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Saltspring Island

A LANDSCAPE ANALYSIS

H.E. Hirvonen , J.P. Senyk & E.T. Oswald

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by

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Pacific Forest Research Centre
Canadian Forestry Service
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ABSTRACT

The physical and vegetation characteristics of Saltspring Island are described in terms of landscape associations, with each association depicting a particular range of soil conditions, parent materials and plant communities. For planning purposes, each association is composed of one or more landscape units. Based on the physical and biological characteristics of each landscape unit and on the interrelationship of units within an association, some use suitabilities are outlined. Some management considerations, illustrating the kinds of problems and assets that may be encountered with a particular unit for a given use, are included.

ACKNOWLEDGEMENTS

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Preface

This study stems from an original request by the Planning Division of the Capital Regional District to provide information on the physical and biological elements of Saltspring Island, and to indicate how this information may be utilized as input for urban planning on the Island. In analyzing the data obtained, an effort was made to complement the basic accords outlined in the Saltspring Electoral Area Community Plan.

In this study, basic physical and vegetation parameters are analyzed and grouped into landscape associations. The map depicting these associations serves only as a visual aid to their location and distribution and is not a land plan. The interpretations provided are not steadfast, but serve to point out the relative natural ability of a landscape association (by means of landscape units) to sustain a certain use. The study team realizes that some of the interpretations are cursory in nature and that many more interpretations for various uses could have been made. However, the intent was not to provide data for a comprehensive plan, but merely to indicate the kinds of problems and decisions with respect to the landscape that would have to be dealt with in land planning on Saltspring Island.

This study is, in part, a learning process of what aspects of the forested landscape are more important than others in urban planning. Comments concerning technical details, desirable changes or any other aspect of this study are invited. Address correspondence to the Director, Pacific Forest Research Centre, 506 W. Burnside Road, Victoria, B.C.

H.E. Hirvonen,
Study Co-ordinator.

INTRODUCTION

Saltspring Island is the largest of the Gulf Islands, covering seventy-odd square miles. Its geographic proximity to Vancouver and Victoria has, in the last few years, not only put pressure on its land resource to accommodate expanding suburban development, but also it is facing an ever increasing demand from people seeking a variety of recreational pursuits. The bountiful natural aesthetics of the Island and its surrounding marine environment make it a major recreation area.

An immediate problem exists in planning for the Island's future in such a way as to accommodate these external pressures and still maintain in rural atmosphere and aesthetic beauty. This report offers one guide whereby the environmental impact of potential uses may be examined.

Emphasis is placed on possible ecological (physical and biological) effects of projected uses on a specific area. With this approach, the intent is to provide guidelines for a general land plan that would harmonize with and not overwhelm the surrounding environment. The Island is divided into landscape associations and unit sub-divisions based on an analysis of various physical and vegetation parameters useful in land planning. Although the results are generalizations about land, such divisions are useful in that a cataloguing of the ecological complexity of land into workable divisions results.

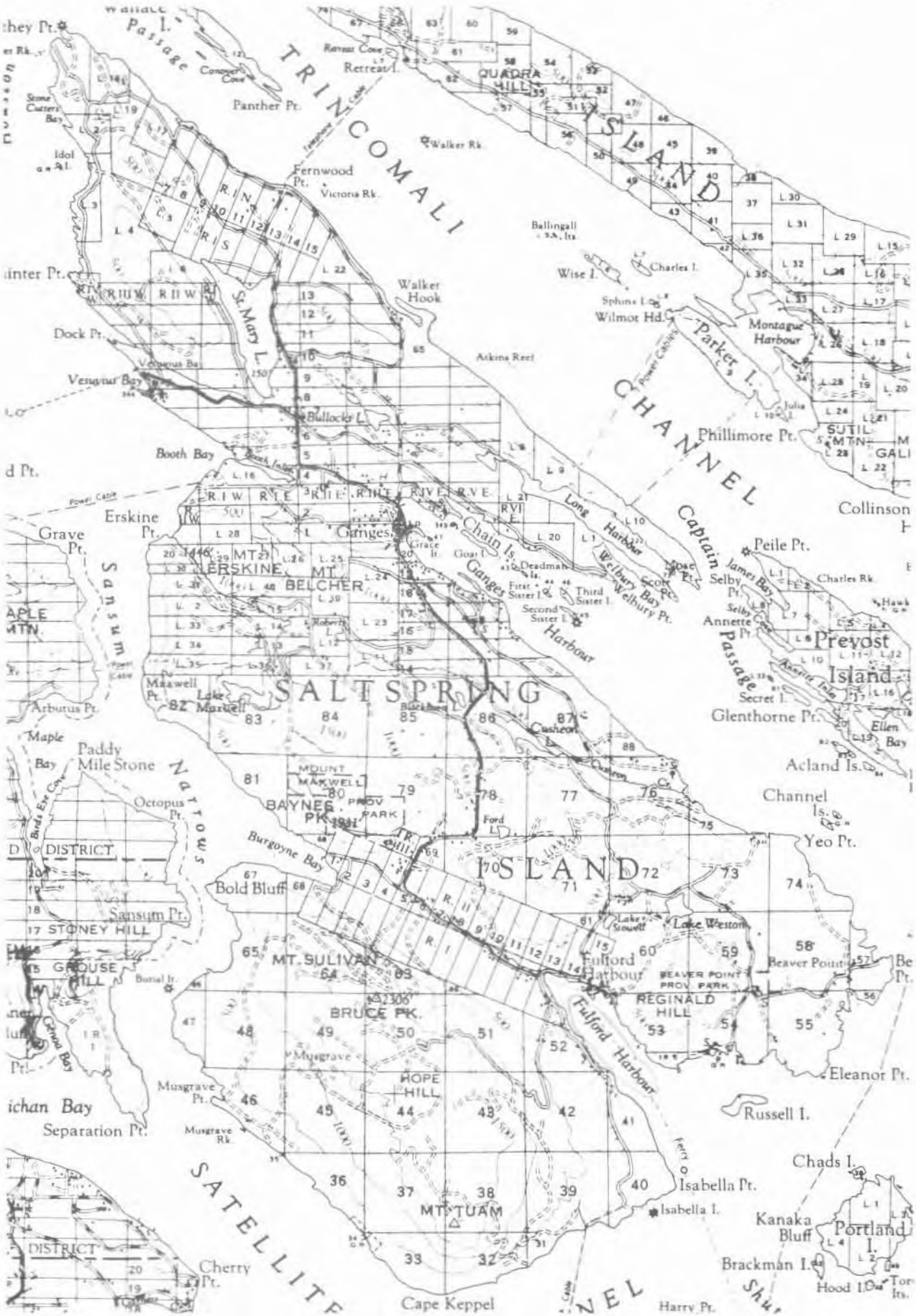
A general geological, landform, soil and vegetation description is presented to establish the biophysical setting of the Island. The vegetation communities and landscape associations are described in detail and specific management considerations for each association are outlined in tabular form.

GENERAL DESCRIPTION

Saltspring Island is characterized by hilly and rugged topography. Upland areas generally range from 600 to 1800 feet above sea level to a maximum of 2311 feet at Bruce Peak. Much of this rugged relief occurs on the southern two-thirds of the Island. Elevations around St. Mary Lake in the north rarely exceed 800 feet. Major transportation routes and settlements have developed along the valley bottoms and other low relief areas that separate the highlands.

I Geology

Saltspring Island is included in the Nanaimo Lowland subsection of the Georgia Depression (Holland, 1964). Much of this subsection is characterized by the low sedimentary ridges separated by narrow valleys. This ridge-valley pattern is the result of differential erosion of the various sedimentary rocks. Ridges such as Walker Hook, Athol Peninsula and Scott Point are underlain by hard, erosion resistant sandstone and conglomerate beds. The intervening valleys have been eroded in shales and other soft rocks.


TRINCOMALI
CHANNEL
SALT SPRING
ISLAND
Wallace I.
Passage
Retreat I.
QUADRA
Panther Pt.
Fernwood
Pt.
Victoria Rk.
Walker Rk.
Ballingall
Is.
Wise I.
Charles I.
Sphinx I.
Wilmot Hd.
Walker
Hook
Dock Pt.
Vesuvius Bay
St. Mary L.
Bullocks L.
Booth Bay
Atkins Reef
Parker I.
Montague
Harbour
Phillimore Pt.
SUTIL
MTN.
Collinson
Captain
Erskine
Pt.
Ganges
Chain Is.
Goat I.
Deadman
Is.
Long
Harbour
Welbury Bay
Welbury Pt.
Scott
Pt.
Peile Pt.
James Bay
Selby
Pt.
Charles Rk.
Annette
Pt.
Prevost
Island
Secret I.
Glenthorne Pt.
Ellen
Bay
Acland Is.
Grave
Pt.
Sansum
ERSKINE
MT.
BELCHER
Maxwell
Pt.
Lake
Maxwell
Arbutus Pt.
Maple
Bay
Paddy
Mile Stone
Octopus
Pt.
Narrows
Bird's Eye Cove
DISTRICT
Sansum Pt.
STONEY HILL
GROUSE
HILL
Burial Pt.
Canoe Bay
Pt.
Burgoyne Bay
Bold Bluff
MOUNT
MAXWELL
PROV. PARK
BAYNES
PK.
1931
Ford
L.
Cushcon
Pt.
Channel
Is.
Yeo Pt.
Lake
Stowell
Lake
Weston
Fulford
Harbour
BEAVER POINT
PROV. PARK
REGINALD
HILL
Beaver Point
Eleanor Pt.
Russell I.
MT. SULIVAN
2306
BRUCE PK.
Musgrave
HOPE
HILL
Musgrave
Pt.
Musgrave
Rk.
ichan Bay
Separation Pt.
SATELLITE
CHANNEL
Isabella Pt.
Isabella I.
MT. TUAM
Chads I.
Kanaka
Bluff
Portland
I.
Brackman I.
Hood I.
DISTRICT
Cherry
Pt.
Cape Keppel
Harry Pt.

