



TERRESTRIAL ECOSYSTEM MAPPING REPORT
for
EFFINGHAM RIVER AND TOQUART BAY

for:

**MINISTRY OF FORESTS
NANAIMO FOREST DISTRICT**

by:

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Bioterrain typing has been the sole responsibility of Heather Stewart. Bob Maxwell, correlated this typing. Helen Reid completed ecosystem mapping; Corey Erwin (MSRM) provided external correlation of the ecosystem mapping.

Kate Miller was the initial project coordinator and this role was subsequently passed onto Pamela Williams and finally to Shari Willmott. Helen Reid and Heather Stewart did the fieldwork. Tina Younker, Jeff Bertoia and Shari Willmott built the datasets. Gillian Radcliffe was responsible for the senior review of the project.

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1 INTRODUCTION

The objective of this project was to classify, map at a scale of 1:20,000, and describe the natural ecosystems within the Effingham River and Toquart Bay study area (mapsheets 92C093, 094, 095, 92F003, 004, 005, 014, 015), according to Resource Inventory Committee (RIC) and Terrestrial Ecosystem Mapping (TEM) Standards (1998).

Madrone Consultants Ltd., on behalf of the Ministry of Forests, completed this mapping and report. Forest Renewal BC funded the project as part of the Forest Renewal Plan (FRP) announced April 14, 1994, by the Government of British Columbia.

Ecosystem mapping is the stratification of a landscape into map units, according to a combination of ecological features including climate, physiography, surficial material, bedrock geology, soil, and vegetation. Ecosystem mapping provides:

- a biological and ecological framework for land management;
- integrated abiotic and biotic ecosystem components on one map;
- basic information on the distribution of ecosystems from which management interpretations can be developed;
- a basis for rating values of resources, or indicating sensitive features;
- a historic record of ecological site conditions that can be used as a framework for monitoring ecosystem response to management; and
- a demonstration tool for portraying ecosystem and landscape diversity.

Ecosystem maps, along with associated interpretations, supply valuable information for many uses, particularly planning resource allocation. For example, the maps are used to meet many Forest Practices Code-related needs, including landscape unit planning, forest development planning, range use planning and the development and application of biodiversity guidelines, riparian guidelines, and the Identified Wildlife Management Strategy. This information should provide a sound ecological basis for subsequent wildlife and biodiversity management in the area.

1.1 STUDY AREA

The study area is located midway up western Vancouver Island, in British Columbia, Canada. It is located in the Clayoquot Sound area, specifically in Barkley Sound. It extends from sea level to an elevation of approximately 1500m and includes Effingham and Toquart River watersheds (Figure 1). The southern boundary extends along Toquart Bay, Sechart Channel and Eagle Channel. Most of the terrestrial boundary follows the height of land of both watersheds. The eastern boundary follows the Mackenzie range. The northern boundary crosses Cat's Ear Peak and 5040 peak. This boundary is adjacent to the Kennedy River study area that was mapped by Madrone Consultants Limited (MCL) in 1998 (Clayoquot Terrestrial Ecosystem Mapping, Year 3). Black Peaks and Broughton Peaks are located in the southern portion of the study area. The total area is approximately 23,974 hectares. It is accessible from Highway 4, which runs from Port Alberni to Pacific Rim National Park.

