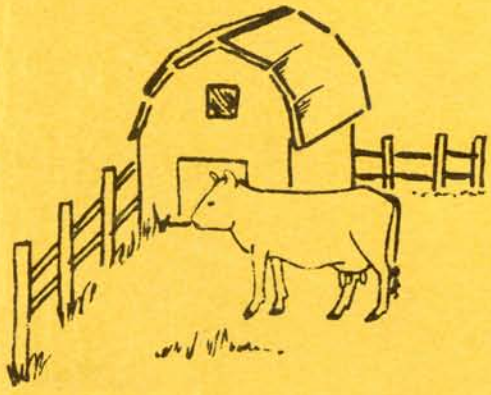
SOIL RESOURCES

of the

SMITHERS - HAZELTON AREA



by

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1972

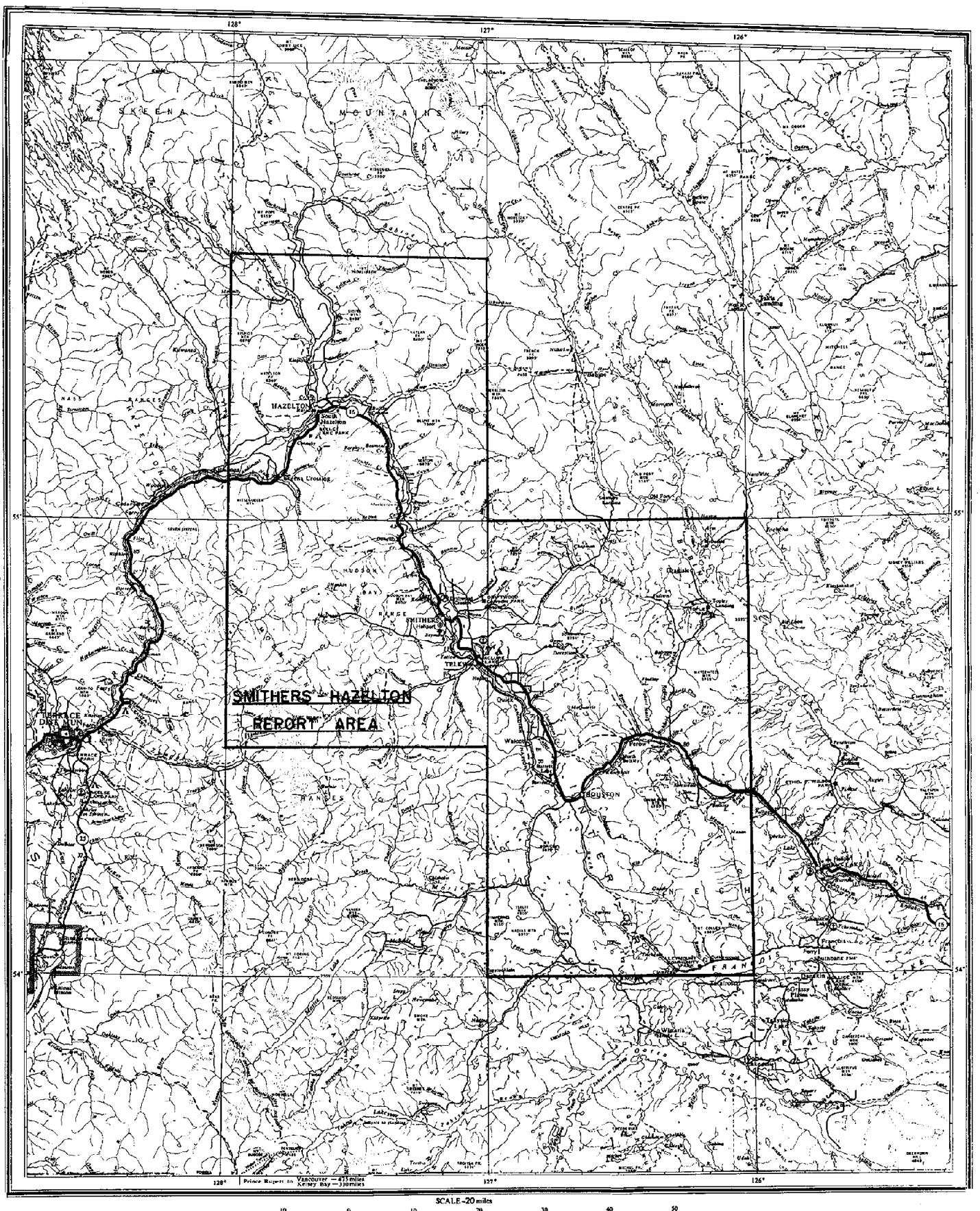
SMITHERS - HAZELTON
REPORT AREA
HAZELTON
SMITHERS
TELKWA
HOUSTON
TERRACE
KITIMAT
Prince Rupert to Vancouver — 415 miles
Kelsey Bay — 310 miles
SCALE - 20 miles
10 0 10 20 30 40 50

TABLE OF CONTENTS

	Page
Introduction	1
Acknowledgements	1
How to Use the Report	2
How the Mapping was Done	2
PHYSICAL FEATURES AND GENERAL INFORMATION	
Location and Physiography	3
History and Economy (References Only)	4
Bedrock Geology	5
Landforms and Soil Forming Deposits	6
GENERAL ENVIRONMENTAL FEATURES	
Climate	7
Vegetation	9
Soil Development and Classification	14
DESCRIPTION OF THE SOILS, THEIR ENVIRONMENT AND GENERAL USE	
Properties of Soil Associations	16
Alix Soils	18
Babine Soils	20
Barrett Soils	22
Berman Soils	25
Causqua Soils	27
Cobb Soils	29
Cronin Soils	31
Crystal Soils	33
Dahl Soils	35

TABLE OF CONTENTS (Cont'd)

	Page
Decker Soils	37
Deserters Soils	39
Dragon Soils	42
Driftwood Soils	44
Hagwilget Soils	47
Kispiox Soils	49
Kitsuns Soils	51
Kitsguecla Soils	53
Kitwanga Soils	55
Kwun Soils	57
Mapes Soils	59
Morice Soils	61
Moricetown Soils	63
Natlan Soils	65
Nechako Soils	67
Oona Soils	69
Ormond Soils	71
Peta Soils	73
Pinkut Soils	75
Prairiedale Soils	77
Ramsey Soils	79
Roaring Soils	81
Saunders Soils	83
Savory Soils	85
Shass Soils	87

TABLE OF CONTENTS (Cont'd)

	Page
Shegunia Soils	89
Sidina Soils	92
Skeena Soils	94
Skins Soils	96
Slug Soils	99
Snodgrass Soils	101
Stellako Soils	103
Suskwa Soils	106
Tatin Soils	108
Tiltusha Soils	110
Twain Soils	112
Utsun Soils	115
Vanderhoof Soils	117
Windfall Soils	119
LAND TYPES	
Organics Soils	122
USE AND MANAGEMENT OF THE SOILS	
Agriculture	125
Recreation	131
Engineering	136
Forestry	145
Wildlife	153
REFERENCES	157
APPENDIX	
I Soils	158

TABLE OF CONTENTS (Cont'd)

APPENDIX (Cont'd)

	Page
II Vegetation	218
III Climate	220
IV Description of Landforms	222
GLOSSARY	226

LIST OF FIGURES

FIGURE NO.		Page
1	Physiography	3
2	Bedrock Geology	4
3	Biogeoclimatic Zones	8
4	Vegetation	13
5	Physiographic Setting of Alix Soils	18
6	Physiographic Setting of Babine Soils	20
7	Physiographic Setting of Barrett Soils	22
8	Physiographic Setting of Berman Soils	25
9	Physiographic Setting of Causqua Soils	27
10	Physiographic Setting of Cobb Soils	29
11	Physiographic Setting of Cronin Soils	31
12	Physiographic Setting of Crystal Soils	33
13	Physiographic Setting of Dahl Soils	35
14	Physiographic Setting of Decker Soils	37
15	Physiographic Setting of Deserters Soils	39
16	Physiographic Setting of Dragon Soils	42
17	Physiographic Setting of Driftwood Soils	44
18	Physiographic Setting of Hagwilget Soils	47
19	Physiographic Setting of Kispiox Soils	49
20	Physiographic Setting of Kitsuns Soils	51
21	Physiographic Setting of Kitsguecla Soils	53
22	Physiographic Setting of Kitwanga Soils	55
23	Physiographic Setting of Kwun Soils	57
24	Physiographic Setting of Mapes Soils	59

LIST OF FIGURES (Cont'd)

FIGURE NO.		Page
25	Physiographic Setting of Morice Soils	61
26	Physiographic Setting of Moricetown Soils	63
27	Physiographic Setting of Natlan Soils	65
28	Physiographic Setting of Nechako Soils	67
29	Physiographic Setting of Oona Soils	69
30	Physiographic Setting of Ormond Soils	71
31	Physiographic Setting of Peta Soils	73
32	Physiographic Setting of Pinkut Soils	75
33	Physiographic Setting of Prairiedale Soils	77
34	Physiographic Setting of Ramsey Soils	79
35	Physiographic Setting of Roaring Soils	81
36	Physiographic Setting of Saunders Soils	83
37	Physiographic Setting of Savory Soils	85
38	Physiographic Setting of Shass Soils	87
39	Physiographic Setting of Shegunia Soils	89
40	Physiographic Setting of Sidina Soils	92
41	Physiographic Setting of Skeena Soils	94
42	Physiographic Setting of Skins Soils	96
43	Physiographic Setting of Slug Soils	99
44	Physiographic Setting of Snodgrass Soils	101
45	Physiographic Setting of Stellako Soils	103
46	Physiographic Setting of Suskwa Soils	106
47	Physiographic Setting of Tatin Soils	108
48	Physiographic Setting of Tiltusha Soils	110
49	Physiographic Setting of Twain Soils	112

LIST OF FIGURES (Cont'd)

FIGURE NO.		Page
50	Physiographic Setting of Utsun Soils	115
51	Physiographic Setting of Vanderhoof Soils	117
52	Physiographic Setting of Windfall Soils	119
53	Physiographic Setting of Organic Soils	122
54	Land Capability for Agriculture (Soils & Climate)	127

LIST OF TABLES

TABLE NO.		Page
1	Distribution of Vegetation Zones	9
2	Alix Soils	19
3	Babine Soils	21
4	Barrett Soils	23
5	Berman Soils	25
6	Causqua Soils	28
7	Cobb Soils	30
8	Cronin Soils	32
9	Crystal Soils	34
10	Dahl Soils	36
11	Decker Soils	38
12	Deserters Soils	40
13	Dragon Soils	43
14	Driftwood Soils	45
15	Hagwilget Soils	48
16	Kispiox Soils	50
17	Kitsuns Soils	52
18	Kitsguecla Soils	54
19	Kitwanga Soils	56
20	Kwun Soils	58
21	Mapes Soils	60
22	Morice Soils	62
23	Moricetown Soils	64
24	Natlan Soils	66

LIST OF TABLES (Cont'd)

TABLE NO.		Page
25	Nechako Soils	68
26	Oona Soils	70
27	Ormond Soils	72
28	Peta Soils	74
29	Pinkut Soils	76
30	Prairiedale Soils	78
31	Ramsey Soils	80
32	Roaring Soils	82
33	Saunders Soils	84
34	Savory Soils	86
35	Shass Soils	88
36	Shegunia Soils	90
37	Sidina Soils	93
38	Skeena Soils	95
39	Skins Soils	97
40	Slug Soils	100
41	Snodgrass Soils	102
42	Stellako Soils	104
43	Suskwa Soils	107
44	Tatin Soils	109
45	Tiltusha Soils	111
46	Twain Soils	113
47	Utsun Soils	116
48	Vanderhoof Soils	118

LIST OF TABLES (Cont'd)

TABLE NO.		Page
49	Windfall Soils	120
50	Organics Soils	123
51	Capability for Agriculture	125
52	Crop and Soil-Climate Suitability	128
53	Surface Erosion Potential	129
54	Agriculture Management Problems	129
55	Limitations of Soils For Recreational Uses	133
56	Landscape Personality	132
57	Inferred Engineering Characteristics of Soils .	136
58	Engineering Use of Soils	141
59	Forestry Interpretations	149
60	Sedimentation Yield Potential	153
61	Ungulate (Moose, Deer, Caribou, Goat) Use	154

INTRODUCTION

The soils inventory of the Smithers-Hazelton area (93L/NE, NW, SE and 93M/SW) in north central B. C. (Fig. 1) was carried out during summers 1969 and 1970. The purpose of the inventory was to provide capability ratings for Agriculture and Forestry for the Canada Land Inventory, and present by map and written report soil, landform, climate and vegetation information, their interrelationships, and performance characteristics as a physical base for land use planning. Since most human activities require land, the information in this report should have some relevance to all land uses. In general, to accomplish sustained yield of renewable resources and to conserve or preserve the soil resource while making wise use of this resource, it is necessary to have basic soils information to assist in making sound management interpretations.

The first part of the report summarizes related environmental information on physiography, geology, climate and vegetation. The second part of the report describes the soils and their interrelationships with other components of the ecosystem. The third part indicates the lands performance characteristics in terms of use for agriculture, forestry, engineering, recreation and wildlife. The last section provides detailed technical information on soils, climate and vegetation.

ACKNOWLEDGEMENTS

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Laboratory analysis and data compilation by V. Osborne and staff.

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The original map manuscript was compiled by F. Waterman, C. Clement and R. Reid.

How to Use the Report

The objective of this soils resource inventory is to provide soils information in a form useful to land managers. The report contains information on soils, geology, vegetation and climate.

Descriptions of the soils, their environment and use are presented in relation to the various mapping units (map symbols), and the soils map showing location and extent of the various soils should be used in combination with the report at all times.

For general information on the area the reader should refer to the sections titled "Physical Features and General Information" and "General Environmental Features". For a more detailed non-technical description of each soil its general use and extent the reader should refer to the section "Description of Soils, their Environment and General Use". For a detailed description and comparison of use and management of each of the soils, including engineering characteristics and uses, and interpretations for agriculture, forestry, wildlife and recreation, the section "Use and Management of Soils" should be consulted. Technical soil, climate and vegetation information is included in the Appendix.

How the Mapping was Done

Prior to the field work, landforms were pretyped on aerial photographs. The landforms, or areas of recurring landscape patterns thus identified formed the mapping units.

Field survey by truck where access permitted, by helicopter and by selected transects on foot provided field checking of aerial photo interpretation and soils were examined in test pits, road cuts, etc. Various characteristics of the total land environment were recorded such as soil morphology (drainage, stoniness, thickness, layers) vegetation, topography, soil forming deposits and climatic indicators which might influence the land and its use.

Representative samples of the more important soils were obtained and analysed in the laboratory.

The mapping was carried out on 1 inch = 1 mile (80 chain) photography and boundaries were transferred to 1:50,000 scale base maps, which were subsequently photographically reduced to approximately 1:125,000 scale maps.

The reliability of mapping depends on access availability. Heavy reliance on aerial photo interpretations was necessary in areas with little access.

PHYSICAL FEATURES AND GENERAL INFORMATION

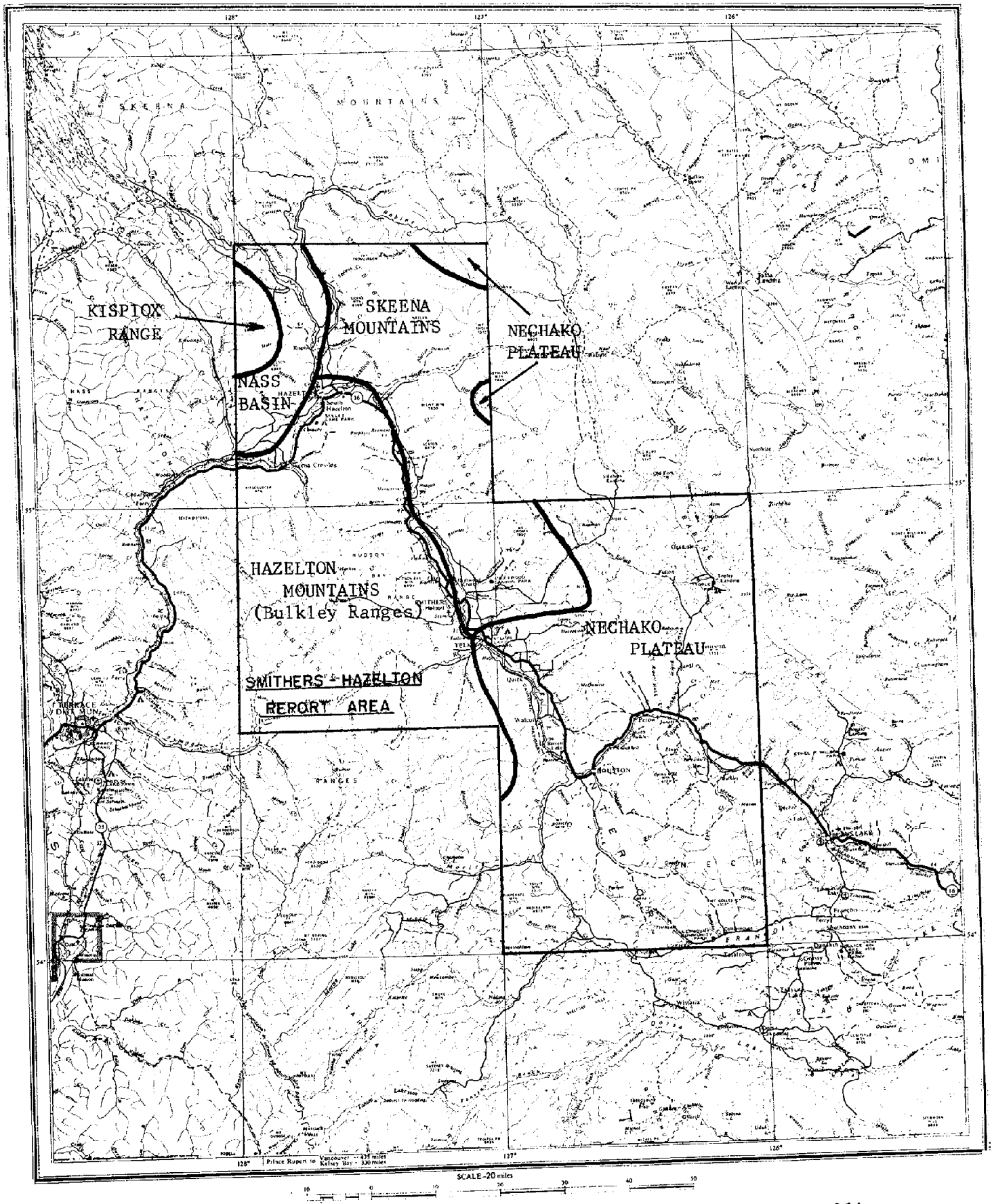


Figure 1. Physiography

Reference: Holland, S. S. 1964 Landforms of B. C.

Reference: Geological Survey of Canada Paper 44-24, Map 617A

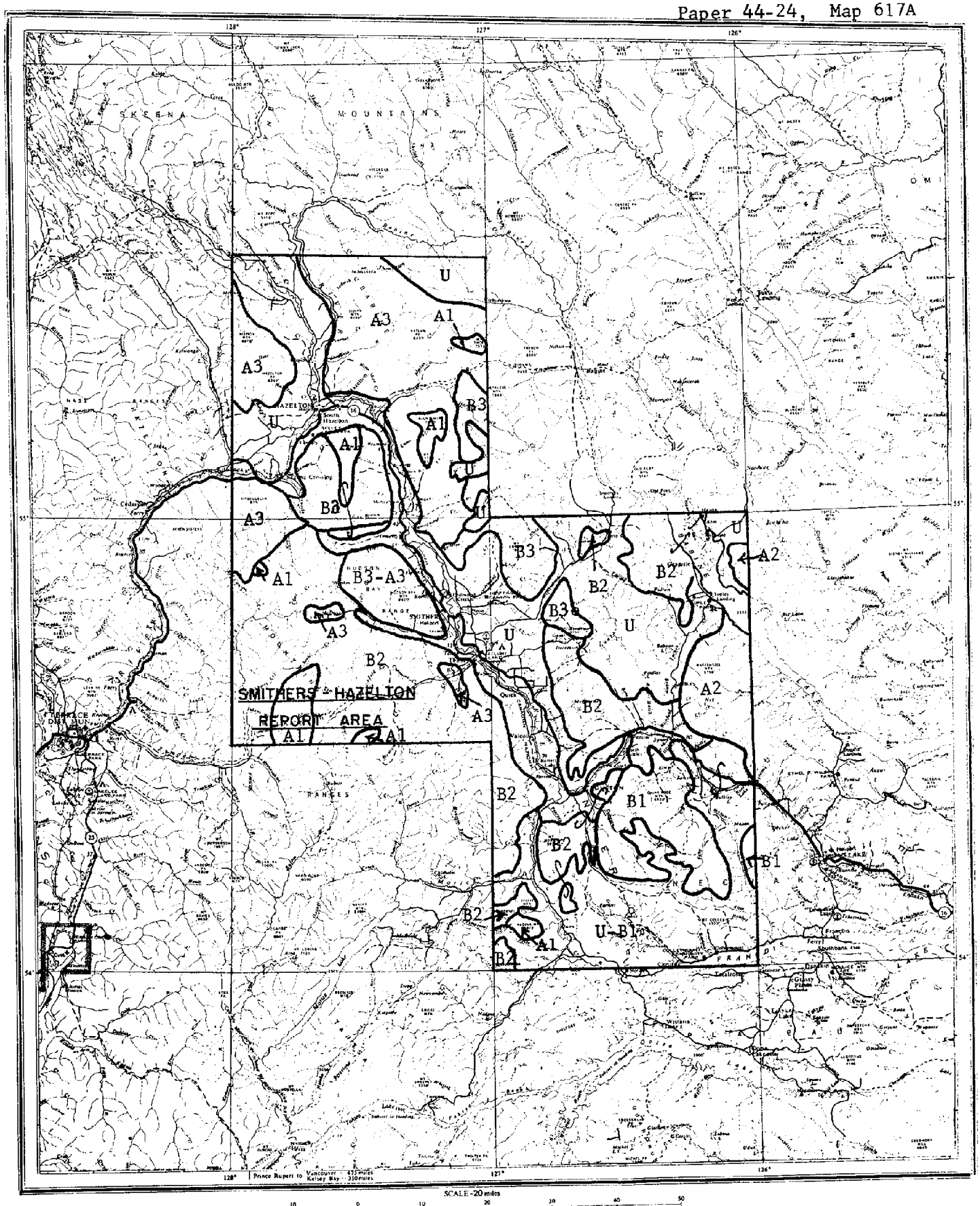


Figure 2. Bedrock Geology

A1 - Granite and Diorite

A2 - Granite, Andesite, Rhyolite

A3 - Mesozoic Sandstone, Conglomerate, Shale.

B1 - Post-Eocene Basalt

B2 - Mesozoic Volcanic Rocks

B3 - Mesozoic Andesite, Argillite, Rhyolite

U - Unconsolidated Material

History and Economy

History references include the following:

The Skeena, River of Destiny, - R.G. Large (1957), Mitchell Press; Gateway to Alaska, R.G. Large (1960), Mitchell Press; Notes from the Century Before, E. Hoagland (1969) Random House; Reports of Lands Service (1949-50); The Collins Overland Telegraph, From Journal of Civilization, New York, MacKay (1946), Provincial Archives.

The economy of the region is best described in, The Bulkley-Nechako Region - A B. C. Regional Economic Study (1970) B. C. Department of Industrial Development, Trade and Commerce.

Landforms and Soil Forming Deposits

The soils in the area formed mainly in mineral materials most of which were deposited during glaciation. These soil forming materials are glacial till, glacial outwash, and glacial lacustrine deposits. More recently alluvium has been deposited in the valleys along streams while colluvium has been deposited on the steeply sloping valley walls. In places, organic soils are formed in decomposed and decomposing plant material that has accumulated in depressions.

These deposits can overlay one another at variable depths and are often influenced by underlying bedrock and its characteristics.

The major soil forming deposits are as follows:

A. Glacial Till

(1) Unsorted mixture of compact, relatively impervious sand, silt, clay and stones deposited by glacial ice.

- rolling to flat and gently undulating glacial till deposits.
- Soil Associations derived from this material: Barrett (BA), Cronin (CN), Deserters (D), Driftwood (DD), Kwun (KN), Twain (TW), Saunders (SD).

(2) as (1) except some modification of surface material due to downslope movement by gravity.

- very steeply sloping mountainous till deposits.
- Soil Associations derived from this material: Causqua (CA), Cronin (CN), Driftwood (DD), Saunders (SD), Tatin (TT).

(3) Unsorted to partially sorted loose, porous material deposited by glacial ice with some modification and transportation by glacial meltwater.

- rolling to flat and gently undulating till deposits.
- Soil Associations derived from this material: Cobb (CB), Crystal (CR), Kitwanga (KT).

B. Glacial Outwash

(1) Relatively well sorted, stratified, loose, sands and gravels deposited by glacial meltwater.

- flat or gently sloping terraces, plains, deltas and eskers.
- Soil Associations derived from this material: Alix (AX), Kitsguecla (KA), Mapes (MS), Moricetown (MT), Peta (PA), Ramsey (R), Savory (SY), Shegunia (SH), Roaring (RG).

(2) Poorly sorted stratified sands and gravels deposited by glacial meltwater in close contact with ice.

- general tendency to be less well sorted than (1).
- hummocky, strongly rolling kame mounds and terraces, often associated with or adjacent to valley walls.
- Soil Associations derived from this material: Morice (M), Snodgrass (SO), Suskwa (SW).

C. Glacial Lacustrine

- well sorted, compact, stratified silts and clays deposited in temporary lakes during deglaciation.
- flat to rolling and somewhat dissected plains.
- Soil Associations derived from this material: Babine (BE), Berman (BN), Prairiedale (PR), Vanderhoof (V).

D. Colluvium

- highly variable, loose deposits which accumulate by the downstream movement of materials under the influence of gravity.
- very steep mountainous slopes, often closely associated with bedrock and glacial till.
- talus cones.
- Soil Associations derived from this material: Dahl (DL), Dragon (DN), Kispiox (KX), Kitsuns (KS), Natlan (NA), Oona (ON), Ormond (OD), Pinkut (PT), Shass (SS), Skins (SK), Utsun (UN), Windfall (WL), Sidina (SA).

E. Alluvium

- variable, often stratified and sorted materials laid down by recent streams and rivers as flat or gently undulating, channeled floodplains and fans.
- Soil Associations derived from this material: floodplains: Stellako (SL), Tiltusha (TA), Nechako (N); fans: Hagwilget (H), Slug (SG).

F. Organic

- generally unstratified organic materials which accumulate in and around closed basins or moisture receiving positions within the landscape.
- Soil Associations derived from this material: Organic (O1), (O2).

GENERAL ENVIRONMENTAL FEATURES

Climate

Altitude and relief play a major role in determining the climate within the area and local influences of topography, aspect, elevation and general landscape position are significant.

A continental type of climate with warm summers and long cold winters prevails throughout the plateau region (approximately eastern half of the area). The increased influence of the Pacific Ocean (higher precipitation, longer frost free periods, etc.) is evident in the western section and is reflected in the vegetation and land use.

Frost free seasons range from 20 days in frost susceptible low lying pockets in the eastern section of the area to 130 days on midslope positions within the Skeena Valley. Growing degree day accumulations range from 700 in the alpine zones of the Babine and Hazelton mountains to 2500 in the Skeena Valley on the western edge of the area. There is a trend in the valleys towards increased growing degree days and frost free periods from east to west. As well within the valleys temperature gradients vary and temperature inversions are commonplace often resulting in frost pockets. Large lakes such as Francois and Babine have a moderating effect. Growing degree days tend to decrease with increase in elevation. Mean annual temperatures are relatively stable with a slight upward trend to the west, i.e. 37^{o} at Telkwa and 39^{o} at New Hazelton.(See Appendix for tabular data).

Although precipitation generally increases with elevation, the rate of increase varies with every location, with aspect, massiveness of mountains and with distance or influence from the ocean. There is a general trend toward increased precipitation in the northwest, west and southwest portions of the area, due to the influence of the ocean to the west. Growing season precipitation ranges from approximately 7.5 inches in the east and most valley bottoms to 13.5 inches on mountain slopes at higher elevations in the west.

Vegetation

The surveyed area is referred to as a coastal transition area since characteristics of the Coastal forest are mixed in with those of the Sub-boreal Spruce forest and the Interior Trembling aspen-Douglas-fir-Lodge-pole pine forest.

On the basis of the distribution of each of the forest types and the degree to which each type is expressed in its forest zones, four sections have been recognized.

These are:

A. Coastal transition, with a strong expression of coastal characteristics (CT1).

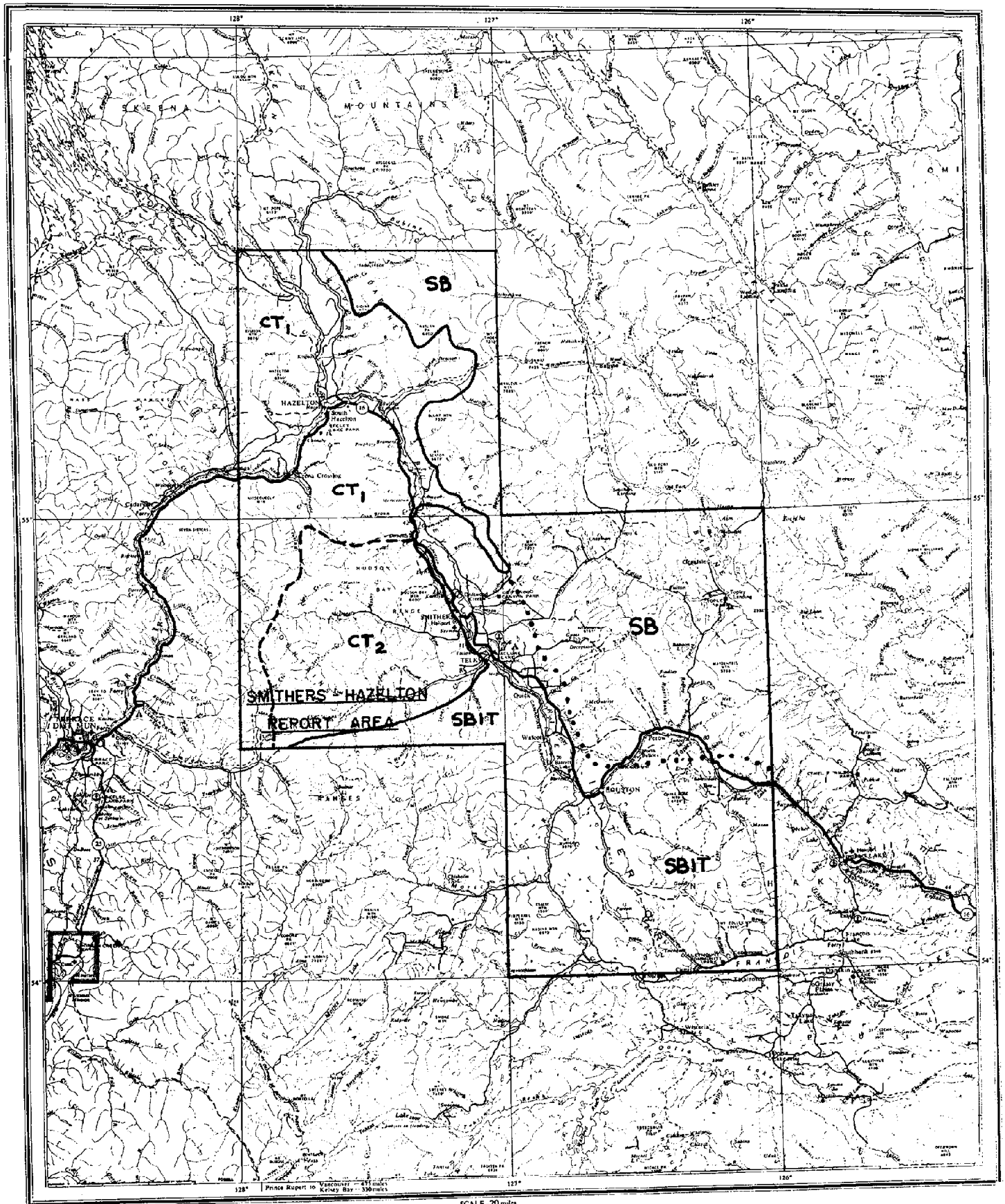


Figure 3.

BIOGEOCLIMATIC ZONES

SBIT - SUBBOREAL INTERIOR TRANSITION - A, wS.
SB - SUBBOREAL SPRUCE - BALSAM - wS, AlF.
CT1 - COASTAL TRANSITION - COASTAL - wH, sS.
CT2 - COASTAL TRANSITION - INTERIOR - wH, wS.

—— ZONAL BOUNDARY
--- SUBZONAL BOUNDARY
···· TENTATIVE ZONAL BOUNDARY

DISTRIBUTION OF VEGETATION ZONES

SMITHERS-HAZELTON REPORT AREA

Table 1

Section A: Coastal Transition 1 (CT1)			Section B: Coastal Transition 2 (CT2)			Section C: Subboreal Spruce (SB)			Section D: Subboreal-Interior Transition (SBIT)		
Vegetation Zone		Altitudinal Limits (Ft.)	Vegetation Zone		Altitudinal Limits (Ft.)	Vegetation Zone		Altitudinal Limits (Ft.)	Vegetation Zone		Altitudina Limits (Ft
	Subzone	Lower Upper		Subzone	Lower Upper		Subzone	Lower Upper		Subzone	Lower Uppe
1. Cedar-Hemlock		1100-(4300), 5000	1. Coastal transition 2	Cedar-Hemlock	2500-4500	1. White spruce-Alpine fir		below 3500	1. Subboreal Interior-transition	White spruce-Interior transition	below 3000
				Eng. spruce Alpine fir-Interior transition	2000-3500					White spruce-Interior-Eng. spruce-Alpine fir transition	3000-3500
2. Engelm. spruce-Alpine fir		4300-(5300), 5500	2. Engelm. spruce-Alpine fir		3500-5500	2. Engelm. spruce-Alpine fir		3500-5500	2. Engelm. spruce-Alpine fir		3500-5000 (prob-ably)
	Krumm-holz	5300-5500		Krummholz	(4500), 5300 -5500		Krummholz	(4700), 5000 -5500			
3. Alpine tundra		above 5500	3. Alpine tundra		above 5500	3. Alpine tundra (probably)		above 5500	3. Alpine tundra		above 500((probably

B. Coastal transition with a predominance of characteristics of the interior forest types (CT_2).

C. Subboreal spruce, with a minor influence of the adjacent forest types (SB).

D. Subboreal-Interior transition (SBIT), in which the characteristics of the Trembling Aspen-Douglas-fir-lodgepole pine forest are well represented.

The distribution of these sections is indicated in figure 3.

(A) The Coastal Transition Section with strong coastal influences (CT_1) is characterized by the following zones:

1. Cedar-Hemlock zone.

In this zone the climatic climax forest consists of western hemlock, while western red cedar prevails on moister soils. The Cedar-Hemlock zone extends from the valley bottoms (1100 feet at South Hazelton and 1500 feet at Moricetown) to an elevation of approximately 5000 feet. At Nine Mile Mountain western hemlock occurs up to 5500 feet elevation on the north and east facing slopes. On Southern exposures the upper limit of the Cedar-Hemlock zone is found between 4000 and 4500 feet elevation.

High precipitation and a relatively deep snowpack, which prevents the soil from freezing, are characteristic conditions for this forest type. Deep podzolic profiles form on the well drained materials. Western red cedar tends to dominate on finer textured, less acidic and moister soils.

On the moist and finer textured soils in this zone, seral stages are characterized by an abundance of shrubs, including willows, red ozier dogwood and hazel with a lush growth of herbs, like twisted stalk and cow parsnip. The more acidic, coarser-textured soils of infrequently and intensively disturbed sites regenerate in trembling aspen. Under the latter conditions the stands take on many of the characteristics of interior forest types.

2. Subalpine Engelmann Spruce - Alpine Fir Zone.

As suggested by the name of this zone, variable proportions of Engelmann spruce and alpine fir form the climatic climax forest. Almost pure stands of spruce are restricted to the edaphically wetter positions, while alpine fir often dominates on drier sites. Although Engelmann spruce has a somewhat lower shade tolerance than alpine fir, the latter tends to become more prevalent after fires. This may be due to the greater resistance of alpine fir to wind and other adverse exposures. Engelmann spruce regenerates in the forest stand possibly after alpine fir has "stabilized" the atmosphere above ground level. A combination of better drained soils and adverse exposures often results in a predominance of alpine fir at the upper parts of the Engelmann spruce-Alpine fir zone especially just below the mountain peaks. It is possible that once the

hardy alpine fir has stabilized the atmosphere, Engelmann spruce can successfully regenerate in vacant locations.

The Engelmann spruce-Alpine fir zone extends from the upper limit of the Cedar-Hemlock zone up to the wind exposed mountain peaks at approximately 5300 feet on east facing slopes and 5500 feet on the westerly exposures. The narrow Krummholz (crooked wood) subzone, an area in which the growth of trees is stunted, is found between 5300 feet and 5500 feet elevation. However, the width and the position of this subzone, and consequently the position of the upper boundary of the Engelmann Spruce-Alpine fir zone and the lower boundary of the Alpine tundra, vary considerably with the depth of the soil, the degree of exposure to wind, sun and frost and the depth and duration of the snow cover.

3. The Alpine tundra zone is found on exposed mountain slopes generally above 5500 feet. In snow chutes and on sites affected by cold air drainage this zone may extend downwards even below 4000 feet.

The Alpine tundra zone is characterized by the absence of alpine fir, Engelmann spruce and western hemlock. Some hardy shrubs, (mainly low-growing willows) and alpine species, which can mature and set seed rapidly, are adapted to the extremely short growing season and can survive the severe winters.

At locations where the snow cover is sufficient in depth and duration to prevent freezing of the soil and where sufficient moisture is available during the growing season, western hemlock may reach up to the timberline. In such locations mountain hemlock may be mixed in with the western hemlock as low as 3500 feet.

(B) <u>The Coastal Transition Section CT_2 with a strong influence of the interior formations is characterized by:</u>

1. The distribution of western hemlock. This species is restricted to protected northeast, north and west facing slopes normally below 4500 feet on which favorable moisture conditions occur.

2. Below 3500 feet elevation the presently predominantly seral vegetation of lodgepole pine and trembling aspen shows much similarity with the transition between the Subboreal Spruce zone and the Interior trembling aspen zone. However regeneration consists nearly always of alpine fir and spruce (probably a hybrid between Sitka and Engelmann spruce), so that it becomes extremely difficult to assign this zone to any particular class.

Some evidence suggests that Coastal forest features were more common in the CT_2 section than they are at present. If this is the case, succession from aspen and lodgepole pine towards western hemlock and Sitka spruce will be extremely slow.

3. The remainder of this section between 3500 feet and 5500 feet belongs to the Subalpine Engelmann spruce-Alpine fir zone. Lodgepole pine is the common seral species. After intensive disturbances trembling aspen can occur in the lower part of the zone. In this zone pockets of stunted growth may be found upwards from 4500 feet elevation. Here removal of the protective forest cover by extensive fires, has caused an expansion of the Krummholz subzone and brought the treeline down several hundred feet. Recovery from this condition may be expected to be extremely slow.

4. Above 5500 feet elevation Alpine tundra is extensive and particularly so on the exposed rounded peaks. Recovery from disturbances is extremely slow under the adverse conditions, creating this biotic zone.

(C) 1. In the Subboreal forest region (SB) white spruce and alpine fir are characteristic. Black spruce frequently occurs in wet depressions. Lodgepole pine commonly pioneers on infrequently burnt sites. However repetitive burning or other more intensive disturbances favor willows on moist to wet sites and trembling aspen on drier sites.

2. Above 3500 feet white spruce is replaced by Engelmann spruce to form a Subalpine Engelmann spruce-Alpine fir zone. This zone extends to approximately 5500 feet. The Krummholz subzone may extend downwards to approximately 4700 feet due to disturbance or local climatic variations. Several locations show evidence of slow recovery from disturbance through advancing timberlines and improved height growth on younger trees.

(D) 1. The lower zone of the Subboreal-Interior forest transition (SBIT) consists of a mixture of trembling aspen stands, white spruce stands, white spruce-alpine fir stands, and some rare local inclusions of Douglas fir stands in the southeastern corner. In most cases lodgepole pine is the seral stage after light or moderate fire disturbance. Trembling aspen succession is more prevalent on areas repeatedly burned or formerly cultivated. Intensive, repeated disturbances may result in "temporary grasslands". On exposed sites such grasslands may become practically permanent due to their influence on micro-climate and soil. Productivity on these induced grasslands is nearly always low. In most cases trembling aspen permanently exerts pressure to reinvade these areas. Regeneration of white spruce under stands of trembling aspen and of lodgepole pine indicates that both species are seral to a white spruce climax. The occurrence of Douglas fir regeneration under a canopy of trembling aspen on some edaphic sites provides evidence of trembling aspen being a seral species to edaphic Douglas fir climax as well. Between the elevations of 3000 feet and 3500 feet the lower white spruce forest is intermixed with the subalpine Engelmann spruce Alpine fir forest.

2. Above 3500 feet the Engelmann Spruce-Alpine fir forest zone extends upwards to the peaks of the relatively low mountains. Lodgepole pine is the major seral species of this zone. The upper limit of this zone is expected to be approximately 5000 feet where the forest yields to the Alpine tundra zone.

The above is summarized in table 1. Figure 4 indicates vegetation symbols used in the diagrams of the "Description of Soils, their Environment and General Use".

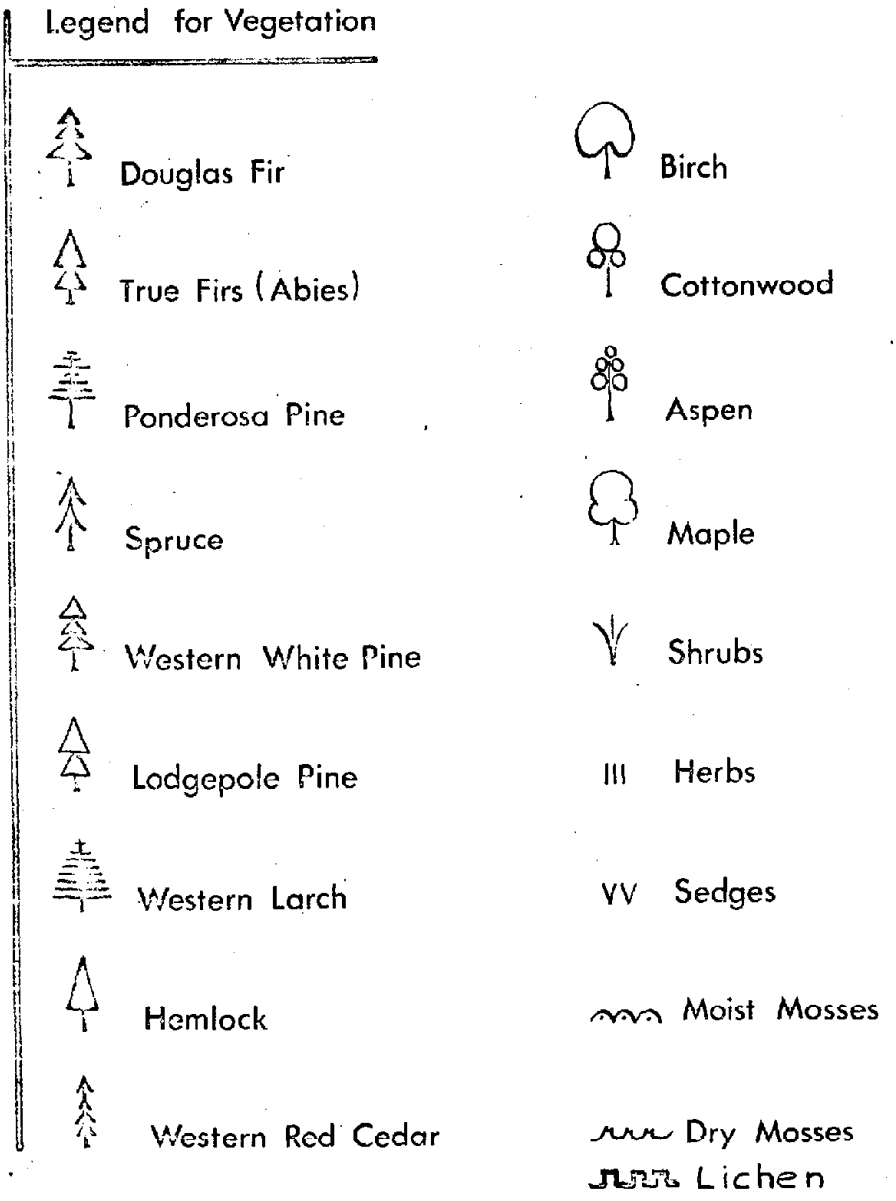


Figure 4. Vegetation

Soil Development and Classification

Soils as natural bodies, are dynamic and did not always exist as such in the landscape. They formed from geologic materials with the interaction of other agencies commonly known as soil forming factors. These soil forming factors, including climate, vegetation, nature of the parent material, relief and drainage, biological activity and length of time determine the type of soil body that is formed.

Soil mapping involves the delination of areas of like soils with similar interpretive groupings.

In the Canadian classification scheme (3), used in this survey the soil order is the highest level of generalization. All of the soils within one order have one or more basic profile characteristics in common. Each soil order is further subdivided into a number of Great Soil Groups. These groups of soils have certain morphological features in common reflecting a similar environment of soil development (pedologic environment).

A soil may be rapidly drained, well drained or poorly drained, depending on its topographical position and size distribution of the mineral particles contained within it (texture). Gravel and coarse sand are the largest while clay particles are the smallest. Soils derived from coarse textured gravelly and sandy deposits are usually rapidly drained while finer textured soils on slopes and semi-flat areas free from the influence of groundwater are well drained. Poorly drained soils are those affected by groundwater.

There are 8 orders in the system of Canadian Soil Classification.

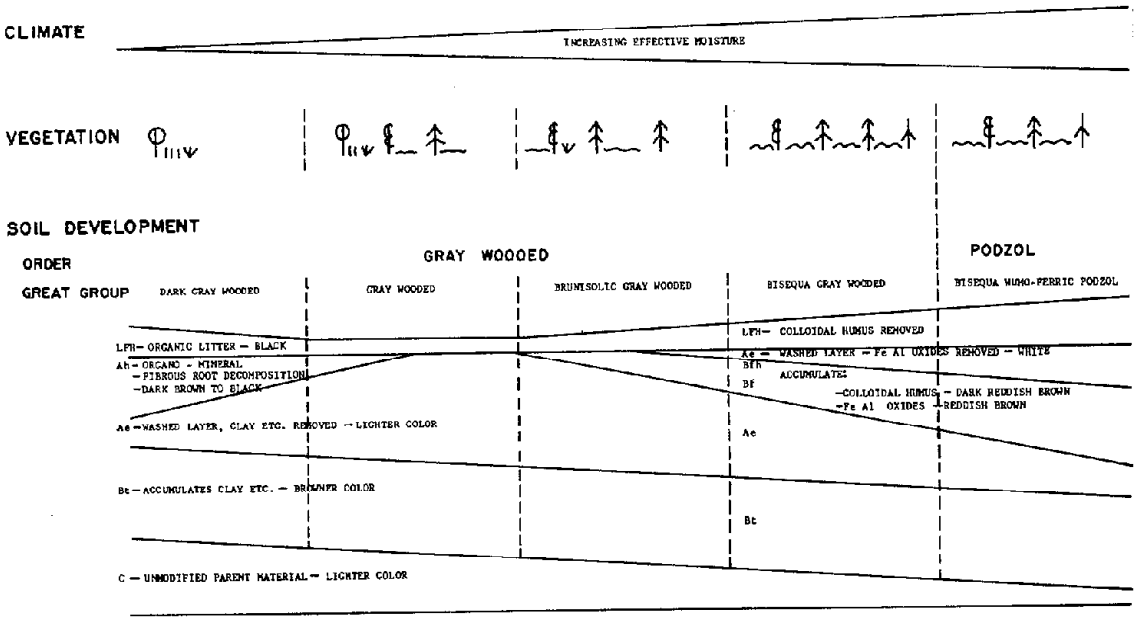
These are:

(1) Grassland soils (Chernozemic Order)
(2) Soils of poor structure and tilth (Solonetzic Order)
(3) Soils of dry forested regions that have movement of clay within the soil (Luvisolic Order)
(4) Soils of the humid forested regions high in iron and/or humus (Podzolic Order)
(5) Soils of the dry interior forests (Brunisolic Order)
(6) Young soils with poor layer (horizon) differentiation and development (Regosolic Order)
(7) Groundwater saturated soils (Gleysolic Order)
(8) Soils containing primarily decomposed and (or) semi-decomposed plant residues (Organic Order)

The aforementioned Orders are usually subdivided into two to four Great Soil Groups. For more detailed description on the technical classification of soils of the area see Canadian Soil Survey Committee Manual (3) and Appendix.

The following diagram indicates the relation of soil forming factors on soil development and thus the general environment.

DEVELOPMENT SEQUENCE FOR MEDIUM TO FINE TEXTURED SOILS



LITHIC SUBGROUPS: DEVELOPMENT SAME AS ABOVE PROFILES BUT WITH BEDROCK WITHIN 20 IN. OF SURFACE.

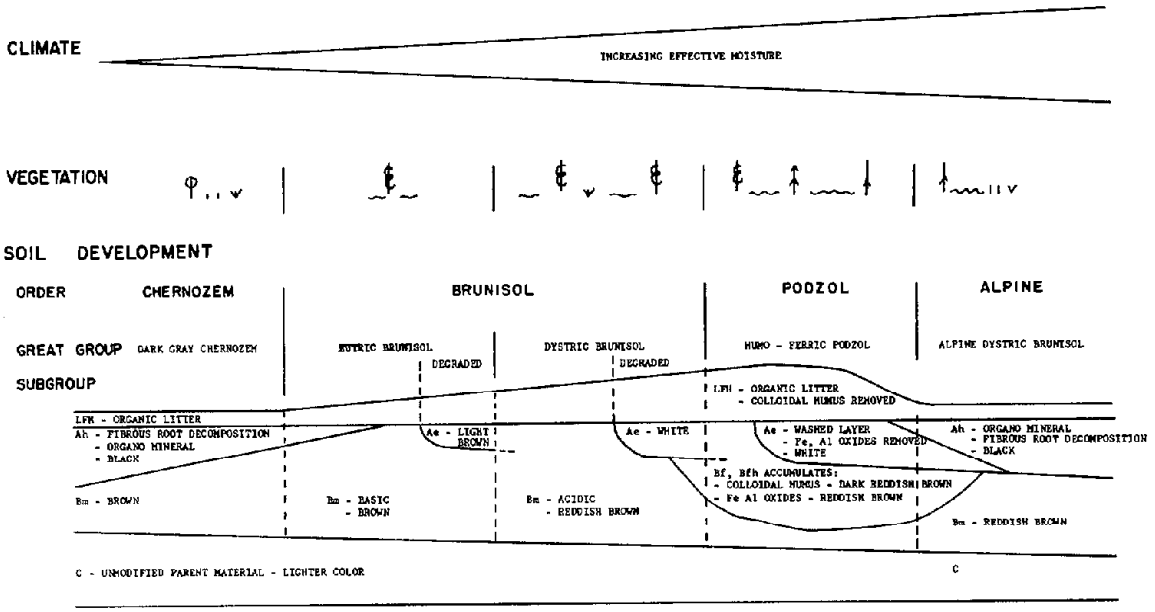
GLEYED SUBGROUPS: DEVELOPMENT SAME AS ABOVE PROFILES, BUT MOIST CONDITIONS CAUSE DULLER COLORS AND BLUISH - GRAY AND REDDISH MOTTLES.

GLEYSOLS: NO RESEMBLANCE TO ABOVE PROFILES. WATER SATURATED MUCH OF THE YEAR, RESTRICTED AERATION CAUSES ORGANIC MATTER ACCUMULATION ON SURFACE AND DARK BLUE-GRAY COLORS AND REDDISH MOTTLES, SUPPORTS OBVIOUS HYDROPHYTIC VEGETATION.

VEGETATION SYMBOLS:

- TREMBLING ASPEN
- LODGEPOLE PINE
- WHITE SPRUCE
- ALPINE FIR
- FORBES
- SHRUBS
- DRIER MOSSES
- MOISTER MOSSES

DEVELOPMENT SEQUENCE FOR MEDIUM TO COARSE TEXTURED SOILS



LITHIC SUBGROUPS: DEVELOPMENT SAME AS ABOVE PROFILES BUT WITH BEDROCK WITHIN 20 IN. OF SURFACE.

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VEGETATION SYMBOLS:

- TREMBLING ASPEN
- LODGEPOLE PINE
- WHITE SPRUCE
- ALPINE FIR
- FORBES
- SHRUBS
- SEDGES
- DRIER MOSSES
- MOISTER MOSSES

DESCRIPTION OF THE SOILS, THEIR ENVIRONMENT AND GENERAL USE

Properties of Soil Associations

Soils in this area were mapped using soil associations. A soil association is defined as a sequence of soils about the same age, derived from similar parent materials, and occurring under similar climatic conditions, but having different characteristics due to variation in relief and in drainage. Similar general climate conditions is taken to include one forest zone and some soil associations are defined on the basis of changes in forest zone i.e. Oona vs. Natlan.