Interbedded sandstones and shales along a road cut north of St. Mary Lake.

An exposed conglomerate sedimentary rock outcrop near Scott Point.

Shales, sandstones, siltstones and conglomerates predominate in the northern half of the Island. Sedimentary outcrops include Mount Erskine and Baynes Peak. The sedimentary beds extend east of Burgoyne Bay along the valley to Fulford Harbour and south along the slopes to Isabella Point. Intrusions of quartz - and feldspar - rich igneous rocks occur on the slopes abutting Burgoyne Bay and along the westerly slopes north of Maxwell Point. Cape Keppel is primarily sandstone, but it is isolated from other major sedimentary outcrops by beds of volcanic origin.

Volcanic rocks assume prominence south of Fulford Creek. Ridge tops such as Mount Sullivan, Bruce Peak and Hope Hill and associated highlands are composed mainly of andesites, tuffs and breccias interspersed with scattered outcroppings of green schists. Mount Tuam contains some slate outcroppings.

Volcanic rocks consisting mainly of tuff and breccia in association with limestone, argillite, quartzite and green schists encompass the land around Lake Weston and Reginald Hill.

II Landforms and Soils

Marine silts and clays predominate low relief areas to approximately 300 feet above sea level and soils derived from them have textures ranging from silt loam to clay loam. They are generally moderately well-drained and of low permeability. Poorly drained areas are characterized by sedge meadows or swamp grass-willow communities. Drainage of such wetlands generally improves the land for agricultural purposes.

Deposits of coarse marine sands over fine marine materials occur on the gently sloping banks extending northward from Walker Hook to beyond Fernwood Point. They adjoin a large area of medium textured marine deposits interspersed with pockets of coarse textured till situated north of Ganges and east of St. Mary Lake.

Outwash deposits occur sporadically along most of the river valleys on the Island and in isolated pockets within deep marine and till deposits. Major deposits occur along the upper reaches of Fulford Creek and on mid-slopes inland from Isabella Point. They are characteristically well-drained and coarse textured and tend to be very dry during the summer.

Imperfectly to poorly drained alluvial deposits (generally silt loam in texture) occur as minor intrusions along the valley bottoms. In depressional areas, where the internal drainage of the soil is poor and the water table is close to the surface, organic soils have formed.

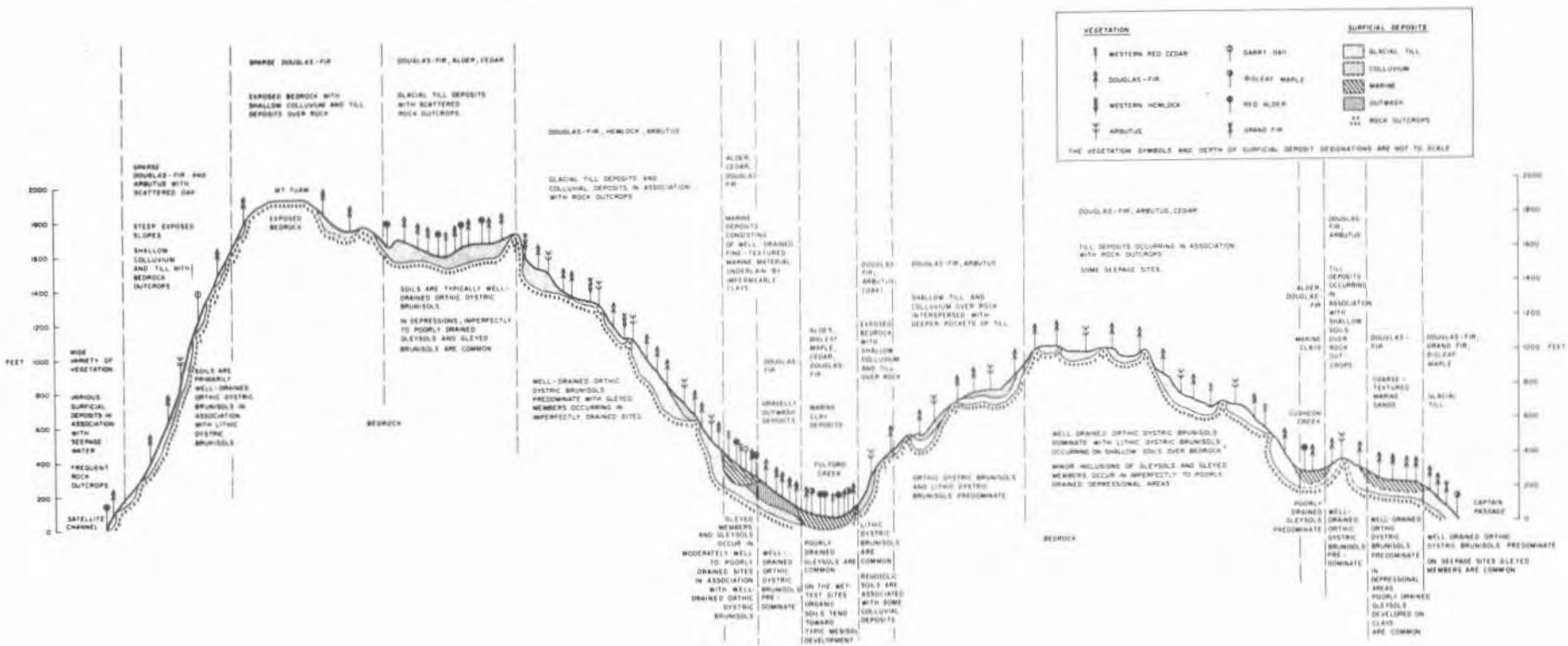
The highlands are covered, in large part, by shallow till deposits over bedrock. Large tracts of deep till in association with minor rock outcrops exist, particularly on the undulating topography surrounding Hope Hill. Surface modification of the till by water has occurred in some places. Steep slopes associated with these highland areas consist predominantly of shallow soils over bedrock. Deep colluvial deposits have formed at the foot of these slopes. These deposits consist of coarse gravels and rock fragments

Volcanic bedrock outcrops, in association with shallow till and colluvium and some deeper pockets of till, characterize the slopes of Mount Tuam.

A gravel pit adjacent to Fulford Creek consisting mainly of stratified, coarse textured outwash materials.

SCHEMATIC PROFILE TRAVERSING SALTSPRING ISLAND FROM CAPE KEPPEL TO CAPTAIN PASSAGE

INDICATING GENERAL VEGETATION, SOILS AND TOPOGRAPHIC RELATIONSHIPS



and are well-drained. Often they receive continuous seepage moisture from the upper slopes. The occurrence of western red cedar, western hemlock and swordfern is an indication of such seepage.

III Vegetation

The vegetation type developed within the climatic regime of Saltspring Island has been termed the Strait of Georgia Section of the Coast Region (Rowe, 1972), or the Coastal Douglar-fir Biogeoclimatic Zone (Krajina, 1969). It is characterized by the presence of Garry oak and arbutus, and the capability of Douglas-fir to regenerate under a forest canopy. Western hemlock, western red cedar, grand fir, red alder, bigleaf maple and flowering dogwood are common, but are usually located on sites wetter or drier than normal.

Several plant communities normally develop under a particular climatic regime because alterations in the physiography create different site conditions. For example, some areas receive seepage water while others shed it; some have deep soil, others shallow; some soil is fine textured and some is coarse textured. Each species has a particular set of environmental conditions in which it can grow or successfully compete with other species.

A complicating factor in describing vegetation communities is stand history. On Saltspring Island, nearly all areas have been recently disturbed through fire, logging, grazing, and urban and rural activities. Consequently, assemblages of plant species, which do not fit the communities described for the Island, occur because they represent a successional stage rather than the stable climax community. This accounts for the abundance of such species as fireweed, Scotch broom, gorse, stinging nettle, western fescue, orchard grass, arbutus and western red cedar.

ANALYSIS PROCEDURE

The following chart illustrates the basic approach used in this study to arrive at land units for interpretive purposes.

