rocks
(vi) limestone rocks
(vii) argillaecous rocks.

1.4 GLACIATION AND SURFICIAL DEPOSITS

The landscape of southern Vancouver Island has been considerably modified by glaciation during the Pleistocene epoch. The Fraser glaciation, the most recent, has resulted in the most extensive surficial deposits. This event began with the advance of glacial ice from the mainland Coast Mountains down the Strait of Georgia. Approximately 18,000 to 19,000 years ago, this ice sheet crossed the southeastern part of Vancouver Island (Alley and Chatwin, 1979).

With glacial retreat, uplift of the land occurred rapidly and a sea level near to that of the present was reached about 12,000 years BP (Clague, 1975). Another brief submergence occurred along eastern Vancouver Island, climaxing about 11,500 years BP, again followed by rapid emergence. As a result, marine deposits accumulated along the coastal region up to an elevation of approximately 100 metres.

The surficial deposits found within the map area are predominantly the result of glaciation. Deposits resulting from the natural processes of colluviation (by gravity) are also widespread while environmentally induced deposits (ie. organic) are locally important. Collectively these deposits form the parent materials of all the soils which have formed. The separation of these surficial materials (landforms) was the third level of differentiation in mapping the soils. Separate landform maps are available. Five major types of surficial deposits were identified in

the study area: colluvial, fluvial, morainal, marine, and organic. In addition, minor areas of lacustrine sediments also occur. The surficial deposits were defined and described using a preliminary draft of the Terrain Classification System (Resource Analysis Branch, 1976). Most symbols are identical to those in the published manual, however, and differences are relatively minor.

1.4.1 COLLUVIAL DEPOSITS

Colluvial materials are produced by mass wastage and have reached their present position by direct, gravity-induced movement. Colluvial deposits (Plate 3) a common parent material in the map area, occurring predominantly on steep slopes.

Colluvial deposits of variable depth occupy large areas in the mountain regions of Vancouver Island and are frequently interspersed with exposed bedrock throughout these rough, steeply sloping landscapes (Plate 4). Colluvial deposits are highly variable as to quantity and type of coarse clastic fragments. The mapping system employed for the separation of colluvial deposits is based on the kind of bedrock from which the colluvium originated (eg. intrusive versus extrusive), and not on the uniformity and size of coarse fragments. The deposits are generally well drained and have textures varying from bouldery, gravelly sand to cobbly or bouldery, sandy gravel.

1.4.2 FLUVIAL DEPOSITS

Fluvial materials have been deposited by flowing water (Plate 5). In the map area, many such materials were deposited by glacial meltwaters and are designated as fluvioglacial. Coarse textured (Plate 6) fluvioglacial sediments (sand to sandy gravel) have a variety of surface expressions, in the form of old terraces, and raised estuaries and deltas. The raised deltas are usually found at or below the limit of marine submergence and have characteristic foreset and topset bedding. Finer textured fluvioglacial materials (sandy silt to silty sand) are not common and occur only as a veneer or blanket over coarser textured fluvioglacial deposits.

The fluvial deposits of contemporary rivers and creeks have a wide range of textures, varying from sandy silt to gravelly sand. Floodplains, low lying fluvial terraces, fans and active deltas are characteristic landforms. Finer textures (sandy silt, silty sand) occur in the surface sediments of currently active deltas and estuaries (ie. Cowichan River delta).

1.4.3 MARINE DEPOSITS

Marine sediments (Plate 7) have settled from suspension in salt or brackish water bodies or have accumulated at their margins through shoreline processes such as wave action and longshore drift.

Many soils of the coastal lowlands are developed on materials that have been deposited in, or modified by the sea. These marine materials are predominantly moderately fine textured but marine sands and gravels are also widespread. They form a veneer or mantle on hills or slopes and may reach considerable depths in level or depressional areas. In general terms these marine deposits have been formed by the washing action of waves upon pre-existing surface materials exposed by emergence after glaciation. They consist of fine materials containing a few stones on low, flat areas and coarser materials containing many stones on sloping areas. In a few places there are

Plate 3. Sandy rubbly colluvial material.

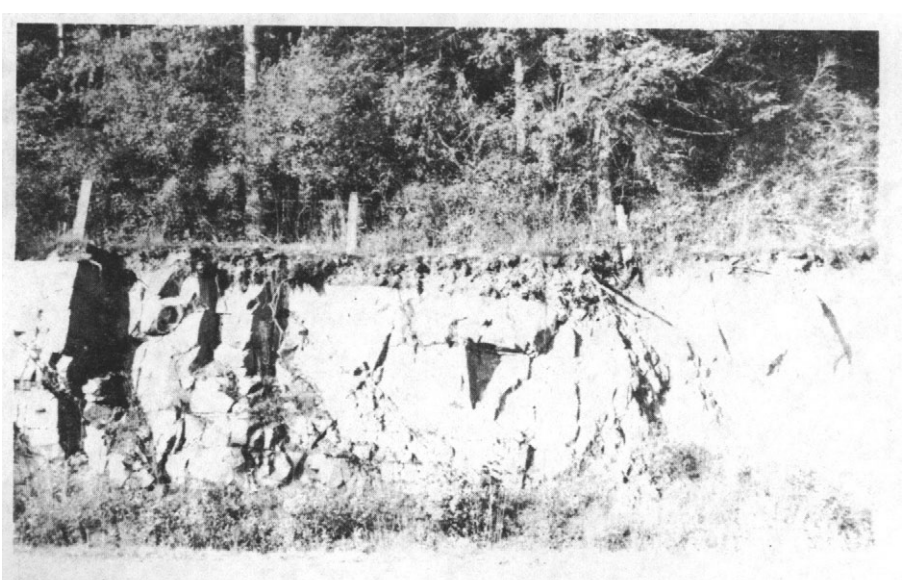


Plate 4. Shallow colluvial and/or morainal veneer over bedrock.

Plate 5. Low relief, gently undulating landscape typical of recent fluvial deposts.

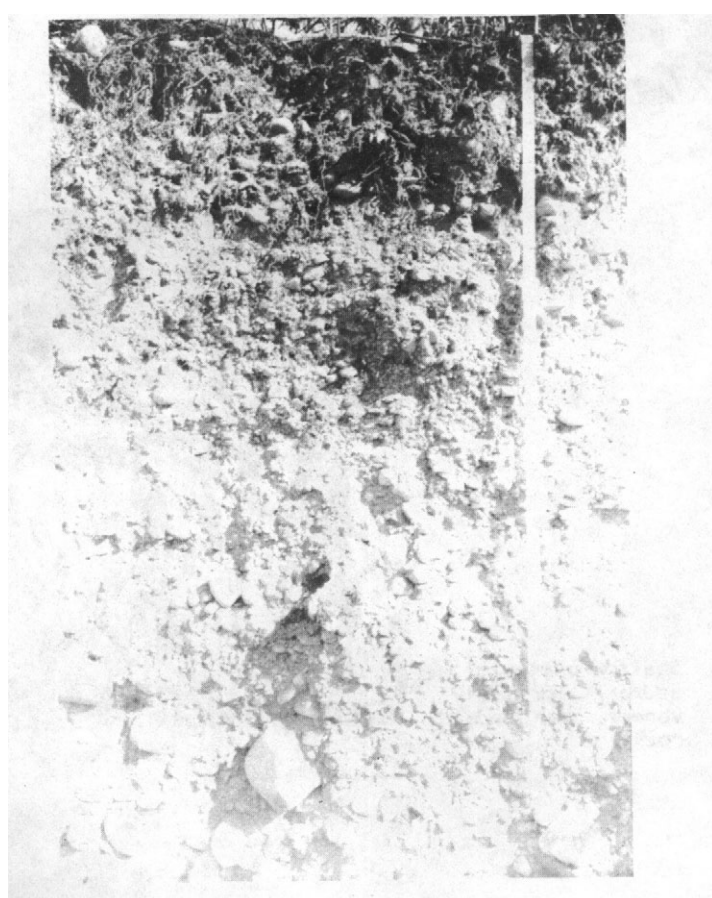


Plate 6. Typical sandy gravelly fluvial deposits.

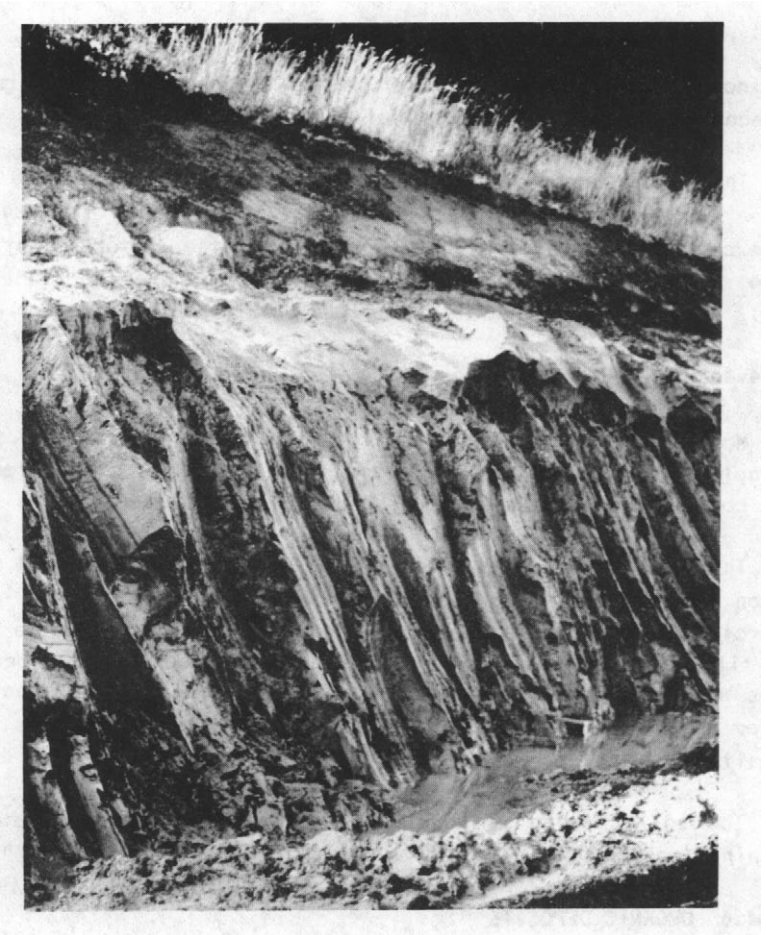


Plate 7. An exposure of deep, silty marine deposits.

Plate 8. Typical low relief of marine deposits.

distinctive and commonly thicker marine deposits such as gravelly shoreline spits, bars, or terraces, and silty to clayey tidal flats.

The soils on marine deposits are most varied in texture (ranging from clay to stony sand) where the former shorelines were underlain by sandy till and were exposed to sizeable waves. These conditions apply to the greater part of the eastern coastal lowland (Plate 8). More uniform (more clayey and less sandy) soils are found where the till is of finer texture (loam to clay loam), where waves were smaller (ie. in landlocked basins such as Alberni Valley).

1.4.4 MORAINAL DEPOSITS

Morainal deposits are deposited by glacial ice, and in the map area, generally consist of strongly compacted, non-stratified material composed of a heterogeneous mixture of sand, silt and clay containing a variable amount and size of coarse fragments (Plate 9).

The morainal deposits of the last glaciation are the most widespread material on the Lowlands and on the lower slopes of the mountain valleys. The rolling to hilly morainal surface (Plate 10) controls the topography of most of the Lowland, even where the till is covered by marine deposits. The till is generally bouldery, compact, coarse textured, and very hard although fine textured tills are encountered occasionally around Courtenay, near Nanaimo and in the Alberni Valley. The latter are mostly derived from shale or volcanic rock whereas intrusive and sandstone bedrock and deposits of interglacial sands were sources for the extensive deposits of sandy tills.

The soils mapped on morainal deposits have been separated on the basis of broad textural grouping (coarse, medium and fine) which roughly correlate with bedrock type.

1.4.5 ORGANIC DEPOSITS

Organic deposits are found in low lying depressions (Plates 11, 12) whose drainage is impeded. Some occur in once shallow arms of the sea that were isolated by a rising coastline after deglaciation. Many surround lakes into which they have encroached by gradual vegetation accumulation. The vegetative material may vary from essentially raw to well decomposed.

1.5 CLIMATE

The weather of Vancouver Island is dominated by low pressure systems in the winter and high pressure systems in the summer (Tuller, 1979). Prevailing winds are predominantly from the southeast in winter, while northwest winds predominate in the summer. The Vancouver Island Ranges significantly modify the easterly moving moisture-laden air masses.

Solar radiation and hours of bright sunshine decrease from the southeast of Vancouver Island to the northwest. Summer temperatures are cool to mild; winter temperatures are also mild (Figure 2) and extremes of temperature are rare. The freeze free period is relatively long, up to 230 days along the coast and 150 days in inland locations.

The major portion of Vancouver Islands' precipitation falls during the winter (Figure 2). Winter and mean monthly precipitation increase from south to north and from east to west. Maximum precipitation occurs on the west coast, while the east coast located in the rain shadow of the Vancouver Island Ranges and Olympic Mountains, is substantially drier.

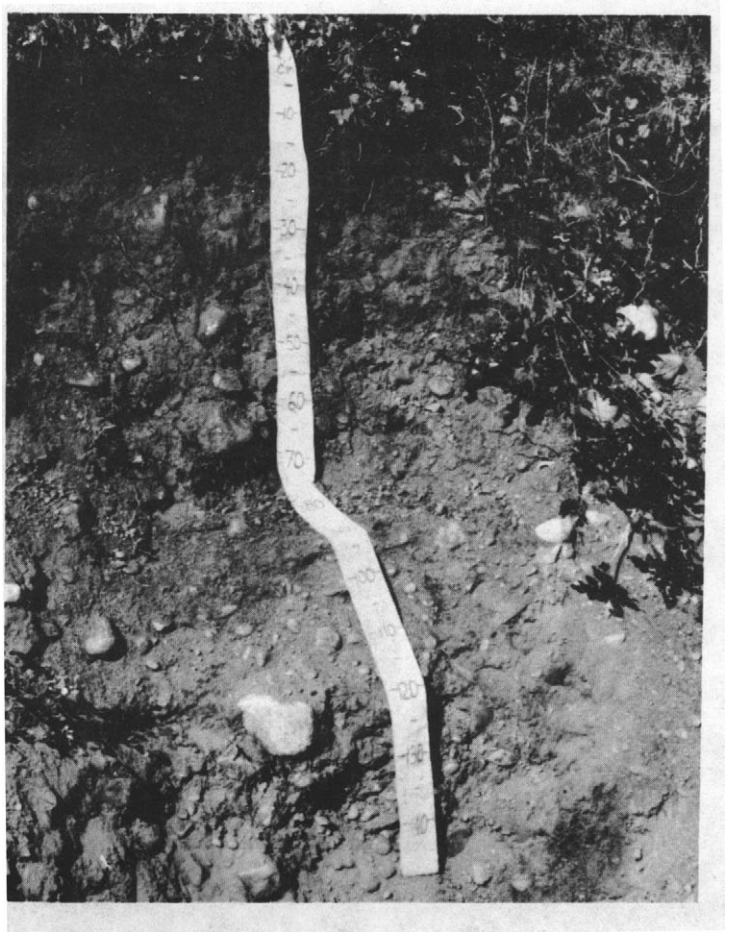


Plate 9. Example of typical sandy gravelly morainal deposits.

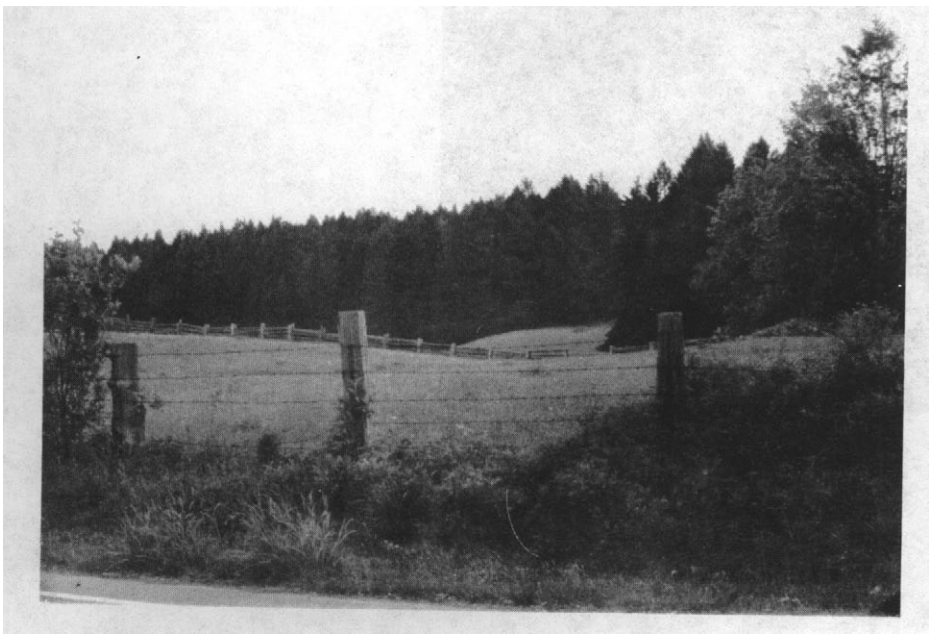


Plate 10. Subdued to rolling topography typical of lowland morainal areas.

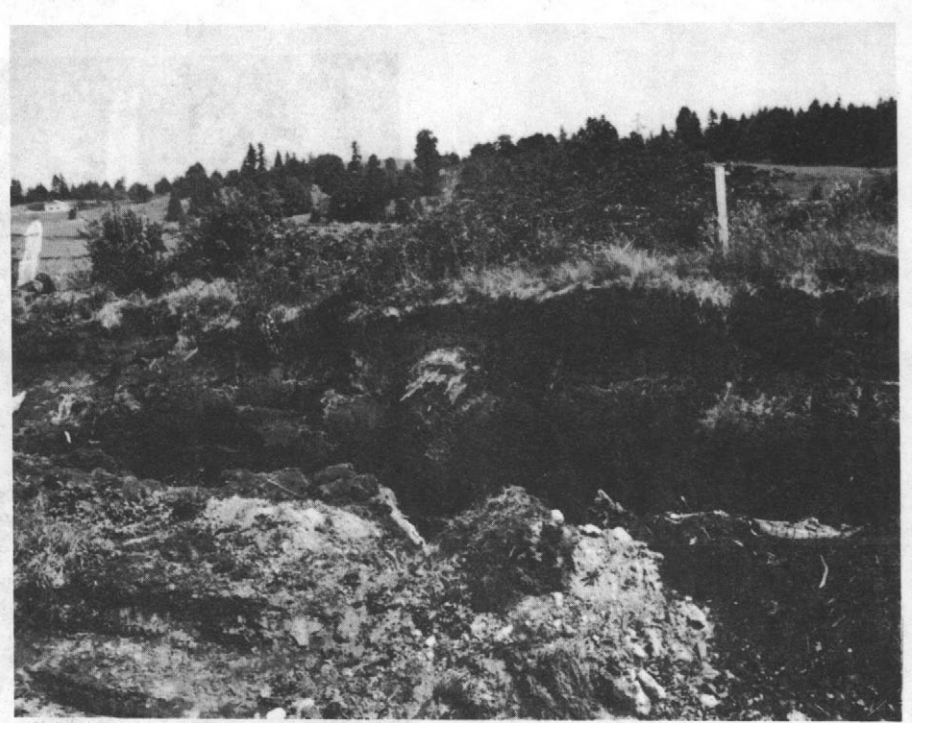


Plate 11. Exposure of organic material on the Nanaimo Lowlands.

Plate 12. Flat to depressional landscapes typical of organic deposits.

Although Vancouver Island receives ample annual precipitation, the summer dry period comes at the time when evaporative demand is at a maximum. Most areas, except for the west coast, have a water deficit during the summer, with the southeast being the most severely affected.

1.6 VEGETATION ZONATION

Two major characteristics of the Pacific coast climate, interacting with the topography of Vancouver Island results in two vegetation regions (see Figure 3). One is dominated by westerly air flow lifting over west-facing mountain slopes (Outer Coastal Region) and the other is dominated by the rainshadow effect of descending air on the leeward side of both the Vancouver Island Ranges and Olympic Mountains (Inner Coastal Region). Each of the vegetation regions has a particular vertical sequence of climax vegetation communities, briefly described in the following section[1].

1.6.1 OUTER COASTAL REGION

Three vegetation zones, with four vegetation subzones, characterize the Outer Coastal Region; only two of these zones are applicable to the map area. These vegetation zones reflect different macroclimatic conditions due to increase in elevation and resulting changes in precipitation pattern.

1.6.1.1 Coastal Western Hemlock - Pacific Silver Fir Zone

This zone occurs at elevations below about 1100 m and is characterized by a mixed climatic climax forest of western hemlock and Pacific silver fir on deep, moderately well to well drained sites. With increasing elevation, the dominant seral species changes from western red cedar to yellow cedar, a differentiation that results in two subzones being described.

The western red cedar subzone (below 600 m) has rain as the dominant form of precipitation, with a climatic moisture surplus. Closed climax forests have shrub and moss dominated understories. Scrubbier forests of western red cedar and western hemlock occur on shallower, less productive sites and may mix with shore pine on sites with poor drainage. Under these conditions, surface organic accumulation may result in sphagnum bog formation. Sitka spruce is common along coastal margins and on floodplains.

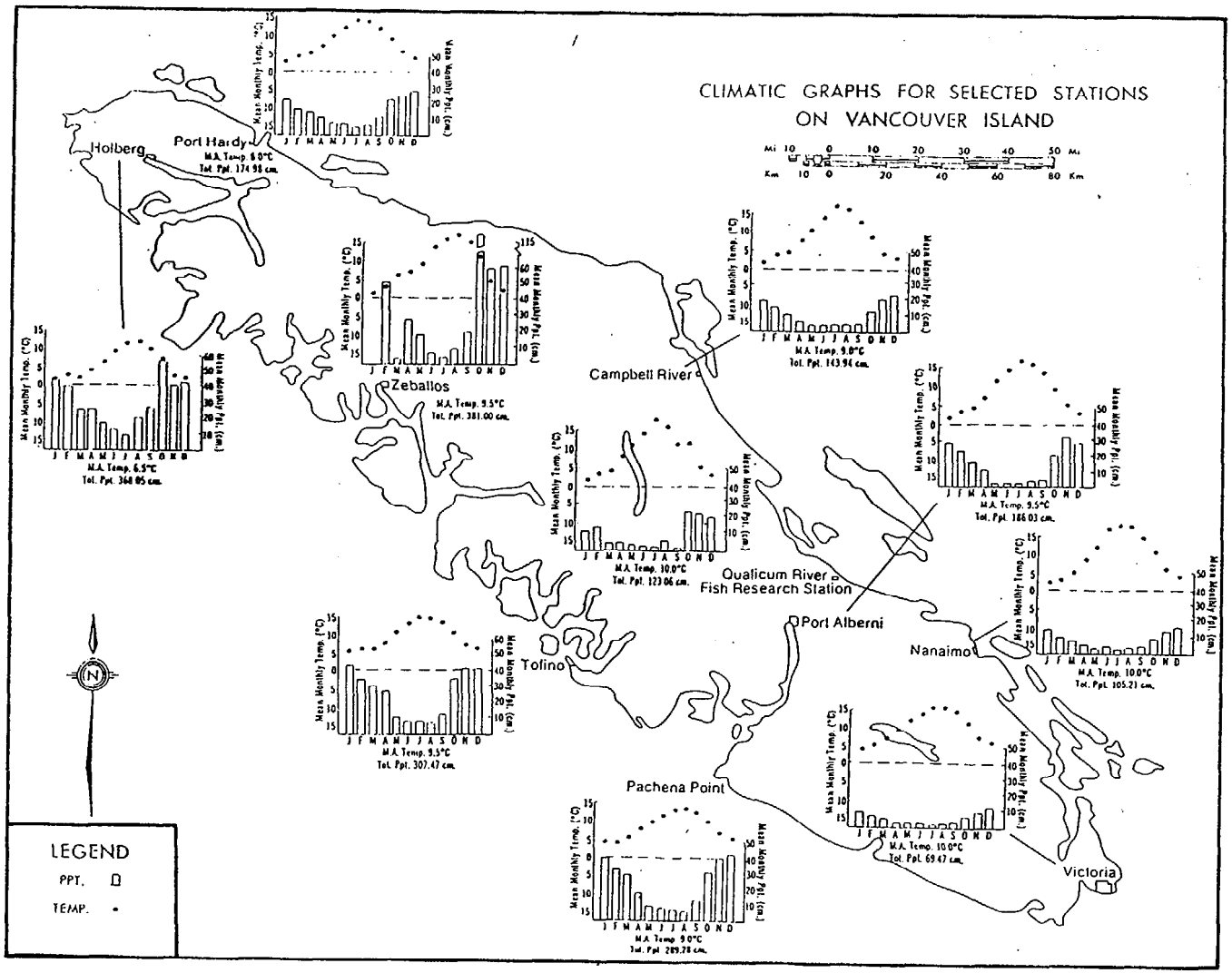
The yellow cedar subzone (550 to 1100 m) also has rain as the dominant precipitation form, but snow is common in winter. Seepage is more common and vegetation less varied than in the lower subzone. Pacific silver fir may be more dominant than western hemlock on deeper soils but understories are still shrub dominated. Yellow cedar becomes common with Pacific silver fir on seepage sites.

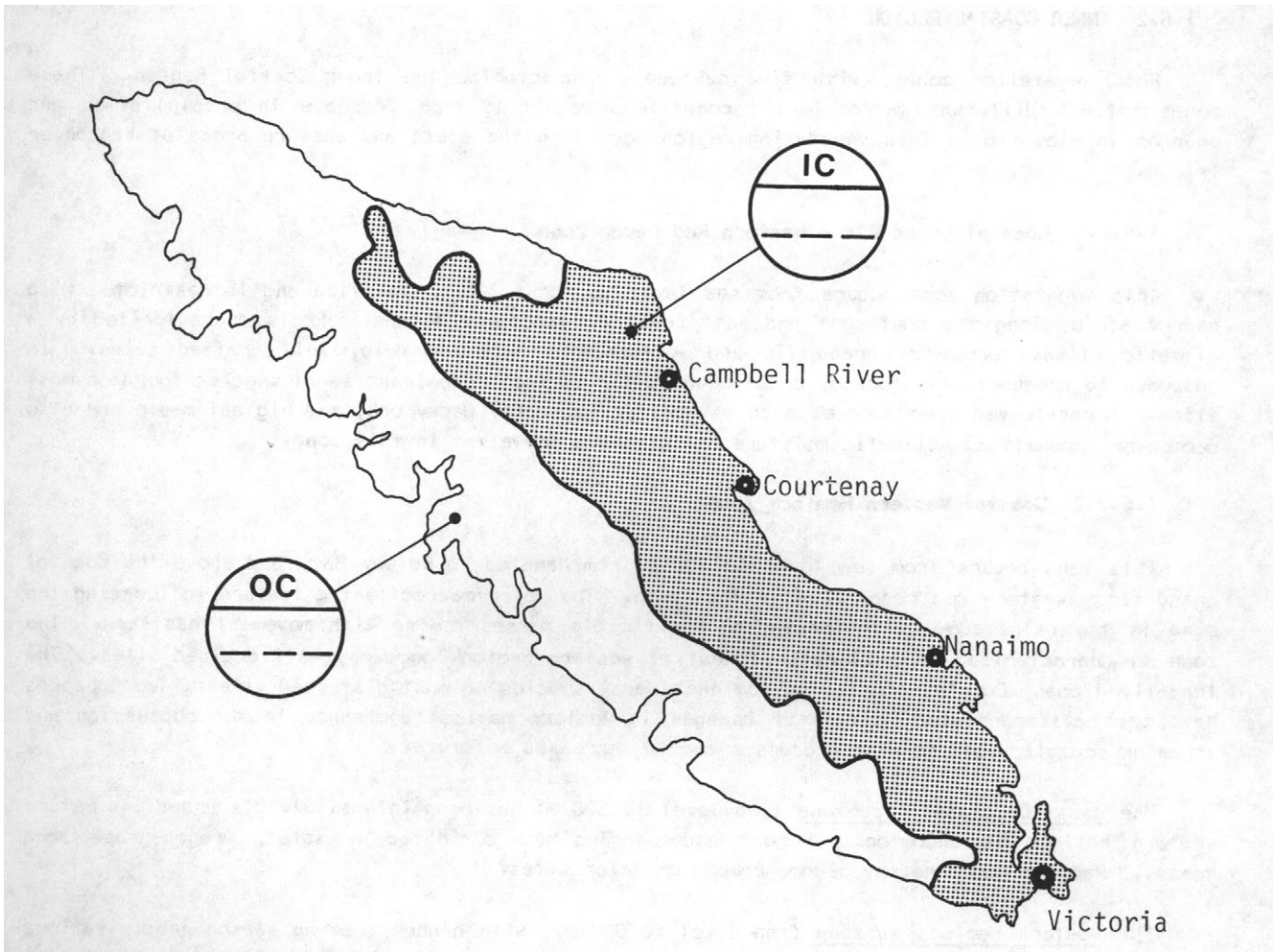
1.6.1.2 Subalpine Mountain Hemlock - Pacific Silver Fir Zone

This zone occurs in the elevation range of 950 to 1800 m and is characterized by a mixed canopy of mountain hemlock and Pacific silver fir. Yellow cedar is again common on seepage sites.