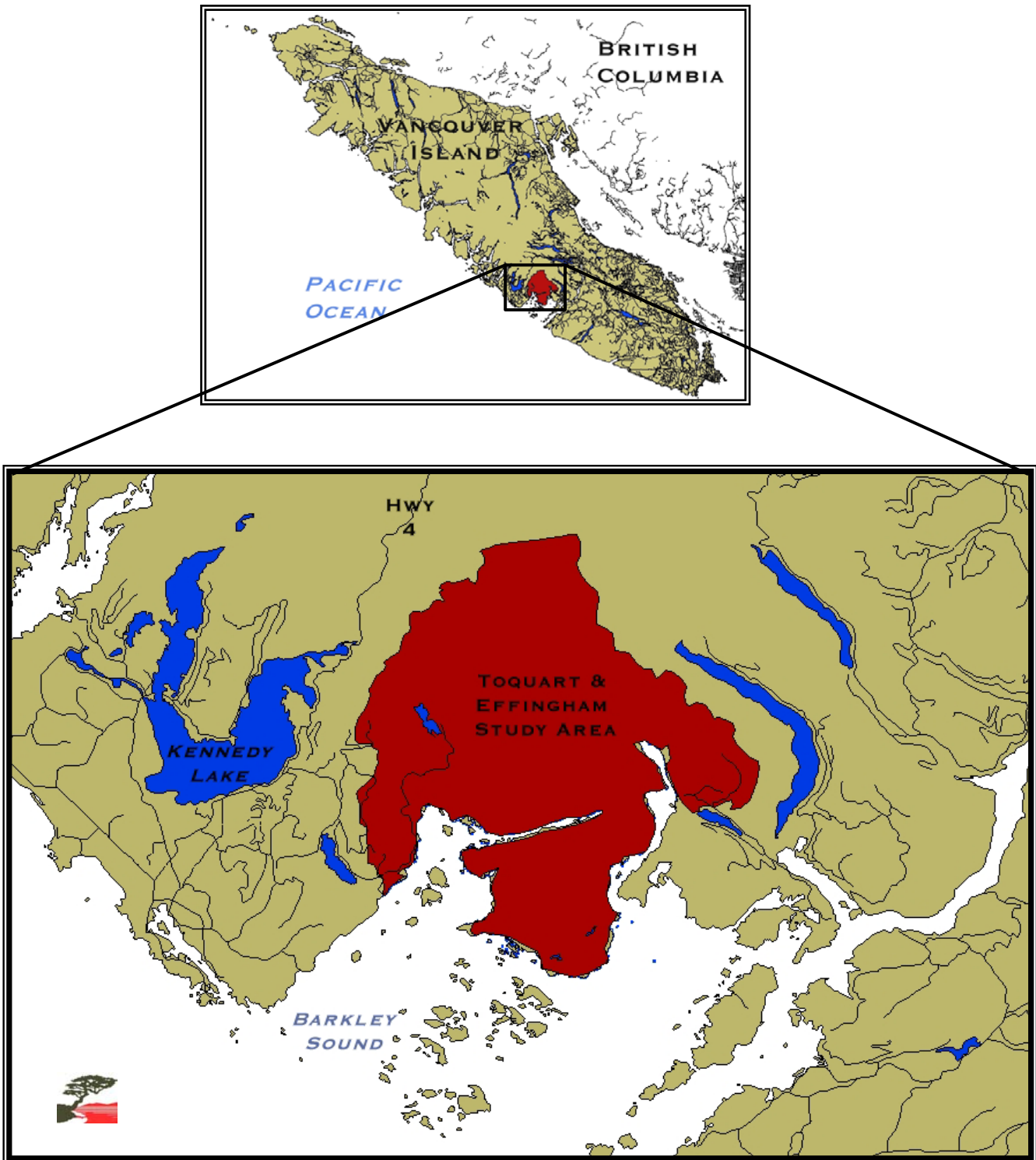


Figure 1. Effingham River and Toquart Bay Study Area

2 METHODOLOGY

2.1 Data Sources

Forest cover maps and TRIM sheets were used for basic tree cover and topographic information. Colour photos (1996) of aerial photography were used.

2.2 Fieldwork

Field sampling for Effingham River and Toquart Bay was carried out in three field trips. The first field trip consisted of one two-person crew sampling between October 8 and 12, 2000. The second consisted of two two-person crews sampling between October 18 and 25, 2000. One two-person crew between August 26 and 28, 2001 carried out the third field trip. Data collection followed methods in the *Field Manual for Describing Ecosystems* (1996). A total of 271 plots were sampled, of which 95 were ground inspections and 90 were visual plots and 86 were air calls.

2.3 Ecosystem Classification

Classification and presentation of the mapping follow the methodology documented in *Standards for Terrestrial Ecosystem Mapping for British Columbia* (RIC, 1998). Each ecosystem is assigned a two-letter symbol that is equivalent to one BEC site series for most forested sites. *The Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Green and Klinka, 1994) was used to determine Site Series. Sparsely vegetated, non-vegetated, and anthropogenic units follow the symbols in the TEM Standard (RIC TEM Standards, 1998). Site modifiers for aspect have been added on appropriately steep slopes (>35%), and soil depth modifiers and landform features have been added to atypical sites using the current Site Series Master Coding List. Structural stages describe the current vegetation stage by a seven level system that has been modified from Hamilton (1988). Appendix I list the ecosystems identified by subzone/variant and some environmental parameters associated with each ecosystem.