Surficial Materials

(Landforms and soils)

+

Vegetation Communities

↓

Landscape Associations

↓

Landscape Units

I Surficial Materials

Much of this information was supplied by the regional Soil Research Institute of the Canada Department of Agriculture (Wiken, 1973). Essentially, Saltspring Island was divided into various landform and soil units based on topography, soil characteristics, landform characteristics and available climate data (Marshall, 1973). Refinements to this base data were made in those areas where field observations allowed for a more detailed analysis of the terrain.

II Vegetation Communities

An attempt was made to identify the more familiar or easily recognizable communities on the Island. The community designations follow descriptive patterns established by Krajina and Spilsbury (1953) and Mueller-Dombois (1959). The scale of description followed the general guidelines established by Eis et al. (1973) in their vegetation assessment of the Capital Regional District. Extrapolations from other Saanich Peninsula studies were also made (Szczawinski and Harrison 1972; Roemer, 1972).

The following communities were described. They are arranged in gradation from the community representative of the driest sites on the Island to the wettest sites characterized by various swamp communities.

Douglas-fir/Moss - Grass Community

This community occurs on extremely shallow soils, often consisting solely of a root mass, over bedrock. Tree cover is sparse and rooting takes hold in interstices of the rock. Douglas-fir is the most prevalent species but arbutus, Garry oak and western red cedar are often present. The understory vegetation consists of a thin carpet of little hair-grass, little clubmoss and rock and dry land mosses (see Appendix III). Hairy manzanita is occasionally found at lower elevations. At high elevations, such as Bruce Peak, kinnikinnick is a common associate. Good examples of this community may be found at Scott Point, Beaver Point and on the west facing slope between Vesuvius and St. Mary Lake.

Douglas-fir - Arbutus/Salal Community

This is the predominant community on rock outcrops that consists of highly fractured bedrock, or of a shallow soil mantle which has accumulated on the bedrock. The primary vegetative feature separating it from the previous community is the prevalence of arbutus. Garry oak is present, but its distribution is sporadic. The understory is dominated by salal and Oregon grape. The moss layer is composed essentially of rock and dry land species. Epiphytes are not well developed and liverworts occur in pockets or shaded areas. This community is well distributed throughout the island.

Douglas-fir/Salal - Oregon Grape Community

This community is the climatic climax vegetation type for the area

Douglas-fir/moss-grass community on extremely shallow soils over bedrock. Douglas-fir and garry oak occur sparsely. Grass, moss and a variety of forbs occupy the rock surfaces.

Douglas-fir - arbutus/salal community on shallow soils over bedrock. Arbutus and Douglas-fir dominate. Salal and Oregon grape are the major understory species.

Douglas-fir/salal-Oregon Grape Community on well-drained shallow soils.
Douglas-fir is the most common tree species.
Oregon grape is abundant; salal tends to be sparsely scattered.

Douglas-fir western hemlock/salal-Oregon-grape community on moderately deep till. Douglas-fir and western hemlock are dominant tree species.
Salal and Oregon grape are the major understory species.

and is widespread on Saltspring Island. It occurs primarly on till soils and well-drained alluvial or colluvial soils. Douglas-fir is the dominant tree species but western red cedar is abundant, especially in those areas that have been logged but not burned and where selective logging has removed Douglas-fir but not other species. Arbutus and willow are common. Garry oak may occur on drier aspects. Salal is the dominant understory species. Oregon grape is almost always present and may become abundant on the drier aspects. Twin-flower, raspberry, huckleberry, blackberry and rose are usually present. A well-developed moss layer, composed of moist land mosses, is usually present. Epiphytes are common.

Douglas-fir - Western Hemlock/Salal - Oregon Grape Community

This community occurs on till soils at higher elevations and on north slopes at moderate elevations. Douglas-fir and western hemlock are the dominant trees species. Douglas-fir frequently dominates the upper tree canopy, western hemlock occurring as the main understory species. Western white pine, lodgepole pine, western yew and red alder may also occur in the community. Salal and Oregon grape are the major understory species. Twinflower, rose, raspberry, huckleberry and blackberry are, to some extent, represented. The moss layer is composed of moist and disturbed land mosses (see Appendix III). Epiphytic mosses and liverworts occur mostly at the base and on lower branches of trees. This community may be considered transitional between the Coastal Douglas-fir and the Coastal Western Hemlock Biogeoclimatic Zones but leans more toward the Douglas-fir Zone. Good examples of the community can be found between Mount Tuam and Bruce Peak and on Mount Belcher.

Douglas-fir/Salal - Swordfern Community

This community occurs extensively along lower slope positions in areas that receive seepage water. The soils are usually coarse textured but have an impervious layer that holds the water within two to three feet from the surface. Douglas-fir is the predominant tree species, but western red cedar and grand fir are almost always present. Western hemlock occasionally occurs along with alder and maple. The understory is characterized by salal and swordfern. Swordfern never attains the dense lush growth found in the following communities, and salal is usually rooted in logs or stumps. It could be considered as a transitional community between salal and swordfern sites. Snowberry, huckleberry, rose, raspberry and Saskatoon berry are among the most common shrubs. Moist land mosses are the major constituents of the moss layer, but wet land species may be present. Liverworts are common.

Douglas-fir - Western Red Cedar/Swordfern Community

This community occurs in depressional areas or on nearly level positions that have ample water most of the year. It is more prevalent on, but not restricted to, the north sides of mountains. Douglas-fir and western red cedar are the major tree species, but grand fir, red alder and bigleaf maple are frequently present. Douglas-fir attains its highest productivity in this community but does not regenerate under a canopy.

Douglas-fir/salal-swordfern community on moderately deep moist soils. Swordfern is common throughout; salal is seen mostly rooted on logs or stumps. Some alder occurs.

Douglas-fir-western red cedar/swordfern community on moderately deep soils that are moist most of the year. Swordfern forms a discontinuous ground cover in association with various forbs and shrubs.

Red alder/swordfern community on poorly drained soils in depressions. Swordfern forms a lush continuous ground cover.

Swamp communities on poorly drained organic soils. No trees occur except at the margins. Swamp grasses and a variety of forbs, mosses and shrubs predominate.

Swordfern is dominant in the understory vegetation and forms dense lush growth. Various shrubs may also be present, including salal, but they are mostly rooted on logs and stumps or on elevated knolls such as around tree bases. This community frequently occurs around the margins of the following community.

Red Alder/Swordfern Community

This community occupies poorly drained depressions that are wet most of the year. It often occurs on fine-textured alluvium or marine materials in valleys, but may also occur in depressions in bedrock. Red alder is the dominant tree, but occasionally bigleaf maple and western red cedar are present. Swordfern is the major understory species, but a large variety of shrubs and forbs are sparsely distributed throughout. Wet land mosses and liverworts are common and moist land mosses occur on logs and stumps. Epiphytes are prevalent and occur from the base to near the top of the trees. The community occurs in rather small patches that are scattered over the entire island, especially at lower elevations. Good examples may be found near Fulford Harbour.

Swamp Communities

These communities occur in very poorly drained depressions that are saturated or inundated most or all of the year. The soil material consists largely of organic remains of vegetation. The type of plant community occurring on these soils depends on the amount and duration of free water present. If standing water occurs essentially all year. cattails are dominant. If standing water is not present all year, various grasses, sedges, bulrushes and rushes dominate, the particular assemblage being dependent on the degree or extent of drying. These areas are too wet for tree growth, but willows and some other shrubs may occur on hummocks or around the edges of the swamp. Good examples of the community occur near St. Mary Lake.

III Landscape Associations

Landscape association divisions were based mainly on surficial materials and topographic position, utilizing vegetation parameters as additional aids. These associations describe natural landscapes in a disturbed or undisturbed state, with a recurring pattern of soils, vegetation, landforms and topography. If an area under consideration has been relatively undisturbed, allowing for a climax vegetation pattern to emerge, the landscape association describing that area is similar to one of the aforementioned vegetation communities. Otherwise, an association, although it may fall within one or more of the vegetation communities, may have dissimilar vegetation distribution patterns.

Because of the recognizable similarity of biophysical relationships within associations (and differences between associations), they supply the basis for management interpretations.

IV Landscape Units

Landscape associations are divided into landscape units. These units describe the biophysical variability within an association. They are defined if they make up 10 percent or better of the overall association or are of key importance to the overall management. Thus, the landscape unit level recognizes differences in site for which different management problems exist and for which specific interpretations can be made. These units are too small and too closely interrelated to be mapped as separate entities at the scale of this study. However, with the description provided, they can be recognized in the field (see Appendix II).

MANAGEMENT USE CONSIDERATIONS

I Limitations

While this study provides information on the ecological sensitivity of Saltspring Island, it cannot be used for management of individual parcels of land. The data on which the interpretations are based were initially gathered for overall planning rather than for site specific use. Accordingly, this study can be used only as a guide for an overall plan for the Island.

The complexity of the landscape necessitated that arbitrary breaks be made. Small site specific depressions, till pockets, rock humps or swamps could not be mapped separately. Thus, each mapping unit (landscape association) is likely to have minor inclusions not described in the analysis of that unit. This again points out the need for site specific analysis for site specific management.