Map Units are shown on the map as symbols e.g. KX1. These map units usually represent a segment of soil association and contain a dominant (or major) soil or soils which account for 40-100% of the soil delineation, with from 20-40% occurring as a minor component (see descriptive tables for each mapping unit). These minor components are those soils most commonly associated with the dominant soil of the map unit.

Complexes are areas delineated on the map where two or more map units from different soil associations are present in an arrangement too complex to separate at the scale of mapping. Most complexes used in this survey are composed of two map units, e.g. SN_2^7 - KA^3 . However, a few complexes are composed of three map units, e.g. KX_1^5 - SN_1^3 - UN^2 .

See Appendix for more technical detail on soils, climate and vegetation. See Use and Management section for more detail on Use and Management characteristics as only highlights related to use are presented in this section. See the Map legend for more detail on map unit symbol description.

Soil Subgroup Abbreviations for Figures

Chernozemic Order	Symbol
Orthic Dark Gray	ODG
Lithic Dark Gray	LiDG
Rego Dark Gray	RDG
Luvisolic (Gray Wooded) Order	
Orthic Gray Wooded	OGW
Dark Gray Wooded	DGW
Brunisolic Gray Wooded	BrGW
Bisequa Gray Wooded	BiGW
Gleyed Orthic Gray Wooded	GIGW
Gleyed Brunisolic Gray Wooded	GIBrGW
Gleyed Dark Gray Wooded	GIDGW
Podzolic Order	
Gleyed Ferro Humic Podzol	GlFHP
Orthic Humo-Ferric Podzol	OHFP
Mini Humo-Ferric Podzol	MHFP
Bisequa Humo-Ferric Podzol	BiHFP

Gleyed Orthic Humo-Ferric Podzol	GlHFP
Gleyed Mini Humo-Ferric Podzol	GlMHFP
Gleyed Bisequa Humo-Ferric Podzol	GlBiHFP
Lithic Orthic Humo-Ferric Podzol	LiHFP
Lithic Mini Humo-Ferric Podzol	LiMHFP

Brunisolic Order

Degraded Eutric Brunisol	DEB
Orthic Sombric Brunisol	OSB
Lithic Orthic Sombric Brunisol	LiSB
Orthic Dystric Brunisol	ODB
Degraded Dystric Brunisol	DDB
Alpine Dystric Brunisol	ADB
Gleyed Orthic Dystric Brunisol	GlDB
Gleyed Degraded Dystric Brunisol	GlDDB
Gleyed Alpine Dystric Brunisol	GlADB
Lithic Orthic Dystric Brunisol	LiDB
Lithic Alpine Dystric Brunisol	LiADB

Regosolic Order

Orthic Regosol	OR
Cumulic Regosol	CuR
Gleyed Orthic Regosol	GlR
Lithic Orthic Regosol	LiR
Lithic Cumulic Regosol	LiCuR

Gleysolic Order

Gleysolic soils	G

Organic Order

Organic soils	O

Miscellaneous

Gleyed Subgroups	Gl Subs.
Lithic Subgroups	Li Subs.

ALIX ASSOCIATION

Physiographic Setting

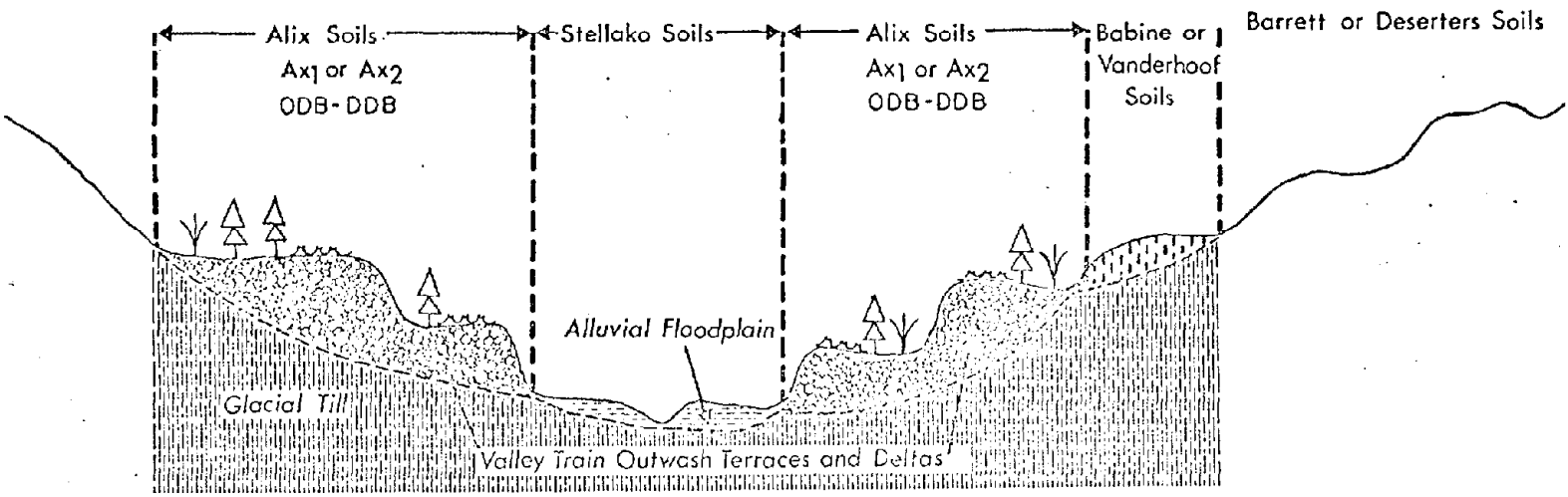

Figure 5.

Elevation: 1500'- 3000'

Landform

Flat to gently sloping (0 to 6% slopes) valley-side glacial terraces or deltas with occasional upland gravel-filled channels. Surfaces are occasionally pitted, and pits have no obvious drainage outlets. Surface drainage patterns are non-existent and short v-shaped gullies typical of gravel materials are common on terrace edges.

Parent Material

Water sorted, stratified gravels which are coarse to moderately coarse textured, often stony, highly permeable and loose. Of variable thickness but always exceeding 5 feet in depth and with stratified gravels and sands common at depth.

Environment (Soil-Climate-Vegetation Relationships)

The combination of the coarse soil texture and high permeability as well as relatively low precipitation (approximately 7.5 inches, May-September) results in a very dry, droughty summer environment. Cold winters and frost free periods of 40-80 days are common, although many of these valley-side terraces have excellent air drainage and provide the best annual climate in the valleys. Associated with these Brunisol soils in the area are lodgepole pine, trembling aspen, dry mosses and a sparse shrub and herb layer due to the lack of moisture. The AX2 map units exhibit a somewhat moister environment than AX1 and usually occur at higher elevations, in very narrow valleys, or in the western (moister) edge of this soils occurrence.

Table 2. Alix Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
AX1	Orthic Dystric Brunisol		rapid	flat terraces with steep edges next to valley center	lodgepole pine, aspen, dry mosses	5,208	5,052
		Degraded Dystric Brunisol	rapid	flat terraces with steep edges next to valley center	lodgepole pine, aspen, dry mosses		
AX2	Degraded Dystric Brunisol		rapid	flat terraces with steep edges next to valley center	lodgepole pine, aspen, dry mosses, white spruce	15,824	8,992
		Orthic Dystric Brunisol	rapid	flat terraces with steep edges next to valley center	lodgepole pine, aspen, dry mosses, white spruce		
					Total Acreage	21,032	14,044

Suitability for Different Uses

a. Agriculture

Although frost free periods are relatively better than on adjacent soils the droughty nature of the soil and stoniness limit the range of crops possible to forages without irrigation. Irrigation water requirement would be high. Where stoniness is not too severe a wide range of climatically adapted crops could be grown under irrigation. Irrigation water is usually close at hand.

b. Forestry

Mean annual increments range from 31-60 cu.ft./ac./yr. for lodgepole pine, with soil drought being the main limitation. Fire hazard is extremely high on these soils. Slash burning is not recommended as organic matter removal only reduces the soil moisture holding capacity and reduces growth.

c. Engineering and Urban Development

Excellent aggregate source. Road location and subdivision development possibilities excellent. Compressibility and bearing strength characteristics are variable and should be checked carefully when heavy structures are contemplated. Sewage effluent disposal potential is high, but some contamination of groundwater is possible under high density development.

d. Wildlife

Physiographic location next to streams and the flat topography near valley bottoms (lesser snow depths usually) make these terraces a useful part of ungulate winter range, although the droughty soils themselves do not produce useful food plants. The dry environment provides excellent upland bird nesting sites with water adjacent and feeding areas often close at hand in the upland or on agriculture lands. Much of the wildlife use is hampered by other use

(transportation routes, homesites, agriculture).

e. Recreation

Excellent capability for most uses. Surface stoniness might limit use for intensive playing fields and topsoil application would be necessary. High irrigation requirement where grassed areas are necessary. Esthetic qualities of open lodgepole pine stands and the excellent views of the valley from the terrace edges are particularly attractive.

BABINE ASSOCIATION

Physiographic Setting

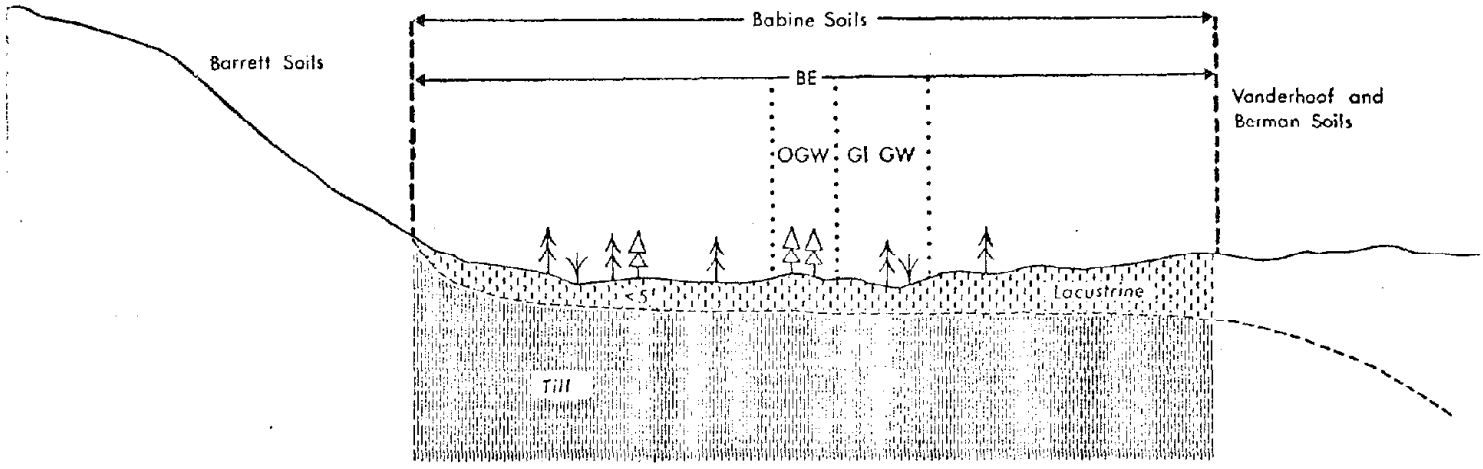

Figure 6. Elevation: 1400'- 2300'

Landform

This glaciolacustrine landform is relatively flat, although erosion and underlying till result in a fair amount of undulating topography (2-9% slopes). An intense dendritic drainage pattern with associated rounded gullies typical of clay materials is common, although modified where very shallow to underlying glacial till.

Parent Material

The deposits consist of less than 5 feet of moderately fine to fine textured (loam to clay) stone-free, non-calcareous, layered, compact, nearly impervious, glaciolacustrine sediments overlying a compact medium textured, (loam to silty clay loam) stony glacial till, which is also nearly impervious.

Environment (Soil-Climate-Vegetation Relationships)

The Babine soils develop on the above parent materials under climates which have 7.5-10.5 inches, May-September precipitation, a mean annual temperature of approximately 37º and long cold winters, cool summers and relatively cold soil temperatures, especially under forest stands. Frost free periods range from 40 to 70 days. Associated major vegetation consists of white spruce with willow and lodgepole pine taking over after fire. In turn white spruce

regenerates under the lodgepole pine and eventually becomes dominant. This is especially obvious on the moderately well drained topographic highs (Orthic Gray Wooded soils). Willow is more specific to the imperfectly drained swales (Gleyed Orthic Gray Wooded soils) and can be dominant in association with white spruce.

Table 3. Babine Soils

Soil Association Map Unit	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
BE	Orthic Gray Wooded		moderately well	on crests or topographic highs in undulating topography	lodgepole pine and white spruce	5,344	12,728
		Gleyed Orthic Gray Wooded	imperfect	moist swales of undulating topography	white spruce and willow		

Suitability for Different Uses

a. Agriculture

Although these soils are quite suitable for cultivation, short frost free periods limit their use to forage crops and hardy cereal grains except in the Bulkley Valley west of Moricetown, where a wider range of crops including vegetables is possible. Cool soil temperatures, slow permeability, high probability of winter killing in swales and necessary late spring cultivation due to the fine texture are the main management limitations. Advantages include high moisture holding capacity and relatively flat topography.

b. Forestry

Mean annual increments (amount of wood growth per year) range from 51 to 70 cu.ft./ac./yr. based on a 100 year rotation for lodgepole pine and spruce. The main limitations are shallow rooting depth (low permeability), perhaps cool soil temperatures and a slight soil moisture deficit during the growing season. The relatively flat topography lends itself to machine harvesting and planting. Due to poor trafficability when wet, winter logging is recommended on these soils.

c. Engineering and Urban Development

These nearly impermeable medium to fine textured soils are subject to frost heaving, have limited potential for effluent disposal, generally poor trafficability when wet and cutbanks have high erosion hazard. The only advantage is relatively flat topography.

d. Wildlife

Generally unsuitable for waterfowl, but suitable to varying degrees for ungulate wildlife depending upon successional stages of vegetation. After logging or fire, browse species will predominate for a short period, after which they will survive only in the moist swales (Gleyed Orthic Gray Wooded soils). As most areas are near major valleys, moderate wildlife suitability is hampered by other uses.

e. Recreation

Generally unsuitable except for extensive use because of the fine textured soils and associated poor suitability for effluent disposal, easily compacted soil surface, and general unattractiveness except as part of a pastoral setting.

BARRETT ASSOCIATION

Physiographic Setting

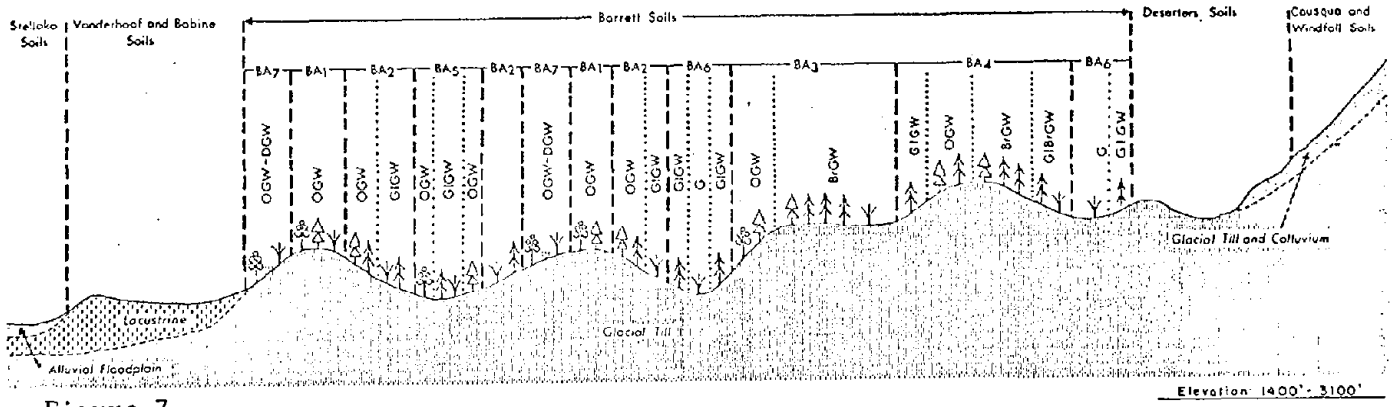

Figure 7.

Landform

An undulating to rolling (5-30% slopes) till plain of the interior plateau occasionally drumlinized but commonly a haphazard pattern of wave-like ridges, humps and swales of various sizes. A uniform modified dendritic surface drainage pattern with tributaries exhibiting little directional change on meeting major drainageways is common, and gullies have the characteristic u-shape of moderately fine textured materials.

Parent Material

A heterogeneous moderately fine textured (clay loam, silty clay loam) glacial till which is hard, compact, often stony and nearly impervious.

Environment (Soil-Climate-Vegetation Relationships)

These soils occur associated with the relatively drier climate in the area (4.5 to 7.5 inches, May to September precipitation-approximately 35 inches annual) and have a wide range of soil drainage conditions and frost free periods (45-85 days). Fire history and the variability in drainage is reflected in the vegetation composition more than usual. A complex and intricate combination of climatic and soil moisture factors occurs ranging from the drier often disturbed sites (Map Unit BA7)at lower elevations or on exposed slopes, to the shaded moister north slopes at higher elevations or on the edge of the coastal transition (BA3 and BA4). Along with this gross climatic variation are the soil moisture characteristics related to landscape position and soil drainage. In depressional areas (BA5,6,4,2) imperfectly and poorly drained soils have a higher shrub and white spruce component in the vegetation cover and this is likely to remain for along period of time. Mature stands

are also more common on these sites. On the well drained soils of (BA1,2, 3,4,7) fire more frequently changes the vegetation components drastically, but shrub cover is likely to be transitory on most except BA7.

Due to the nearly impervious nature of the soil, roots have difficulty in penetrating and only moist sites have roots below 30 inches.

Table 4. Barrett Soils

Soil Association Map Unit	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
BA1	Orthic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps, relatively steeper slopes	lodgepole pine, white spruce, aspen	39,032	37,268
BA2	Orthic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps, relatively steeper slopes	lodgepole pine, white spruce, aspen		
		Gleyed Orthic Gray Wooded	imperfect	moisture receiving swales, flat plains and seepage channels	white spruce, abundant shrubs, lodgepole pine, aspen	70,928	20,552
BA3	Orthic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps, relatively steeper slopes	lodgepole pine, white spruce, aspen		
		Brunisolic Gray Wooded	well to moderately well	moisture shedding convex ridges, humps, relatively steeper slopes (north and east aspects common)	white spruce, lodgepole pine, shrubs	58,324	15,088
BA4	Orthic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and steeper slopes	lodgepole pine, white spruce, aspen		
		Brunisolic Gray Wooded	well to moderately well	moisture shedding convex ridges, humps and steeper slopes			
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains and seepage channels	lodgepole pine, white spruce, aspen		
BA5	Gleyed Orthic Gray Wooded		imperfect	moisture receiving swales, flat plains and seepage channels	lodgepole pine, white spruce, aspen		
		Orthic Gray Wooded	moderately well to well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce, aspen	3,000	5,468
BA6	Gleysolics		poor	deep swales and seepage channels, moisture receiving	shrubs, black spruce, white spruce, abundant shrubs, lodgepole pine	2,888	
		Gleyed Orthic Gray Wooded	imperfect	swales, flat plains and seepage channels			
BA7	Orthic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	aspen, lodgepole pine, shrubs	46,056	16,884
		Dark Gray Wooded	well	moisture shedding convex ridges, humps and relatively steeper slopes (steepest slopes within Barrett)	abundant shrub, herb and grass cover, stunted aspen clumps		
					Total Acreage	220,228	95,260

Suitability for Different Uses

a. Agriculture

Although slopes do get rather severe in some locations all of the Barrett soils are arable. The main limitations are the hard, nearly impervious soil material (difficult to cultivate), some stoniness and in most cases short frost free periods (the greater area covered by 45 to 60 days frost free period with growing degree days approximately 1650). In the extreme western occurrence of these soils (mouth of the Bulkley Valley) frost free periods do rise to as high as 90 days, but this involves a very small area. The greater part of the acreage is limited to forage crops and hardy cereals and vegetables although a wider range of crops is possible in the limited area within the Bulkley Valley from Telkwa westward.

b. Forestry

The mean annual increments range from; (1) 71-90 cu.ft./ac./yr. for white spruce on the imperfectly drained soils within Map Units BA2,4,5,6; (2) on the moister Brunisolic Gray Wooded segments of Map Units BA3 and BA4, to 51-70 cu. ft./ac./yr. for lodgepole pine; (3) on the well drained Gray Wooded soils of Map Units BA1,2,3,4,5; (4) 11-30 cu.ft./ac./yr. for black spruce on the wet Gleysol soils Map Unit BA6, and (5) 30-51 cu.ft./ac./yr. for aspen of Map Unit BA7. Excellent topography for machine harvesting and planting. This soil material can be very sloppy and sticky during fall and spring and presents some harvesting problems. Some frost heaving and compaction can be expected.

c. Engineering and Urban Development

Barrett soils are subject to frost heaving, have limited potential for effluent disposal. Trafficability generally poor when wet and while only limited cuts are necessary for road construction (flat topography) cutbanks have high erosion hazard. Fluctuating water tables are associated with imperfectly and poorly drained soils in Map Units BA2,4,5,6.

d. Wildlife

Under natural conditions a wide range of vegetation suitable for ungulate and upland game bird food and cover could be expected on these soils. The lower elevations and exposed slopes of BA7 map units provide part of the ungulate winter range along the Bulkley Valley. Continuance of present habitat, its diversity and the various successional stages of vegetation on these soils will depend on mans use through forest management and mono-cultures, especially on the well drained soils in Map Units BA1,2,3,4,5,7.

e. Recreation

Generally unsuitable flat landscape except for extensive use such as hiking and riding. Some lakes and streams associated have higher capability. Rather attractive vegetation and use pattern associated with Map Unit BA7. Intensive use limited by poor trafficability when wet, compaction problems and limited potential for effluent disposal.

BERMAN ASSOCIATION

Physiographic Setting

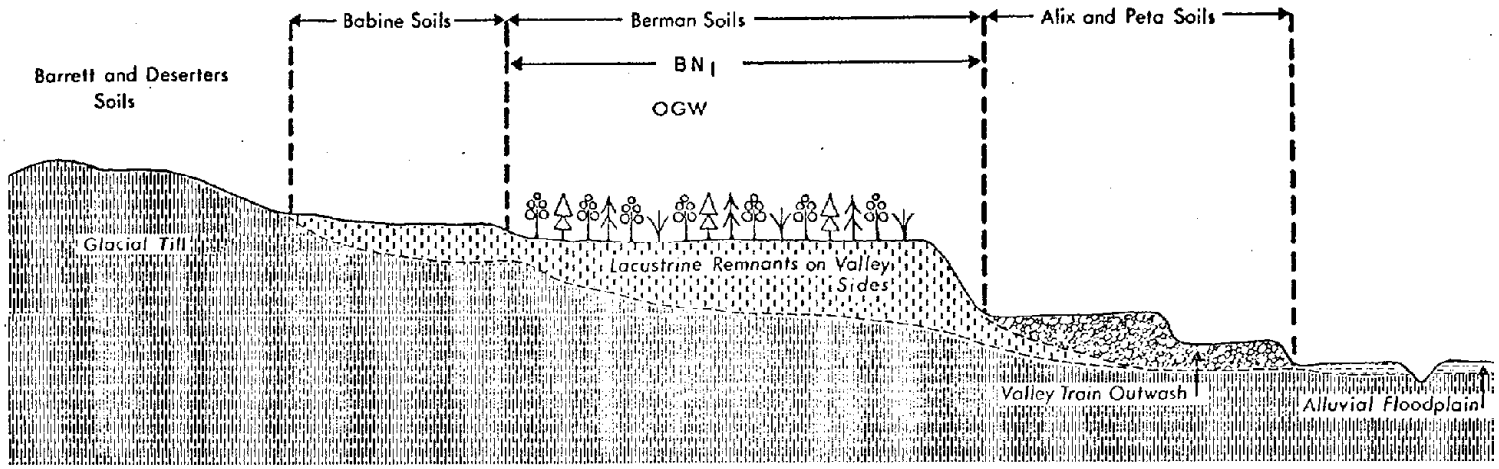

Figure 8. Elevation: 1400'- 2500'

Landform

Flat to eroded and dissected valley-side terraces. Dissected units have numerous u-shaped progressing gullies with a complex dendritic (branched) surface drainage pattern. Slopes from 0 to 6% common; dissected areas (7-50%).

Parent Material

Medium to moderately fine textured (silty), stone-free, layered, and relatively permeable, glaciolacustrine (lakebed) sediments.

Environment (Soil-Climate-Vegetation Relationships)

These moderately well to well drained, moderately permeable, highly erodable soils are associated with a climate characterized by approximately 7.5 inches of May-September precipitation and frost free periods ranging from 60-80 days. Aspen is the dominant tree species with scattered white spruce and lodgepole pine. Abundance of the shrub and herb layer varies with stand density but generally is abundant. Roots penetrate easily.

Table 5. Berman Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
BNI	Orthic Gray Wooded		moderately well to well	flat and dissected valley side terraces	aspen, white spruce, lodgepole pine	940	

Suitability for Different Uses

a. Agriculture

Highly desirable agricultural soil with no physical limitations where not dissected by gullies. Capable of producing a range of crops within climatic limits (forages, hardy cereals and vegetables). Often located in position of best air drainage on valley side.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for lodgepole pine. These soils are highly erodable especially where dissected and careful harvesting procedures and skid trail construction, are essential to maintaining the site and preventing stream sedimentation. Frost heaving of seedlings likely.

c. Engineering and Urban Development

Frost heaving likely. Sliding and slumping hazard high on edge of terraces and in dissected areas. Ditch maintenance high due to flowing characteristics when wet. Trafficability generally poor when wet. Flat topography a road construction advantage. Moderately suitable for effluent disposal although some hazard of seepage between layers of material. Low bearing strength.

d. Wildlife

Location at lower elevations (lesser snow depths) and a soil-climate combination conducive to the production of food plants useful to both upland game birds and ungulates. An interspersion of dense stands provides necessary cover.

e. Recreation

Sticky and slippery when wet and subject to compaction and erosion. Occasional panoramic views of the valley, otherwise not generally suitable for intensive recreation use.

CAUSQUA ASSOCIATION

Physiographic Setting

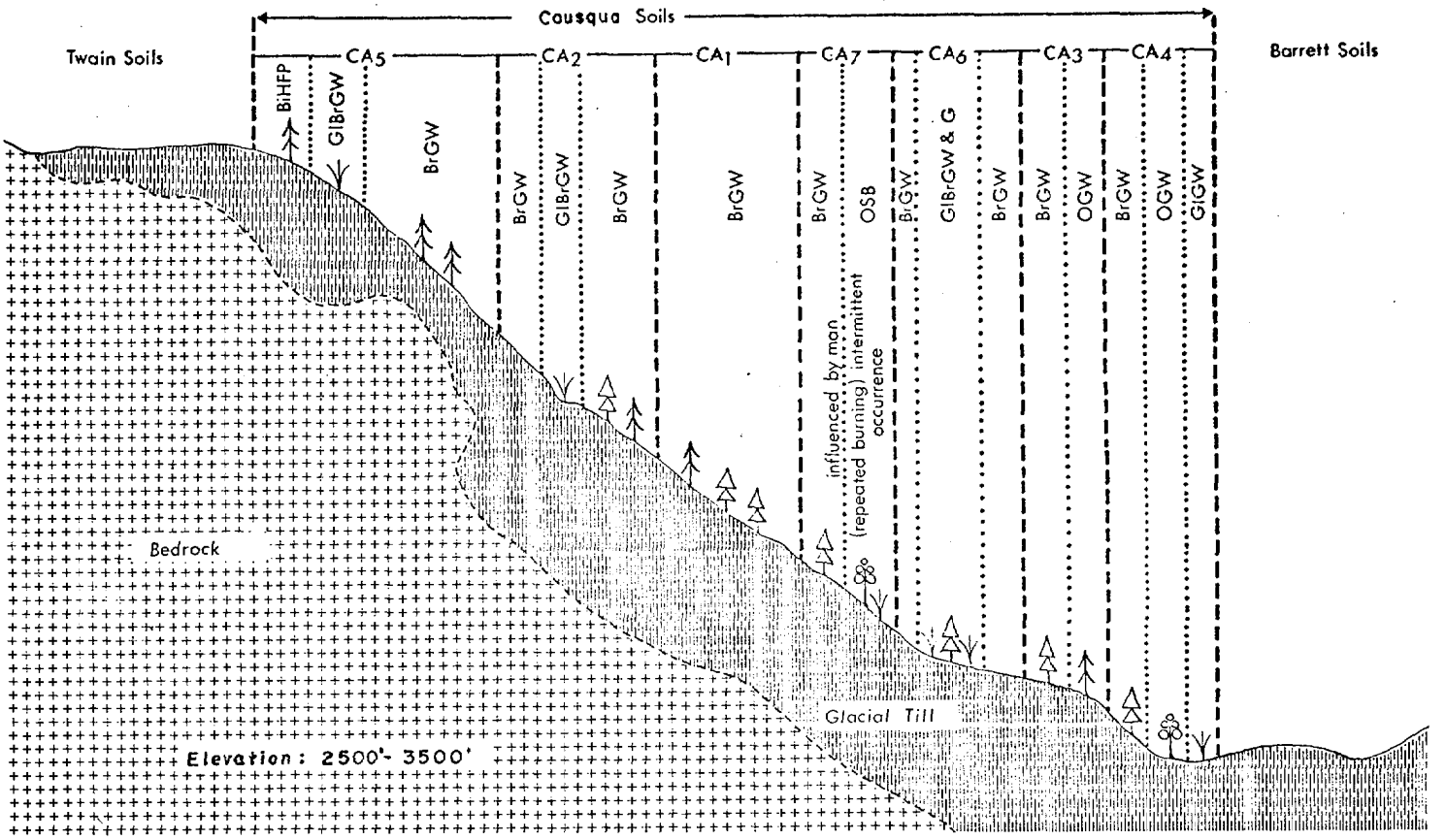

Figure 9.

Landform

A very steeply sloping, (over 30%; average 45% slopes) glacial till plain on steep valley walls. Often parallel or modified dendritic surface drainage pattern, with abrupt directional changes where underlying bedrock is encountered. Gullies cut deeply into the surface, with u-shaped profiles common and typical of medium textured material.

Parent Material

A heterogeneous medium to moderately fine textured, (loam to silty clay loam) stony, relatively impermeable, compact glacial till which often has some surface modification due to downslope movement of material as a result of gravity. The surface modification may be a reworking of the local glacial till or an admixture of detritus from further up slope.

Environment (Soil-Climate-Vegetation Relationships)

The Causqua soils develop on the above parent materials under climates which have approximately 10.5 inches of May-September precipitation and mean annual temperatures of 36°. Long,cold winters, cool, moderately humid summers

and relatively cool soil temperatures, especially under forest stands are typical. Some of these slopes are exposed to the south and west and are somewhat drier than surrounding moister environment. Frost free periods range from 40 to 60 days. Associated vegetation consists of white spruce and willow with lodgepole pine and trembling aspen taking over after fire. In turn white spruce regenerates under the lodgepole pine and aspen, and eventually becomes dominant. Willow is more specific to the imperfectly drained seepage slopes (predominantly Gleyed Brunisolic Gray Wooded soils) and can be dominant on these sites.

Table 6. Causqua Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
CA1	Brunisolic Gray Wooded		well	shedding convex slope	white spruce, lodgepole pine	208	1,696
CA2	Brunisolic Gray Wooded		well	shedding convex slope	lodgepole pine, white spruce		
		Gleyed Brunisolic Gray Wooded	imperfect	receiving concave slope base or seepage channel	willow, white spruce, lodgepole pine	772	1,660
CA3	Brunisolic Gray Wooded		well	shedding convex slope	lodgepole pine, white spruce		
		Orthic Gray Wooded	well	exposed convex shedding slope	lodgepole pine, white spruce, trembling aspen	1,900	5,272
CA4	Brunisolic Gray Wooded		well	shedding convex slope	white spruce, lodgepole pine, willow		
		Orthic Gray Wooded	well	exposed convex shedding slope	lodgepole pine, aspen, saskatoon, white spruce	3,492	3,788
		Gleyed subgroups	imperfect	receiving concave slope base or seepage channel	white spruce, willow, lodgepole pine		
CA5	Brunisolic Gray Wooded		well to moderately well	shedding convex slope	white spruce, lodgepole pine, willow, alpine fir		
		Bisequa Humo-Ferric Podzol				9,628	14,956
		Gleyed subgroups	imperfect	receiving concave slope base or seepage channel	white spruce, willow, lodgepole pine, alpine fir		
CA6	Gleyed Brunisolic Gray Wooded		imperfect	receiving concave slope base or seepage channel			
		Brunisolic Gray Wooded	moderately well	lower part of shedding slope		292	
		Gleysolics	poor	depressional concave or continuous seepage on slope			
CA7	Brunisolic Gray Wooded		well	shedding convex slope	white spruce, willow, lodgepole pine		
		Orthic Sombric Brunisol	well to moderately well	shedding convex slope	willow, forbes, aspen, lodgepole pine		840
					Total Acreage	16,292	28,212

Suitability for Different Uses

a. Agriculture

All soils non-arable. Limited natural grazing after fire and logging for a short period of time until conifer regeneration eliminates desirable grasses and forbes.

b. Forestry

Mean annual increments (amount of wood growth per year) ranges from 71-90 cu.ft./ac./yr. on Map Unit CA5 to 31-50 cu.ft./ac./yr. on the Gleysolic soils in Map Unit CA6 based on a 100 year rotation for lodgepole pine and white spruce. Main limitations are; (1) steep slopes which shed moisture, (2) rooting depth restrictions, (3) skid-road erosion hazard. Brushing in problems can be severe especially on Map Units CA5 and CA6. Main advantage is comparatively high productivity especially at the higher elevations and in moisture receiving positions.

c. Engineering and Urban Development

Not well suited to urban development because of the steep topography and relatively impermeable subsoil. Much cut and fill necessary for road construction. Moderate erosion and slump hazard. Relatively good source of road fill material.

d. Wildlife

High probability of browse species suitable for moose persisting for a long period of time, especially after logging and/or fires if not intensively managed for wood production. Moderate erosion hazard could result in stream sedimentation detrimental to fish production.

e. Recreation

Generally unattractive landscape with the exception of a few small streams and panoramic views from upper slopes. Not really suited for either extensive or intensive use.

COBB ASSOCIATION

Physiographic Setting

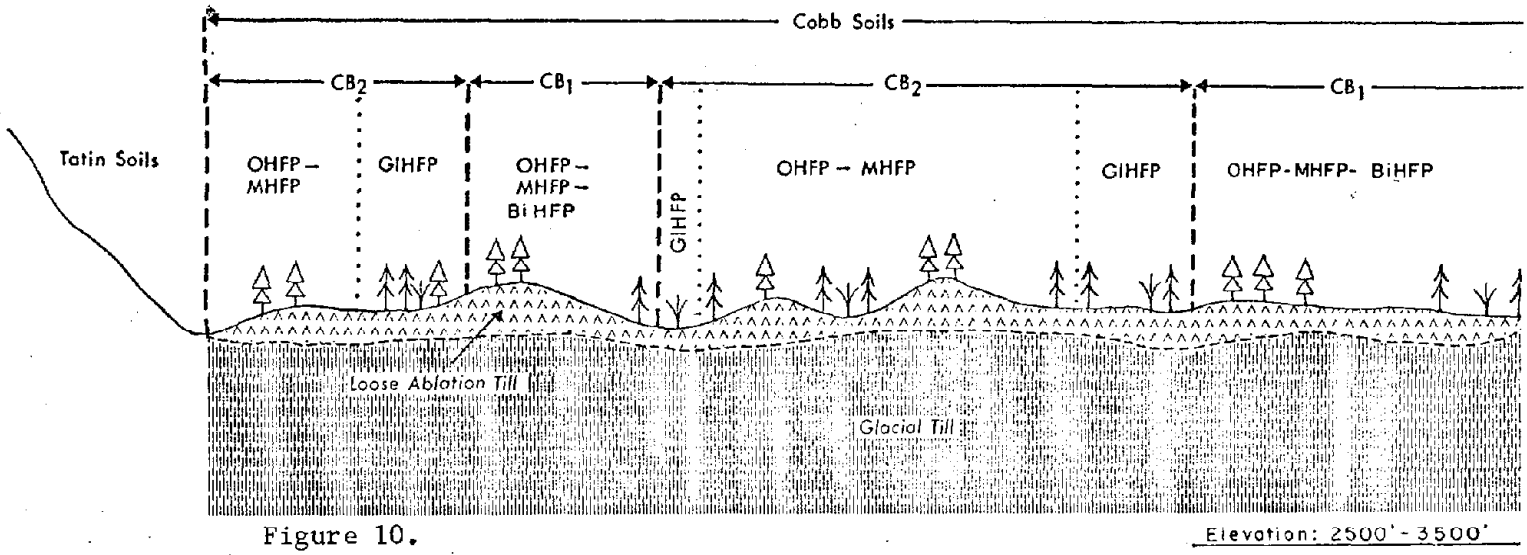

Figure 10.

Elevation: 2500' - 3500'

Landform

Low hummocky and kettled, or sag-and-swale till plain relief is common. Topography varies from gently to strongly rolling (5-30% slopes). The repetitiveness and uniformity of topography usually makes an impression (regular irregularity). Surface drainage patterns are nonintegrated and haphazard with little uniformity of pattern. A repetitive condition of short drainage channels ending in swales is common.

Parent Material

Loose, permeable, partially water sorted, stony, moderately coarse ablation materials of variable thickness (usually 7 or 8 feet) over compact, hard, nearly impervious moderately fine textured glacial till. Variability in the ablation overlay and its characteristics is high due to differences in thickness, stratification and textures because of its origin and deposition processes.

Environment (Soil-Climate-Vegetation Relationships)

Characteristics of the environment include a 10.5 - 13.5 inch May to September precipitation, with approximately 30 to 50 frost free days. The moderately coarse textured, permeable, Podzol soils are associated with lodgepole pine, Engelmann spruce, alpine fir occasionally and variable shrub cover. The relatively moist climate is somewhat counterbalanced by the low moisture holding capacity and high permeability of most of these soils. The humps, in fact, can be quite dry during the growing season while the swales are quite moist, (Gleyed soils of CB2) resulting in lodgepole pine and little shrub cover on the humps and Engelmann spruce, lodgepole pine and abundant shrub cover in the swales. Repeated fires which occur on interconnecting dry sites often results in a patchwork vegetation pattern. The depth to compact material although greater than 5 feet, can have a considerable affect on the surface conditions and environment.

Table 7. Cobb Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
CB1	Orthic Humo-Ferric Podzol		well to moderately well	hummocks (humps) and shallow swales	lodgepole pine	5,468	32,376
		Mini Humo-Ferric Podzol	well to moderately well	hummocks (humps) and shallow swales	lodgepole pine		
		Bisequa Humo-Ferric Podzol	moderately well to well	flatter areas and shallow swales	lodgepole pine, Engelmann spruce		
CB2	Orthic Humo-Ferric Podzol			hummocks (humps) and shallow swales	lodgepole pine	2,460	30,884
		Mini Humo-Ferric Podzol	well	hummocks (humps) and shallow swales	lodgepole pine		
		Gleyed subgroups	imperfect	swales or depressions	Engelmann spruce, lodgepole pine and shrubs		
					Total Acreage	7,928	63,260

Suitability for Different Uses

a. Agriculture

Mostly arable, but low capability with severe limitations of short frost free period, low soil moisture holding capacities, stoniness and rough topography. Suitable for production of hardy forage crops only. High probability of winter killing in swales.

b. Forestry

Mean annual increments range from 51-90 cu.ft./ac./yr. for lodgepole pine and white spruce, with soil drought being the main limitation. Slash burning not recommended as organic matter removal only reduces soil moisture holding capacity. Trafficability excellent.

c. Engineering and Urban Development

Some shallow aggregate sources (deposits not void of fine particles). Excellent for road locations and road fill material. Compressability and bearing strength characteristics are variable and should be checked carefully when heavy structures are contemplated. Fluctuating water tables in swales. Seepage along compact till underlay could present effluent disposal problem.

d. Wildlife

A wide variety of vegetation at various successional stages could be expected as a long term situation in this environment. Both cover and food plants should remain abundant under natural conditions for upland game birds and ungulates. At higher elevations snow depths would limit winter use by ungulates. The dry humps and moist swales and associated shrub and forest vegetation provide excellent grouse habitat.

e. Recreation

Location in the uplant forest area makes it undesirable for most intensive uses, although it is suitable for such uses. A wide variety of vegetation (fire history and soil drainage differences) provide an interesting hiking and riding environment.

CRONIN ASSOCIATION

Physiographic Setting

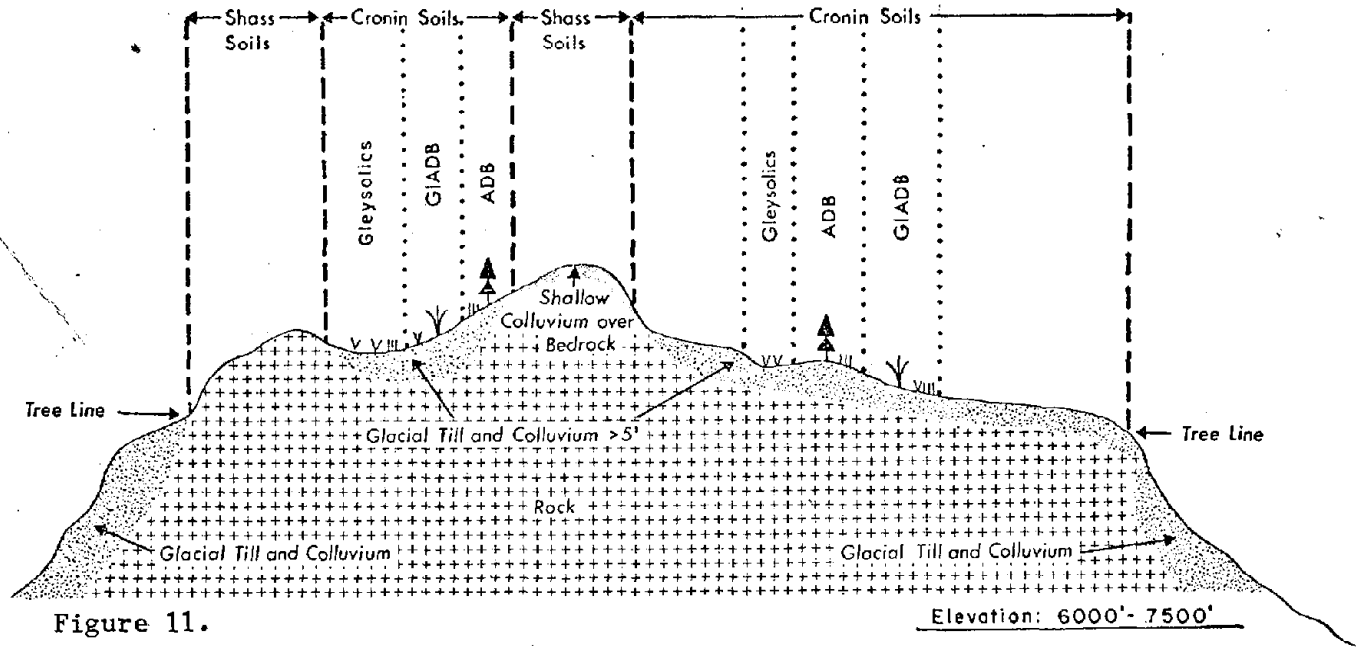

Figure 11.

Elevation: 6000'- 7500'

Landform

A depressional to rolling and moderately steeply sloping (2-40% slopes) bedrock controlled plain on mountain tops above tree line. Some evidence of frost action (frost polygons) and related upheaving of the microtopography. Gullies disoriented with abrupt directional changes caused by underlying bedrock.

Parent Material

More than 5 feet of heterogeneous moderately coarse to medium textured (gravelly sandy loam to loam), mixtures of glacial till, colluvium and detritus with variable permeability. Material is stony, bouldery and moderately loose.

Environment (Soil-Climate-Vegetation Relationships)

These soils occur in the alpine above tree line under severe climatic conditions characterized by less than 30 days frost free period, approximately 40 inches of annual precipitation, a mean annual temperature near 32°, and severe winds which result in extremely short summers and long cold winters. Associated vegetation is dwarfed, and on moderately well drained soils includes hardy forbes, heathers and grasses and scattered stunted clumps of alpine fir. On imperfectly drained soils, sedges, heathers and dwarf willow predominate. Frost heaving is common, especially in the imperfectly and poorly drained soils.

Table 8. Cronin Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
CN	Alpine Dystric Brunisol		well to moderately well	slightly convex shedding slopes	forbes, grasses, stunted alpine fir, heathers	772	7,332
		Gleyed Alpine Dystric Brunisol	imperfect	swales and seepage channels	dwarf willow, sedges, forbes		
		Gleysolics	poor	depressions and slopes with continuous moisture source	wet Alpine forbes		

Suitability for Different Uses

a. Agriculture

Limited natural grazing capability often in direct conflict with wild ungulates. Overgrazing could easily cause irreversible damage to the ecology.

b. Forestry

No wood production capability due to severe climatic limitations.

c. Engineering and Urban Development

Not suitable because of severe climate and difficult access.

d. Wildlife

Suitable as summer range for ungulates, but severe climate and deep snow accumulation limit winter use to wind swept slopes. Provides excellent ptarmigan habitat, especially those areas with imperfectly and poorly drained soils adjoining shallow to bedrock soils.

e. Recreation

Extremely attractive landscape in association with the surroundings. Panoramic views are common. These soils have a very low carrying capacity and ecological damage hazard is severe. Extensive use only with care.

CRYSTAL ASSOCIATION

Physiographic Setting

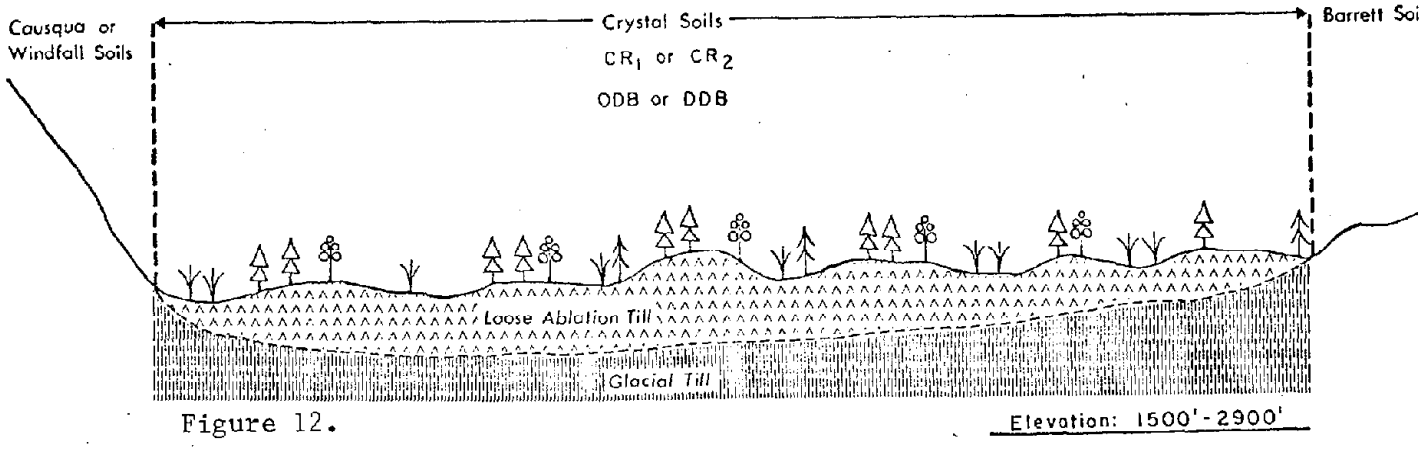

Figure 12.

Landform

Low hummocky and kettled or sag-and-swale till plain relief is common. Topography varies from gently to strongly rolling (5-30% slopes). The repetitiveness and uniformity of topography usually makes an impression (regular irregularity). Surface drainage patterns are non-integrated and haphazard with little uniformity of pattern. A repetitive condition of short drainage channels ending in swales is common.

Parent Material

Loose, permeable, partially water sorted, occasionally stratified, stony, bouldery, moderately coarse ablation materials of variable thickness (usually 7 or 8 feet), over compact, hard, nearly impervious moderately fine textured glacial till. Variability in the ablation overlay and its characteristics is high due to differences in thickness, stratification, and textures because of its origin and deposition processes.

Environment (Soil-Climate-Vegetation Relationships)

The environment is characterized by approximately 7.5 inches of May to September precipitation and a frost free period of 60 to 80 days in combination with moderately coarse textured, permeable Brunisol soils supporting lodgepole

pine and aspen on the humps and white spruce, willow and shrubs in the swales. The swale soils are not imperfectly drained as Cobb soils were due to the somewhat drier climate, but still obtain additional moisture as they are in a moisture receiving position. Variability of vegetation between the humps and swales is not as obvious as on the Cobb at higher elevations, but is still well reflected in forest composition, better productivity and abundance of shrubs and mosses. The depth to compact material although greater than 5 feet can have a considerable affect on the surface conditions and environment.

Table 9. Crystal Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
CR1	Orthic Dystric Brunisol		well	humps and shallow swales	lodgepole pine, aspen, white spruce	420	13,556
		Degraded Dystric Brunisol	well	humps and shallow swales	lodgepole pine, white spruce, shrubs		
CR2	Degraded Dystric Brunisol		well	humps and shallow swales	lodgepole pine, white spruce, shrubs	15,808	87,648
		Orthic Dystric Brunisol	well	humps and shallow swales	lodgepole pine, aspen, white spruce		
					Total Acreage	16,228	101,204

Suitability for Different Uses

a. Agriculture

Mostly arable, but limitations of low moisture holding capacity, stoniness and in some cases rough topography along with a somewhat short frost free period. A moisture deficit during the growing season restricts crop range to forages without irrigation. With irrigation a somewhat wider range of crops including production of cereal grains, cool season vegetables and small fruits is possible under intensive management, although variability in texture of the plough layer could be a problem.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for lodgepole pine with soil drought and growing season moisture deficit being the main limitations. Slash burning not recommended. Trafficability excellent.

c. Engineering and Urban Development

Some shallow aggregate sources (deposits not void of fine particles). Excellent for road location and road fill material. Compressability and bearing strength characteristics are variable and should be checked carefully when heavy structures are contemplated. Seepage along compact till underlay could present effluent disposal problems.

d. Wildlife

A wide variety of vegetation at various successional stages could be expected as a long term situation under natural conditions, but land use competition on these lower elevation soils and man's influence could be detrimental. Higher frost free periods and shallower snow depths help to provide a better wintering habitat for ungulates than the closely related Cobb soils at higher elevations.

e. Recreation

Suitable for most intensive uses and ideally situated adjacent to transportation routes. The establishment of campsite, hiking trails, and picnicking sites would present few problems on these soils. Stoniness and rough topography can be somewhat limiting.

DAHL ASSOCIATION

Physiographic Setting

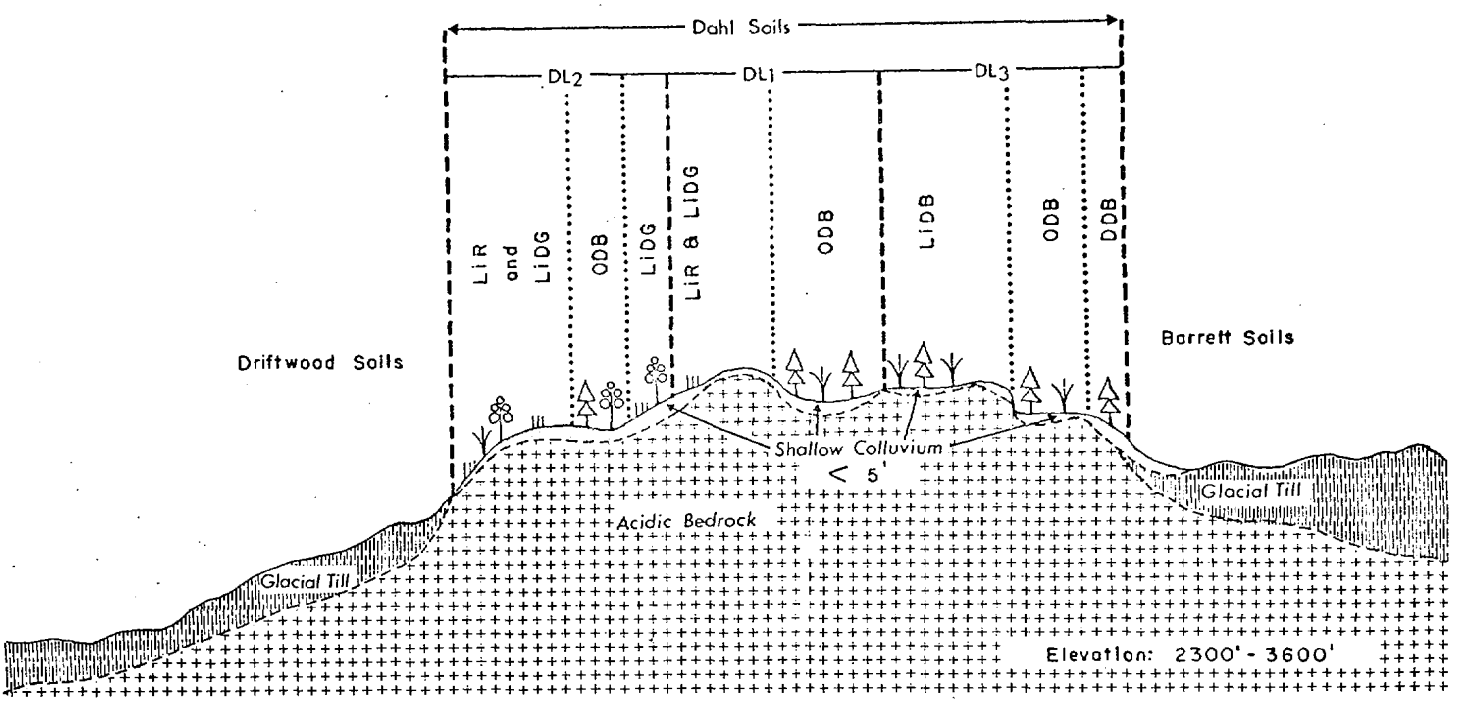

Figure 13.