[1] A more detailed description of the biophysical vegetation units may be found in Vegetation Resources of Vancouver Island, Volume 1 (Harcombe and Oswald, in press).

Figure 2. Climatic graphs for selected stations on Vancouver Island.





(IC) Inner Coastal Region
(OC) Outer Coastal Region

Figure 3. Forest regions of Vancouver Island.

Forest cover is not continuous. At higher elevations trees tend to be clumped and patchy, with growth reflecting the more adverse environment by becoming stunted and bushy. On the basis of this change in growth form and structure, the zone is divided into forested and parkland subzones. Openings in the parkland subzone may be dominated by heathers and crowberry. Distribution of snow, time of snow melt, and depth of surficial materials become dominant factors governing plant distribution. Occasional islands of alpine tundra may be present but are too fragmented to map or describe in detail.

1.6.2 INNER COASTAL REGION

Four vegetation zones, with five subzones, characterize the Inner Coastal Region. These zones reflect different macroclimatic conditions resulting from decrease in precipitation and changes in elevation. This vegetation region occurs on the south and eastern areas of Vancouver Island.

1.6.2.1 Coastal Grand Fir - Western Red Cedar Zone

This vegetation zone occurs from sea level to about 300 m elevation and is restricted to a narrow strip along the southeast and east coast of Vancouver Island. It is characterized by a climatic climax forest of grand fir and western red cedar on deep, well drained sites. In response to frequent disturbance, coast Douglas-fir is the predominant seral species found on most sites. Broad-leaved tree species such as Pacific madronne, Garry oak, and bigleaf maple are also common on some sites. Climatic moisture deficits are prevalent in this zone.

1.6.2.2 Coastal Western Hemlock Zone

This zone occurs from sea level to 900 m from Nanaimo to Kelsey Bay, and above the Coastal grand fir - western red cedar zone in the south. The major macroclimatic feature influencing the zone is the rainshadow, with descending Pacific air masses drying with movement eastward. The zone is characterized by a climatic forest of western hemlock on deep, well drained sites. The long-lived coast Douglas-fir is the dominant seral species on most disturbed sites. Two subzones have been differentiated to reflect changes in western hemlock dominance in the succession and stronger podzolic soil forming processes due to increased moisture.

The coast Douglas-fir subzone (sea level to 500 m) has been intensively disturbed and mature western hemlock is uncommon. Forest understories are dominated by salal, Oregon-grape, and mosses. Pacific madronne may become common on drier sites.

The western hemlock subzone (sea level to 900 m), with higher growing season precipitation, is characterized by faster invasion of western hemlock regeneration and increasing accumulation of forest floor organic materials, resulting in improved forest capabilities. Red alder and coast Douglas-fir are common seral species, the former especially prevalent on disturbed floodplains and road margins.

1.6.2.3 Coastal Western Hemlock - Pacific Silver Fir Zone

The yellow cedar subzone of this zone occurs above the Coastal western hemlock zone, ranging in elevation from 700 to 1100 m. Precipitation is high, with snow common, and negible moisture

deficits in the growing season. Coast Douglas-fir may be a dominant seral species on drier sites; otherwise, this subzone is similar to that in the Outer Coastal Region.

1.6.2.4 Subalpine Mountain Hemlock - Pacific Silver Fir Zone

This zone is found in an elevational range of about 1000 to 1800 m. The upper limits of the zone are either the height of land, exposed bedrock with soils too shallow to support trees, or isolated patches of alpine tundra. Vegetation is similar to that described for the Outer Coastal Region.

1.7 SOIL CLASSIFICATION

Soil classification is based on the nature of the soil profile which reflects the influence of the various factors of soil formation. The delineation of the kinds of soils and recognizing their properties and interpretive potential is in essence the purpose of soil surveys.

The mountainous physiography of Vancouver Island, the climate, vegetation, and landforms, many of which have been influenced, moulded or formed by glaciation are the physical and environmental setting for the soils of the map area (Table 1). The soil parent materials are of glacial origin or have been subsequently modified by natural processes of colluviation, fluvial activity, and marine inundation. The soils found represent a broad spectrum with respect to their nature and characteristics. Taxonomically the soils have been classified into five soil orders. They are: (i) Podzolic, (ii) Brunisolic, (iii) Gleysolic, (iv) Regosolic, and (v) Organic.

1.7.1 PODZOLIC SOILS

Podzolic soils are by far the most widespread in the map area due mainly to the maritime climate which is characterized by high precipitation, low moisture deficits and cool to moderately cold soil temperature regimes. The soil moisture regimes are humid to perhumid. These factors act on the soil parent material to form bright, reddish-coloured, deeply weathered soils which are strongly leached, have low base saturations and are very acid. In the perhumid west coast areas and at high elevations, the soils become darker in colour due to increased organic matter in the B horizons. These black to rusty-red soil horizons are sometimes over 1 metre thick.

The podzolic soils in the map area usually have only thin eluvial (Ae) horizons. They are dominated by thick reddish to dark reddish brown B horizons which are medium to coarse textured, lack clay accumulation horizons and are frequently turbated. Iron, aluminum and organic matter accumulation is enhanced by the weathering and acidifing effects of the climate and vegetation. Additional moisture flowing via seepage during the wet season is present in many areas but is not readily apparent in the usual form of gleying and mottling. Its' presence is evidenced by an increased organic matter content and duller profile colours. The friable Bf and Bhf horizons are often underlain by strongly cemented duric layers.

1.7.2 BRUNISOLIC SOILS

Brunisolic soils occur only in a small part of the map area mainly along the southeastern coastal lowland and on the Gulf Islands. They also occur on relatively young fluvial and fine textured marine soil parent materials.

Brunisolic soils occur where the climate is characterized by warm, dry summers with high moisture deficits and relatively low total precipitation. The soil moisture regime is Semiarid while the soil temperature regime is Mild Mesic. Compared to the Podzols, the Brunisolic soils are less acid and leached, have much lighter colors and higher base saturations.

1.7.3 GLEYSOLIC SOILS

Poorly drained Gleysolic soils are found on level to very gently sloping terrain, usually on marine and fluvial deposits where moisture accumulation and/or seepage exert a significant role. Soil profiles are strongly gleyed and mottled, and saturated for long periods. Soil moisture regimes are peraquic and aquic.

Typical vegetation in gleysolic areas include red alder, cottonwood, willow, skunk cabbage and sedges.

1.7.4 REGOSOLIC SOILS

Regosolic soils occur mainly on recently deposited fluvial and marine deposits, and on steep, rubbly, unstable colluvium at the high elevations.

Periodic deposition, erosion and flooding in fluvial areas maintains the soils in an immature state while at the high elevations, continual colluvial activity restricts soil horizon development.

1.7.5 ORGANIC SOILS

Two types of organic soils occur in the map area. The first consists of organic accumulations in very poorly drained depressional locations where decay is retarded by more or less continual saturation and high water tables. The organic material, which may be essentially raw (fibric) to well decomposed (humic), originated from mainly moss, sedge and other hydrophytic vegetation. These types of organic soils are most common in the lowland areas.

The second type of organic soil consists of accumulations of forest litter overlying bedrock and is more common in the forested mountainous areas, particularly on the western side of Vancouver Island. The origin of the organic material is needles, leaves, twigs and other material resulting from the forest vegetation. These folisolic soils are well to imperfectly drained and usually occupy the higher parts of the landscape.

1.7.6 MAIN FEATURES OF VANCOUVER ISLAND SOILS

The main and/or unique features of the soils in the map area are the prevalence of strongly developed podzolic B horizons, the formation of thick organic (L-F-H) horizons, and the presence of extremely compact cemented pans in the lower B and C horizons.

The range in thickness of the organic surface horizons varies greatly and ranges from less than 4 cm in the mild and dry parts of the map area to between 30 and 50 cm in the cool, wet regions. The thickness of F and H horizons increases dramatically in the latter environment. The humus form classes are predominantly mor with some moder, and a few mull.

Cemented (duric) subsoils are common throughout the map area. They occur mainly in areas having annual precipitation ranging from approximately 900 mm to 5000 mm and mean annual temperatures of 5° to 10°C. The subsoils rarely, if ever, freeze because of deep snow cover during the winter. They occur almost exclusively in medium to coarse textured morainal and gravelly fluvial deposits and have not been observed in finer textured material. A friable podzolic or brunisolic B horizon betweem 50 and 100 cm thick usually overlies the duric horizon and a root mat has commonly developed at its' surface. The uppermost part of the duric horizon is the most strongly cemented and is commonly darkened with infiltrated organic material. The colour of the duric horizon varies from a blotched reddish-grey, including prominent brownish-red mottles, to the colour of the parent material and purple to black coatings on the coarse fragments are common in some areas. The structure is massive breaking to coarse platy. Duric horizons are relatively impervious to roots and water, and seepage water accumulates and flows along the surface. Bulk densities are high; values in excess of 2 gm/cm^3 are not uncommon.

Placic horizons also occur but are restricted to sandy deposits which contain relatively high amounts of organic matter and have fluctuating water tables. The horizons are very thin, ranging from .1 mm to 4 mm in thickness, and may occur either as horizontal bands or in branched, random fashion. Permeability of the placic horizon is low and perched water tables on their surface, together with seepage, is common.

A third type of cemented horizon found in the map area consists of cemented Bhf or Bf horizons. These ortstein horizons appear most frequently where fluctuating water tables occur and textures are coarse. They are rare in well drained soils; duric horizons dominate in these areas.

CHAPTER TWO
MAPPING METHODS AND SOIL LEGEND DEVELOPMENT

2.1 MAPPING METHODS

Initially, aerial photographs (1:63 360 scale) were examined stereoscopically to acquaint the mapper with the map area and to delineate the landforms. The aerial photo interpretation at this stage involved a deductive and inductive evaluation of the six main elements (drainage, erosion, tone, topography, vegetation and landuse). Existing information on bedrock geology and physiography was also used as an aid in the interpretation. This initial landform mapping formed the basis for organized field checking. Field work was carried out during the summers of 1973 to 1976 inclusive by vehicle where road access permitted and by helicopter in otherwise inaccessible areas. Road cuts and pits dug by hand provided exposures of soils and parent materials.

The main soil characteristics of the soil profiles, such as color (according to the Munsell notation), horizon sequences and depth, structure, texture, and presence/absence of mottles were recorded. Characteristics of the total environment such as drainage, stoniness, parent material, topography, aspect and vegetation were also recorded. Representative soil samples of some soil associations were taken and analyzed in the laboratory for characteristics such as reaction (pH), organic carbon, nitrogen, exchangeable bases, cation exchange capacity, iron, aluminum, phosphorus and particle size. All soils were classified according to The System of Soil Classification for Canada (Canada Department of Agriculture, 1974) and subsequently were updated to the current system (Canada Soil Survey Committee, 1978).

It was within the geomorphic landform framework that known information on soils and land capability was extended and extrapolated over adjacent landscapes. To this end, a preliminary soil legend was developed during the first field season. This legend was updated and revised during the following field seasons as new information was accumulated. Field checking also resulted in modification and correction of the initial boundaries on the aerial photographs and the surficial material designations.

Upon completion of the field work, the polygon boundaries and surficial material designations on the aerial photographs were finalized. The information was then transferred to 1:50 000 scale base maps and final manuscript terrain (surficial geology) maps were prepared.

These terrain maps then served as a base for the production of soil maps since the soil information and legend had been developed within a landform framework. As such, the majority of the polygon boundaries on the soil maps are the same as those on the terrain maps. The manuscript soil maps were also prepared at a scale of 1:50 000 but a photographic reduction to 1:100 000 scale was made for publication and inclusion with this report.

Mapping reliability depends partially on accessibility and to some extent on landscape complexity and density of forest cover. Accessibility was fair to good in lowland areas and in many of the mountain valleys. There are however, significant areas where mapping was mainly by aerial photo interpretation and extrapolation with limited field checking by helicopter. The reliability is consistent with that expected in a Survey Intensity Level 4 survey (Mapping Systems Working Group, 1981).

2.2 LEGEND DEVELOPMENT

The legend for the soils of Southern Vancouver Island map area is based on the concept of the Soil Association. A Soil Association is a group of soils of about the same age, occurring under similar climatic conditions and derived from similar parent materials.

The soils falling in each Soil Association were defined by progressively stratifying the landscape as illustrated in Figure 4 and Table 1 (located in the map pocket at back). The first level of stratification is on the basis of forest zone and subzone (see Section 1.6). Six groups

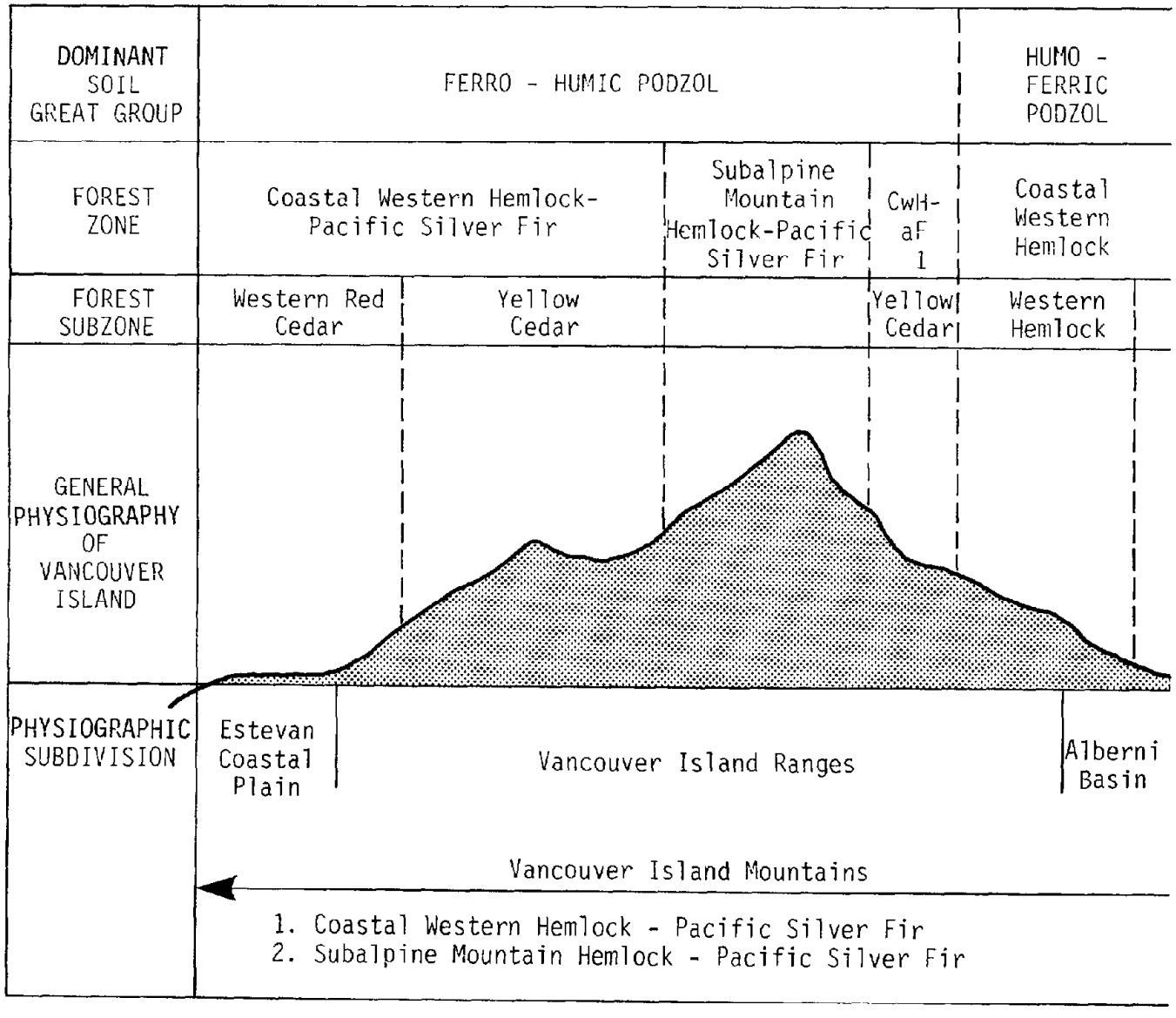
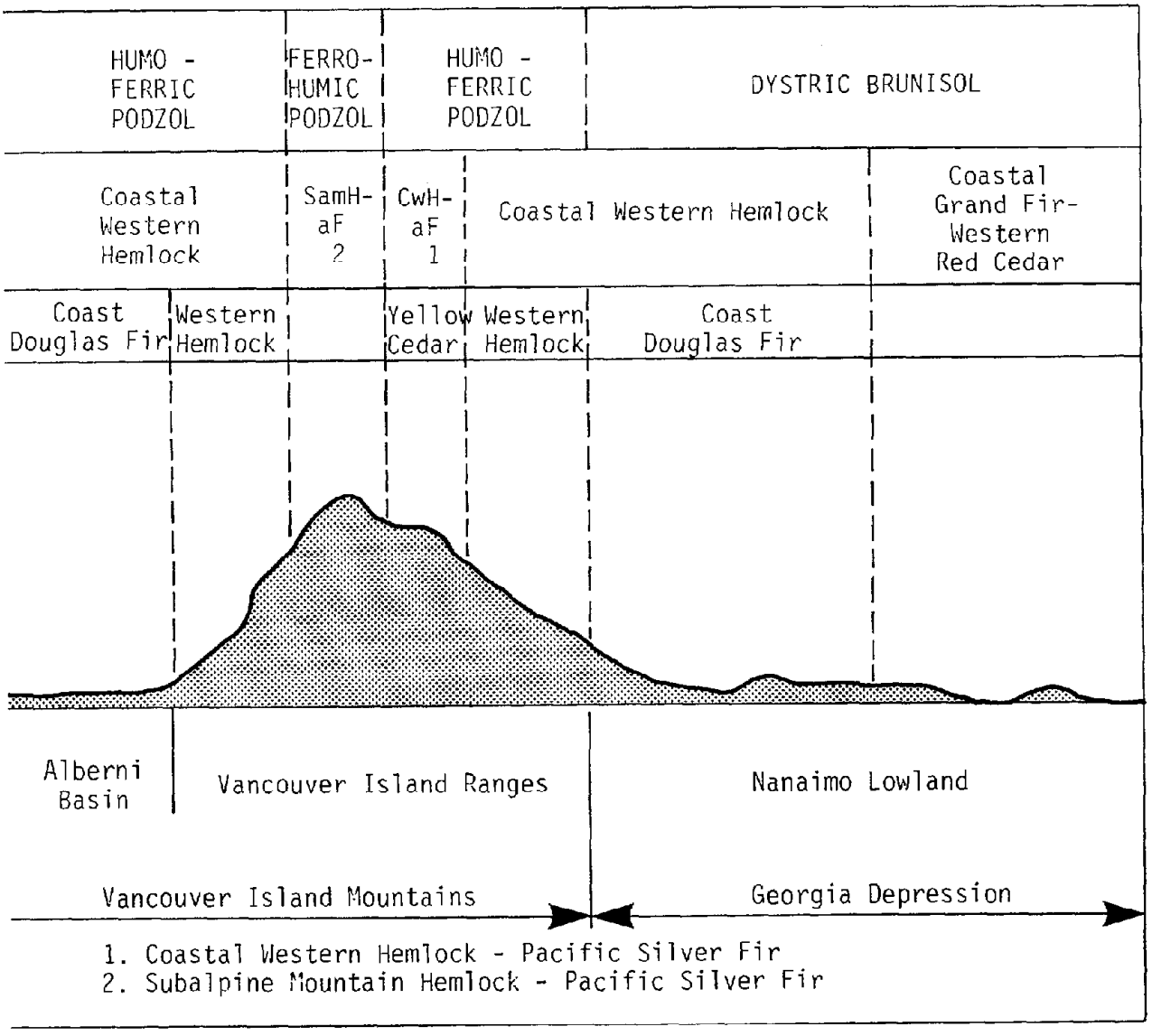


Figure 4. Relationships of Soil Great Groups, Forest Zones and Subzones to the Physiography of Vancouver Island.

were recognized at this level. These groups were then stratified further on the basis of soil parent material, then dominant associated bedrock (see Section 1.3), then texture (or degree of decomposition for organic materials) and finally dominant taxonomic soil classification. This resulted in a total of 125 named Soil Associations in the map area.

Each Soil Association represents a group of soils which have developed in a similar environment and with a number of properties in common. Of these, one soil occurs most often and represents the central or modal concept of that Association. It is this soil that is represented by the dominant taxonomic classification in Table 1. It is also this soil which is generally



described for each Association and which represents the "Most Common Soil" in the Soil Association Descriptions in the following section. The other soils within the Association are associated with this most common soil but differ due to factors such as differences in topographic position, elevation, drainage, textural variation and soil depth. Soil Association Components are used to indicate the presence of a significant proportion of an associated soil. Thus, a Soil Association Component generally consists of 50% or more of the soil which represents the central concept of that Association together with 20 to 50% of an associated soil with some different properties. Soil Association Components are the units which are used to map the soils of the area.

A standard numbering system on mineral soils is used for designating soil association components such that components 1 through 6 (with few exceptions) occur due to similar reasons in each Association. Components 8 to 9 are not standardized. The general meaning of components 1 through 6 is as follows:

1 - Consists dominantly of the soil which represents the central concept of the Association. Inclusions make up less than 20% of the component.

2 - Soil representing the central concept of the Association is dominant. Soil either developed in a somewhat drier environment, or pedologically younger, makes up 20 to 50% of the component.

3 - Soil representing the central concept of the Association is dominant. Soil developed in a somewhat wetter environment makes up 20 to 50% of the component.

4 - Soil representing the central concept of the Association is dominant. Soil with a significant taxonomic difference makes up 20 to 50% of the component.

5 - Soil representing the central concept of the Association is dominant. Very shallow or shallow lithic phases* of the soil representing the modal concept make up 20 to 50% of the component.

6 - Very shallow lithic phases of the soil representing the central concept of the Association are dominant. Shallow lithic phases of the soil representing the central concept of the Association makes up 20 to 50% of the component.

7,8,9 - These components are not standardized and are used to describe any other associated soils which occur.

*very shallow lithic phase - 10 to 50 cm of soil over bedrock
shallow lithic phase - 50 to 100 cm of soil over bedrock

CHAPTER THREE
SOIL ASSOCIATION DESCRIPTIONS

Each soil Association and Association Component classified and mapped in the Southern Vancouver Island map area is described on the following pages. The Associations are arranged in alphabetical order by Association name.

The forest zone, physiographic region, landform (terrain) characteristics, slope and elevational ranges, underlying bedrock characteristics, general landscape position and other noteworthy soil and landscape features are provided for each Association as a whole.

The most commonly occurring soil which represents the central soil concept of the Association is then described in terms of its perviousness, texture, coarse fragment content, reaction (pH), taxonomic classification and other noteworthy features. This description applies to the "Most Common Soil" in the component descriptions and as such, represents at least 50% of each component with a few minor exceptions.

The "Less Common Soil" indicated for each component comprises 20 to 50% of that component and has the general characteristics of the "Most Common Soil" with the exception of taxonomic classification and those differences noted under "Drainage" and "Comments."

Soil classification is according to the Canadian System of Soil Classification (Canada Soil Survey Committee, 1978). Drainage classes are described in Describing Ecosystems in the Field (Resource Analysis Branch, 1980).

AHOUSAT Soil Association - AS

Ahousat soils have developed in depressional, level and gently sloping areas within the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone and occur mainly at the upper elevations of the Vancouver Island Mountains. They have developed in strongly to very strongly acid, shallow, organic deposits derived from mosses, sedges and other hydrophytic vegeatation. Slopes are usually level; elevations range between about 900 and 1800 m.

Ahousat soils are at a mesic (intermediate) stage of decomposition. The organic material ranges from 40 to 160 cm in depth. The soils are generally saturated and free water is common at or near the soil surface for most of the year. The usual taxonomic classification is Terric Mesisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
AS1	Terric Mesisol	very poor	-	-	Consists dominantly of the usual or most common soil as described above.
AS7	Typic Mesisol	very poor	-	-	Organic material deeper than 160 cm is most common.

ALBERNI Soil Association - A

Alberni soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Alberni Basin physiographic subdivision. They have developed in deep, silty, and/or clayey marine deposits that occupy the valley floor. Slopes are normally level to gently sloping although minor gullied areas with slopes to 70% also occur. Elevations range from sea level to about 100 m.

Alberni soils are well to moderately well drained. Silty clay loam or silt loam are the usual surface textures; these change to silty clay loam to clay at depth. Alberni soils are generally coarse fragment free with the exception of occasional stone-sized erratics. The upper horizons contain abundant spherical concretions. The brown to strong brown solum is usually less than 50 cm in thickness, and medium acid. Relatively unweathered parent material occurs within 1 m of the soil surface. Dense compact subsoil layers restrict perviousness to slow. A moder layer between 2 and 8 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
A1	Orthic Dystric Brunisol	well to mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
A3	Orthic Dystric Brunisol	well to mod. well	Orthic Humo-Ferric Podzol	well to mod. well	Less common soil has a strong brown to reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.

AMPHITRITE Soil Association - AT

Amphitrite soils occupy scattered in depressional, level and gently sloping areas in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone and occur mainly in the Estevan Coastal Plain physiographic subdivision. They have developed in very strongly to extremely acid, shallow organic deposits derived from mosses, sedges and other hydrophytic vegeatation. Slopes are usually level to slightly sloping; elevations range from sea level to approximately 500 m.

Amphitrite soils are at a mesic (intermediate) stage of decomposition. The organic material ranges from 40 to 160 cm in depth. The soils are generally saturated and free water is common at or near the soil surface for most of the year. The usual taxonomic classification is Terric Mesisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
AT1	Terric Mesisol	very poor	-	-	Consists dominantly of the usual or most common soil as described above.
AT2	Terric Mesisol	very poor	Typic Mesisol	very poor	Less common soil consists of deep (>160 cm) organic material.
AT3	Terric Mesisol	very poor	Fibric Mesisol	very poor	Less common soil is deeper than 160 cm and contains a layer of slightly decomposed organic material more than 25 cm thick.
AT7	Typic Mesisol	very poor	Terric Mesisol	very poor	Organic material deeper than 160 cm is most common.