II Sensitive versus Tolerant Landscapes

The landscape associations have been divided into one of two basic categories, based on the natural stability of their surficial materials and on the ability to support varying intensities of use without resulting in serious deterioration of the vegetative and physical characteristics of the association. In the division of the associations into the following two categories, recognition must be made of the fact that a continuum of conditions exists. Not all sensitive associations are equally sensitive and not all tolerant associations are equally tolerant. An attempt has been made to fit each association into the grouping that is most suitable.

1. Sensitive Landscape Associations

These are associations that, for reasons of shallow soils, excessive slopes, poor drainage, etc., with accompanying shallow-rooted vegetation, are highly susceptible to serious damage of the soil mantle and vegetation present through intensive or uncontrolled residential use, recreation or grazing.

In addition, all landscape associations within present and future watersheds where quantity and quality water sources are of key importance

are included in this category. This takes in all associations within the St. Mary Lake, Cusheon Lake and Weston Lake watersheds, as outlined in the Official Community Plan of Saltspring Island (1972), and the Lake Maxwell watershed, a potentially important watershed in the future. The availability and quality of water is a major concern on Saltspring Island, thus rendering all the watersheds as sensitive areas to use.

2. Tolerant Landscape Associations

These landscape associations have characteristically deep to moderately deep, medium to coarse textured soils on moderate to level topography with good drainage. Vigorous, deep-rooted, hardy vegetation dominates. These associations may be subjected to fairly intensive use and development with minimal deterioration of their physical and biological attributes. However, one must keep in mind that any intensive use of any area will substantially modify the faunal and floral conditions that exist.

Individual landscape units within an association provide a means of assessing the sensitivity of sensitive associations and, similarly, the relative tolerance of tolerant associations. Even within tolerant associations there may be units highly susceptible to deterioration. Specific use suitability must be considered and planned for accordingly.

Consequently, similar landscape units may have differing management considerations attached to them. These considerations are influenced, in large part, by whether the unit is part of a tolerant or sensitive association, by the unit's relative importance within an association (in size or otherwise) and by the interrelationship of units within an association.

LANDSCAPE ASSOCIATION TABLES

The tables are divided into two sections: the first outlines use interpretations for all sensitive associations; the second outlines similar interpretations for all tolerant associations. The associations are referenced by number to the landscape association map accompanying this report.

The landscape units comprising any specific association are described in Appendix II. Within the tables, the unit comprising the largest area within an association is outlined first and subsequent units are evaluated in descending order of area.

The hazards listed pertain to the landscape unit as a whole, whereas management considerations have been tied to one of the specific use suitabilities mentioned. Some management considerations are important to more than one potential use, but to avoid excessive repetition, these considerations are mentioned with the use most directly to be affected.

Recreation, forestry, wildlife and agriculture use are rated in descriptive terms, although much of the background information was obtained from Canada Land Inventory (CLI) sources (Benn, 1973; Blower, 1973; Marshall, 1973; Wiken, 1973) and some CLI field procedures were used

(Kowall, 1969). A small outline of each use potential was deemed more useful than a class rating system.

The suitability of a landscape association to residential use is determined by the physical and biological properties of that association. Economics and social parameters are not considered, although some of these are noted under management considerations. Accordingly, units classed as "avoid, if possible" may be suited to residential development if various economic and social factors are deemed to outweigh the ecological damage that could result. Often, for example, the best suited areas for residential development from a physical standpoint are also the best lands for tree growth or for agriculture. Social pressures may demand that such areas be directed away from such lands. This may mean direction toward areas dominated by sensitive landscape associations.

No attempt has been made to assess the value of one use against another for any unit. Each use is considered individually for each land unit and, at times, in terms of each association. The land planners are left with the task of analyzing the information given with other pertinent information in determining a land plan.

SENSITIVE LANDSCAPE ASSOCIATIONS

LANDSCAPE ASSOCIATION

1

Douglas-fir, kinnickinnick, moss, grass on shallow soils over rock. Occurs only on Mount Tuam and Bruce Peak. Presently used for beacon, relay and lookout towers. Can be considered to be within the Douglas-fir/moss-grass community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
B	- high erosion potential - droughty, fire prone - dangerous footing	RECREATION: hiking and viewing (some of the best panoramic views on the Island).	- kinnickinnick unique to these high elevation areas. - exposed, high wind areas. - trampling may cause root damage and surface soil sloughing - difficult access.
		FORESTRY: not viable.	
		WILDLIFE: extensive use by deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- probable high servicing costs. - effluent disposal problems due to bedrock at or close to the surface.

The effects of sheep browsing on the westerly slopes of Mount Tuam is clearly evident. Luscious grass growth occurs within the fenced area where browsing has not occurred.

Clear-cutting and subsequent slash burning has destroyed part of the soil mantle in some areas of the Island. Regeneration to former forest cover is difficult.

LANDSCAPE ASSOCIATION

2

Douglas-fir, grass, moss on shallow soils over rock with frequent rock outcrops. Has aesthetic appeal in association with adjacent landscapes. Portions fall within the Maxwell Lake watershed. Heavily sheep grazed. Can be considered to be within the Douglas-fir/moss-grass community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
A	- high erosion potential - dangerous footing - droughty, fire prone	RECREATION: hiking, viewing and climbing.	- fragile understory vegetation and soil mantle. - exposed high wind areas. - difficult access.
		FORESTRY: limited potential for growth of commercial Douglas-fir.	- originally clear-cut. - severe problems in revegetating. - soils have low moisture holding capacity. - steep slopes. - sheep browsing of seedlings.
		WILDLIFE: some spring browse for deer. - shelter and food for upland game birds.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- probable high servicing costs. - effluent disposal problems due to shallow soils over rock.

LANDSCAPE ASSOCIATION

3

Garry oak, Douglas-fir on shallow soils over rock. Occurs within the St. Mary Lake watershed and Beaver Point Provincial Park. Can be considered to be within the Douglas-fir/moss-grass community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
C	- high erosion potential - droughty, fire prone - dangerous footing	RECREATION: hiking and viewing - cottaging when associated with marine environment.	- heavy trampling may cause root damage and surface soil slough. - special care with open fires.
		FORESTRY: some selective cutting possibilities. - non-viable commercial operation.	- past history of selective logging. - severe revegetating problems. - low moisture holding capacity.
		WILDLIFE: spring browse for deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- oak communities may warrant preservation (perhaps ecological reserve status) because of limited occurrence. - probable high servicing costs. - effluent disposal problems due to shallow soils over rock.
A	- high erosion potential - droughty, fire prone - danagerous footing	RECREATION: hiking and viewing.	- heavy trampling may cause root damage and surface soil slough.
		FORESTRY: some selective cutting possibilities. - non-viable commercial operation.	- severe revegetating problems. - low moisture holding capacity. - some wind-throw potential.
		WILDLIFE: some spring browse for deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- probable high servicing costs. - effluent disposal problems due to shallow soils over rock.

LANDSCAPE ASSOCIATION

4

Douglas-fir, Garry oak, arbutus occur on shallow, occasionally deep, coarse-textured, well-drained till and colluvium. Arbutus has increased considerably after logging. Portion occurs within St. Mary Lake watershed. Can be considered to be within the Douglas-fir - arbutus/salal community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
C	- high erosion potential - droughty, fire prone	RECREATION: hiking and viewing.	- maintain variety of age classes, densities and species of trees. - fragile shallow rooted vegetation. - control open campfires.
		FORESTRY: some potential for commercial production of Douglas-fir.	- avoid proliferation of roads and skid trails. - some wind-throw susceptibility. - summer log to minimize chances of erosion from excessively wet conditions. - many sensitive shallow to rock areas.
		WILDLIFE: spring browse for deer.	- open nature of the forest land enhances the deer habitat and allows for a wide variety of upland small animals and birds.
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, of possible. - some low density possibilities.	- probable high servicing costs. - effluent disposal problems in the many shallow over rock areas. Possible effluent seepage along contact with compact till. - possible low density development in areas of deep till.

LANDSCAPE ASSOCIATION

7

Douglas-fir, salal and western red cedar on shallow to deep till and colluvium located on north and east aspects. Slopes are generally cool and moist. Presently, association is dominated by dense stands of young Douglas-fir. Portions occur within the St. Mary Lake watershed. Can be considered to be within the Douglas-fir/salal-Oregon grape community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
F	- high erosion potential	RECREATION: hiking, some viewing.	- avoid seepage sites.
		FORESTRY: some potential for commercial production of Douglas-fir.	- steep slopes. - brush competition. - avoid many roads or skid trails. - could patch log, and regenerate immediately to protect from erosion. - some thinning needed.
		WILDLIFE: extensive use by deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible. - some low density possibilities.	- probable high servicing costs on steep slopes. - effluent disposal problems on shallow to rock areas. Possible seepage of effluents along contact with compact till. - some low density development can be directed to areas with deeper soils.
D	- high erosion potential	RECREATION: hiking, some viewing.	- fragile understory vegetation. - avoid very shallow to rock areas to prevent surface soil slough.
		FORESTRY: not viable.	
		WILDLIFE: spring browse for deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- probable high servicing costs. - effluent disposal problems due to shallow soils over rock. - traversing unit with roads and services may increase erosion.