Landform

The surface form is typical of the underlying acidic bedrock as the surface mantle is less than 5 feet thick. Dome-shaped hills having rounded tops, and steep side slopes (40%+) are common. Where soil mantles are thin (lithic subgroups) a characteristic irregular pattern of curvilinear fractures modifys the surface. Surface dendritic drainage patterns are of varying density and channels tend to have a rounded shape with tributary intersections tending to resemble a right angle.

Parent Material

Shallow colluvium which is moderately coarse textured, permeable, stony, and loose glacial till. Material derived from rock materials which combine to form a surface mantle which moves down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

Soil developments would indicate that the plant ecology of the Dahl soils has been static for some time, (slow vegetation successional trends). The wide range of environment might best be attributed to the complexity of topography and aspect associated with these shallow soils. The sharp vegetation contrasts which occur on these soils were probably enhanced by frequent forest fires on the exposed, drier locations, Map Unit DL2 - grasses and shrubs, while the shaded, moister aspects immediately adjacent to Map Units DL1 and DL3 indicate a long term conifer cover. These map units most often rise above the general landscape, with relatively better air drainage and thus better climates than the surrounding land. Precipitation is approximately 7.5 inches during May to September and the frost free period is approximately 50-60 days. Exposed bedrock is included as a minor component of some map units.

Table 10. Dahl Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
DL1	Orthic Dystric Brunisol		well	steeply sloping stabilized north and east slopes and flatter swales	lodgepole pine, aspen, white spruce	296	168
		Lithic Orthic Regosol	well	steeply sloping active north and east slopes and convex rocky humps	shrubs, aspen		
		Lithic Dark Gray	well	steeply sloping stabilized south and west slopes	forbes, grasses, stunted aspen		
DL2	Lithic Orthic Regosol		well	steeply sloping active south and west slopes	forbes, shrubs, grasses	332	6,801
	Lithic Dark Gray		well	steeply sloping stabilized south and west slopes	forbes, grasses, stunted aspen		
		Orthic Dystric Brunisol	well	swales in rock or north and east slopes	aspen, lodgepole pine		
DL3	Orthic Dystric Brunisol		well	steeply sloping stabilized north and east slopes and flatter swales	lodgepole pine, aspen, white spruce	112	868
		Degraded Dystric Brunisol	well	steeply sloping stabilized north and east slopes and flatter swales	lodgepole pine, aspen, white spruce		
		Lithic subgroups	well	convex rocky humps and steep slopes	lodgepole pine, aspen		
					Total Acreage	740	7,837

Suitability for Different Uses

a. Agriculture

Non-arable as topography is too steep and soils are shallow to bedrock. These soils are easily damaged by overgrazing, but have good native forage production potential if carrying capacities are adhered to.

b. Forestry

Mean annual increments range from 11 cu.ft./ac./yr. on Map Unit DL2 to 50 cu.ft./ac./yr. on Map Unit DL3. Limitations are moisture deficiency and shallowness to bedrock. Logging not recommended and Dahl areas should be retained as protection forests as the soil is easily eroded from the bedrock.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

Exposed slopes and sharp forest-openland vegetation transitions provide a limited area of suitable habitat for deer and moose and upland game birds. Associated rock outcrops provide escape terrain.

c. Recreation

Not suitable for intensive use, but very attractive landscape with contrasting vegetation for hiking and riding. Vegetation easily damaged by over-use.

DECKER ASSOCIATION

Physiographic Setting

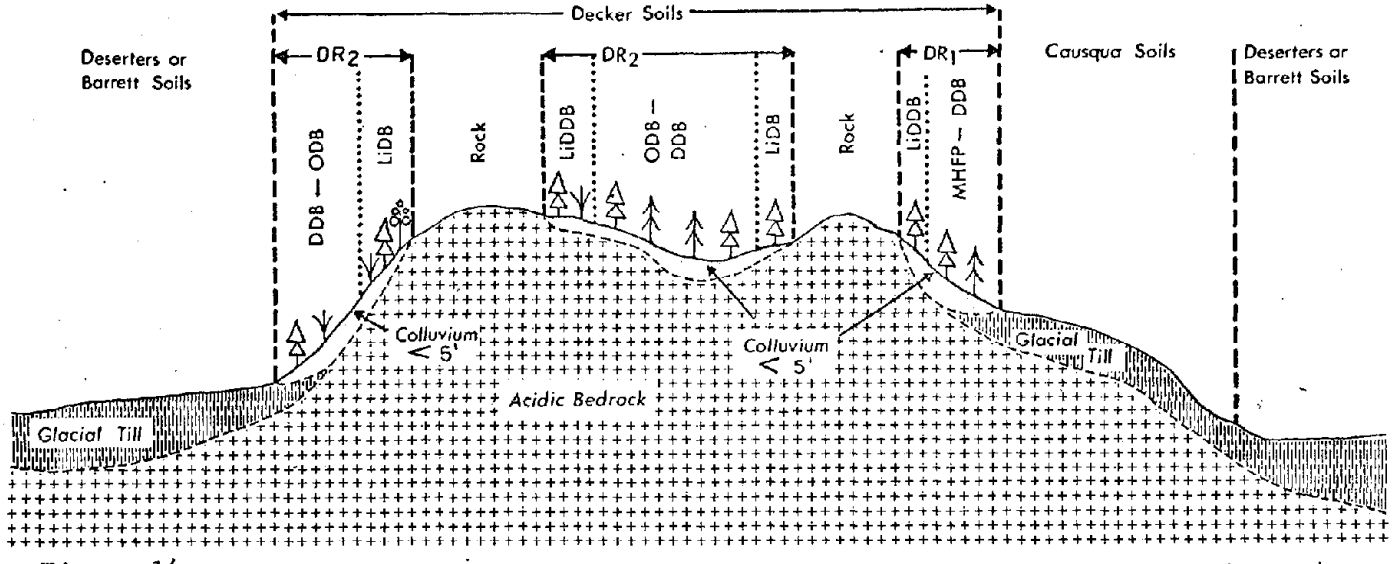

Figure 14.

Landform

The surface form is typical of the underlying acidic bedrock as the surface mantle is less than 5 feet thick. Dome-shaped hills having rounded tops, and steep side slopes (40%+) are common. Where soil mantles are thin (lithic subgroups) a characteristic irregular pattern of curvilinear fractures modifys the surface. Surface dendritic drainage patterns are of varying density and channels tend to have a rounded shape with tributary intersections tending to resemble a right angle.

Parent Material

Shallow colluvium which is moderately coarse textured, permeable, stony, and loose glacial till. Material derived from rock materials which combine to form a surface mantle which moves down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

This environment is somewhat moister (approximately 7.5-10.5 inches of May-September precipitation and colder <50 days frost free period common) than the Dahl Soils on the same landform and parent materials. The Dystric Brunisol and Podzol soils of the Decker Association reflect these conditions. Tree and shrub cover is sparce in areas composed mainly of very shallow, lithic soils, interspersed with bare rocks and boulders, while on deeper soils (2-5 feet) the soil moisture regime is improved with tree and shrub cover more dense. Major vegetation includes lodgepole pine, white spruce and some alpine fir, and scattered shrub species.

Table 11. Decker Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
DR1	Degraded Dystric Brunisol		well	steeply sloping stabilized slopes or flatter swales	lodgepole pine, white spruce	132	5,492
		Mini Humo-Ferric Podzol	well	steeply sloping stabilized east and north facing slopes	white spruce, alpine fir, lodgepole pine		
		Lithic sub-groups	well	convex rocky humps and exceptionally steep shallow slopes	lodgepole pine, shrubs		
DR2	Degraded Dystric Brunisol		well	steeply sloping stabilized slopes or flatter swales	lodgepole pine, white spruce		
		Orthic Dystric Brunisol	well	steeply sloping stabilized south and west facing slopes	lodgepole pine, aspen	172	3,140
		Isohs ?					
					Total Acreage	304	8,632

Suitability for Different Uses

a. Agriculture

Non-arable with limited grazing following fires and before forest regeneration takes over the site.

b. Forestry

Mean annual increments range from 31 cu.ft./ac./yr. on the very shallow lithic soils to 70 cu.ft./ac./yr. in the deeper swales between bedrock or on north facing slopes. Shallowness to bedrock and soil moisture deficiency are the main limitations to tree growth. Logging not recommended because of the shallow soil depth.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

Small units not particularly useful, except perhaps as a part of escape terrain.

e. Recreation

Intensive use not recommended. Often provides locations for viewing surrounding landscape. Vegetation could be easily damaged by over-use.

DESERTERS ASSOCIATION

Physiographic Setting

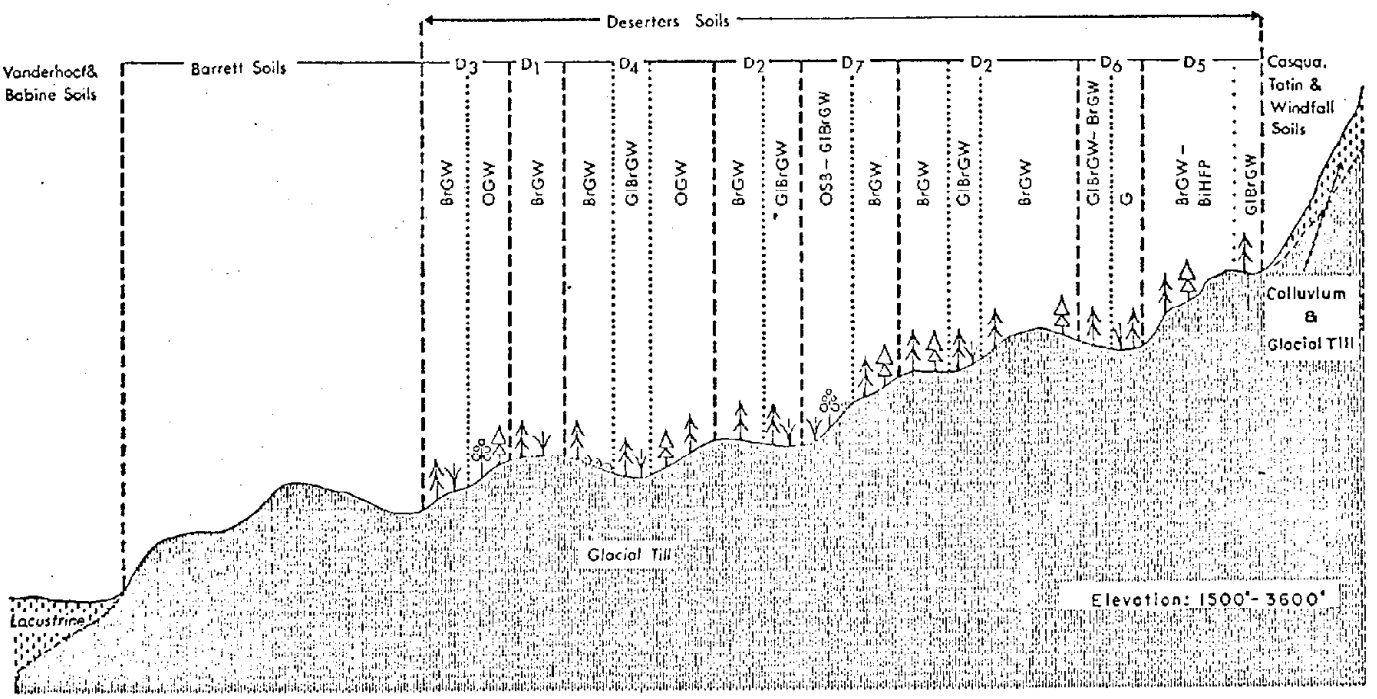

Figure 15.

Landform

An undulating to rolling (5-30% slopes) till plain of the interior plateau occasionally drumlinized but commonly a haphazard pattern of wave-like ridges, humps and swales of various sizes. A uniform modified dendritic surface drainage pattern with tributaries exhibiting little directional change on meeting major drainageways is common, and gullies have the characteristic u-shape of moderately fine textured materials.

Parent Material

A heterogeneous moderately fine textured (clay loam, silty clay loam) glacial till which is hard, compact, often stony and nearly impervious.

Environment (Soil-Climate-Vegetation Relationships)

These soils develop under higher precipitation (approximately 7.5-10.5 inches, May-September) than the associated Barrett soils. A wide range of drainage characteristics result from the irregular topography. The combination of variable drainage, temperature and precipitation result in a complex vegetation pattern. Conditions range from the open aspen, shrub vegetation of the Sombric Brunisol soils in Map Unit D7 to the white spruce and shrub dominance in the imperfectly drained swales of Map Units D2,4,5,6, and 7, and the higher elevation white spruce-alpine fir forest of Map Unit D5. Shrub and herb layers depend on forest stand density, but generally are more abundant than on Barrett soils. Lodgepole pine is common and occurrence depends on fire history. Due to the nearly impervious nature of the soil, roots have difficulty in penetrating and only moist sites have roots below 30 inches.

Table 17. Desertora Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-60%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
D1	Brunisolic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce	8,144	3,876
D2	Brunisolic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce	50,740	37,228
		Gleyed Brunisolic Gray Wooded	imperfect	moisture receiving swales, flat plains and seepage channels	white spruce, lodgepole pine		
D3	Brunisolic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce	35,336	9,548
		Orthic Gray Wooded	well	moisture shedding convex ridges, humps and relatively steeper slopes and exposed south slopes of ridges	lodgepole pine, white spruce, aspen		
D4	Brunisolic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce		
		Orthic Gray Wooded	well	moisture shedding convex ridges, humps and relatively steeper slopes and exposed south slopes or ridges	lodgepole pine, white spruce, aspen	36,260	31,828
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains and seepage channels	white spruce, lodgepole pine		

Table 12. (Cont'd) Deserters Soils

D5	Brunisolic Gray Wooded		moderately well to well	moisture shedding convex ridges, humps and relatively steeper slopes	white spruce, lodgepole pine	33,264	56,168
		Bisequa Humo-Ferric Podzol	moderately well to well	moisture shedding convex ridges, humps and relatively steeper slopes (north and east aspects common)	white spruce, lodgepole pine		
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains and seepage channels	white spruce, alpine fir		
D6	Gleyed Brunisolic Gray Wooded		imperfect	moisture receiving swales, flat plains and seepage channels	white spruce, lodgepole pine		
		Brunisolic Gray Wooded	moderately well to well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce		
		Gleysolics	poor to very poor	depressions with little drainage outlet	black spruce and shrubs	4,808	7,656
D7	Brunisolic Gray Wooded		well to moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	lodgepole pine, white spruce	620	5,052
		Orthic Sombric Brunisol	moderately well	moisture shedding convex ridges, humps and relatively steeper slopes and steeper slopes common	aspen, shrubs, forbes		
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains, and seepage channels	white spruce, aspen, lodgepole pine, shrubs		
					Total Acreage	169,172	151,356

Suitability for Different Uses

a. Agriculture

Mostly arable, marginal for agriculture, crop range severely restricted (forage crops only) by short frost free periods which generally range from 30-50 days with growing degree days <1650. A few areas near the mouth of the Bulkley Valley are much better but small in area. Soil limitations include hard, nearly impervious soil material, topography and some stoniness.

b. Forestry

Mean annual increments range from 91-110 cu.ft./ac./yr. on the imperfectly drained soils to 71-90 cu.ft./ac./yr. on the well and moderately well drained soils to 31-50 cu.ft./ac./yr. on the poorly drained soils. Limitations include soil moisture deficiency in shedding landscape positions, and poor rooting depth. Frost heaving and stream sedimentation hazards likely.

c. Engineering and Urban Development

Deserters soils are subject to frost heaving, have limited potential for effluent disposal. Trafficability generally poor when wet and while only limited cuts are necessary for road construction (flat topography) cutbanks have high erosion hazard. High frequency of fluctuating water tables associated with imperfectly and poorly drained soils in Map Units D2,4,5,6,7.

d. Wildlife

After fire and logging a wide range of food plants and cover suitable for ungulate and upland game birds could be expected. Although shrubs may last

indefinitely in open stands, the trend will be toward closed stands and reduced shrub and understory cover. Shrub cover could be expected over a long term on the imperfectly and poorly drained soils, especially in Map Units D5 and 6.

e. Recreation

Generally unsuitable for intensive use because of the nearly impermeable, easily compacted and sticky soils. Some lakes and streams associated have higher capability, otherwise a relatively unattractive forested landscape.

DRAGON ASSOCIATION

Physiographic Setting

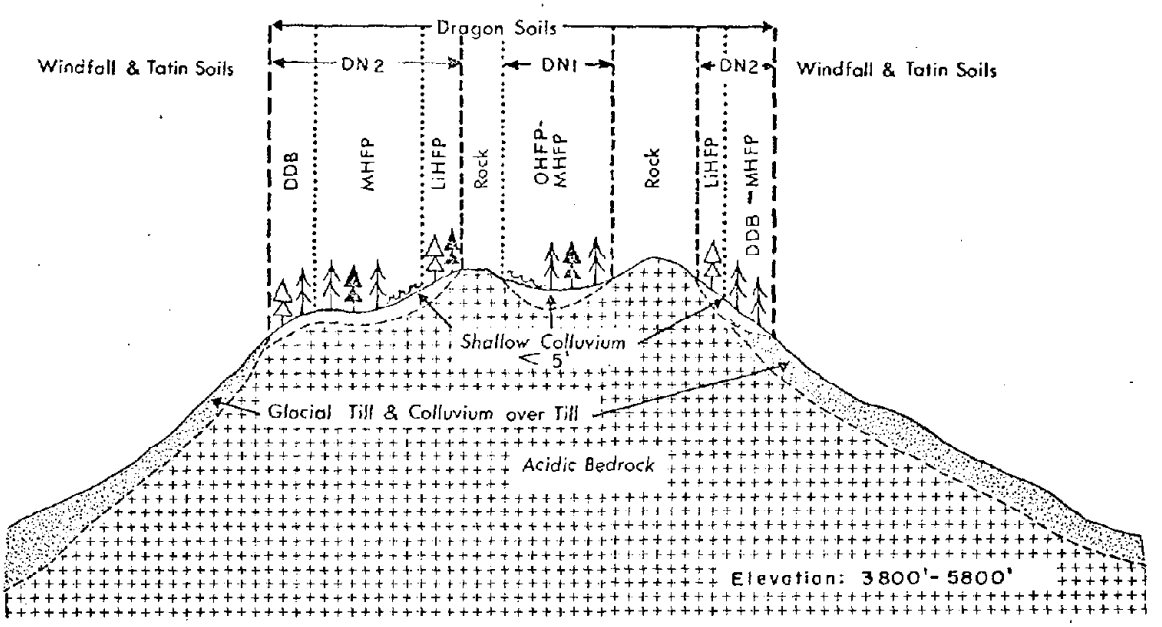

Figure 16.

Landform

The surface form is typical of the underlying acidic bedrock as the surface mantle is less than 5 feet thick. Dome-shaped hills having rounded tops, and steep side slopes (40%+) are common. Where soil mantles are thin (lithic subgroups) a characteristic irregular pattern of curvilinear fractures modifys the surface. Surface dendritic drainage patterns are of varying density and channels tend to have a rounded shape with tributary intersections tending to resemble a right angle.

Parent Material

Shallow colluvium which is moderately coarse textured, permeable, stony, and loose glacial till. Material derived from rock materials which combine to form a surface mantle which moves down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

The moist environment associated with Dragon soils is typified by the 10.5-13.5 inches of May-September precipitation and Podzol soil development which occurs on north and east slopes at the lower elevations and on all aspects at the higher elevations. These landforms often stick up above the surrounding landscape and wind damaged vegetation is evident at higher elevations. Tree (lodgepole pine, Engelmann spruce and alpine fir) and shrub cover is sparce, on the very shallow, lithic soils, interspersed with bare rocks and boulders while on deeper soils 2-5 feet the soil moisture regime is improved with tree and shrub cover more dense. On moister sites and at higher elevations with colder soil temperatures alpine fir is more abundant. Exposed bedrock occurs in some map units.

Table 13. Dragon Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
DN1	Orthic Humo-Ferric Podzol		well	steeply sloping stabilized slopes or flatter swales between rock outcrops	Engelmann spruce, lodgepole pine, alpine fir	752	8,036
		Mini Humo-Ferric Podzol	well	steeply sloping stabilized slopes or flatter swales between rock outcrops	Engelmann spruce, lodgepole pine, alpine fir		
		LSOBS ?					
DN2	Mini Humo-Ferric Podzol		well	steeply sloping stabilized slopes or flatter swales between rock outcrops	Engelmann spruce, lodgepole pine, alpine fir	2,636	8,384
		Degraded Dystric Brunisol	well	(south and west slopes common)	Engelmann spruce, lodgepole pine		
		Lithic subgroups	well	convex rocky humps and exceptionally steep shallow slopes	lodgepole pine, Engelmann spruce, alpine fir		
					Total Acreage	3,388	16,420

Suitability for Different Uses

a. Agriculture

Unsuitable for any use.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for lodgepole pine and alpine fir on the very shallow lithic soils of Map Unit DN2, to 51-70 cu.ft./ac./yr. for lodgepole pine on the deeper materials (still <5 feet). Limitations are shallowness to rock and moisture deficiency due to steep shedding slopes. Logging is not recommended.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

Not suitable except as escape terrain. Only small scattered areas of suitable habitat (food plants and cover) for upland game birds and ungulates. Deep snow makes winter use difficult.

e. Recreation

Intensive use not recommended. Often provides locations for viewing surrounding landscape. Vegetation could be easily damaged by over-use.

DRIFTWOOD ASSOCIATION

Physiographic Setting

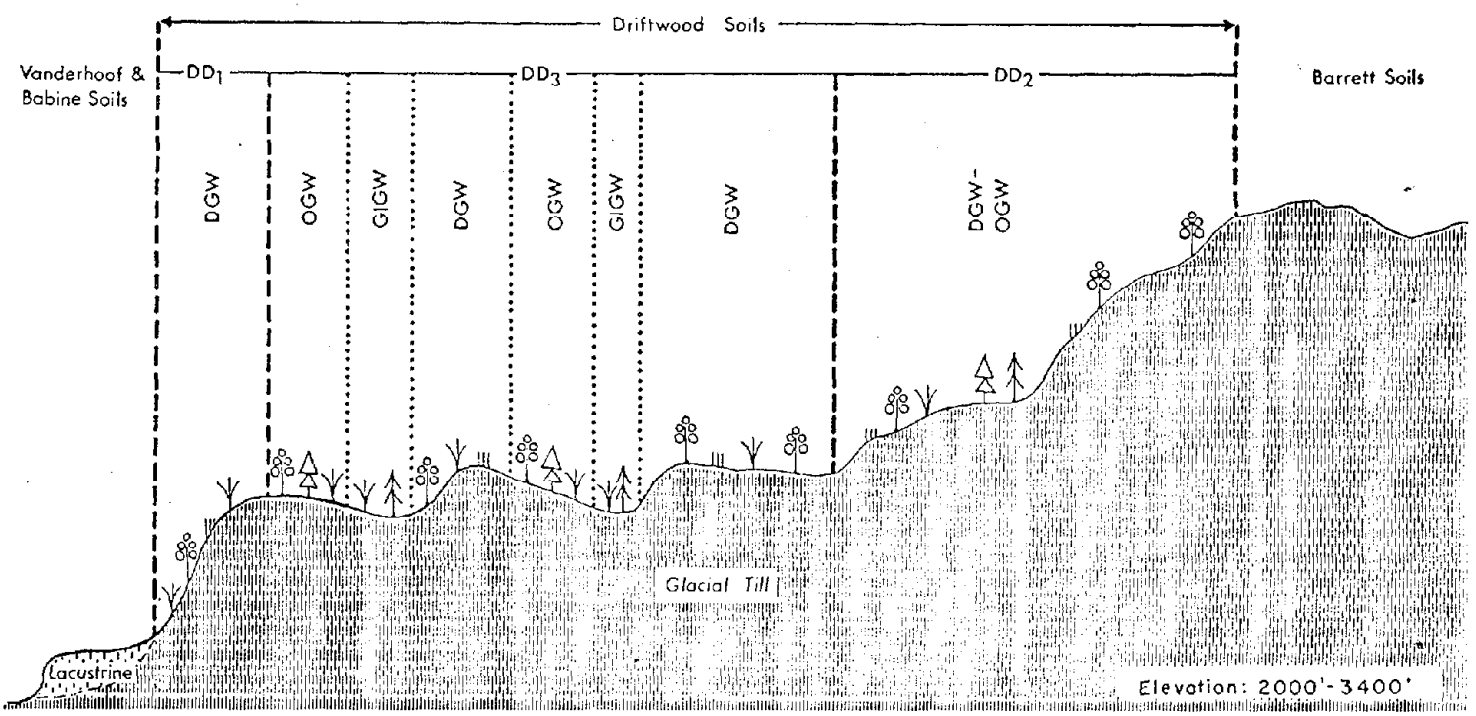

Figure 17.

Landform

Similar to Barrett and Deserters with steeper slopes (10-40%) and a tendency to more long simple slopes rather than the haphazard pattern of wave-like ridges.

Parent Material

A heterogeneous moderately fine textured (clay loam, silty clay loam) glacial till which is hard, compact, often stony and nearly impervious.

Environment (Soil-Climate-Vegetation Relationships)

The open or semi-open vegetation typical of this environment has been subjected to a long history of man's influence (burning and clearing). Uncultivated areas have scattered clumps of young aspen and an abundant shrub and herb cover. Steep and droughty southern exposures often have only stunted aspen growth and scattered understory. This environment is one of the most droughty in the area (7.5 inches or less May-September precipitation) and a tendency for long south and west facing slopes. Frost free periods range from 60-75 days. The dark surface layer (horizon) of soil is indicative of the general environment as it has developed from decomposing deciduous leaves, shrubs, grasses and herbs.

Orthic Gray Wooded soils have developed on north and east slopes and in swales, with an environment similar to that described for Barrett. Root penetration is impeded below the dark surface layer by the hard compact subsoil and in some cases may be the reason shrub and herb vegetation communities have taken over.

Table 14. Driftwood Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
DD1	Dark Gray Wooded		well to moderately well	exposed south and west slopes often relatively steep	aspen, abundant shrubs, herbs and grasses	596	848
DD2	Dark Gray Wooded		well to moderately well	exposed south and west slopes often relatively steep	aspen, abundant shrubs, herbs and grasses	19,268	12,688
		Orthic Gray Wooded	well to moderately well	swales between ridges, flatter plains and north and east slopes	lodgepole pine, white spruce, aspen		
DD3	Dark Gray Wooded		well to moderately well	exposed south and west slopes often relatively steep	aspen, abundant shrubs, herbs and grasses	72	
		Orthic Gray Wooded	well to moderately well	swales between ridges, flatter plains and north and east slopes	lodgepole pine, white spruce, aspen		
		Gleyed subgroups	imperfect	swales and depressions	white spruce, aspen, shrubs and herbs		
					Total Acreage	19,936	13,536

Suitability for Different Uses

a. Agriculture

Mostly arable with a large acreage now cultivated and mainly used for pasture and hay production. Frost free periods range from 60-75 days with 1650-1900 degree days (heat units). Possible crop range includes forages, coarse grains and vegetables. Topography and scattered stoniness are the main limitations The surface horizon is particularly mellow and easy to cultivate but some difficulty might be expected with deep rooting crops. Grazing capability is high on non-arable steep slopes, but the forage is easily damaged by overgrazing.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for trembling aspen on the Dark Gray Wooded component to 51-70 cu.ft./ac./yr. for lodgepole pine on the Orthic Gray Wooded component of DD2. Limitations are moisture deficiency and shallow rooting depth. Frost heaving of seedlings likely.

c. Engineering and Urban Development

Soils are subject to frost heaving, have moderately high shrink-swell potential, limited potential for effluent disposal and generally poor trafficability when wet. Cutbanks have a high erosion hazard, and ditch maintenance requirement would be high. Attractive settings for low density residential development on long south and west facing slopes.

d. Wildlife

High capability winter range for ungulates with abundant shrub cover, relatively shallow snow depths and available escape cover under natural conditions. Transportation routes and settlement has made animal use difficult. The edge effect of open shrub and aspen areas, abandoned fields, cultivated areas and forested cover provide excellent upland game bird (grouse)habitat.

e. Recreation

Vegetation easily damaged. If used for intensive use (campsites), careful management and density control is essential. These soils are easily compacted and sticky and slippery when wet especially when the surface layer (horizon) is removed. Pastoral settings attractive.

HAGWILGET ASSOCIATION

Physiographic Setting

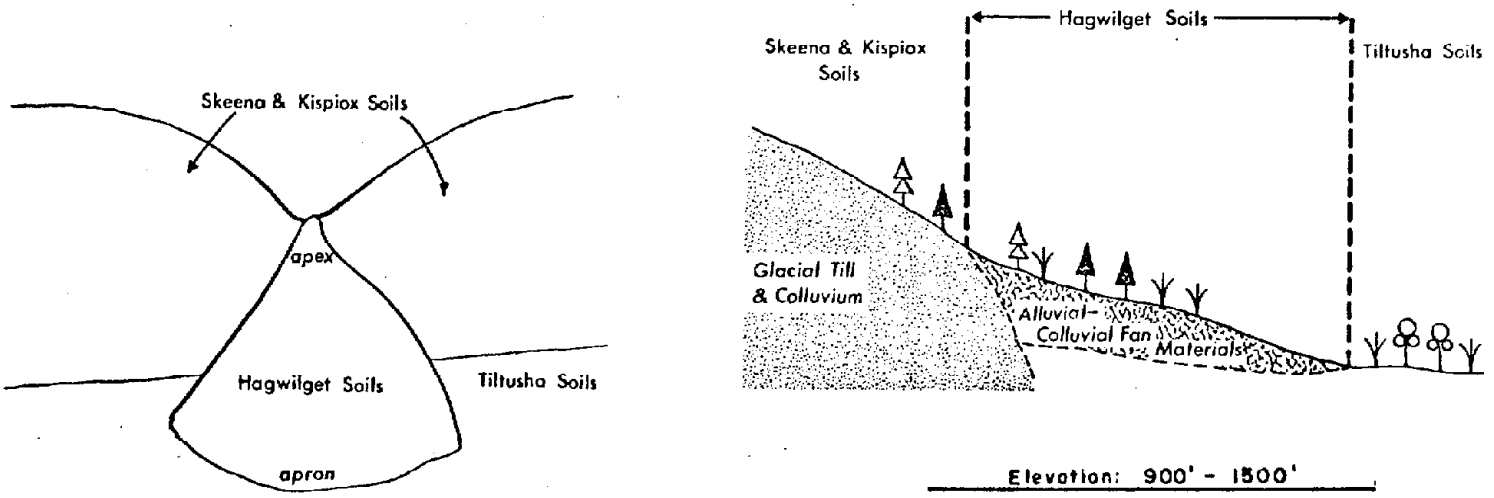

Figure 18.

Landform

Flat to steeply sloping (0-50% slopes) fan-like form occurring where a stream runs onto a level plain or meets a slower stream. No drainage pattern as such occurs but the surface is often marked by variegated current scars, abandoned and presently occupied channels. There is a noticeable slope towards the fan toe or apron.

Parent Material

The water sorted, partially stratified, coarse textured (gravelly), often stony, loose, permeable materials are located at the fan apex and finer materials (sands, silts and minor clays) sometimes slightly compact and less permeable occur toward the apron.

Environment (Soil-Climate-Vegetation Relationships)

The Hagwilget soils form on the above geological materials under a vegetation of hemlock, alder, willow, cottonwood, lodgepole pine, cedar, white spruce and hazelnut. The associated climate has 65-90 frost free days, 7.5-13.5 inches of May-September precipitation, frequent fog cover and a mean annual temperature of approximately 40°F. The well drained Podzol soils have a cover of hemlock, lodgepole pine and alder while the willow, cottonwood, cedar and hazelnut predominate on the imperfectly drained Regosol soils and the poorly drained Gleysolics, especially in abandoned channels and seepage spots. Seepage through these materials can change direction over short periods of time with resulting affects on vegetation and use capability. Some active channels tend to erode the soils rather severely during high water due to the steep stream gradients.

Table 15. Hagwilget Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
H1	Mini Humo-Ferric Podzol		moderately well to well	mainly fan apex and away from abandoned channels and recent deposition	hemlock, alder, lodgepole pine	5,112	2,888
		Orthic Regosol	well	positions of recent deposition and fan aprons	hemlock, cottonwood, alder		
		Gleyed subgroups	imperfect	abandoned channels, seepage depressions and fan aprons	willow, alder, cedar, cottonwood, spruce, hazelnut		
H2	Degraded Dystric Brunisol		moderately well to well	mainly fan apex and away from abandoned channels and recent deposition	hemlock, lodgepole pine, alder	1,316	3,128
		Mini Humo-Ferric Podzol	moderately well to well	mainly fan apex and away from abandoned channels and recent deposition	hemlock, lodgepole pine, alder		
		Gleyed subgroups	imperfect	abandoned channels, seepage depressions and fan aprons	cottonwood, willow, hazelnut, alder, cedar, spruce		
H3	Gleyed Orthic Regosol		imperfect	recent deposition and abandoned channels seepage depressions and fan aprons	cottonwood, willow, hazelnut, alder, cedar, spruce	1,876	
		Gleysolics	poor to very poor	seepage depressions and fan aprons	cedar, cottonwood, willow		
H4	Orthic Regosol		well to moderately well	recent deposition, fan apron	cottonwood, willow, alder, hemlock	1,504	
		Gleyed Orthic Regosol	imperfect	abandoned channels and seepage depressions	cottonwood, alder, willow, cedar, spruce		
H5	Orthic Humo-Ferric Podzol		well to moderately well	mainly apex and away from channels	hemlock, lodgepole pine, cedar	696	392
		Orthic Regosol	well to moderately well	recent deposition	cottonwood, alder, willow		
		Gleyed subgroups	imperfect	abandoned channels and fan aprons	cottonwood, alder, cedar, willow spruce, hazelnut		
					Total Acreage	10,504	6,408

Suitability for Different Uses

a. Agriculture

High capability for a wide range of crops including forages, grains, vegetables and small fruits. Apex of fans may have some stoniness limitation and stream channels may erode, wander, and flood occasionally if not carefully managed after natural vegetation is removed. Variable soil moisture holding capacities and drainage can present management problems.

b. Forestry

Mean annual growth increment ranges from approximately 60 cu.ft./ac./yr. on the Gleysol soils in Map Unit H3 to the more average situation of 110 to 130 cu.ft./ac./yr. for white spruce, lodgepole pine and western hemlock, on the imperfectly and moderately well drained soils typical of the major acreage. The main limitation to managing these soils for wood production is the site variability caused by varying soil moisture holding capacities, wandering channels and seepage spots. Productivity for cottonwood, especially on the imperfectly and poorly drained soils, could be expected to be very high. Brushing in problems could be severe on the best sites.

c. Engineering and Urban Development

Location near valley bottoms and gentle slopes towards the valley make these soils valuable for urban development where needed. Apexes of these fans are common sources of aggregate and are also suitable building or subdivision sites. The variable soil textures and drainage properties as well as stream channel wandering make fan aprons difficult engineering problems in road-bed construction and maintenance and foundation settling.

d. Wildlife

Although the successional trend is toward a hemlock forest, the variability of soil drainage on these landforms and the results of man's influence has produced a wide range of browse species of vegetation (willow, alder) and escape cover useful to ungulates and upland game birds. As stream gradients are steep, soil erosion and resulting sedimentation could be severe and detrimental to fish especially under conditions of clear-cutting or cultivation.

e. Recreation

Location at stream confluences, gently sloping topography, rapid permeability in fan apexes and diversity of natural vegetation make the Map Units H1,2 and 5 attractive recreation sites for a wide range of uses. Map Units H3 and 4 have occasional high water tables and occasional flooding which reduce their desirability.

KISPIOX ASSOCIATION

Physiographic Setting

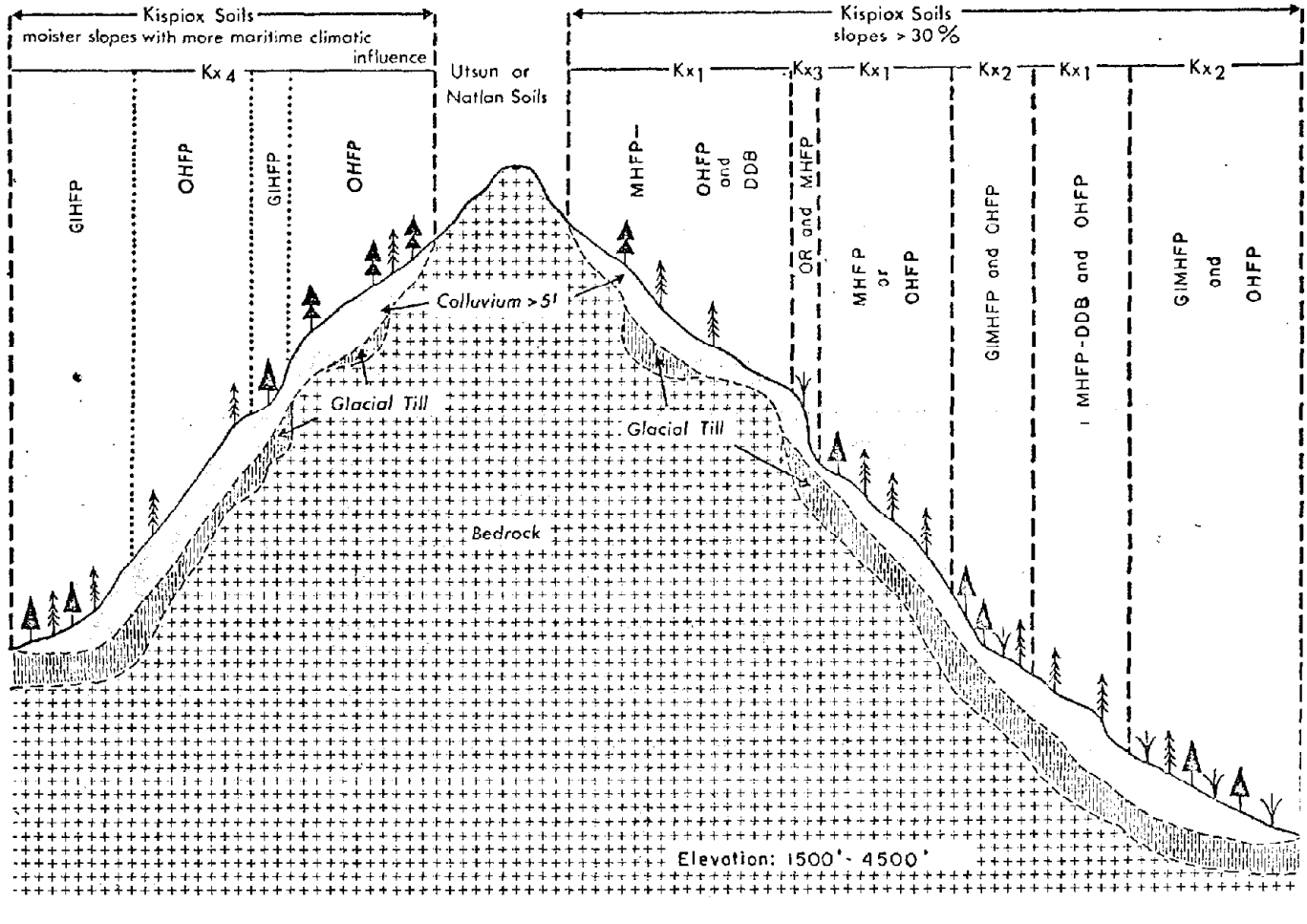

Figure 19

Landform

Very steeply sloping (40%+ slopes) mantle of detrital materials on valley walls in hilly and mountainous terrain. Drainage pattern variable but generally dendritic and parallel with abrupt directional changes when bedrock is encountered.

Parent Material

A heterogeneous, moderately coarse to coarse textured (gravelly, sandy) stony, loose permeable material deposited on steep slopes and base of slopes by gravity. These colluvial materials are of variable depths, but generally exceeds 5 feet and overlie glacial till or bedrock. The material contains coarse fragments of rock and are often closely associated with rock outcrops.

Environment (Soil-Climate-Vegetation Relationships)

These mountain side Podzol soils occur in the coastal transition region under cool, moist summers and relatively mild winters, May-September precipitation ranges from 10.5-16.5 inches with frost free periods of 65-90 days. Associated vegetation includes hemlock, scattered cedar, amabilis fir at higher elevations and a heavy cover of mosses. The western slopes on the coastal side of the divide(Zymoetz River) have soils and vegetation reflecting somewhat higher moisture. As these soils have formed by downslope movement of material they can be relatively unstable. This continuous downslope movement is often indicated by curved tree boles. The most striking thing about this environment is the extremely steep slopes.

Table 16. Kisplox Soils

Soil Association Map Units	Major Soil (60-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
KX1	Mini Humo-Ferric Podzol		well to rapid	steeply sloping convex shedding slopes	hemlock, mosses	9,704	45,666
		Orthic Humo-Ferric Podzol	well to rapid	steeply sloping convex shedding slopes	hemlock, mosses		
		Degraded Dystric Brunisol	well to rapid	steeply sloping convex shedding slopes	hemlock, mosses		
KX2	Gleyed Mini Humo-Ferric Podzol		imperfect	lower receiving slopes (concave) or seepage channels on steep slopes	hemlock, cedar, mosses	10,450	23,234
		Orthic Humo-Ferric Podzol	well	steeply sloping shedding slopes	hemlock, mosses		
KX3	Orthic Regosol		well to rapid	very steeply sloping convex shedding slopes	hemlock	8,976	15,756
		Mini Humo-Ferric Podzol	well to rapid	very steeply sloping convex shedding slopes	hemlock		
KX4	Orthic Humo-Ferric Podzol		well	steeply sloping convex shedding slopes	hemlock, amabilis fir, mosses	2,560	8,168
		Gleyed Ferro Humic Podzol	imperfect	lower receiving slopes or seepage channels on steep slopes	cedar, hemlock, mosses		
		Gleyed Humo-Ferric Podzol	imperfect	lower receiving slopes or seepage channels on steep slopes	cedar, hemlock, mosses		
					Total Acreage	31,690	92,822

Suitability for Different Uses

a. Agriculture

All non-arable due to extremely steep topography and unsuitable for grazing, (vegetative competition severe under the high rainfall).

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for alpine fir at the upper elevations and on exposed slopes of May Unit KX1, to 71-90 cu. ft./ac./yr. on middle slopes for white spruce and western hemlock with low soil moisture holding capacity being the main limitation. The lower slopes and other landscape positions receiving moisture are capable of producing 90-110 cu.ft./ac./yr. Some care should be taken in slash burning upper and middle slopes because exposure on steep slopes combined with soil droughtiness (coarse texture) and reduced organic matter content could be hard on regeneration (planted or natural).

c. Engineering and Urban Development

Unsuitable for urban development due to bouldery, unstable material on extremely steep slopes. Road or pipeline construction and maintenance could have minor problems due to the unstable nature of the material especially boulders tumbling downslope or seepage in areas mapped as KX2. Bedrock often closely associated.

d. Wildlife

Generally unsuitable because of short period of succession when desirable food plants are available. Notable area of protective cover and steeply sloping escape terrain.

e. Recreation

Unattractive and unsuitable for most uses except for viewing of mature hemlock forest on very steep slopes.

KITSUNS ASSOCIATION

Physiographic Setting

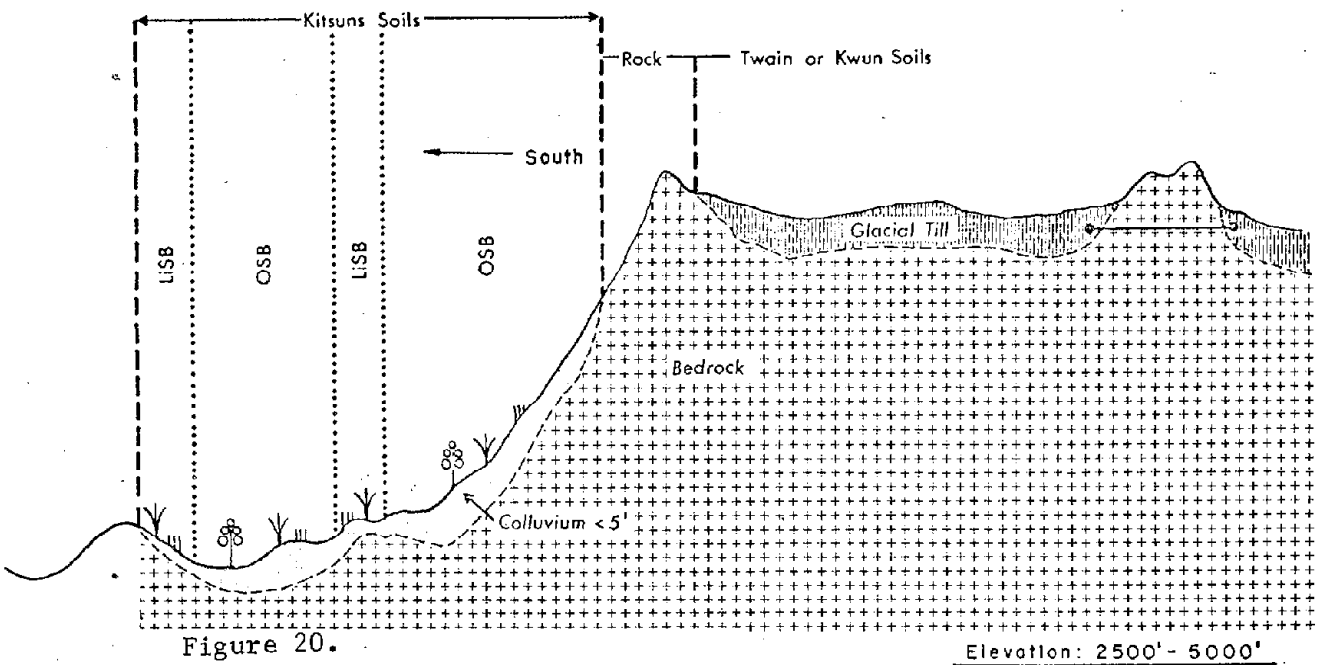

Figure 20.

Landform

The surface form is typical of the underlying basic bedrock and is highly variable and expressed in many different surface forms. Topography may vary from level to strongly undulating to steeply sloping (2-60%+). Sharp peaks, vertical cliffs, steep slopes, large flat to rolling volcanic lava flows and dissected sedimentary shales are included. Surface drainage pattern varies from nil to a highly integrated parallel pattern.

Parent Material

Shallow, moderately coarse to medium textured colluvium which is permeable, stony, bouldery and loose. Deposits derived from weathered glacial till and rock material which combine to form a shallow mantle which moves slowly down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches, lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

This environment occurs in a relatively moist climate (10.5-13.5 inches, May-September precipitation) and it appears the aspen and shrub vegetation has become dominant because of repeated fire history. This fire induced environment has predominated for a considerable period as reflected in the Sombric Brunisol soil development. Most of these soils occur on south and west facing slopes along well used pack trails and in the vicinity of favorite camp sites (near lakes) and hunting areas. Droughtiness caused by aspect and shallow soils helps to maintain the present vegetation. Vegetation on the lithic (very shallow soils) can be easily damaged. Abundance of vegetative cover increases in moisture receiving swales, where soils are somewhat deeper.

Table 17. Kitsuns Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
KS	Orthic Sombric Brunisol		well to moderately well	south slopes of convex rocky humps as well as stabilized steep south and west facing slopes	aspen, shrubs, herbs, grasses	1,416	1,740
		Lithic Orthic Brunisol	well	shallow rocky humps and active south and west slopes	shrubs, stunted aspen, herbs, grasses		

Suitability for Different Uses

a. Agriculture

Non-arable. Grazing capability high, but very easily damaged by overgrazing.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for trembling aspen. Logging not recommended.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

The high shrub (notably willow), herb and deciduous content of the semi-open vegetation and the adjacent escape cover and terrain provide a limited area of suitable habitat, and in some cases high capability habitat, for ungulates and upland game birds. Snow depths may be a problem in some cases.

e. Recreation

An attractive landscape with semi-open vegetation and rocky terrain often next to lakes and streams. Not suitable for intensive use.

KITSGUECLA ASSOCIATION

Physiographic Setting

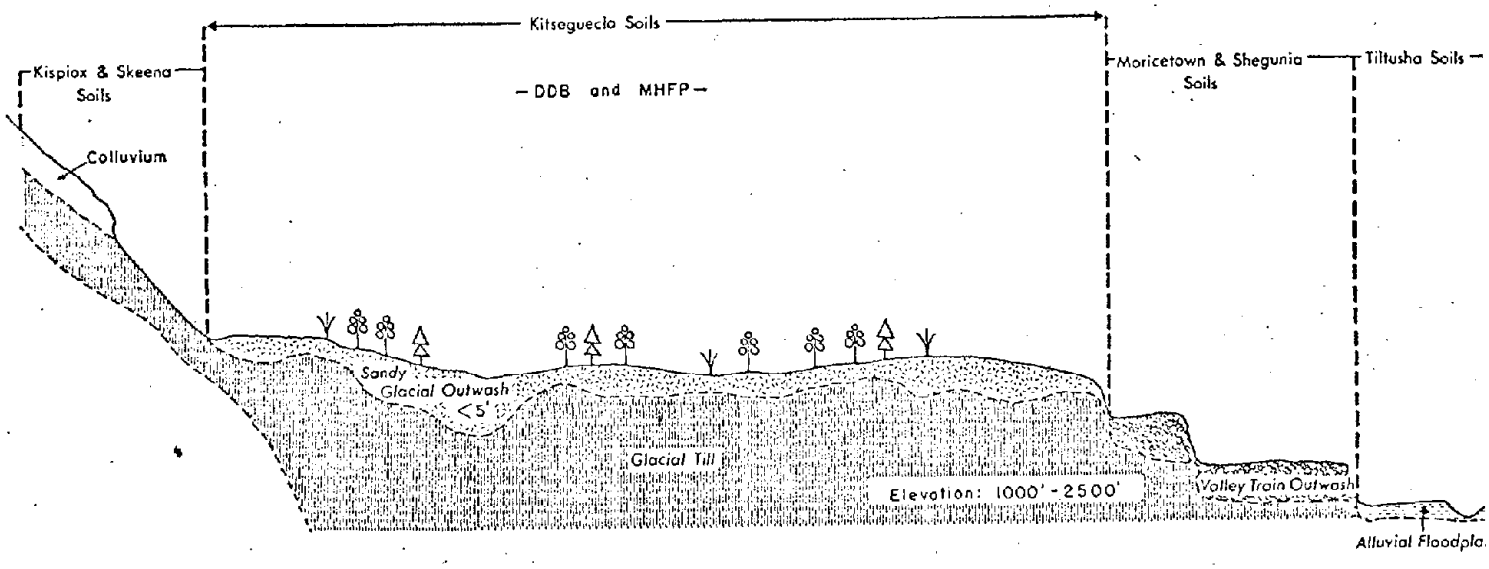

Figure 21.

Landform

Flat to gently rolling (2-20% slopes) smoothly molded till plain with a sand overlay which has the effect of smoothing out the topography. Drainage patterns are nonexistent to modified dendritic with abrupt changes in angularity of channels when the underlying till is reached. Associated gullies also have an unusual pattern as the v-shaped gully typical of noncohesive sandy materials changes to a steeper sloped u-shaped gully as the underlying cohesive till is encountered. Often gullies are a combination of both.

Parent Material

Less than 5 feet of loose, permeable, water sorted, stratified, moderately coarse textured (sandy) glaciofluvial material overlying a compact, hard, heterogeneous, often stony, nearly impermeable glacial till.

Environment (Soil-Climate-Vegetation Relationships)

The environment is characterized by 7.5-10.5 inches, May to September precipitation, 75-90 frost free days, good air drainage, highly permeable Brunisol and Podzol soils with low moisture holding capacity, and a nearly impervious underlying material which often keeps the lower part of the sand moist. The vegetation is a result of recurring fire history on these easily accessible valley lands, and includes trembling aspen, lodgepole pine and a heavy shrub cover.