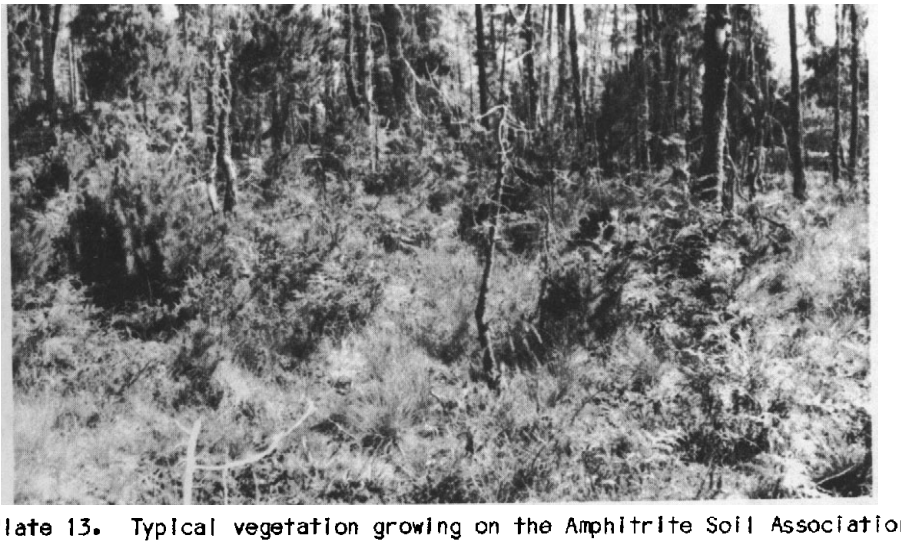


Plate 13. Typical vegetation growing on the Amphitrite Soil Association.

ARROWSMITH Soil Association - AR

Although Arrowsmith soils occupy scattered in depressions throughout the Coastal Western Hemlock Forest Zone (coast Douglas-fir subzone), they occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions. They have developed in strongly to very strongly acid, shallow, organic deposits derived from mosses, sedges and other hydrophytic vegeatation. Slopes are usually level; elevations range from sea level to approximately 500 m.

Arrowsmith soils are at a mesic (intermediate) stage of decomposition. The organic material generally ranges from 40 to 160 cm in depth although significant areas of deep (>160 cm) also occur. The soils are generally saturated and free water is common at or near the soil surface for most of the year. The usual taxonomic classification is Terric Mesisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
AR1	Terric Mesisol	very poor	-	-	Consists dominantly of the usual or most common soil as described above.
AR2	Terric Mesisol	very poor	Typic Mesisol	very poor	Less common soil consists of deep organic (>160 cm) material.
AR3	Terric Mesisol	very poor	Fibric Mesisol	very poor	Less common soil is deeper than 160 cm and contains a layer of slightly decomposed organic material more than 25 cm thick.
AR7	Typic Mesisol	very poor	Terric Mesisol	very poor	Organic material deeper than 160 cm is most common.

ARTLISH Soil Association - Al

Although Artlish soils occupy depressions throughout the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone, they occur mainly in the middle to upper elevations of the Vancouver Island Ranges. They have developed in very strongly acid, shallow organic deposits derived from mosses, sedges and other hydrophytic vegeatation. Slopes are usually level; elevations range from 300 to approximately 1100 m.

Artlish soils are at a mesic (intermediate) stage of decomposition. The organic material ranges from 40 to 160 cm in depth. The soils are generally saturated and free water is common at or near the soil surface for most of the year. The usual taxonomic classification is Terric Mesisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
A11	Terric Mesisol	very poor	-	-	Consists dominantly of the usual or most common soil as described above.
A12	Terric Mesisol	very poor	Typic Mesisol	very poor	Less common soil consists of deep (>160 cm) organic material.

AVELINE Soil Association - AE

Although Aveline soils occupy depressions throughout the Coastal Western Hemlock Forest Zone (western hemlock subzone), they occur mainly on the Nanaimo Lowlands and on the floors of low elevation valleys in the southern Vancouver Island Mountains. They have developed in strongly to very strongly acid, shallow organic deposits derived from mosses, sedges and other hydrophytic vegeatation. Slopes are usually level; elevations range from sea level to approximately 900 m.

Aveline soils are at a mesic (intermediate) stage of decomposition. The organic material ranges from 40 to 160 cm in depth. The soils are generally saturated and free water is common at or near the soil surface for most of the year. The usual taxonomic class-ification is Terric Mesisol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
AE1	Terric Mesisol	very poor	-	-	Consists dominantly of the usual or most common soil as described above.
AE2	Terric Mesisol	very poor	Typic Mesisol	very poor	Less common soil consists of deep (>160 cm) organic material.
AE7	Typic Mesisol	very poor	Terric Mesisol	very poor	Organic material deeper than 160 cm is most common.

AZILION Soil Association - AZ

Azilion soils occupy scattered depressions throughout the Coastal Grand Fir - Western Red Cedar Forest Zone. They mainly occur in the Nanaimo Lowland and Alberni Basin physiographic subdivision. They have developed in strongly to very strongly acid, shallow organic deposits derived from mosses, sedges and other hydrophytic vegeatation. Slopes are usually level; elevations range from sea level to approximately 300 m.

Azilion soils are at a mesic (intermediate) stage of decomposition. The organic material usually ranges from 40 to 160 cm in depth. The soils are generally saturated and free water is common at or near the soil surface for most of the year. The usual taxonomic classification is Terric Mesisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
AZ1	Terric Mesisol	very poor	-	-	Consists dominantly of the usual or most common soil as described above.
AZ2	Terric Mesisol	very poor	Typic Mesisol	very poor	Less common soil consists of deep (>160 cm) organic material.
AZ3	Terric Mesisol	very poor	Fibric Mesisol	very poor	Less common soil is deeper than 160 cm and contains a layer of slightly decomposed organic material more than 25 cm thick.
AZ9	Typic Mesisol: saline phase	very poor	Terric Mesisol	very poor	Organic material deeper than 160 cm is most common. These soils occur mainly in estuaries where sea water results in saline conditions.

BEAVERTAIL Soil Association - BL

Beavertail soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in shallow, sandy, marine or fluvial deposits over compact silty marine or gravelly sandy morainal deposits. Slopes are normally level to gently sloping. Elevations range from sea level to about 200 m.

Beavertail soils are well drained. Loamy sand or sandy loam are the usual surface textures; these change to gravelly sandy loam or silt loam at depth. Beavertail soils generally contain less than 20% of fine gravels by volume and occasional cobble or stone-sized fragments. The podzolized solum is usually less than 70 cm in thickness, strong brown to yellowish red and strongly acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mor layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
BL1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
BL2	Orthic Humo-Ferric Podzol	well	Orthic Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.

BOWSER Soil Association - B

Bowser soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in shallow, sandy marine or fluvial deposits overlying silty to clayey marine deposits. Slopes are normally level to gently sloping; elevations range from sea level to about 200 m.

Bowser soils are imperfectly drained. Sandy loam or loamy sand are the usual surface textures; these change to silt loam or silty clay loam at depth. Bowser soils are mostly free of coarse fragments with the exception of minor amounts of fine gravel and occasional cobble or stone-sized fragments. The upper horizons contain abundant spherical concretions. The podzolized solum is usually about 70 cm in thickness, yellowish red to reddish brown and strongly acid. Dense, compact subsoil layers restrict perviousness to slow. Distinct to prominent mottles and gleying occur at depths below 50 cm. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Gleyed Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
B1	Gleyed Humo-Ferric Podzol	Imperfect	-	-	Consists dominantly of the usual or most common soil as described above.
B2	Gleyed Humo-Ferric Podzol	Imperfect	Gleyed Dystric Brunisol	Imperfect	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
B4	Gleyed Humo-Ferric Podzol	Imperfect	Duric Humo-Ferric Podzol	Imperfect	Less common soil contains a moderately to strongly cemented subsoil layer.
B7	Gleyed Humo-Ferric Podzol	Imperfect	Orthic Humic Gleysol	poor	Less common soil is poorly drained. It is equivalent to the most common soil in the Parksville soil association.

Plate 14. An example of the alder dominated vegetation growing on Bowser and other imperfectly drained soils.

CADBORO Soil Association - CD

Cadboro soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone. They occur in the Nanaimo Lowland physiographic subdivision. They have developed in deep gravelly sandy morainal (till) deposits. Slopes vary between 2 and 10%; elevations range from sea level to 300 m.

Cadboro soils are well drained. Gravelly sandy loam or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of compact gravelly sandy loam. The coarse fragment content varies between 35 and 50%; cobbles, stones, and boulders are common. Friable surface and subsurface horizons are usually up to 80 cm in thickness, black to brown, and medium acid. A strongly cemented layer is present at depths between 70 and 100 cm while relatively unweathered compact parent material is encountered at depths between 90 and 120 cm. A mull layer between 10 and 125 cm is present at the soil surface. The usual taxonomic classification is Duric Sombric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CD3	Duric Sombric Brunisol	well	Duric Dystric Brunisol	well	Less common soil has a light yellowish-brown to yellowish-brown surface layer. It is equivalent to the most common soil in the Shawnigan soil association.

CALMUS Soil Association - CS

Calmus soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Mountains physiographic subdivision. They have developed in deep (>1 m), sandy rubbly colluvial deposits, mainly derived from volcanic bedrock. Slopes vary between 30 and 100%; elevations range from sea level to 600 m.

Calmus soils are well to moderately well drained. Gravelly loam to cobbly, gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of very gravelly sandy loam. The coarse fragment content is usually between 35 and 60%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are dark brown to dark reddish brown, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 15 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CS1	Orthic Ferro-Humic Podzol	well to mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
CS2	Orthic Ferro-Humic Podzol	well to mod. well	Orthic Humo-Ferric Podzol	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Carmanah association.
CS3	Orthic Ferro-Humic Podzol	well to mod. well	Gleyed Ferro-Humic Podzol	imperfect	Less common soil has a very dark brown, strongly podzolized solum due to its occurrence in edaphically wetter locations.
CS8	Orthic Ferro-Humic Podzol	well to mod. well	Orthic Regosol	rapid	Less common soil occurs on very steep, unstable slopes. It is equivalent to the most common soil in the Clayoquot soil association.

CARMANAH Soil Association - CM

Carmanah soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Mountains physiographic subdivision. They have developed in deep (>1 m), sandy rubbly colluvial deposits derived mainly from extrusive bedrock. Slopes vary between 30 and 100%; elevations range from sea level to 600 m.

Carmanah soils are well drained. Gravelly loam or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of very gravelly sandy loam. The coarse fragment content is usually between 35 and 60%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are yellowish-red to reddish-brown, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 5 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CM1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CM3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well to mod. well	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Calmus association.

CARWITHEN Soil Association - CN

Carwithen soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Mountains physiographic subdivision. They have developed in deep (>1 m), sandy bouldery colluvial deposits, mainly derived from intrusive bedrock. Slopes vary between 30 and 100%; elevations range from sea level to 600 m.

Carwithen soils are well drained. Gravelly sandy loam to very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly loamy sand to bouldery sand. The coarse fragment content is usually between 40 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are yellowish red to dark brown, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 5 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CN1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CN3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	mod. well	Less common soil has a dark brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Cotter association.
CN8	Orthic Humo-Ferric Podzol	well	Orthic Regosol	rapid	Less common soil occurs on very steep, unstable slopes. It is equivalent to the most common soil in Clayoquot soil association.

CASSIDY Soil Association - CA

Cassidy soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial deposits such as gravel bars, recent fans, and terraces along creeks and rivers which are subject to flooding. Slopes are usually less than 5%; elevations range from sea level to about 700 m.

Cassidy soils are rapidly drained. Very gravely loamy sand or very gravelly sand are the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The weakly weathered surface and subsurface horizons are usually less than 60 cm in thickness, light yellowish brown to pale brown, and medium acid. Relatively unweathered parent material is encountered at depths between 50 and 100 cm. A mull layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CA1	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
CA4	Orthic Dystric Brunisol	rapid	Orthic Regosol	rapid	Less common soil consists of recently deposited material.
CA7	Gleyed Regosol	imperfect	Orthic Regosol and/or Rego Gleysol	rapid poor	The most common soil consists of recently deposited material and contains a fluctuating water table. Less common soils consists of those with either no or high water tables.
CA9	Gleyed Regosol: saline phase	imperfect	Orthic Regosol: saline phase and/or Rego Gleysol: saline phase	rapid poor	As for component CA7 and including saline conditions.

CATFACE Soil Association - CC

Catface soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy rubbly colluvial deposits derived mainly from extrusive bedrock. Slopes vary between 30 and 100%; elevations range from 900 to approximately 2100 m.

Catface soils are well drained. Gravelly sandy loam or very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is usually between 40 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are yellowish red to dark brown, and very strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 5 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CC1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CC3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Chetwood soil association.
CC8	Orthic Humo-Ferric Podzol	well	Orthic Regosol	rapid	Less common soil occurs on very steep, unstable slopes. It is equivalent to the most common soil in the Clayoquot soil association.

CHEMAINUS Soil Association - CH

Chemainus soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland physiographic subdivisions and on the floors of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, silty fluvial deposits and are subject to varying degrees of flooding. Slopes are usually less than 5%; elevations range from sea level to about 700 m.

Chemainus soils are moderately well to imperfectly drained. Loam or silt loam is the usual texture in the upper horizons; subsoils consist of fine sandy loam. Chemainus soils are normally free of coarse fragments, although minor gravelly areas may occur. Surface and subsurface horizons are usually less than 100 cm in thickness, dark yellowish brown to olive brown, and medium to strongly acid. Relatively unweathered parent material is encountered at depths between 100 and 150 m. A moder or mull layer between 1 and 15 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CH1	Orthic Dystric Brunisol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
CH4	Orthic Dystric Brunisol	mod. well	Orthic Regosol	well	Less common soil consists of recently deposited material. Little or no soil development is evident.
CH7	Gleyed Regosol (Gleyed Dystric Brunisol)	imperfect	Orthic Regosol and/or Rego Gleysol	well poor	Most common soil is imperfectly drained and mottled. Soil development is weak. Well and poorly drained minor inclusions also occur.

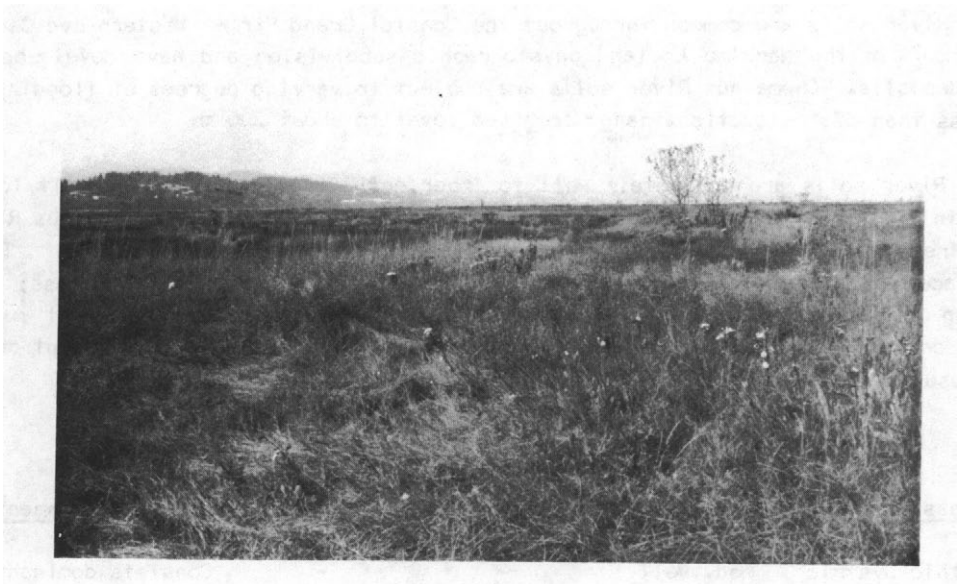


Plate 15. Typical estuary landscape of the CP9 component of the Chemainus River Soil Association.

Plate 16. Typical fluvial landscape of the Chemainus Soil Association.

CHEMAINUS RIVER Soil Association - CP

Chemainus River soils are common throughout the Coastal Grand Fir - Western Red Cedar Forest Zone. They occur in the Nanaimo Lowland physiographic subdivision and have developed in deep, silty fluvial deposits. Chemainus River soils are subject to varying degrees of flooding. Slopes are usually less than 5%; elevations range from sea level to about 200 m.

Chemainus River soils are moderately well to imperfectly drained. Loam or silt loam is the usual texture in the upper horizons; subsoils consist of fine sandy loam. Chemainus River soils are normally free of coarse fragments, although minor gravelly areas may occur. The weakly weathered surface and subsurface horizons are usually less than 100 cm in thickness; are dark yellowish brown to olive brown, and medium acid. Relatively unweathered parent material is encountered at depths below 100 m. A mull layer between 1 and 15 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CP1	Orthic Dystric Brunisol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
CP4	Orthic Dystric Brunisol	mod. well	Orthic Regosol	well	Less common soil consists of recently deposited material. Little or no soil development is evident.
CP7	Gleyed Regosol (Gleyed Dystric Brunisol)	imperfect	Rego Gleysol and/or Orthic Dystric Brunisol	poor mod. well	Most common soil is imperfectly drained and mottled. Less common soil is same as component CP1 or poorly drained.
CP9	Gleyed Regosol: saline phase (Gleyed Dystric Brunisol: saline phase)	imperfect	Rego Gleysol: saline phase and/or Orthic Dystric Brunisol: saline phase	poor mod. well	Soils are the same as component CP7 with the addition of being saline. This component is found in estuary locations.

CHETWOOD Soil Association - CW

Chetwood soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy rubbly colluvial deposits derived mainly from extrusive bedrock. Slopes vary between 30 and 100%; elevations range from 900 to approximately 2100 m.

Chetwood soils are well drained. Gravelly sandy loam to very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sand. The coarse fragment content is usually between 35 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are dark brown to dark reddish brown, and very strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 15 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CW1	Orthic Ferro-Humic Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CW2	Orthic Ferro-Humic Podzol	well	Orthic Humo-Ferric Podzol	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Catface soil association.
CW3	Orthic Ferro-Humic Podzol	well	Gleyed Ferro-Humic Podzol	imperfect	Less common soil has a mottled, very dark brown, strongly podzolized solum due to its occurrence in edaphically wetter locations.
CW8	Orthic Ferro-Humic Podzol	well	Orthic Regosol	rapid	Less common soil occurs on very steep, unstable slopes. It is equivalent to the most common soil in the Clayoquat soil association.

CLAYOQUAT Soil Association - CY

Clayoquat soils occur in all Forest Zones, however, they are most common in the Subalpine Mountain Hemlock - Pacific Silver Fir and the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zones. They occur within the Vancouver Island Mountains physiographic subdivision and have developed in deep, rubbly and/or bouldery colluvial deposits, greater than 1 m thick. Clayoquat soils occur in steep terrain associated with talus and scree deposits and in active avalanche tracks. Slopes vary between 50 and 100%; elevations range from sea level to 2200 m.

Clayoquat soils are rapidly drained. Bouldery and cobbly gravelly sand is the usual texture in the upper horizons; 50 to 70% subsoils consist of cobbly and bouldery very gravelly sand. The coarse fragment content is usually 65% by volume. Cobbles, stones, and boulders are numerous. The surface and subsurface horizons are very pale brown to yellow and strongly acid. The usual taxonomic classification is Orthic Regosol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CY1	Orthic Regosol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
CY3	Orthic Regosol	rapid	Orthic Dystric Brunisol	rapid	Less common soil is weakly podzolized due to greater stability of the soil.
CY5	Orthic Regosol	rapid	Orthic Regosol: lithic phase	rapid	Less common soil is between 50 and 100 cm thick over bedrock.
CY7	Orthic Regosol	rapid	Orthic Humo-Ferric Podzol	rapid	Less common soil has a strong brown to reddish brown podzolized solum.
CY8	Orthic Regosol	rapid	Orthic Ferro-Humic Podzol	rapid	Less common soil has a dark reddish brown to dark brown strongly podzolized solum.

COOMBS Soil Association - CO

Coombs soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone on low elevation valley sides of the Vancouver Island Ranges. They have developed in deep, rubbly sandy colluvial deposits derived from intrusive bedrock, and are greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from sea level to 700 m.

Coombs soils are well drained. Cobbly, gravelly loamy sand or cobbly, gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, gravelly sand. The coarse fragment content is usually between 50 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are yellowish-brown to light yellowish brown and strongly to medium acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CO1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CO2	Orthic Humo-Ferric Podzol	well	Orthic Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
CO3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well to mod. well	Less common soil has a dark brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.

COTTAM Soil Association - CE

Cottam soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone on low elevation valley sides of the Vancouver Island Ranges. They have developed in deep, rubbly sandy colluvial deposits, mainly derived from extrusive bedrock, and greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from sea level to 700 m.

Cottam soils are well drained. Gravelly sandy loam to cobbly, very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sandy loam. The coarse fragment content is usually between 50 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are strong brown to yellowish-red and strongly to medium acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CE1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CE2	Orthic Humo-Ferric Podzol	well	Orthic Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.

COTTER Soil Association - CR

Cotter soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone at the lower elevations within the Vancouver Island Mountains physiographic subdivision. They have developed in deep, sandy bouldery colluvial deposits, derived mainly from intrusive bedrock, and are greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from sea level to 600 m.

Cotter soils are well drained. Gravelly sandy loam to very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, loamy sand to bouldery sand. The coarse fragment content is usually between 40 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are dark brown to strong brown, and very strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 15 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CR1	Orthic Ferro-Humic Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CR2	Orthic Ferro-Humic Podzol	well	Orthic Humo-Ferric Podzol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Carwithen soil association.
CR3	Orthic Ferro-Humic Podzol	mod. well	Gleyed Ferro-Humic Podzol	imperfect	Less common soil has a very dark brown to black, strongly podzolized, mottled solum. It occurs in edaphically wetter (seepage) locations.
CR8	Orthic Ferro-Humic Podzol	well	Orthic Regosol	rapid	Less common soil occurs on very steep, unstable slopes. It is equivalent to the most common soil in Clayoquot soil association.

COUNCIL Soil Association - CL

Council soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy rubbly colluvial deposits, derived mainly from intrusive bedrock, and greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from sea level to 1100 m.

Council soils are well drained. Cobbly, gravelly loamy sand to cobbly, very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sand. The coarse fragment content is usually between 50 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are strong brown to reddish-yellow, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 5 and 10 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CL1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CL3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	-	Less common soil has a reddish-brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.

COWICHAN Soil Association - C

Cowichan soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland and Alberni Basin physiographic subdivisions. They have developed in deep, silty and/or clayey marine deposits that occupy depressional areas. Slopes are normally level to gently sloping. Elevations range from sea level to about 150 m.

Cowichan soils are poorly drained. Silty clay loam or silt loam are the usual surface textures; these change to silty clay or silty clay loam at depth. Cowichan soils are generally free of coarse fragments with the exception of occasional stone-sized fragments. Cowichan soils have a black organic matter-enriched surface horizon, underlain by strongly gleyed, greenish-gray horizons sometimes enriched with eluviated clay. The solum is less than 100 cm thick, and medium acid. A high, perched water table (often at the surface) typically occurs during the wet season. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 10 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humic Gleysol or Humic Luvic Gleysol.

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
C1	Orthic Humic Gleysol (Humic Luvic Gleysol)	poor	-	-	Consists dominantly of the usual or most common soil as described above.
C4	Orthic Humic Gleysol (Humic Luvic Gleysol)	poor	Gleyed Regosol	imperfect	Less common soil has either no or only weak soil development.

Plate 17. Typical level to depressional landscape of the Cowichan Soil Soil Association.

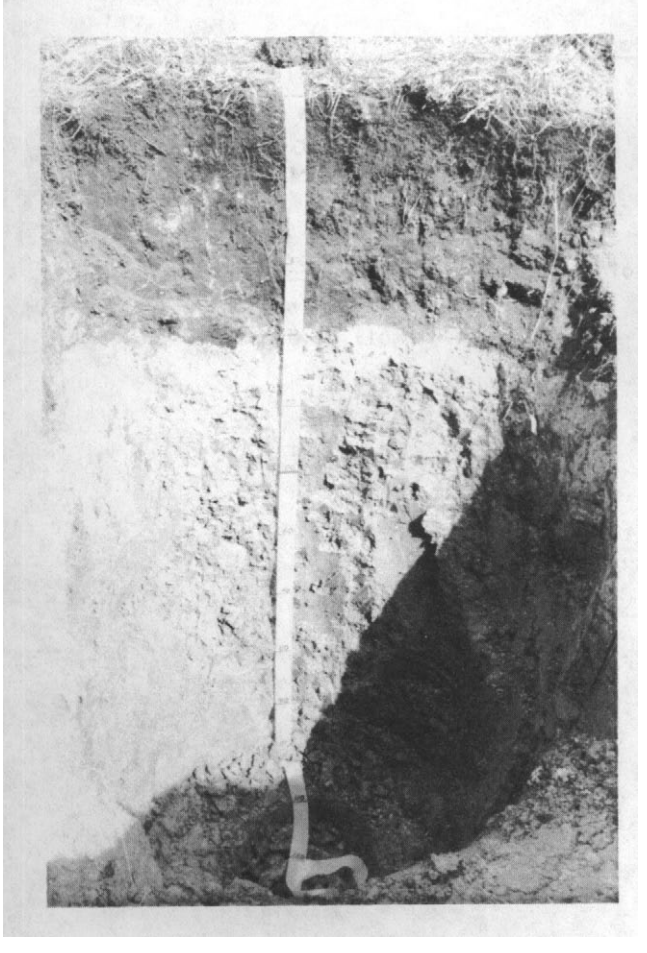


Plate 18. Typical Orthic Humic Gleysol profile of the Cowichan Soil Association.

CRESPI Soil Association - CI

Crespi soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy rubbly colluvial deposits, derived mainly from extrusive bedrock, and greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from 600 to 1100 m.

Crespi soils are well drained. Cobbly, gravelly sandy loam to cobbly, very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sand. The coarse fragment content is usually between 50 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are dark brown to dark reddish brown, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 10 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CI1	Orthic Ferro-Humic Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CI2	Orthic Ferro-Humic Podzol	well	Orthic Humo-Ferric Podzol	well	Less common soil has a podzolized, strong brown to yellowish red solum due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Kildonan soil association.
CI3	Orthic Ferro-Humic Podzol	well	Gleyed Ferro-Humic Podzol	imperfect	Less common soil has a dark reddish brown to black, strongly podzolized, mottled solum due to its occurrence in climatically and/or edaphically wetter (seepage) locations.
CI8	Orthic Ferro-Humic Podzol	well	Orthic Regosol	rapid	Less common soil occurs on steep, unstable slopes. It is equivalent to the most common soil in the Clayoquat soil association.

CROFTHILL Soil Association - CF

Crofthill soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in deep, silty, fluvial deposits that occupy the low elevations along streams and rivers. Crofthill soils have high water tables and are subject to varying degrees of flooding. Slopes are normally level to very gently sloping. Elevations range from sea level to about 300 m.

Crofthill soils are poorly drained. Silty clay loam or silt loam are the usual surface textures; these change to silt loam or fine sandy loam at depth. Crofthill soils are generally free of coarse fragments. Crofthill soils have a very dark brown organic matter-enriched surface horizon which is underlain by grayish-brown, strongly mottled horizon. The solum is usually less than 90 cm in thickness, and medium acid. The subsoil is moderately pervious. Relatively unweathered parent material occurs within 90 cm of the soil surface. A mull layer between 10 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humic Gleysol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CF1	Orthic Humic Gleysol	poor	-	-	Consists dominantly of the usual or most common soil as described above.
CF4	Orthic Humic Gleysol	poor	Gleyed Regosol	imperfect	Less common soil occurs on slightly higher levees. Soil development is very weak.
CF9	Orthic Humic Gleysol: saline phase	poor	Gleyed Regosol: saline phase	imperfect	Similar to soil component CF4 but is also saline. Generally occurs in estuary locations.

CULLITE Soil Association - CT

Cullite soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy rubbly colluvial deposits, derived mainly from extrusive bedrock, and greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from sea level to 1100 m.

Cullite soils are well drained. Cobbly, gravelly sandy loam to cobbly, gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly loamy sand. The coarse fragment content is usually between 50 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are yellowish-red to strong brown, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 5 and 10 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
CT1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
CT2	Orthic Humo-Ferric Podzol	well	Orthic Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
CT3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well	Less common soil has a reddish-brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.