LANDSCAPE ASSOCIATION

8

Douglas-fir, arbutus and Garry oak on shallow to deep till and colluvium on south and west aspects. Large portions are presently in Park Reserve. Presently, consists of open stands with a sparse understory. Some heavy sheep grazing. Originally clear-cut and burned. Occurs as a minor component in the St. Mary, Stowell and Weston Lake watersheds. Can be considered to be within the Douglas-fir - arbutus/salal community.

LANDSCAPE UNITS	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
D	- high erosion potential - fast runoff - dangerous footing - droughty, fire prone	RECREATION: hiking and viewing.	- no brush problem. - avoid open campfires.
		FORESTRY: some potential for commercial Douglas-fir production.	- needs vegetative rehabilitation in some overgrazed areas. - sheep browse of seedlings. - some steep slopes.
		WILDLIFE: extensive use by deer.	- competition for browse from sheep.
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- difficult access problems. - probable high servicing costs. - effluent disposal problems due to shallow soils over rock.
C	- high erosion potential - fast runoff - dangerous footing - droughty, fire prone	RECREATION: hiking and viewing.	- locate trails on stable deep soils. - oak communities may warrant preservation. - fragile understory vegetation.
		FORESTRY: some selective cutting possibilities.	- many sensitive shallow to rock areas.
		WILDLIFE: extensive use by deer.	- protect from sheep grazing.
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- Garry oak stands may warrant preservation status. - probable high servicing costs. - effluent disposal problems in areas of shallow soil and in till deposits where an impermeable layer occurs near the surface.

LANDSCAPE ASSOCIATION

13

Swordfern with red alder and Douglas-fir on fine marine deposits. Portions occur with the Lakes Stowell and West on watersheds. Generally at elevations below 300 feet. Most of this association is presently in agriculture. Can be considered to be within the red alder/swordfern community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
I	- high erosion hazard - high shrink-swell ratio for soils - soils easily compacted - minor slumping potential - flooding potential	RECREATION: limited use: pastoral viewing.	
		FORESTRY: good potential for commercial production of Douglas-fir.	- low trafficability. - summer logging could lessen damage to soil from excessively wet winter conditions.
		WILDLIFE: wide diversity of species and habitats along valleys.	- agriculture practices limit utilization of large areas.
		AGRICULTURE: very good for field crops.	- heavy soil texture places some limitations on irrigation. - may need ditching and draining.
		RESIDENTIAL: avoid, if possible.	- poor drainage. - poor foundation materials. - lack of good septic field material. - presently within the agriculture land reserve.
K	- high erosion potential - high shrink-swell ratio for soils - soils easily compacted	RECREATION: limited use, outdoor education.	- fragile understory vegetation.
		FORESTRY: not viable.	
		WILDLIFE: browse and cover for deer.	- some conflicts with agriculture.
		AGRICULTURE: good possibilities for field crops with draining.	- seasonal flooding may delay working the soil
		RESIDENTIAL: avoid, if possible.	- poor drainage. - poor foundation material. - lack of good septic field material. - presently within the agriculture land reserve.

LANDSCAPE ASSOCIATION

15

Douglas-fir, red alder with swordfern on medium over fine-textured marine deposits. Some rock outcrops and till inclusions. Presently, dense stands of immature Douglas-fir exist where agricultural clearings do not occur. Can be considered to be within the Douglas-fir - western red cedar/swordfern community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
I	- high erosion potential - minor slump potential - severe soil compaction	RECREATION: hiking and viewing.	- fragile understory vegetation.
		FORESTRY: generally good potential for commercial production of Douglas-fir.	- patch or contour strip logging should reduce soil erosion. - could possibly burn slash, regenerate immediately to reduce brush competition. - avoid wet weather logging. - poor trafficability.
		WILDLIFE: limited use. - browse, good cover for deer in some areas.	- agriculture practices limit utilization of large areas.
		AGRICULTURE: good for field crops	- irrigation may be problem due to heavy soil textures.
		RESIDENTIAL: avoid, if possible.	- poor foundation material. - poor drainage. - lack of good septic field material. - presently within the agriculture land reserve.
K	- high erosion potential - high water table, seasonal flooding - severe soil compaction	RECREATION: limited; outdoor education.	- fragile understory vegetation.
		FORESTRY: not viable.	- subject to wind-throw if stands opened up.
		WILDLIFE: as in unit I.	
		AGRICULTURE: limited - (viable for field crops if drained).	- act as water storage reservoir. - minor frost pockets.
		RESIDENTIAL: avoid, if possible.	- avoid crossing unit with roads and services. - slumping may occur. - poor drainage. - poor foundation material. - lack of good septic field material.

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LANDSCAPE ASSOCIATION

15 con't...

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
D	- high erosion potential	RECREATION: some hiking.	- trails should follow deep, more stable areas. - fragile understory vegetation.
		FORESTRY: some selective cutting possibilities.	- trees subject to wind-throw if stands opened up.
		WILDLIFE: extensive use by deer.	
		AGRICULTURE: not viable.	- avoid grazing on shallow soils.
		RESIDENTIAL: avoid, if possible.	- consists of small areas often surrounded by agricultural land. - effluent disposal problems due to shallow soils over rock.

Excellent viewpoints abound on Saltspring Island. Hikers and picnickers alike can enjoy the panoramic views of varying land use patterns and natural landscapes surrounding them.

The varied shoreline of Saltspring Island provides ample opportunities for cottaging, low tide activities, boating, camping and some beach access. Here, Fulford Harbour provides shelter for fishing vessels. Cottaging abounds along its shoreline and some beach access is available.

Mainly Douglas-fir, red alder and western red cedar on a variety of materials including till, shallow soils over rock, colluvium and fan deposits. Generally seepage areas in exposed positions fronting on salt water. Garry oak, bigleaf maple and arbutus are common. Can be considered to be within the Douglas-fir - western red cedar/swordfern community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
H	- many seepage areas - some slump potential - wave action erosion - highly exposed areas to wind and salt spray	RECREATION: potential associated with water activities - camping and cottaging	- avoid seepage areas. - locate on coarse well-drained material. - fragile understory vegetation.
		FORESTRY: good potential for commercial production of Douglas-fir.	- many poor productive area inclusions. - difficult access. - some steep shorelines exist.
		WILDLIFE: good browse and cover for deer. - diversity of species present.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible. - some low density possibilities.	- slump hazards from wave action and downslope. - effluent disposal problems seepage in areas of shallow soils. - low density development can be directed to stable till areas. - probable high servicing costs.
D	- high erosion potential - droughty, fire prone - highly exposed areas to wind and salt spray	RECREATION: hiking and viewing. - water associated activities.	- oak communities may warrant preservation. - fragile understory vegetation.
		FORESTRY: some selective cutting possibilities.	- trees subject to wind-throw if stands opened up.
		WILDLIFE: extensive use by deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- effluent disposal problems in areas of shallow soils. - probable high servicing costs. - difficult access.

LANDSCAPE ASSOCIATION

17

Swamp grass and associated vegetation on very poorly drained organic soils. Many areas have been at least partially drained and are used for grazing or "hay" crops. No distinction was made among the various organic areas. Can be considered to be within the swamp communities.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
L	- high water table year round - frequently flooded - severe soil compaction problems	RECREATION: limited use; outdoor education.	- boardwalks required. - severe trafficability problems. - may warrant consideration as ecological reserves.
		FORESTRY: not viable.	
		WILDLIFE: nesting feeding areas for various species of birds.	- may warrant preservation.
		AGRICULTURE: generally not viable - some areas may be drained and have potential for growing field crops.	- possible source of peat. - frost pockets.
		RESIDENTIAL: avoid, if possible.	- important as water reservoirs. - catchments for surface and subsurface water flow (could become contaminated). - probable high maintenance costs. - poor drainage. - poor septic field material. - poor foundation material.

TOLERANT LANDSCAPE

ASSOCIATIONS

LANDSCAPE ASSOCIATION

5

Douglas-fir, arbutus with salal on well-drained till interspersed with shallow till and colluvium. One of the most common associations on the Island. It occurs within the St. Mary, Maxwell, Weston and Stowell Lake watersheds. Previous clear-cuts have increased alder and arbutus components. Much of it is presently in dense immature Douglas-fir. Can be considered to be within the Douglas-fir - arbutus/salal community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
F	- minor seepage areas	RECREATION: good for camping, picnicing and hiking. - cottaging and beach activities along the shorelines.	- avoid seepage areas.
		FORESTRY: good potential for commercial production of Douglas-fir.	- stands of overstocked Douglas-fir need thinning. - severe brush competition. - wind-throw problems when stands opened. - burning of slash and immediate regeneration should reduce brush competition after logging.
		WILDLIFE: browse and cover for deer. - wide variety of upland birds and small animals.	- mix of tree species, age classes and densities is desirable.
		AGRICULTURE: limited, some viability for small mixed farming operations.	
		RESIDENTIAL: suburban development possibilities.	- generally good foundation material. - effluent disposal a problem when impermeable, compact till is close to surface. - large lots may be desirable to minimize erosion and sewage disposal problems.
D	- some erosion potential	RECREATION: hiking and viewing.	- fragile, shallow rooted vegetation.
		FORESTRY: some commercial potential for logging purposes if considered with unit F.	- many shallow to rock areas.