Table 18. Kitsguecla Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
KA	Degraded Dystric Brunisol		well	over the whole landform	aspen, lodgepole pine, and heavy shrub cover	1,392	3,524
		Mini Humo-Ferric Podzol	well	over the whole landform	aspen, lodgepole pine, and heavy shrub cover		

Suitability for Different Uses

a. Agriculture

All arable, and a reasonably wide range of crops possible including vegetables, small fruits, cereals and forage crops. Irrigation is essential for commercial production of most crops on these sandy soils. Easily cultivated, high fertilizer requiring soils.

b. Forestry

Mean annual increment ranges from 71-90 cu.ft./ac./yr. for lodgepole pine. The only limitation is the low moisture holding capacity. Erosion hazard on slopes and slash burning not recommended.

c. Engineering and Urban Development

Erosion of sand during construction, slumping into pipeline and construction excavations could be expected. Suitable for effluent disposal, but some seepage along compact underlying glacial till likely. Because of variability in depth, the sandy overlay should be removed where heavy structures are contemplated. One of the better soils for subdivision and most urban uses.

d. Wildlife

Small area of excellent habitat for ungulates and upland game birds with a variety of shrub food plants and adjacent escape cover and terrain, but close to transportation routes and settled areas. The deciduous forest, open field, and edge provide excellent grouse habitat.

e. Recreation

Suitable for most intensive uses. Subject to blowing if the subsoil is exposed. Some ideal campsite locations.

KITWANGA ASSOCIATION

Physiographic Setting

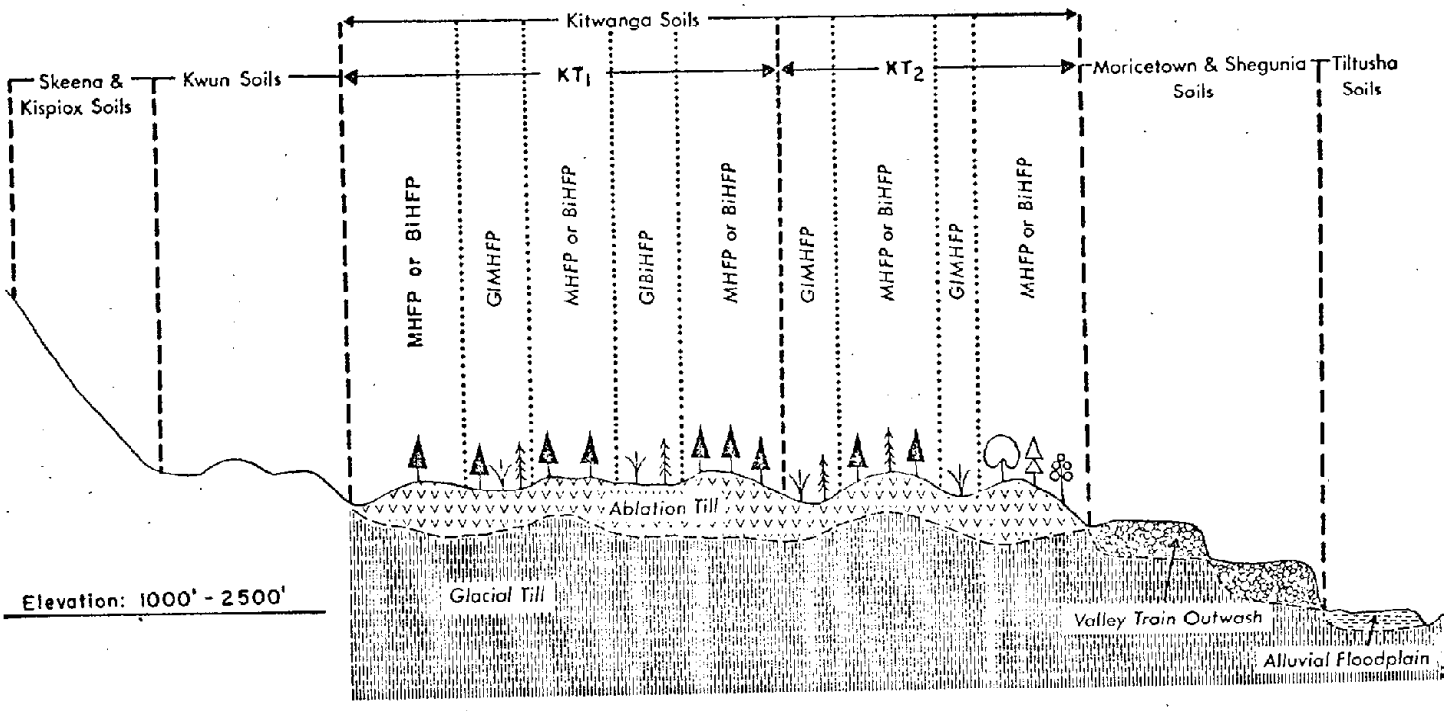

Figure 22.

Landform

Similar to Cobb and Crystal with a higher frequency and larger flat and swale components in the landscape.

Parent Material

Similar to Cobb and Crystal, except that the underlying compact glacial till is moderately fine to fine textured (silty clay loam to clay) and often is closer to the surface, although usually greater than 5 feet.

Environment (Soil-Climate-Vegetation Relationships)

The most striking thing related to this environment is the contrasting variability in vegetative cover. Vegetation depends on the frequency of disturbances, mainly fire, soil drainage and depth to the compact glacial till, the relatively moist, humid climate (approximately 10.5-13.5 inches, of May-September precipitation), and approximately 80-90 days frost free period. Vegetation includes trembling aspen, lodgepole pine, white birch, alder, hazelnut, willow and a heavy cover of other shrubs in the areas with a high frequency of disturbance mainly fire. Regeneration is commonly either hemlock or white spruce. In mature stands, hemlock is dominant with occasional cedar in the swales with little shrub cover. This environment occurs under moister, milder climates than the Cobb and Crystal associations.

Table 19. Kitwanga Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
KT1	Mini Humo-Ferric Podzol		well to moderately well	humps and moisture shedding positions	western hemlock, aspen, lodgepole pine, white spruce	13,524	7,764
		Bisequa Humo-Ferric Podzol	moderately well to well	usually on slopes of humps	lodgepole pine, western hemlock, aspen and heavy shrub cover		
		Gleyed subgroups	imperfect	flatter areas and swales	western hemlock, cedar, alder, heavy shrub cover, white spruce		
KT2	Bisequa Humo-Ferric Podzol		moderately well to well	humps and moisture shedding positions	lodgepole pine, western hemlock, aspen, white spruce, alder	19,792	27,312
		Mini Humo-Ferric Podzol	well to moderately well	humps and moisture shedding positions	lodgepole pine, western hemlock, aspen, white spruce, alder		
		Gleyed subgroups	imperfect	flatter areas and swales	western hemlock, cedar, alder, white spruce and shrubs		
					Total Acreage	33,316	35,076

Suitability for Different Uses

a. Agriculture

Although the climate is relatively good with 80-90 frost free days, stoniness, variable drainage, topography and low moisture holding capacity limitations reduce the range of crops possible to forages except for isolated pockets.

b. Forestry

Mean annual increments range from 111 to 130 cu.ft./ac./yr. for white spruce on the imperfectly drained soils to 71 to 90 cu.ft./ac./yr. for white spruce and lodgepole pine on the well drained sites. Note that white spruce and lodgepole pine used for species indicators. (See Use and Management section). Clean logging recommended.

c. Engineering and Urban Development

See Cobb and Crystal. Note higher frequency of areas with fluctuating water tables.

d. Wildlife

In areas of frequent disturbance such as fire, useful habitat for ungulates, particularly moose and upland game birds exists. This is likely to be a short term successional stage on most sites, although these soils could be managed to produce a large volume of browse species with controlled burning.

e. Recreation

Variable drainage, permeability, stoniness and undulating topography limite usefulness to extensive recreation. Vegetation contrasts provide interesting hiking, viewing and riding possibilities.

KWUN ASSOCIATION

Physiographic Setting

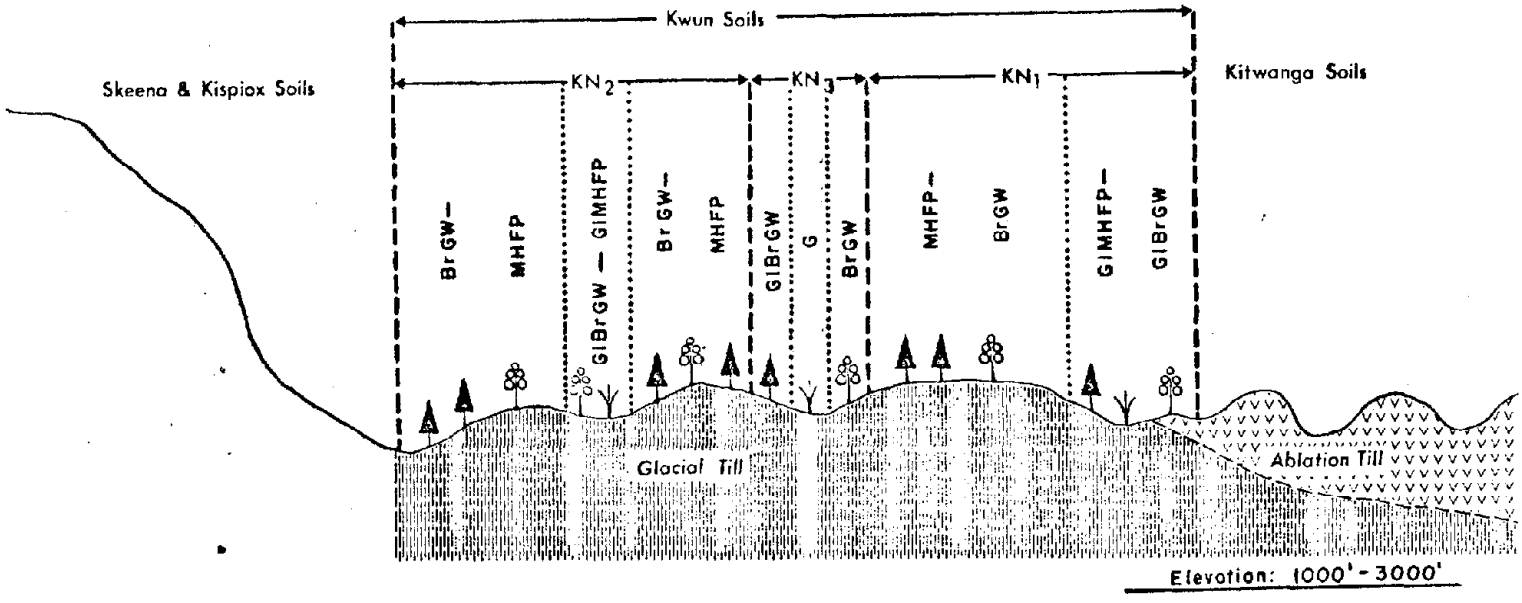

Figure 23.

Landform

See Barrett or Deserters. Gullies often have flat angles due to the higher clay content in the materials.

Parent Material

A heterogeneous, moderately fine to fine textured (silty clay loam, clay) glacial till, which is hard, compact, often stony and nearly impervious.

Environment (Soil-Climate-Vegetation Relationships)

This environment is characterized by a relatively humid climate receiving 10.5-13.5 inches, May to September precipitation and shallow soils having variable drainage. The vegetation is dominated by mature hemlock stands with a heavy ground cover of mosses, and some scattered pockets of deciduous cover consisting mainly of aspen, birch, alder and shrubs where fire has been frequent. The deciduous cover is much less frequent than on the adjacent Kitwanga and might be attributed to the much higher moisture holding capacity of the Kwun soils, since the fires most often occur on moderately well drained sites. The imperfectly drained soils have the occasional cedar mixed with the hemlock vegetation which is very seldom altered by fire. The poorly drained Gleysol soils occur in depressions and could be expected to be frost pockets, and vegetation is limited to shrubs.

Table 20. Kwun Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
KN1	Mini Humo-Ferric Podzol		moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	western hemlock and heavy moss cover	4,220	10,692
		Brunisolic Gray Wooded	moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	western hemlock and heavy moss cover		
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains and seepage channels	western hemlock, cedar, shrubs		
KN2	Brunisolic Gray Wooded		moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	western hemlock and heavy moss cover	7,920	14,016
		Mini Humo-Ferric Podzol	moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	western hemlock and heavy moss cover		
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains and seepage channels	western hemlock, cedar, shrubs, mosses		
KN3	Brunisolic Gray Wooded		moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	western hemlock and heavy moss cover	832	860
		Gleysolics	poor to very poor	deep swales or enclosed depressions	shrubs		
		Gleyed Brunisolic Gray Wooded	imperfect	moisture receiving swales, flat plains and seepage channels	western hemlock, cedar, shrubs, mosses		
KN4	Bisequa Humo-Ferric Podzol		moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	western hemlock, amabilis fir, mosses	1,336	3,992
		Orthic Ferro Humic Podzol	moderately well	shallow swales and lower parts of slopes	western hemlock, amabilis fir, mosses		
					Total Acreage	14,308	29,560

Suitability for Different Uses

a. Agriculture

All arable but soils extremely sticky when wet, hard and impermeable when dry and have some topographic and stoniness limitations. Climate capability indicates production of a wide range of crops is possible but soil management problems are serious.

b. Forestry

Mean annual increments range from 111-130 cu.ft./ac./yr. for white spruce and western hemlock on the imperfectly drained soils to 71-110 cu. ft./ac./yr. for white spruce and western hemlock on the moderately well drained soils on moisture shedding slopes to 31-50 cu.ft./ac./yr. for white spruce in the very wet, poorly drained depressions. Frost heaving, compaction, erosion and stream sedimentation problems likely.

c. Engineering and Urban Development

Avoid where possible. Poor trafficability when wet, high shrink-swell potential, subject to frost heaving, high erosion potential and slumping hazard, fluctuating water tables and seepage and poor effluent disposal rates due to impermeability are a few of the problems likely on these soils.

d. Wildlife

Vegetation successional stages suitable for most widlife habitats would likely be short lived. May provide escape cover with more desirable soils adjacent, e.g. Kitwanga, providing the other habitat requirements.

e. Recreation

Unsuitable - see Engineering limitations.

MAPES ASSOCIATION

Physiographic Setting

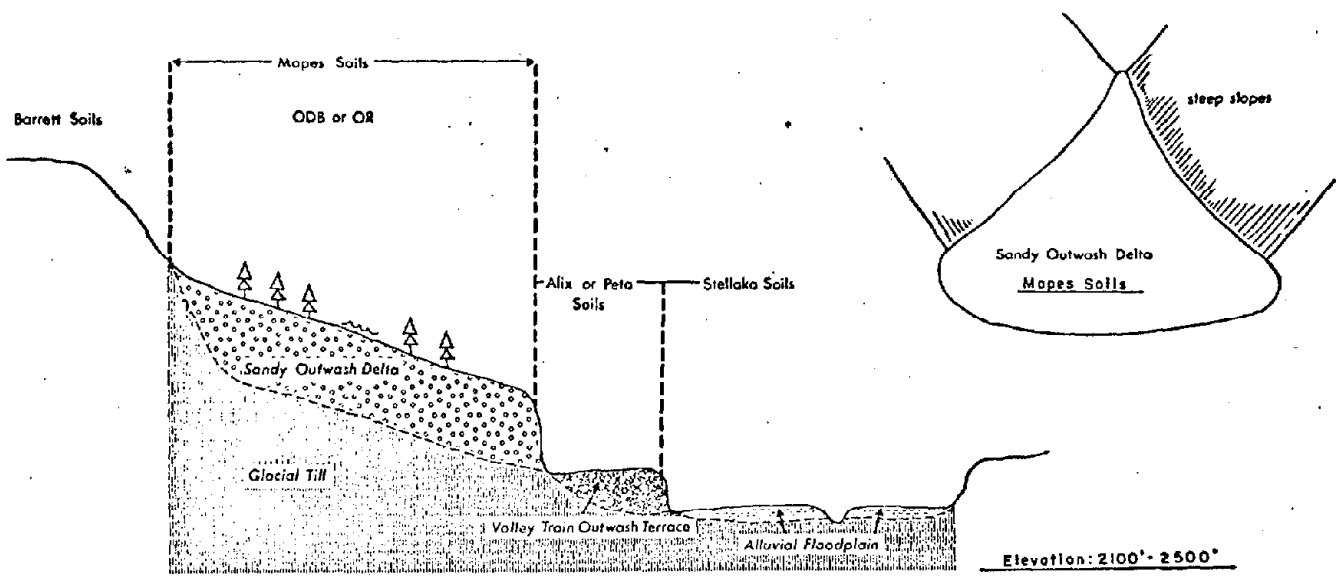

Figure 24.

Landform

Typical delta or fan shape (see diagram), relatively level with 0-5% slopes which usually end in a fairly steep face next to the valley. No drainage pattern, but visible current scars and abandoned channels may occur. V-shaped gullies are common.

Parent Material

Water sorted and stratified, deep sands which are moderately coarse textured, highly permeable and loose. Occasional stratified gravels at depth. Easily windblown when vegetation is removed and the surface exposed.

Environment (Soil-Climate-Vegetation Relationships)

This environment is characterized by very droughty, well to rapidly drained, highly permeable sandy Brunisol soils which receive approximately 7.5 inches of May-September precipitation. The frost free period is usually less than 60 days. Lodgepole pine vegetation is typical and the stands are often very open and subject to frequent fires. Because of frequent disturbance, mainly fire, and removal of sparse ground cover the soils are subject to wind erosion and deposition.

Table 21. Mapes Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Positions	Major Vegetation	Pure Units Acreage	Complex Acreage
MSI	Orthic Dystric Brunisol		well to rapid	stabilized portions of delta	lodgepole pine	1,044	5,560
		Orthic Regosol	rapid	unstabilized, actively eroding by wind or water	very open lodgepole pine		

Suitability for Different Uses

a. Agriculture

All arable, but with a high irrigation water requirement for most crop production due to the low available moisture holding capacity. Soils subject to wind erosion when cultivated.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for lodgepole pine. Slash burning not recommended.

c. Engineering and Urban Development

Easy to subdivide (flat topography, sandy materials). Limitations include variable compressibility and bearing strength, sand blowing when subsoil exposed, high stream sedimentation hazard and excavation cave-ins likely. Excellent sand source.

d. Wildlife

Suitable only as a part of a larger habitat unit in association with adjacent units. Little suitable food vegetation or cover, but sites often function as movement corridors across valleys, access to adjacent streams. Snow depths relatively less so can form part of ungulate winter range.

e. Recreation

Suitable for most intensive and extensive uses. Sand blowing, and low moisture holding capacities limit some uses. Open stands provide interesting hiking and riding possibilities.

MORICE ASSOCIATION

Physiographic Setting

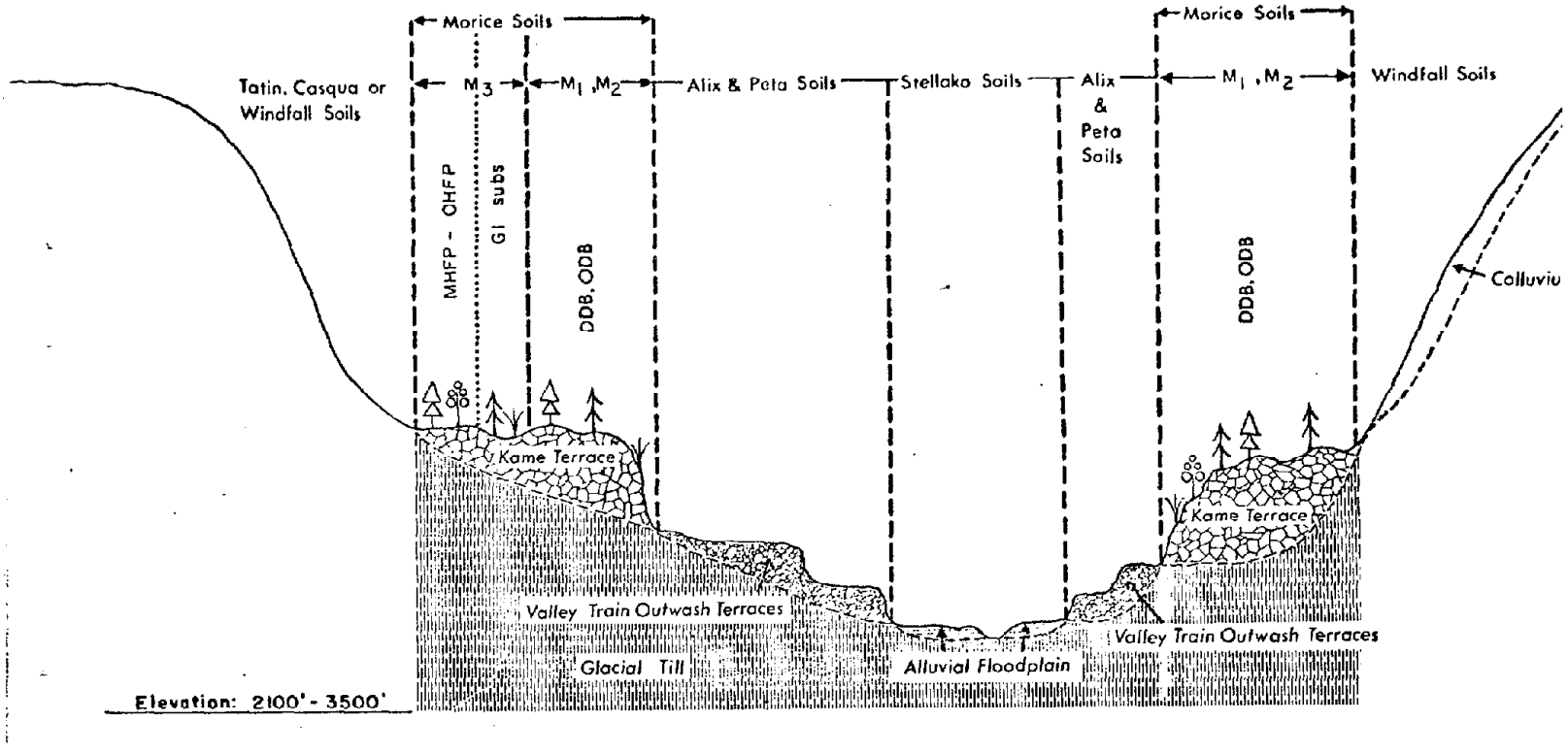

Figure 25.

Landform

Level to rolling and strongly irregular (0-50% slopes) of hummocks, mounds and terraces often conforming partly to valley walls or rock faces (hanging on valley sides). Gives the impression of collapsed topography. A very haphazard, disoriented, discontinuous drainage pattern is typical. Gullies variable shape, but usually short and discontinuous.

Parent Material

Partially water sorted and roughly stratified deposits which are moderately coarse to coarse (sandy and gravelly) textured, often stony, usually loose and of variable permeability and depth.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by a range of precipitation from 7.5-10.5 inches May-September for Map Units M1 and M2 (Brunisol soils) and 10.5-13.5 inches for Map Unit M3 (Podzol soils) and with approximately 50-70 frost free days. The high variability in the sorting,permeability, depth, slope and textures of the materials influence site-specific considerations of the vegetation. In general lodgepole pine and aspen occur on Map Units M1 and M2 which have drier environments with a higher frequency of disturbance, usually from fire, whereas lodgepole pine, white spruce and some alpine fir occur on the higher elevation moister M3 Map Units. Seepage originating from higher valley slopes occurs at depth along layers which are more compact or finer textured.

Table 22. Morice Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
M1	Orthic Dystric Brunisol		rapid to well	predominantly humps and steep slopes	lodgepole pine, aspen, shrubs	1,916	8,404
		Degraded Dystric Brunisol	rapid to well	predominantly humps and steep slopes	lodgepole pine, aspen, shrubs		
M2	Degraded Dystric Brunisol		rapid to well	predominantly humps and steep slopes	lodgepole pine, aspen, shrubs	5,892	23,316
		Orthic Dystric Brunisol	rapid to well	predominantly humps and steep slopes	lodgepole pine, aspen, shrubs		
M3	Mini Humo-Ferric Podzol		rapid to well	moisture shedding, humps and steep slopes	lodgepole pine, white spruce, aspen	13,348	23,140
		Orthic Humo-Ferric Podzol	rapid to well	moisture shedding, humps and steep slopes			
		Gleyed subgroups	imperfect	moisture receiving, swales and depressions	white spruce, aspen, lodgepole pine, alpine fir		
					Total Acreage	21,156	54,860

Suitability for Different Uses

a. Agriculture

Only very small pockets arable due to rough topography and highly variable soils. The frost free periods of approximately 50-70 days, are relatively better than the surrounding landforms because of valley side position and better air drainage. Forage crops are most suitable.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for lodgepole pine on the drier sites of Map Units M1 and M2 to 90-100 cu.ft./ac./yr. for white spruce on the imperfectly drained moister sites of Map Unit M3. Slash burning is not recommended.

c. Engineering and Urban Development

Some seepage and slump problems can be expected along valley face. Variable quality aggregate source - sometimes excellent but most often a high percentage of finer particles. Highly variable compressibility and bearing strength, therefore, check carefully. Sewage effluent disposal potential variable but most often good except for seepage hazard along impermeable layers.

d. Wildlife

Not a particularly suitable habitat; little browse and cover; some use for movement corridors along valley sides; often droughty.

e. Recreation

Interesting topography for viewing and hiking, and suitable for most intensive recreational uses.

MORICETOWN ASSOCIATION

Physiographic Setting

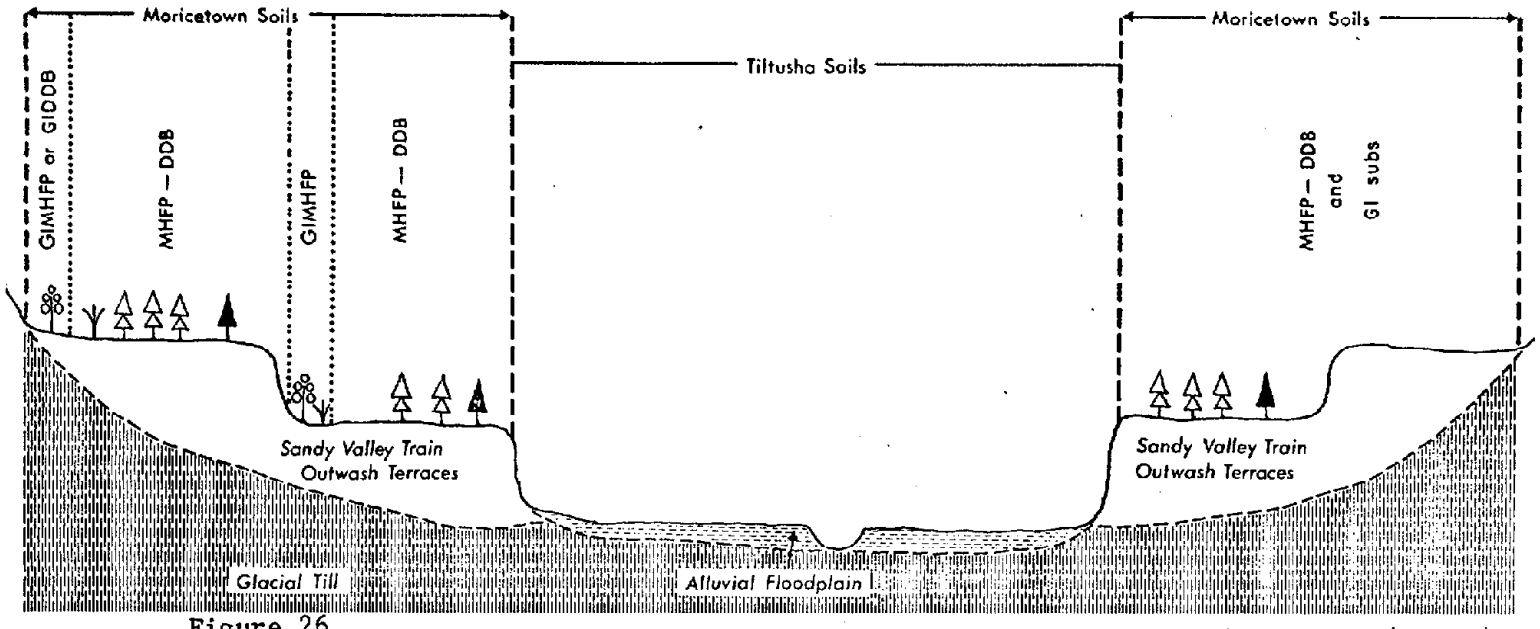

Figure 26.

Landform

Flat to gently sloping (0 to 6% slopes) valley-side glacial terraces or deltas with occasional upland gravel-filled channels. Surfaces are occasionally pitted, and pits have no obvious drainage outlets. Surface drainage patterns are non-existent and short v-shaped gullies typical of gravel materials are common on terrace edges.

Parent Material

Water sorted, stratified, moderately coarse to coarse, highly permeable loose sands of variable thickness but always exceeding 5 feet in depth. Stratified gravels common at depth.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by a wide range of vegetation with most interior species including lodgepole pine, white spruce, aspen and birch common and in close association with more coastal-like species such as hemlock, cedar, alder and hazelnut. This environment, because of its location in the lower parts of the valley has been subjected to a high frequency of fire. As well, a moderate climate of 80-100 frost free days and 7.5 to 10.5 inches May-September precipitation and soils with rapid permeability, deep rooting possibilities and flat topography provide a desirable environment for many uses.

Table 23. Moricetown Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-60%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
MT	Mini Humo-Ferric Podzol		well	major flat section and terrace faces	lodgepole pine, western hemlock	4,084	8,196
		Degraded Dystric Brunisol	well	major flat section and terrace faces	lodgepole pine, western hemlock		
		Gleyed subgroups	imperfect	back of terrace against slope (moisture receiving)	lodgepole pine, western hemlock, cedar, shrubs		

Suitability for Different Uses

a. Agriculture

Very desirable climate and soil combination. Irrigation and heavy fertilizer application necessary for commercial production of the full range of climatically adapted crops which includes cereals, forages, vegetables, and small fruits.

b. Forestry

Mean annual increments range from 51-90 cu.ft./ac./yr. for lodgepole pine. Slash burning is not recommended.

c. Engineering and Urban Development

Excellent sand source. Landform provides excellent flat transportation route locations. Variable compressibility and bearing strength and sand blowing when subsoil exposed. Easily subdivided due to flat topography. High sedimentation hazard with some hazard of excavation cave-in.

d. Wildlife

Suitable habitats for ungulates and upland game birds during vegetation successional stage immediately following fire for a short period of time. Drier sites on terrace faces or bluffs may remain suitable for a longer period of time and form part of ungulate winter range.

e. Recreation

Suitable for most intensive and extensive uses. Sand blowing, and low moisture holding capacities limit some uses. Open stands provide interesting hiking and riding possibilities.

NATLAN ASSOCIATION

Physiographic Setting

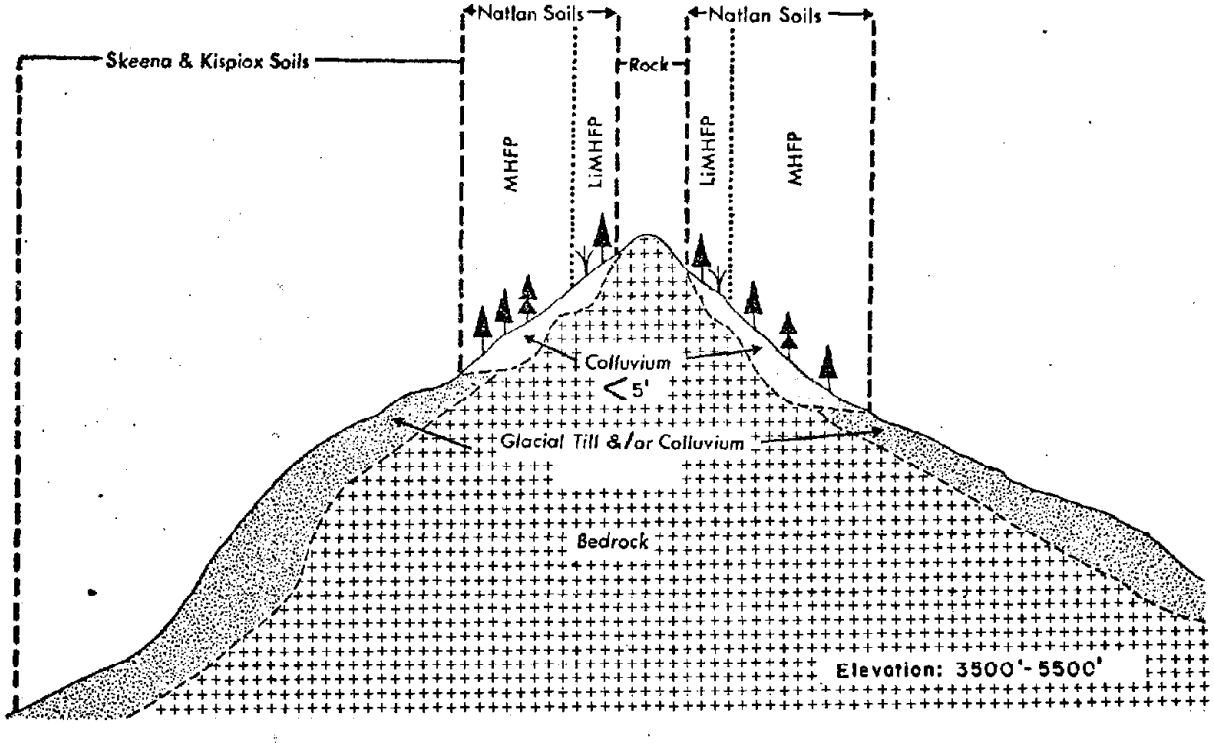

Figure 27.

Landform

The surface form is typical of the underlying basic bedrock and is highly variable and expressed in many different surface forms. Topography may vary from level to strongly undulating to steeply sloping (2-60%+). Sharp peaks, vertical cliffs, steep slopes, large flat to rolling volcanic lava flows and dissected sedimentary shales are included. Surface drainage pattern varies from nil to a highly integrated parallel pattern.

Parent Material

Shallow, moderately coarse to medium textured colluvium which is permeable, stony, bouldery and loose. Deposits derived from weathered glacial till and rock material which combine to form a shallow mantle which moves slowly down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches, lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by a moist climate having 13.5-16.5 inches, May-September precipitation, but a very short frost free period of approximately 30-50 days. Associated soils are relatively shallow and rocky, and support a vegetation of western hemlock, occasional mountain hemlock and much alpine fir at higher elevations. Shrubs are found on the drier sites (very shallow soils). Rock outcrops are frequent.

Table 24. Natlan Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
NA	Mini Humo-Ferric Podzol		well	convex rocky humps as well as stabilized steep slopes	western hemlock, alpine fir, mosses	2,488	19,332
		Lithic Mini Humo-Ferric Podzol	well	shallow rocky humps and steep slopes	stunted western hemlock, alpine fir, shrubs		

Suitability for Different Uses

a. Agriculture

Unsuitable for any use.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for lodgepole pine and alpine fir on the very shallow drier sites to 51-70 cu.ft./ac./yr. for lodgepole pine on the deeper materials. Logging is not recommended.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

Useful only as escape terrain and for limited summer range.

e. Recreation

Can serve as attractive viewpoints.

NECHAKO ASSOCIATION

Physiographic Setting

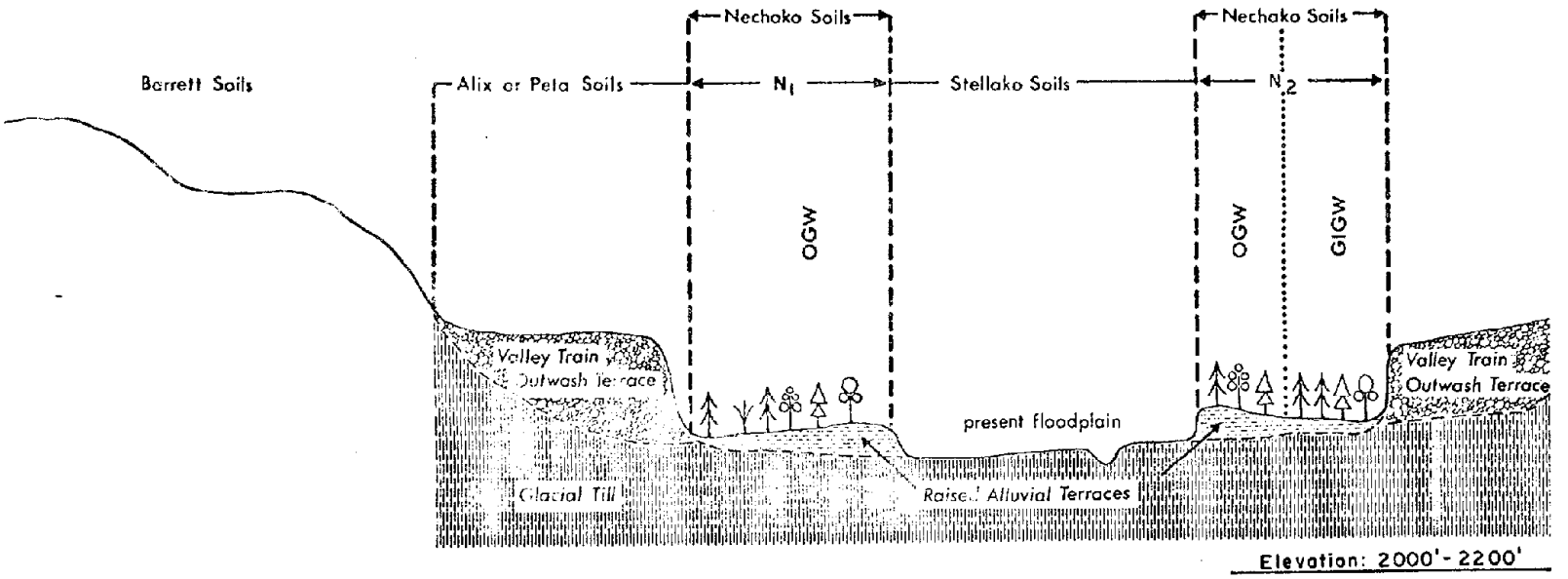

Figure 28.

Landform

Flat to gently undulating (0-5% slopes) raised alluvial terraces which are 20-30 feet above the present floodplain and often are terraced in sequence. Some are marked by current scars and abandoned channels. No particular drainage pattern and gully profiles are usually u-shaped (silty materials).

Parent Material

Water deposited, stratified and moderately fine textured (silty), stream alluvium of variable permeability and compactness up to 3 feet. Underlain by fine or medium loose, permeable sands and occasional gravels.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by approximately 7.5 inches May-September precipitation and frost free periods from 60-75 days, soils with high moisture holding capacity, reasonably good rooting characteristics and with variable permeability and compactness depending on the nature of the original stream deposit. Although almost all these soils are cultivated at present, remnant vegetation suggests aspen, white spruce, lodgepole pine and a heavy shrub cover on the well drained soils, with white spruce, cottonwood and even more abundant shrubs on the imperfectly drained soils.

Table 25. Nechako Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
N1	Orthic Gray Wooded		moderately well	raised well drained portions of the terrace	aspen, white spruce, lodgepole pine and abundant shrubs	228	324
N2	Orthic Gray Wooded		moderately well	raised well drained portions of the terrace	aspen, white spruce, lodgepole pine and abundant shrubs	88	
		Gleyed Orthic Gray Wooded	imperfect	depressions or abandoned channels without drainage outlets	white spruce, cottonwood and abundant shrubs		
					Total Acreage	316	324

Suitability for Different Uses

a. Agriculture

Almost all areas cultivated at present. Capable of producing a fairly wide range of climatically adapted crops under dry farming with improved productivity under irrigation.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for lodgepole pine on the well drained soils to 71-90 cu.ft./ac./yr. for white spruce on the imperfectly drained soils. Some stream sedimentation hazard.

c. Engineering and Urban Development

Moderately slow permeability and fluctuating water tables on imperfectly drained soils limit sewage effluent disposal capability. Bearing strength and compressibility characteristics should be checked carefully when heavy structures are contemplated. Trafficability when wet can be poor.

d. Wildlife

Quite suitable habitat for ungulates (wintering especially) and upland game birds under natural conditions, but only remnant areas remain as most have been cultivated. Some forest, brushland and cultivated edge remains, providing habitat for upland game birds.

e. Recreation

Moderately suitable for intensive use, but slippery and sticky when wet and subject to compaction.

OONA ASSOCIATION

Physiographic Setting

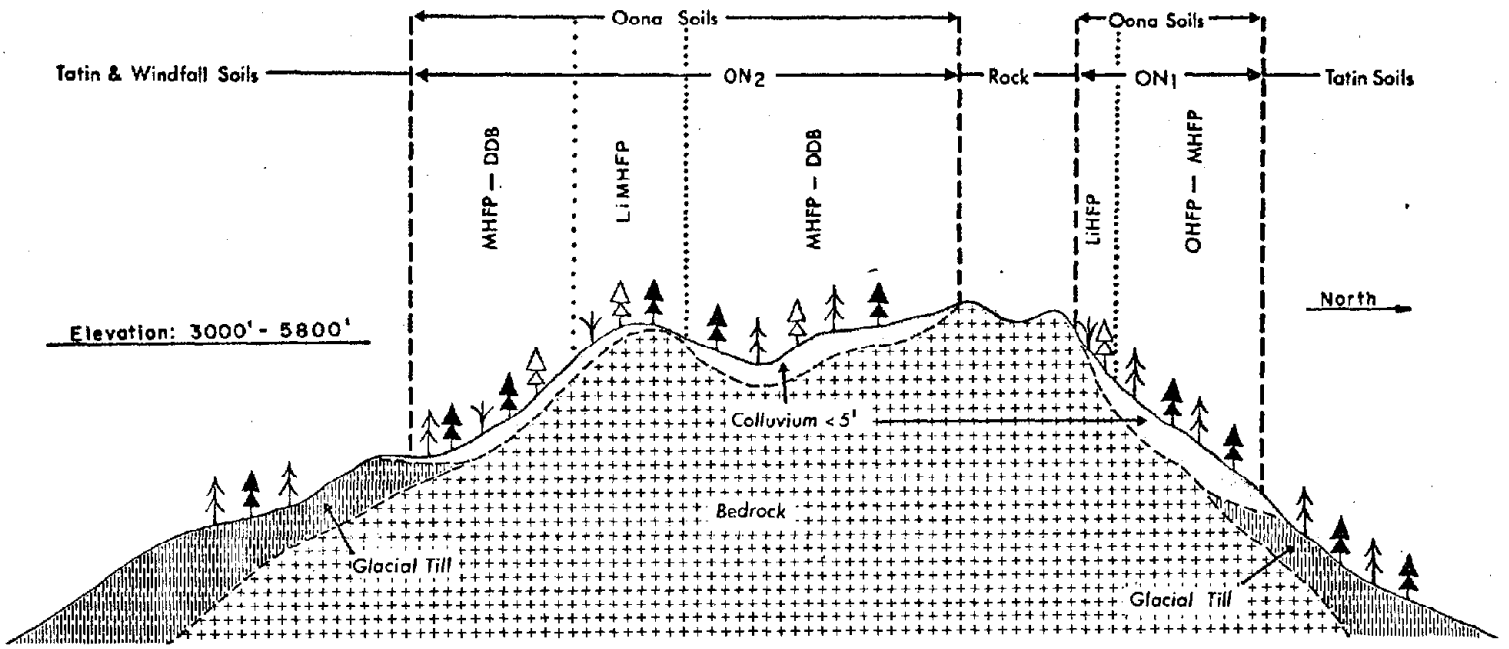

Figure 29.

Landform

The surface form is typical of the underlying basic bedrock and is highly variable and expressed in many different surface forms. Topography may vary from level to strongly undulating to steeply sloping (2-60%+). Sharp peaks, vertical cliffs, steep slopes, large flat to rolling volcanic lava flows and dissected sedimentary shales are included. Surface drainage pattern varies from nil to a highly integrated parallel pattern.

Parent Material

Shallow, moderately coarse to medium textured colluvium which is permeable, stony, bouldery and loose. Deposits derived from weathered glacial till and rock material which combine to form a shallow mantle which moves slowly down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches, lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by a moist climate 13.5-16.5 inches May-September precipitation with relatively short frost free periods (50 days common), and cold soil temperatures. Vegetation is typical of the spruce-alpine fir zone and includes Engelmann spruce, alpine fir, lodgepole pine and scattered shrubs. Shrubs are abundant particularly on the deeper soils for some time after fire, but as the forest canopy closes they rapidly disappear. Map Unit ON2 commonly occurs at lower elevations and in somewhat drier situations than Map Unit ON1 and supports less alpine fir but more lodgepole pine.

Table 26. Oona Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
ON1	Orthic Humo-Ferric Podzol		well	convex rocky humps and moisture shedding steep slopes	alpine fir, Engelmann spruce, lodgepole pine	8,012	56,432
		Mini Humo-Ferric Podzol	well	convex rocky humps and moisture shedding steep slopes	alpine fir, Engelmann spruce, lodgepole pine		
		Lithic subgroups	well	shallow convex rocky humps and very steep slopes	lodgepole pine, alpine fir		
ON2	Mini Humo-Ferric Podzol		well	convex rocky humps and moisture shedding steep slopes	lodgepole pine, Engelmann spruce, alpine fir	3,348	23,588
		Degraded Dystric Brunisol	well	convex rocky humps and moisture shedding steep slopes	lodgepole pine, Engelmann spruce		
		Lithic subgroups	well	shallow convex rocky humps and very steep slopes	lodgepole pine, alpine fir		
					Total Acreage	11,360	80,020

Suitability for Different Uses

a. Agriculture

Unsuitable for any use.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for lodgepole pine and alpine fir on the very shallow lithic soils to 51-70 cu.ft./ac./yr. for lodgepole pine on the deeper soils with better moisture availability. Logging is not recommended.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

Escape terrain and limited summer ungulate range. Can support abundant shrub cover for short periods after fire, especially on the deeper soils.

e. Recreation

Viewpoints only.

ORMOND ASSOCIATION

Physiographic Setting

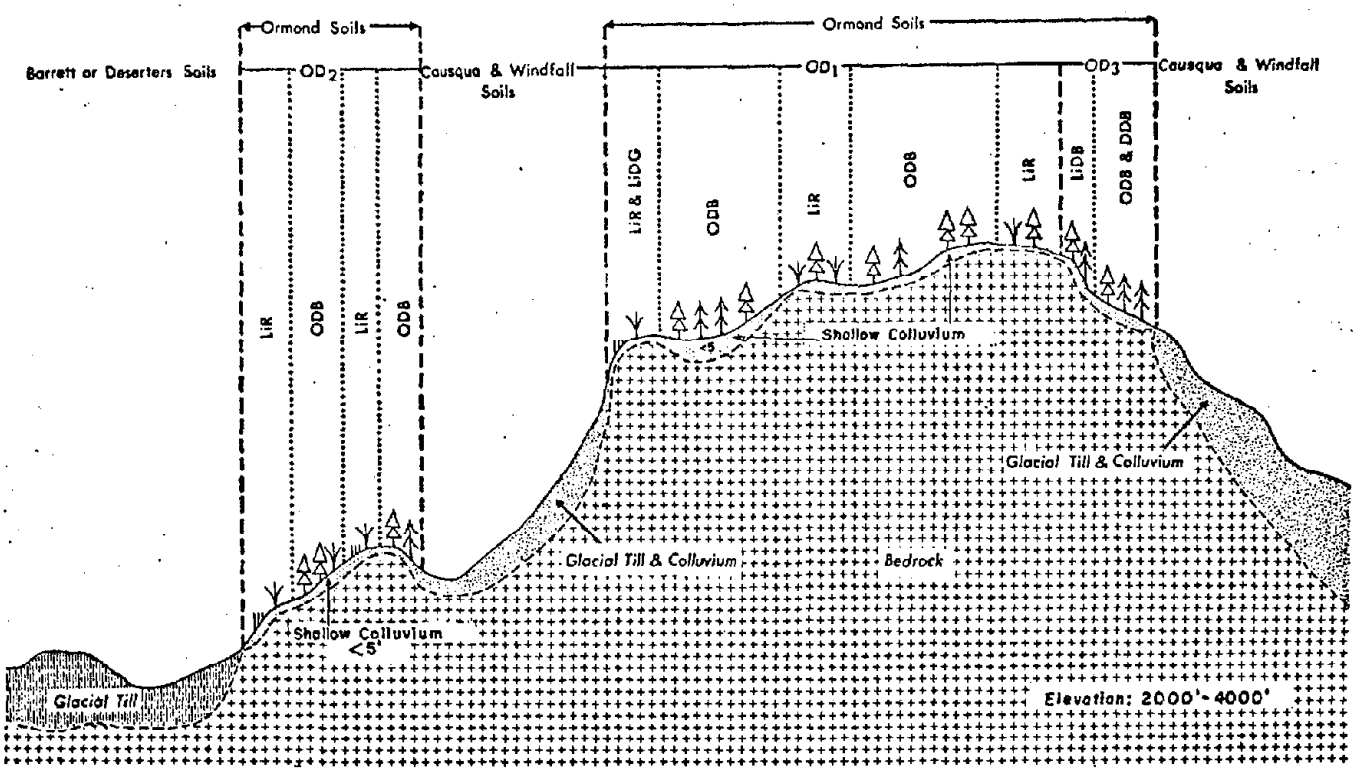

Figure 30.

Landform

The surface form is typical of the underlying basic bedrock and is highly variable and expressed in many different surface forms. Topography may vary from level to strongly undulating to steeply sloping (2-60%+). Sharp peaks, vertical cliffs, steep slopes, large flat to rolling volcanic lava flows and dissected sedimentary shales are included. Surface drainage pattern varies from nil to a highly integrated parallel pattern.

Parent Material

Shallow, moderately coarse to medium textured colluvium which is permeable, stony, bouldery and loose. Deposits derived from weathered glacial till and rock material which combine to form a shallow mantle which moves slowly down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches, lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

The environment of the Ormond Association is characterized by a 7.5-10.5 inch May-September precipitation with 50-75 frost free days and a wide range in soil development (total environment indicator) because of the complexity of topography, aspect, elevation, soil depth and fire history. The dry southern exposures, especially at lower elevations, are subject to frequent fires and are either sparsely forested or in places void of any trees except stunted aspen. Such areas tend to have heavy ground cover of shrubs and grasses and the Dark Gray soil development indicates a temporary grassland environment. Deeper soils adjacent indicate a longer term forested environment (lodgepole pine, aspen, shrubs) which reflects the higher soil moisture availability. The extremely steep, shallow slopes (mostly Lithic Regosols) often have materials actively moving downslope due to gravity. The OD3 Map Units usually occur on north and east slopes or at higher elevations where moisture efficiency is somewhat better and a component of white spruce vegetation is common. In general, tree cover is sparse and interspersed with bare rocks and boulders on the very shallow soils, while on deeper portions the tree canopy is thicker and shrubs are often more abundant.

Table 27. Ormond Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
OD1	Orthic Dystric Brunisol		well	convex rocky humps and swales between rock humps	lodgepole pine, aspen, shrubs	4,192	24,876
		Lithic Orthic Regosol	well	shallow very steep slopes and rocky humps	shrubs, grasses and stunted aspen		
		Lithic Rego Dark Gray	well	more stabilized south and west facing slopes	shrubs, grasses and stunted aspen		
OD2	Lithic Orthic Regosol		well	shallow very steep slopes and rocky humps	shrubs, grasses and stunted aspen	1,268	7,112
		Orthic Dystric Brunisol	well	swales between rocky humps and north and east facing slopes	lodgepole pine, aspen, shrubs		

Table 27. Ormond Soils (Cont'd)

OD3	Orthic Dystric Brunisol		well	convex rocky humps and swales between rock humps	lodgepole pine, white spruce	3,716	19,872
		Degraded Dystric Brunisol	well	between rock and north and east facing slopes	white spruce, lodgepole pine		
		Lithic subgroups	well	shallow very rocky humps and very steep slopes	shrubs, lodgepole pine		
					Total Acreage	9,176	51,860

Suitability for Different Uses

a. Agriculture

All non-arable. Some grazing capability on Map Units OD1 and OD2 but low carrying capacity and vegetation very easily damaged by overgrazing.

b. Forestry

Mean annual increments from 31-50 cu.ft./ac./yr. for trembling aspen on May Units OD1 and OD2 to 51-70 cu.ft./ac./yr. for lodgepole pine on Map Unit OD3. Logging is not recommended and areas should remain in protection forest.

c. Engineering and Urban Development

Some attractive views for low density residential development. See Dahl for similar limitations plus the fact that this underlying rock is often shattered and effluent disposal seepage could be expected.

d. Wildlife

High capability wintering habitat on Map Units OD1 and OD2 for ungulates (moose), with long term probability of native food plants and escape terrain. Relatively shallow snow depths. Use conflict is somewhat of a problem as most of these areas are readily accessible. Desirable upland game bird habitat as well.

e. Recreation

Excellent viewpoints, otherwise limited use because of shallowness, easily damaged vegetation, stony surface and steep topography.