DASHWOOD Soil Association - D

Dashwood soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and to a minor extent in the Alberni Basin physiographic subdivisions. They have developed in shallow, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Normally less than 1 m thick and underlain by compact sandy gravelly moralnal deposits. Slopes are usually less than 20%; elevations range from sea level to about 200 m.

Dashwood soils are well drained. Very gravelly loamy sand to gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is generally at least 40% and usually exceeds 50% by volume. The podzolized surface and subsurface horizons are usually less than 75 cm in thickness; are strong brown to brown, and medium to strongly acid. A strongly cemented duric layer is generally present at depths between 75 and 100 cm (in the upper part of the moralnal material); relatively unweathered parent material is encountered at depths between 100 and 120 cm. A mor or moder layer between 1 and 4 cm thick is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
D1	Duric Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
D2	Duric Humo-Ferric Podzol	well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
D4	Duric Humo-Ferric Podzol	well	Orstein Humo-Ferric Podzol	well	Less common soil contains orstein cementing in the upper B horizons.
D7	Orthic Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol	well	Soils without strongly cemented layers form a major part of the soil component.

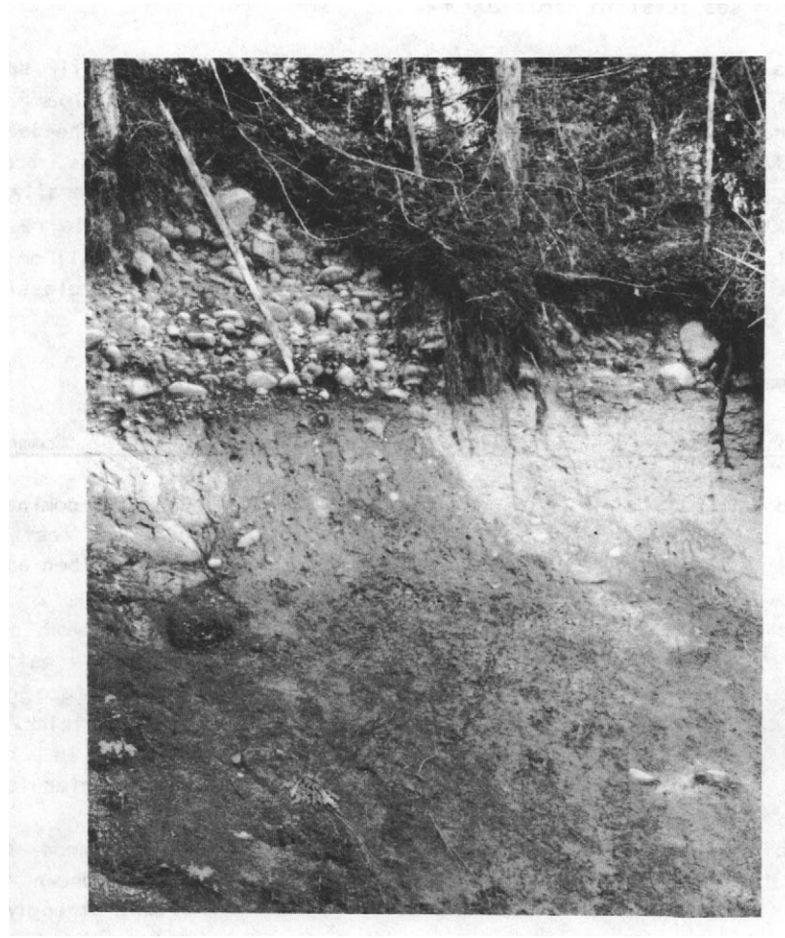


Plate 19. Shallow, sandy gravelly fluvial deposits overlying moraine (till) typifes the parent material of Dashwood and Dashwood Creek Soil Associations.

DASHWOOD CREEK Soil Association - DD

Dashwood Creek soils are common throughout the Coastal Grand Fir - Western Red Cedar Forest Zone and they occur mainly in the Nanaimo Lowland physiographic subdivision. They have developed in shallow, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Normally less than 1 m thick and underlain by compact sandy gravelly morainal deposits. Slopes are usually less than 20%; elevations range from sea level to about 200 m.

Dashwood Creek soils are well drained. Very gravelly loamy sand to gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is generally at least 40% and usually exceeds 50% by volume. The weakly podzolized surface and subsurface horizons are usually less than 75 cm in thickness, brown to dark brown, and medium acid. A strongly to moderately cemented duric layer is generally present at depths between 75 and 100 cm (in the upper part of the morainal deposit), while relatively unweathered parent material is encountered at depths between 100 and 120 cm. A mull or moder layer between 2 and 8 cm thick is present on the soil surface. The usual taxonomic classification is Duric Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
DD1	Duric Dystric Brunisol	well	-	-	Consists dominantly of the usual or most common soil as described above.
DD2	Duric Dystric Brunisol	well	Duric Sombric Brunisol	well	Less common soil has an organic matter-enriched (Ah) surface greater than 10 cm thick. Usually occurs in climatically and/or drier locations.
DD3	Duric Dystric Brunisol	well	Duric Humo-Ferric Podzol	well	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.

EFFINGHAM Soil Association - EH

Effingham soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland and Alberni Basin physiographic subdivisions, and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, silty fluvial deposits located on terraces along streams and rivers. Effingham soils are subject to varying degrees of flooding. Slopes are normally level to gently sloping while elevations range from sea level to about 1100 m.

Effingham soils are moderately well to well drained. Loam or silt loam are the usual surface textures; these change to fine sandy loam at depth. Effingham soils are generally free of coarse fragments, although minor gravelly areas may occur. The weakly podzolized, dark yellowish brown to olive brown solum is usually less than 100 cm thick, and medium to strongly acid. Compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull or moder layer between 1 and 15 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
EH1	Orthic Dystric Brunisol	mod. well to well	-	-	Consists dominantly of the usual or most common soil as described above.
EH4	Orthic Dystric Brunisol	mod. well to well	Orthic Regosol	well	Less commmon soil occurs on recently deposited material. Soil development is very weak.
EH7	Gleyed Regosol	imperfect	Orthic Regosol and/or Rego Gleysol	well poor	Most common soil is imperfectly drained and occurs on recently deposited parent material. Less common soils are rapidly and/or poorly drained.
EH9	Gleyed Regosol: saline phase	imperfect	Orthic Regosol: saline phase; and/or Rego Gleysol: saline phase	well poor	Soils are similar to component EH7 but are also saline. These soils occur in estuary locations.

ERRINGTON Soil Association - EA

Errington soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone, mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial deposits such as gravel bars, recent fans and low terraces (floodplains) along streams and rivers. Errington soils are subject to flooding. Slopes are usually less than 5%; elevations range from sea level to about 1100 m.

Errington soils are rapidly drained. Very gravelly loamy sand to very gravelly sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The weakly podzolized surface and subsurface horizons are usually less than 60 cm in thickness, light yellowish brown to pale-brown, and medium acid. Relatively unweathered parent material is encountered at depths between 50 and 100 cm. A mull layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
EA1	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
EA4	Orthic Dystric Brunisol	rapid	Orthic Regosol	rapid	Less common soil occurs on recently deposited material.
EA7	Gleyed Regosol	imperfect	Orthic Regosol and/or Rego Gleysol	rapid poor	Most common soil is mottled. Less common soils are rapidly and/or poorly drained (all occur on recently deposited parent materials).

ESPINOSA Soil Association - EI

Espinosa soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Vancouver Island Ranges physiographic subdivision and have developed in deep, sandy gravelly fluvial or fluvioglacial deposits. Slopes are usually less than 10%; elevations range from approximately 550 to 1100 m.

Espinosa soils are moderately well drained. Very gravelly loamy sand or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly loamy sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The strongly podzolized surface and subsurface horizons are usually between 50 and 100 cm in thickness, are strong brown to reddish-brown, and strongly to very strongly acid. A strongly cemented duric layer is generally present at depths between 80 and 140 cm while relatively unweathered parent material is encountered at depths below 140 cm. A humimor layer between 10 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
EI1	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
EI2	Duric Humo-Ferric Podzol	mod. well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
EI3	Duric Humo-Ferric Podzol	mod. well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Hepatzi soil association.
EI4	Duric Humo-Ferric Podzol	mod. well	Orthic Humo-Ferric Podzol	well to rapid	Less common soil lacks a strongly cemented (duric) horizon.
EI5	Duric Humo-Ferric Podzol	mod. well	Duric Humo-Ferric Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

ESPINOSA Soil Association - E1 (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		
	Classification	Drainage	Classification	Drainage	Comments
E17	Orthic Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol	mod. well	Most common soil lacks a strongly cemented (duric) horizon.
E18	Orthic Humo-Ferric Podzol	well	Orthic Regosol	rapid	Strongly cemented horizons are not present. Less common soil is very weakly developed are usually occurs on recently deposited gravel bars and fans.

FAIRBRIDGE Soil Association - F

Fairbridge soils occur in the coast Douglas-fir subzone of the Coastal Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in deep, silty and/or clayey marine deposits that occupy areas of gentle relief. Slopes are normally level to gently sloping although minor gullied areas with slopes to 70% also occur. Elevations range from sea level to about 150 m.

Fairbridge soils are imperfectly to moderately well drained. Silt loam is the usual surface texture, changing to silty clay loam at depth. Fairbridge soils are generally free of coarse fragments with the exception of an occasional stone. The upper horizons contain abundant spherical concretions. The strong brown to light yellowish brown solum is usually less than 80 cm in thickness, and strongly to medium acid. Fairbridge soils normally have a perched water table during the winter months as evidenced by prominent mottling below 50 cm. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 2 and 8 cm thick is present on the soil surface. The usual taxonomic classification is Gleyed Eluviated Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
F1	Gleyed Eluviated Dystric Brunisol	Imperfect	-	-	Consists dominantly of the usual or most common soil as described above.
F2	Gleyed Eluviated Dystric Brunisol	Imperfect	Gleyed Eluviated Sombric Brunisol	Imperfect	Less common soil has an organic matter-enriched (Ah) surface horizon greater than 10 cm thick.
F3	Gleyed Eluviated Dystric Brunisol	Imperfect	Gleyed Luvisolic Humo-Ferric Podzol	Imperfect	Less common soil has a strong brown to reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. A clay accumulation horizon (Bt) is also present below depths of 50 cm.

FINLAYSON Soil Association - FF

Finlayson soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in deep, silty and/or clayey marine deposits that occupy areas of gentle relief. Slopes are normally level to gently sloping although minor gullied areas with slopes to 70% also occur. Elevations range from sea level to about 100 m.

Finlayson soils are imperfectly to moderately well drained. Silt loam is the usual surface texture changing to silty clay loam at depth. Finlayson soils are generally free of coarse fragments with the exception of an occasional stone. The upper horizons contain abundant spherical concretions. The strong brown to light yellowish brown solum is usually less than 80 cm in thickness, and strongly to medium acid. Finlayson soils normally have a perched water table during the winter months as evidenced by prominent mottling below 50 cm. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 2 and 8 cm thick is present on the soil surface. The usual taxonomic classification is Gleyed Eluviated Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
FF1	Gleyed Eluviated Dystric Brunisol	Imperfect	-	-	Consists dominantly of the usual or most common soil as described above.
FF2	Gleyed Eluviated Dystric Brunisol	Imperfect	Gleyed Eluviated Sombric Brunisol	Imperfect	Less common soil has an organic matter-enriched (Ah) horizon greater than 10 cm thick.

FLEETWOOD Soil Association - Fl

Fleetwood soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the mid to upper elevations with the Vancouver Island Ranges physiographic subdivision and have developed in deep, gravelly fine morainal (till) deposits associated with extrusive and/or fine grained sedimentary bedrock areas. Slopes vary between 5 and 50%; elevations range from 600 to 1100 m.

Fleetwood soils are moderately well to imperfectly drained. Gravelly loam to cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly clay loam or gravelly loam. The coarse fragment content is usually between 30 and 50%; cobbles and stones are common. The strongly podzolized surface and subsurface horizons are usually less than 80 cm in thickness, yellowish-red to strong brown, and strongly acid. A moderate to strongly cemented layer is present at depths between 60 and 90 cm; relatively unweathered compact parent material is encountered at depths between 90 and 120 cm. A humimor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
F11	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
F13	Duric Humo-Ferric Podzol	mod. well	Duric Ferro-Humic Podzol	imperfect	Less common soil has a strong brown to reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
F14	Duric Humo-Ferric Podzol	mod. well	Orthic Humo-Ferric Podzol	mod. well	Cemented (duric) horizons are absent in the less common soil.
F17	Orthic Humo-Ferric Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Cemented (duric) horizons are absent in the most common soil.

GENOA BAY Soil Association - GA

Genoa Bay soils are common throughout the Coastal Grand Fir - Western Red Cedar Forest Zone and occur mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, sandy gravelly fluvial deposits on gravel bars, recent fans, and low lying terraces along creeks and rivers. Genoa Bay soils are subject to varying degrees of flooding. Slopes are usually less than 5%; elevations range from sea level to about 300 m.

Genoa Bay soils are rapidly drained. Gravelly loamy sand to very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. Surface and subsurface horizons are usually less than 60 cm in thickness, light yellowish brown to pale brown, and medium acid. Relatively unweathered parent material is encountered at depths between 60 and 100 cm. A mull layer between 2 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GA1	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
GA4	Orthic Dystric Brunisol	rapid	Orthic Regosol	rapid	Less common soil is very weakly developed, normally occuring on very recent fluvial deposits.
GA9	Gleyed Regosol: saline phase	imperfect	Orthic Regosol: saline phase; and/or Rego Gleysol: saline phase	rapid poor	The most common soil is mottled. Rapidly drained and/or poorly drained inclusions also occur. All are saline due to their estuarine locations and have developed in very recently deposited material.

GOLDSTREAM Soil Association - GL

Goldstream soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and in low elevation areas within the Vancouver Island Ranges. They have developed in deep, sandy gravelly morainal (till) deposits which are associated with intrusive bedrock areas. Slopes vary between 10 and 50%; elevations range from sea level to 600 m.

Goldstream soils are moderately well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly loamy sand. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 150 cm in thickness, dark reddish brown to very dark brown, and strongly acid. A strongly cemented, often indurated, layer (duric) is present at depths between 80 and 150 cm; relatively unweathered, compact parent material is encountered at depths below 150 cm. A mor layer between 20 and 40 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GL1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
GL2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Grierson soil association.
GL3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol	imperfect	Less common soil occurs in edaphically wetter (seepage) locations.
GL5	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: shallow lithic phase		Less common soil is between 50 and 100 cm thick over bedrock.

GRANITE Soil Association - GT

Granite soils are common throughout the western hemlock subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland physiographic subdivision and to a lesser extent within the Vancouver Island Ranges. They have developed in deep, sandy gravelly morainal (till) deposits associated with intrusive bedrock areas. Slopes vary between 5 and 70%; elevations range from sea level to 1100 m.

Granite soils are well drained. Gravelly loamy sand or very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of gravelly loamy sand or gravelly sand loam. The coarse fragment content is usually between 35 and 65%; cobbles, stones, and boulders are common. The podzolized surface and subsurface horizons are usually less than 100 cm in thickness, brown to dark brown, and strongly acid. A strongly cemented to indurated layer (duric) is present at depths between 80 and 120 cm; relatively unweathered, very compact parent material is encountered at depths between 120 and 150 m. A mor layer between 5 and 10 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GT1	Duric Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
GT2	Duric Humo-Ferric Podzol	well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
GT3	Duric Humo-Ferric Podzol	well	Duric Ferro-Humic Podzol	well	Less common soil has a reddish brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
GT4	Duric Humo-Ferric Podzol	well	Orthic Humo-Ferric Podzol	well	Cemented (duric) horizons are either absent or only weakly cemented in the less common soil.
GT5	Duric Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

GREEN MOUNTAIN Soil Association - GN

Green Mountain soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone at the upper elevations within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy gravelly morainal (till) deposits associated with intrusive bedrock areas. Slopes vary between 10 and 50%; elevations range from 900 to 2100 m.

Green Mountain soils are moderately well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils also consist of gravelly loamy sand or gravelly sandy loam. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, yellowish-red to strong brown, and strongly acid. A strongly cemented, often indurated layer is present at depths between 60 and 100 cm; relatively unweathered, very compact parent material is encountered at depths between 100 and 150 m. A mor layer between 10 and 15 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GN1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
GN3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol	imperfect	Less common soil occurs in edaphically wetter (seepage) locations.
GN5	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: shallow lithic phase	mod. well	Less common soil is between 50 and 100 cm thick over bedrock.

GRIERSON Soil Association - GR

Grierson soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and low elevation areas within the Vancouver Island Ranges. They have developed in deep, sandy gravelly morainal (till) deposits associated with intrusive bedrock areas. Slopes vary between 10 and 50%; elevations range from sea level to 600 m.

Grierson soils are moderately well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly loamy sand or gravelly sandy loam. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 120 cm in thickness, brown to strong brown, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 110 cm; relatively unweathered, very compact parent material is encountered at depths between 120 and 150 cm. A mor layer between 15 and 30 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GR1	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
GR3	Duric Humo-Ferric Podzol	mod. well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a dark reddish brown to very dark brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Goldstream soil association.

GRILSE Soil Association - GI

Grilse soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone mainly at the mid-to-upper elevations within the Vancouver Island Ranges. They have developed in deep, sandy gravelly moralnal (till) deposits associated with intrusive bedrock. Slopes vary between 10 and 50%; elevations range from 550 to 1100 m.

Grilse soils are moderately well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly loamy sand. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark reddish brown to dark brown, and strongly acid. A strongly cemented, often indurated, layer is present at depths between 80 and 140 cm; relatively unweathered, very compact parent material is encountered at depths below 150 cm. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GI1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
GI2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Less common soil has a brown to strong brown, podzolized solum due to its occurrence in climatically and/or edaphically drier locations.
GI3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol	imperfect	Less common soil has a dark reddish brown to black, strongly podzolized solum due to its occurrence in edaphically wetter (seepage) locations.
GI4	Duric Ferro-Humic Podzol	mod. well	Orthic Ferro-Humic Podzol	mod. well	Strongly cemented are absent in the less common soil.
GI5	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: shallow lithic phase	mod. well	Less common soil is between 50 and 100 cm thick over bedrock.

GUEMES Soil Association - GS

Guemes soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They are located in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and at the lower elevations within the Vancouver Island Ranges. Guemes soils have developed in deep, sandy gravelly morainal (till) deposits associated with intrusive bedrock. Slopes vary between 5 and 50%; elevations range from sea level to 700 m.

Guemes soils are well drained. Gravelly loamy sand or very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of gravelly loamy sand or gravelly sandy loam. The coarse fragment content is usually between 35 and 65%; cobbles, stones, and boulders are common. The podzolized surface and subsurface horizons are usually less than 90 cm in thickness, brown to strong brown, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 110 cm; relatively unweathered, very compact parent material is encountered at depths between 120 and 150 m. A mor layer between 2 and 8 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
GS1	Duric Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
GS2	Duric Humo-Ferric Podzol	well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Shawnigan soil association.

HANKIN Soil Association - HK

Hankin soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Estevan Coastal Plain physiographic subdivision. They have developed in cobbly, gravelly fine and/or gravelly sandy colluvial or morainal deposits, less than 1 m thick, overlying argillite bedrock. Slopes vary between 1 and 30%; elevations range from sea level to 600 m.

Hankin soils are well drained. Gravelly loam or gravelly silt loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 40 and 60%. The surface and subsurface horizons are strong brown to dark brown, and very strongly to extremely acid. Argillaceous bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 15 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HK1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
HK5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
HK6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and/or Typic Folisol	well well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm thick over bedrock, and folisolic (organic matter over bedrock) soils also occur.
HK7	Orthic Ferro-Humic Podzol: shallow lithic phase		Orthic Ferro-Humic Podzol: very shallow lithic phase and/or Typic Folisol	well well	Less common soil is between 10 and 50 cm thick over bedrock and/or consists of >10 cm of organic material over bedrock.

HASLAM Soil Association - H

Haslam soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone, mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, gravelly fine morainal (till) deposits, which are normally underlain by fractured shale and siltstone. Slopes vary between 0 and 30%; elevations range from sea level to 300 m.

Haslam soils are well drained. Gravelly sandy loam or gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly loam. The coarse fragment content is usually between 10 and 30%; occasional cobbles, stones, and boulders occur. The weakly podzolized surface and subsurface horizons are usually less than 80 cm in thickness, dark yellowish brown to yellowish-brown, and medium acid. Relatively unweathered parent material is encountered at depths between 80 and 100 cm. A mull layer between 1 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
H1	Orthic Dystric Brunisol	well	-	-	Consists dominantly of the usual or most common soil as described above.
H2	Orthic Dystric Brunisol	well	Orthic Sombric Brunisol	well	Less common soil has a surface mull (Ah) horizon greater than 10 cm thick.
H5	Orthic Dystric Brunisol	well	Orthic Dystric Brunisol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

HATZITE Soil Association - HT

Hatzite soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in gravelly fine colluvial or morainal deposits, less than 1 m thick, overlying schist bedrock. Slopes vary between 10 and 100%; elevations range from sea level to 600 m.

Hatzite soils are well drained. Gravelly loam is the usual texture in both the upper horizons and subsoil. The coarse fragment content is usually between 10 and 30%. The surface and subsurface horizons are dark brown to very dark brown, moderately pervious, and strongly to very strongly acid. Shist bedrock is normally encountered between 50 and 100 cm from the surface. A mor layer between 15 and 30 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HT1	Orthic Humo-Ferric Podzol-shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
HT2	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Dystric Brunisol: shallow lithic phase	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
HT3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Less common soil has a dark reddish brown to very dark gray, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
HT4	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Regosol: shallow lithic phase	well	Less common soil is very weakly developed and occurs in unstable areas.
HT5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

HATZITE Soil Association - HA (Continued)

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
HT6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

HAWARTH Soil Association - HA

Hawarth soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 700 m.

Hawarth soils are rapidly drained. Very gravelly to gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The podzolized surface and subsurface horizons are usually less than 60 cm in thickness, reddish-brown to strong brown, and strongly acid. A strongly cemented duric layer is generally present at depths between 50 and 90 cm; relatively unweathered parent material is encountered at depths between 1.5 and 2 m. A mor layer between 2 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HA1	Duric Humo-Ferric Podzol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
HA2	Duric Humo-Ferric Podzol	rapid	Duric Dystric Brunisol	rapid	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Qualicum soil association.
HA4	Duric Humo-Ferric Podzol	rapid	Orstein Humo-Ferric Podzol	rapid	Less common soil contains a podzolized, reddish-brown cemented layer in the upper solum.
HA5	Duric Humo-Ferric Podzol	rapid	Duric Humo-Ferric Podzol: shallow lithic phase	rapid	Less common soil is between 50 and 100 cm thick over bedrock.
HA7	Orthic Humo-Ferric Podzol	rapid	Orstein Humo-Ferric Podzol	rapid	Soils without strongly cemented horizons are most common.

HAWARTH Soil Association - HA (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
HA8	Orthic Humo-Ferric Podzol	rapid	Orthic Regosol	rapid	Strongly cemented horzions are not present. Less common soil is very weakly developed and usually occurs on recently deposited alluvium.

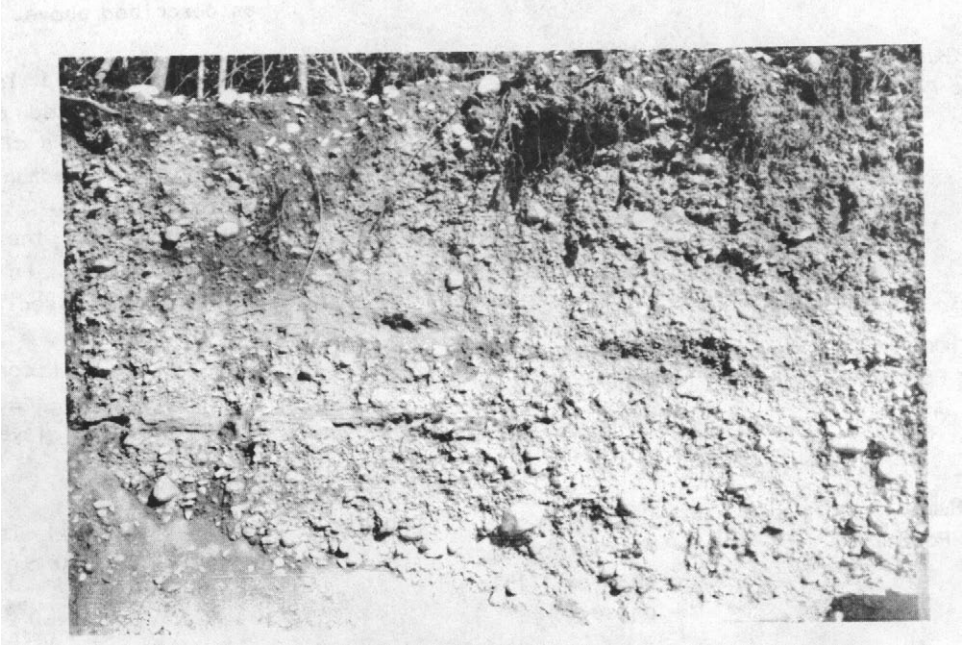


Plate 20. Hawarth, Honeymoon and Qualicum are common soil associations developed on deep, coarse textured fluvial, fluvioglacial or marine deposits.

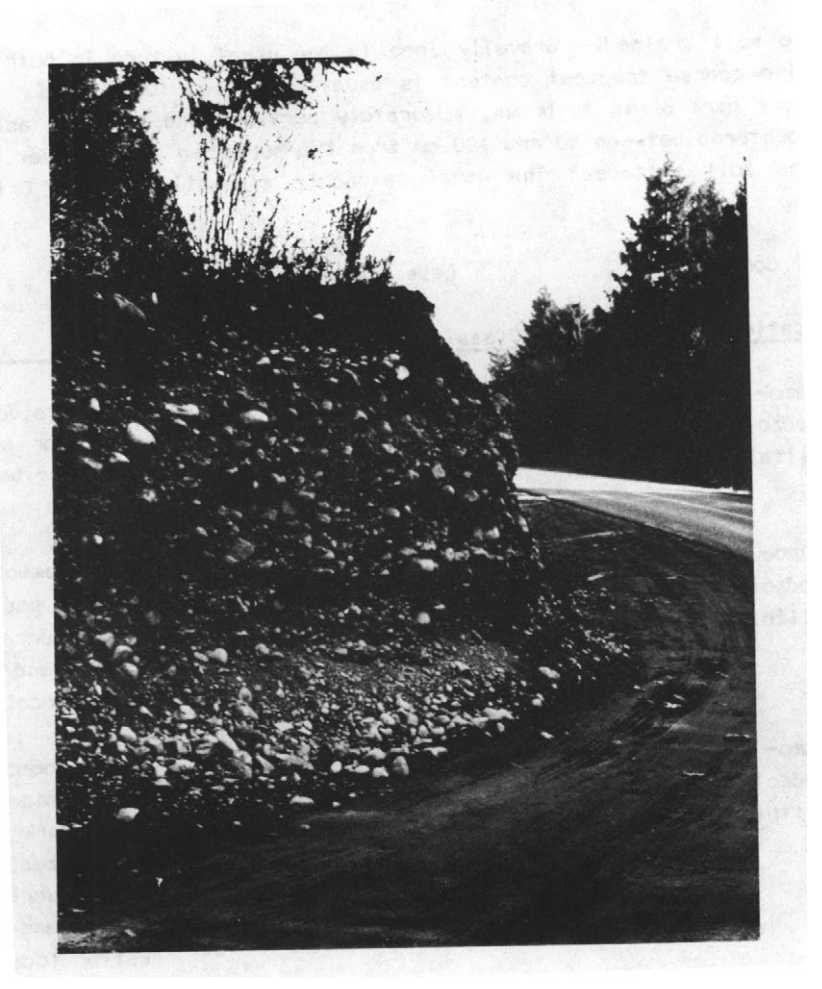


Plate 21. Moderate to strong cementation is common in sandy gravelly, well to rapidly drained fluvial deposits.