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LANDSCAPE ASSOCIATION

5 con't...

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
D con't..		WILDLIFE: use mainly associated with unit F.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: low density possibilities.	- could be utilized as greenspace or buffer in any residential development plans. - avoid crossing this unit with roads and other services. - probable high servicing costs.
K	- high water table, flooding potential - high erosion hazard - soil easily compacted	RECREATION: some potential for outdoor education purposes.	- fragile understory vegetation. - boardwalks could be constructed through unit.
		FORESTRY: limited potential for commercial production.	- wetness and soil slough problems. - low trafficability.
		WILDLIFE: provides browse of cover for deer. - diversity of small animals.	
		AGRICULTURE: viable if drained but should avoid if possible.	- drainage may destroy natural water reservoir.
		RESIDENTIAL: avoid, if possible.	- avoid crossing unit with roads and services. - could become catchments for septic effluents in densely spaced residential development. - poor drainage. - poor foundation material. - could be part of greenspace in a development plan.

LANDSCAPE ASSOCIATION

6

Douglas-fir salal and arbutus on deep coarse textured till on lower slope positions and shallow till and colluvium on upper slopes. Similar to association 5 except that it contains a greater portion of deeper material (unit F), has a minor cedar component and less arbutus. Large areas of dense immature Douglas-fir occur. Can be considered to be within the Douglas-fir/salal - Oregon grape community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
F	- minor seepage areas	RECREATION: good for camping and picnicing. - some hiking potential. - cottaging along shoreline.	- avoid seepage areas. - no problem with outdoor facilities.
		FORESTRY: good potential for commercial production of Douglas-fir.	- stands of overstocked Douglas-fir may need thinning. - severe brush competition. - burning of slash and immediate regeneration after logging should reduce problems from brush competition.
		WILDLIFE: browse and cover for deer. - wide variety of upland birds and small animals.	- mix of species, age classes and densities of trees is desirable.
		AGRICULTURE: limited; some viability for small mixed farming operations.	
		RESIDENTIAL: suburban development possibilities.	- good foundation material. - effluent disposal a problem when impermeable, compact till is close to surface. - large lots may be desirable to minimize erosion and sewage problems.
D	- some erosion potential	RECREATION: hiking and viewing.	- fragile, shallow rooted vegetation.
		FORESTRY: not viable unless considered with unit F for commercial productions.	- many sensitive shallow to rock areas.
		WILDLIFE: use mainly associated with unit F.	

LANDSCAPE ASSOCIATION

6 con't...

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
D con't..		AGRICULTURE: not viable.	
		RESIDENTIAL: low density possibilities.	- could be utilized as greenspace or buffer in any residential development. - avoid crossing this unit with roads and other services. - probable high servicing costs.
K	- high water table, flooding potential - soil easily compacted	RECREATION: outdoor education possibilities.	- fragile understory vegetation. - boardwalks should be constructed through unit.
		FORESTRY: limited, low potential for commercial production.	- low trafficability. - wetness and soil slough problems.
		WILDLIFE: browse and cover for deer.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- avoid crossing unit with roads and services. - could become catchments for effluents. - poor drainage. - poor foundation material. - could be part of greenspace in a development plan.

LANDSCAPE ASSOCIATION

9

Douglas-fir, western hemlock and red alder on hummocky terrain with deep and shallow till with some colluvium at elevations above 1500 feet. Forms a large part of the provincial parkland of Mounts Maxwell, Sullivan and Bruce and Hope Hill. Occurs within the Lake Maxwell watershed. Has some of the oldest timber on Island. Dense stands of young Douglas-fir occur in many areas. Can be considered to be within the Douglas-fir - western hemlock/salal - Oregon grape community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
G	- some erosion potential	RECREATION: hiking and viewing - intensive camping potential.	- old stands may warrant preservation as examples of past history. - cool summers. - avoid seepage sites.
		FORESTRY: good potential for commercial Douglas-fir production.	- difficult access. - avoid wet weather logging. - avoid proliferation of roads and skid trails. - severe brush competition.
		WILDLIFE: browse and cover for deer. - diverse bird and animal life.	- existing diversity of vegetation enhances the habitat for deer and many other animals.
		AGRICULTURE: not viable.	
		RESIDENTIAL: low density possibilities.	- effluent disposal problems where compact till is near the surface.
H	- high water table, periodic flooding - soil easily compacted - slight frost pocket	RECREATION: outdoor education.	- should construct boardwalks. - fragile understory vegetation.
		FORESTRY: good potential for commercial Douglas-fir production.	- avoid large openings, may promote wind-throw. - soil compaction problems.
		WILDLIFE: browse and cover for deer. - diverse bird and animal life.	- avoid drainage.
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- imperfectly to poorly drained till.

con't...

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
H con't			- slumping may occur. - effluent disposal problems because of a high water table.
D	- high erosion potential - droughty, fire prone	RECREATION: hiking and viewing.	- fragile understory vegetation. - direct trails along deep soils.
		FORESTRY: selective cut possibilities.	- avoid large openings in stands, chance of wind-throw. - arbutus will proliferate when fir removed.
		WILDLIFE: extensive use by deer.	- attempt to maintain various age classes and densities.
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- probable high servicing costs. - effluent disposal problems due to shallow soils over rock. - could be utilized as greenspace or buffer in any residential development.

Aside from sheep raising, present agricultural practices on the Island tend to dairying (upper photo) and small orchards (lower photo). Agriculture capability ratings indicate that much of the marine soils are suited to the growing of cash crops. However, cultivation of such crops is not presently widespread.

Douglas-fir, western red cedar and red alder on deep till with minor rock inclusions. Salal and swordfern are common. Occurs within the low lying areas af the Lake Maxwell and Lake Cusheon watersheds. Falls within Provincial Park in the Bruce Peak area. Extensive logging in the past. Presently dense young stands of Douglas-fir with cedar exist. Can be considered to be within the Douglas-fir - western red cedar/swordfern community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
F		RECREATION: camping. - hiking and viewing.	
		FORESTRY: good potential for commercial production of Douglas-fir.	- suited to large patch logging with minimal erosion damage. - some brush competition. - stands need thinning.
		WILDLIFE: good browse and cover for deer. - a wide diversity of birds and small animals.	- past logged areas enhance habitat for deer.
		AGRICULTURE: moderate potential for field crops. - salal harvest potential.	
		RESIDENTIAL: suburban development possibilities.	- difficult access. - effluent disposal problems where impermeable, compact till is close to surface. - some areas fall within the agriculture land reserve.
H	- minor soil compaction problems	RECREATION: limited, some hiking.	
		FORESTRY: good potential for commercial production of Douglas-fir.	- thinning needed on present stands. - wind-throw problems in seepage areas. - some brush competition.
		WILDLIFE: as in unit F.	
		AGRICULTURE: as in unit F.	- some seepage areas are too wet.
		RESIDENTIAL: low density development.	- should concentrate on better drained areas.

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LANDSCAPE ASSOCIATION

10 con't ...

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
H con't..			- effluent disposal problems where impermeable compact till is close to surface. - some areas fall within the agriculture land reserve.
K	- high water table, periodic flooding - soils easily compacted	RECREATION: limited; outdoor education. FORESTRY: some selective cutting possibilities. WILDLIFE: browse and cover for deer. - extensive use by small animals. AGRICULTURE: not viable. RESIDENTIAL: avoid, if possible.	- fragile understory vegetation. - boardwalks should be constructed. - low trafficability. - red alder stands could be a good source of firewood. - may become catchment basin for effluent. - could be reserved as greenspace or buffer in residential development.
D	- high erosion potential - droughty, fire prone	RECREATION: hiking. FORESTRY: not viable. WILDLIFE: extensive use for browse and cover by deer. AGRICULTURE: not viable. RESIDENTIAL: avoid, if possible.	- fragile understory vegetation. - could be reserved for greenspace in residential development. - probable high servicing costs. - effluent disposal problems in areas of shallow soil over rock.

Douglas-fir, red alder, grand fir with salal and swordfern on deep till (some colluvium). Forms much of the shore and backshore of the St. Mary and Maxwell Lake watersheds. Of minor occurrence in the other watersheds. Previously clear-cut. Can be considered to be within the Douglas-fir/salal - swordfern community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
F	- some erosion potential	RECREATION: intensive camp site possibilities. - hiking and viewing. - cottaging along lakeshore and seashore.	- avoid seepage areas.
4		FORESTRY: good potential for commercial production of Douglas-fir.	- brush competition. - avoid cutting close to shoreline to minimize soil slough. - some steep slopes.
		WILDLIFE: browse and cover for deer.	
		AGRICULTURE: limited production field crops.	
		RESIDENTIAL: low density possibilities.	- concenteate in flat, well-drained areas. - effluent disposal a problem due to seepage and shallowness to compact till.
H	- seasonally high water table - high erosion, slump potential in seepage areas	RECREATION: limited; hiking.	- fragile understory vegetation.
		FORESTRY: some potential for commercial production of Douglas-fir.	- low trafficability. - avoid wet weather logging. avoid excessive openings of stands to lessen wind-throw possibility.
		WILDLIFE: as in unit F.	
		AGRICULTURE: not viable.	
		RESIDENTIAL: avoid, if possible.	- effluent disposal problems due to high water table. - poor drainage. - probable high maintenance cost.