PETA ASSOCIATION

Physiographic Setting

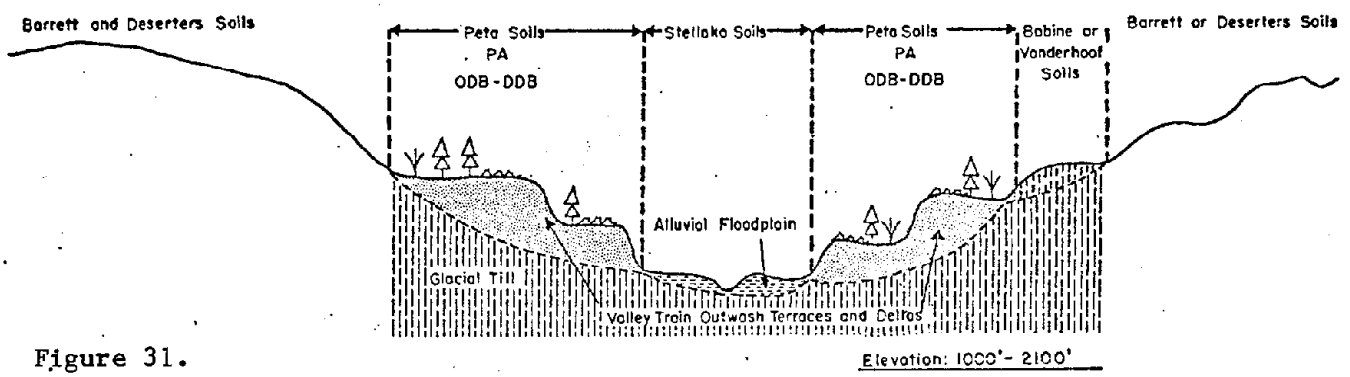

Figure 31.

Landform

Flat to gently sloping (0 to 6% slopes) valley-side glacial terraces or deltas with occasional upland gravel-filled channels. Surfaces are occasionally pitted, and pits have no obvious drainage outlets. Surface drainage patterns are non-existent and short v-shaped gullies typical of gravel materials are common on terrace edges.

Parent Material

Water sorted, stratified, moderately coarse to coarse, highly permeable loose sands of variable thickness but always exceeding 5 feet in depth. Stratified gravels common at depth.

Environment (Soil-Climate-Vegetation Relationships)

The environment of the Peta Association is characterized by 7.5-10.5 inches of May-September precipitation, frost free periods of 60-80 days, some fog protection from being adjacent to rivers, and very permeable sandy soils which function as an excellent rooting medium, but with low moisture holding capacities. Associated vegetation consists of lodgepole pine, aspen, scattered white spruce and a sparse shrub cover due to the droughty soil.

Table 28. Peta Soils

Soil Association Map Units	Major Soil	Minor Soil	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
PA1	Degraded Dystric Brunisol		well to rapid	flat terraces	lodgepole pine, aspen, white spruce	2,858	3,132
		Orthic Dystric Brunisol	well to rapid	flat terraces	lodgepole pine, aspen		

Suitability for Different Uses

a. Agriculture

Suitable for a fairly wide range of climatically adapted crops under irrigation. Limited productivity under dry farming.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for lodgepole pine. Slash burning is not recommended.

c. Engineering and Urban Development

Excellent sand source. Landform provides excellent flat transportation route locations. Variable compressibility and bearing strength and sand blowing when subsoil exposed. Easily subdivided due to flat topography. High sedimentation hazard with some hazard of excavation cave-in.

d. Wildlife

Physiographic location next to streams and the flat topography near valley bottoms (lesser snow depths usually) make these terraces a useful part of ungulate winter range, although the droughty soils themselves do not produce useful food plants. The dry environment provides excellent upland bird nesting sites with water adjacent and feeding areas often close at hand in the upland or on agriculture lands. Much of the widlife use is hampered by other use (transportation routes, homesites, agriculture).

e. Recreation

Suitable for most intensive and extensive uses. Sand blowing, and low moisture holding capacities limit some uses. Open stands provide interesting hiking and riding possibilities.

PINKUT ASSOCIATION

Physiographic Setting

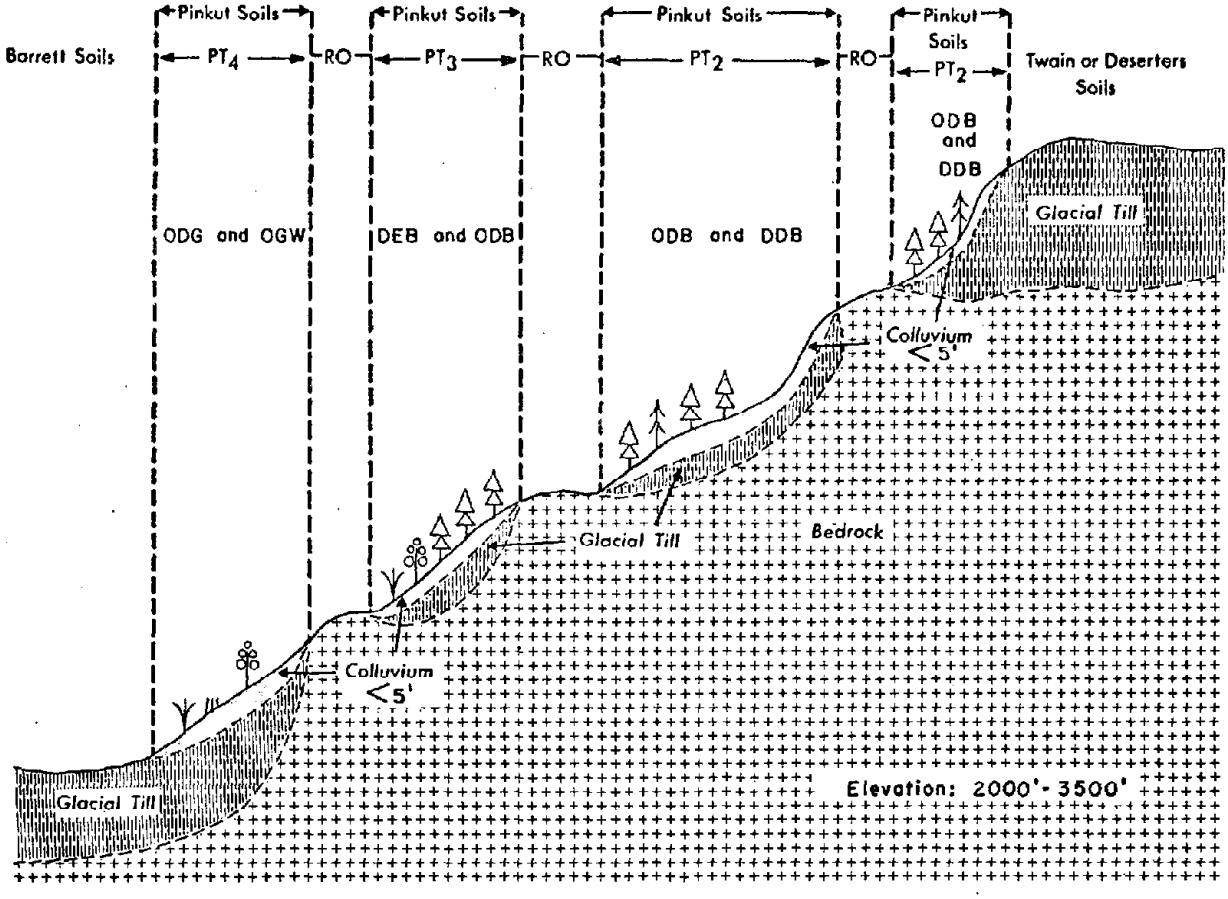

Figure 32.

Landform

Very steeply sloping (40%+ slopes) mantle of detrital materials on valley walls in hilly and mountainous terrain. Drainage pattern variable but generally dendritic and parallel with abrupt directional changes when bedrock is encountered.

Parent Material

A heterogeneous, moderately coarse to coarse textured (gravelly, sandy) stony, loose permeable material deposited on steep slopes and base of slopes by gravity. These colluvial materials are of variable depths, but generally exceeds 5 feet and overlie glacial till or bedrock. The material contains coarse fragments of rock and are often closely associated with rock outcrops.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by relatively drier sites than those surrounding with precipitation ranging from 7.5-10.5 inches May-September and frost free periods from 40 to 60 days. The drier Dark Gray soils of Map Unit PT4 which are subject to a high frequency of fire, are at the lowest elevations, and aspen, lodgepole pine and shrub vegetation is typical. Soils of Map Unit PT3 are intermediate in moisture efficiency and elevation and support a vegetation of lodgepole pine, aspen and shrubs, while Map Unit PT2 reflects moister environments due to higher elevations and on north and east facing slopes. Here the vegetation consists of lodgepole pine and white spruce.

Table 29. Pinkut Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
PT2	Orthic Dystric Brunisol		well to rapid	steeply sloping convex shedding slopes	lodgepole pine, white spruce	4,688	9,196
		Degraded Dystric Brunisol	well to rapid	steeply sloping convex shedding slopes, often north and east facing slopes	white spruce, lodgepole pine		
PT3	Degraded Eutric Brunisol		well to rapid	steeply sloping convex shedding slopes (south and west slopes common)	lodgepole pine, aspen, shrubs		
		Orthic Dystric Brunisol	well to rapid	steeply sloping convex shedding slopes north and east slopes common	lodgepole pine, white spruce		1,368
PT4	Orthic Dark Gray		well to rapid	very steeply sloping lower elevation shedding slopes	aspen, shrubs, herbs	288	2,220
		Orthic Gray Wooded	well to rapid	steeply sloping stabilized slopes	aspen, lodgepole pine, shrubs		
					Total Acreage	4,976	12,784

Suitability for Different Uses

a. Agriculture

Limited grazing capability on Map Units PT3 and PT4 but easily overgrazed. Otherwise not suitable.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for trembling aspen on Map Unit PT4 to 51-70 cu.ft./ac./yr. on Map Unit PT2. Steep, unstable slopes and logging across slopes suggested.

c. Engineering and Urban Development

Unsuitable for urban development due to bouldery, unstable material on extremely steep slopes. Road or pipeline construction and maintenance could have minor problems due to the unstable nature of the material especially boulders tumbling downslope or seepage in areas mapped as PT2. Bedrock often closely associated.

d. Wildlife

Excellent potential for food plants and cover for ungulate and upland game bird habitat on Map Units PT3 and PT4, while Map Unit PT2 is suitable only as cover and escape terrain.

e. Recreation

Unsuitable as topography is too steep. Can be an attractive part of viewed landscape from a distance.

PRAIRIEDALE ASSOCIATION

Physiographic Setting

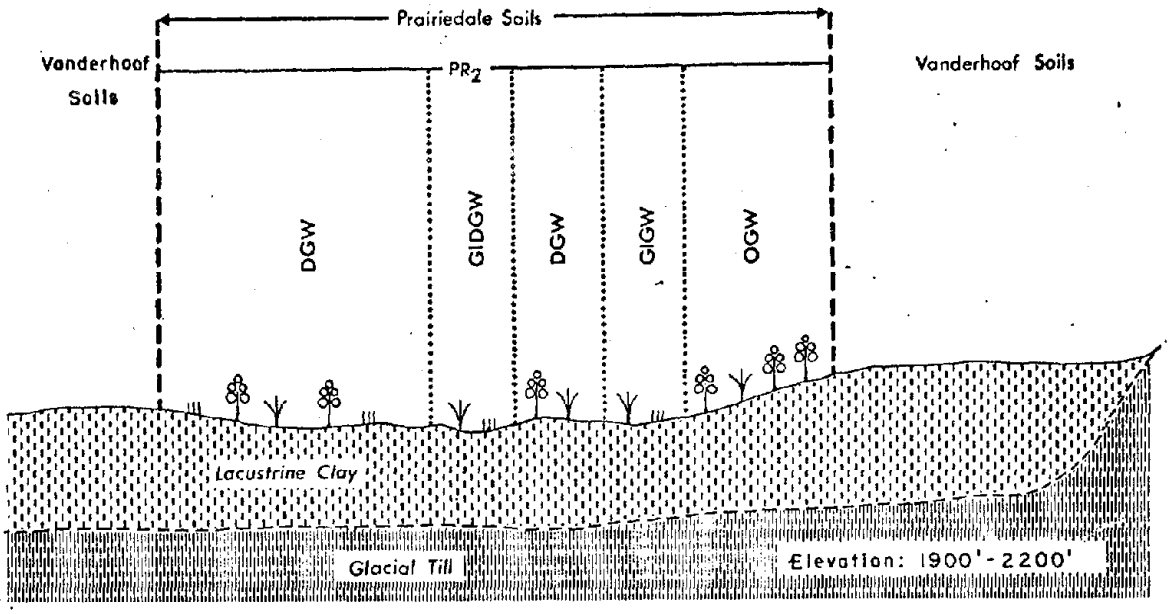

Figure 33.

Landform

Flat to gently undulating (0-5% slopes) glaciolacustrine plain. The general flatness is broken by entrenched stream valleys and occasional progressing gullies which are rounded.

Parent Material

Moderately fine textured deep, (clayey) stone-free, layered, compact slowly permeable lakebed sediments.

Environment (Soil-Climate-Vegetation Relationships)

This small unit which is part of a much larger laking basin, has a unique micro-environment with the following characteristics:

- approximately 7.5 inches of May-September precipitation with 50-75 frost free days.
- soils with dark surface layers (horizons) unusual in this environment. The organic matter accumulation may be a result of successive forest fires followed by invasion of shrubs and grasses of of poor drainage which was subsequently improved by man. The soils are compact, slowly permeable, with high moisture holding capacities and fluctuating water tables in the swales.
- although now mostly cultivated, natural vegetation remnants include aspen, and a thick cover of shrubs, grasses and herbs.

Table 30. Prairiedale Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
PR2	Dark Gray Wooded		moderately well to well	flat and undulating plain	aspen, grasses and shrubs	188	564
		Orthic Gray Wooded	well to moderately well	flat and undulating plain	aspen, shrubs		
		Gleyed subgroups	imperfect	swales and depressions	aspen, shrubs, grasses		

Suitability for Different Uses

a. Agriculture

Somewhat restricted crop range because of the short frost free period but a very desirable dry farming soil with a friable topsoil.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for trembling aspen to 51-70 cu.ft./ac./yr. for lodgepole pine. Compaction, erosion, frost heaving, stream siltation hazards.

c. Engineering and Urban Development

These nearly impermeable medium to fine textured soils are subject to frost heaving, have limited potential for effluent disposal, generally poor trafficability when wet and cutbanks have high erosion hazard. The only advantage is relatively flat topography.

d. Wildlife

Almost all cultivated edges useful upland game bird habitat and native vegetation remnants would indicate reasonable wintering habitat for moose.

e. Recreation

Moderate to severe for intensive use. Pastoral setting attractive.

RAMSEY ASSOCIATION

Physiographic Setting

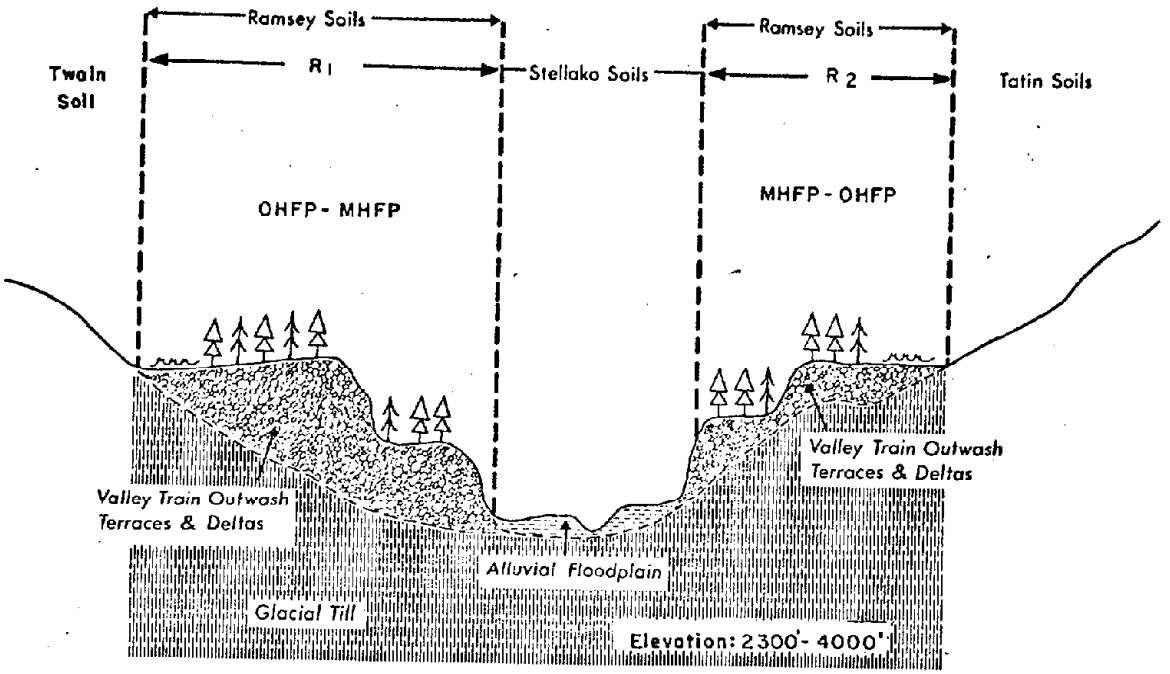

Figure 34.

Landform

Flat to gently sloping (0 to 6% slopes) valley-side glacial terraces or deltas with occasional upland gravel-filled channels. Surfaces are occasionally pitted, and pits have no obvious drainage outlets. Surface drainage patterns are non-existent and short v-shaped gullies typical of gravel materials are common on terrace edges.

Parent Material

Water sorted, stratified gravels which are coarse to moderately coarse textured, often stony, highly permeable and loose. Of variable thickness but always exceeding 5 feet in depth with stratified gravels and sands common at depth.

Environment (Soil-Climate-Vegetation Relationships)

The environment of this soil association is characterized by very droughty, rapidly drained gravelly soils (low moisture holding capacity) in a relatively moist climate having approximately 13.5 inches of precipitation during May to September, and a very short frost free period of less than 50 days. Droughtiness is further enhanced by a high fire frequency which destroys the organic surface litter. Typical of drier sites in the spruce-alpine fir zone, lodgepole pine with little ground cover is the predominant vegetation although black and Engelmann spruce and alpine fir are common. The shrub cover tends to be more abundant at the higher elevations.

Table 31. Ramsey Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
R1	Orthic Humo-Ferric Podzol		rapid	flat terraces with steep edges next to valley center	lodgepole pine, scattered spruce, alpine fir	1,384	4,654
		Mini Humo-Ferric Podzol	rapid	flat terraces with steep edges next to valley center	lodgepole pine, scattered spruce, alpine fir		
R2	Mini Humo-Ferric Podzol		rapid	flat terraces with steep edges next to valley center	lodgepole pine, scattered spruce, alpine fir	2,388	8,328
		Orthic Humo-Ferric Podzol	rapid	flat terraces with steep edges next to valley center	lodgepole pine, scattered spruce, alpine fir		
					Total Acreage	3,772	12,982

Suitability for Different Uses

a. Agriculture

Very limited possibilities of forage production in small pockets. Limitations include short frost free period, stoniness and low moisture holding capacity.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for lodgepole pine on extremely droughty sites to 71-90 cu.ft./ac./yr. for white spruce on somewhat moister sites at higher elevations. Slash burning is not recommended.

c. Engineering and Urban Development

Excellent aggregate source. Road location and subdivision development possibilities excellent. Compressibility and bearing strength characteristics are variable and should be checked carefully when heavy structures are contemplated. Sewage effluent disposal potential is high, but some contamination of groundwater is possible under high density development.

d. Wildlife

These small upland valley terraces serve as movement corridors from summer to winter range for ungulates, particularly moose. Otherwise not a particularly useful habitat component.

e. Recreation

Useful and attractive landform for most intensive recreation uses. Stoniness and low soil moisture holding capacity impose some limitations to such uses as campsites.

ROARING ASSOCIATION

Physiographic Setting

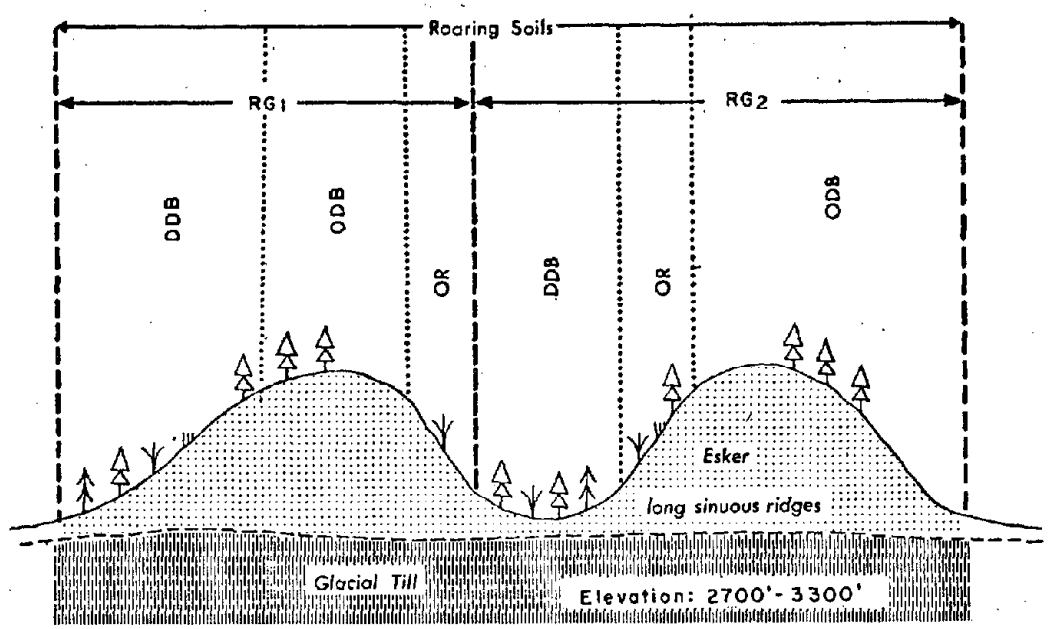

Figure 35.

Landform

Irregular, long, sinuous, round-topped ridges with 10-50% slopes. Side slopes are usually very steep. An intricate topographic criss-cross pattern of ridges occurs in one unit. No visible surface drainage pattern. V-shaped gullies are common.

Parent Material

Water sorted and stratified deep coarse textured gravels and sands with occasional layers of silt. Stony, highly permeable and loose.

Environment (Soil-Climate-Vegetation Relationships)

The Roaring Association is characterized by a very droughty environment caused by the coarse, rapidly drained and highly permeable soils on steep slopes, and a 7.5-10.5 inch May-September precipitation. The two extremes in micro-environment on the eskers are the very steep southern exposed slopes (Regosol soils) which are particularly dry, often partly bare, or with a forest of stunted aspen and lodgepole pine versus the shaded swales between ridges which have a maximum moisture efficiency as indicated by Degraded Dystric Brunisol soils and a vegetation of lodgepole pine and white spruce.

Table 32. Roaring Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
RG1	Degraded Dystric Brunisol		rapid to well	swales and north and east facing slopes	lodgepole pine, scattered white spruce	300	
		Orthic Dystric Brunisol	rapid	top of ridges south and west facing slopes	lodgepole pine		
		Orthic Regosol	rapid	very steep side slopes	stunted aspen, lodgepole pine		
RG2	Orthic Dystric Brunisol		rapid to well	top of ridges and slopes	lodgepole pine	392	
		Degraded Dystric Brunisol	rapid to well	swales and some north and east facing slopes	lodgepole pine, scattered white spruce		
		Orthic Regosol	rapid	very steep side slopes	stunted aspen, lodgepole pine		
					Total Acreage	692	

Suitability for Different Uses

a. Agriculture

Unsuitable for any use.

b. Forestry

Mean annual increment of 31-50 cu.ft./ac./yr. for lodgepole pine. Slash burning is not recommended. Skid roads should be limited.

c. Engineering and Urban Development

As for Alix plus steep topography limitation. Silt layers can be a problem when materials used as aggregate source.

d. Wildlife

Generally unsuitable, except as escape terrain or possibly as dry, warm nesting areas for upland game birds.

e. Recreation

Attractive unusual landform for viewing. Few limitations to extensive use except for steep topography, some stoniness and low moisture holding capacity.

SAUNDERS ASSOCIATION

Physiographic Setting

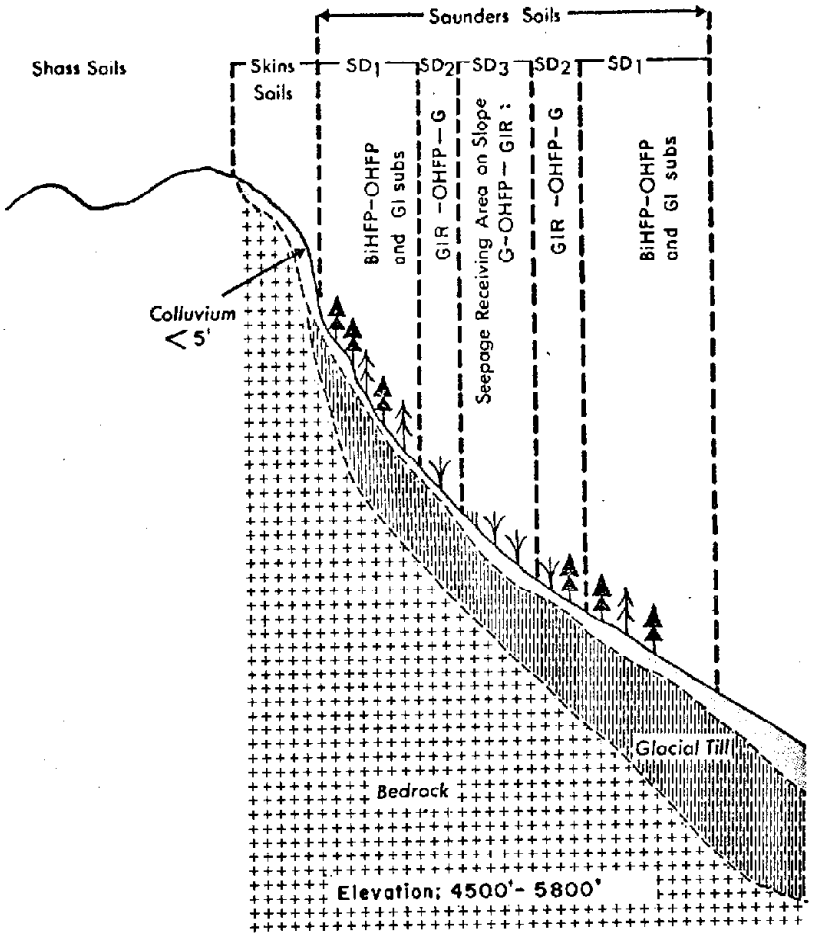

Figure 36.

Landform

Very steeply sloping (over 30% - average 45% slopes) glacial till on steep valley walls and strongly rolling upland plateaus. Parallel surface drainage patterns down the steep slopes are common. Variable gully profiles due to variation in the compactness of the material and frost action.

Parent Material

A heterogeneous, moderately coarse to medium textured (gravelly loam to silt loam), stony, compact glacial till which most often has some surface modification due to downslope movement of material as a result of gravity. The surface modification may be a reworking of the local glacial till or an admixture of detritus from further upslope.

Environment (Soil-Climate-Vegetation Relationships)

The Saunders Association is characterized by steeply sloping Podzol and Gleysol soils which developed under relatively moist (approximately 13.5 inches of May-September precipitation) and cold (approximately 30-50 days frost free period) conditions typical of the highest elevations of the Spruce-Alpine fir vegetation zone. Moisture often seeps down these slopes from higher elevations so that Gleyed and Gleysolic soils are major components of many map units. Alpine fir and scattered Engelmann spruce is the dominant vegetation on these cold and moist soils, with forbes and shrubs dominating the wet seepage slopes where conifer trees cannot establish. Alpine fir is most often stunted at the higher elevations.

Table 33. Saunders Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SD1	Bisequa Humo-Ferric Podzol		moderately well to well	convex moisture shedding slope	alpine fir, scattered Engelmann spruce	45,412	62,946
		Orthic Humo-Ferric Podzol	well to moderately well	convex moisture shedding slope	alpine fir, scattered Engelmann spruce		
		Gleyed subgroups	imperfect	concave moisture receiving positions or seepage channels on slope	forbes and shrubs, scattered alpine fir		
SD2	Gleyed Orthic Regosol		imperfect	temporary seepage slope or concave moisture receiving position on slope	forbes and shrubs, scattered alpine fir	2,740	6,912
		Orthic Humo-Ferric Podzol	moderately well to well	convex moisture shedding slope	alpine fir, scattered Engelmann spruce		
		Gleysolics	poor to very poor	seepage slope	wet forbes, shrubs scattered		
SD3	Gleysolics		poor to very poor	seepage slope	wet forbes, shrubs scattered	940	2,140
		Orthic Humo-Ferric Podzol	moderately well to well	convex moisture shedding slopes	alpine fir, scattered Engelmann spruce		
		Gleyed Orthic Regosol	imperfect	temporary seepage slope or concave moisture receiving position on slope	forbes and shrubs, scattered alpine fir		
					Total Acreage	49,092	71,998

Suitability for Different Uses

a. Agriculture

Unsuitable. Some seepage slopes have palatable forage, but grazing season is very short.

b. Forestry

Mean annual increments range from 11-30 cu.ft./ac./yr. for alpine fir on the moist, cold soils of Map Unit SD2 to 51-70 cu.ft./ac./yr. for alpine fir at the lower elevations and warmer sites of Map Unit SD1. Frost heaving and slumping hazards often severe. Logging is not generally recommended except on Map Unit SD1.

c. Engineering and Urban Development

Frost heaving, slumping, slow permeability, erosion and seepage hazards. High snowfall. Low sewage effluent disposal potential.

d. Wildlife

Map Units SD2 and SD3 provide some summer range potential for moose and deer plus some escape terrain for caribou, as well as upland game bird habitat for ptarmigan and grouse. Map Unit SD1 provides only escape cover.

e. Recreation

Some hiking and viewing potential. Not suitable for intensive use.

SAVORY ASSOCIATION

Physiographic Setting

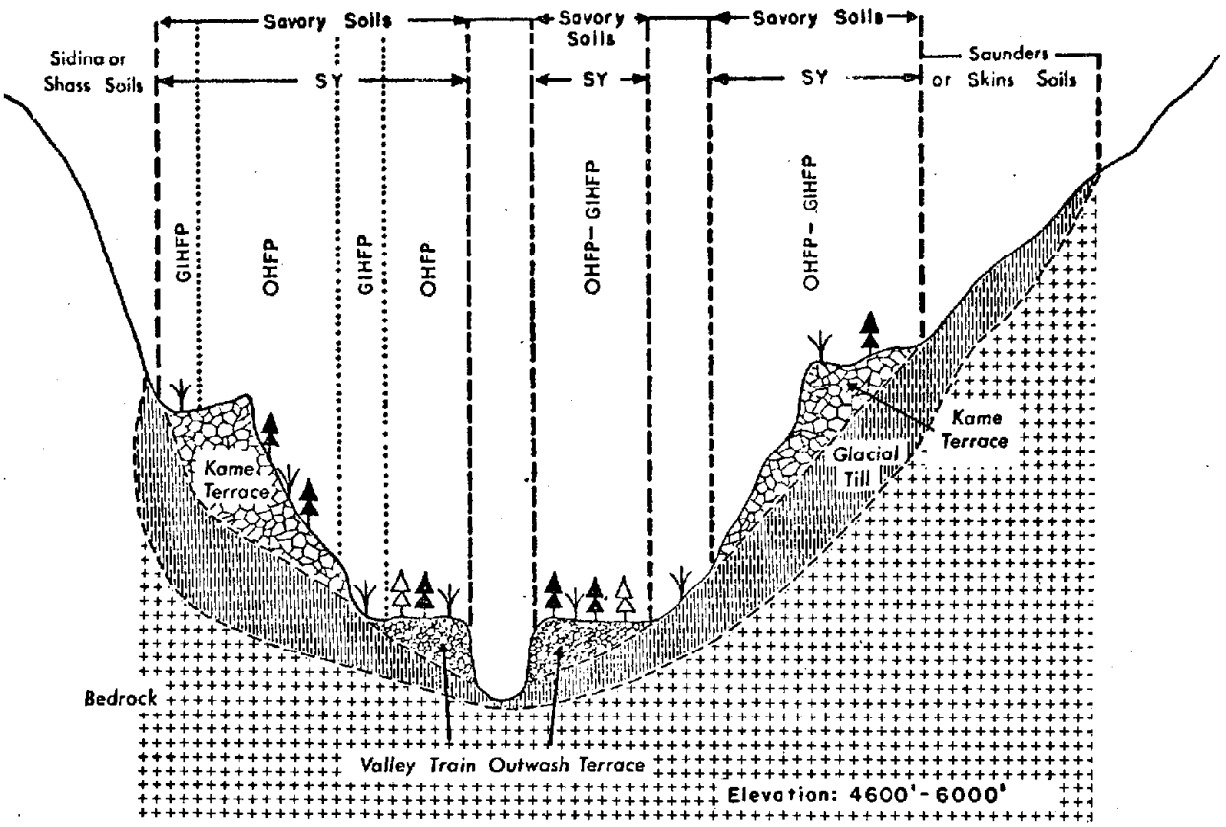

Figure 37.

Landform

Flat to gently sloping (0 to 6% slopes) valley-side glacial terraces or deltas with occasional upland gravel-filled channels. Surfaces are occasionally pitted, and pits have no obvious drainage outlets. Surface drainage patterns are non-existent and short v-shaped gullies typical of gravel materials are common on terrace edges.

Parent Material

Water sorted, stratified, moderately coarse textured glaciofluvial gravels of variable thickness. Deposits highly permeable, loose and often stony. Often considerable amount of fine particles (silts and clays) mixed in the gravels.

Environment (Soil-Climate-Vegetation Relationships)

The Savoury Association is characterized by a cold, moist environment as indicated by a 30-40 day frost free period and approximately 13.5 inches of May-September precipitation, and heavy winter snowfall at timberline. The associated well drained Podzol soils are permeable and have a low moisture holding capacity and support a vegetation of stunted alpine fir and shrubs. The moister, Gleyed soils of the map unit occur against the back slopes and support a larger component of shrubs.

Table 34. Savory Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SY	Orthic Humo-Ferric Podzol		well	flat terraces and steep bluffs next to valley center	alpine fir, lodge-pole pine, shrubs	2,452	1,828
		Gleyed Orthic Humo-Ferric Podzol	imperfect	moisture receiving position at back edge of terrace	alpine fir, shrubs		

Suitability for Different Uses

a. Agriculture

Unsuitable.

b. Forestry

Mean annual increments range from 11 to 30 cu.ft./ac./yr. for alpine fir to 31-50 cu.ft./ac./yr. for alpine fir and Engelmann spruce on the very best sites. Logging is not recommended.

c. Engineering and Urban Development

Only source of aggregate at high elevations. Soil characteristics suitable for residential or cottage development but climate severe. Excellent trafficability.

d. Wildlife

Suitable habitat as part of summer range for ungulates and upland game birds, especially ptarmigan.

e. Recreation

Soils suitable for most intensive uses, but climate severe. Excellent campsite possibilities.

SHASS ASSOCIATION

Physiographic Setting

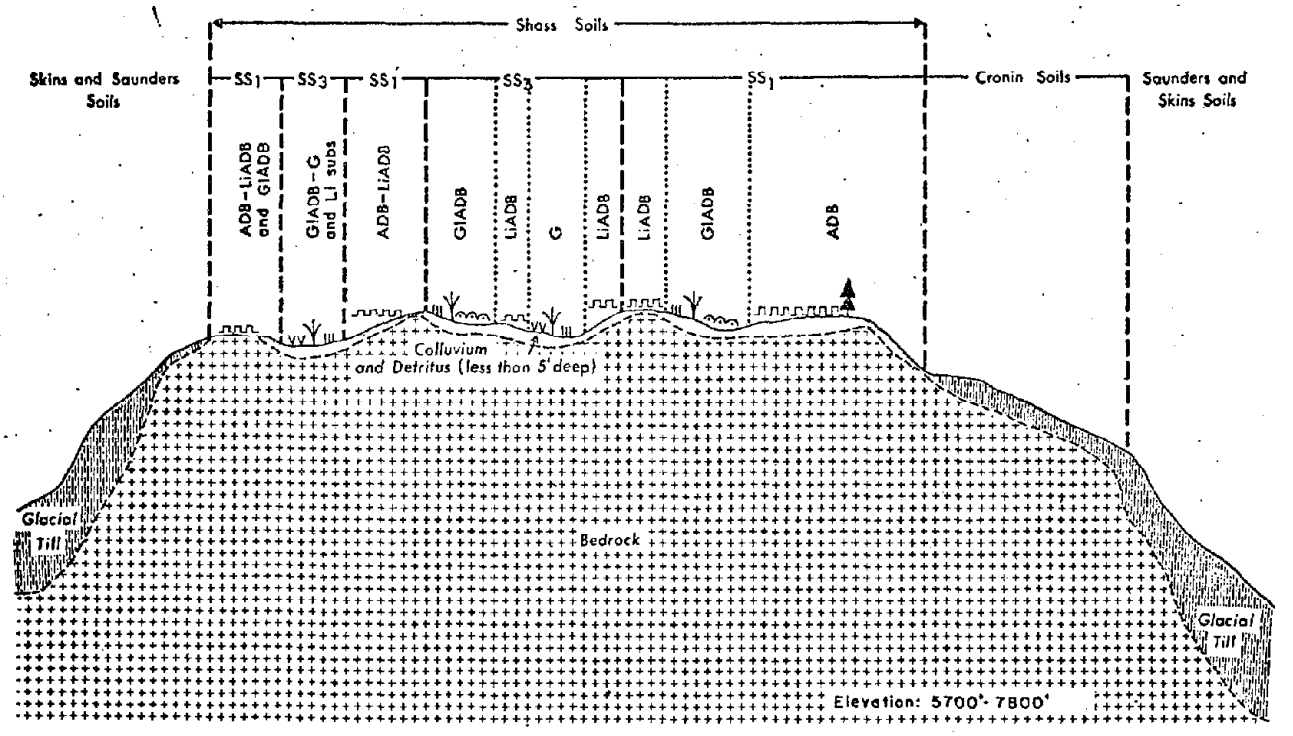

Figure 38.

Landform

A rolling to very steeply sloping (15-60% slopes) bedrock controlled surface often closely associated with rock outcrops. The landforms take on the characteristics of the underlying bedrock as the surface mantle is less than 5 feet thick. The surface form can range from dome-shaped hills having rounded tops and steep side slopes with a characteristic irregular pattern of curvilinear fractures, to sharp peaks with very steep slopes. Drainage patterns and gully profiles are highly variable depending on the characteristics of the underlying bedrock. Dissection is strongest where shales form the underlying bedrock. Evidence of frost action and related upheaving of the micro-topography.

Parent Material

Shallow, moderately coarse to medium textured colluvium derived from weathered rock material which can either remain in place or move downslope by gravity and frost action. The material is permeable, loose, stony and bouldery, and hard or shattered bedrock is usually encountered within 3 to 5 feet. Where surface deposits are less than 20 inches thick, shallow lithic soils are indicated. Surface layers are often more stony than the subsoil and some locations are paved with angular pieces of fractured rock.

Environment (Soil-Climate-Vegetation Relationships)

Shass soils occur above timberline and the environment is characterized by a very short, cool growing season, cold temperatures, high snowfall and strong winds. The associated cold and shallow turfy-topped alpine soils support only dwarfed vegetation. This ranges from wet alpine forbes on the moist Gleyed and Gleysolic soils to lichen on the very shallow soils and alpine heather and dwarfed clumps of alpine fir in protected locations. Many slopes and ridges are extremely windswept and exposed to all the elements. Frost heaving is common, especially on the imperfectly and poorly drained soils. The severe climate is the dominating feature.

Table 35. Shass Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SS1	Alpine Dystric Brunisol		well to moderately well	rocky humps and shallow swales between	lichen, alpine heather	21,860	80,808
		Gleyed Alpine Dystric Brunisol	imperfect	swales, seepage slopes and channels	wet alpine forbes and shrubs		
		Lithic subgroups	well	shallow convex rocky humps and minor seepage slopes	lichen		
SS3	Gleyed Alpine Brunisol		imperfect	swales, seepage slopes and channels	wet alpine forbes and shrubs	5,756	19,592
		Gleysolics	poor	deep depressions and seepage slopes	wet alpine forbes and shrubs		
		Lithic subgroups	imperfect to poor	seepage slopes	wet alpine forbes, alpine heathers		
					Total Acreage	27,616	100,400

Suitability for Different Uses

a. Agriculture

Non-arable. Limited short season grazing possible, but vegetation can be easily irreversably damaged by over-use.

b. Forestry

Unsuitable due to climatic limitations.

c. Engineering and Urban Development

Severe climate and easily damaged alpine ecology; avoid where possible.

d. Wildlife

Suitable habitat for summer use by ungulates (moose) and winter use of lichen by caribou on the windswept ridges and slopes. Excellent ptarmigan habitat. Suitable goat habitat including rock cliffs and outcroppings often associated.

e. Recreation

Excellent scenery of mountains and vegetation for extensive use such as hiking and riding. Ecology very easily damaged. This environment has a very low carrying capacity so extensive use only is recommended, and then only with extreme care.

SHEGUNIA ASSOCIATION

Physiographic Setting

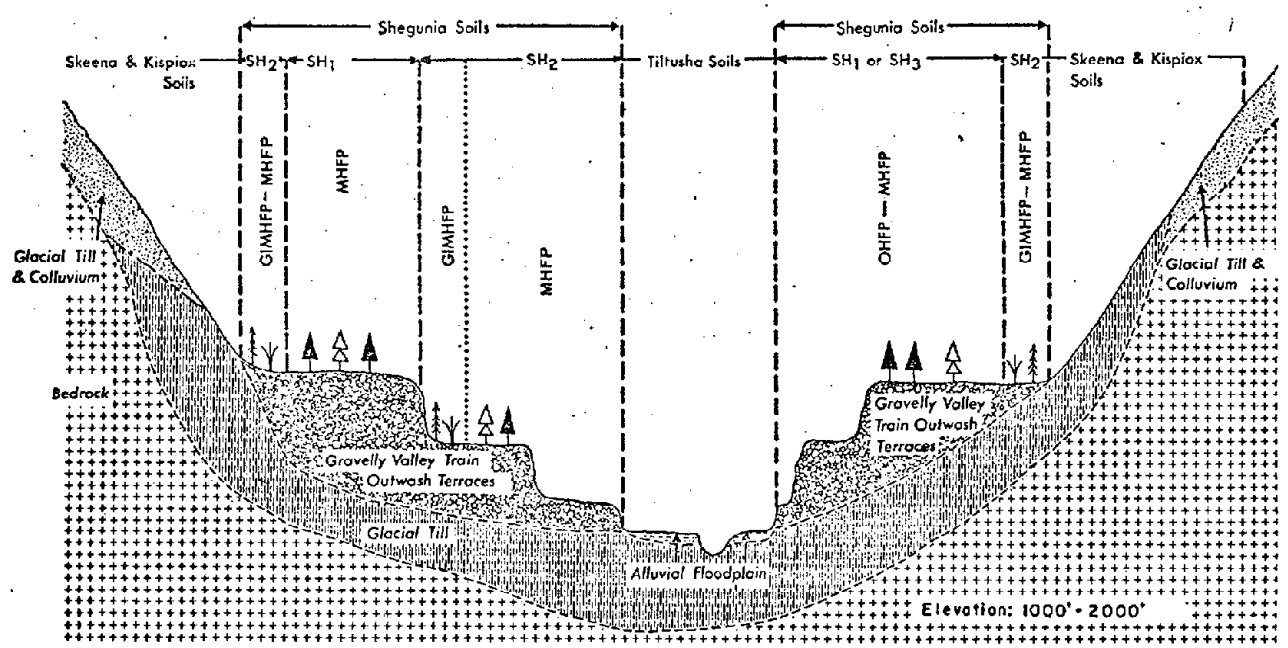

Figure 39.

Landform

Flat to gently sloping (0 to 6% slopes) valley-side glacial terraces or deltas with occasional upland gravel-filled channels. Surfaces are occasionally pitted, and pits have no obvious drainage outlets. Surface drainage patterns are non-existent and short v-shaped gullies typical of gravel materials are common on terrace edges.

Parent Material

Water sorted, stratified gravels which are coarse to moderately coarse textured, often stony, highly permeable and loose. Of variable thickness but always exceeding 5 feet in depth and with stratified gravels and sands common at depth.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by the coastal transition vegetation of western hemlock and lodgepole pine on the well to rapidly drained, droughty, Podzol soils, and western hemlock, cedar, scattered white spruce and shrubs on the imperfectly drained Gleyed Podzol soils. The climate is relatively mild with 75-100 frost free days and moist with approximately 13.5-16.5 inches of May-September precipitation. The excellent air drainage which occurs on these terraces in the wider valleys provides the best climate in the area. SH3 map units (Orthic Humo-Ferric Podzol soils) indicate a somewhat moister climate than the SH1 map units, (Mini Humo-Ferric Podzol soils).

Table 36. Shegunia Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SH1	Mini Humo-Ferric Podzol		rapid	flat terrace and terrace bluff	western hemlock, lodgepole pine	7,012	11,796
SH2	Gleyed Mini Humo-Ferric Podzol		imperfect	back of terrace against valley wall	hemlock, cedar, shrubs, mosses	1,716	496
		Mini Humo-Ferric Podzol	rapid to well	flat terrace and terrace bluff	western hemlock, lodgepole pine		
SH3	Orthic Humo-Ferric Podzol		rapid	flat terrace and terrace bluff	western hemlock, lodgepole pine	1,824	2,300
		Mini Humo-Ferric Podzol	rapid	flat terrace and terrace bluff	western hemlock, lodgepole pine		
					Total Acreage	10,552	14,592

Suitability for Different Uses

a. Agriculture

Although the climate is quite suitable, stoniness and low soil moisture holding capacities limit the range of crops possible. Irrigation would improve crop range and productivity.

b. Forestry

Mean annual increments range from 71-90 cu.ft./ac./yr. for lodgepole pine on the rapidly drained soils to 110-130 cu.ft./ac./yr. for western hemlock on the imperfectly drained soils.

c. Engineering and Urban Development

Excellent aggregate source. Road location and subdivision development possibilities excellent. Compressibility and bearing strength characteristics are variable and should be checked carefully when heavy structures are contemplated. Sewage effluent disposal potential is high, but some contamination of groundwater is possible under high density development. Imperfectly drained soils with fluctuating water tables can present problems for sewage effluent disposal and road maintenance, as well as causing seepage into borrow pits.

d. Wildlife

Unsuitable except for movement corridors along valleys. Regeneration to conifers fairly rapid after disturbance.

e. Recreation

Suitable for most intensive uses, except where imperfectly drained soils occur. Stoniness and low soil moisture holding capacity limitations.

SIDINA ASSOCIATION

Physiographic Setting

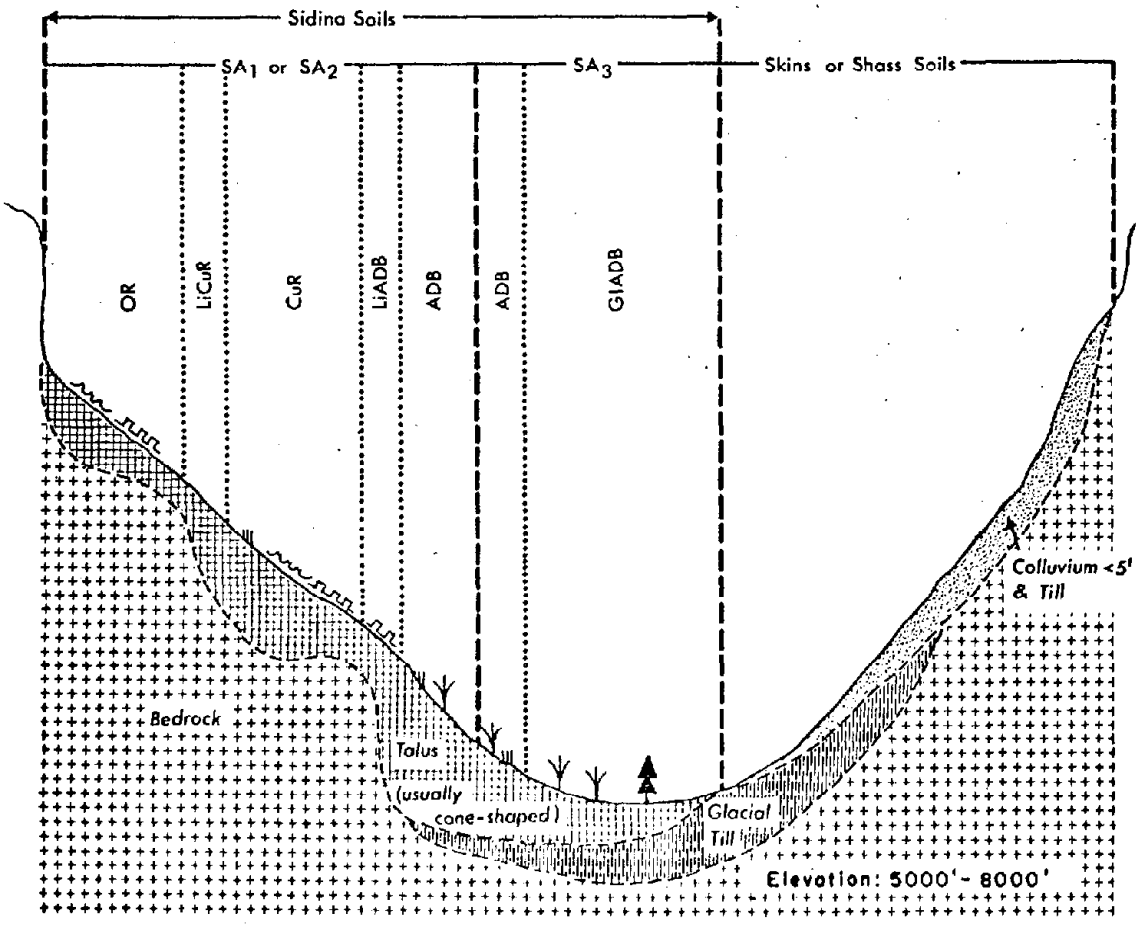

Figure 40.

Landform

Very steeply sloping (50%+ slopes), most often cone-shaped form, consisting of detrital material which has accumulated at the base of a steeper slope or bluff. No surface drainage pattern.

Parent Material

Coarse textured angular, bouldery, loose, permeable colluvial material which has been deposited by gravity. The distribution of materials on the landform is variable but most often the larger fragments are located on the talus apron while finer materials are located near the apex. Often finer particles are distributed between angular rock fragments and boulders.

Environment (Soil-Climate-Vegetation Relationships)

The environment is characterized by unstable, droughty materials (except for SA3) associated with rock bluffs and sharp peaks mainly above timberline where short, cool, growing seasons, cold temperatures, high snowfall, strong winds and cold soil temperatures predominate. Vegetation establishment is difficult under these severe conditions with lichen and scattered shrubs on the less stabilized materials of Map Unit SA1 to grasses, lichen and shrubs on Map Unit SA2 with its many buried surfaces (Cumulic Regosols), and the abundant forbes and shrubs of Map Unit SA3. This latter has a different micro-environment in that it is usually somewhat protected from the elements and has a better moisture regime.

Table 37. Sidina Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SA1	Orthic Regosol		rapid	steep unstabilized slope	nil to scattered lichen and shrubs	21,666	13,271
		Alpine Dystric Brunisol	well to rapid	steep stabilized slope	shrubs, lichen		
		Lithic subgroups	well	shallow steep rocky slope	nil to scattered lichen and shrubs		
SA2	Cumulic Regosol		rapid	steep semi-stabilized slope	lichen, grasses	5,780	10,076
		Orthic Regosol	rapid	steep unstabilized slope	nil to scattered lichens and shrubs		
		Lithic subgroups	well	shallow steep rocky slope	nil to scattered lichens and shrubs		
SA3	Gleyed Alpine Dystric Brunisol		imperfect	base of slope (moisture receiving position)	abundant alpine forbes and shrubs	324	1,984
		Alpine Dystric Brunisol	moderately well to well	moderate slopes	abundant alpine forbes and shrubs		
					Total Acreage	27,770	25,331

Suitability for Different Uses

a. Agriculture
Unsuitable.

b. Forestry
Unsuitable.

c. Engineering and Urban Development
Source of fragmental rock for construction processes although access is often difficult. Very unstable landform, avoid for road construction and building sites where possible. Seepage problems and fluctuating water tables in SA3.

d. Wildlife
Suitable goat habitat, especially in association with escape terrain in adjacent rock bluffs and sharp peaks. Where talus slopes are stabilized, suitable food plants are usually available. Ptarmigan habitat excellent, especially with combinations of SA3 and SA1 environments.

e. Recreation
Excellent scenery. Easily damaged alpine ecology. Extensive hiking, wilderness camping, and viewing only - low carrying capacity.