HEALEY Soil Association - HE

Healey soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in gravelly fine colluvial or moralnal deposits, less than 1 m thick, overlying schist bedrock. Slopes vary between 10 and 100%; elevations range from sea level to 1100 m.

Healey soils are well drained. Gravelly loam is the usual texture in both the upper horizons and subsoil. The coarse fragment content is usually between 10 and 35%. The surface and subsurface horizons are dark brown to brown, moderately pervious and strongly acid. Schist bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HE1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
HE2	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Dystric Brunisol: shallow lithic phase	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
HE3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Less common soil has a dark reddish brown to very dark gray, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
HE4	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Regosol: shallow lithic phase	well	Less common soil is very weakly developed and usually occurs in unstable areas.
HE5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

HEALEY Soil Association - HE (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
HE6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

HEATHER Soil Association - HH

Heather soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They are located mainly in the Estevan Coastal Plain physiographic subdivision and on the floors of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial deposits such as river bars and active fans. Slopes are usually less than 15%; elevations range from sea level to about 600 m.

Heather soils are well drained. Very gravelly loamy sand or very gravelly sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 50% and usually exceeds 60% by volume. Surface and subsurface horizons are usually very weakly developed and less than 20 cm in thickness, very pale brown, and medium acid. Relatively unweathered parent material is encountered at depths between 0 and 20 cm. Heather soils are rapidly pervious, have intermittent, seasonal water tables, and are subject to frequent flooding. The usual taxonomic classification is Orthic Regosol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
HH1	Orthic Regosol	well	-	-	Consists dominantly of the usual or most common soil as described above.
HH4	Orthic Regosol	well	Orthic Dystric Brunisol	well to rapid	Less common soil is weakly podzolized. It occurs on slightly higher terraces where flooding is less frequent.
HH7	Orthic Regosol	well	Orthic Dystric Brunisol; and/or Orthic Humo-Ferric Podzol	well to rapid	Similar to component HH4 but includes areas of strongly podzolized soils; these occur on high terraces.

HEMMINGSEN Soil Association - HG

Hemmingsen soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in fine gravelly colluvial or morainal deposits, less than 70 cm thick, overlying limestone bedrock. Slopes vary between 10 and 100%; elevations range from sea level to 1100 m.

Hemmingsen soils are rapidly drained. Cobbly, gravelly loam or gravelly loam is the usual texture in the upper horizons; subsoils are also gravelly loam. The coarse fragment content is usually between 30 and 50%. The surface and subsurface horizons are dark reddish brown to dark brown. Reaction grades from moderately acid near the surface to neutral at depth. Limestone bedrock is normally encountered between 30 and 70 cm from the surface. A mor layer between 5 and 10 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HG1	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
HG5	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
HG6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

HEPATZI Soil Association - HI

Hepatzi soils occur in the yellow cedar subzone of the Coastal Western - Pacific Silver Fir Zone, mainly in the Vancouver Island Ranges physiographic subdivision. They occupy valley bottom locations and have developed in deep, sandy gravelly fluvial or fluvioglacial deposits. Slopes are usually less than 10%; elevations range from approximately 550 to 1100 m.

Hepatzi soils are moderately well drained. Very gravelly loamy sand or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The strongly podzolized surface and subsurface horizons are usually between 100 to 125 cm in thickness, dark reddish brown to reddish-brown, and very strongly to strongly acid. A strongly cemented duric layer is generally present at depths between 80 and 140 cm; relatively unweathered parent material is encountered at depths below 140 cm. A humimor layer between 10 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HI1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
HI2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Espinosa soil association.
HI7	Duric Ferro-Humic Podzol	mod. well	Orstein Ferro-Humic Podzol	mod. well	Less common soil contains cemented podzolic surface and subsurface horizons.

HERBERT Soil Association - HB

Herbert soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone, mainly in the southern part of the Vancouver Island Ranges. They have developed in deep, gravelly fine moraInal (till) deposits derived mainly from schist. Slopes vary between 2 and 50%; elevations range from 300 to 1100 m.

Herbert soils are well to moderately well drained. Gravelly loam or gravelly silt loam is the usual texture in the upper horizons; subsoils consist of gravelly loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and occasional boulders also occur. The podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark brown to dark grayish brown, and medium to strongly acid. Relatively unweathered, moderately pervious parent material is encountered at depths between 80 and 120 cm. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HB1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
HB2	Orthic Humo-Ferric Podzol	well	Orthic Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
HB3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well	Less common soil has a dark reddish brown to dark grayish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
HB4	Orthic Humo-Ferric Podzol	well	Orthic Regosol	well	Less common soil is very weakly developed and occurs in unstable areas.

HESQUIAT Soil Association - HQ

Hesquiat soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Estevan Coastal Plain and lower elevations of the Vancouver Island Ranges physiographic subdivisions. They have developed in fine gravelly colluvial or morainal deposits, less than 70 cm thick, overlying limestone bedrock. Slopes vary between 10 and 100%; elevations range from sea level to 600 m.

Hesquiat soils are rapidly drained. Cobbly, gravelly loam or gravelly loam is the usual texture in the upper horizons; the subsoils are similar. The coarse fragment content is usually between 30 and 50%. The surface and subsurface horizons are reddish-brown to strong brown, and medium to slightly acid. Limestone bedrock normally is encountered between 30 and 70 cm from the surface. A mor layer between 10 and 30 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HQ1	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
HQ3	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Ferro-Humic Podzol: shallow lithic phase	rapid	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter (seepage) locations.
HQ5	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Ferro-Humic Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
HQ6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Ferro-Humic Podzol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

HILLER Soil Association - HL

Hiller soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in sandy gravelly colluvial or morainal deposits, less than 1 m thick, overlying sedimentary (sandstone or conglomerate) bedrock. Slopes vary between 5 and 100%; elevations range from sea level to 700 m.

Hiller soils are rapidly drained. Gravelly loamy sand or very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly loamy sand. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are dark brown to brown, rapidly pervious and strongly acid. Sandstone or conglomerate bedrock normally is encountered between 40 and 80 cm from the surface. A mor layer between 1 and 4 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HL1	Orthic Dystric Brunisol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
HL2	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Sombric Brunisol: shallow lithic phase	rapid	Less common soil occurs in climatically and/or edaphically drier locations and has an organic matter-enriched (Ah) surface horizon >10 cm thick.
HL3	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
HL5	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
HL6	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

HOARDER Soil Association - HR

Hoarder soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They are located mainly in the Vancouver Island Ranges, particularly in San Juan River area. They have developed in deep, gravelly fine moraina1 (till) deposits, mainly derived from schist. Slopes vary between 2 and 50%; elevations range from 100 to 600 m.

Hoarder soils are well drained. Gravelly loam is the usual texture in both the upper horizons and subsoil. The total coarse fragment content is usually between 20 and 50% and includes cobbles, stones, and occasional boulders. The podzolized surface and subsurface horizons are usually less than 80 cm in thickness, dark brown to dark grayish brown, and strongly acid. Relatively unweathered, moderately pervious parent material is encountered at depths between 80 and 120 cm. A mor layer between 15 and 30 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HR1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
HR3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well	Less common soil has a dark reddish brown to dark grayish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
HR4	Orthic Humo-Ferric Podzol	well	Orthic Regosol	well	Less common soil is very weakly developed and occurs in unstable areas.

HOLFORD Soil Association - HO

Holford soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They are located mainly in the Estevan Coastal Plain physiographic subdivisions and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 600 m.

Holford soils are well to moderately well drained. Very gravelly loamy sand or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The podzolized surface and subsurface horizons are usually less than 100 cm in thickness, strong brown to reddish-brown, and very strongly acid. A strongly cemented layer is generally present at depths between 60 and 90 cm; relatively unweathered parent material is encountered at depths between 100 and 150 m. A mor layer between 15 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HO1	Duric Humo-Ferric Podzol	well to mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
HO2	Duric Humo-Ferric Podzol	well to mod. well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
HO3	Duric Humo-Ferric Podzol	well to mod. well	Orstein Ferro-Humic Podzol	well to mod. well	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Hooper soil association.
HO4	Duric Humo-Ferric Podzol	well to mod. well	Orthic Humo-Ferric Podzol	well	Strongly cemented (duric) layers are absent in the less common soil.

HOLFORD Soil Association - HO (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
HO5	Duric Humo-Ferric Podzol	well to mod. well	Duric Humo-Ferric Podzol	well	Less common soil is between 50 and 100 cm thick over bedrock.
HO7	Orthic Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol: shallow lithic phase	well to mod. well	Strongly cemented (duric) layers are absent in the most common soil.
HO8	Orthic Humo-Ferric Podzol	well	Orthic Regosol	rapid	Cemented layers (duric) are absent. Less common soil is very weakly developed and occurs on recent fluvial deposits.

HOLYOAK Soil Association - HY

Holyoak soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision and in low elevation areas in the Vancouver Island Ranges. They have developed in gravelly fine colluvial or morainal deposits, or saprolite, less than 1 m thick, overlying fractured shale or siltstone bedrock. Slopes vary between 10 and 70%; elevations range from sea level to 1100 m.

Holyoak soils are well drained. Gravelly loam is the usual texture in the upper horizons; subsoils are also gravelly loam to very gravelly loam. The coarse fragment content is usually between 20 and 50%. The surface and subsurface horizons are dark yellowish brown to brown, moderately pervious and strongly acid. Shale or siltstone bedrock is normally encountered between 50 and 100 cm from the surface. A mor layer between 2 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HY1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
HY2	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Dystric Brunisol: shallow lithic phase	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
HY5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
HY6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

HONEYMOON Soil Association - HM

Honeymoon soils are common throughout the western hemlock subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 1100 m.

Honeymoon soils are rapidly drained. Very gravelly loamy sand or gravelly loamy sand is the usual texture in the upper horizons; subsoils are very gravelly loamy sand as well. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The podzolized surface and subsurface horizons are usually less than 100 cm in thickness, reddish-brown to strong brown, rapidly pervious and strongly acid. A strongly cemented (duric) layer is generally present at depths between 70 and 100 cm; relatively unweathered parent material is encountered at depths between 1.5 and 2 m. A mor layer between 2 and 10 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HM1	Duric Humo-Ferric Podzol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
HM2	Duric Humo-Ferric Podzol	rapid	Duric Dystric Brunisol	rapid	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
HM3	Duric Humo-Ferric Podzol	rapid	Duric Ferro-Humic Podzol	rapid	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
HM4	Duric Humo-Ferric Podzol	rapid	Orthic Humo-Ferric Podzol	rapid	Cemented (duric) layers are absent in the less common soil.
HM5	Duric Humo-Ferric Podzol	rapid	Duric Humo-Ferric Podzol: shallow lithic phase	rapid	Less common soil is between 50 and 100 cm thick over bedrock.

HONEYMOON Soil Association - HM (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
HM7	Orthic Humo-Ferric Podzol	rapid	Duric Humo-Ferric Podzol	rapid	Cemented (duric) layers are absent in the most common soil.
HM8	Orthic Humo-Ferric Podzol	rapid	Orthic Regosol	rapid	Cemented (duric) horizons are absent. Less common soil is very weakly developed and usually occurs on recently deposited alluvium.

HOOPER Soil Association - HP

Hooper soils are common throughout the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 600 m.

Hooper soils are well to moderately well drained. Very gravelly loamy sand or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark reddish brown to dark brown, and strongly acid. Strongly cemented surface and subsurface layers are generally present at depths between 100 and 150 cm; relatively unweathered parent material is encountered at depths below 150 cm. A mor layer between 15 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Orstein Ferro-Humic Podzol.

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
HP1	Orstein Ferro-Humic Podzol	well to mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
HP2	Orstein Ferro-Humic Podzol	well to mod. well	Duric Humo-Ferric Podzol	well to mod. well	Less common soil has a strong brown to brown, less strongly podzolized solum due to its occurrence in climatically and/or edaphically drier locations. Cementation is absent in the upper horizons. It is equivalent to the most common soil in the Holford soil association.
HP3	Orstein Ferro-Humic Podzol	well to mod. well	Gleyed Orstein Ferro-Humic Podzol	imperfect	Less common soil has a dark reddish brown to black, strongly podzolized, mottled solum due to its occurrence in climatically and/or edaphically wetter locations.
HP4	Orstein Ferro-Humic Podzol	well to mod. well	Duric Ferro-Humic Podzol	well to mod. well	Cementing in the upper horizons is absent in the less common soil.

HOOPER Soil Association - HP (Continued)

Soil Assoc. Component	Most Common Soil Classification	Most Common Soil Drainage	Less Common Soil Classification	Less Common Soil Drainage	Comments
HP5	Orstein Ferro-Humic Podzol	well	Orstein Ferro-Humic Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.
HP7	Orthic Ferro-Humic Podzol	well	Orstein Ferro-Humic Podzol	well to mod. well	Strongly cemented layers are absent in the most common soil.
HP8	Orthic Ferro-Humic Podzol	well	Orthic Regosol	rapid	Cemented layers are absent. Less common soil is very weakly developed and occurs on recently deposited alluvium.

HUFFER Soil Association - HF

Huffer soils occur in the Coast Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in gravelly sandy colluvial and/or morainal deposits, less than 70 cm thick, overlying sandstone bedrock. Slopes vary between 2 and 20%; elevations range from sea level to 300 m.

Huffer soils are rapidly drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils are gravelly loamy sand. The coarse fragment content is usually between 20 and 50%. The surface and subsurface horizons are very dark grayish brown to dark yellowish brown, rapidly pervious and medium acid. Sandstone bedrock is normally encountered between 10 and 70 cm from the surface. A mull layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Sombric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
HF5	Orthic Sombric Brunisol: shallow lithic phase	rapid	Orthic Sombric Brunisol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
HF6	Orthic Sombric Brunisol: very shallow lithic phase	rapid	Orthic Sombric Brunisol: shallow lithic phase	rapid	The most common soil is generally between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

KAMMAT Soil Association - KT

Kammat soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy fluvial, fluvioglacial and/or marine deposits. Kammat soils which occur on lowlying fluvial floodplains are subject to varying degrees of flooding and/or water table fluctuation. Slopes are usually less than 5%; elevations range from sea level to about 1000 m.

Kammat soils are rapidly drained and rapidly pervious. Loamy sand and/or sandy loam is the usual texture in the upper horizons; subsoils consist of loamy sand or sand. The coarse fragment content is less than 20%, consisting mainly of fine gravel. The weakly podzolized surface and subsurface horizons are usually less than 70 cm in thickness, dark yellowish brown to brown, and medium to strongly acid. Relatively unweathered parent material is encountered at depths between 80 and 120 cm. A mull layer between 2 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
KT1	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
KT4	Orthic Dystric Brunisol	rapid	Orthic Regosol	rapid	Less common soil is very weakly developed due to active disturbance by shifting stream channels and/or flooding.
KT7	Gleyed Regosol	imperfect	Orthic Regosol and/or Rego Gleysol	rapid poor	Most common soil except for mottling, is very weakly developed due to active disturbance by shifting stream channels and/or flooding. Less common soil sometimes contains excess moisture due to a permanently high water table.

KENNEDY LAKE Soil Association - KL

Kennedy Lake soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Estevan Coastal Plain physiographic subdivision. They have developed in deep, silty and/or clayey marine deposits that occupy significant areas on the flat coastal plain. Slopes are normally level to gently sloping although minor gullied areas with slopes to 70% also occur. Elevations range from sea level to about 100 m.

Kennedy Lake soils are moderately well drained. Silty clay loam or silt loam are the usual surface textures; these change to clay or silty clay loam at depth. Kennedy Lake soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. The upper horizons contain spherical concretions. The podzolized solum is usually less than 80 cm in thickness, and very strongly to extremely acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mor layer between 5 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
KL1	Orthic Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
KL3	Orthic Humo-Ferric Podzol	mod. well	Orthic Ferro-Humic Podzol	mod. well	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
KL5	Orthic Humo-Ferric Podzol	mod. well	Orthic Humo-Ferric Podzol: shallow lithic phase	mod. well	Less common soil is between 50 and 100 cm thick over bedrock.

KILDONAN Soil Association - KI

Kildonan soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in deep, sandy rubbly colluvial deposits, derived mainly from extrusive bedrock, and greater than 1 m thick. Slopes vary between 30 and 100%; elevations range from 700 to 1100 m.

Kildonan soils are well drained. Cobbly, gravelly sandy loam to cobbly, very gravelly sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sand. The coarse fragment content is usually between 50 and 65%. Cobbles, stones, and boulders are common. The surface and subsurface horizons are strong brown to yellowish-red, and strongly acid. These soils are normally deeply weathered; relatively unweathered parent material occurs at depths greater than 150 cm. A mor layer between 10 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
KI1	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
KI2	Orthic Humo-Ferric Podzol	well	Orthic Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
KI3	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well	Less common soil has a dark brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Crespi soil association.
KI8	Orthic Humo-Ferric Podzol	well	Orthic Regosol	rapid	Less common soil occurs on very steep, unstable slopes. It is equivalent to the most common soi in the Clayoquat soil association.

KINKADE Soil Association - KE

Kinkade soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone. They are located mainly in the Nanaimo Lowland physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy fluvial, fluvioglacial and/or marine deposits usually underlain at depth by gravelly deposits. Slopes are usually less than 5%; elevations range from sea level to about 1000 m.

Kinkade soils are rapidly drained and rapidly pervious. Loamy sand and/or sandy loam is the usual texture in the upper horizons; subsoils consist of loamy sand or sand. The coarse fragment content is less than 20%, and consists of fine gravel. The podzolized surface and subsurface horizons are usually less than 70 cm in thickness, yellowish-brown to brown, and strongly acid. Relatively unweathered parent material is encountered at depths between 80 and 120 cm. A mor layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
KE1	Orthic Humo-Ferric Podzol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
KE2	Orthic Humo-Ferric Podzol	rapid	Orthic Dystric Brunisol	rapid	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Kammat soil association.
KE4	Orthic Humo-Ferric Podzol	rapid	Duric Humo-Ferric Podzol	rapid to well	Less common soil contains a cemented (duric) layer at depths between 50 and 100 cm.

KOOTOWIS Soil Association - KO

Kootowis soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Estevan Coastal Plain physiographic subdivision. They have developed in deep, silty and/or clayey marine deposits that occur in areas where lateral drainage is restricted or in seepage areas. Slopes are normally level to gently sloping. Elevations range from sea level to about 100 m.

Kootowis soils are imperfect to poorly drained. Silty clay loam or clay loam are the usual surface textures; these change to clay or silty clay loam at depth. Kootowis soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. The upper horizons contain some spherical concretions. The podzolized solum is usually less than 70 cm in thickness, and very strongly to extremely acid. Dense, compact subsoil layers restrict perviousness to slow. Kootowis soils have distinct or prominent mottles indicative of gleying within 1 m of the surface. Relatively unweathered parent material occurs within 1 m of the soil surface. A humimor layer between 10 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Gleyed Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
KO1	Gleyed Humo-Ferric Podzol	Imperfect	-	-	Consists dominantly of the usual or most common soil as described above.
KO4	Gleyed Humo-Ferric Podzol	Imperfect	Orthic Humo-Ferric Podzol	mod. well	Less common soil occurs in edaphically drier locations. It is equivalent to the Kennedy Lake soil association.
KO7	Gleyed Humo-Ferric Podzol	Imperfect	Fera-Humic Gleysol	poor	Less common soil is gleyed and occurs in edaphically wetter locations. It is equivalent to the Tofino soil association.

KUHUSHAN Soil Association - KA

Kuhushan soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone, mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, sandy fluvial, fluvioglacial and/or marine deposits. Those located on low-lying fluvial floodplains are subject to varying degrees of flooding and have an intermittent fluctuating water table. Slopes are usually less than 5%; elevations range from sea level to about 700 m.

Kuhushan soils are rapidly drained. Sandy loam and/or loamy sand is the usual texture in the upper horizons; subsoils consist of loamy sand or sand. The coarse fragment content is less than 20% and consists of fine gravel. The weakly podzolized surface and subsurface horizons are usually less than 50 cm in thickness, yellowish-brown to brown, rapidly pervious and medium acid. Relatively unweathered parent material is encountered at depths between 80 and 120 cm. A mull layer between 2 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
KA1	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
KA4	Orthic Dystric Brunisol	rapid	Orthic Regosol	rapid	Less common soil is very weakly developed due to active disturbance by shifting stream channels and/or flooding.
KA7	Gleyed Regosol	imperfect	Orthic Regosol and/or Rego Gleysol	rapid poor	All soils are very weakly developed due to active disturbance by shifting stream channels and/or flooding. Most common soil is mottled in the subsoil while some of the less common soil contains excess moisture due to permanently high water tables.

KYE Soil Association - KY

Kye soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone, mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, sandy, fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%, although minor steeply sloping hummocky topography also occurs. Elevations range from sea level to about 200 m.

Kye soils are rapidly drained. Loamy sand is the usual texture in the upper horizons; subsoils consist of loamy sand or sand. The coarse fragment content is less than 15%, all of which is fine gravel. The podzolized surface and subsurface horizons are usually less than 50 cm in thickness, yellowish-brown to brown, and strongly acid. Relatively unweathered parent material is encountered at depths between 80 and 120 cm. A mor layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
KY1	Orthic Humo-Ferric Podzol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
KY2	Orthic Humo-Ferric Podzol	rapid	Orthic Dystric Brunisol	rapid	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Kuhushan soil association.

LANGFORD Soil Association - L

Langford soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone, mainly in the Nanaimo Lowland physiographic subdivision unless they are exclusive to the Victoria - Saanich Peninsula area. They have developed in sandy gravelly fluvial, fluvioglacial and/or marine deposits, normally less than 1 m in thickness and underlain by gravelly sandy moralnal deposits. Slopes are usually less than 15%; elevations range from sea level to about 200 m.

Langford soils are well drained. Gravelly sandy loam or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 20 and 50%. The surface and subsurface horizons are usually less than 80 cm in thickness, dark brown to brown, and medium acid. A cemented duric layer may be present at depths between 50 and 100 cm (in the top of the underlying till) while relatively unweathered parent material is encountered at depths between 100 and 150 cm. A mull layer between 10 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Sombric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
L1	Orthic Sombric Brunisol	well	-	-	Consists dominantly of the usual or most common soil as described above.
L3	Orthic Sombric Brunisol	well	Orthic Dystric Brunisol	well	Less common soil lacks an organic enriched surface (Ah) horizon. It occurs in climatically and/or edaphically wetter locations and is equivalent to the most common soil in the Dashwood Creek soil association.

LEMMENS Soil Association - L1

Lemmens soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in fine gravelly colluvial or morainal deposits, less than 70 cm thick, overlying limestone bedrock. Slopes vary between 10 and 100%; elevations range from 550 to 1100 m.

Lemmens soils are well drained. Gravelly loam is the usual texture in the soil profile. The coarse fragment content is generally between 30 and 50%. The surface and subsurface horizons are dark reddish brown to dark brown, and slightly acid. Limestone bedrock normally is encountered between 30 and 70 cm from the surface. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		
	Classification	Drainage	Classification	Drainage	Comments
L15	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
L16	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

MEMEKAY Soil Association - ME

Memekay soils occur in the western hemlock subzone of the Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision, mainly in the Campbell River -Sayward area. They have developed in deep, silty and/or clayey marine deposits. Slopes are normally level to gently sloping although minor gullied areas with slopes to 70% also occur. Elevations range from sea level to about 200 m.

Memekay soils are moderately well to imperfectly drained. Silt loam or silty clay loam are the usual surface textures; these change to clay loam or silty clay loam at depth. Memekay soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. The upper horizons contain abundant spherical concretions. The podzolized solum is between 50 and 100 cm in thickness, and strongly acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 150 cm of the soil surface. A mor layer between 1 and 4 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
ME1	Orthic Humo-Ferric Podzol	mod. well to imperfect	-	-	Consists dominantly of the usual or most common soil as described above.

MERVILLE Soil Association - M

Merville soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in shallow, silty marine deposits which overlie gravelly fine morainal materials. Slopes are normally gently sloping to nearly level. Elevations range from sea level to about 100 m.

Merville soils are moderately well drained. Silt loam or loam are the usual surface textures; these change to gravelly silty clay loam or gravelly silt loam in the underlying till. Merville soils are generally free of coarse fragments in the upper part, with the exception of occasional stone-sized erratics. The upper horizons contain abundant spherical concretions. The solum is usually less than 100 cm in thickness, and medium acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs below 1 m of the soil surface. A mull layer between 10 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Sombric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
M1	Orthic Sombric Brunisol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
M3	Orthic Sombric Brunisol	mod. well	Orthic Dystric Brunisol	mod. well	Less common soil lacks an organic matter enriched (Ah) surface horizon. It occurs in climatically and/or edaphically wetter locations.

METCHOSIN Soil Association - MT

Although Metchosin soils occur in depressions throughout the Coastal Grand Fir - Western Red Cedar Forest Zone, but are most common in the Nanaimo Lowland physiographic subdivision. They have developed in very strongly to strongly acid, shallow, organic deposits derived from mosses, sedges and other hydrophytic vegetation. Slopes are usually level; elevations range from sea level to approximately 300 m.

Metchosin soils are at a advanced (humic) stage of decomposition. The organic material is predominantly from 40 to 160 cm in depth, although significant areas of deep (>160 cm) organic material also occur. The soils are generally saturated and free water is common at or near the soil surface for most of the year. Metchosin soils are very poorly drained. The usual taxonomic classification is Terric Humisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
MT1	Terric Humisol	very poor	Typic Humisol	very poor	Less common soil consists of deep (>160 cm) organic material.

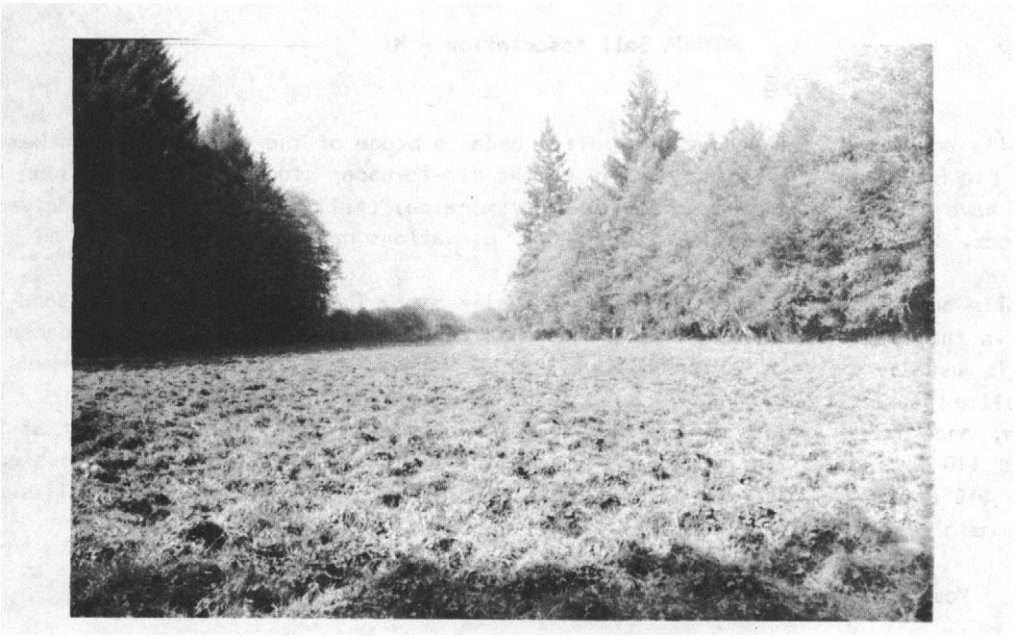


Plate 22. A level to depressional landscape of the Metchosin Soil Association.