LANDSCAPE ASSOCIATION

12

Douglas-fir with salal on deep coarse-textured outwash. Minor occurrence within the Lakes Stowell and Weston watersheds. Can be considered to be within the Douglas-fir/salal - Oregon grape community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
E		RECREATION: good for intensive camping. - trails.	- avoid gravel pits open to view.
		FORESTRY: some potential for commercial production of Douglas-fir.	- moisture deficiency problems.
		WILDLIFE: some browse and cover for deer.	
		AGRICULTURE: moderate field crop production possibilities.	- relatively dry soil conditions in summer.
		RESIDENTIAL: very good suburban development possibilities.	- excellent source of gravels. - few problems with roads and service installations. - good drainage. - effluent disposal may be a problem due to lack of stratified fine materials. - effluent seepage to downslope areas may occur. - much of the area is presently within the agriculture land reserve.

Few small holly orchards dot the agricultural landscape of Saltspring Island.

The use of arable land for the production of Christmas trees is proving to be a viable undertaking on the Island.

LANDSCAPE ASSOCIATION

11

Douglas-fir, western red cedar with swordfern on medium to coarse textured sands over compact fine sands and silts. Occupies. major part of the lowland within St. Mary Lake watershed. Presently being used for agriculture. Can be considered to be within the Douglas-fir - western red cedar/swordfern community.

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
J	- local erosion potential	RECREATION: intensive camping. - cottaging along shoreline.	- avoid seepage areas.
		FORESTRY: good for commercial production of Douglas-fir. - Christmas tree plantation. - forest nurseries. - seed orchards on dry areas.	- seepage may cause problems. - woodlot management a possibility. - fine sands and silts may cause problems for Christmas tree plantations and seed orchards.
		WILDLIFE: extensive use by deer.	- agricultural practices limit full utilization.
		AGRICULTURE: very good for field crops and stock.	- irrigation needed.
		RESIDENTIAL: low density possibilities.	- foundation problems in fine silts and sands. - septic fields would be quite shallow and effluent likely to seep along contact zone. - presently within the agriculture land reserve.
K	- some erosion potential	RECREATION: limited; outdoor education.	- fragile understory vegetation.
		FORESTRY: selective tree cutting possibilities.	- avoid winter cutting. - low trafficability. - red alder stands are a good source of firewood.
		WILDLIFE: browse and cover for deer.	
		AGRICULTURE: good for field crops when drained.	- some areas too wet.

con't...

LANDSCAPE UNIT	HAZARDS	USE	MANAGEMENT CONSIDERATIONS
K con't.		RESIDENTIAL: avoid, if possible.	- avoid crossing unit with roads and services. - could become catchments for effluents. - poor drainage. - poor foundation material. - presently within the agriculture land reserve.
I	- some erosion potential	RECREATION: limited use, viewing.	
		FORESTRY: good potential for commercial production of Douglas-fir. - tree nurseries. - seed orchards.	- woodlot management a possibility. - avoid wet weather logging. - some seepage problems. - some brush competition.
		WILDLIFE: extensive use by deer.	
		AGRICULTURE: good for field crops.	
		RESIDENTIAL: low density development.	- drainage problems. - foundation problems. - effluent seepage along contact with compact materials. - presently within the agriculture land reserve.

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APPENDIX I

GLOSSARY OF TERMS

ALLUVIUM: a general term for all deposits of post glacial rivers and streams.

AVAILABLE SOIL MOISTURE: the portion of water in a soil that can be readily absorbed by plant roots.

BRYOPHYTE: a collective term for any mosses or liverworts.

CLIMAX STAND: the terminal community in a plant succession that is in dynamic equilibrium with the prevailing climate.

COLLUVIUM: loose material accumulated on or at the foot of slopes by various gravitational processes.

DRAINAGE (soil): the rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces.

EDAPHIC: of or pertaining to the soil; resulting from, or influenced by, factors inherent in the soil rather than by climatic factors.

EPIPHYTE: a non-parasitic plant that grows on another plant but gets its noursihment from the air; includes some mosses and lichens.

GLEYED SOIL: an imperfectly or poorly drained soil in which the material has been modified by reduction or alternating reduction and oxidation.

LANDFORM: structural configuration of the topography as a result of past and present geological activity.

MARINE DEPOSITS: materials deposited in salt or brackish water; of variable texture (most often silt, clay and sand); moderately well-sorted and moderately well-stratified.

OUTWASH: material deposited by glacial meltwater consisting generally of sand and gravel; ranges from well-sorted and well-stratified to poorly sorted and poorly stratified.

PARENT MATERIAL: the unaltered or essentially unaltered mineral or organic material from which the soil profile develops by pedogenci processes.

PEDOLOGY: those aspects of soil science involving constitution, distribution, genesis and classification of soils.

PERMEABILITY: the ease with which water and air pass through the soil to all parts of the profile.

PLANT COMMUNITY: an assemblage of plants of different species that occupy similar site conditions and thereby usually occur together.

PLANT SUCCESSION: the orderly process of plant community change over time for a given site.

SEEPAGE: the escape of water downward through the soil; the emergence of water from the soil along an extensive line of surface in contrast to a spring where the water emerges from a local spot.

SOIL TRAFFICABILITY: pertaining to the ability of a soil to stand up to vehicular movement.

TILL: materials deposited directly by ice; variable textures (most often a mixture of sands, silts and clays - some often stony and bouldery); unsorted and unstratified.

WATER TABLE: the upper limit of the part of the soil or underlying rock material that is wholly saturated with water.

The following definitions of the soils outlined in this report are general descriptions adapted from the classification of soils as outlined by the Canada Soil Survey Committee (1970).

DYSTRIC BRUNISOLS: mildy acid soils generally indicative of drier environments. They are normally well-drained and medium to coarse textured.

- lithic dystric brunisols: shallow dystric brunisol soils. Depth to bedrock is 10-50 cm.

- orthic dystric brunisols: well-drained, medium to coarse textured dystric brunisols; considered the "modal" soil for a dystric brunisol environment.

GLEYSOLS: soils that occupy depressional areas of the landscape and are saturated with water for extended periods of time throughout the year.

ORGANICS: soils of organic origin which accumulate in and around closed basins or moisture receiving positions within the landscape; usually wet and unstratified.

- typic mesisol: an organic soil that is in a stage of partial decomposition and is usually wet.

REGOSOLS: new or young soils that, due to ongoing processes, do not exhibit definite horizon characteristics.

APPENDIX II

LANDSCAPE UNITS

Key identifying features for each unit are underlined.

UNIT NUMBER	DESCRIPTION
A	Various grasses and mosses occur on very shallow soils over rock. Rock outcrops are common. Sparse Douglas-fir and Garry oak occur in the few till and colluvium depressions that occur. Drainage is very rapid. Topography is moderately to steeply sloping.
B	Douglas-fir with kinnickinnick and various mosses and grasses occur on very shallow colluvium at uppermost elevations. Rock outcrops are common. Soils are coarse-textured and rapidly drained. Topography is gently undulating to steeply sloping.
C	Garry oak, Douglas-fir and arbutus dominate with various grasses mosses on shallow colluvium and till with occasional deep till deposits. Stands are open in nature. Soils are coarse textured and well to rapidly drained, but a compact, impermeable layer may occur at depths of about three feet.
D	Douglas-fir and arbutus in association with salal occur on shallow to very shallow soils. Western red cedar and Oregon grape are also common. Soils are coarse to medium textured and well to rapidly drained. Topography is undulating.
E	Douglas-fir with salal occur on deep outwash gravels with instrusions of deltaic and fan materials. Scattered rock outcrops and till pockets occur. Soils are coarse textured and well drained. Topography is gently sloping.

F — Douglas-fir and salal occur on deep till with some colluvium. Western red cedar and swordfern are common on the occasional seepage areas that occur. Soils are medium to coarse textured and well to moderately well-drained. A compact impermeable layer may occur at depths of about three feet. Topography is moderately to steeply sloping.

G — Douglas-fir, western hemlock with salal on deep tills at elevations above 1500 feet. Soils are well-drained and coarse textured. A compact impermeable layer exists at depths of approximately three feet. Topography is undulating.

H — Douglas-fir, red alder, bigleaf maple and western hemlock occur with swordfern on deep tills. Seepage moisture is common. Soils are medium textured and moderately well to imperfectly drained. A compact impermeable lay may occur at depths of about three feet. Topography is slightly depressional to moderately sloping.

I — Douglas-fir, red alder and western red cedar occur with swordfern on marine silts and fine sands. Salal occurs on the few well-drained portions. Soils are medium to fine textured and moderately well-drained. Topography is flat to gently sloping.