2.4 Digital Mapping and Database Production

Bioterrain polygons were delineated on the air photos. These polygons were sometimes further subdivided for ecosystem labeling on the basis of aspect or structural stage variation. The air photo linework was then digitized. Biogeoclimatic boundaries for the Mountain Hemlock (MH) and Coastal Western Hemlock (CWH) zones were added to the resultant maps and these boundaries were also added to the air photos. The polygons cut by these boundaries were adjusted to avoid creating minute sliver polygons. The polygons were numbered at this time to facilitate data entry of bioterrain and ecosystem attributes for each polygon.

Polygon attributes were entered into the provincial bioterrain and ecosystem database, which was downloaded from the TEM website. The data was then reviewed using the data capture (DC) Tool to ensure that the database was error-free. Once the database was clean, ecosystem labels were added to the maps and the final map legend was produced. Draft maps were plotted and reviewed for final edits before producing digital maps and attribute files for delivery.

2.5 Classification Issues

A minor problem in using the guidebook for the west coast is the classification of floodplain ecosystems. The low benches are identified as Act-willow, but neither black cottonwood nor shrub willows have been found on active floodplains within the study area. Species that define these frequently flooded ecosystems are red alder and salmonberry.

The labeling system designated by the Resource Inventory Committee (RIC) for the two CWH subzones present in the study area can create some confusion. In some instances, the same two-letter code is allotted to ecosystems with different places on the edatopic grid in different subzones. For example, the mesic ecosystem for the CWHvh and the submesic ecosystem of the CWHvm are both labeled HS. Hence, on the same mapsheet, the same symbol appears in two adjacent subzones, but they are, in fact, different ecosystem types. Table 1 lists these ecosystem units having the same two-letter map code in different subzones.

Table 1. Ecosystems with the same map code but different places on the edatopic grid for each BEC subzone.

Map Code	BEC Subzone	Site Series Name	Site Series #	SMR	SNR
HS (Zonal)	CWHvh1	CwHw – Salal	01	4 - 5	A - C
HS	CWHvm1 / vm2	HwCw – Salal	03	1 - 2	A - C
LS	CWHvh1	PICy – Sphagnum	12	6 - 7	A - B
RS	CWHvh1	CwYc – Salal	03	1 - 2	A - C
RS	CWHvm1 / vm2	CwHw – Salal	04	1 - 2	D - E
SS	CWHvh1	Ss – Salal	14	2 - 3	A - C
SS	CWHvm1	Ss – Trisetum	09	5 - 6	C - E
AB	CWHvm1 / vm2	HwBa – Blueberry	01	3 - 4	A - C
AB	MHmm1	HmBa – Bramble	04	4 - 5	A - C

3 BIOPHYSICAL DESCRIPTION OF THE STUDY AREA

3.1 Topography and Drainage

Both the Effingham and Toquart Rivers flow southerly from their headwaters to the coast; Effingham River empties into Effingham Inlet on the east side of the study area and the Toquart River empties into Toquart Bay on the west side.

The northern two thirds of the study area fall within the Vancouver Island Ranges, Insular Mountains (Holland, 1964). Slopes here are generally steep and rugged. Mount Hall (over 1400 m.) and Handsome Mountain (1198 m.) are part of the mountainous spine that separates the Effingham and Toquart watersheds. The remaining portion of the study area, roughly south of Pipestem Inlet, falls within the Estevan Coastal Plain (Holland, 1964) and is characterized by more subdued terrain.

The slopes above the floodplain of Effingham River generally face east and west and are steep. Effingham Lake, near the river's headwaters, recedes in the drier summer to late fall months, and greatly increases in size during the winter wet months. This creates a unique ecosystem in the dry months, which can only be sampled when the area is exposed. An area of subdued, hummocky terrain with alternating wetlands and dry ecosystems is located on the eastern side of the Effingham River watershed.

The slopes of the upper reaches of Toquart River are generally steep and rugged. South of Toquart Lake, in the southwestern portion of the Toquart drainage, the topography is subdued, consisting of wetlands and poorly drained forest. An extensive floodplain extends along the lower reaches of the river.