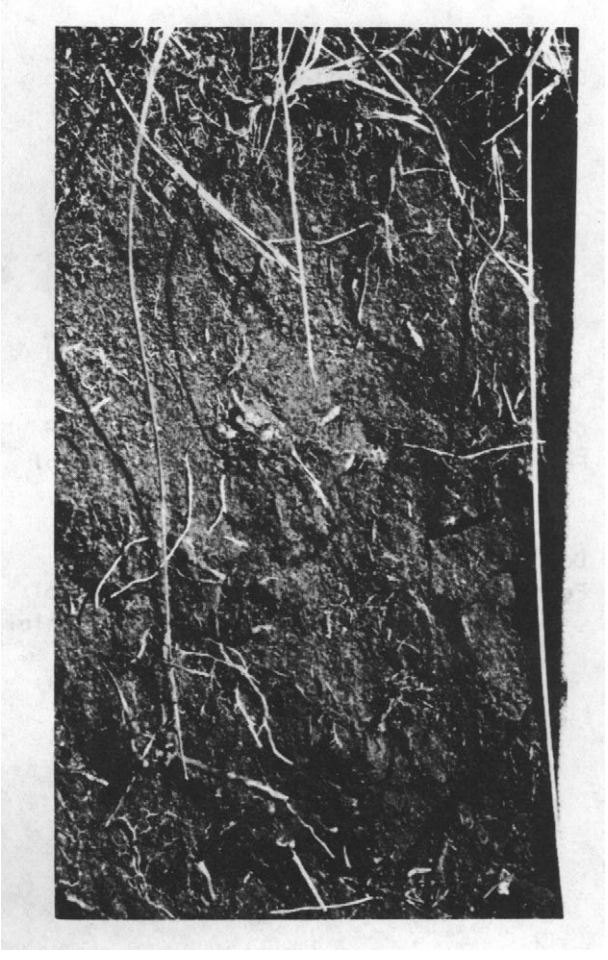


Plate 23. A typical profile of the Metchosin soils.

MOYEHA Soil Association - MI

Moyeha soils are common throughout the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone and occur mainly on the mid-to-upper slopes of the Vancouver Island Rangess. They have developed in deep, gravelly sandy moralnal (till) deposits mainly derived from extrusive bedrock. Slopes vary between 10 and 100%; elevations range from 500 to 1100 m.

Moyeha soils are moderately well drained. Gravelly sandy loam or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm thick, strong brown to brown, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 110 cm; relatively unweathered, very compact parent material is encountered at depths between 110 and 150 cm. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
MI1	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
MI3	Duric Humo-Ferric Podzol	mod. well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a dark reddish brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Quibble soil association.
MI4	Duric Humo-Ferric Podzol	mod. well	Orthic Humo-Ferric Podzol	well	Strongly cemented horizons are absent in the less common soil.
MI5	Duric Humo-Ferric Podzol	mod. well	Duric Humo-Ferric Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

NITINAT Soil Association - NI

Nitinat soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision, predominantly on mid-to-upper steep slopes of these mountain ranges. They have developed in rubbly, sandy gravelly colluvial or morainal deposits, less than 1 m thick, overlying mixed (extrusive and intrusive) bedrock. Slopes vary between 30 and in excess of 100%, elevations range from 500 to 1100 m.

Nitinat soils are well drained. Gravelly sandy loam or cobbly, gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly loamy sand. The coarse fragment content is usually between 45 and 65%. The surface and subsurface horizons are strong brown to dark brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
NI1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
NI3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow and very shallow phases	well	Less common soil has a dark reddish brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Rainer and/or Shirmish soil associations.
NI4	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orstein Humo-Ferric Podzol: shallow lithic and very shallow lithic phases	well	Surface horizons are cemented in the less common soil and minor inclusions of soils are between 10 and 50 cm thick over bedrock.
NI5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

NITINAT Soil Association - NI (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
NI6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is generally between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

NOOTKA Soil Association - NT

Nootka soils are common throughout the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur on the Estevan Coastal Plain physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy fluvial, and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 600 m.

Nootka soils are well drained. Loamy sand or sand is the usual texture in the upper horizons; subsoils consist of sand. The coarse fragment content is generally less than 15% and consists of fine gravel. The strongly podzolized surface and subsurface horizons are usually less than 70 cm in thickness, dark reddish brown to reddish-brown, and strongly to very strongly acid. A strongly cemented layer is generally present at depths between 5 and 50 cm; relatively unweathered parent material is encountered at depths between 70 and 100 cm. A humimor layer between 15 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Orstein Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
NT1	Orstein Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
NT3	Orstein Humo-Ferric Podzol	well	Orstein Ferro-Humic Podzol	well	Less common soil has a dark reddish brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
NT7	Orthic Regosol	rapid	Orthic Dystric Brunisol and/or Orthic Humo-Ferric Podzol	rapid	Most common soil is very weakly developed and usually occurs on recently deposited alluvium. Less common soil occupies slightly higher terraces.

OSHINOW Soil Association - OS

Oshinow soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone, mainly in high elevation valley bottom locations within the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial or fluvioglacial deposits. Slopes are usually less than 10%; elevations range from 900 to about 2000 m.

Oshinow soils are moderately well drained. Very gravelly loamy sand or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 40% and usually exceeds 50% by volume. The very strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark reddish brown to reddish-brown, and very strongly acid. A strongly cemented layer is generally present at depths between 50 and 100 cm; relatively unweathered parent material is encountered at depths between 100 and 150 cm. A mor layer between 10 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
OS1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.

PACHENA Soil Association - P1

Pachena soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone, mainly in the southern part of the Vancouver Island Ranges physiographic subdivision. They have developed in deep, gravelly fine morainal (till) deposits mainly derived from schist. Slopes vary between 2 and 50%; elevations range from 600 to 1100 m.

Pachena soils are well drained. Gravelly loam or gravelly silt loam is the usual texture in the upper horizons; subsoils consist of gravelly loam. The coarse fragment content is usually between 20 and 50% and consists mainly of gravel although cobbles, stones, and occasional boulders also occur. The podzolized surface and subsurface horizons are usually less than 80 cm in thickness, dark brown to dark grayish brown, and strongly acid. Relatively unweathered, moderately pervious parent material is encountered at depths between 80 and 120 cm. A mor layer between 10 and 20 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
P11	Orthic Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
P13	Orthic Humo-Ferric Podzol	well	Orthic Ferro-Humic Podzol	well	Less common soil has a dark reddish brown to dark grayish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
P14	Orthic Humo-Ferric Podzol	well	Orthic Regosol	well	Less common soil is very weakly developed and occurs in unstable areas.

PARKSVILLE Soil Association - PA

Parksville soils occur in the coast Douglas-fir subzone of the Coast Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed shallow sandy deposits overlying deep, silty and/or clayey marine deposits that occupy depressional areas. The sandy veneers are normally between 30 and 70 cm in thickness. Slopes are level to gently sloping. Elevations range from sea level to about 150 m.

Parksville soils are poorly drained. Sandy loam or loamy sand are the usual surface textures; these change to silt loam or silty clay loam at depth. Parksville soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. The black to very dark gray, organic matter enriched surface horizons are usually less than 30 cm in thickness and are underlain by strongly gleyed material. The solum is medium to slightly acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 10 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humic Gleysol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
PA1	Orthic Humic Gleysol	poor	-	-	Consists dominantly of the usual or most common soil as described above.
PA2	Orthic Humic Gleysol	poor	Gleyed Regosol and/or Gleyed Sombric Brunisol	imperfect	Less common soils occur in slightly higher landscape locations with less restricted drainage. Soil development is either weak or restricted to Ah and weak Bm horizons.

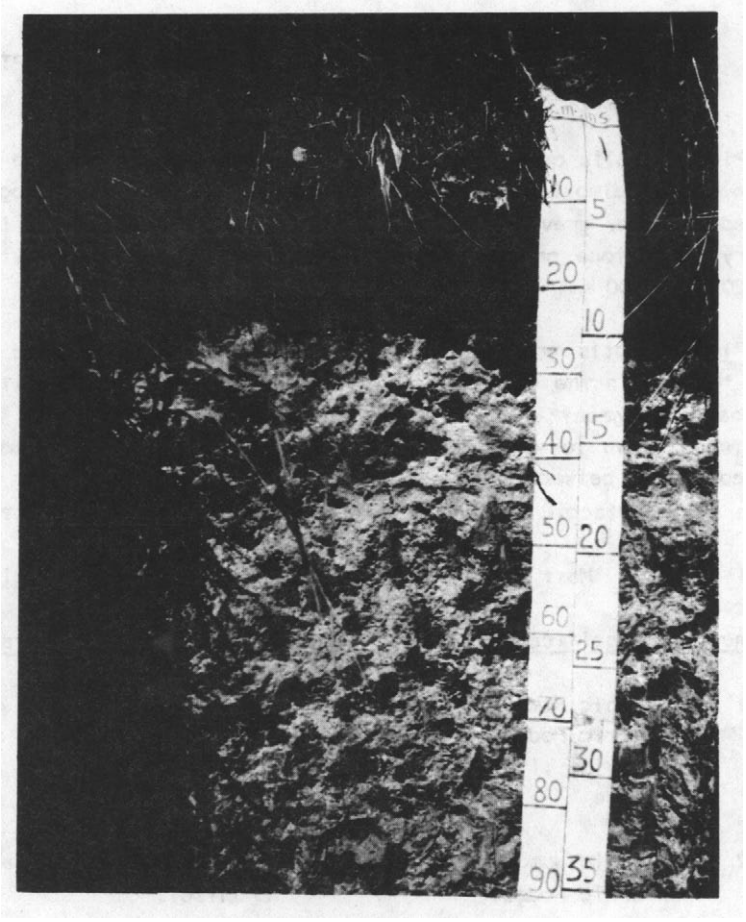


Plate 24. Orthic Humic Gleysol profile typical of Parksville Soil Association.

Plate 25. Very shallow colluvium over sedimentary bedrock on which Piggott and Hiller soils are typically developed.

PIGGOTT Soil Association - PT

Piggott soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland and Vancouver Island Ranges physiographic subdivisions. They have developed in sandy gravelly colluvial and/or morainal deposits, less than 1 m thick, overlying sedimentary (sandstone or conglomerate) bedrock. Slopes vary between 5 and 100%; elevations range from 200 to 1100 m.

Piggott soils are rapidly drained. Gravelly loamy sand or very gravelly loamy sand is the usual texture in the upper horizons; subsoils are very gravelly loamy sand or very gravelly sand. The coarse fragment content is usually between 35 and 60%. The surface and subsurface horizons are strong brown to yellowish-red, and strongly acid. Sandstone or conglomerate bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
PT1	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
PT2	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	Less common soil occurs in climatically and/or edaphically drier locations.
PT5	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
PT6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

QUALICUM Soil Association - Q

Qualicum soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone, and mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, sandy, gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 500 m.

Qualicum soils are rapidly drained. Very gravelly to gravelly loamy sand is the usual texture in the upper horizons; subsoils are very gravelly loamy sand to very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The weakly podzolized surface and subsurface horizons are usually less than 70 cm in thickness, light yellowish brown to yellowish-brown, and strongly acid. A strongly to moderately cemented layer is generally present at depths between 50 and 90 cm; relatively unweathered parent material is encountered at depths between 1.5 and 2 m. A mor layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Duric Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
Q1	Duric Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
Q2	Duric Dystric Brunisol	rapid	Duric Sombric Brunisol	rapid	Less common soil occurs in climatically and/or edaphically drier locations and has an organic matter enriched surface (Ah) layer >10 cm thick.
Q3	Duric Dystric Brunisol	rapid	Duric Humo-Ferric Podzol	rapid	Less common soil has a strong brown to reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Hawarth soil association.
Q4	Duric Dystric Brunisol	rapid	Orthic Dystric Brunisol	rapid	Strongly cemented horizons are absent in the less common soil.

QUALICUM Soil Association - Q (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
Q5	Duric Dystric Brunisol	rapid	Duric Dystric Brunisol: shallow lithic phase	rapid	Less common soil is between 50 and 100 cm thick over bedrock.
Q7	Orthic Dystric Brunisol	rapid	Duric Dystric Brunisol	rapid	Strongly cemented horizons are absent in the most common soil.
Q8	Orthic Dystric Brunisol	rapid	Orthic Regosol	rapid	Strongly cemented horizons are absent. Less common soils is very weakly developed and usually occurs on recently deposited alluvium.

QUAMICHAN Soil Association - QU

Quamichan soils are common throughout the Coastal Grand Fir - Western Red Cedar Forest Zone and occur mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 300 m.

Quamichan soils are rapidly drained. Very gravelly to gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly loamy sand or very gravelly sand. The coarse fragment content is at least 35% and usually exceeds 50% by volume. The weakly podzolized surface and subsurface horizons are usually less than 70 cm in thickness, light yellowish brown to yellowish-brown, and strongly acid. A weak to moderate cemented layer is generally present at depths between 50 and 90 cm; relatively unweathered parent material is encountered at depths between 1.5 and 2 m. A mor layer between 1 and 4 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
QU1	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
QU3	Orthic Dystric Brunisol	rapid	Duric Humo-Ferric Podzol	rapid	Less common soil has a strong brown to reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. A strongly cemented subsoil (duric) horizon is also present.
QU4	Orthic Dystric Brunisol	rapid	Duric Dystric Brunisol	rapid	Less common soil contains a moderate to strongly cemented (duric) horizon.
QU5	Orthic Dystric Brunisol	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	Less common soil is between 50 and 100 cm thick over bedrock.
QU7	Orthic Dystric Brunisol	rapid	-	-	Consists dominantly of the usual or most common soil as described above.

QUATSINO Soil Association - QS

Quatsino soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and in low elevation areas in the Vancouver Island Ranges. They have developed in deep, gravelly sandy morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 20 and 100%; elevations range from sea level to 600 m.

Quatsino soils are well drained. Gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam or gravelly loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, strong brown to yellowish-red, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 120 cm; relatively unweathered compact parent material is encountered at depths between 120 and 150 cm. A mor layer between 15 and 40 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
QS1	Duric Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
QS3	Duric Humo-Ferric Podzol	well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Sarita soil association.

QUIBBLE Soil Association - QI

Quibbie soils are common throughout the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone, mainly in the mid-to-upper elevational areas within the Vancouver Island Ranges. They have developed in deep, gravelly sandy moraina! (till) deposits associated mainly with extrusive bedrock. Slopes vary between 10 and 100%; elevations range from 550 to 1100 m.

Quibbie soils are moderately well drained. Gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark reddish brown to dark brown, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 120 cm; relatively unweathered compact parent material is encountered at depths between 120 and 150 cm. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
QI1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
QI2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Moyeha soil association.
QI3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: gleyed phase	imperfect	Less common soil has a dark reddish brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. The subsoil is strongly mottled.
QI4	Duric Ferro-Humic Podzol	mod. well	Orthic Ferro-Humic Podzol	mod. well	Strongly cemented horizons are absent in the less common soil.
QI5	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: shallow lithic phase	mod. well	Less common soil is between 50 and 100 cm thick over bedrock.

QUIMPER Soil Association - QP

Quimper soils are common throughout the western hemlock subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and at low elevations in the valleys of the Vancouver Island Ranges. They have developed in deep, sandy gravelly morainal (till) deposits associated mainly with extrusive bedrock. Slopes vary between 2 and 60%; elevations range from sea level to 1100 m.

Quimper soils are well drained. Gravelly sandy loam or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 120 cm in thickness, dark brown to reddish-brown, and strongly to medium acid. A strongly cemented or indurated layer is present at depths between 70 and 120 cm; relatively unweathered, very compact parent material is encountered at depths between 120 and 150 cm. A mor layer between 1 and 4 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
QP1	Duric Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
QP2	Duric Humo-Ferric Podzol	well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
QP3	Duric Humo-Ferric Podzol	well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a strong brown to reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
QP4	Duric Humo-Ferric Podzol	well	Orthic Humo-Ferric Podzol	well	Strongly cemented horizons are absent in the less common soil.
QP5	Duric Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol: lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

QUINSAM Soil Association - QN

Quinsam soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivisions and in low valley locations within the Vancouver Island Ranges. They have developed in deep, sandy gravelly morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 0 and 50%; elevations range from sea level to 700 m.

Quinsam soils are well drained. Gravelly sandy loam or gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 30 and 50%; cobbles, stones, and boulders are common. The podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark brown to strong brown, and strongly to medium acid. A strongly cemented to indurated layer is present at depths between 70 and 120 cm; relatively unweathered, very compact parent material is encountered at depths between 120 and 150 cm. A mor layer between 1 and 4 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
QN1	Duric Humo-Ferric Podzol	well	-	-	Consists dominantly of the usual or most common soil as described above.
QN2	Duric Humo-Ferric Podzol	well	Duric Dystric Brunisol	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Shawnigan soil association.
QN3	Duric Humo-Ferric Podzol	well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
QN4	Duric Humo-Ferric Podzol	well	Orthic Humo-Ferric Podzol	well	Strongly cemented horizons are absent in the less common soil.

QUINSAM Soil Association - QN (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
QN5	Duric Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.
QN7	Orthic Humo-Ferric Podzol	well	Duric Humo-Ferric Podzol	well	Strongly cemented horizons are absent in the most common soil.

RAGBARK Soil Association - RJ

Ragbark soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in rubbly sandy and/or gravelly sandy colluvial and/or moraine deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 300 m.

Ragbark soils are rapidly drained. Cobbly, gravelly sandy loam or cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly or very gravelly sandy loam. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are brown to dark yellowish brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RJ1	Orthic Dystric Brunisol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
RJ5	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
RJ6	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

RAINIER Soil Association - RI

Rainier soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in sandy rubbly colluvial and/or morainal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 20 and 100%; elevations range from 600 to 1100 m.

Rainier soils are well drained. Cobbly, gravelly sandy loam or cobbly, very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sandy loam. The coarse fragment content is usually between 40 and 65%. The surface and subsurface horizons are dark brown to dark reddish brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RI1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RI2	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic and very shallow lithic phase and Orthic Ferro-Humic Podzol: very shallow lithic phase	well well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Nitinat soil association.
RI5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
RI6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and Typic Folisol	well	The most common soil is generally between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock or consisting of organic material (>10 cm thick) over bedrock also occur.

RAINIER Soil Association - RI (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
RI7	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase and Typic Folisol		Less common soils are between 10 and 50 cm thick over bedrock or consist of organic material (>10 cm thick) over bedrock.

REALEX Soil Association - RX

Realex soils occur in all forest zones, but most commonly in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone, within the Vancouver Island Ranges physiographic subdivision. They have developed in rubbly and/or bouldery, colluvial deposits, less than 1 m thick, overlying bedrock. Slopes vary between 50 and 100%; elevations range from 600 to 2200 m.

Realex soils are rapidly drained. Cobbly sand to very gravelly sand is the usual texture in the upper horizons; subsoils consist of cobbly sand. The coarse fragment content is usually between 50 and 65%. The surface and subsurface horizons are very pale brown, and medium to strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 0 and 2 cm is present on the soil surface. The usual taxonomic classification is Orthic Regosol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RX1	Orthic Regosol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
RX5	Orthic Regosol: shallow lithic phase	rapid	Orthic Regosol: very shallow lithic phase and/or Typic Folisol	rapid	Less common soils are between 10 and 50 cm thick over bedrock and/or consist of organic material (>10 cm thick) over bedrock.
RX6	Orthic Regosol: very shallow lithic phase	rapid	Orthic Regosol: shallow lithic phase and Typic Folisol	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur or consisting of organic material (>10 cm thick) over bedrock also occur.
RX7	Orthic Regosol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase and	rapid	Less common soil is podzolized.
			Orthic Regosol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.

REALEX Soil Association - RX (Continued)

Soil Assoc. Component	Most Common Soil: Classification	Most Common Soil: Drainage	Less Common Soil: Classification	Less Common Soil: Drainage	Comments
RX8	Orthic Regosol: shallow lithic phase	rapid	Orthic Ferro-Humic Podzol: shallow lithic phase and	rapid	Less common soil is strongly podzolized.
			Orthic Regosol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.

REEGAN Soil Association - RN

Reegan soils are occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone, mainly at the mid-to-lower elevations in the Vancouver Island Ranges physiographic subdivision. They have developed in deep, gravelly fine morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 5 and 50%; elevations range from 300 to 1100 m.

Reegan soils are moderately well drained. Gravelly loam or cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly clay loam or gravelly loam. The coarse fragment content is usually between 30 and 50%; cobbles and stones are common. The strongly podzolized surface and subsurface horizons are usually less than 70 cm in thickness, strong brown to yellowish-red, and strongly to medium acid. A moderate to strongly cemented layer is present at depths between 60 and 90 cm; relatively unweathered compact parent material is encountered at depths between 90 and 120 cm. A moder layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RN1	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
RN2	Duric Humo-Ferric Podzol	mod. well	Duric Dystric Brunisol	mod. well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations.
RN3	Duric Humo-Ferric Podzol	mod. well	Duric Ferro-Humic Podzol	mod. well to imperfect	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
RN4	Duric Humo-Ferric Podzol	mod. well	Orthic Humo-Ferric Podzol	mod. well	Strongly cemented (duric) horizons are absent in the less common soil.
RN5	Duric Humo-Ferric Podzol	mod. well	Duric Humo-Ferric Podzol: shallow lithic phase	mod. well	Less common soil is between 50 and 100 cm thick over bedrock.

REEGAN Soil Association - RN (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
RN7	Orthic Humo-Ferric Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Strongly cemented (duric) horizons are absent in the most common soil.

REESES Soil Association - RS

Reeses soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in shallow bouldery sand and/or sandy rubbly colluvial and/or moraine deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 600 m.

Reeses soils are well drained. Cobbly, very gravelly or gravelly sandy loam or cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of very gravelly sandy loam. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are dark brown to dark reddish-brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 10 and 30 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RS1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RS2	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic and very shallow lithic phase and	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Rutley soil association.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
RS3	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Gleyed Ferro-Humic Podzol: shallow lithic phase and	imperfect	Less common soil has a very dark brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

REESES Soil Association - RS (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
RS4	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orstein Ferro-Humic Podzol: shallow lithic phase		Less common soil contains cemented upper B horizons.
RS5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
RS6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and Typic Folisol		The most common soil is between 10 and 50 cm thick over bedrock. Less common soil are between 50 and 100 cm to bedrock or consist of organic materials (>10 cm thick) over bedrock.
RS7	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase and Typic Folisol		Less common soils are between 10 and 50 cm thick over bedrock or consist of organic material (>10 cm thick) over bedrock.

REGINALD Soil Association - RE

Reginald soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in sandy rubbly colluvial and/or morainal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 15 and 100%; elevations range from 900 to 2100 m.

Reginald soils are well drained. Cobbly, gravelly loam to cobbly, very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of very gravelly sandy loam. The coarse fragment content is usually between 35 and 65%. The surface and subsurface horizons are yellowish-red to reddish-brown, and very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil: Classification	Most Common Soil: Drainage	Less Common Soil: Classification	Less Common Soil: Drainage	Comments
RE1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RE3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and	well	Less common soil has a dark reddish brown to dark brown, strongly podzolized solum due to its occurrence in climatically and/ or edaphically wetter locations. It is equivalent to the most common soil in the Ritherton association.
			Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
RE5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

REGINALD Soil Association - RE (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
RE6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase and Typic Folisol	well well	The most common soil is between 10 and 50 cm thick over bedrock. Less common soils between 50 and 100 cm to bedrock also occur as do soils consisting of organic material (>10 cm thick) over bedrock.
RE7	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase and Typic Folisol		Less common soil is between 10 and 50 cm thick over bedrock or consists of organic material (>10 cm thick) over bedrock.

Plate 26. Rubbly colluvial typical of shallow to bedrock soils.

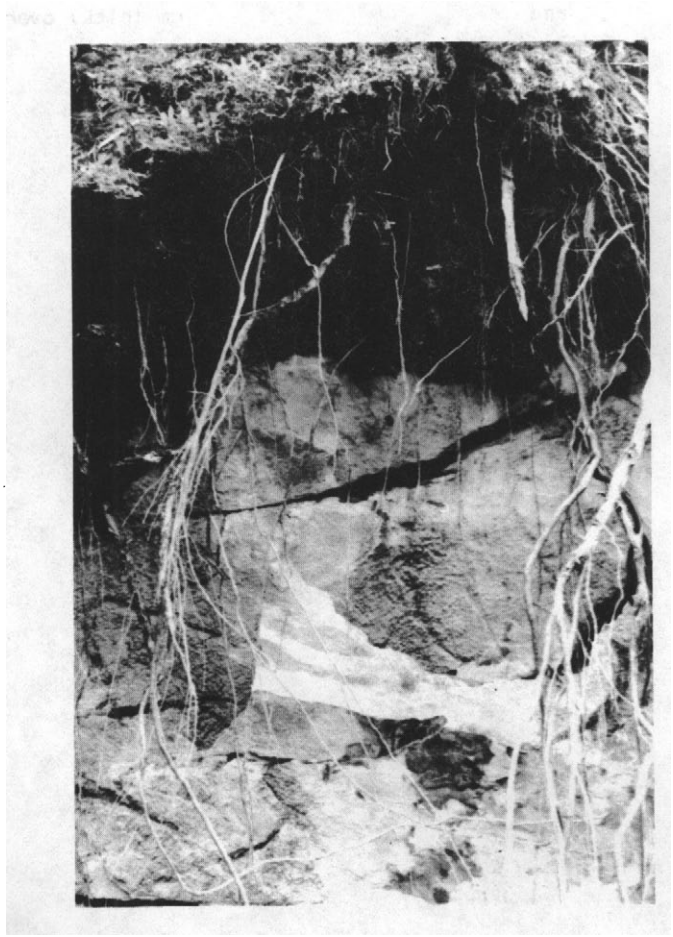


Plate 27. Organic accumulation over bedrock typical of folisolic soils. These soils occur on the west coast and at high elevations.

RITHERTON Soil Association - RH

Ritherton soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in sandy rubbly colluvial and/or morainal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 15 and 100%; elevations range from 900 to 2100 m.

Ritherton soils are well drained. Cobbly, very gravelly sandy loam or cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of very gravelly sandy loam. The coarse fragment content is usually between 35 and 65%. The surface and subsurface horizons are dark brown to dark reddish brown, and very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RH1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RH2	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic and very shallow lithic phases and	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Reginald soil association.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
RH3	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Gleyed Ferro-Humic Podzol: shallow lithic phase and	imperfect	Less common soil has a dark brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

RITHERTON Soil Association - RH (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
RH5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.
RH6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and Typic Folisol	well well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock or organic material (>10 cm thick) over bedrock also occur.
RH7	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase and Typic Folisol	well well	Less common soil is between 10 and 50 cm thick over bedrock or consists of organic material (>10 cm thick) over bedrock.

ROBERTSON Soil Association - RB

Robertson soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland and Vancouver Island Ranges physiographic subdivisions. They have developed in rubbly sandy and/or gravelly sandy colluvial or morainal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 5 and 100%; elevations range from sea level to 700 m.

Robertson soils are well to rapidly drained. Gravelly loam to cobbly, very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, gravelly sandy loam. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are dark brown to dark yellowish brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 1 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RB1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RB2	Orthic Humo-Ferri Podzol: shallow lithic phase	well	Orthic Dystric Brunisol: shallow lithic phase	well	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Rosewall soil association.
RB5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
RB6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

RONALD Soil Association - RA

Ronald soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone. They occur mainly in the Nanaimo Lowland and Alberni Basin physiographic subdivision and on lower valley sides in the Vancouver Island Ranges. They have developed in deep, gravelly fine morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 5 and 40%; elevations range from sea level to 700 m.

Ronald soils are moderately well drained. Cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly clay loam. The coarse fragment content is usually between 20 and 50%; cobbles and stones are common. The podzolized surface and subsurface horizons are usually less than 80 cm in thickness, strong brown to brown, and strongly acid. A strongly to moderately cemented layer is present at depths between 60 and 100 cm; relatively unweathered compact parent material is encountered at depths between 100 and 130 m. A moder layer between 2 and 6 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RA1	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
RA2	Duric Humo-Ferric Podzol	mod. well	Gleyed Dystric Brunisol	Imperfect	Less common soil is only weakly podzolized due to its occurrence in climatically drier locations. It is equivalent to the most common soil in the Royston soil association.
RA5	Duric Humo-Ferric Podzol	mod. well	Duric Dystric Brunisol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.
RA7	Orthic Humo-Ferric Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Most common soil does not contain cemented (duric) layers.