J — Douglas-fir and western red cedar occur with swordfern on coarse marine sands over compact fine sands and silts. Soils are generally well-drained with some moisture moving along the contact between the coarse and fine sands. Topography is gently sloping to undulating.

K — Red alder occurs with swordfern on silts and clays in depressions. Soils are fine textured and imperfectly to poorly drained. Some surface organic accumulation is present. Topography is depressional.

L	Swamp grass and sedge occur with minor willow on organic deposits. Soils are organic and very poorly drained. Occasional flooding may occur. Topography is depressional.

APPENDIX III

LIST OF THE COMMON VEGETATION OCCURRING ON SALTSPRING ISLAND

Trees

Arbutus	*Arbutus menziesii*
Bigleaf	*Acer macrophyllum*
Douglas-fir	*Pseudotsuga menziesii*
Flowering dogwood	*Cornus nuttallii*
Garry oak	*Quercus garryana*
Grand fir	*Abies grandis*
Lodgepole pine	*Pinus contorta*
Red alder	*Alnus rubra*
Western hemlock	*Tsuga heterophylla*
Western red cedar	*Thuja plicata*
Western white pine	*Pinus monticola*
Western yew	*Taxus brevifolia*

Shrubs

Blackberry	*Rubus vitifolius*
Gorse	*Ulex europaeus*
Hairy manzanita	*Arctostaphylos columbiana*
Huckleberry	*Vaccinium* spp.
Kinnickinnick	*Arctostaphylos uva-ursi*
Ocean spray	*Holodiscus discolor*
Oregon grape	*Berberis nervosa*
Salal	*Gaultheria shallon*
Saskatoon berry	*Amelanchier florida*
Scotch broom	*Cytisus scoparius*
Snowberry	*Symphoricarpus albus*
Trailing raspberry	*Rubus pedatus*
Wild rose	*Rosa* spp.
Willow	*Salix scouleriana*

Forbs

Blue wild-rye	*Elymus glaucus*
Bracken	*Pteridium aquilinum*
Bulrushes	*Scirpus* spp.
Cattail	*Typha latifolia*
Fireweed	*Epilobium angustifolium*
Little clubmoss	*Selaginella wallacei*
Little hair-grass	*Aira praecox*
Orehardgrass	*Dactylus glomerata*
Reed canary grass	*Phalaris arundinacea*
Rushes	*Juncus* spp.
Sedge	*Carex* spp.
Stinging nettle	*Urtica lyallii*
Swordfern	*Polystichum muritum*
Twin-flower	*Linnaea borealis*

(Forbs con't...)

Western fescue — Festuca occidentalis

Rock and dry land mosses

Dicranum fuscescens
Dicranum howellii
Pogonatum contortum
Polytrichum piliferum
Rhacomitrium canescens
Rhacomitrium heterostichum
Rhytidiadelphus triquetrus

Moist land mosses

Brachythecium asperrimum
Eurhynchium oreganum
Homalothecium megaptilum
Hylocomium splendens
Rhytidiopsis robusta

Wet land mosses

Leucolepis menziesii
Rhizomnium glabrescens

Disturbed land mosses

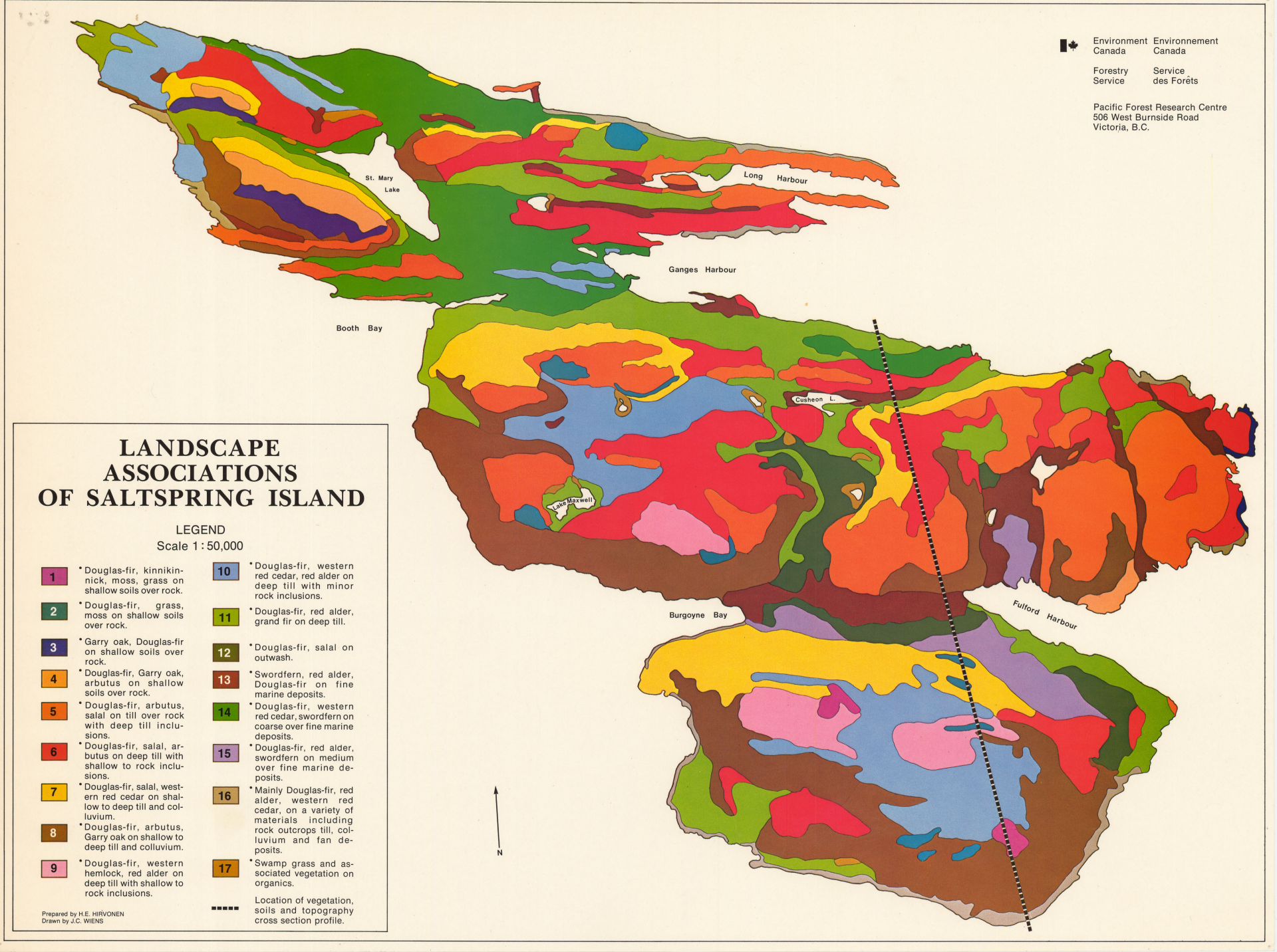
Ceratodon purpureus
Funaria hygrometrica
Pohlia spp.
Polytrichum juniperinum

Epiphytes

Dendroalsia abietina
Homalothecium nuttallii
Isothecium spiculiferum
Neckera menziesii

Liverworts

Calypogeia trichomanis
Plagiochila asplenioides
Porella navicularis
Scapania bolanderi


Environment Canada
Environnement Canada
Forestry Service
Service des Forêts
Pacific Forest Research Centre
506 West Burnside Road
Victoria, B.C.
St. Mary Lake
Long Harbour
Ganges Harbour
Booth Bay
Cusheon L.
Lake Maxwell
Burgoyne Bay
Fulford Harbour
N
LANDSCAPE ASSOCIATIONS OF SALTSPRING ISLAND
LEGEND
Scale 1 : 50,000
1 • Douglas-fir, kinnikinnick, moss, grass on shallow soils over rock.
2 • Douglas-fir, grass, moss on shallow soils over rock.
3 • Garry oak, Douglas-fir on shallow soils over rock.
4 • Douglas-fir, Garry oak, arbutus on shallow soils over rock.
5 • Douglas-fir, arbutus, salal on till over rock with deep till inclusions.
6 • Douglas-fir, salal, arbutus on deep till with shallow to rock inclusions.
7 • Douglas-fir, salal, western red cedar on shallow to deep till and colluvium.
8 • Douglas-fir, arbutus, Garry oak on shallow to deep till and colluvium.
9 • Douglas-fir, western hemlock, red alder on deep till with shallow to rock inclusions.
10 • Douglas-fir, western red cedar, red alder on deep till with minor rock inclusions.
11 • Douglas-fir, red alder, grand fir on deep till.
12 • Douglas-fir, salal on outwash.
13 • Swordfern, red alder, Douglas-fir on fine marine deposits.
14 • Douglas-fir, western red cedar, swordfern on coarse over fine marine deposits.
15 • Douglas-fir, red alder, swordfern on medium over fine marine deposits.
16 • Mainly Douglas-fir, red alder, western red cedar, on a variety of materials including rock outcrops till, colluvium and fan deposits.
17 • Swamp grass and associated vegetation on organics.
----- Location of vegetation, soils and topography cross section profile.
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Drawn by J.C. WIENS