The portion of the study area south of Pipestem Inlet is almost entirely bounded by coastline. The terrain is much more subdued in this portion. Broughton Peaks, the highest point in the southern portion of the study area rises to 1043 m. Closer to the southern coastline the terrain is subdued with scattered wetlands.

3.2 Terrain

The most frequently mapped surficial material in the study area is till, with 1302 out of 2683 polygons having till as the dominant component. Colluvium and bedrock are the second most frequently mapped surficial materials with 541 and 588 polygons having these surficial materials as the dominant component. Fluvial materials are uncommon while organic, lacustrine, glaciofluvial and marine sediments occur rarely.

Gullying and mass movements are the main geomorphological processes in the study area, generally occurring on the steeper slopes.

3.3 Biogeoclimatic Zones

The study area is located in the Windward Island Mountains Ecosection (WIM). There are three biogeoclimatic zones within the Effingham River and Toquart Bay study area: the Coastal Western Hemlock (CWH) Zone, the Mountain Hemlock (MH) Zone and the Alpine Tundra (AT) zone.

Terrestrial Ecosystem Mapping: Effingham River and Toquart Bay

Two subzones and three variants of the CWH occur within the study area. The southern variant of the very wet hypermaritime subzone (vh1) occurs along the outer coast up to a maximum elevation of 200m. Both the submontane (vm1) and montane (vm2) variants of the very wet maritime subzone of the CWH are present. The submontane variant (vm1) lies below 600m, while the montane variant (vm2) lies between 600m and 800m throughout the area.

The Mountain Hemlock (MH) zone is represented by the moist maritime subzone, windward variant (mm1), and lies above 800m near the outer coast. Nine hundred meters above sea level has previously been suggested as the lower boundary of the MH along the West Coast in the Clayoquot Sound area (Green and Klinka, 1994). However, based on fieldwork, it appears that 800m better reflects the ecological conditions along the outer coastal areas. The parkland subzone (mmp1) of the MH begins between 1,200m and 1,250m.

The Alpine Tundra (AT) zone is represented by high elevation, alpine mountain environments. It is normally found above 1300m and is dominated by snow, rock, ice, extremely shallow soils and a short growing season.

3.4 Ecosystems

The ecosystems found in the Effingham/Toquart study area are similar to those previously mapped in Clayoquot Sound. Therefore, most of the detailed descriptions of Clayoquot Sound as written in the Year Three Clayoquot Report apply to this area (Madrone Consultants Ltd., 2000).

Logging is extensive along the floodplains of both the Effingham and Toquart Rivers. Logging generally extends from the floodplains up the valley sides and along major creeks draining in the rivers. Extensive logging has also taken place south of Broughton Peaks, in the southern portion of the study area.

Coastal Western Hemlock Zone, Very Wet Maritime Subzone, Submontane and Montane Variants (CWHvm1 and vm2)

Bog forests (YG) are common throughout the CWHvm, where slopes are gentle to flat, and hummocky. Associated with this ecosystem are the drier forest (HS) and the wetter bog woodland forest (LS). These ecosystems are common east of Toquart Lake and Little Toquart Lake.

The subxeric, nutrient rich forest (RS), seldom mapped in Clayoquot Sound, was mapped on the south facing slopes lying to the west of the lower reaches of Effingham River. Most of these Douglas-fir dominated forests have been recently logged. These forests are generally found on south-facing colluvial slopes and are dominated by Douglas-fir, with an understory consisting of a variety of ferns; including sword fern, spiny wood fern, lady fern and deer fern. These logged sites are now herbaceous with sword fern and deer fern dominating.

The wetland WS and VS units, mapped only occasionally in Clayoquot, were both found within this study area. The shrubby WS wetland, dominated primarily by willows and/or hardhack, occurs in two separate polygons adjacent to Effingham Lake. Willows dominate one polygon, while the other is dominated by hardhack. The herb and sedge

Terrestrial Ecosystem Mapping: Effingham River and Toquart Bay

dominated VS wetland meadow occurs where water movement is continuous and on fluvial plains or fluvial fans. In the Effingham-Toquart area, these (VS) ecosystems are found both in the CWHvm2 and the MHmm1. In the CWHvm2, two (VS) wetland polygons are mapped adjacent to Effingham Lake; and several (VS) polygons are mapped in the MMmm1. Two of these are adjacent to unnamed lakes north east of Effingham River and are on fluvial fans. Several other (VS) polygons are mapped along the upper slopes of the western border of the study area, adjacent to small lakes and ponds.