ROSANDER Soil Association - RR

Rosander soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and in low valley locations in the Vancouver Island Ranges. They have developed in deep, gravelly fine morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 5 and 40%; elevations range from sea level to 600 m.

Rosander soils are moderately well drained. Gravelly loam to cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly clay loam. The coarse fragment content is usually between 20 and 50%; cobbles and stones are common. The very strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, reddish-brown to dark reddish brown, and very strongly acid. A strongly cemented layer is present at depths between 80 and 140 cm; relatively unweathered, compact parent material is encountered at depths below 150 cm. A mor layer between 20 and 35 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RR1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
RR2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	mod. well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Rowland soil association.
RR3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol	imperfect	Less common soil occurs in edaphically wetter (usually seepage) locations.
RR4	Duric Ferro-Humic Podzol	mod. well	Orthic Ferro-Humic Podzol	mod. well	Strongly cemented (duric) horizons are absent in the less common soil.
RR5	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: very shallow lithic phase	mod. well	Less common soil is between 10 and 50 cm thick over bedrock.

ROSEWALL Soil Association - RL

Rosewall soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in rubbly sandy and/or gravelly sandy colluvial or morainal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 700 m.

Rosewall soils are rapidly drained. Cobbly, gravelly sandy loam or cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly to very gravelly sandy loam. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are brown to dark yellowish brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RL1	Orthic Dystric Brunisol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
RL3	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Robertson soil association.
RL5	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
RL6	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

ROSSITER Soil Association - RT

Rossiter soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in rubbly sandy and/or gravelly sandy colluvial or moraínal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 5 and 100%; elevations range from sea level to 1100 m.

Rossiter soils are well to rapidly drained. Gravelly loam to cobbly, very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sandy loam. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are dark brown to reddish-brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 1 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RT1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RT3	Orthic Humó-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phases and	well	Less common soil has a dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
			Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
RT4	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Ortstein Humo-Ferric Podzol: shallow lithic phase	well	Surface and subsurface layers are strongly cemented in the less common soil.
RT5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.

ROSSITER Soil Association - RT (continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		
	Classification	Drainage	Classification	Drainage	Comments
RT6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soils is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

ROWLAND Soil Association - RD

Rowland soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and in low valley locations in the Vancouver Island Ranges. They have developed in deep, gravelly fine moraine (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 5 and 40%; elevations range from sea level to 600 m.

Rowland soils are moderately well drained. Gravelly loam to cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly clay loam. The coarse fragment content is usually between 20 and 50%; cobbles and stones are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, strong brown to yellowish-red , and strongly acid. A strongly cemented layer is present at depths between 80 and 120 cm; relatively unweathered compact parent material is encountered at depths between 120 and 150 m. A mor layer between 10 and 20 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
RD1	Duric Humo-Ferric Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
RD3	Duric Humo-Ferric Podzol	mod. well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a dark reddish brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Rosander soil association.

ROYSTON Soil Association - R

Royston soils occupy small areas in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone and occur mainly in the Nanaimo Lowland physiographic subdivision and at low valley elevations in the Vancouver Island Ranges. They have developed in deep, gravelly fine morainal (till) deposits. Slopes vary between 5 and 35%; elevations range from sea level to 700 m.

Royston soils are imperfectly drained. Cobbly, gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly loam or gravelly clay loam. The coarse fragment content is usually between 20 and 40%; cobbles and stones are common, particularly on the surface. The weakly podzolized surface and subsurface horizons are usually less than 50 cm in thickness, dark brown to light yellowish brown, and medium to strongly acid. Prominent mottles are usually present at depths below 50 cm. A moderately cemented layer is occasionally present at depths between 60 and 90 cm; relatively unweathered compact parent material is encountered at depths between 90 and 120 m. A mull layer between 4 and 8 cm is present on the soil surface. The usual taxonomic classification is Gleyed Dystric Brunisol.

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
R1	Gleyed Dystric Brunisol	Imperfect	Duric Dystric Brunisol	Imperfect	Consists dominantly of the usual or most common soil as described above. Less common soils have a moderately to strongly cemented layer.
R3	Gleyed Dystric Brunisol	Imperfect	Duric Humo-Ferric Podzol	Imperfect	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Ronald soil association.
R4, R7	Gleyed Dystric Brunisol	Imperfect	-	-	Consists dominantly of the usual or most common soil as described above.

RUTLEY Soil Association - RY

Rutley soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Mountains physiographic subdivision. They have developed in rubbly bouldery sand colluvial or morainal deposits, less than 1 m thick, overlying extrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 600 m.

Rutley soils are well drained. Gravelly loam to very gravelly or gravelly sandy loam is the usual texture in the upper horizons and subsoil textures are similar. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are yellowish-red to reddish-brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 5 and 20 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil: Classification	Drainage	Less Common Soil: Classification	Drainage	Comments
RY1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
RY3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and	well	Less common soil has a dark reddish brown to dark brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Reeses soil association.
			Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
RY5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

RUTLEY Soil Association - RY (Continued)

Soil Assoc. Component	Most Common Soil Classification	Most Common Soil Drainage	Less Common Soil Classification	Less Common Soil Drainage	Comments
RY6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

SAANICHTON Soil Association - SA

Saanichton soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision, mainly in the Victoria - Saanich Peninsula area. They have developed in deep, silty and/or clayey marine deposits that occupy level to gently sloping areas. Elevations range from sea level to about 100 m.

Saanichton soils are well drained. Clay loam or silty clay loam are the usual surface textures; these change to clay or silty clay loam at depth. Saanichton soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. The upper horizons contain spherical concretions. The dark grayish brown to yellowish-brown solum is usually less than 80 cm in thickness, and strongly acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 10 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Sombric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SA1	Orthic Sombric Brunisol	well	-	-	Consists dominantly of the usual or most common soil as described above.

SANDHILL Soil Association - SD

Sandhill soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur in the Estevan Coastal Plain physiographic subdivision and on the floor of low elevation valleys within the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial and/or marine deposits. Slopes are usually level to very gently sloping; elevations range from sea level to about 200 m.

Sandhill soils are imperfectly drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sand. The coarse fragment content is generally between 20 and 50%. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark grayish brown to dark brown, and very strongly acid. Distinct to prominent mottles are present below 50 cm. Cemented ortstein and duric layers are present at depths between 10 and 70 cm; relatively unweathered parent material is encountered at depths between 100 and 150 cm. A mor layer between 10 and 30 cm thick is present on the soil surface. The usual taxonomic classification is Gleyed Ortstein Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SD1	Gleyed Ortstein Ferro-Humic Podzol	imperfect	-	-	Consists dominantly of the usual or most common soil as described above.
SD4	Gleyed Ortstein Ferro-Humic Podzol	imperfect	Ortstein Ferro-Humic Podzol	mod. well	Less common soil occupies landscape positions which are usually not affected by fluctuating water tables.
SD7	Gleyed Ortstein Ferro-Humic Podzol	imperfect	Orthic Humic Gleysol	poor	Less common soil occupies depressional areas which have high water tables.
SD8	Orthic Humic Gleysol	poor	Gleyed Ortstein Ferro-Humic Podzol	imperfect	Most common soil occupies depressions or other areas affected by high water tables.

SARITA Soil Association - SR

Sarita soils are common throughout the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone and occur mainly in the Vancouver Island Ranges and Estevan Coastal Plain physiographic subdivisions. They have developed in deep, gravelly sandy morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes are usually less than 50% but may sometimes range to 100%; elevations range from sea level to 600 m.

Sarita soils are moderately well drained. Gravelly sandy loam to gravelly loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 120 cm in thickness, dark reddish brown to dark brown, and very strongly to strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 120 cm; relatively unweathered very compact parent material is encountered at depths between 120 and 150 cm. A mor layer between 15 and 30 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SR1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
SR2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	well	Less common soil is less strongly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Quatsino soil association.
SR3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: gleyed phase	imperfect	Less common soil has a dark reddish brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. Subsoils are mottled.
SR4	Duric Ferro-Humic Podzol	mod. well	Orthic Ferro-Humic Podzol	well	Strongly cemented horizons are absent in the less common soil.

SARITA Soil Association - SR (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		
	Classification	Drainage	Classification	Drainage	Comments
SR5	Duric Ferro-Humic Podzol	mod. well	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.
SR7	Orthic Ferro-Humic Podzol	well	Duric Ferro-Humic Podzol	mod. well	Strongly cemented horizons are absent in the most common soil.

SAYWARD Soil Association - SY

Sayward soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in deep, sandy fluvial or marine deposits which are underlain by silty clay material. Slopes are normally level to gently sloping. Elevations range from sea level to about 300 m.

Sayward soils are imperfectly drained. Loamy sand is the usual surface texture; changing to sand at depth. Silty clay loam or silt loam textures normally occur at depths greater than 100 cm. Sayward soils are generally free of coarse fragments but the upper horizons contain a moderate amount of spherical concretions. The strongly podzolized solum is usually less than 100 cm in thickness, and strongly acid. Moderately to strongly cemented horizons are present in the upper B horizon. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs below 1 m of the soil surface. A mor layer between 2 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Gleyed Ortstein Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
SY1	Gleyed Ortstein Humo-Ferric Podzol	Imperfect	-	-	Consists dominantly of the usual or most common soil as described above.
SY4	Gleyed Ortstein Humo-Ferric Podzol	Imperfect	Orthic Humo-Ferric Podzol	mod. well	Cemented horizons are either absent or only weakly developed in the less than common soil.
SY7	Gleyed Ortstein Humo-Ferric Podzol	Imperfect	Orthic Humic Gleysol	poor	Less common soil occupies areas with high water tables.

SHAWNIGAN Soil Association - S

Shawnigan soils are common throughout the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone but occur mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, gravelly sandy morainal (till) deposits. Slopes vary between 0 and 50%; elevations range from sea level to 700 m.

Shawnigan soils are well drained. Gravelly sandy loam or very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The weakly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark yellowish brown to yellowish-brown, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 110 cm; relatively unweathered very compact parent material is encountered at depths between 110 and 130 m. A mor layer between 1 and 4 cm is present on the soil surface. The usual taxonomic classification is Duric Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
S1	Duric Dystric Brunisol	well	-	-	Consists dominantly of the usual or most common soil as described above.
S2	Duric Dystric Brunisol	well	Duric Sombric Brunisol	well	Less common soil has an organic matter-enriched surface (Ah) horizon greater than 10 cm thick.
S3	Duric Dystric Brunisol	well	Duric Humo-Ferric Podzol	well	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Quinsam soil association.
S5	Duric Dystric Brunisol	well	Duric Dystric Brunisol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

Plate 28. Undulating stony and cobbly landscape typical of the Shawnigan and Somenos Soil Associations.

Plate 29. Soil profile typical of Shawnigan and Somenos soils. Note the strongly cemented zone just below the depth of rooting.

SHELBERT Soil Association - SB

Shelbert soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Mountains physiographic subdivision. They have developed in cobbly and/or rubbly sandy colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 600 m.

Shelbert soils are well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly loamy sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are strong brown to reddish-brown, and very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
SB1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
SB3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and	well	Less common soil has a reddish-brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Sprise soil association.
			Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SB5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

SHELBERT Soil Association - SB (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
SB6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

SHEPHERD Soil Association - SP

Shepherd soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in cobbly and/or rubbly sandy colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 700 m.

Shepherd soils are rapidly drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly loamy sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are brown to strong brown, and strongly to very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 10 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SP1	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
SP2	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow and very shallow lithic phases and	rapid	Less common soil is only weakly podzolized due to its occurrence in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Squally soil association.
			Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
SP5	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
SP6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

SHIRMISH Soil Association - SI

Shirmish soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in sandy bouldery and/or sandy rubbly colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 20 and 100%; elevations range from 600 to 1100 m.

Shirmish soils are well drained. Cobbly, gravelly loamy sand or cobbly, very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are dark brown to dark reddish brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SI1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
SI2	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase and	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Nitinat soil association.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SI5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SI6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock, or less common soil consists of organic material (>10 cm thick) over bedrock.
			Typic Folisol	well	

SHIRMISH Soil Association - SI (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
SI7	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase and Typic Folisol	well well	Less common soil is between 10 and 50 cm thick over bedrock, or less common soil consists of organic material (>10 cm thick) over bedrock.

SHOFIELD Soil Association - SO

Shofield soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone, in the upper elevational valleys of the Vancouver Island Ranges. They have developed in deep, gravelly sandy morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 10 and 80%; elevations range from 900 to 2100 m.

Shofield soils are moderately well drained. Gravelly sandy loam to cobbly, gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam or gravelly loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The very strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark brown to dark red, and very strongly acid. A strongly to moderately cemented layer is present at depths between 50 and 100 cm; relatively unweathered compact parent material is encountered at depths between 100 and 150 m. A mor layer between 10 and 20 cm is present on the soil surface. The usual taxonomic classification is Duric Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SO1	Duric Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
SO2	Duric Ferro-Humic Podzol	mod. well	Duric Humo-Ferric Podzol	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Stockett soil association.
SO3	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: gleyed phase	imperfect	Less common soil has a dark reddish brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. Its' subsoil is mottled.
SO5	Duric Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

SMOKEHOUSE Soil Association - SH

Smokehouse soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone in upper elevational areas within the Vancouver Island Ranges. They have developed in cobbly and/ or rubbly sandy colluvial or moralnal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from 900 to 2100 m.

Smokehouse soils are well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly or very gravelly loamy sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are reddish-brown to dark reddish brown, and very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 5 and 20 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SH1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
SH2	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic and very shallow lithic phases and	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Snakehead soil association.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SH3	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Gleyed Ferro-Humic Podzol: shallow lithic phase and	Imperfect	Less common soil has a very dark brown to black, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. Its' subsoil is mottled.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

SMOKEHOUSE Soil Association - SH (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
SH5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SH6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and Typic Folisol	well well	The most common soils is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur or consists of organic materials (>10 cm thick) over bedrock.
SH7	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase or Typic Folisol	well	Less common soil is between 10 and 50 cm thick over bedrock or consists of organic material (>10 cm thick) over bedrock.

SNAKEHEAD Soil Association - SU

Snakehead soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone in upper elevational areas within the Vancouver Island Ranges. They have developed in cobbly and/ or rubbly sandy colluvial or moraInal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from 900 to 2100 m.

Snakehead soils are well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly or very gravelly loamy sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are strong brown to yellowish-red, and very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SU1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
SU3	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic and very shallow lithic phases	well	Less common soil has a reddish-brown to dark reddish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Smokehouse soil association.
SU5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SU6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase and Typic Folisol	well well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock, or consists of organic material (>10 cm thick) over bedrock.

SNUGGERY Soil Association - SG

Snuggery soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in silty fluvial deposits which normally overlie sandy or gravelly deposits at depth. Snuggery soils are subject to varying degrees of flooding. Slopes are usually less than 5%; elevations range from sea level to about 300 m.

Snuggery soils are moderately well drained. Silt loam or silty clay loam is the usual texture in the upper horizons; subsoils consist of sandy loam or loamy sand. Snuggery soils are normally free of coarse fragments, although minor gravelly areas may occur. Surface and subsurface horizons (solum) are usually less than 15 cm in thickness, brown to dark brown, and very strongly to extremely acid. Significant soil development has not occurred due to the periodic flooding and surface addition of new material. A mull layer between 1 and 5 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Regosol although significant areas of Orthic Dystric Brunisol also occur.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SG4	Orthic Regosol	mod. well	Orthic Dystric Brunisol	mod. well	Consists dominantly of the usual or most common soil as described above. Less common soil is weakly podzolized due to its occurrence in less slightly higher areas which flood less frequently.
SG7	Gleyed Regosol	Imperfect	Orthic Gleysol	poor	Most common soil is affected by fluctuating water tables while the less common soil has permanently high water tables. These soils occur in low-lying locations within the fluvial landscape.
SG8	Orthic Dystric Brunisol	mod. well	Orthic Humo-Ferric Podzol	mod. well	These weakly to strongly podzolized soils occur on slightly higher terraces which rarely flood.
SG9	Gleyed Regosol: saline phase	Imperfect	Orthic Gleysol: saline phase		As for SG7 but also saline. These soils normally occur in estuary locations.

SOMENOS Soil Association - SE

Somenos soils are common throughout the Coastal Grand Fir - Western Red Cedar Forest Zone and occur mainly in the Nanaimo Lowland physiographic subdivision. They have developed in deep, gravelly sandy morainal (till) deposits. Slopes vary between 0 and 50%; elevations range from sea level to 300 m.

Somenos soils are well drained. Gravelly sandy loam or very gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The weakly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark yellowish brown to yellowish-brown, and strongly acid. A strongly cemented to indurated layer is present at depths between 70 and 110 cm; relatively unweathered very compact parent material is encountered at depths between 110 and 130 m. A mor layer between 1 and 4 cm is present on the soil surface. The usual taxonomic classification is Duric Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SE1	Duric Dystric Brunisol	well	-	-	Consists dominantly of the usual or most common soil as described above.
SE2	Duric Dystric Brunisol	well	Duric Sombric Brunisol	well	Less common soil has an organic matter-enriched surface (Ah) horizon greater than 10 cm thick.
SE5	Duric Dystric Brunisol	well	Duric Dystric Brunisol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.

SPRISE Soil Association - SS

Sprise soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Mountains physiographic subdivision. They have developed in cobbly and/or rubbly sandy colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 600 m.

Sprise soils are well drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, gravelly or very gravelly loamy sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are reddish-brown to dark reddish brown, and very strongly to extremely acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 10 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SS1	Orthic Ferro-Humic Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
SS2	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase and	well	Less common soil occurs in climatically and/or edaphically drier locations. It is equivalent to the most common soil in the Shelbert soil association.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SS3	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Gleyed Ferro-Humic Podzol: shallow lithic phase and	imperfect	Less common soil has a very dark brown to black, strongly podzolized solum due to its occurrence in climatically and/ or edaphically wetter locations. Its' subsoil is mottled.
			Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.

SPRISE Soil Association - SS (Continued)

Soil Assoc. Component	Most Common Soil Classification	Most Common Soil Drainage	Less Common Soil Classification	Less Common Soil Drainage	Comments
SS4	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orstein Ferro-Humic Podzol: shallow lithic phase	well	Less common soil contains cemented upper B horizons.
SS5	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
SS6	Orthic Ferro-Humic Podzol: very shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase and Typic Folisol	well well	The most common soil is between 10 and 50 cm thick over bedrock. The less common soil is either between 50 and 100 cm to bedrock, or consists of organic materials (>10 cm thick) over bedrock.
SS7	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: very shallow lithic phase and Typic Folisol	well well	Less common soil is between 10 and 50 cm thick over bedrock, or consists of organic material (>10 cm thick) over bedrock.

SPRUCEBARK Soil Association - SJ

Sprucebark soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in sandy bouldery and/or sandy rubbly colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 300 m.

Sprucebark soils are rapidly drained. Cobbly, gravelly loamy sand or cobbly, very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly sand. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are yellowish-brown to brown, and strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 5 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SJ1	Orthic Dystric Brunisol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
SJ5	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Dystric Brunisol: very shallow lithic phase		Less common soil is between 10 and 50 cm thick over bedrock.
SJ6	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase		The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

SQUALLY Soil Association - SL

Squally soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland and Alberni Basin physiographic subdivisions. They have developed in cobbly and/or rubbly sandy colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 700 m.

Squally soils are rapidly drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of very gravelly and cobbly sand. The coarse fragment content is between 30 and 50%. The surface and subsurface horizons are yellowish-brown to light yellowish brown, and strongly acid. Intrusive bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 10 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc. Component	Most Common Soil Classification	Drainage	Less Common Soil Classification	Drainage	Comments
SL1	Orthic Dystric Brunisol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
SL3	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Shepherd soil association.
SL5	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Less common soil is between 50 and 100 cm thick over bedrock.
SL6	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

STOCKETT Soil Association - SC

Stockett soils occur in the Subalpine Mountain Hemlock - Pacific Silver Fir Forest Zone, mainly in the upper elevational valleys of the Vancouver Island Ranges. They have developed in deep, gravelly sandy morainal (till) deposits associated mainly with extrusive bedrock areas. Slopes vary between 10 and 80%; elevations range from 900 to 2100 m.

Stockett soils are well drained. Gravelly sandy loam or cobbly, gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of gravelly sandy loam or gravelly loam. The coarse fragment content is usually between 20 and 50%; cobbles, stones, and boulders are common. The strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, strong brown to reddish-brown, and strongly acid. A strongly to moderatly cemented layer is present at depths between 50 and 100 cm; relatively unweathered, compact parent material is encountered at depths between 100 and 150 m. A mor layer between 5 and 15 cm is present on the soil surface. The usual taxonomic classification is Duric Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SC3	Duric Humo-Ferric Podzol	well	Duric Ferro-Humic Podzol	mod. well	Less common soil has a dark brown to dark red, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations. It is equivalent to the most common soil in the Shoffield soil association.

STRATA Soil Association - ST

Strata soils occur in the western hemlock subzone of the Coastal Western Hemlock Forest Zone, within the Nanaimo Lowland and Alberni Basin physiographic subdivisions and at the low elevations within the Vancouver Island Ranges. They have developed in cobbly and/or rubbly sandy colluvial or morainal deposits, less than 1 m thick, overlying intrusive bedrock. Slopes vary between 15 and 100%; elevations range from sea level to 1100 m.

Strata soils are rapidly drained. Gravelly loamy sand or gravelly sandy loam is the usual texture in the upper horizons; subsoils consist of cobbly, very gravelly loamy sand. The coarse fragment content is usually between 30 and 65%. The surface and subsurface horizons are strong brown to brown, and very strongly acid. Bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 2 and 10 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
ST1	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
ST3	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Ferro-Humic Podzol: shallow lithic and very shallow lithic phases and	rapid	Less common soil has a strong brown to reddish-brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
			Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
ST4	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Ortstein Humo-Ferric Podzol: shallow lithic phase	well	Less common soil contains moderately to strongly cemented surface and subsurface layers.
ST5	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.

STRATA Soil Association - ST (Continued)

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
ST6	Orthic Humo-Ferric Podzol: very shallow lithic phase	rapid	Orthic Humo-Ferric Podzol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

SUGSAW Soil Association - SW

Sugsaw soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy to gravelly fluvial deposits. Slopes are usually less than 5%; elevations range from sea level to about 600 m.

Sugsaw soils are poorly drained. Sandy loam or loam to gravelly loamy sand textures occur in the upper horizons; subsoils consist of sand or gravelly sand. The coarse fragment content is generally less than 30%. Surface and subsurface horizons are usually less than 60 cm in thickness, very dark grayish brown to very dark gray, and medium to slightly acid. The subsurface and subsoil is strongly gleyed and/or mottled. Relatively unweathered parent material is encountered at depths below 60 cm. A mull layer between 10 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Rego Humic Gleysol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
SW4	Rego Humic Gleysol	poor	Gleyed Regosol and Orthic Regosol	imperfect well	Less common soil occurs on slightly better drained areas with fluctuating or occupies higher-lying, well drained positions within the fluvial landscape.
SW9	Rego Humic Gleysol: saline phase	poor	-	-	Most common soil is saline. Occurs in estuarine locations.

TAGNER Soil Association - TT

Tagner soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in deep, silty and/or clayey marine deposits that occupy depressional areas. Slopes are normally level to gently sloping. Elevations range from sea level to about 100 m.

Tagner soils are poorly drained. Silty clay loam or silt loam are the usual surface textures; these change to clay or silty clay loam at depth. Tagner soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. Tagner soils have a black, organic matter-enriched surface (Ah) layer 10 to 30 cm thick, which is underlain by a strongly gleyed, greenish-grey horizons. The solum is less than 100 cm thick, and medium acid. A high, perched water table (often at the surface) typically occurs during the wet season. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. The usual taxonomic classification is either Orthic Humic Gleysol or Humic Luvic Gleysol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
TT1	Orthic Humic Gleysol	poor	-	-	Consists dominantly of the usual or most common soil as described above.
TT4	Orthic Humic Gleysol	poor	Gleyed Regosol	imperfect	Less common soil has little or no soil development; occurs on recently deposited parent material.
TT7	Humic Luvic Gleysol	poor	-	-	Consists dominantly of the usual or most common soil as described above and contains a clay accumulation horizon 30 to 50 cm thick.

TOFINO Soil Association - TO

Tofino soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Estevan Coastal Plain physiographic subdivision. They have developed in deep, silty and/or clayey marine deposits that occupy depressional locations. Slopes are nearly level to level. Elevations range from sea level to about 100 m.

Tofino soils are poorly drained; high water tables are common throughout the year. The vegetation is dominated by mosses, Labrador tea and lodgepole pine. Silty clay or clay are the usual surface textures; subsoils consists of clay. Tofino soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. Prominent mottles and gleying is present within 50 cm of the surface. The solum is usually less than 50 cm in thickness, and very strongly acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 50 cm of the soil surface. A mor layer between 5 and 15 cm thick is present on the soil surface and overlies a mull layer about 10 to 20 cm thick. The usual taxonomic classification is Fera Humic Gleysol.

Soil Assoc. Component	Most Common Soil		Less Common Soil		Comments
	Classification	Drainage	Classification	Drainage	
TO1	Fera Humic Gleysol	poor	-	-	Consists dominantly of the usual or most common soil as described above.

TOLMIE Soil Association - T

Tolmie soils occur in the coast Douglas-fir subzone of the Coastal Western Hemlock Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in shallow sandy deposits which overlie deep, silty and/or clayey marine deposits. Slopes are normally level to very gently sloping. Elevations range from sea level to about 150 m.

Tolmie soils are poorly drained. Sandy loam or loamy sand are the usual surface textures; these change to silty clay loam or silt loam at depth. Tolmie soils are generally free of coarse fragments with the exception of occasional stone-sized erratics. Prominent mottles and gleying is present within 50 cm of the surface. The brown to light olive grey solum is usually less than 100 cm in thickness, and medium to slightly acid. Dense, compact subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mull layer between 10 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Orthic Humic Gleysol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
T1	Orthic Humic Gleysol	poor	-	-	Consists dominantly of the usual or most common soil as described above.
T4	Orthic Humic Gleysol	poor	Gleyed Regosol	imperfect	Less common soil occupies higher areas with very moderately restricted drainage.

TZUHALEM Soil Association - TM

Tzuhalem soils occur in the Coastal Grand Fir - Western Red Cedar Forest Zone within the Nanaimo Lowland physiographic subdivision. They have developed in sandy gravelly colluvial or morainal deposits, less than 1 m thick, overlying sedimentary (sandstone or conglomerate) bedrock. Slopes vary between 5 and 100%; elevations range from sea level to 300 m.

Tzuhalem soils are rapidly drained. Gravelly loamy sand or very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly loamy sand. The coarse fragment content is usually between 30 and 60%. The surface and subsurface horizons are brown to dark brown, rapidly pervious and strongly acid. Sandstone or conglomerate bedrock normally is encountered between 40 and 80 cm from the surface. A mor or moder layer between 1 and 4 cm is present on the soil surface. The usual taxonomic classification is Orthic Dystric Brunisol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
TM1	Orthic Dystric Brunisol: shallow lithic phase	rapid	-	-	Consists dominantly of the usual or most common soil as described above.
TM2	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Sombric Brunisol: very shallow lithic phase	rpaid	Less common soil occurs in climatically and/or edaphically drier locations and has an organic matter enriched surface (Ah) horizon. It is also between 10 and 50 cm thick over bedrock. It is equivalent to the most common soil in the Huffer soil association.
TM5	Orthic Dystric Brunisol: shallow lithic phase	rapid	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Less common soil is between 10 and 50 cm thick over bedrock.
TM6	Orthic Dystric Brunisol: very shallow lithic phase	rapid	Orthic Dystric Brunisol: shallow lithic phase	rapid	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

UCLUELET Soil Association - UC

Ucluelet soils are common throughout the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone. They occur mainly in the Estevan Coastal Plain physiographic subdivision and on the floor of low elevation valleys in the Vancouver Island Ranges. They have developed in deep, sandy gravelly fluvial, fluvioglacial and/or marine deposits. Slopes are usually less than 5%; elevations range from sea level to about 200 m.