SKEENA ASSOCIATION

Physiographic Setting

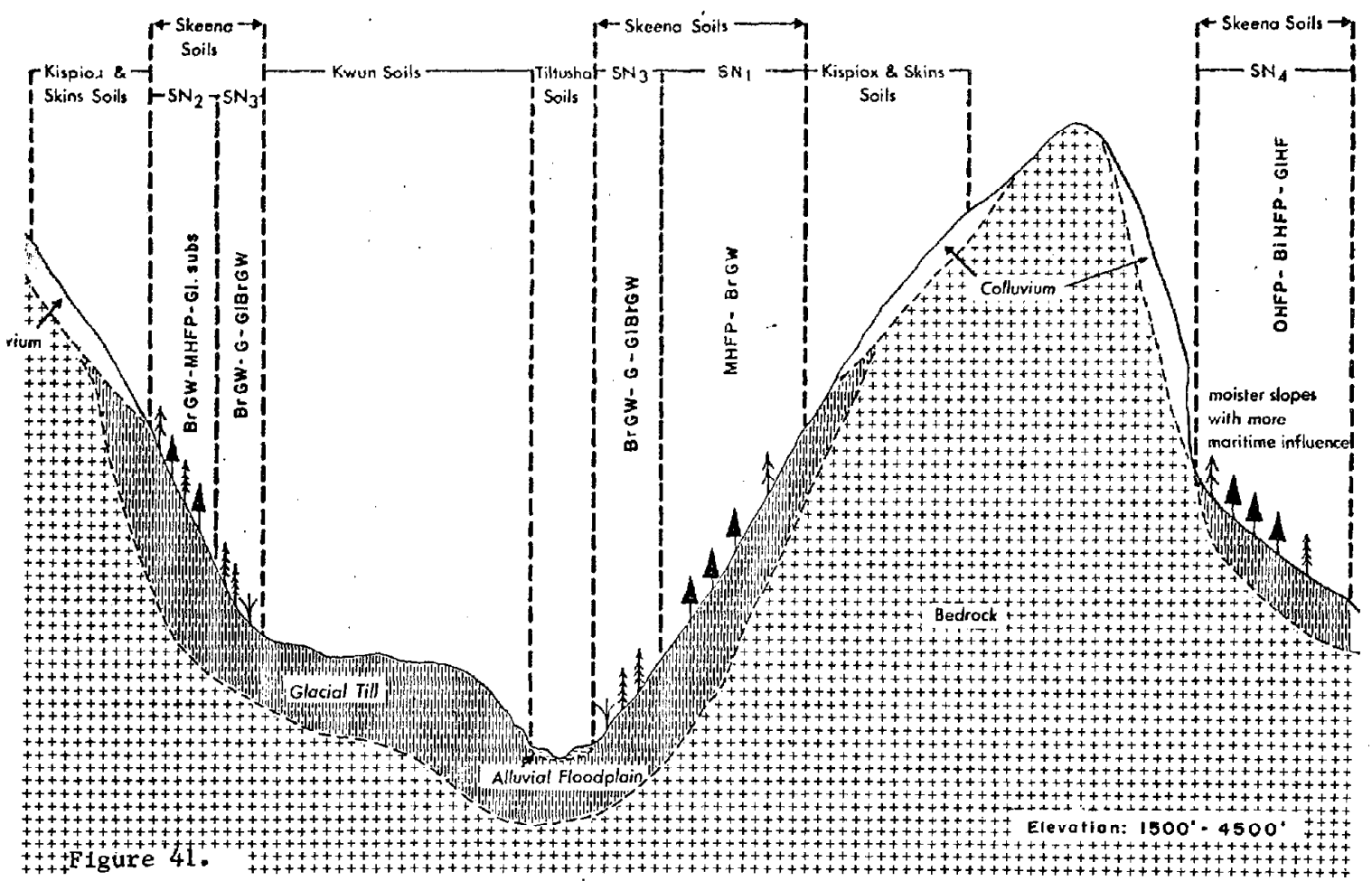

Figure 41.

Landform

Very steeply sloping (over 30% - average 45% slopes) glacial till located on steep valley walls. Parallel or modified dendritic (branched) surface drainage pattern, with abrupt directional changes where underlying bedrock is encountered. Gullies are cut deeply into the surface with u-shaped profiles.

Parent Material

A heterogeneous medium to moderately fine textured (loam to silty clay loam), occasionally stony, very compact, sticky (when wet), relatively impermeable glacial till which often has some surface modification due to downslope movement of material as a result of gravity. The surface modification may be a reworking of the local glacial till or an admixture of detritus from further upslope. Often pockets of clay till at depth.

Environment (Soil-Climate-Vegetation Relationships)

The Skeena soils are characterized by a relatively moist (13.5-16.5 inches of May-September precipitation), mild (70-95 frost free days), climate associated with steep valley side slopes, relatively impermeable, highly erodable, compact, sticky soils and a hemlock, cedar and moss vegetative cover. After disturbance shrub competition can be extensive but conifer regeneration rapidly takes over in most cases. SN4 Map Units occur in somewhat moister environments than SN 1 or 3. Following disturbance of vegetation, soil erosion can be excessive due to the combination of highly erodable soils on steep slopes and a relatively high precipitation.

Table 38. Skeena Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SN1	Mini Humo-Ferric Podzol		moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover	4,988	31,720
		Brunisolic Gray Wooded	moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover		
SN2	Brunisolic Gray Wooded		moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover		
		Mini Humo-Ferric Podzol	moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover		
		Gleyed subgroups	imperfect	concave, moisture receiving position or seepage channel	western hemlock, cedar, mosses		
SN3	Brunisolic Gray Wooded		moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover	4,320	3,268
		Gleysolics	poor to very poor	depressions without drainage outlet and continuous seepage slopes	shrubs, scattered cedar		
		Gleyed Brunisolic Gray Wooded	imperfect	concave, moisture receiving position or seepage channel or slope	western hemlock, cedar, mosses		
SN4	Orthic Humo-Ferric Podzol		moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover	496	10,008
		Bisequa Humo-Ferric Podzol	moderately well to well	steep convex moisture shedding slopes	western hemlock, dense moss cover		
		Gleyed subgroups	imperfect	concave, moisture receiving position or seepage channel on slope	western hemlock, cedar, mosses		
					Total Acreage	9,804	44,996

Suitability for Different Uses

a. Agriculture

Unsuitable.

b. Forestry

Mean annual increments range from 110-130 cu.ft./ac./yr. for western hemlock and white spruce on the imperfectly drained soils to 71-90 cu.ft./ac./yr. for white spruce and alpine fir at the higher elevations. Slide, slump and erosion hazards, frost heaving and stream sedimentation hazard.

c. Engineering and Urban Development

High erosion, slump, slide, frost heaving and sedimentation hazards. Avoid where possible. Much cut and fill necessary for road construction.

d. Wildlife

Generally unsuitable. Short term ungulate habitat following fire as the useful succession stage likely is short. Very high stream sedimentation hazard is detrimental to fish.

e. Recreation

Unsuitable.

SKINS ASSOCIATION

Physiographic Setting

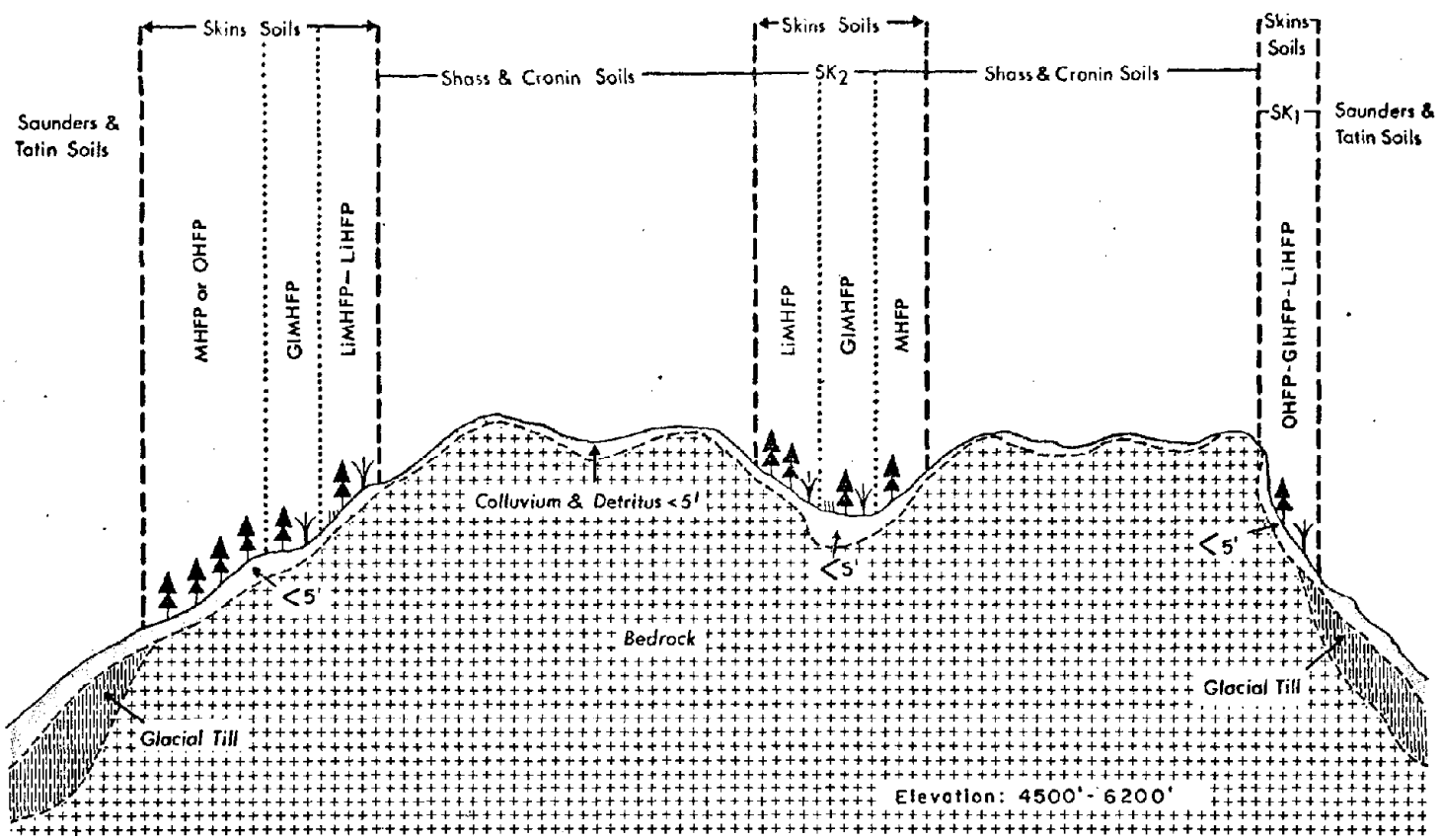

Figure 42.

Landform

A rolling to very steeply sloping (15-60% slopes) bedrock controlled surface often closely associated with rock outcrops. The landforms take on the characteristics of the underlying bedrock as the surface mantle is less than 5 feet thick. The surface form can range from dome-shaped hills having rounded tops and steep side slopes with a characteristic irregular pattern of curvilinear fractures, to sharp peaks with very steep slopes. Drainage patterns and gully profiles are highly variable depending on the characteristics of the underlying bedrock. Dissection is strongest where shales form the underlying bedrock. Evidence of frost action and related upheaving of the micro-topography.

Parent Material

Shallow colluvium which is moderately coarse textured, permeable, stony, and loose glacial till. Material derived from rock materials which combine to form a surface mantle which moves down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

Skins soils are located at timberline where the severe climate, including a very short growing season, cold temperatures, high moisture and snowfall, and strong winds are the predominating influences on the environment. The associated shallow, rocky, cold, often steeply sloping Podzol soils support a vegetation dominated by stunted and dwarfed alpine fir. The trees often grow in clumps, with variable shrub cover depending on stand density, and a component of forbes on imperfectly drained soils. This is the upper limit of continuous forest cover and the upper edges are only sparsely covered.

Table 39. Skins Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SK1	Orthic Humo-Ferric Podzol		well	convex moisture shedding slopes	alpine fir	36,496	141,904
		Gleyed Orthic Humo-Ferric Podzol	imperfect	swales and seepage slopes (moisture receiving positions)	alpine fir, shrubs, forbes		
		Lithic Orthic Humo-Ferric Podzol	well to moderately well	shallow convex rocky ridges and steep slopes	alpine fir, shrubs		

Table 39. Skins Soils (Cont'd)

SK2	Mini Humo-Ferric Podzol		well	convex moisture shedding slopes	alpine fir	2,552	20,036
		Gleyed Mini Humo-Ferric Podzol	imperfect	swales and seepage slopes (moisture receiving positions)	alpine fir, shrubs, forbes		
		Lithic Mini Humo-Ferric Podzol	well to moderately well	shallow convex rocky ridges and steep slopes	alpine fir, shrubs		
					Total Acreage	39,048	161,940

Suitability for Different Uses

a. Agriculture

Unsuitable. Some grazable forbes but too scattered and easily damaged by livestock.

b. Forestry

Mean annual increments range from 51-70 cu.ft./ac./yr. for alpine fir on the best sites to 11-30 cu.ft./ac./yr. for alpine fir on the shallow sites. Logging is not recommended.

c. Engineering and Urban Development

Severe climate, shallow rocky soils with some seepage, and fluctuating water tables in the swales are the main limitations. Easily damaged ecology.

d. Wildlife

This environment occurs at timberline and can provide escape cover as a part of the alpine habitat (i.e. summer range for moose or ptarmigan; cover for caribou and goat). Some food plants likely but not abundant usually.

e. Recreation

Attractive scenery (clumps of stunted alpine fir and rock outcrops on the edge of the alpine region). Extensive use only.

SLUG ASSOCIATION

Physiographic Setting

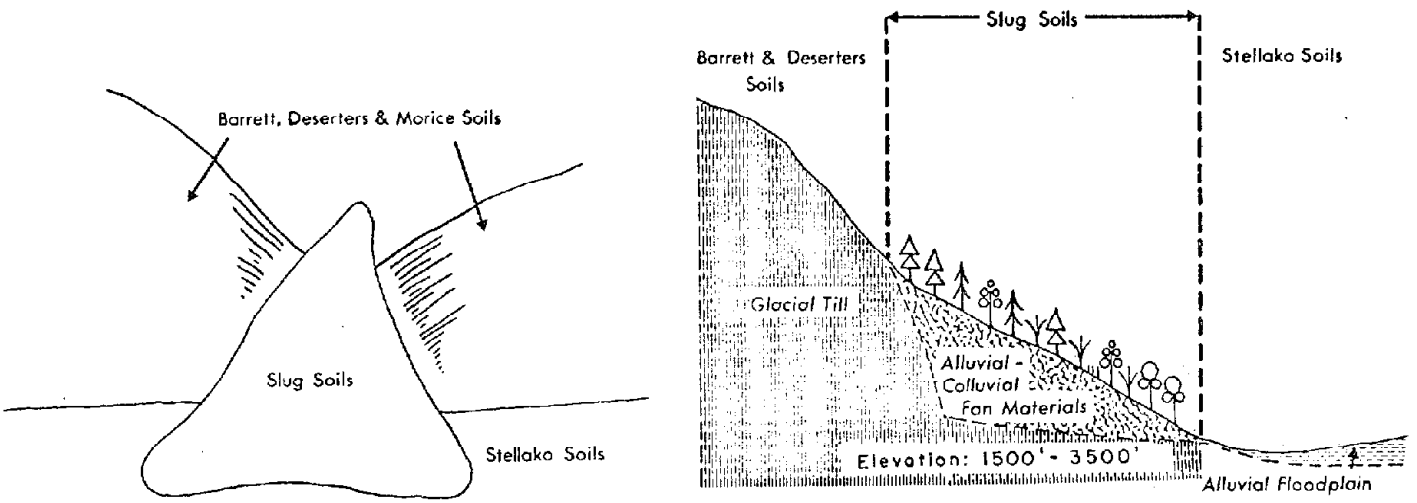

Figure 43.

Landform

Flat to steeply sloping (0-50% slopes) fan-like form occurring where a stream runs onto a level plain or meets a slower stream. No drainage pattern as such occurs but the surface is often marked by variegated current scars, abandoned and presently occupied channels. There is a noticeable slope towards the fan toe or apron.

Parent Material

The water sorted, partially stratified, coarse textured (gravelly), often stony, loose, permeable materials are located at the fan apex and finer materials (sands, silts and minor clays) sometimes slightly compact and less permeable occur toward the apron.

Environment (Soil-Climate-Vegetation Relationships)

The environment is characterized by a wide range of soil development, climate, and vegetation conditions even within one small map unit. May to September precipitation ranges from 7.5-13.5 inches, with much local variation in frost free periods depending on cold air sources from side valleys leading in from above the landform. The soil pattern is complex and highly variable. Drainage, permeability, stoniness and time of deposition are also variable. The resulting vegetation is also variable and is complicated further by a history of high fire frequency. Vegetation ranges from pure lodgepole pine stands on the well and rapidly drained soils of older deposits to trembling aspen and shrubs on the recently deposited, well drained (Regosol) soils, to shrubs, aspen, white spruce and cottonwood on the imperfectly drained soils to shrubs, white spruce, and cottonwood on the poorly drained soils.

Table 40. Sing Valley

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SG1	Orthic Dystric Brunisol		well to rapid	mainly fan apex	lodgepole pine	4,456	4,516
		Orthic Regosol	well to rapid	positions of recent deposition and fan aprons	aspen, shrubs		
SG2	Orthic Dystric Brunisol		well	mainly fan apex	lodgepole pine	8,240	2,416
		Orthic Regosol	well to rapid	position of recent deposition and fan aprons	aspen, shrubs		
		Gleyed subgroups	imperfect	abandoned channels, seepage depressions and fan aprons	lodgepole pine, white spruce		
SG3	Mini Humo-Ferric Podzol		well	mainly fan apex	lodgepole pine, white spruce	9,728	3,040
		Orthic Regosol	well	position of recent deposition and fan aprons	aspen, shrubs		
		Gleyed subgroups	imperfect	abandoned channels, seepage depressions and fan aprons	white spruce, lodgepole pine, birch, aspen, shrubs		
SG4	Orthic Regosol		well	positions of recent deposition next to streams	aspen, shrubs	1,732	808
		Gleyed Orthic Regosol	imperfect	abandoned channels, seepage depressions and fan aprons	shrubs, aspen, cottonwood, white spruce		
SG5	Gleyed Orthic Regosol		imperfect	abandoned channels, seepage depressions and fan aprons	shrubs, aspen, cottonwood, white spruce	2,032	744
		Gleysolics	poor to very poor	swales, depressions and seepage sites on fan aprons	shrubs, white spruce, cottonwood		
					Total Acreage	26,188	11,524

Suitability for Different Uses

a. Agriculture

The climate is often limiting as in general it is severe and complicated by local frosts. Stoniness, flooding hazard, variable soil moisture-holding capacities and drainage limit the range of crops to forages in general, although there are some exceptions.

b. Forestry

Mean annual increments range from 31-60 cu.ft./ac./yr. for white spruce on the poorly drained soils to 90-110 cu.ft./ac./yr. for white spruce on the imperfectly drained soils. A wide range in site. Slash burning is not recommended.

c. Engineering and Urban Development

Location near valley bottoms and gentle slopes towards the valley make these soils valuable for urban development where needed. Apexes of these fans are common sources of aggregate and are also suitable building or subdivision sites. The variable soil textures and drainage properties as well as stream channel wandering make fan aprons difficult engineering problems in road-bed construction and maintenance and foundation settling.

d. Wildlife

A wide range of habitat types and variability of site within one landform. A useful habitat for upland game birds and winter range for ungulates, but usually in small units and therefore must be considered as part of larger adjacent units. Adjacent to streams, therefore some hazard of erosion and sedimentation detrimental to fish.

e. Recreation

High capability. Location at stream confluences, gently sloping topography, rapid permeability in fan apexes and diversity of vegetation make the well drained Map Unit SG1, parts of Map Units SG2,3 and 4 attractive recreation sites for a wide range of uses. The imperfectly drained parts of Map Units SG2,3,4 and SG5 have occasional high water tables and occasional flooding which reduce their desirability.

SNODGRASS ASSOCIATION

Physiographic Setting

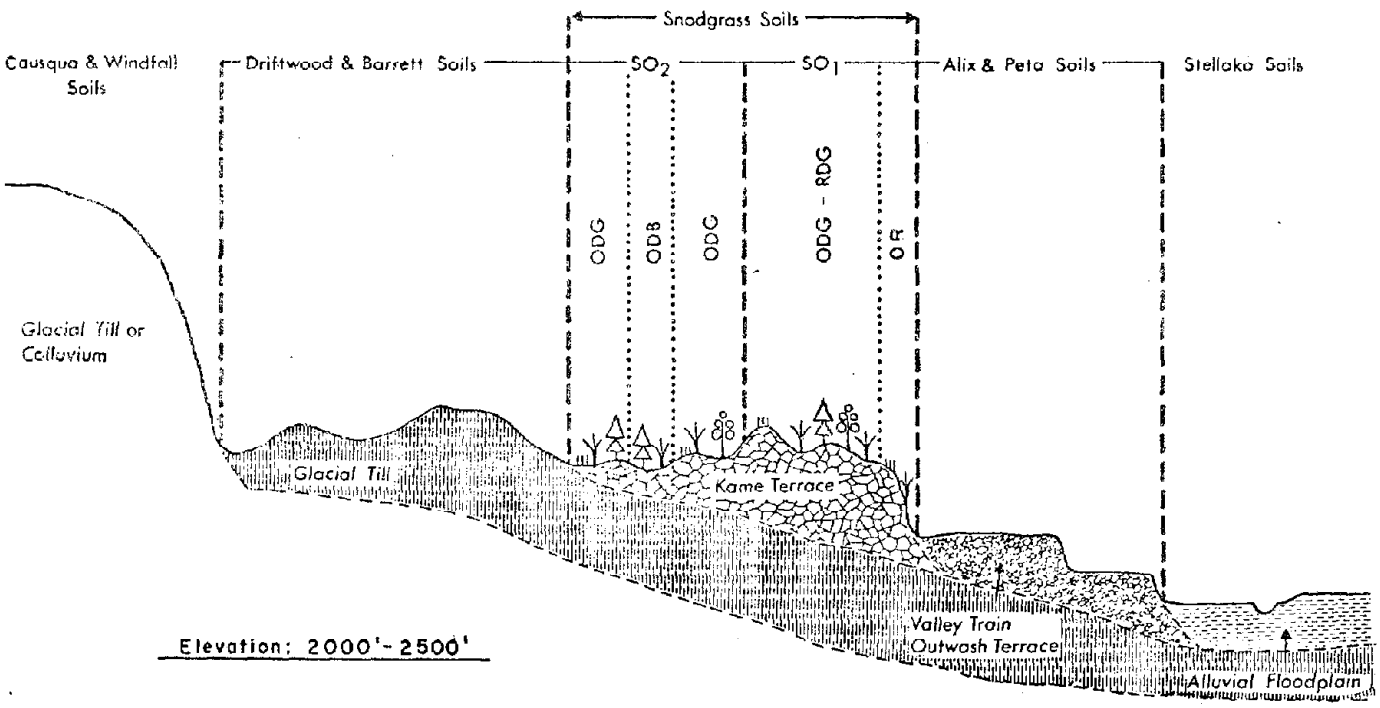

Figure 44.

Landform

Level to rolling and strongly irregular (0-50% slopes) of hummocks, mounds and terraces often conforming partly to valley walls or rock faces (hanging on valley sides). Gives the impression of collapsed topography. A very haphazard, disoriented, discontinuous drainage pattern is typical. Gullies variable shape, but usually short and discontinuous.

Parent Material

Partially water sorted and roughly stratified deposits which are moderately coarse to coarse (sandy and gravelly) textured, often stony, usually loose and of variable permeability and depth.

Environment (Soil-Climate-Vegetation Relationships)

Snodgrass Soils support a contrasting vegetation as related to surrounding landscapes. In this somewhat drier environment of approximately 7.5 inches of May-September precipitation, associated with a coarse textured, droughty soil, and a high fire frequency, south and west slopes take on some grassland characteristics. These conditions favour a vegetation of shrubs, grasses, forbes and stunted aspen and Dark Gray soils. Only shaded swales and north and east slopes have the more typical characteristics of the northern forest with Brunisol soils and lodgepole pine and shrub vegetation.

Table 41. Snodgrass Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SO1	Orthic Dark Gray		rapid to well	steeply sloping usually south and west slopes	shrubs, grasses, forbes, stunted aspen	748	2,224
		Rego Dark Gray	rapid to well	steeper slopes than above	grasses, forbes, shrubs		
		Orthic Regosol	rapid to well	very steep exposed slopes	grasses, forbes, shrubs		
SO2	Orthic Dark Gray		rapid to well	steep south and west slopes	shrubs, grasses, forbes, stunted aspen	184	648
		Orthic Dystric Brunisol	rapid to well	north and east slopes and protected swales	lodgepole pine, shrubs		
					Total Acreage	932	2,872

Suitability for Different Uses

a. Agriculture

Mostly non-arable due to steep topography. Reasonable grazing capability, but these droughty soils can be easily overgrazed and permanently damaged.

b. Forestry

Mean annual increments range from 11-30 cu.ft./ac./yr. for trembling aspen on the drier sites and 31-50 cu.ft./ac./yr. for lodgepole pine on the moister sites. Logging is not recommended.

c. Engineering and Urban Development

Variable quality aggregate source, sometimes excellent but most often containing a high percentage of finer particles. Variable compressability and bearing strength. Sewage effluent disposal potential variable but most often good except for some seepage hazard along impermeable layers. Attractive physical setting for subdivision.

d. Wildlife

Early spring greening on these exposed slopes forms a useful part of ungulate winter habitat. Long term shrub and forb cover likely, with escape cover provided by the associated conifer forest of Map Unit S02. Forest edge provides long term grouse habitat as well.

e. Recreation

An attractive landscape with high capability for a wide range of intensive and extensive uses.

STELLAKO ASSOCIATION

Physiographic Setting

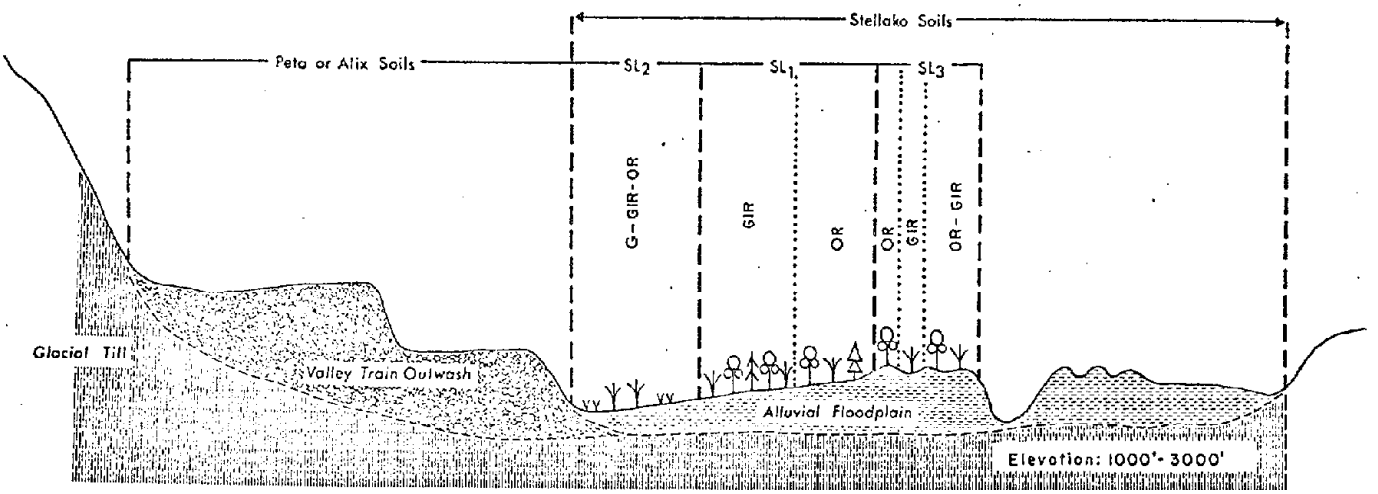

Figure 45.

Landform

An alluvial floodplain characterized by:

(1) Curvilinear ridge and swale (lateral accretion) pattern with topography ranging from 0-7% slopes immediately adjacent to the present stream channels. A poorly integrated or discontinuous surface drainage pattern connecting swales is common.

(2) between the ridge and swale section and the valley wall a flat depressional plain (0-2% slopes) - (vertical accretion) often occurs. These two forms are often very complex and integrated, with the ridge-swale type often very narrow or missing completely as a result of erosion and deposition sequences.

Parent Material

Water sorted, stratified and variable textured alluvial materials which are deep, moderately permeable and slightly compact. The surface layers are usually silty, underlain by sands and at depth occasionally gravels.

Environment (Soil-Climate-Vegetation Relationships)

The floodplains are susceptible to flooding and have variable frost free periods of 40 to 80 days and receive approximately 7.5 inches May-September precipitation. Local variations in frost free periods are caused by fog cover and frost pooling in Map Unit SL2, but in general the further east and south, the shorter the frost free period. The soil-vegetation interrelationships are very complex depending on soil texture, drainage and flooding frequency. In general these floodplains support heavy shrub (mostly willow) and cottonwood cover, with scattered black and white spruce and lodgepole pine on the well and imperfectly drained soils of Map Units SL1 and SL3 with shrubs, usually very dense on the imperfectly drained soils. The poorly drained soils of Map Unit SL2 have a dense cover of mostly willow, shrubs and forbes. Fluctuating water tables control the general environment, especially in Map Units SL1 and SL2.

Table 42. Stellako Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
SL1	Gleyed Orthic Regosol		imperfect	shallow swale or gentle slope away from stream	shrubs, cottonwood, white spruce	17,256	8,004
		Orthic Regosol	well to moderately well	slope or ridge on flood-plain	shrubs, cottonwood		
SL2	Gleysolics		poor to very poor	depressions, swales and back of floodplain	wet forbes, shrubs, (mostly willow)	13,156	8,980
		Gleyed Orthic Regosol	imperfect	slight ridges or edge of depressions	shrubs, cottonwood, white spruce		
		Orthic Regosol	well to moderately well	ridges or upper slopes of floodplain next to stream	shrubs, cottonwood		

Table 42. Stellako Soils (Cont'd)

SL3	Orthic Regosol		well to moderately well	ridges	cottonwood, shrubs	7,444	
		Gleyed Orthic Regosol	imperfect	swales	shrubs, cottonwood		
					Total Acreage	37,856	16,984

Suitability for Different Uses

a. Agriculture

The crop range possible depends on the complex climate-soil drainage and texture combination. In some areas, a wide range of climatically suited crops is possible, while others are limited to forages only.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for white spruce on the poorly drained soils of Map Unit SL2, to as high as 231-250 cu.ft./ac./yr. for black cottonwood on Map Units SL1 and SL3. Yield varys with soil texture, drainage, permeability and flooding frequency. Some stream sedimentation hazard.

c. Engineering and Urban Development

Flooding and lateral stream erosion hazard, variability in compressibility and bearing strength due to texture variation and fluctuating water tables. Aggregate source at depth in some locations.

d. Wildlife

Very high capability, especially ungulate (moose) wintering habitat. Excellent upland game bird habitat as well.

e. Recreation

Unsuitable in general, although well drained areas have only moderate limitations for intensive use.

SUSKWA ASSOCIATION

Physiographic Setting

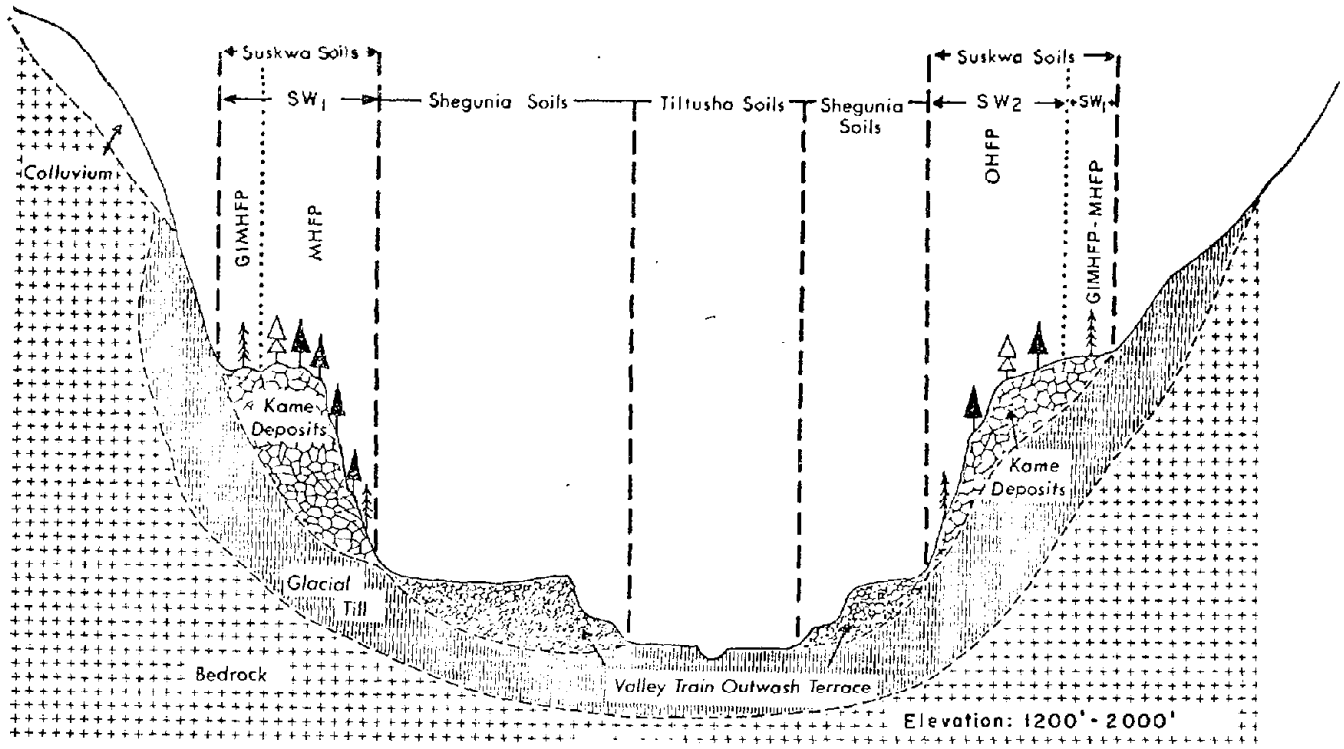

Figure 46.

Landform

Level to rolling and strongly irregular (0-50% slopes) of hummocks, mounds and terraces often conforming partly to valley walls or rock faces (hanging on valley sides). Gives the impression of collapsed topography. A very haphazard, disoriented, discontinuous drainage pattern is typical. Gullies variable shape, but usually short and discontinuous.

Parent Material

Partially water sorted and roughly stratified deposits which are moderately coarse to coarse (sandy and gravelly) textured, often stony, usually loose and of variable permeability and depth.

Environment (Soil-Climate-Vegetation Relationships)

A coastal transition-like vegetation of western hemlock and lodgepole pine occurs on the well to rapidly drained Podzol soils while western hemlock, cedar, scattered white spruce and shrubs grow on the imperfectly drained Podzol soils. The climate is relatively mild with 75-100 frost free days, and quite moist with approximately 13.5-16.5 inches, May-September precipitation. The air drainage is excellent on this valley-side landform. Soils subject to seepage occur against the valley wall, but usually form minor components in Map Unit SW1. SW2 Map units indicate a somewhat moister environment.

Table 43. Cuskwa Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Comple Acreag
SW1	Mini Humo-Ferric Podzol		well to rapid	humps and steep slopes (moisture shedding)	western hemlock, lodgepole pine	11,412	23,776
		Gleyed Mini Humo-Ferric Podzol	imperfect	swales, seepage slopes and section adjacent to valley wall	cedar, white spruce, western hemlock		
SW2	Orthic Humo-Ferric Podzol		well to rapid	humps, terraces and steep slopes	western hemlock	3,584	3,596
					Total Acreage	14,996	27,372

Suitability for Different Uses

a. Agriculture

Only small pockets are arable due to the rough topography. Forage crops only are recommended due to soil limitations, although climate would allow a wider range of crops.

b. Forestry

Mean annual increments range from 71-90 cu.ft./ac./yr. for lodgepole pine on the drier sites of Map Unit SW1, to 110-130 cu.ft./ac./yr. for western hemlock in the moister environment of Map Unit SW2.

c. Engineering and Urban Development

Some seepage and slump problems can be expected along the valley face. Variable quality aggregate source - sometimes excellent but most often a high percentage of finer particles. Highly variable compressibility and bearing strength, therefore, check carefully. Sewage effluent disposal potential variable but most often good except for seepage hazard along impermeable layers.

d. Wildlife

Unsuitable.

e. Recreation

Interesting topography for viewing and hiking, and suitable for most intensive recreational uses.

TATIN ASSOCIATION

Physiographic Setting

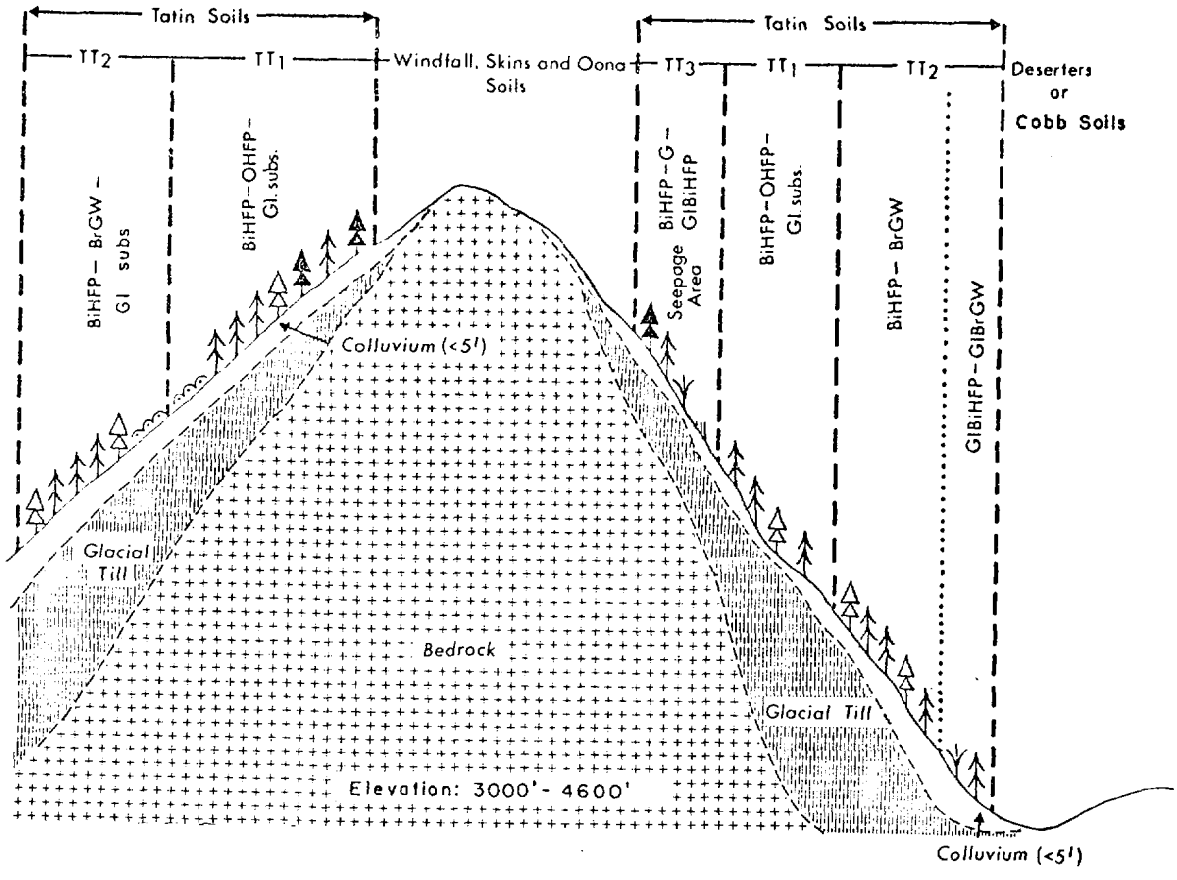

Figure 47.

Landform

Very steeply sloping (over 30% - average 45% slopes) glacial till located on steep valley walls. Parallel or modified dendritic (branched) surface drainage pattern, with abrupt directional changes where underlying bedrock is encountered. Gullies are cut deeply into the surface with u-shaped profiles.

Parent Material

A heterogeneous medium to moderately fine textured (loam to silty clay loam), occasionally stony, very compact, sticky (when wet), relatively impermeable glacial till which often has some surface modification due to downslope movement of material as a result of gravity. The surface modification may be a reworking of the local glacial till or an admixture of detritus from further upslope. Often pockets of clay till at depth.

Environment (Soil-Climate-Vegetation Relationships)

The environment is characterized by a relatively moist (10.5-13.5 inches, May-September precipitation), cool (approximately 50 days frost free period), climate, associated with cold, compact soils and a vegetation typical of the spruce-alpine fir zone. Engelmann spruce, lodgepole pine and alpine fir occurs on the well and moderately well drained soils, with Engelmann spruce, alpine fir, and shrubs on the imperfectly drained soils and shrubs, forbes and alpine fir on the poorly drained soils subject to seepage. Map Unit TT3 is always at the higher elevations with colder temperatures, numerous seepage slopes and a larger component of alpine fir in the stands. Map Unit TT2 most often occurs at the lowest elevations on the slopes. Following disturbance of vegetation, soil erosion can be excessive due to the combination of somewhat erodable soils on steep slopes and relatively high precipitation.

Table 44. Totin Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
TT1	Bisequa Humo-Ferric Podzol		moderately well to well	steep, convex moisture shedding slopes	Engelmann spruce, lodgepole pine, alpine fir	11,292	50,516
		Orthic Humo-Ferric Podzol	well to moderately well	steep, convex moisture shedding slopes	Engelmann spruce, lodgepole pine, alpine fir		
		Gleyed subgroups	imperfect	concave, moisture receiving position or seepage channel	Engelmann spruce, alpine fir		
TT2	Bisequa Humo-Ferric Podzol		moderately well to well	steep, convex moisture shedding slopes	Engelmann spruce, lodgepole pine, alpine fir	31,960	119,322
		Brunisolic Gray Wooded	moderately well to well	steep, convex moisture shedding slopes	Engelmann spruce, lodgepole pine, alpine fir		
		Gleyed subgroups	imperfect	concave, moisture receiving position or seepage channel	Engelmann spruce, alpine fir		
TT3	Bisequa Humo-Ferric Podzol		moderately well	shedding slopes	alpine fir, Engelmann spruce	7,608	63,752
		Gleysolics	poor to very poor	depressions, seepage channels	shrubs, forbes, alpine fir, Engelmann spruce		
		Gleyed Bisequa Humo-Ferric Podzol	imperfect	concave, moisture receiving positions or seepage channels	Engelmann spruce, alpine fir		
					Total Acreage	50,860	233,590

Suitability for Different Uses

a. Agriculture

Unsuitable.

b. Forestry

Mean annual increments range from 90-110 cu.ft./ac./yr. for white spruce on the imperfectly drained soils to 51-70 cu.ft./ac./yr. for alpine fir on the cold soils at the highest elevation. Slide, slump and erosion hazards, frost heaving and stream sedimentation hazards.

c. Engineering and Urban Development

As for Skeena except lower precipitation perhaps decreases slide, slump and erosion hazard somewhat.

d. Wildlife

Generally unsuitable except for Map Unit TT3 where food plant and cover combination provides suitable long-term summering habitat for moose and upland game birds.

e. Recreation

Generally unsuitable, but TT3 Map Units are attractive from a vegetation viewing standpoint and offer some extensive use possibilities for hiking and viewing.

TILTUSHA ASSOCIATION

Physiographic Setting

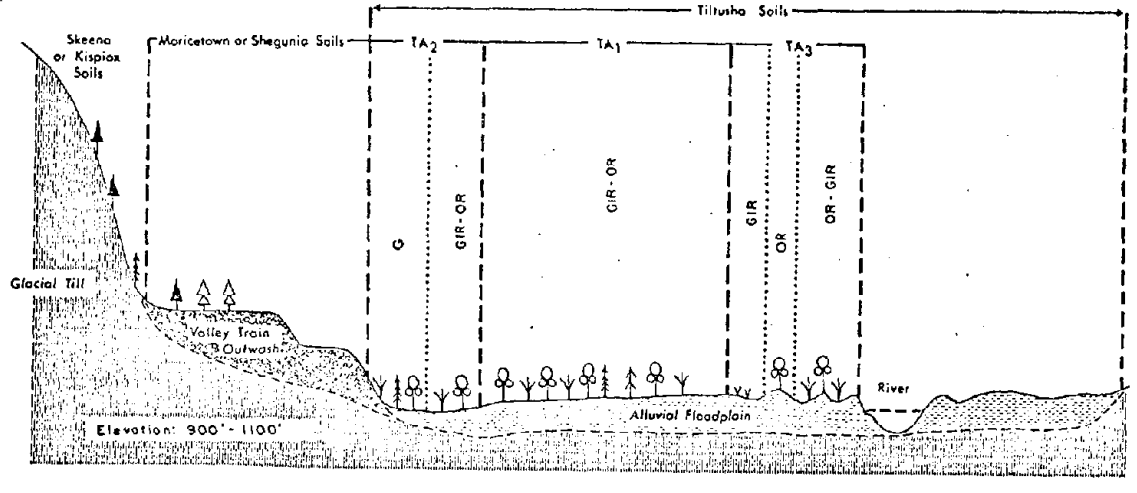

Figure 48.

Landform

An alluvial floodplain characterized by:

(1) Curvilinear ridge and swale (lateral accretion) pattern with topography ranging from 0-7% slopes immediately adjacent to the present stream channels. A poorly integrated or discontinuous surface drainage pattern connecting swales is common.

(2) between the ridge and swale section and the valley wall a flat depressional plain (0-2% slopes) - (vertical accretion) often occurs. These two forms are often very complex and integrated, with the ridge-swale type often very narrow or missing completely as a result of erosion and deposition sequences.

Parent Material

Water sorted, stratified and variable textured alluvial materials which are deep, moderately permeable and slightly compact. The surface layers are usually silty, underlain by sands and at depth occasionally gravels.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by the relatively flat, long, flood susceptible floodplains adjacent to the major streams, which have relatively mild climates (65-100 days frost free period) with some frost pooling (TA2 especially) and fog cover with approximately 7.5 to 10.5 inches, May-September precipitation. Fluctuating water tables control the general environment, especially on Map Units TA1 and TA2. The soil-vegetation relationships are very complex and depend on soil texture, drainage and flooding frequency. In general these floodplains support a coastal-transition type vegetation which includes a heavy shrub (hazelnut dominant) and cottonwood cover. Scattered white spruce and western hemlock predominate on the well to moderately well drained soils of Map Units TA1 and TA3, with the same plus a heavier shrub layer and a cedar component on the imperfectly drained soils. The poorly drained soils of Map Unit TA2 usually have a dense cover of shrubs and forbes.

Table 45. Tiltusha Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
TA1	Gleyed Orthic Regosol		imperfect	shallow swale or gentle slope away from stream	shrubs, cottonwood, hemlock, cedar, white spruce	4,480	568
		Orthic Regosol	moderately well	slope or ridge on floodplain	shrubs, cottonwood		
TA2	Gleysolics		poor	depression, swales and back of floodplain	wet forbes, shrubs	1,464	1,308
		Gleyed Orthic Regosol	imperfect	slight ridges or edge of depression	shrubs, cottonwood, cedar, hemlock, white spruce		
		Orthic Regosol	well to moderately well	ridges or upper slopes of floodplain next to stream	shrubs, cottonwood		
TA3	Orthic Regosol		well to moderately well	ridges	shrubs, cottonwood	692	
		Gleyed Orthic Regosol	imperfect	swales	shrubs, cottonwood, hemlock, cedar, white spruce		
					Total Acreage	6,636	1,876

Suitability for Different Uses

a. Agriculture

Suitable for a wide range of climatically adapted crops, but some flooding hazard, and management on this landform can be complicated due to variable soil textures and drainage.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for white spruce on the poorly drained soils of Map Unit TA2, to 91-110 cu.ft./ac./yr. for white spruce and western hemlock and a probable 250 cu.ft./ac./yr. productivity for black cottonwood on the imperfectly drained soils. Some stream sedimentation hazard.

c. Engineering and Urban Development

Flooding and lateral stream erosion hazard, variability in compressibility and bearing strength due to texture variation and fluctuating water tables. Aggregate source at depth in some locations.

d. Wildlife

See Stellako. Shrub cover very dense, although regeneration to conifers may be somewhat faster and useful successional stages may be depleted more rapidly without fire.

e. Recreation

Unsuitable in general, although well drained areas have only moderate limitations for intensive use.

TWAIN ASSOCIATION

Physiographic Setting

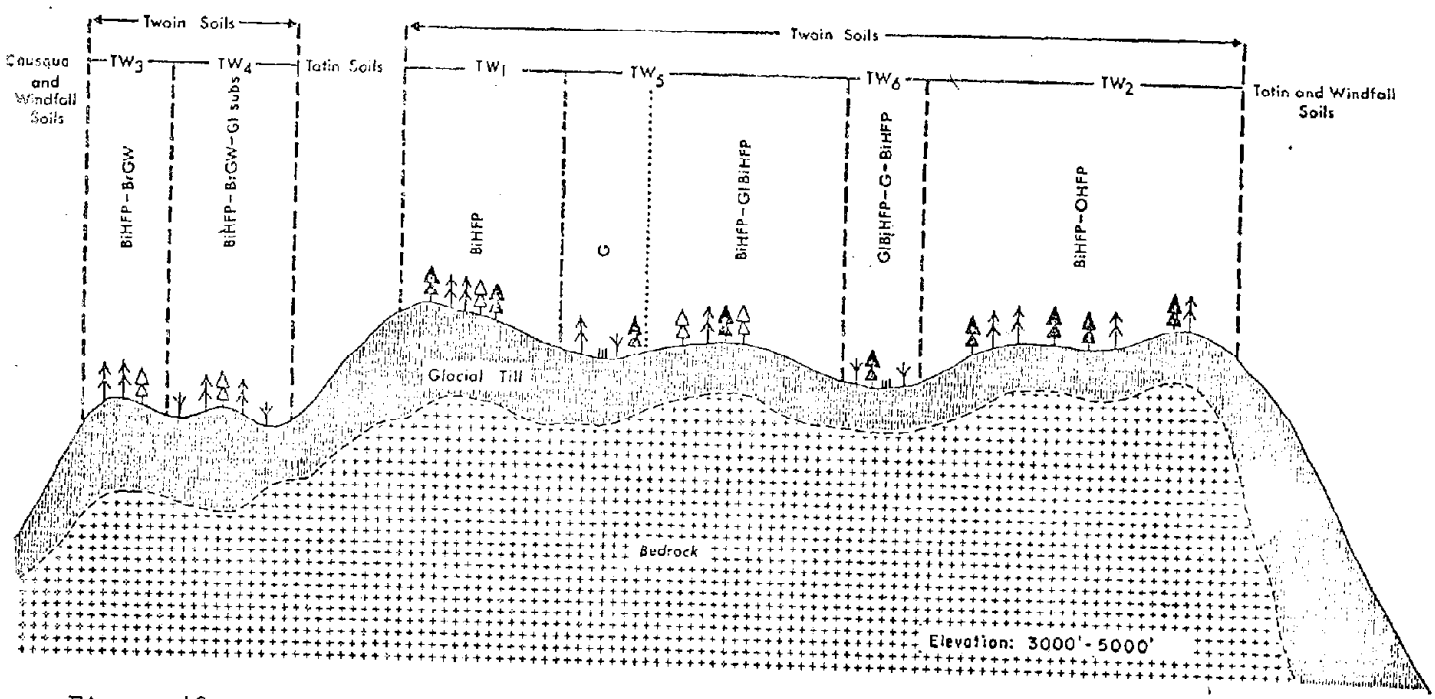

Figure 49.

Landform

An undulating to rolling (5-30% slopes) till plain located on high plateaus and with a haphazard pattern of wave-like ridges, often bedrock controlled, with humps and swales of various sizes. A uniform dendritic surface drainage pattern with tributaries exhibiting little directional change, except where diverted by bedrock, on meeting major drainageways. Gullies have the characteristic u-shape of moderately fine textured material.

Parent Material

A heterogeneous moderately fine textured (clay loam, silty clay loam) glacial till which is hard, compact, often stony and nearly impervious.

Environment (Soil-Climate-Vegetation Relationships)

The Twain Association is characterized by a relatively moist (10.5-13.5 inches of May-September precipitation), cool (approximately 50 days frost free period) climate, associated with cold, compact soils and a vegetation typical of the spruce-alpine fir zone. Engelmann spruce, lodgepole pine and alpine fir occur on the well and moderately well drained soils, with Engelmann spruce, alpine fir and shrubs on the imperfectly drained soils and shrubs, forbes and alpine fir on the poorly drained soils. The components of imperfectly and poorly drained soils form a much greater proportion of the landscape than on the associated Tatin soils. Shrub abundance depends largely on tree stand density, and is highly variable.