A small herbaceous dominated floodplain (CW) was mapped adjacent to Effingham Lake. This type of floodplain has been mapped previously within the Clayoquot Sound area. In the fall, this ecosystem was dominated by field mint, great burnett and cow-parsnip. The field crew tried to go into this polygon in the following early summer, but the lake was too high to conduct field verification.

Mountain Hemlock Zone, Moist Maritime Subzone, (MHmm1)

The herb dominated meadow (LD), found only in the upper slopes of the Kennedy River watershed in the MHmm1, was also mapped on the upper slopes of the Effingham Toquart watersheds. These lush alpine meadows, dominated by herbs such as lupines, asters, Indian hellebore and sedges, are found on colluvial slopes at high elevations where snowpack lasts late into the year. Herb species vary, depending on moisture availability.

The wet, rich forests (MT) are scattered throughout the MH zone. This unit includes four ecosystems: AB (04), MT (05), MD (06) and YH (07). In this study, these four ecosystems are physically located close together and cannot be separated by airphoto interpretation. The subhygric units, AB and MT, both occur on steep seepage slopes, while the hygric units, MD and YH, occur on lower receiving slopes just below AB and MT. All four units occur on deep soils.

The ecosystems mapped in the study area are listed in the legend (Appendix 1).

4 ECOSYSTEM DESCRIPTIONS

The following section provides more detailed descriptions of ecosystems identified in this study but not previously mapped or described in the Clayoquot Sound Inventory Study. For discussion of previously mapped ecosystem units, refer to *Terrestrial Ecosystem Mapping of the Clayoquot Sound Area, Interim Document, Year Three (1998-1999)*, Madrone Consultants Ltd. Table 2 lists the ecosystems by biogeoclimatic zone, subzone, and variant, site modifiers mapped, as well as site attributes typical for the ecosystem.

Table 2: Ecosystem Units Mapped in the Toquart/Effingham Area that were not Mapped in the Clayoquot Year 3 Study.

Map Code	Site Series #	Site Series Name	Assumed Modifiers	Typical Conditions	Typical Moisture Regime	Mapped Modifiers
CW	CWHvm 1- (11)	Cottonwood - Willow	a, c	Low bench-floodplain, coarse-textured soil	subhydric	None
Vegetation Description: This ecosystem was a herb-dominated, low bench floodplain. When mapped in the fall, field mint, great burnett and cow parsnip dominated this ecosystem.						

5 REFERENCES

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6 APPENDIX 1. Ecosystem Legend for Effingham/Toquart Study Area

TERRESTRIAL ECOSYSTEM MAPPING OF CLAYOQUOT SOUND

TOQUART – EFFINGHAM STUDY AREA

Vancouver Island, BC
Vancouver Forest Region

Map sheets 92C.093, 094, and 095
92F.003, 004, 005, 014, and 015.

Scale 1:20,000
September 2002

INTRODUCTION

The objective of this project is to classify and map at a scale of 1:20,000, the natural ecosystems within the study area according to Resource Inventory Committee (RIC) Standards (1998). Madrone Consultants Ltd. conducted this project on behalf of the Ministry of Forests. Forest Renewal BC funded the project as part of the Forest Renewal Plan (FRP) announced April 14, 1994, by the Government of British Columbia. This information should provide a sound ecological basis for subsequent wildlife and biodiversity management in the area.

ECOSECTION

WIM: Windward Island Mountains

BIOGEOCLIMATIC UNITS

CWHvh1 Coastal Western Hemlock Very Wet Hypermaritime, Southern Variant
CWHvm1 Coastal Western Hemlock Very Wet Maritime, Submontane Variant
CWHvm2 Coastal Western Hemlock Very Wet Maritime, Montane Variant
MHm1 Mountain Hemlock Moist Maritime, Windward Variant
MHmmp1 Mountain Hemlock Moist Maritime, Parkland Subzone
AT Alpine Tundra