Ucluelet soils are moderately well drained. Very gravelly sandy loam or very gravelly loamy sand is the usual texture in the upper horizons; subsoils consist of very gravelly sand. The coarse fragment content is generally at least 35% and usually exceeds 50% by volume. The very strongly podzolized surface and subsurface horizons are usually less than 100 cm in thickness, dark reddish brown, and very strongly acid. Strongly cemented ortstein layers occur near the surface while duric layers are present at greater depths; relatively unweathered parent material is encountered at depths below 125 cm. A mor layer between 10 and 25 cm thick is present on the soil surface. The usual taxonomic classification is Ortstein Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
UC1	Ortstein Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
UC4	Ortstein Ferro-Humic Podzol	mod. well	Duric Ferro-Humic Podzol	mod. well	Cemented ortstein horizons are absent in the less common soils. Subsoils contain a duric horizon.
UC5	Ortstein Ferro-Humic Podzol	mod. well	Ortstein Ferro-Humic Podzol: shallow lithic phase	well	Less common soil is between 50 and 100 cm thick over bedrock.
UC7	Orthic Ferro-Humic Podzol	well	Ortstein Ferro-Humic Podzol	mod. well	Cemented horizons are absent in the most common soil.

VARGAS Soil Association - V

Vargas soils occur in the western red cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Estevan Coastal Plain physiographic subdivision. They have developed in deep, sandy marine deposits that occupy the lowland areas. Slopes are normally level to gently sloping. Elevations range from sea level to about 100 m.

Vargas soils are moderately well to well drained. Loamy sand or sandy loam are the usual surface textures; these change to fine sand at depth. Vargas soils are generally free of coarse fragments. The strongly podzolized solum is usually less than 70 cm in thickness, and very strongly to strongly acid. Vargas soils contain cemented placic layers which vary considerably in morphology. They can be single or branched, range in thickness from 0.1 mm to 4 mm and can be dull or vitreous. These placic subsoil layers restrict perviousness to slow. Relatively unweathered parent material occurs within 1 m of the soil surface. A mor layer between 10 and 20 cm thick is present on the soil surface. The usual taxonomic classification is Placic Ferro-Humic Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
V1	Placic Ferro-Humic Podzol	mod. well	-	-	Consists dominantly of the usual or most common soil as described above.
V2	Placic Ferro-Humic Podzol	mod. well	Placic Humo-Ferric Podzol	well	Less common soil occurs in climatically and/or edaphically drier locations.
V4	Placic Ferro-Humic Podzol	mod. well	Orthic Ferro-Humic Podzol	well	Well developed placic horizons are absent from the less common soil.

ZEBRIO Soil Association - ZI

Zebrio soils occur in the yellow cedar subzone of the Coastal Western Hemlock - Pacific Silver Fir Forest Zone within the Vancouver Island Ranges physiographic subdivision. They have developed in gravelly fine colluvial or morainal deposits, less than 1 m thick, overlying schist bedrock. Slopes vary between 10 and 100%; elevations range from 500 to 1100 m.

Zebrio soils are well drained. Gravelly loam is the usual texture in the upper horizons; subsoils are a;sp gravelly loam. The coarse fragment content is usually between 10 and 35%. The surface and subsurface horizons are dark brown to very dark brown, moderately pervious and strongly to very strongly acid. Shist bedrock normally is encountered between 50 and 100 cm from the surface. A mor layer between 15 and 25 cm is present on the soil surface. The usual taxonomic classification is Orthic Humo-Ferric Podzol.

Soil Assoc.	Most Common Soil		Less Common Soil		
Component	Classification	Drainage	Classification	Drainage	Comments
ZI1	Orthic Humo-Ferric Podzol: shallow lithic phase	well	-	-	Consists dominantly of the usual or most common soil as described above.
ZI2	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Ferro-Humic Podzol: shallow lithic phase	well	Less common soil has a dark reddish brown to very dark grayish brown, strongly podzolized solum due to its occurrence in climatically and/or edaphically wetter locations.
ZI5	Orthic Humo-Ferric Podzol: shallow lithic phase	well	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Less common soil is between 10 and 50 cm thick over bedrock.
ZI6	Orthic Humo-Ferric Podzol: very shallow lithic phase	well	Orthic Humo-Ferric Podzol: shallow lithic phase	well	The most common soil is between 10 and 50 cm thick over bedrock. Inclusions of soils between 50 and 100 cm to bedrock also occur.

CHAPTER FOUR
DERIVATIONS AND INTERPRETATIONS

The main purpose of mapping and describing soils is to present information which can be used to evaluate both the suitability and the limitations or constraints of land for various purposes. One of the simpler uses of the information is to make derivations. This involves extracting a single characteristic or parameter (eg. depth to bedrock) from the soil descriptions. Soil interpretations are more complex. In these, a number of soil characteristics are considered and evaluated together to arrive at suitabilities, capabilities and/or limitations or constraints for specified land uses.

It should be noted that reconnaissance (Survey Intensity Level 4) soil maps are not totally precise and accurate. Up to 15 or 20% inclusions of unmapped soils may be encountered within map polygons due to scale limitations. Inaccuracies may also be present because of limited ground access and field checking, particularly in areas where dense forest cover makes air photo interpretation difficult. The user is therefore cautioned that while derivations and interpretations based on the maps and soil descriptions are an excellent source of information for preliminary and overview plans, they do not negate the requirement for on-site investigation before detailed final plans are put into effect. An excellent use of the information is to stratify the overall area so that the detailed studies are carried out only in areas where significant potential for the proposed use is indicated.

4.1 METHODS FOR PRODUCING SOIL DERIVATIONS

A number of common derivations are presented and discussed below. The list is not comprehensive, but rather is intended to show examples of the types of information which can quickly and easily be extracted from the soil descriptions and maps. Individual users can make additional derivations to suit their particular needs.

4.1.1 SOURCES OF SAND AND/OR GRAVEL

Soils which are potential sources of sand and gravel are those which have developed in fluvial and fluvioglacial surficial materials. A listing of these soils is contained in the stratification in Table 1. Some of the soils however, may be better suited than others for the intended use. For example, Kye soils are mainly sand with little gravel while Hawarth soils are dominantly gravel with little sand. Sarita soils are also potentially suited but contain significant quantities of silt, while Hillier soils are potential but very shallow sources. These types of differences are noted in the soil descriptions. Some of the soil associations (and/or particular soil association components) which may be potentially suited for sand and/or gravel sources may also be subject to high water tables and/or flooding. Attention also should be paid to these derivations when potential sand and/or gravel sources are considered.

4.1.2 SOURCES OF COARSE AGGREGATE

In addition to the sources of sand and gravel discussed in Section 4.1.1, soils which may be potential sources of coarse aggregate can also be derived from the soil descriptions and map. Most commonly these are soils which have developed in colluvial surficial materials. These are

listed in Table 1 and the appropriate soil association descriptions indicate the percentage of the soil composed of coarse fragments. The coarse fragments are usually angular in shape and vary in size. The depth of coarse aggregate sources is important and particular attention should be paid to this derivation also, as many colluvial deposits are less than 1 m thick.

4.1.3 SHALLOW SOILS

A knowledge of soil depth over bedrock is important for a number of land use purposes. Shallow soils are indicated on the soil map by means of soil association components. Soil association component 5 is always (except in the case of organic soils) composed of a significant percentage (20 to 50%) of soils that are shallower than 1 m to bedrock. Component 6 dominantly (50 to 80%) consists of soils that are shallower than 50 cm to bedrock. The individual soil association descriptions should be consulted to determine the specific meaning of these components in the context of each association.

4.1.4 SLOPE

A total of 10 simple and complex slope classes are shown on the soil maps with each one indicating a specific range of slopes. These can often be combined into two or three groups when slopes critical to a use are known. For example, if a use requires a slope of 10% or less, then all map polygons with slopes less than 10% can be grouped.

4.1.5 WETNESS

Soils which are subject to high water tables, temporary perched water tables or which occur in moisture receiving landscape positions (seepage) are also easily identifiable. Soils with periodic or seasonal moisture surpluses are indicated as "Gleyed" subgroups in the "Dominant Taxonomic Classification" column in Table 1. Gleysols and Organic soils (again, refer to Table 1) have permanent, or nearly so, high water tables and an almost continuous moisture excess.

4.1.6 FLOODING

Areas which have been subject to flooding in the past and therefore can be assumed to have significant potential for a flooding recurrence are those soils which have developed on recent fluvial or fluvial fan deposits and which have Regosolic soil development (see Table 1). The Regosolic soil development in this case is generally the result of periodic soil disturbances by surface water flow and recent sediment deposition.

4.1.7 SOIL INSTABILITY

Colluvial processes such as avalanching, rock falls, and rapid soil creep inhibit soil development and result in Regosolic soil classification. Areas of significant soil instability due to colluvial (gravitational) processes can therefore be identified from the combination of colluvial surficial materials and Regosolic soil classification (Table 1). As with flooding, the presence of soil components 2, 3 and 4 indicates less active disturbance.

4.1.8 OTHER DERIVATIONS

Other derivations as required can similarly be made by extracting relevant soil characteristics from the soil descriptions and soil map.

4.2 SOIL INTERPRETATIONS - GENERAL DISCUSSION AND REFERENCES

Interpretations are more complex than derivations because they usually require the simultaneous evaluation of a number of soil properties. There is a wide variety of interpretations that can be made on the basis of soils information for a number of different uses. The methods of making these interpretations are not described here, but rather a listing of potential interpretations is given below, together with references as to where these methods have been published.

4.2.1 ENGINEERING USES - URBAN DEVELOPMENT

Septic Tank Absorption Fields (Maynard, 1979 a and b; USDA, 1971)
Foundations for Low-Rise Buildings (Maynard, 1979 a and b; USDA, 1971)
Subgrade for Roads and Streets (Maynard, 1979 a and b; USDA, 1971)
Ease of Excavation (Maynard, 1979 a and b; USDA, 1971)
Solid Waste Disposal Sites (Maynard, 1979 a and b; USDA, 1971)
Source of Topsoil (Maynard, 1979 a and b; USDA, 1971)
Sewage Lagoons (USDA, 1971)
Potential Frost Action (USDA, 1971)
Flood Hazard (Maynard, 1979 a and b)

4.2.2 FORESTRY

Forest Capability (McCormack, 1972; Kowall, 1971)
Erosion Hazard (Kenk, 1980; Vold and Kowall, 1982)
Geomorphic Hazard (Kenk, 1980; Vold and Kowall, 1982)
Frost Action (Vold and Kowall, 1982)
Windthrow Hazard (Vold and Kowall, 1982)
Logging Road Limitations (Vold and Kowall, 1982)
Forest Harvesting Limitations (Kenk, 1980; Vold and Kowall, 1982)
Slash Disposal (Vold and Kowall, 1982)
Limits to Regeneration (Vold and Kowall, 1982)
Tree Species Selection (Vold and Kowall, 1982)
Suitability for Sand and Gravel (Vold and Kowall, 1982)

4.2.3 RECREATION

Suitability for Playgrounds (Montgomery and Edminster, 1966)
Suitability for Camp Areas (Montgomery and Edminster, 1966)
Suitability for Picnic Areas (Montgomery and Edminster, 1966)
Suitability for Paths and Trails (Montgomery and Edminster, 1966)
Recreation Carrying Capacity (Block and Hignett, 1982)

4.2.4 AGRICULTURE

Agriculture Capability (CLI, 1972; Runka, 1973)
Land Capability Classification for Agriculture in British Columbia (Kenk and Cotic, 1983)

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APPENDIX A

TABLE 1: SOILS OF SOUTHERN VANCOUVER ISLAND AREA

FOREST ZONE[1] AND (SUBZONE)	SOIL PARENT[2] MATERIAL (SURFICIAL MATERIALS)	DOMINANT[3] ASSOCIATED BEDROCK	TEXTURE[4] OR (DEGREE OF DECOMPOSITION)	DOMINANT[5] TAXONOMIC (CLASSIFICATION)	SOIL ASSOCIATION	
					Name	Symbol
Coastal Grand Fir - Western Red Cedar	Colluvium (<1 m)	Intrusive	very gravelly coarse	O.DYB	Sprucebark	SJ
		Extrusive	gravelly mod. coarse	O.DYB	Ragbark	RJ
		Sandstone	gravelly coarse	O.SB	Huffer	HF
		Sandstone, conglomerate	gravelly coarse	O.DYB	Tzuhalem	TM
	Fluvial (recent)	Undifferentiated	medium	O.DYB	Chemainus River	CP
		Undifferentiated	medium	O.HG	Crofthill	CF
		Undifferentiated	very gravelly coarse	O.DYB	Genoa Bay	GA
	Fluvial, fluvioglacial or marine	Undifferentiated	very gravelly coarse	O.DYB	Quamichan	QU
		Undifferentiated	gravelly coarse	O.SB	Langford	L
		Undifferentiated	very gravelly coarse	DU.DYB	Dashwood Creek	DD
	Marine	Undifferentiated	medium	O.SB	Saanichton	SA
		Undifferentiated	medium	O.DYB	Finlayson	FF
		Undifferentiated	moderately fine	O.DYB	Tagner	TT
	Morainal	Undifferentiated	gravelly coarse	DU.SB	Cadboro	CD
		Undifferentiated	gravelly coarse	DU.DYB	Somenos	SE
		Undifferentiated	gravelly mod. coarse or gravelly medium	O.DYB	Haslam	H
	Organic	Undifferentiated	(humic)	T.H	Metchosin	MT
		Undifferentiated	(mesic)	T.M	Azilion	AZ
Coastal Western Hemlock (coast Douglas-fir)	Colluvium (<1 m)	Intrusive	gravelly coarse	O.DYB	Squally	SL
		Intrusive	gravelly coarse	O.HFP	Shepherd	SP
		Extrusive	gravelly mod. coarse or gravelly medium	O.DYB	Rosewall	RL
		Extrusive	gravelly mod. coarse or gravelly medium	O.HFP	Robertson	RB
		Sandstone, conglomerate	gravelly coarse	O.DYB	Hiller	HL
	Colluvium (>1 m)	Intrusive	gravelly coarse	O.HFP	Coombs	CO
		Extrusive	gravelly mod. coarse	O.HFP	Cottam	CE
	Fluvial (recent)	Undifferentiated	medium	O.DYB	Chemainus	CH
		Undifferentiated	coarse	O.DYB	Kuhushan	KA
		Undifferentiated	very gravelly coarse	O.DYB	Cassidy	CA
	Fluvial, fluvioglacial or marine	Undifferentiated	coarse	O.HFP	Kye	KY
		Undifferentiated	very gravelly coarse	DU.DYB	Qualicum	Q
		Undifferentiated	very gravelly coarse	DU.HFP	Hawarth	HA
		Undifferentiated	coarse over medium or gravelly coarse	O.HFP	Beavertail	BL
		Undifferentiated	coarse over medium	GL.HFP	Bowser	B
		Undifferentiated	coarse over mod. fine	O.HG	Parksville	PA
		Undifferentiated	very gravelly coarse over gravelly coarse	DU.HFP	Dashwood	D
	Marine	Undifferentiated	medium	GLE.DYB	Fairbridge	F
		Undifferentiated	medium and mod. fine	O.HG	Cowichan	C
		Undifferentiated	medium and mod. fine	O.DYB	Alberni	A
		Undifferentiated	medium over gravelly medium	O.SB	Merville	M
		Undifferentiated	coarse over medium	O.HG	Tolmie	T

TABLE 1: (Continued)

FOREST ZONE[1] AND (SUBZONE)	SOIL PARENT[2] MATERIAL (SURFICIAL MATERIALS)	DOMINANT[3] ASSOCIATED BEDROCK	TEXTURE[4] OR (DEGREE OF DECOMPOSITION)	DOMINANT[5] TAXONOMIC (CLASSIFICATION)	SOIL ASSOCIATION	
					Name	Symbol
Coastal Western Hemlock (coast Douglas-fir) (continued)	Morainal	Intrusive	gravelly coarse	DU.HFP	Guemes	GS
		Undifferentiated	gravelly coarse	DU.DYB	Shawnigan	S
		Undifferentiated	gravelly coarse	DU.HFP	Quinsan	QN
		Undifferentiated	gravelly medium	GL.DYB	Royston	R
		Undifferentiated	gravelly medium	DU.HFP	Ronald	RA
	Organic	Undifferentiated	(mesic)	T.M	Arrowsmith	AR
Coastal Western Hemlock (western hemlock)	Colluvium (<1 m)	Intrusive	gravelly coarse	O.HFP	Strata	ST
		Extrusive	gravelly mod. coarse or gravelly medium	O.HFP	Rossiter	RT
		Limestone	gravelly medium	O.HFP	Hemmingsen	HG
		Schist	gravelly medium	O.HFP	Healey	HE
		Sandstone, conglomerate	gravelly coarse	O.HFP	Piggot	PT
		Siltstone, shale	gravelly medium	O.DYB	Holyoak	HY
	Colluvium (>1 m)	Intrusive	gravelly coarse	O.HFP	Council	CL
		Extrusive	gravelly mod. coarse	O.HFP	Cullite	CT
	Fluvial (recent)	Undifferentiated	medium	O.DYB	Effingham	EH
		Undifferentiated	coarse	O,DYB	Kammat	KT
		Undifferentiated	very gravelly coarse	O.DYB	Errington	EA
	Fluvial, fluvioglacial or marine	Undifferentiated	coarse	O.HFP	Kinkade	KE
		Undifferentiated	coarse	GLOT.HFP	Sayward	SY
		Undifferentiated	very gravelly coarse	DU.HFP	Honeymoon	HM
	Marine	Undifferentiated	moderately fine	O.HFP	Memekay	ME
	Morainal	Intrusive	gravelly coarse	DU.HFP	Granite	GT
		Undifferentiated	gravelly coarse	DU.HFP	Quimper	QP
		Extrusive	gravelly mod. fine	DU.HFP	Reegan	RN
		Schist	gravelly medium	O.HFP	Herbert	HB
	Organic	Undifferentiated	(mesic)	T.M	Aveline	AE
Coastal Western Hemlock - Pacific Silver Fir (yellow cedar)	Colluvium (<1 m)	Intrusive	gravelly coarse	O.FHP	Shirmish	SI
		Extrusive	gravelly mod. coarse	O.FHP	Rainier	RI
		Extrusive or intrusive	gravelly coarse	O.HFP	Nitinat	NI
		Limestone	gravelly medium	O.HFP	Lemmens	LI
		Schist	gravelly medium	O.HFP	Zebrio	ZI
	Colluvium (>1 m)	Intrusive	gravelly coarse	O.FHP	Crespi	CI
		Extrusive	gravelly mod. coarse	O.HFP	Kildonan	KI
	Fluvial	Undifferentiated	very gravelly coarse	DU.FHP	Hepatzi	HI
		Undifferentiated	very gravelly coarse	DU.HFP	Espinosa	EI
	Morainal	Intrusive	gravelly coarse	DU.FHP	Grilse	GI
		Extrusive	gravelly mod. coarse	DU.FHP	Quibble	QI
		Extrusive or intrusive	gravelly coarse	DU.HFP	Moyeha	MI
		Schist	gravelly medium	O.HFP	Pachena	PI
		Extrusive/Shale	gravelly medium	DU.HFP	Fleetfoot	FI
	Organic	Undifferentiated	(mesic)	T.M	Artlish	AI

TABLE 1: (Continued)

FOREST ZONE[1] AND (SUBZONE)	SOIL PARENT[2] MATERIAL (SURFICIAL MATERIALS)	DOMINANT[3] ASSOCIATED BEDROCK	TEXTURE[4] OR (DEGREE OF DECOMPOSITION)	DOMINANT[5] TAXONOMIC (CLASSIFI-CATION)	SOIL ASSOCIATION	
					Name	Symbol
Coastal Western Hemlock - Pacific Silver Fir (western red cedar)	Colluvium (<1 m)	Intrusive	gravelly coarse	O.HFP	Shelbert	SB
		Intrusive	gravelly coarse	O.FHP	Sprise	SS
		Extrusive	gravelly mod. coarse	O.HFP	Rutley	RY
		Extrusive	gravelly mod. coarse	O.FHP	Reeses	RS
		Limestone	gravelly medium	O.HFP	Hesquiat	HQ
		Schist	gravelly medium	O.HFP	Hatzite	HT
		Argilite	gravelly medium	O.FHP	Hankin	HK
	Colluvium (>1 m)	Intrusive	gravelly coarse	O.HFP	Carwithen	CN
		Intrusive	gravelly coarse	O.FHP	Cotter	CR
		Extrusive	gravelly mod. coarse	O.HFP	Carmanah	CM
		Extrusive	gravelly mod. coarse	O.FHP	Calmus	CS
	Fluvial (recent)	Undifferentiated	medium or mod. fine	O.R	Snuggery	SG
		Undifferentiated	coarse	OT.HFP	Nootka	NT
		Undifferentiated	gravelly coarse	O.R	Heather	HH
		Undifferentiated	gravelly medium to gravelly coarse	R.HG	Sugsaw	SW
	Fluvial, fluvioglacial or marine	Undifferentiated	coarse and mod. coarse	P.FHP	Vargas	V
		Undifferentiated	very gravelly coarse	OT.FHP	Ucluelet	UC
		Undifferentiated	gravelly coarse	GLOT.FHP	Sandhill	SD
		Undifferentiated	very gravelly coarse	DU.HFP	Holford	HO
		Undifferentiated	very gravelly coarse	OT.FHP	Hooper	HP
	Marine	Undifferentiated	mod. fine to medium	O.HFP	Kennedy Lake	KL
		Undifferentiated	mod. fine to fine	GL.HFP	Kootowis	KO
		Undifferentiated	mod. fine to fine	FE.HG	Tofino	TO
	Morainal	Intrusive	gravelly coarse	DU.HFP	Grierson	GR
		Intrusive	gravelly coarse	DU.FHP	Goldstream	GL
		Extrusive	gravelly mod. coarse or gravelly medium	DU.HFP	Quatsino	QS
		Extrusive	gravelly mod. coarse or gravelly medium	DU.FHP	Sarita	SR
		Extrusvie	gravelly medium	DU.HFP	Rowland	RD
		Extrusive	gravelly medium	DU.FHP	Rosander	RR
		Schist	gravelly medium	O.HFP	Hoarder	HR
	Organic	Undifferentiated	(mesic)	T.M	Amphitrite	AT
Subalpine Mountain Hemlock - Pacific Silver Fir	Colluvium (<1 m)	Extrusive or intrusive	very gravelly coarse	O.R	Realex	RX
		Intrusive	gravelly coarse	O.HFP	Snakehead	SU
		Intrusive	gravelly coarse	O.FHP	Smokehouse	SH
		Extrusive	gravelly mod. coarse or gravelly medium	O.HFP	Reginald	RE
		Extrusive	gravelly mod. coarse or gravelly medium	O.FHP	Ritherton	RH
	Colluvium (>1 m)	Extrusive or intrusive	very gravelly coarse	O.HFP	Catface	CC
		Extrusive or intrusive	very gravelly coarse	O.FHP	Chetwood	CW
	Fluvial	Undifferentiated	very gravelly coarse	DU.FHP	Oshinow	OS

TABLE 1: (Continued)

FOREST ZONE[1] AND (SUBZONE)	SOIL PARENT[2] MATERIAL (SURFICIAL MATERIALS)	DOMINANT[3] ASSOCIATED BEDROCK	TEXTURE[4] OR (DEGREE OF DECOMPOSITION)	DOMINANT[5] TAXONOMIC (CLASSIFICATION)	SOIL ASSOCIATION	
					Name	Symbol
Subalpine Mountain Hemlock - Pacific Silver Fir (continued)	Morainal	Intrusive Extrusive Extrusive	gravelly coarse gravelly mod. coarse or gravelly medium gravelly mod. coarse or gravelly medium	DU.FHP DU.HFP DU.FHP	Green Mountain Stockett Shofield	GN SC SU
	Organic	Undifferentiated	(mesic)	T.M	Ahousat	AS
All Zones	Colluvium	Intrusive or extrusive	very gravelly	O.R	Clayoquat	CY

Footnotes:

1. Forest zones and subzones were determined according to methods described in Harcombe (1985). They are generally described in Section 1.6.
2. Refer to Resource Analysis Branch (1978) for definition of surficial material terms.
3. Refer to bedrock in Section 1.3.
4. See texture in Figure 5.
5. Also see Taxonomic Classification Abbreviations on page 198 and/or C.S.S.C. (1978). Dominant taxonomic classification refers to the classification of the soil which represents the most common and/or central concept of the Soil Association. Associated soils have differing classifications.

TEXTURAL GROUPINGS

The textures given in the Texture column of Table 1 are based on a grouping of soil textures. These groupings are as follows:

Coarse-textured group
(1) Very coarse textured: sands and loamy sands
(2) Moderately coarse textured: sandy loam and fine sandy loams

Medium-textured group
(1) Medium textured: loam, silt loam, and silt
(2) Moderately fine textured: sandy clay loam, clay loam, and silty clay loam

Fine-textured group
(1) Fine textured: sandy clay and silty clay
(2) Very fine textured: heavy clay (more than 60% clay)

These groupings are illustrated below in Figure 5.

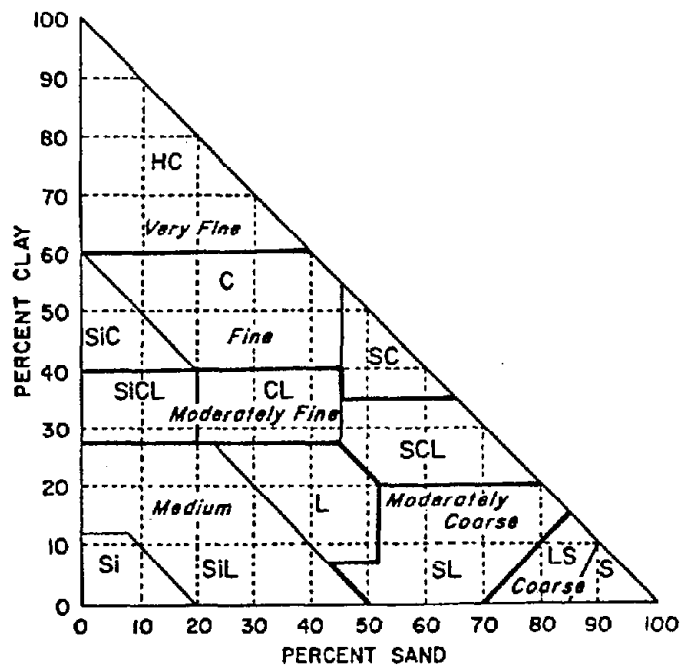

Figure 5. Soil textural triangle showing generalized textural groupings.

TAXONOMIC CLASSIFICATION ABBREVIATIONS

The full name for taxonomic abbreviations in Table 1 are as follow:

Symbol	Subgroup
O.SB	Orthic Sombric Brunisol
DU.SB	Duric Sombric Brunisol
O.DYB	Orthic Dystric Brunisol
E.DYB	Eluviated Dystric Brunisol
GLE.DYB	Gleyed Eluviated Brunisol
GL.DYB	Gleyed Dystric Brunisol
DU.DYB	Duric Dystric Brunisol
O.HG	Orthic Humic Gleysol
R.HG	Rego Humic Gleysol
FE.HG	Fera Humic Gleysol
T.M	Terric Mesisol
T.H	Terric Humisol
O.FHP	Orthic Ferro-Humic Podzol
OT.FHP	Ortstein Ferro-Humic Podzol
P.FHP	Placic Ferro-Humic Podzol
DU.FHP	Duric Ferro-Humic Podzol
GLOT.FHP	Gleyed Ortstein Ferro-Humic Podzol
O.HFP	Orthic Humo-Ferric Podzol
OT.HFP	Ortstein Humo-Ferric Podzol
DU.HFP	Duric Humo-Ferric Podzol
GL.HFP	Gleyed Humo-Ferric Podzol
GLOT.HFP	Gleyed Ortstein Humo-Ferric Podzol
O.R	Orthic Regosol