Table 46. Twain Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
TW1	Bisequa Humo-Ferric Podzol		moderately well	moisture shedding convex ridges, humps and relatively steep slopes	Engelmann spruce, lodgepole pine, alpine fir	35,220	16,288
TW2	Bisequa Humo-Ferric Podzol		moderately well	moisture shedding convex ridges, humps and relatively steep slopes	Engelmann spruce, lodgepole pine, alpine fir	8,292	23,192
		Orthic Humo-Ferric Podzol	moderately well to well	steepest slopes	Engelmann spruce, lodgepole pine, alpine fir		
TW3	Bisequa Humo-Ferric Podzol		moderately well	moisture shedding convex ridges and shallow swales	Engelmann spruce, lodgepole pine, alpine fir	12,216	44,258
		Brunisolic Gray Wooded	moderately well to well	moisture shedding convex ridges and shallow swales (south and west aspects common)	Engelmann spruce, lodgepole pine, alpine fir		
TW4	Bisequa Humo-Ferric Podzol		moderately well	moisture shedding convex ridges and shallow swales	Engelmann spruce, lodgepole pine, alpine fir	25,000	48,289
		Brunisolic Gray Wooded	moderately well to well	moisture shedding convex ridges and shallow swales (south and west aspects common)	Engelmann spruce, lodgepole pine, alpine fir		
		Gleyed subgroups	imperfect	moisture receiving swales, flat plains and seepage channels	Engelmann spruce, alpine fir, shrubs		

Table 46. Twain Soils (Cont'd)

TW5	Bisequa Humo-Ferric Podzol		moderately well	moisture shedding convex ridges, humps and relatively steeper slopes	Engelmann spruce, alpine fir, lodgepole pine	7,884	18,752
		Gleyed Bisequa Humo-Ferric Podzol	imperfect	moisture receiving swales, flat plains and seepage channels	Engelmann spruce, alpine fir, shrubs		
		Gleysolics	poor	depressions with little drainage outlet	shrubs, forbes, alpine fir		
TW6	Gleyed Bisequa Humo-Ferric Podzol		imperfect	moisture receiving swales, flat plains and seepage channels	Engelmann spruce, alpine fir, shrubs	2,552	1,408
		Gleysolics	poor	depressions without drainage outlet	shrubs, forbes, alpine fir		
		Bisequa Humo-Ferric Podzol	moderately well to well	moisture shedding convex ridges, humps and relatively steep slopes	Engelmann spruce, lodgepole pine, alpine fir		
					Total Acreage	91,164	152,187

Suitability for Different Uses

a. Agriculture

Although most of the soils are topographically suitable for cultivation, very short frost free periods and cold soil temperatures would limit crop range to very hardy varieties of forage.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for white spruce on the poorly drained soils to 91-110 cu.ft./ac./yr. for white spruce on the imperfectly drained soils. Frost heaving, stream siltation, compaction hazards.

c. Engineering and Urban Development

Twain soils are subject to frost heaving and have limited potential for effluent disposal. Trafficability generally poor when wet and while only limited cuts are necessary for road construction (flat topography) cutbanks have high erosion hazard. Higher frequency of areas with fluctuating water tables in Map Units TW4,5, and 6. Depth to bedrock also shallow, but always greater than 5 feet.

d. Wildlife

The imperfectly and poorly drained soils provide some useful habitat for moose and upland game birds. After disturbance, length of time food plants are available varies with stand history (density) but usually is short lived.

e. Recreation

Unsuitable.

UTSUN ASSOCIATION

Physiographic Setting

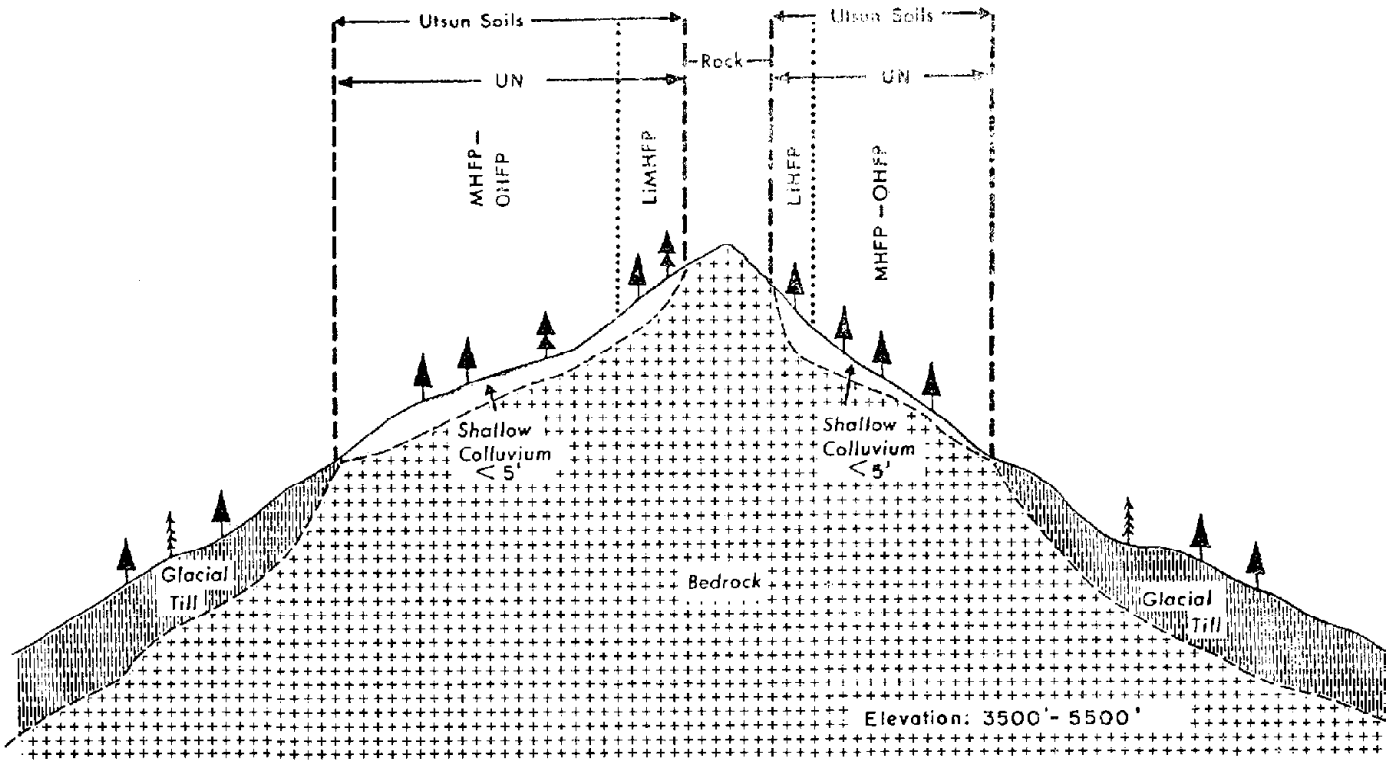

Figure 50.

Landform

The surface form is typical of the underlying acidic bedrock as the surface mantle is less than 5 feet thick. Dome-shaped hills having rounded tops, and steep side slopes (40%+) are common. Where soil mantles are thin (lithic subgroups) a characteristic irregular pattern of curvilinear fractures modifys the surface. Surface dendritic drainage patterns are of varying density and channels tend to have a rounded shape with tributary intersections tending to resemble a right angle.

Parent Material

Shallow colluvium which is moderately coarse textured, permeable, stony, and loose glacial till. Material derived from rock materials which combine to form a surface mantle which moves down the steep rocky slopes. Hard or shattered rock is usually within 3 to 5 feet, where surface deposits are less than 20 inches lithic subgroups (shallow soils) are indicated.

Environment (Soil-Climate-Vegetation Relationships)

Utsun soils are characterized by a moist climate having 13.5-16.5 inches of May-September precipitation and a very short frost free period of approximately 30-50 days. The associated soils are relatively shallow, and cold and support a vegetation of western hemlock, occasional mountain hemlock and alpine fir, the latter becoming dominant at higher elevations and on exposed sites.

Table 47. Utsun Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
UN	Mini Humo-Ferric Podzol		well	shallow rocky ridges and steep slopes	western hemlock, alpine fir, mosses	640	7,516
		Orthic Humo-Ferric Podzol	well	swales, north and east slopes	western hemlock, alpine fir, mosses		
		Lithic subgroups	well	very shallow rocky ridges and very steep slopes	stunted western hemlock, alpine fir, shrubs		

Suitability for Different Uses

a. Agriculture

Unsuitable.

b. Forestry

Mean annual increments range from 31-50 cu.ft./ac./yr. for lodgepole pine and alpine fir on the very shallow drier sites to 51-70 cu.ft./ac./yr. for lodgepole pine on the deeper materials. Logging is not recommended.

c. Engineering and Urban Development

Steep topography and shallow depth to bedrock main engineering limitations. Bedrock characteristics variable, some blasting necessary, although much fracturing common. Generally best to avoid where possible.

d. Wildlife

Useful only as escape terrain and for limited summer range.

e. Recreation

Can be attractive viewpoints from which to look at surrounding landscape.

VANDERHOOF ASSOCIATION

Physiographic Setting

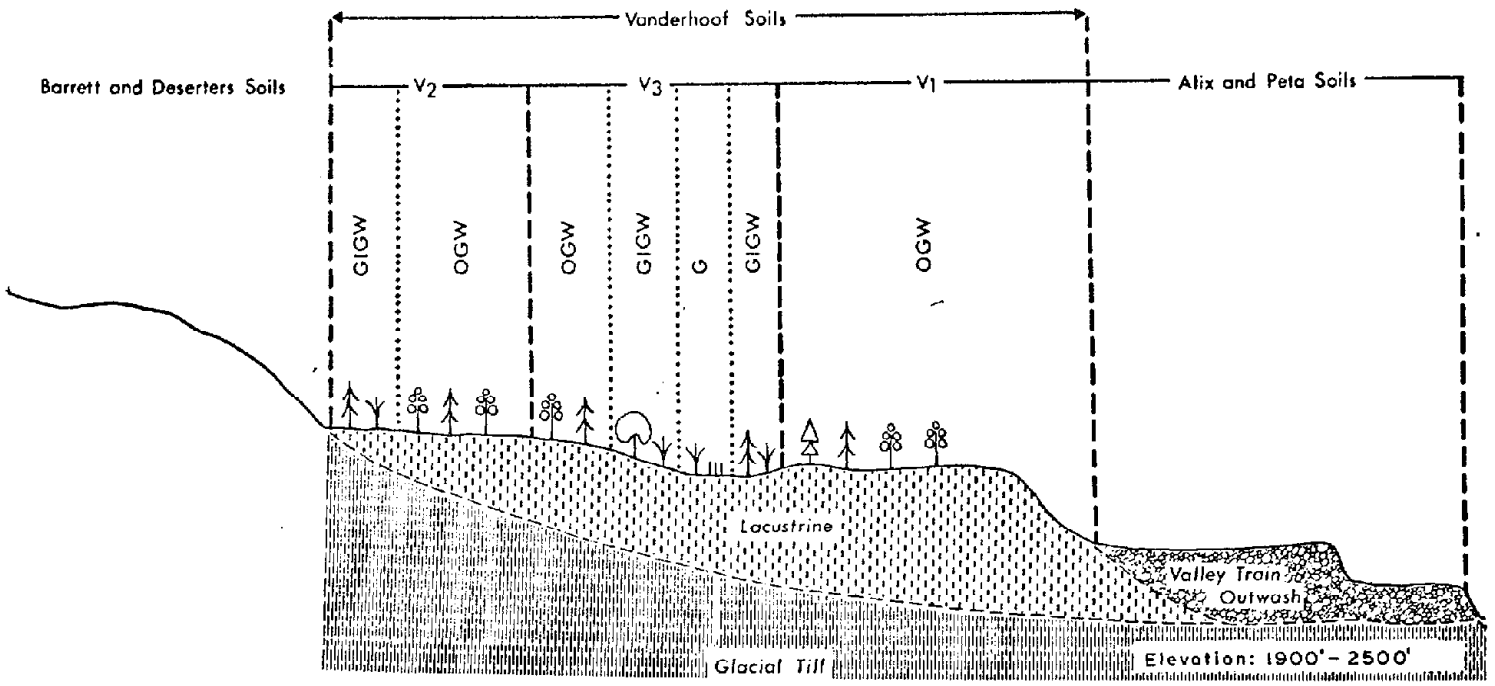

Figure 51.

Landform

A flat to undulating (0-9% slopes) glaciolacustrine plain, occasionally dissected by deeply entrenched gullies, especially where only remnants of the plain remain on the valley side. An intense dendritic drainage pattern with associated rounded gullies typical of moderately fine and fine textured materials is common.

Parent Material

Moderately fine to fine textured (silty clay loam to clay) glaciolacustrine sediments which are water sorted, stone-free, layered, sticky, compact and nearly impervious. While these lakebed deposits are of variable thickness they always exceed 5 feet in thickness and silts underly the clays at depths of 10 to 15 feet.

Environment (Soil-Climate-Vegetation Relationships)

The environment is characterized by Gray Wooded soils which developed in a relatively dry and cool climate having 7.5 inches, May-September precipitation and approximately 50-70 frost free days. The associated vegetation has been subjected to a high fire frequency and includes trembling aspen with scattered white spruce and lodgepole pine and shrub cover on the well to moderately well drained soils. The fluctuating water

tables of the imperfectly drained soils of Map Units V2 and V3 result in better rooting depths with more abundant shrubs and vigorous tree growth. The poorly drained soils of Map Unit V3 with continuous high water tables, support a vegetation of white and black spruce, scattered aspen and birch, plus moisture tolerant shrubs and forbes. Root penetration through the subsoil is difficult on the well drained soils.

Table 48. Vanderhoof Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
V1	Orthic Gray Wooded		well to moderately well	on crests or topographic highs in undulating topography	aspen, lodgepole pine, white spruce, shrubs	10,680	6,728
V2	Orthic Gray Wooded		well to moderately well	on crests or topographic highs in undulating topography	aspen, lodgepole pine, white spruce, shrubs	184	1,836
		Gleyed Orthic Gray Wooded	imperfect	swales or flat plains	aspen, white spruce, lodgepole pine, shrubs		
V3	Orthic Gray Wooded		well to moderately well	on crests or topographic highs in undulating topography	aspen, lodgepole pine, white spruce, shrubs	2,060	
		Gleyed Orthic Gray Wooded	imperfect	swales or flat plains	aspen, white spruce, lodgepole pine, shrubs		
		Gleysolics	poor	depressions without drainage outlet	black and white spruce, aspen, shrubs and forbes		
					Total Acreage	12,924	8,564

Suitability for Different Uses

a. Agriculture

Mostly arable. Difficult to cultivate due to heavy texture but relatively good dry farming soil. Crop range limited by the short frost free period and impermeability of the soil.

b. Forestry

Mean annual increment ranges from 31-50 cu.ft./ac./yr. for white spruce on the poorly drained soils to 71-90 cu.ft./ac./yr. for white spruce on the imperfectly drained soils. Frost heaving, compaction and stream siltation hazards.

c. Engineering and Urban Development

These nearly impermeable medium to fine textured soils are subject to frost heaving, have limited potential for effluent disposal, generally poor trafficability when wet and cutbanks have high erosion hazard. The only advantage is relatively flat topography.

d. Wildlife

Generally unsuitable for waterfowl, but suitable to varying degrees for ungulate wildlife depending upon successional stages of vegetation. After logging or fire, browse species will predominate for a short period, after which they will survive only in the moist swales (Gleyed Orthic Gray Wooded soils). As most areas are near major valleys, moderate wildlife suitability is hampered by other uses.

e. Recreation

Unsuitable.

WINDFALL ASSOCIATION

Physiographic Setting

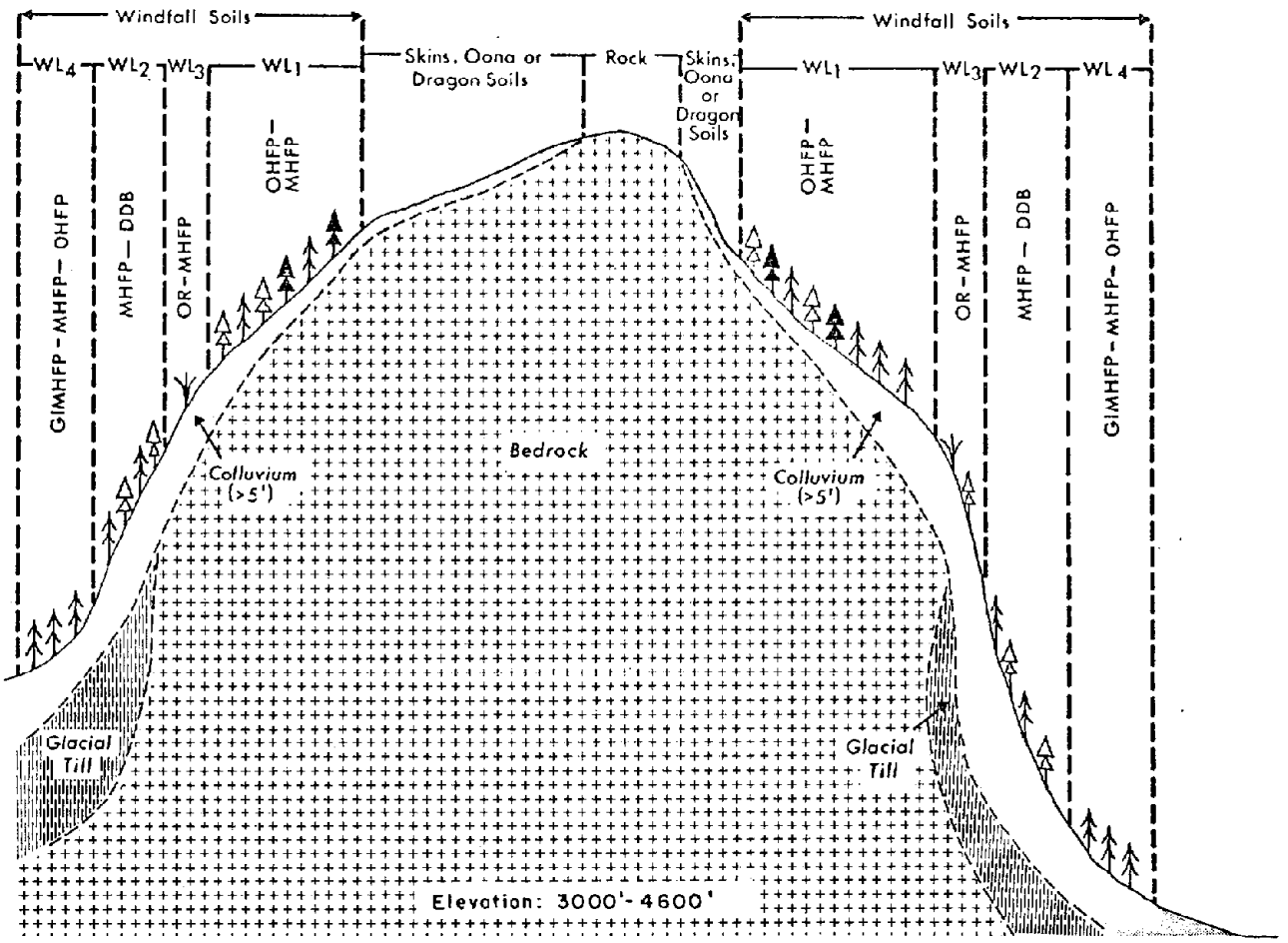

Figure 52.

Landform

Very steeply sloping (40%+ slopes) mantle of detrital materials on valley walls in hilly and mountainous terrain. Drainage pattern visible but generally dendritic and parallel with abrupt directional changes when bedrock is encountered.

Parent Material

A heterogeneous moderately coarse to medium textured layer of colluvium greater than 5 feet in depth deposited on steep slopes and the base of slopes by gravity. The material is gravelly, bouldery, stony, loose and permeable.

Environment (Soil-Climate-Vegetation Relationships)

The soils of the Windfall Association developed under a climate having moist, (approximately 10.5 inches precipitation) and cool (40-65 days frost free period), growing season and cold winters. Under these conditions, Podzols usually occur, however on very steep areas soil development can be retarded due to the unstable nature of the material. Coarse fragments of rock and rock outcrops are often closely associated. Associated vegetation includes lodgepole pine and white spruce on the well to rapidly drained soils of Map Units WL1 and WL2 with a component of alpine fir at the higher elevations. White spruce dominates on the imperfectly drained soils with a component of shrubs, and at higher elevations alpine fir. Conifers have difficulty establishing on the very steep slopes of Map Unit WL3 and shrubs take over. These steep, exposed slopes of soils with low moisture holding capacities are subject to a high fire frequency.

Table 49. Windfall Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
WL1	Orthic Humo-Ferric Podzol		well to rapid	steeply sloping convex shedding slopes	lodgepole pine, white spruce, alpine fir	12,728	70,718
		Mini Humo-Ferric Podzol	well to rapid	steeply sloping convex shedding slopes	lodgepole pine, white spruce, alpine fir		
WL2	Mini Humo-Ferric Podzol		well to rapid	steeply sloping convex shedding slopes	lodgepole pine, white spruce, alpine fir	3,868	30,652
		Degraded Dystric Brunisol	well to rapid	steeply sloping convex shedding slopes	lodgepole pine, white spruce, alpine fir		
WL3	Orthic Regosol		rapid	very steeply sloping convex shedding slopes	shrubs, lodgepole pine, scattered aspen	5,124	17,516
		Mini Humo-Ferric Podzol	rapid	very steeply sloping convex shedding slopes	lodgepole pine, shrubs		

Table 49. Windfall Soils (Cont'd)

WL4	Gleyed Mini Humo-Ferric Podzol		imperfect	lower moisture receiving slopes (concave) or seepage channels on steep slopes	white spruce, shrubs	6,986	6,952
		Mini Humo-Ferric Podzol	well to moderately well	steeply sloping convex shedding slopes	lodgepole pine, white spruce, alpine fir		
		Orthic Humo-Ferric Podzol	well to moderately well	steeply sloping convex shedding slopes	lodgepole pine, white spruce, alpine fir		
					Total Acreage	26,704	125,838

Suitability for Different Uses

a. Agriculture
Unsuitable

b. Forestry
Mean annual increments range from 51-70 cu.ft./ac./yr. for alpine fir at the higher elevations to 91-110 cu.ft./ac./yr. for white spruce on the imperfectly drained soils near the base of slopes.

c. Engineering and Urban Development
Unsuitable for urban development due to bouldery, unstable material on extremely steep slopes. Road or pipeline construction and maintenance could have minor problems due to the unstable nature of the material especially boulders tumbling downslope or seepage in areas mapped as WL4. Bedrock often closely associated.

d. Wildlife
Unsuitable except for short-term ungulate range following fire.

e. Recreation
Unsuitable.

LAND TYPES

ORGANIC ASSOCIATION

Physiographic Setting

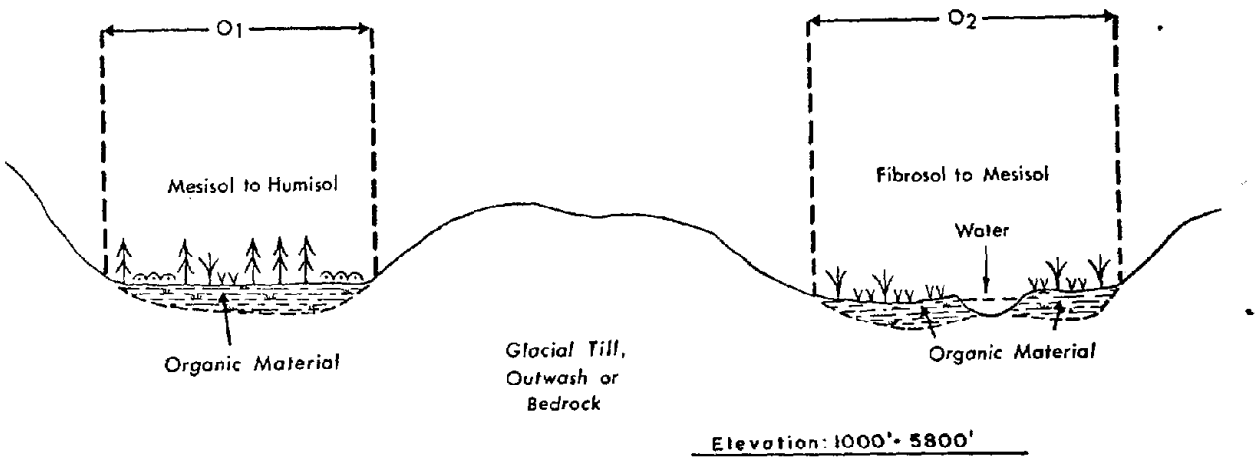

Figure 53.

Landform

Generally depressional topography with little drainage outlet. The surface form consists of relatively flat, slightly elevated, peatland with minor irregularities. The elevated surface is due to peat accumulation at lower elevations and frost upheaval at higher elevations.

Parent Material

Organic material in various stages of decomposition. Depths, stratification and permeability are variable.

Environment (Soil-Climate-Vegetation Relationships)

Characterized by the wet, poorly to very poorly drained organic soils, which are usually located in frost pockets, although climate in general is highly variable and ranges from 7.5-16.5 inches of May-September precipitation and approximately 30-70 days frost free period. Vegetation on the O1 Map units consists of black spruce, shrubs, mosses and sedges, while O2 Map units consist of more open sedge meadows with different degrees of wetness. Combination of sedge meadow forest and shrub and moss are also included. Very often the edges of the organic areas are forested with the middle part open sedge bog.

Table 50. Organic Soils

Soil Association Map Units	Major Soil (40-100%)	Minor Soil (20-40%)	Drainage	Landscape Position	Major Vegetation	Pure Units Acreage	Complex Acreage
01	Mesisols		poor to very poor	depressional restricted drainage outlets	black spruce, shrubs, mosses, sedges	28,208	31,134
		Humisols	poor to very poor	depressional restricted drainage outlets	black spruce, shrubs, mosses, sedges		
02	Fibrosols		poor to very poor	depressional restricted drainage outlets	sedges, reeds, mosses, shrubs, black spruce	12,772	7,532
		Mesisols	poor to very poor	depressional restricted drainage outlets	sedges, reeds, mosses, shrubs, black spruce		
					Total Acreage	40,980	38,666

Suitability for Different Uses

a. Agriculture

Limited potential for native hay production particularly on Map Units 02. Not usually worth draining (climate limitations).

b. Forestry

Unsuitable.

c. Engineering and Urban Development

High water tables and organic materials; avoid where possible.

d. Wildlife

Important component of ungulate (moose) and upland game bird habitat, as well as providing some useful waterfowl habitat.

e. Recreation

Unsuitable for intensive use. Attractive ecology for hiking or nature study.

BEDROCK

Rock outcrops with no surface mantle. For general description of various rock types see the Geology section and References.

RO pure unit acreage	= 54,336
RO complex acreage	= 118,896
Total	173,232

GLACIER

Areas of permanent snow and ice generally above 6000 feet elevation; lower on north and east aspects and higher on south and west aspects. Important viewing attractions.

G acreage = 20,048

USE AND MANAGEMENT OF THE SOILS

AGRICULTURE

Although the soils are often excellent, the severe climate (mainly short frost free season) restricts the agricultural use of much of the arable land. Forage crop and livestock production provide the base for a stable agriculture. Climate and soil factors favor the production of perennial grasses and legumes but impose severe limitations on most cereal grains and other annual crops.

In favoured locations, almost exclusively in the Bulkley and Skeena River valleys west of Houston, a wider range of crops such as cool-season vegetables, berry fruits, cereal grains and forages can be produced commercially. Where water is available increased yields can be expected from irrigation. Adjacent to these higher capability lands and to the north and east, (See Figure 5.) hardier varieties of the cultivated crops mentioned above can be grown but the highest potential is in forage production. Scattered throughout the area are large acreages which have severe physical limitations, are suitable only for forage production and can seldom stand alone as production units. Natural grazing lands are limited, but extremely useful for livestock production. Carrying capacity of these lands is often comparatively low.

See the following tables for more detail related to agricultural management of the various mapping units:

Table 51. Capability for Agriculture

The agriculture capability classification is based on the effects of combinations of climate and soil characteristics, on limitations in use of the soils for agriculture, and there general productive capacity for common field crops. Good management practices are assumed. Distance to market, kind of roads, location, size of farms, characteristics of land ownership and cultural patterns, and the skill or resources of individual operators are not criteria for capability groupings.

Climatic characteristics used include the following:

- length of frost free period, growing degree days (heat units), annual precipitation, length of growing season, and growing season moisture deficit.

Soil characteristics used include the limitations due to:

- stoniness, topography, excess water, soil droughtiness, salinity, flooding hazard, erosion, low permeability, and shallowness to bedrock.

Capability Classes

Class 1 - Soils and climate combinations in this class have no significant limitations in use for crops.

Class 2 - Soils and climate combination in this class have moderate limitations that restrict the range of crops or require moderate conservation practices.

Class 3 - Soils and climate combination in this class have moderately severe limitations that restrict the range of crops or require special conservation practices.

Class 4 - Soils and climate combination in this class have severe limitations that restrict the range of crops or require special conservation practices or both.

Class 5 - Soils and climate combination in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible.

Class 6 - Soils and climate combination in this class are capable only of producing perennial forage crops, and improvement practices are not feasible.

Class 7 - Soils and climate combination in this class have no capability for arable culture or permanent pasture.

Capability Class*	Acreage	Main Landforms and Location
No class 1 or 2 in the area		
Class 3 Moderate limitations for cultivated crops - vegetables, grains and forages.	48,488	River floodplains, terraces and adjacent topographically suitable slopes from Houston west in the Bulkley Valley and the Skeena and Bulkley valleys.
Class 4 Severe limitations for cultivated crops - forages, hardy grains and vegetables.	235,168	Topographically and climatically suitable land adjacent to Babine and Francois Lakes, the Bulkley, Skeena and Kispiox valleys.
Class 5 Very severe limitations - forages only.	602,279	Scattered throughout the area, mainly higher elevation till plain with severe climates and areas with topographic limitations on main valley slopes.

LAND CAPABILITY FOR AGRICULTURE (SOILS & CLIMATE)

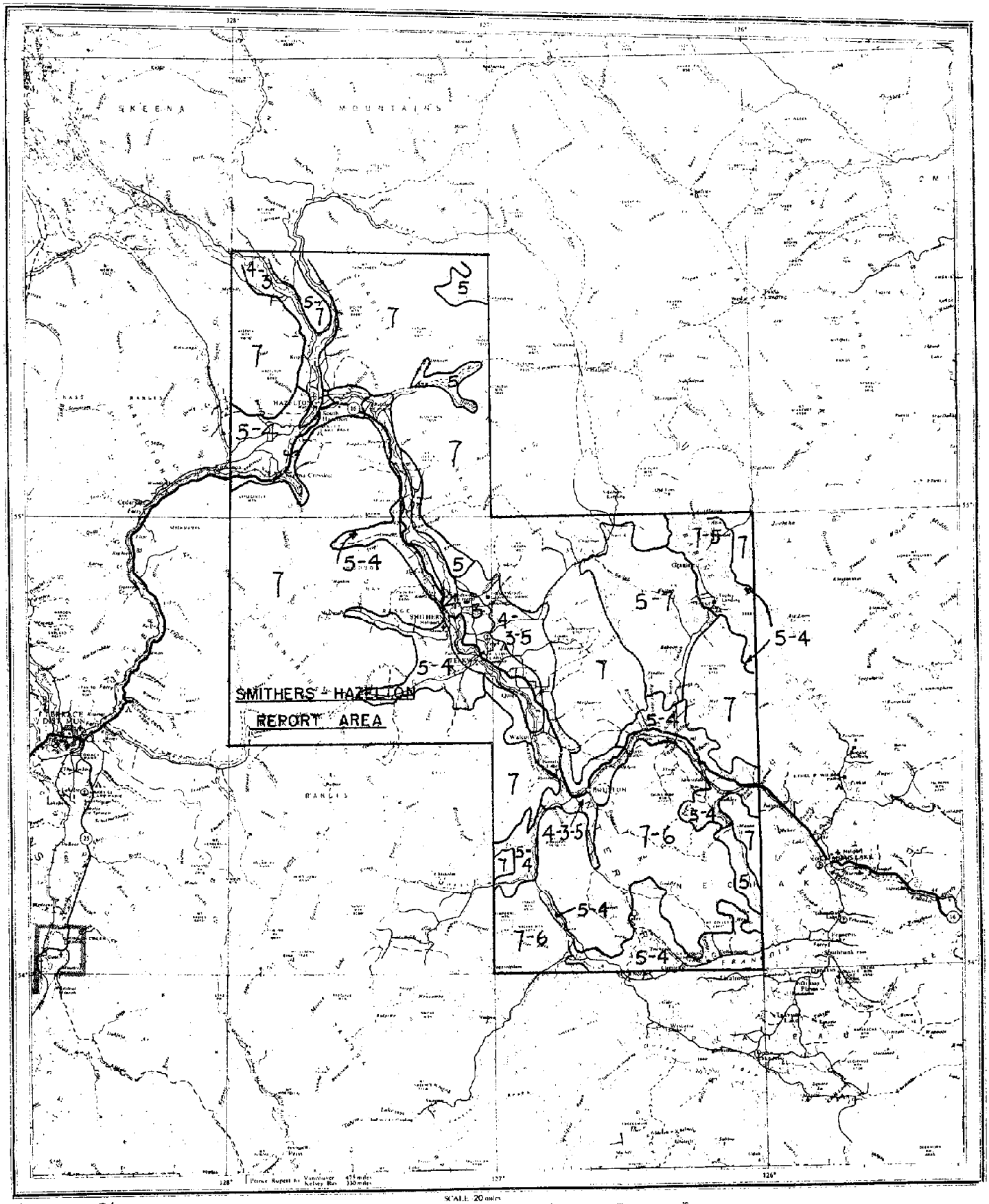

Figure 54.

Class 3 - Moderate Limitations for cultivated crops (vegetables, grains, forages)
Class 4 - Severe Limitations for cultivated crops (forages, hardy grains & vegetables)
Class 5 - Very Severe Limitations (forages only)
Class 6 - Non-arable (grazing of native forage plants)
Class 7 - Unsuitable

Table 51. Capability for Agriculture (Cont'd)

Class 6 Non-arable; grazing of native forage plants.	238,717	Eastern half of area on steep south and west slopes.
Class 7 Unsuitable	2,227,899	Mostly higher elevation mountainous lands with severe climates and steep topography.
O organics	62,539	Scattered throughout area mainly at higher elevations with severe climates. Generally not economically feasible to reclaim.

* See Canada Land Inventory, Soil Capability Classification for Agriculture, for description of classes.

Table 52. Crop and Soil-Climate Suitability

Crop	Most Suitable Soils and Climate
1. Pasture	
Bromegrass - alfalfa	AX; BA; CR; DD1, 2; H1, 2; KA; MS; M1, 2; MT; PA; R; SH; SG1, 2; SO; SW. (Irrigation necessary for optimum yields).
Red clover, alsike clover	BE; BA1 -5; BN; D1 -5; DD3; H4, 5; KT; KN1, 2, 4; N; PR; SG3, 4; SL1, 3; TA1, 3; V1, 2; BA6; D6; H3; KN3; SG5; SL2; V3; O1, 2.
Reed canary grass	BA6; D6; H3; KN3; SG5; SL2; TA2; V3; O1, 2.
2. Hay and Silage	
Bromegrass - alfalfa	AX; BA7; CR; DD1, 2; H1, 2; KA; MS; MT; PA; SH; SG1, 2; SO.
Timothy, red clover, alsike clover	BE; BA1 -4; BN; D1 -5; DD3; H4, 5; KT; KN1, 2, 4; N; PR; SG3; TA3; V1, 2.
Reed canary grass, red clover, alsike clover	BA5, 6; D6; H3; KN3; SG4, 5; SL1, 2; TA1, 2; V3.

3. Oats, barley - wheat hazardous (Houston area and west in Bulkley and Skeena valleys and adjacent to large lakes only).	BE; BA; BN; DD; H; KA; KN; MT; N; PA; PR; SG; SL; TA; V.
4. Vegetables (potatoes, turnips, carrots, cabbage, lettuce and other cool season crops) and berry fruits (Houston west in Bulkley and Skeena valleys).	BN; DD; H1, 2, 4, 5; KA; MS; MT; N; PA; SG1-4; SL1, 3; TA1, 3.

Table 53. Surface Erosion Potential

This rating is based on expected losses of surface soil when all vegetative cover, including litter, is removed. Evaluations of climate, slope gradient and length, soil characteristics, hydrologic characteristics of the soil and bedrock materials of each mapping unit are considered in making ratings. Average topography of the map unit is used although variation can influence the erosion potential significantly.

Very Slight - Practically no loss of surface soil material is expected. AX, DL, DR, DN, MT, PA, R, SY, SH, UN, O.

Slight - Little loss of soil materials is expected. Some minor sheet and rill erosion may occur. CB, CR, H1 - 3, KS, KA, KT, M, MS, ON, OD, SA, SG1 - 3, SO, SW.

Moderate - Some loss of surface soil materials can be expected. Rill erosion and some small gullies on sheet erosion may be occurring. BA, CA, D, DD, H4, 5, KX, N, PT, SS, SK, SG4 - 5, SL, TA, TW, WL.

Severe - Considerable loss of surface soil materials can be expected. Rill erosion, numerous small gullies or evidence that considerable loss from sheet erosion may occur. BE, CN, PR, SD, TT.

Very Severe - Large loss of surface soil material can be expected in the form of many large gullies and/or numerous small gullies or large loss from sheet erosion. BN, KN, SN, V.

Table 54. Agriculture Management Problems

The following refers to arable soils only (except 1 & 13):

1. Soils and climate combinations with severe to very severe erosion hazard: BE, CN, PR, SD, TT, BN, KN, SN, V.

2. Soils with lower moisture holding capacities (droughty) and highest irrigation water requirements: AX, CR, H, KA, KT, MS, MT, PA, R, SH, SG, SO.

3. Soils requiring drainage: BA6, D6, H3, KN3, SG5, SL2, TA2, TW6, V3, O.

4. Soils subject to flooding: BA5, 5, D6, H3, KN3, N2, SG2-5, SL, TA, TW5 - 6, V3.

5. Soils of heavy texture and poor structure with heavy power requirement for cultivation: BE, BA, D, KN, N, PR, TW, V.

6. Soils subject to wind erosion and sand blasting: KA, MS, MT, PA.

7. Soils likely to be nitrogen deficient: AX, BE, BA, BN, CR, D, H1, 2, 5, KA, MS, M, MT, N, PA, R, SH, SG1-4, SL3, TA3, TW1-4, V.

8. Soils likely to be sulfur deficient: BE, BA, BN, D, N, V, O.

9. Soils subject to compaction, poor root penetration, surface puddling and crusting: BE, BA, BN, KN, N, PR, V.

10. Soils low in organic matter: all except DD, PR, SO.

11. Soils likely to have highest land clearing costs: KN, KT, TA, MT, KA, H, SH, SW.

12. Soils in locations with extremely short frost free periods: parts of BA, CR, D, R, SG5, SL2, TA2, TW, O.

13. Soils easily overgrazed (native vegetation): SO, DD, DL, OD, SS, CN.

RECREATION

In Table 55, "Limitations for Recreational Use", soils are rated for different recreational purposes according to the soil properties listed in the last column of the table. Limitations and ratings are based on soil characteristics, not demand or proximity to population centers.

None to Slight soil limitations mean that soil is free of limitations or limitations can be easily eliminated, like slight stoniness or mild slopes.

Moderate soil limitations indicate that soil still can be used satisfactorily for a particular purpose with correct planning and good management. Main limitations include: somewhat poor drainage, moderate or not too steep slopes, silty or sandy texture, moderate stoniness, shallower water table, restricted depth, occasional flooding, occasional seepage or ponding, moderately slow permeability.

Severe soil limitations almost exclude use of soil for the stated purpose. In certain cases it can be overcome, but would require major reclamation work. Severe limitations include: steep or very steep slopes, high water table, poor drainage, flooding, serious ponding and seepage, unfavorable texture (loose sand, clay), acidity, excessive stoniness and rockiness, shallow depth, very slow permeability and organic deposits.

The column "Ecological Damage Hazard" is a relative rating and includes hazards to vegetation and soil under relatively intensive recreational use.

The Table 56, "Landscape Personality", groups soil map units into broad scenic and esthetic groups to provide some indication as to attractiveness for viewing, hiking, photography, driving and nature study.

Table 56. Landscape Personality

Map units grouped as to attractiveness for viewing, photography, driving, nature study.

1. Lands with alpine scenic features resulting in extremely attractive landscapes: SS, SK, CN, SA, SY and associated bedrock and glaciers.

2. Lands of the alpine coniferous forest transition with contrasting vegetation very attractive: SD, SK, TT3, SN3, TW6, CA6.

3. Coniferous forests on lands of the steep mountainous slopes, somewhat monotonous landscapes within themselves, but with some scenic attractions especially in combination with the above landscapes: TT, WL, SN, KX, DN, DR, ON, UN, NA, OD1, 3, CA.

4. Coniferous forests on rolling uplands often interspersed with variable sized lakes and organic bogs or swamps. A somewhat monotonous landscape, but the lakes and bogs provide contrast and often attractive shorelands: D, DR, OD3, ON, UN, NA, TW, KN, CB, CR, KT, KA, SG3.

5. Mixed coniferous and deciduous forest on rolling to flat uplands often interspersed with variable sized lakes and streams. A somewhat attractive landscape due to contrasting vegetation patterns and often attractive shorelands: BA, OD1, DL1, D7, CA7, PT2, 3, MS, BN, M1, SG1, 2, 4, 5, H3, 4, SL, N, TA, V, BE.

6. Mixed grassland-deciduous landscape of vegetation and use contrasts. Pastoral setting often extremely attractive where lands are partially cultivated and associated with lakes or streams: PR, DD, DL1, 2, OD1, 2, KS, BA, PT4, SO.

7. Lands most often providing panoramic views of surrounding landscapes: SS, SK, CN, SA, DD, DN, DR, DL, ON, OD, KS, UN, NA, AX, MT, R, SH, PA.

8. Lands of the flat valley bottoms with contrasting vegetation, use patterns and with close-to-home, less strenuous hiking and nature study capabilities: SG, H, KA, SL, N, TA, SW, MT, SH, M, SO, MS, PA, R, AX, RG.

9. Lands with unique landforms and rock formations:
   Landforms - RG, M, SO, SA, Glaciers.
   Rock formations - bedrock land types - DN, DL, DR, ON, OD, KS, NA.

10. Lands with high frequency of associated organic bogs and swamps: CR, CB, D, SL, TA, SD, SS.

Table 55. Limitations of Soils for Recreational Use

Soil Name	Map Unit Symbol	Intensive Camp and Picnic Areas	Building Sites In Recreational Areas	Paths and Trails	Intensive Play Areas	Cottaging	Ecological Damage Hazard	Soil Features Influencing Use
Alix	AX	none to slight	none	none	moderate	none	none	Rapidly drained, very rapid permeability, flat, minor surface stoniness.
Babine	BE	moderate	moderate	moderate	moderate to severe	moderate	moderate	Very slow permeability, sticky and slippery when wet, subject to compaction.
Barrett	BA1-4	moderate	moderate	none to slight	moderate to severe	moderate	none to slight	Moderately slow permeability, sticky and slippery when wet, rolling to undulating topography.
	BA5	moderate	moderate to severe	moderate	moderate	moderate to severe	moderate	Seasonal high water table otherwise as above.
	BA6	severe	severe	severe	severe	severe	moderate	Poor drainage, high water table for long periods, subject to ponding, poor trafficability.
	BA7	moderate	moderate	none	moderate to severe	moderate to severe	severe	Steeply sloping to rolling topography, moderately slow permeability, sticky and slippery when wet.
Berman	BN1	moderate	moderate	moderate	moderate	moderate to severe	severe	Variable topography, moderately slow permeability, sticky and slippery when wet, subject to compaction.
Causqua	CA1-5	moderate to severe	moderate	moderate	severe	severe	none to slight	Steeply sloping topography, moderately slow permeability, sticky and slippery when wet, some stoniness.
	CA6	severe	severe	severe	severe	severe	moderate	Depressional landscape position, imperfect to poorly drained, some ponding, high water tables, sticky and slippery when wet.
	CA7	moderate to severe	moderate	none	severe	severe	severe	Steeply sloping topography, some stoniness moderately slow permeability, sticky and slippery when wet.
Cobb	CB	moderate to slight	none to slight	none to slight	severe	moderate to slight	none	Often stony, rapid permeability, gently undulating topography.
Cronin	CN	severe	severe	moderate	severe	severe	very severe	Stony, undulating to rolling topography, subject to wind and water erosion, poor trafficability, variable permeability.
Crystal	CR	moderate to slight	none to slight	none to slight	severe	moderate to slight	none	Often stony, rapid permeability, gently undulating topography.
Dahl	DL1-2	severe	severe to moderate	moderate	severe	severe	severe	Shallow depth to bedrock, steeply sloping topography, stony surface, variable permeability.
	DL3	severe	moderate	moderate	severe	severe	moderate	Shallow depth to bedrock, steeply sloping topography, stony surface, variable permeability.
Decker	DR	severe	moderate to severe	moderate	severe	severe	moderate	Shallow depth to bedrock, steeply sloping topography, stony surface, variable permeability.
Deserters	D1-5	moderate	moderate	none to moderate	moderate to severe	moderate	none to slight	Moderately slow permeability, sticky and slippery when wet, rolling to undulating topography.
	D6	moderate	moderate to severe	moderate	severe	severe	moderate	Depressional topography, seasonal high water tables, sticky and slippery when wet.
	D7	moderate	moderate	none to slight	moderate	moderate	severe	Moderately slow permeability, sticky and slippery when wet, rolling to undulating topography.
Dragon	DN	severe	moderate to severe	moderate	severe	severe	moderate	Shallow depth to bedrock, steeply sloping topography, stony surface, variable permeability.
Driftwood	DD	moderate	moderate	moderate	moderate to severe	moderate	severe	Steeply sloping to rolling topography, moderately slow permeability, sticky and slippery when wet.
Hagwilget	H1,2,5	none to slight	none	none	moderate	none to slight	none to slight	Some stoniness, rapid permeability, gently sloping topography, no ponding.
	H3,4	moderate	moderate to severe	moderate	moderate	severe	moderate	As above with occasional flooding and seasonal high water tables.
Kispiox	KX	severe	severe	moderate	severe	severe	none to slight	Bouldery and stony, very steeply sloping topography, often unstable, variable permeability.
Kitsuns	KS	moderate	moderate	none	severe	severe	severe	Shallow depth to bedrock, stony surface, variable permeability.
Kitsguecla	KA	none	none	none	none	none	none to slight	Subject to blowing if subsoil exposed. Well drained, no ponding. Variable depth to underlying compact material, flat topography generally.

Table 55. (Cont'd)

Soil Name	Map Unit Symbol	Intensive Camp and Picnic Areas	Building Sites In Recreational Areas	Paths and Trails	Intensive Play Areas	Cottaging	Ecological Damage Hazard	Soil Features Influencing Use
Kitwanga	KT	moderate	none	none to slight	severe	moderate	none	Stony bouldery surface, variable permeability, undulating topography.
Kwun	KN1,2,4	moderate	moderate	none to slight	severe	severe	none	Subject to compaction, very slow permeability, sticky and slippery when wet.
	KN3	severe	severe	moderate	severe	severe	none	Depressional landscape position, seasonal high water tables plus above.
Mapes	MS1	none to slight	none	none	none to slight	none	none	Flat, rapid permeability, no ponding, subject to blowing if subsoil exposed.
Morice	M	moderate to slight	moderate-slight	moderate-slight	severe	moderate to slight	moderate	Variable topography, stony surface.
Moricetown	MT	none to slight	none	none	none to slight	none	none	Flat, rapid permeability, no ponding, subject to blowing if subsoil exposed.
Natlan	NA	moderate	moderate	moderate	severe	severe	moderate	Shallow depth to bedrock, stony surface, steeply sloping topography.
Nechako	N	moderate	none to slight	none	moderate	moderate	none	Moderately slow permeability, sticky and slippery when wet, subject to compaction.
Oona	ON	severe	moderate to severe	moderate	severe	severe	moderate	Shallow depth to bedrock, stony surface, steeply sloping topography.
Ormond	OD	severe	severe to moderate	moderate	severe	severe	severe	Shallow depth to bedrock, stony surface, variable permeability.
Peta	PA1	none to slight	none	none	none to slight	none	moderate	Flat, subject to blow if subsoil exposed, rapid permeability.
Pinkut	PT	severe	severe	severe	severe	severe	moderate	Very steep topography, unstable, bouldery and stony, rapid permeability.
Prairiedale	PR2	moderate	moderate to severe	moderate	moderate to severe	severe	none	Moderate to slow permeability, flat, subject to compaction, sticky and slippery when wet.
Ramsey	R	none to slight	none	none	moderate	none	none	Some surface stoniness, rapid permeability flat.
Roaring	RG	moderate to slight	moderate-slight	none	severe	moderate	none	Long sinuous ridges, rapid permeability, some surface stoniness.
Saunders	SD1	moderate	moderate	moderate	severe	moderate to severe	moderate	Steeply sloping, moderately slow permeability, sticky and slippery when wet.
	SD2	moderate	moderate to severe	moderate	severe	severe	moderate	Seepage plus above.
	SD3	severe	severe	severe	severe	severe	severe	High water tables for long periods, subject to ponding and seepage.
Savory	SY	none	none	none	moderate	none	moderate	Some surface stoniness, rapid permeability, flat.
Shass	SS1,2	severe	moderate to severe	moderate	severe	severe	very severe	Shallow depth to bedrock, variable topography, variable permeability.
	SS3	severe	severe	severe	severe	severe	very severe	As above plus high water tables.
Shegunia	SH1,3	none	none	none	moderate	none	none	Some surface stoniness, rapid permeability, flat.
	SH2	moderate	moderate	none	severe	moderate	none	As above plus fluctuating water tables.
Sidina	SA1,2	severe	severe	severe	severe	severe	severe	bouldery and stony surface, rapid permeability, surface movement of boulders downslope, steeply sloping topography.
	SA3	moderate to severe	severe	moderate	severe	severe	moderate to severe	bouldery and stony surface, imperfect drainage (seepage position), variable topography, variable permeability.
Skeena	SN1,2,4	severe	severe	none	severe	severe	moderate	High slump and slide hazard, very sticky and slippery when wet, steeply sloping topography, slow permeability, subject to compaction.
	SN3	severe	severe	moderate	severe	severe	moderate	as above plus high water tables.
Skins	SK	severe	severe to moderate	severe to moderate	severe	severe	moderate	Shallow depth to bedrock, slow permeability, stony surface, variable topography.
Slug	SG1-3	none	none	none	moderate	none	moderate to slight	Rapid permeability, gently sloping topography, minor surface stoniness.
	SG4,5	moderate	moderate to severe	moderate	severe	severe	moderate	Variable permeability, fluctuating water table, subject to some ponding and flooding, gently sloping topography.

Table 55. (Cont'd)

Soil Name	Map Unit Symbol	Intensive Camp and Picnic Areas	Building Sites In Recreational Areas	Paths and Trails	Intensive Play Areas	Cottaging	Ecological Damage Hazard	Soil Features Influencing Use
Snodgrass	SO	moderate to slight	moderate to slight	moderate-slight	severe	moderate to slight	moderate	Rapid permeability, rolling topography, some surface stoniness.
Stellako	SL1	moderate	moderate	moderate	moderate	severe	moderate	Some flooding hazard, seasonal high water table, variable permeability, hummocky micro topography, subject to compaction.
	SL2	severe	severe	severe	severe	severe	moderate	High water table for long periods, subject to ponding and flooding, slow permeability subject to compaction.
	SL3	moderate	slight to moderate	none	moderate	moderate	moderate	Subject to flooding, variable permeability, subject to minor compaction.
Suskwa	SW	none	none	none	severe	none	none	Rapid permeability, rolling topography, some surface stoniness.
Tatin	TT1,2	severe	severe	moderate	severe	severe	moderate	steeply sloping topography, subject to some slumping, slow permeability, subject to compaction.
	TT3	severe	severe	moderate	severe	severe	moderate	as above with seasonal high water tables.
Tiltusha	TA1	moderate	moderate	moderate	moderate	severe	moderate	Some flooding hazard, seasonal high water table, variable permeability, hummocky micro topography, subject to compaction.
	TA2	severe	severe	severe	severe	severe	moderate	High water table for long periods, subject to ponding and flooding, slow permeability subject to compaction.
	TA3	moderate	none	none	moderate	moderate	none	Subject to flooding, variable permeability, subject to minor compaction.
Twain	TW1-5	moderate	moderate	none	moderate	severe	none	rolling topography, slow permeability, subject to compaction.
	TW6	severe	severe	moderate	severe	severe	moderate	as above with seasonal high water tables.
Utsun	UN	moderate	moderate	none	severe	severe	moderate	Shallow depth to bedrock, steeply sloping topography, strong surface, variable permeability.
Vanderhoof	V1,2	severe to moderate	moderate	moderate	severe	severe	moderate	Subject to compaction, very slow permeability, very sticky and slippery when wet, flat.
	V3	severe	severe	moderate	severe	severe	moderate	as above with seasonal high water tables.
Windfall	WL	severe	severe	moderate	severe	severe	none to slight	Bouldery and stony, very steeply sloping topography, often unstable, variable permeability.
Organics	O	severe	severe	severe	severe	severe	severe	High water table throughout the year, organic soil.

ENGINEERING

There are some differences between the terminology of soil science and that of engineering - terms used in soil surveys are those of soil science. The interpretation of engineering properties of soils is based mainly on information gathered and observations made in the field during the course of the soil survey.