SITE MODIFIERS

Code	Criteria	Code	Criteria
a	active floodplain	q	very steep, cool aspect (285°-135°, slope >100%)
c	coarse textured soil	r	Ridge
g	gullying occurring	s	shallow soils (20-100cm to bedrock)
h	hummocky terrain	t	Terrace
j	gentle slope (slope <35%)	v	very shallow soil (<20cm to bedrock)
k	cool aspect (285°-135°, slope 35 – 100 %)	w	warm aspect (135°-285°, slope 35 – 100 %)
n	fan or cone	z	very steep, warm aspect (135°-285°, >100% slope)
p	peaty material on surface		

STRUCTURAL STAGE

Code	Structural Stage
1	Sparse/Bryoid
2	Herb
2a	Forb
2b	Graminoid
2c	Aquatic
2d	Dwarf Shrub
3	Shrub/Herb
3a	Low Shrub
3b	Tall Shrub

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4	Pole/Sapling
5	Young Forest (generally 40-80 years but may begin as early as age 30, depending on tree species and ecological conditions)
6	Mature Forest (CWH and MH, 80-250 years)
7	Old Forest (CWH and MH, >250 years)

SITE DISTURBANCE

Code	Disturbance
A.w	Atmosphere-related effect – windthrow
F.c	Fires – overstorey crown fire
L.c	Forest harvesting – clearcut system
T.a	Terrain-related effect – avalanche
T.s	Terrain-related effect – terrain failures

ECOSYSTEM UNITS

CWHvh1 Coastal Western Hemlock Very Wet Hypermaritime, Southern Variant						
Map Code	Site Series #	Site Series Name	Assumed Modifiers	Typical Conditions	Typical Moisture Regime	Mapped Modifiers
GB	-	Gravel bar	-	-	-	-
GS	00	Tufted - Silverweed estuarine marsh	a, f	intertidal position, fine deposits	Subhydryc-hydric	-
HS	01	Western redcedar - Western hemlock-Salal	d, j, m	gentle slopes; middle slope position; deep medium-textured soils	Mesic	c, h, n, q, s, v, w, z
LA	-	Lake	-	-	-	-
LR	02	Lodgepole pine - Yellow-cedar-Racomitrium	j, r, s	gentle slopes; crest position; shallow soils	Very xeric	w
LS	12	Lodgepole pine - Yellow-cedar-Sphagnum	p	treed bog; organic wetland	Hygic-subhydryc	-
OW	-	Shallow open water	-	-	-	-
RC	13	Western redcedar - Sitka spruce - Skunk cabbage	d	swamp forest, poorly drained, deep, mineral soil	Hygic-subhydryc	p
RI	-	River	-	-	-	-
RO	-	Rock outcrop	-	-	-	h, k, q, z
RS	03	Western redcedar - Yellow cedar - Salal	j, r, s	gentle slopes; upper slope to crest position; shallow soils	Xeric-subxeric	c, h, k, s, v, w, z
SD	07	Western redcedar - Sitka spruce - Devil's club	d, j, m	gentle slopes of lower, receiving sites; deep medium-textured soils; seepage	Subhydryc-hygic	c, g, h, k, n, q, s, t, v, w
SF	06	Western redcedar - Sitka spruce - Foamflower	d, m	significant slope of deep medium-textured soils; middle slope position; richer nutrient regime	Submesic-mesic	h, j, k, n, s, v, w
SK	15	Sitka spruce - Kindbergia	c, d	deep, coarse-textured soils of old beach plain, shoreline/ocean spray	Subxeric to submesic	k, s, v, w
SM	00	Sweet-gale - Sphagnum bog	p	shallow to very shallow organic veneers	Subhydryc	-
SS	14	Sitka spruce - Salal	d, m	deep, medium-textured soils of beach plains, shoreline/ocean spray	Xeric-very xeric	h, s, v
SW	17	Sitka spruce – Swordfern	T	Marine terrace/scarp; shoreline/ocean spray; richer nutrient regime	Mesic	-
UR	00	Urban Area	-	Urban Anthropogenic site	-	-
YG	11	Lodgepole pine - Yellow cedar – Goldthread	j, p	depression to lower slope; organic bog forest	Subhydryc-hygic	H

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CWHvm1 Coastal Western Hemlock Very Wet Maritime, Submontane Variant						
CWHvm2 Coastal Western Hemlock Very Wet Maritime, Montane Variant						
Map Code	Site Series #	Site Series Name	Assumed Modifiers	Typical Conditions	Typical Moisture Regime	Mapped Modifiers
AB	01	Western hemlock - Amabilis fir - Blueberry	d, j, m	gentle slope, middle slope position; deep medium-textured soils	Submesic-mesic	g, h, k, n, q, r, s, t, v, w, z
AF	05	Amabilis fir - Western redcedar - Foamflower	d, m	significant slope, middle slope position; deep medium-textured soils; richer nutrient regime	Submesic-mesic	g, h, j, k, n, s, t, v, w
AS	07	Amabilis fir - Western redcedar - Salmonberry	d, j, m	gentle lower receiving slope, deep, medium-textured soil	Subhygric-hygric	g, j, k, n, q, s, t, v, w, z
AW	00	Red alder - Fern	d	lower slope depositional zones of slope failure, deep soils	Mesic-subhygric	g, k, n, s, w, z
CW	vm1 11	Cottonwood - Willow	a, c	low bench-floodplain, coarse-textured soil	Subhydric	-
DS	00	Dune grass - Silverweed	c	adjacent to beaches on sandy deposits	Xeric-subxeric	n
ES	-	Exposed soil	-	-	-	g, k, n, w, z
GB	-	Gravel bar	-	-	-	a, k, n, w
GS	00	Tufted hairgrass - Silverweed estuarine marsh	a, f	intertidal position, fine deposits	Subhydric-hydric	n
HD	06	Western hemlock - Amabilis fir - Deer fern	d, m	significant slope, deep medium-textured soils, seepage	Subhygric	g, h, j, k, n, q, s, t, v, w, z
HS	03	Western hemlock - Western redcedar - Salal	j, s	upper slope position; gentle slope on shallow soils	Xeric-subxeric	h, k, n, q, r, v, w, z
IF	00	Indian hellebore - Fern	j	gentle to moderate lower colluvial slopes, toe of avalanche tracks	Subhygric	n
LA	-	Lake	-	-	-	-
LC	02	Western hemlock - Lodgepole pine - Cladina	j, r, s	gentle slope; crest position, shallow soils	Very xeric	h, k, q, v, w, z
LS	vm1 13 vm2 10	Lodgepole pine - Sphagnum	p	treed bog; organic	Subhydric	h, v
MM*	02	Mountain hemlock - Amabilis fir - Mountain-heather	j, r, s	gentle slopes; crest position; shallow soils	Very xeric to xeric	h, k, v,
MT*	00	Amabilis fir - Mountain hemlock - Twisted stalk.	d, m	significant slopes; deep medium-textured soils; middle to lower slope position, seepage; richer nutrient regime	Subhygric	j, k,, s,
OW	-	Shallow open water	-	-	-	-
RC	vm1 14 vm2 11	Western redcedar - Sitka spruce - Skunk cabbage	d, j, m	swamp forest; level to depression, deep, medium-textured soil; poorly drained	Subhydric	k, n
RI	-	River	-	-	-	-
RO	-	Rock outcrop	-	-	-	g, h, k, q, r, w, z
RS	04	Western redcedar - Western hemlock - Sword fern	d, m	significant slope, upper slope position; deep soils of colluvial material	Xeric-subxeric	k, s, t, v, w
SA	00	Salmonberry - Sitka alder	d	avalanche tracks, steep to moderate slopes, middle to lower slope positions, deep soils of colluvium	Subhygric	g, j, k, n, q, s, v, w, z
SC	00	Sphagnum - Cottongrass fen	p	organic deposits with water movement	Subhydric -hydric	n, t
SM	00	Sweet-gale - Sphagnum bog	p	shallow to very shallow organic veneers	subhydric	-
SS	vm1 09	Sitka spruce - Salmonberry	a, m	high bench-floodplain, medium-textured soil	subhygric-hygric	-
TA	-	Talus	-	-	-	k, n, w
VS*	00	Sitka valerian - Sedge	j	gentle gradient; fluvial fans	subhygric to hygric	a, n

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		meadow				
WS	00	Willow - Salmonberry swamp	a, p	active floodplain organic blanket	subhygric-subhydryc	-
YG	vm1 12 vm2 09	Western redcedar - Yellow cedar - Goldthread	p	organic bog forest; depression to lower slope;	subhygric-hygric	h, k, n, s, v, w

*Indicates site series that have been taken from the MHmm1.

MHmm1 Mountain Hemlock Moist Maritime, Windward Variant MHmp1 Mountain Hemlock Moist Maritime, Parkland Subzone						
Map Code	Site Series #	Site Series Name	Assumed Modifiers	Typical Condition	Typical Moisture Regime	Mapped Modifiers
AB	01	Western hemlock - Amabilis fir - Bramble	d, j, m	gentle slope, middle slope position; deep medium-textured soils	submesic-mesic	k, s, q, v
ES	-	Exposed soil	-	-	-	g, k, s, w, z
IF	00	Indian hellebore – Fern	j	gentle to moderate lower colluvial slopes, toe of avalanche tracks	subhygric	w
LA	-	Lake	-	-	-	-
LD	00	Arctic lupine – Subalpine daisy	-	steep, upper colluvial slopes	submesic to subhygric	k, w
MB	01 (includes 04)	Mountain hemlock - Amabilis fir - Blueberry	d, m	significant slopes; deep medium-textured soils	mesic	g, h, j, k, n, q, r, s, v, w, z
MH	00	Mountain-heather heath	s	crest and upper slope position on shallow soils	subxeric-mesic	h, k, q, w
MK	00	Mountain hemlock krummholz	j, s	well drained; gentle rocky slopes of shallow soils; variable aspect	xeric-submesic	h, k, q, r, v, w, z
MM	02	Mountain hemlock - Amabilis fir - Mountain-heather	j, r, s	gentle slopes; crest position; shallow soils	very xeric to xeric	g, h, k, q, v, w, z
MO	03	Amabilis fir - Mountain hemlock - Oak fern	d, m	significant slopes; deep medium-textured soils; richer nutrient regime	subxeric-mesic	g, j, k, n, s, v, w, z
MT	05	Amabilis fir - Mountain hemlock - Twisted stalk.	d, m	significant slopes; deep medium-textured soils; middle to lower slope position, seepage; richer nutrient regime	subhygric	a, h, j, k, n, q, s, v, w, z
OW	-	Shallow open water	-	-	-	-
PN	-	Permanent snow	-	-	-	k, w, z
RO	-	Rock outcrop	-	A gentle to steep, bedrock escarpment or outcropping, with little soil development and sparse vegetative cover.	-	g, h, k, n, q, r, w, z
SA	00	Sitka alder - Salmonberry	-	active avalanche tracks on colluvial blankets and cones	mesic-subhygric	g, h, k, n, q, v, w, z
SC	00	Sphagnum - Cottongrass fen	p	organic blankets	subhydryc	n
TA	-	Talus	-	-	-	k, n, q, w, z
VS	00	Sitka valerian – Sedge meadow	j	gentle gradient; fluvial fans	subhygric to hygric	a, n

Terrestrial Ecosystem Mapping: Effingham River and Toquart Bay

AT Alpine Tundra						
Map Code	Site Series #	Site Series Name	Assumed Modifiers	Typical Condition	Typical Moisture Regime	Mapped Modifiers
LD*	00		-	-	-	h, k, q, z
MH*	00	Mountain-heather heath	s	crest and upper slope position on shallow soils	subxeric-mesic	h, k, q, w
MK*	00	Mountain hemlock krummholz	j, s	well drained; gentle rocky slopes of shallow soils; variable aspect	xeric-submesic	h, k, q, r, v, w, z
PN	--	Permanent Snow		Snow or ice that is not part of a glacier but is found during summer months on the landscape.		
RO	--	Rock Outcrop		A gentle to steep, bedrock escarpment or outcropping, with little soil development and sparse vegetative cover.		h, k, q, z

*Indicates site series that have been taken from the MHmm1

DATA SOURCES

This mapping project is based on 1:20,000 colour aerial photography from Geographic Data BC taken in 1996. The base map is from Terrain Resource Inventory Mapping (TRIM) from Geographic Data BC. Various forest cover maps were used. Total number of polygons is 2,681. Ground inspection plots as well as visual checks were completed in the study area to achieve a survey intensity 5 (5%-14%). The total number of plots was 283, of which 95 are ground inspections, 90 are visual checks, and 98 are aircalls (1998 fieldwork). Fieldwork was completed in October 2000, and August 2001. Plot locations are shown on the map. Visual plots begin with V, Ground with a G, and air with an A.

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Bioterrain Correlation: Bob Maxwell.

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