Table 57 titled "Inferred Engineering Characteristics of Soils", relates the Unified System of soil classification to the soil survey mapping units (Soil Map Symbol) and noted engineering characteristics. These are general guidelines and relative ratings and there is no intent that these in any way replace site specific engineering investigation. Analytical data will be forthcoming for selected soils and the table "Inferred Engineering Characteristics of Soils" is therefore tentative.

Table 57. Inferred Engineering Characteristics of Soils

MAJOR DIVISIONS AND SUBDIVISIONS	LETTER1. UNIFIED SYSTEM	SOIL MAP SYMBOL	TYPICAL NAMES	PERMEABILITY CHARACTERISTICS	SHEAR STRENGTH (when saturated)	COMPRESSIBILITY AND EXPANSION (when saturated)	SLUMP AND SLIDE HAZARD	COMPACTION CHARACTERISTICS	POTENTIAL FROST ACTION	PEDOLOGICAL DRAINAGE CLASS	WORKABILITY AS A CONSTRUCTION MATERIAL
Coarse grained soils	GW	AX SH R	Well graded gravels or gravel-sand mixtures, little or no fines	Pervious	Excellent	Almost none	Low	Excellent, crawler type tractor, rubber-tired equip., steel wheeled roller	none to very slight	rapid	Excellent
Gravel and Gravelly soils	GP	M SA2 SO SW AX SH R RG	Poorly graded gravels or gravel sand mixtures little or no fines	Very pervious	Good	Almost none	Low	Good to excellent crawler type tractor, rubber-tired equip., steel wheeled roller	none to very slight	rapid	Good
	GM	M SY SO SS3 SW SA2 RG SK3 CB CR KT SG H WL2 KX2	Silty gravels, gravel-sand-silt mixtures	Semi-pervious to pervious	Good	Very slight to slight	Low to moderate	Good to excellent rubber-tired equipment, sheepsfoot roller; close control of moisture	slight to medium	rapid to wall	Good
	GC	CB PT KT SS3 SG SK3 H WL KX	Clayey gravels, gravel-sand-clay mixtures	Variable (most often semi-pervious)	Good to Fair	slight	Low to Moderate	Excellent, rubber-tired equip., sheepsfoot roller	slight to medium	well	Good
Sand and Sandy soils	SW	PA KA MT MS	Well graded sand or gravelly sands, little or no fines	Pervious	Excellent	Almost none	Low to Moderate	Excellent, crawler type tractor, rubber-tired equipment	none to very slight	rapid	Excellent
	SP	PA KA MT MS	Poorly graded sands or gravelly sands	Pervious	Good	Almost none	Moderate to Low	Good to excellent, crawler-type tractor, rubber-tired equip.	none to very slight	rapid	Fair
	SM	SG DL3 M DN3 M NA3 SO ON3 SW UN3 SN N SL TA	Silty sands, sand-silt mixtures	Semi-pervious	Good	Very slight to medium	Moderate	Good to excellent with close control of moisture, rubber tired equip, sheepsfoot roller	slight to high	rapid to well	Fair

Table 57. (Concld)

Major Divisions		Letter Symbol	Soil Map Symbol	Typical Names	Permeability Characteristics	Shear Strength (when compacted)	Compressibility and Expansion (when compacted)	Slope Stability	Compaction	Potential Frost Action	Pedological Drainage Class	Workability as a Construction Material
		SC	CB CR KT SG H	Clayey sands, sand-clay mixtures	Semi-pervious to impervious	Good to Fair	Slight to medium	Moderate	Excellent, sheepsfoot roller, rubber tired equip.	slight to high	well to moderately well	Good
Fine Grained Soils	Silts and Clays	ML	BN DR[3] H KS[3] SC OD[3] TA SD SL N	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Semi-pervious to impervious	Fair	Slight to medium	Moderate to high	Good to poor rubber-tired equip., sheepsfoot roller; close control of moisture	medium to very high	well to imperfect	Fair
		CL	CN BA D CA DD SD	Inorganic clays of low plasticity, gravelly clays, sandy clays, silty clays, lean clays	Impervious	Fair	Medium	Moderate to high	Fair to good sheepsfoot roller, rubber-tired equip.	medium to high	well to poor	Good to fair
		OL	SL O	Organic silts and organic silty clay of low to medium plasticity	Semi-pervious to impervious	Poor	Medium to high	Moderate to high	Fair to poor sheepsfoot roller	medium to high	imperfect to very poor	Fair
		CI	CN TT BA TW D PR CA SD DD BE KN	Inorganic clays of medium plasticity, gravelly clays, sandy clays, silty clays	Impervious	Fair to Poor	Medium to high	High to Moderate	Fair to poor sheepsfoot roller	medium to high	well to poor	Fair
		MH	SL	Inorganic silts, micaceous or diotomaceous fine sandy or silty soils, elastic silts	Semi-pervious	Fair to Poor	High	High to Moderate	Poor to very poor sheepsfoot roller	medium to high	well to poor	Poor
		CH	V SH BE KN	Inorganic clays of high plasticity, fat clays	Impervious	Poor	High	Very high	Fair to poor sheepsfoot roller	medium	well to poor	Poor
		OH	O V PR	Organic clays of high plasticity, organic silts	Impervious	Poor	High	High	Poor to very poor, sheepsfoot roller	medium	poor to very poor	Poor
Highly Organic Soils		PT	O	Organic soils	variable (usually semi-impervious to impervious)	-	very high	-	Compaction not practical	slight	very poor	-

1. - Estimates only - detailed data analysis to follow.
2. - Generally high component of rock fragments - most often have overlay of materials of different composition - steep slope landscape position.
3. - shallow over bedrock (high component of coarse rock fragments)
(characteristics not typical of group)

Table 58, titled "Engineering Use of Soils" relates use to the Unified System of soil classification and the soil survey map units.

Criteria used are as follows:

1. Unified System - soils classified according to particle - size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. Soils on the borderline or crossing two classes are designated by symbols for both classes.

2. Hydrologic Soil Groups - general infiltration and water movement ability of the soil and bedrock materials.
   Group A - soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well to rapidly drained sands and/or gravel. These soils have a high rate of water transmission and therefore a low runoff potential.
   Group B - soils having moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. Soils having a moderate rate of water transmission.
   Group C - soils having slow infiltration rates when thoroughly wetted, consisting chiefly of, (1) soils with a layer that impedes the downward movement of water or, (2) soils with moderately fine to fine texture, slow infiltration rates, and slow rates of water transmission.
   Group D - soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of (1) clay soils with high swelling potential, (2) soils with a high permanent water table, (3) soils with a clay pan or clay layer at or near the surface, and (4) shallow soils over nearly impervious materials. Very slow rates of water transmission and high runoff potential.

3. Topsoil Suitability - Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability, but also considered in the ratings is the damage that will result at the area from which topsoil is taken.

4. Suitability as source of sand and gravel - Soil factors to consider are:
   a) Depth to water table
   b) Presence of stones and boulders
   c) Presence and amount of finer particles
   d) Thickness of the deposits and depth to sand and gravel
   e) Grain sizes of sand and gravel
   f) Shape of sand and gravel particles

5. Suitability as a source of fill material - Soil factors to consider are:
   a) Shear strength
   b) Compressibility
   c) Workability
   d) Shrink-swell potential
   e) Compaction characteristics
   f) Susceptibility to frost action
   g) Stability
   h) Erodiblity
   i) Depth to water table
   j) Moisture content
   k) Presence of stones or boulders

6. Soil features affecting road location
   a) Presence of organic material and thickness
   b) Depth to bedrock and presence of stones and boulders
   c) Depth to water table
   d) Stability of slopes
   e) Potential for frost heaving
   f) Erodibility
   g) Flooding hazard
   h) Topography
   i) Ease of hauling and excavation
   j) Plasticity of the material
   k) Presence of springs and seeps

7. Soil Factors affecting foundations for low buildings
   a) Shear strength
   b) Shrink-swell potential
   c) Compressibility
   d) Consolidation characteristics
   e) Susceptibility to liquifaction and piping
   f) Soil texture
   g) Soil permeability
   h) Depth to bedrock
   i) Depth to water table
   j) Susceptibility to sliding

8. Soil features that determine the limitations for septic tank filter fields
   a) Soil permeability
   b) Depth to water table
   c) Flooding hazards
   d) Steepness of slope
   e) Depth to bedrock or other impervious materials
   f) Crevassed bedrock that may lead polluted water to other places

9. Soil factors affecting use for sewage lagoons
   a) Permeability of materials
   b) Depth to bedrock
   c) Steepness of slope
   d) Reservoir basin material
   e) Embankment materials
   f) Presence of coarse rock fragments

10. Soil factors affecting use for pipelines
   a) Corrosivity of the material (soil drainage, texture, chemical composition)
   b) Depth to bedrock
   c) Stability of material
   d) Susceptibility to frost heaving
   e) Depth to water table
   f) Presence of coarse rock fragments and boulders

Table 58. Engineering Use of Soils

SOIL MAP SYMBOL	UNIFIED SYSTEM	SOIL GROUP	HYDROLOGIC SUITABILITY AS SOURCE OF: TOPSOIL	GRANULAR MATERIAL (sand&gravel)	FILL MATERIAL	SOIL FEATURES AFFECTING: ROAD LOCATION	BUILDING FOUNDATIONS	EXCAVATIONS	SOIL LIMITATIONS FOR: SEPTIC TANK FILTER FIELDS	SEWAGE LAGOONS	PIPELINES (Construction & Corrosivity)
AX	GW-GP	A	Poor	Good	Good	no restrictions	low compressibility	no restrictions	Slight-some contamination hazard by effluent.	Severe-high percolation, stony	Slight
BE	CI-CH	C-D	Poor	Not suitable	Fair-Poor	Bearing strength and frost heaving problems	Bearing strength and compressibility problems	no restrictions	Severe-relatively low permeability	Slight	Moderate (some corrosion texture)
BA1,2,3,4	CL-CI	C	Poor	Not suitable	Fair	Bearing strength and frost heaving problems	Bearing strength and compressibility problems	no restrictions	Moderate-severe: low permeability	Slight	Moderate to slight (some corrosion-texture)
BA5,6	CL-CI	D	Fair	Not suitable	Fair-Poor	Bearing strength and frost heaving problems and high to fluctuating water tables	Bearing strength and compressibility problems, high and fluctuating water tables	high and fluctuating water tables	Severe-high and fluctuating water tables, low permeability	Severe-high and fluctuating water tables	High to Moderate (corrosion-high water tables)
BA7	CL-CI	C	Good	Not suitable	Fair	Topography limitation. Bearing strength and frost heaving problems	Adverse topog. Bearing strength and compressibility should be investigated	No restrictions	Moderate-severe adverse topog. and low permeability	Moderate-adverse topography	Moderate to slight (some corrosion-texture)
BN	SM-ML	B-C	Fair	Not suitable	Good-Fair	Susceptible to frost heaving and erosion, topog. limitation, unstable	Adverse topog. Bearing strength and compressibility should be investigated	some slumping hazard	Slight	Moderate	Slight
CA1-5, 7	CL-CI	C	Poor	Not suitable	Fair	Topog. limitation Bearing strength and frost heaving problems	Adverse topog. Bearing strength and compressibility should be investigated	adverse topog.	Moderate-severe adverse topog. and low permeability	Severe-Adverse topog.	Moderate to slight (some boulders-minor corrosion)
CA6	CL-CI	D	Fair	Not suitable	Fair-Poor	Topog. limitation Bearing strength and frost heaving problems and high water tables	Adverse topog. Bearing strength and compressibility should be investigated and high water tables	high water tables	Severe-high water table and low permeability	Severe-high water table	High (corrosion high water tables)
CB	GM,GC, SC	C-B	Poor	Fair (gravel)	Good	no restrictions except variable depth to compact underlay	Variable compressibility	no restrictions	Moderate-some seepage along compact underlay	Moderate-variable depth to compact underlay	Slight
CN	CL-CI	C-D	Poor	Not suitable	Fair	Bearing strength and severe frost heaving problems	Bearing strength and compressibility problems	Some topog. limitations	Severe-low permeability, severe frost heaving	Moderate-frost heaving	Moderate (corrosion and severe frost heaving)
CR	GM,GC, SC	C-B	Poor	Fair (gravel)	Good	no restrictions except variable depth to compact underlay	variable compressibility	no restrictions	Moderate-some seepage along compact underlay	Moderate-variable depth to compact underlay	Slight
DL	SM*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)

Table 58. (Cont'd)

SOIL MAP SYMBOL	UNIFIED SYSTEM	HYDROLOGIC SOIL GROUP	SUITABILITY AS SOURCE OF: TOPSOIL	GRANULAR MATERIAL (sand&gravel)	FILL MATERIAL	SOIL FEATURES AFFECTING: ROAD LOCATION	BUILDING FOUNDATIONS	EXCAVATIONS	SOIL LIMITATIONS FOR: SEPTIC TANK FILTER FIELDS	SEWAGE LAGOONS	[illegible] (Construction & Corrosivity)
DR	ML*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)
D1-5, 7	CL-CI	C	Poor	Not suitable	Fair	Bearing strength and frost heaving problems	Bearing strength and compressibility problems	no restrictions	Severe-moderate-relatively low permeability	Slight	Moderate to slight (some corrosion-texture)
D6	CL-CI	D	Fair	Not suitable	Fair-Poor	Bearing strength and frost heaving problems and high water tables	Bearing strength and compressibility problems and high water tables	high water tables	Severe-high water tables, low permeability	Severe-high water tables	High to moderate (corrosion-high water tables)
DN	SM*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Slight-Moderate (shallow to bedrock)
DD	CL-CI	C	Good	Not suitable	Fair	Topography limitation. Bearing strength and frost heaving problems	Adverse topog. Bearing strength and compressibility should be investigated	no restrictions	Moderate-severe adverse topog. and low permeability	Moderate-adverse topog.	Moderate to slight (some corrosion-texture)
H1,2, 4,5	GM,GC, SM,SC, ML,MH	A-D	Fair-Poor	Fair	Good	Highly variable soils, some frost heaving	Variable compressibility and bearing strength	no restrictions	Slight to severe (highly variable)	Slight to severe (highly variable)	Slight to high variable soils, cave-ins some corrosion
H3	GC,SM, SC,ML, MH	C-D	Fair-Poor	Fair	Good	High and fluctuating water tables	High and fluctuating water tables	high water tables	Severe-high water tables	Severe-high water tables	High-corrosion high and fluctuating water tables
KK	GM-GC	A-B	Poor	Poor	Fair	Topog. limitation. Closely assoc. with bedrock. Boulders common	Adverse topog.-highly variable bearing strength and compressibility	adverse topog. Boulders	Severe-adverse topog. slope seepage	Severe-adverse topog.-seepage	Slight-Moderate (large boulders on steep slopes)
KS	ML*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)
KA	SW-SP	B	Fair	Good(sand)	Good-Fair	Difficult to compact	Low compressibility of surface material	no restrictions	Moderate-some seepage on compact underlay	Moderate to severe-high percolation to compact underlay	Slight (ditch cave-in hazard)
KT	GM,GC, SC	C-B	Poor	Fair (gravel)	Good	no restrictions except variable depth to compact underlay	Variable compressibility	no restrictions	Moderate-some seepage along compact underlay	Moderate-variable depth to compact underlay	Slight
KN	CL-CH	D	Poor	Not suitable	Fair-Poor	Slippery when wet, bearing strength and frost heaving problems	Bearing strength, compressibility and erosion problems	no restrictions	Severe-low permeability	Slight	Moderate (corrosion-texture)

Table 58. (Cont'd)

SOIL MAP SYMBOL	UNIFIED SYSTEM	HYDROLOGIC SUITABILITY AS SOURCE OF: SOIL GROUP	TOPSOIL	GRANULAR MATERIAL (sand&gravel)	FILL MATERIAL	SOIL FEATURES AFFECTING ROAD LOCATION	BUILDING FOUNDATIONS	EXCAVATIONS	SEPTIC TANK FILTER FIELDS	SEPTIC TANK LAGOONS	PIPELINES (Corrosivity)
MS	SW-SP	A	Fair	Good (sand)	Good-Fair	Difficult to compact	Low compressibility	Some slumping of excavation sidewall	Slight	Severe-high percolation	Slight-Moderate (ditch cave-in hazard)
M	GM-SM	A-B	Poor	Good-Fair (s&g)	Good	No restrictions except topog. occassionally	Low compressibility	no restrictions	Slight-some seepage in steeper topog.	Severe-high percolation, adverse topog.	Slight
MT	SW-SP	A	Fair	Good (sand over gravel)	Good-Fair	Difficult to compact	Low compressibility	Some slumping of excavation sidewall	Slight	Severe-high percolation	Slight-moderate (ditch cave-in hazard)
NA	SM*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)
N	SM-ML	C	Fair	Poor	Good	Minor-fluctuating water tables	Bearing strength should be investigated	no restrictions	Moderate-some permeability limitations	Slight	Slight-Moderate (some ditch cave-in and corrosion hazard)
ON	SM*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)
OD	ML*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)
PA	SW-SP	A	Fair	Good (sand over gravel)	Good-Fair	Difficult to compact	Low compressibility	Some slumping of excavation sidewall	Slight	Severe-high percolation	Slight-moderate (ditch cave-in hazard)
PT	GC	B	Poor	Poor	Fair-Good	Topog. limitation. Assoc. with bedrock	Adverse topog.-highly variable bearing strength and compressibility	Adverse topog. boulders	Severe-adverse topog. slope seepage	Severe-adverse topog. seepage	Slight-moderate (large boulders on steep slopes assoc. with bedrock)
PR	CL	D	Fair-Good	Not suitable	Poor	Slippery when wet, frost heaving, unstable, bearing strength problems	Bearing strength problems, high risk of frost heaving	no restrictions	Severe-low permeability	Slight	Moderate (corrosion-texture)
R	GW-GP	A	Poor	Good	Good	no restrictions	low compressibility	no restrictions	Slight-some contamination hazard by effluent	Severe-high percolation, stony	Slight
RC	GP-GM	A	Poor	Good (gravel)	Good	no restrictions except topog.	low compressibility	no restrictions	Moderate-adverse topog.	Severe-high percolation	Slight
SD	ML-CL, CL	C	Poor	Not suitable	Fair	Topog. limitation Bearing strength and frost heaving problems	Bearing strength should be investigated, adverse topog.	no restrictions	Moderate-severe adverse topog. and low permeability	Severe-adverse topog.	Moderate (corrosion-texture)
SY	GM	A	Poor	Good (gravel)	Good	No restrictions	low compressibility	no restrictions	Slight	Severe-high percolation	Slight
SS1	GM*-GC*	D	Poor	Not suitable	Poor	shallow to bedrock	Shallow to bedrock, adverse topog.	shallow to bedrock	Severe-shallow to bedrock, adverse topog.	Severe-shallow to bedrock, adverse topog.	Slight-moderate (shallow to bedrock)
SH	GW-GP	A	Poor	Good	Good	no restrictions	low compressibility	no restrictions	Slight-some contamination hazard by effluent	Severe-high percolation, stony	Slight
SA	GP	A	Poor	Poor	Poor-Fair	Large boulders and rock fragments unstable topog. limitations	low compressibility Large boulders and rock fragments unstable	large boulders and rock fragments unstable	Moderate-severe adverse topog. seepage boulders unstable	Severe-high percolation, adverse topog.	Slight-moderate (large boulders, unstable slopes)
SN	CH	D	Poor	Not suitable	Poor	Adverse topog. slide hazard, bearing strength, seepage and frost heaving problems	Adverse topog. slide hazard, bearing strength, seepage and frost heaving problems	adverse topog. slide hazard	Severe-adverse topog. low permeability	Severe-adverse topog., seepage, slide hazard	Moderate to high (corrosion and slide hazard)

Table 58. (Cont'd)

SOIL MAP SYMBOL	UNIFIED SYSTEM	HYDROLOGIC SUITABILITY AS SOURCE OF: SOIL GROUP	TOPSOIL	GRANULAR MATERIAL (sand&gravel)	FILL MATERIAL	SOIL FEATURES AFFECTING ROAD LOCATION	BUILDING FOUNDATIONS	EXCAVATIONS	SOIL LIMITATIONS FOR: SEPTIC TANK FILTER FIELDS	SEWAGE LAGOONS	CONCRETE & Corrosivity)
SK	GM*-GC*	D	Poor	Not suitable	Poor	shallow to bedrock	Shallow to bedrock, adverse topog.	shallow to bedrock	Severe-shallow to bedrock, adverse topog.	Severe-shallow to bedrock, adverse topog.	Slight-moderate (shallow to bedrock)
SG1-4	GM,GC, SM,SC, ML,MH	A-D	Fair-Poor	Fair	Good	Highly variable soils, some frost heaving	Variable compressibility and bearing strength	no restrictions	Slight to severe (highly variable)	Slight to severe (highly variable)	Slight to high variable soils, cave-ins, some corrosion
SG5	GC,SM, SC,ML, MH	C-D	Fair-Poor	Fair	Good	High and fluctuating water tables	High and fluctuating water tables	high water tables	Severe-high water tables	Severe-high water tables	High-corrosion high and fluctuating water tables
SD	GP-GM	A	Good-Fair	Good (gravel)	Good	no restrictions except topog.	low compressibility	no restrictions	Moderate-adverse topog.	Severe-high percolation	Slight
SL1,3	ML-MH	B	Fair	Poor	Fair-Good	some flooding hazard, frost heaving	variable bearing strength and compressibility	no restrictions	Moderate-some flooding, variable permeability	Moderate-some flooding, variable percolation	Slight-moderate (some ditch cave-in hazard)
SL2	OL-MH	D-C	Fair	Poor	Fair-Good	High water tables, flooding	high water tables and variable bearing strength and compressibility	high water tables	Severe-high water tables, flooding	Severe-high water tables	High (corrosion-high water tables)
SW	GM-SM	A-B	Poor	Good-Fair (s&g)	Good	no restrictions except topog. occassionally	low compressibility	no restrictions	Slight-some seepage in steeper topog.	Severe-high percolation, adverse topog.	Slight
TT	CI	C	Poor	Poor	Fair	Topog. limitation, bearing strength and frost heaving problems	Bearing strength and compressibility should be investigated, adverse topog.	adverse topog.	Severe-adverse topog, low permeability	Severe-adverse topog, seepage	Moderate (corrosion-texture)
TA1,3	ML-MH	B-A	Fair	Poor-Fair (sand)	Fair-Good	Some flooding hazard, frost heaving, fluctuating water tables	Some flooding hazard, frost heaving, fluctuating water tables and variable bearing strength and compressibility	no restrictions	Moderate-some flooding, variable permeability	Moderate-some flooding, variable percolation	Slight-moderate (some ditch cave-in hazard)
TA2	OL-MH	D-C	Fair	Poor	Fair	High water tables, flooding	High water tables, variable bearing strength and compressibility	high water tables	Severe-high water tables, flooding	Severe-high water tables, flooding	High (corrosion high water tables)
TW1-5	CI	C-D	Poor	Poor	Fair	Slippery when wet, bearing strength and frost heaving problems	Bearing strength and compressibility should be investigated	no restrictions	Severe-low permeability	Slight	Moderate (corrosion-texture)
TW6	CI	D	Fair	Poor	Fair-Poor	Slippery when wet, bearing strength and frost heaving problems and high water tables	Bearing strength and compressibility should be investigated and high water tables	high water tables	Severe-low permeability and high water tables	Severe-high water tables	High to moderate (corrosion - high water tables)
UN	SM*	D	Poor	Not suitable	Poor	Shallow to bedrock and adverse topog.	Shallow to bedrock and adverse topog.	shallow to bedrock and adverse topog.	Severe to moderate-shallow to bedrock, adverse topog. some seepage	Severe-shallow depth to bedrock, stony, adverse topog.	Moderate (shallow to bedrock)
V	CH	D	Poor	Not suitable	Poor	Slippery when wet, frost heaving, unstable, bearing strength problems	Bearing strength problems, high risk of frost heaving	no restrictions	Severe-low permeability	Slight	Moderate (corrosion-texture)
WL	GM-GC	A-B	Poor	Poor	Fair	Topog. limitation. Closely assoc. with bedrock, boulders moving downslope common	Adverse topog. highly variable bearing strength and compressibility, large boulders	adverse topog. large boulders	Severe-adverse topog. slope seepage	Severe-adverse topog., seepage	Slight to moderate-(large boulders moving down slope common)
O	PT	D	Fair	Not suitable	Not suitable	Very high water tables organic material should be removed	Low bearing strength and high compressibility	high water tables	Severe-very high water tables	Severe-very high water tables	High-high and fluctuating water tables (corrosion)

* Shallow to bedrock - high content of rock fragments (materials variable - not typical of group)

FORESTRY

Introduction

The report area covers a large part of Pulp Harvesting Area 4 which includes the Smithers, Morice, Burns Lake, Babine and Ootsa P.S.Y.U's. as well as portions of the Skeena P.S.Y.U. and T.F.L. 1.

At lower elevations in the Interior Forest Section lodgepole pine, white spruce and trembling aspen are the dominant tree species. With an increase in elevation white spruce and alpine fir predominate. Westward, tree species change as the coast-interior forest transition is encountered. At Smithers and northward in the lee side of the coastal mountains and in the Skeena river valley, western hemlock and western red cedar are found in pure stands or mixed with the white spruce and lodgepole pine. White spruce and alpine fir are located at the higher elevations. Coastal-like forests of western hemlock and amabilis fir are located on the western side of the area in the Zymoetz valley.

Information on a number of forest management considerations is presented in Table 59. "Forestry Interpretations" and the following explanations apply to that table.

Potential Capability (Capability Classes)

The potential capability of each soil to grow wood fibre was determined by the location and measurement of forest productivity plots. The methodology of locating and measuring forest productivity plots, and assessing the capability of the soils is outlined by Kowall, 1971. The seven capability classes are based on a productivity range as follows:

Class 7 has a mean annual increment range of 0-10 cubic feet per acre per year, Class 6, 11-30; Class 5, 31-50; Class 4, 51-70; Class 3, 71-90; Class 2, 91-110; and Class 1, 111-131 cubic feet per acre per year. Class 1 is assumed to have no limitations to tree growth and therefore has no subclass designation. The subclasses used to indicate limitations to tree growth for Classes 2 to 7 are: A - high evapotranspiration due to southerly and westerly exposure, C - combination of climatic factors at high elevations, D - physical restriction to rooting by dense or unsolidated layers, other than bedrock, H - cold temperatures - soil and air, M - soil moisture deficiency, R - restriction to rooting by bedrock, S - a combination of soil factors which collectively lower the capability class, and W - soil moisture excess.

The percent slope was broken into three categories; less than 30%, less than 60%, and greater than 30%.

Windthrow Hazard

Windthrow hazard ratings are based on such characteristics as texture, soil depth, slope and water table that control the development of tree roots and thus affect wind firmness. Rooting characteristics of the different tree species are not taken into account. Three ratings are given:

Low - Factors indicate windthrow is not likely. The effective rooting depth is generally greater than 36 inches.

Moderate - Factors indicate some susceptibility to windthrow, but major problems are not likely. The effective rooting depth is generally between 18 and 36 inches.

High - Factors indicate that windthrow hazard is high. The effective rooting depth is generally less than 18 inches.

Plant Competition

This item refers to the rate of invasion by unwanted trees, shrubs, and vines following harvesting. The ratings are based on soil characteristics and performance and three are presented:

Low - Indicates that plant competition does not prevent adequate establishment of a desirable stand of trees.

Moderate - Indicates that plant competition delays the establishment and slows the growth of seedlings but does not prevent the development of a desirable stand of trees.

High - Indicates that plant competition prevents adequate establishment of a desirable stand of trees without site preparation.

Limits of Regeneration

The major limits to regeneration are indicated as follows:

(a) frost heaving - usually on finer textured soils.
(b) coarse textured - limits fertility.
(c) droughty - mostly associated with very coarse textured soils.
(d) soil moisture limitations - mostly associated with moderately coarse to coarse textured soils.
(e) excess soil moisture
(f) high elevations - climatic - cold soil and air temperatures, short growing season.
(g) low elevations - climatic - high evapotranspiration especially on south and west exposures.
(h) surface slides - unstability of soil surface (mass movement).
(i) shallow soils - shallow rooting medium - usually less than 20 inches.
(j) rocky - rocks effectively reduce the soil rooting medium.

Recommended Tree Species To Plant

This column lists the tree species that the soil, climate, and topographic factors indicate would be best suited for planting. They include alpine fir - alF, black cottonwood - bCo, lodgepole pine - lP, trembling aspen - tA, western hemlock - wH and white spruce - wS.

Natural Regeneration

These are the indigenous species that are likely to regenerate naturally. In addition to the species to plant they include western red cedar - wC, and amabilis fir - aF.

Susceptibility to Soil and Other Resource Damage by Timber Harvest Operation

This interpretation indicates the susceptibility of soils and other resources to incur damage during timber harvest. This includes timber removal, spur roads, slash burning, landing and other activities related to timber harvest operations. Damage is caused to soils by creating soil disturbance which may destroy soil structure, cause compaction and increase erosion. This may affect other resources through loss of timber production, lower water quality and yield, and loss of fisheries. Factors involved in making these ratings are soil texture, percentage of coarse fragments, slope and drainage.

Low - This rating indicates that soils and other resources are likely to incur minor damage.

Moderate - This rating indicates that soils and other resources are likely to incur moderate damage.

High - This rating indicates that soils and other resources are likely to incur major damage.

Type of Damage Expected During and Subsequent to Timber Harvest Operations

This column indicates the type of soil or other resource damage expected as follows:

(a) loss of soil structure
(b) increased compaction
(c) soil damage from skidding
(d) loss of soil organic matter
(e) loss of soil resource from skidding and erosion
(f) road waste damage to resources
(g) road construction damage
(h) increased erosion
(i) increased mass movement potential
(j) increased slide hazard
(k) stream sedimentation
(l) stream siltation

Recommended Slash Disposal Method

This interpretation indicates the slash disposal method that is most adapted to conserving and protecting the soil and water values of each soil. When two methods are listed, the first method is the more preferable. Factors considered in these recommendations include soil properties, elevation, aspect, slope, litter thickness, drainage, and the ability of the site to revegetate.

It must be remembered that slash burning can reduce soil fertility by volatilizing many of the nutrients and rendering others vulnerable to leaching, destroy duff and litter and expose the soil to erosion and the effects of non-wetability. Recommendations are as follows:

No Treatment - the slash is left on the ground with no burning.
Broadcast Burn - standard methods of broadcast burning.
Machine Pile - the slash is piled with cats or tractors and then burned.
Clean Logging - culls and tops are pulled or swung to landing, piled and burned.

Consideration for Management Practices

This column provides some consideration for management practices which best protect the soil and water resource. These considerations, which are directed toward the highest level of multiple use management, provide additional information that may apply to a particular mapping unit.

(a) do not log - excessive potential damage to soil resource, leave as protection forest.
(b) do not log - low capability, leave as protection forest
(c) winter log
(d) skid across slope to minimize erosion
(e) alpine - no commercial trees
(f) no special consideration

Table 59. Forestry Interpretations

SOIL ASSOCIATION	CAPABILITY CLASSES	PERCENT SLOPE	WIND-THROW HAZARD	PLANT COMPETT-TION	REGENER-ATION POTENTIAL	LIMITS TO REGENERATION	SPECIES TO PLANT	NATURAL REGENER-ATION	SOIL DAMAGE BY HARVESTING	TYPE OF DAMAGE	SLASH DISPOSAL	CONSIDERATION FOR MANAGEMENT PRACTICES
Alix	5M 4M	<30	L	L	L	coarse textured-limits fertility, droughty	lP	lP	L	loss of organic matter, mixing of surface	no treatment	no special consideration
Babine	3D	<30	H	H	H	frost heaving	wS,lP	wS,lP, bCo	H	damage to soils from loss of structure, compaction increased erosion and and stream siltation	broadcast burn	winter log, skid trails across the slope
Barrett	4M D 3S	<30	H	L	M	some frost heaving	lP,wS,	lP,wS, tA	L	some loss of soil structure and compaction stream sedimentation	broadcast burn	no special consideration
Berman	4M	<30	H	H	M	frost heaving	lP,wS	lP,tA	H	loss of soil structure, increased compaction, erosion and stream siltation	clean logging	winter log
Causqua	4M D 3S 2S	>30	H	M-H	H	N/A	wS,lP	wS,lP	H	road waste damage to resources, soil damage from skidding, stream sedimentation, increased slide hazard	clean logging	skid across slope
Cobb	3M 4M	<30	L	L	M	soil moisture limitations	lP,wS	lP	L	N/A	no treatment	no special consideration
Cronin	7C R	<30	N/A	N/A	N/A	high elevation -climatic	N/A	N/A	N/A	N/A	N/A	alpine-no commercial trees
Crystal	4M	<30	L	L	M	soil moisture limitations	lP,wS	lP	L	N/A	no treatment	no special consideration
Dahl	4R M	<60	H	L	L	shallow soils, rocky, soil moisture limitations	lP	lP	H	loss of soil resource from skidding and erosion	no treatment	do not harvest or winter log
Decker	4M R 5R M	<60	H	L	L	shallow soils, rocky, soil moisture limitations	lP	lP	H	loss of soil resource from skidding and erosion	no treatment	do not harvest or winter log
Deserters	3S 2S	<30	H	M-H	H-M	soil moisture limitations some frost heaving	lP,wS	lP,wS	L	stream sedimentation	broadcast burn	no special consideration
Dragon	4M R 5R H	<60	H	L	L	shallow soils, rocky, soil moisture limitations	lP,wS	lP,wS alF	H	loss of soil resource from skidding and erosion	no treatment	do not harvest or winter log
Driftwood	5M D	<30	H	L	L	soil moisture limitations, some frost heaving	lP	tA,lP	H	some loss of soil structure and compaction	broadcast burn	no special consideration
Hagwilget	1 3M	<30	L	H-M	H	N/A	wS,wH	wS,lP, wH,aF	L	N/A	broadcast burn	no special consideration
Kispiox	3M 4H 2S	>30	M	M	M-H	soil moisture limitations, surface slides	wS,lP, wH	wS,lP, alF,wH, wC	H	road waste damage to resources, increased mass movement potential	clean logging	skid across slope

Table 59. (Cont'd)

SOIL ASSOCIATION	CAPABILITY CLASSES	PERCENT SLOPE	WIND-THROW HAZARD	PLANT COMPETI-TION	REGENER-ATION POTENTIAL	LIMITS TO REGENERATION	SPECIES TO PLANT	NATURAL REGENER-ATION	SOIL DAMAGE BY HARVESTING	TYPE OF DAMAGE	SLASH DISPOSAL	CONSIDERATION FOR MANAGEMENT PRACTICES
Kitseguecla	3M	<30	L	L	M	soil moisture limitations	lP,wS,	lP,wS, tA	L	increased erosion, loss of soil organic matter	no treatment	no special consideration
Kitsuns	4M R 5R M	<60	M-H	L	L-M	shallow soils, rocky, soil moisture limitations	lP,wS	lP,wS	M-H	loss of soil resource from skidding and erosion	no treatment	do not harvest or winter log
Kitwanga	3M 2S	<30	M	M	M	soil moisture limitations	wS,lP	wS,lP, wH,wC	L	N/A	clean logging	no special consideration
Kwun	2S 3S	<30	M	M	M	some frost heaving	wS,lP, wH	wS,lP, wH,aF, wC	M	some loss of soil structure and increased compaction and erosion, stream sedimentation	broadcast burn	no special consideration
Mapes	4M	<30	L	L	M	soil moisture limitations, coarse textured -limits fertility	lP,wS	lP,wS, tA	L	loss of soil organic matter, mixing of surface	no treatment	no special consideration
Morice	4M 5M	<30	L	L-M	L-M	coarse textured -limits fertility, droughty to soil moisture limitations	lP,wS	lP,wS, alF	L	loss of soil organic matter, mixing of surface	no treatment	no special consideration
Moricetown	4M	<30	L	L	M	soil moisture limitations, coarse textured -limits fertility	lP,wS	lP,wS	L	loss of soil organic matter, mixing of surface	no treatment	no special consideration
Natlan	4M R 5R M	<60	M	L	L	shallow soils rocky, soil moisture limitation	lP,alF	lP,alF, wS	M	loss of soil resource from skidding and erosion	no treatment	do not harvest or winte log
Nechako	3M 4M	<30	L	M	M-M	N/A	bCo,wS	bCo,wS, lP	L	stream sedimentation	clean log	no special consideration
Ocna	4M R 5R M	<60	M-M	L	L-M	shallow soils, rocky, soil moisture limitations	lP,alF	lP,alF, wS	M-M	loss of soil resource from skidding and erosion	no treatment	do not harvest or winter log
Ormond	5R M 4M R	<60	M	L	L	shallow soils, rocky, soil moisture limitations	lP	lP,wS	M	loss of soil resource from skidding and erosion	no treatment	do not harvest of winter log
Pata	4M	<30	L	L	M	soil moisture limitations, coarse textured -limits fertility	lP,wS	lP,wS, wH,wC	L	loss of soil organic matter, mixing of surface	no treatment	no special consideration
Pinkut	4M	>30	M	L	M	soil moisture limitations, surface slides	lP	lP,tA	M	road waste damage to resources, increased mass movement potential	clean log	skid across slope
Prairiedale	5D M 4M D	<30	M	L	L-M	frost heaving	lP,tA	lP,tA	M	loss of soil structure, increased com-paction and stream siltation	clean log	winter log

Table 59. (Cont'd)

SOIL ASSOCIATION	CAPABILITY CLASSES	PERCENT SLOPE	WIND-THROW HAZARD	PLANT COMPETI-TION	REGENER-ATION POTENTIAL	LIMITS TO REGENERATION	SPECIES TO PLANT	NATURAL REGENER-ATION	SOIL DAMAGE BY HARVESTING	TYPE OF DAMAGE	SLASH DISPOSAL	CONSIDERATION FOR MANAGEMENT PRACTICES
Ramsey	4M	<30	L	L	M	coarse textured -limits fertility, droughty	1P,wS	1P,wS	L	loss of organic matter, mixing of surface	no treatment	no special consideration
Roaring	5M	<60	L-M	L	L	coarse textured -limits fertility, droughty	1P,wS	1P,wS	L-M	loss of organic matter, mixing of surface road construction and skidding damage	no treatment	limit skid roads no special consideration
Saunders	5H 4H	>30	H	L	L	high elevations -climatic frost heaving	alF,wS	alF,wS	H	road waste damage to resources, increased mass movement potential		
Savory	5H 6H	<30	L	L	L	high elevations -climatic, soil moisture limitations	alF,wS	alF,wS	L	N/A	clean log	do not log
Shass	7C R	<60	N/A	N/A	N/A	high elevations climatic, shallow soils, rocky	N/A	N/A	N/A	N/A	N/A	alpine-no commercial trees
Shegunia	3M 2S	<30	L-M	M	M	soil moisture limitations	wS,wM, 1P	wH,wS, 1P,wC	L	some loss of soil organic matter	no treatment to broad-cast burn	no special consideration
Sidina	7C P	>30	N/A	N/A	N/A	high elevations -climatic, rocky	N/A	N/A	N/A	N/A	N/A	alpine-no commercial trees
Skeena	2S 3S 1	>30	M	M-H	M	N/A	wS,1P, wH	wH,wC, wS,1P	M	road waste damage to resources, soil damage from skidding, increased slide hazard, stream sedimentation	clean log	skid across slope
Skins	5M R 4M M	<60	M-M	L	L-M	high elevations -climatic shallow soils, rocky	alF,wS	alF,wS	M-M	loss of soil resource from skidding and erosion	no treatment	do not log
Slug	4M 3M 2S	<30	L	M-L	M	coarse textured -limits fertility,soil moisture limitations	wS,1P, wH	wS,1P wH,wC alP	L	loss of soil organic matter	no treatment	no special consideration
Snodgrass	5M 6A M	<30	L	L	L	droughty, low elevations-climatic, coarse textured -limits fertility	1P	1P,tA	L	N/A	no treatment	do not log
Stellako	2S 3M 1	<30	L	M	M	N/A	bCo,wS	bCo,wS, wH,wC	L	stream sedimentation	clean log	no special consideration
Suskwa	3M 2S	<30	L	M	M	soil moisture limitations	wS,1P, wH	wH,wC, wS,1P	L	N/A	broadcast burn	no special consideration
Tatin	3S 4H 2S	>30	M	M-L	M-M	frost heaving, high elevations -climatic	wS,1P, alP	alF,wS, 1P	M-M	road waste damage to resources, road construction damage, soil damage from skidding, increased mass movement potential, stream siltation	clean log	skid across slope winter log

Table 59. (Cont'd)

SOIL ASSOCIATION	CAPABILITY CLASSES	PERCENT SLOPE	WIND-THROW HAZARD	PLANT COMPETI-TION	REGENER-ATION POTENTIAL	LIMITS TO REGENERATION	SPECIES NATURAL TO PLANT	REGENER-ATION	SOIL DAMAGE BY HARVESTING	TYPE OF DAMAGE	SLASH DISPOSAL	CONSIDERATION FOR MANAGEMENT PRACTICES
Tiltusha	3M 2S	<30	L	M	M	N/A	bCo,wS,wH	bCo,wS,wH,wC	L	stream sedimentation	clean log	no special consideration
Twain	3S 4M 2S	<30	M	M	M-M	frost heaving high elevations -climatic	wS,1P	wS,1P alF	M	loss of soil structure, increased compaction, increased erosion, stream siltation	clean log	winter log
Utsun	4M R 5R M	<60	M-M	L	L-M	shallow soils, rocky, soil moisture limitations	wS,1P, wH	wS,wH, wC,1P	M-M	loss of soil resource from skidding and erosion	no treatment	do not harvest or winter log
Vanderhoof	4D M	<30	M	L	M	frost heave	1P,wS	1P,wS, tA	M	loss of soil structure, increased compaction, increased erosion, stream siltation	clean log	winter log
Windfall	3M 4M	>30	M	L	M	soil moisture limitations, surface slides	wS,1P	wS,1P alF	M	road waste damage to resources, increased mass movement potential	clean log	skid across slope
Organic	7W	<30	M	L	L	excess soil moistures	bS	bS,wS	L	N/A	no treatment	do not log
Bedrock	7R	<60	N/A	N/A	N/A	high elevations -climatic, rocky	N/A	N/A	N/A	N/A	N/A	alpine-no commercial trees

FISH AND WILDLIFE

The following section indicates some of the more important soil-climate-vegetation interrelationships which effect fish and wildlife in the area:

Fisheries

Table 60. Sedimentation Yield Potential

This interpretation indicates the potential for water sedimentation and pollution from silt and clay particles carried in suspension following timber harvest, road construction, or other activities. Factors considered in making ratings are soil texture and structure, drainage patterns, landform and climate.

Low - Sedimentation levels of silt and clay particles are not expected to be significant following management activities. Soils are generally moderately coarse-textured.
* AX, CB, CR, H, KA, DL, DR, DN, MS, M, MT, ON, PA, R, RG, SY, SH, SA, SK, SG, SO, SW, UN, O.

Moderate - Sedimentation levels of silt and clay particles may be significantly increased following management activities with moderate loss of water quality and damage to fisheries. Soils are generally medium textured.
BA, CA, DD, H, KX, KS, KT, NA, OD, PT, SD, SS, SG, ***SL, TA, ***WL.

High - Sedimentation levels of silt and clay particles are expected to be high following management activities. Streams become turbid and there is considerable loss of water quality and damage to fisheries. Soils are generally fine to moderately fine textured.
BE, BN, CN, D, H, KN, N, PR, **SN, TT, TW, V.

UNGULATES

Table 61, titled "Ungulate Use" indicates the common indicator vegetation, its succession status and the chances of useful seral stages occurring (good, medium and poor) for the ungulate species indicated. Indicator vegetation is the most common vegetation combination occurring at the successional stage indicated.

Remarks indicate some of the more important physical characteristics of the various map units related to ungulate habitat.

* Soil map symbol
** Very high
*** Lateral streambank erosion can be a problem

Table 61. Ungulate (Moose, Deer, Caribou, Goat) Use

SOIL MAP SYMBOL	ANIMAL HABITAT TYPES (VEGETATION-SOIL-CLIMATE) INDICATOR VEGETATION (TENTATIVE ONLY)	SUCCESSION STAGES	CHANCES OF USEFUL SERAL VEGETATION OCCURRING	UNGULATE SPECIES	REMARKS
AX	lodgepole pine-squashberry-pink peavine	early seral, light fire disturbance	poor	moose, deer	shallow snow depths, valley terraces with low moisture holding capacities.
BE	spruce-squashberry-sarsaparilla-pink wintergreen	advanced fire seral with climax species	medium	moose, deer	variable soil moisture status.
BA1-4	lodgepole pine-squashberry-pink peavine	early seral, light fire disturbance	medium	moose, deer	variable soil moisture status.
BA5-6	spruce-squashberry-sarsaparilla-pink wintergreen	advanced fire seral with climax species	medium to good	moose	moist sites.
BA7	trembling aspen-rose-pinegrass	early seral, heavily disturbed	good	moose, deer	significant component of high capability winter range, steep exposed slopes common.
BN*	spruce-squashberry-sarsaparilla-showy aster	medium seral, heavily disturbed	good	moose, deer	shallow snow depths, abundance of food plants and cover.
CA1-4	spruce-squashberry-blueberry-feathermoss	seral, some climax species	good to medium	moose, deer	high probability of browse species over long periods of time.
CA6*	spruce-squashberry-sarsaparilla-pink wintergreen	advanced fire seral with climax species	good	moose, deer	high probability of browse species over long periods of time, (moist sites conducive to long term browse species production).
CA7*	trembling aspen-rose-pinegrass	early seral, heavily disturbed	good	moose, deer	high probability of browse species over long periods of time, (moist sites conducive to long term browse species production).
CB*	lodgepole pine-squashberry-pink peavine	early seral, light fire disturbance	poor to medium	moose, deer	wide variety of vegetation at various successional stages could be expected, snow depth limiting.
CN*	alpine fescue-lichen	climax	good	caribou, goat	high elevation alpine, some wind swept slopes, snow depths limiting.
CR	lodgepole pine-squashberry-pink peavine	early seral, light fire disturbance	poor	moose, deer	as for CB with shallower snow depths and more land use competition.
DL	bluegrass-aspen	early seral, heavily disturbed	good	moose, deer	exposed slopes and sharp forest-open-land vegetation transitions, associated rock outcrops.
DR*	lodgepole pine-squashberry-pink peavine	early seral, light fire disturbance	poor	moose, deer	small units, part of escape terrain.
D1-4	spruce-arnica-queen's cup-feathermoss	climax	good	moose, deer	after fire or logging a wide range of food plants and cover, but trend toward closed stands and reduced shrub and understory cover.
D5	alpine fir-blueberry-dwarf rubus-feathermoss	climax	medium to poor	moose, deer	trend toward closed stands more rapid
D6*	spruce-squashberry-oakfern-cow parsnip	climax	good	moose, deer	moist sites longer term shrub cover
D7*	trembling aspen-rose-pinegrass	early seral	good to medium	moose, deer	moist sites longer term shrub cover
DN*	alpine fir-blueberry-false hellebore-liverwort	climax	poor	moose, caribou	deep snow, part of escape terrain, associated rock outcrops
DD*	trembling aspen-rose-pinegrass-	early seral heavily disturbed	good	moose, deer	high capability winter range-abundant shrub cover, shallow snow depths.
H1,2	hemlock-blueberry-bunchberry-layered moss, birch, aralia-squashberry-3 flowered bedstraw	climax early seral	good	moose, deer	wide range of browse species due to drainage variability.
H3,4,5	hemlock-devils club-lady fern-birch-aralia-squashberry-3 flowered bedstraw	climax early seral	good	moose, deer	long term probability of browse specie due to soil variability.
KX	hemlock-blueberry-bunchberry-layered moss	climax	poor	moose, goat, deer	generally unsuitable except as escape terrain.
KS*	bluegrass-aspen	seral	good	moose, deer	small units, but suitable habitat.
KA	spruce-squashberry-sarsaparilla-showy aster birch-aralia-squashberry-3 flowered bedstraw	medium seral, intensive disturbance, some climax species, seral	good	moose, deer	small area of excellent wintering habitat (abundant browse, shallow snow depths).
KT	hemlock-blueberry-bunchberry-layered moss	climax	medium to poor	moose, deer	useful habitat for short periods after fire or logging.
KN	hemlock-blueberry-bunchberry-layered moss	climax	poor to medium	moose, deer	vegetation successional stages suitabl for most wildlife habitats likely shor -lived.

Table 61. (Cont'd)

SOIL MAP SYMBOL	ANIMAL HABITAT TYPES (VEGETATION-SOIL-CLIMATE) INDICATOR VEGETATION (TENTATIVE ONLY)	SUCCESSION STAGES	CHANCES OF USEFUL SERAL VEGETATION OCCURRING	UNGULATE SPECIES	REMARKS
MS*	lodgepole pine-squashberry-pink peavine	early seral, light fire disturbance	poor	moose, deer	droughty, shallow snow depths.
M	spruce-arnica-queen's cup-feathermoss	climax (higher elevation)			droughty, little browse.
	lodgepole pine-squashberry-pink peavine	seral (fire disturbance)	poor	moose, deer	
MT	spruce-squashberry-sarsaparilla-showy aster	medium seral some climax species			small area of suitable habitats during vegetation successional stage immediately following fire.
	birch-aralia-squashberry-3 flowered bedstraw	seral	medium	moose, deer	
NA	hemlock-blueberry-bunchberry-layered moss	climax	poor	moose, goat, caribou	associated rock outcrops, escape terrain, limited summer range.
N*	trembling aspen-rose-pinegrass	seral	medium	moose, deer	no significant acreage.
ON	alpine fir-blueberry-false hellebore-liverwort	climax	poor	moose, goat, caribou	associated rock outcrops, escape terrain, limited summer range.
OD*	trembling aspen-rose-pinegrass	seral (fire disturbance)	good	moose, deer	high capability winter range, exposed slopes, associated rock outcrops common.
PR*	trembling aspen-rose-pinegrass	seral (fire disturbance)	good	moose, deer	almost all cultivated-small acreage.
PT*	trembling aspen-rose-pinegrass	seral (fire disturbance)	good	moose, deer	exposed steep slopes, excellent habitat common.
PA*	lodgepole pine-squashberry-pink peavine	early seral (light fire disturbance	poor	moose, deer	shallow snow depths, valley terraces with low moisture holding capacities.
R	lodgepole pine-common moss	seral	poor	moose, deer	movement corridors along streams.
RG*	lodgepole pine-squashberry-pink peavine	early seral	poor	moose, deer	generally unsuitable.
SD1*	alpine fir-blueberry-dwarf rubus-feather moss	climax	medium to poor	moose, caribou, deer	high elevation next to alpine, snow depth limitations.
SD2,*3	krummholz-false hellebore-valerian	climax	good to medium	moose, caribou, deer	excellent habitat for summer range (browse very abundant).
SY*	krummholz-false hellebore-valerian	climax	good to medium	moose, caribou	suitable as part of summer range, high elevation.
SB	alpine fescue-lichen	climax	good to medium	caribou, goat, moose	windswept alpine ridges and slopes, rock outcrop associated.
SH	hemlock-blueberry-bunchberry-layered moss	climax	poor	moose, deer	generally unsuitable, regeneration to conifers rapid.
	birch-aralia-squashberry-3 flowered bedstraw	seral			
SA	unavailable	unavailable	medium	goat	high elevation talus slopes associated with rock outcrop.
SN	hemlock-blueberry-oakfern-layered moss	climax	poor	moose, deer	useful successional stage very short.
SK	krummholz-false hellebore-valerian				
	alpine fir-blueberry-false hellebore-liverwort	climax	medium	moose, caribou	escape cover as part of alpine habitat
SG1-3	lodgepole pine-common moss	seral (fire disturbance)	poor to medium	moose, deer	wide range of habitat type.
SG4,5	spruce-squashberry-oakfern-cow parsnip	climax	poor	moose, deer	browse species abundant over longer period of time.
SO*	bluegrass-aspen	seral	medium	moose, deer	early spring greening on exposed slope
SL1,3*	trembling aspen-rose-pinegrass	seral	good	moose, deer	very high capability winter range, shallow snow depths.
SL2	unavailable	unavailable	good	moose, deer	moist sites, shallow snow depths.
SW	hemlock-blueberry-oakfern-layered moss	climax	poor	moose, deer	unsuitable, regeneration to conifers rapid.
TT1,2	alpine fir-blueberry-dwarf rubus-feathermoss	climax	poor	moose, deer	generally unsuitable, except for short periods after logging or fire.
TT3	alpine fir-blueberry-foam flower-feathermoss	climax	medium	moose	excellent summer habitat
TA1,3	trembling aspen-rose-pinegrass	seral	good	moose, deer	shrub cover abundant, high capability although tendency to regenerate to conifers.
TA2	unavailable	unavailable	good	moose, deer	moist sites, very high capability winter range.

Table 61. (Cont'd)

SOIL MAP SYMBOL	ANIMAL HABITAT TYPES (VEGETATION-SOIL-CLIMATE) INDICATOR VEGETATION (TENTATIVE ONLY)	SUCCESSION STAGES	CHANCES OF USEFUL SERAL VEGETATION OCCURRING	UNGULATE SPECIES	REMARKS
TW1-5	alpine fir-blueberry-dwarf rubus-feathermoss	climax	poor	moose, deer	habitat usually short lived, rapid regeneration to conifers.
TW6	spruce-arnica-queen's cup-feathermoss	climax	poor	moose, deer	useful browse on these moist sites.
UN	lodgepole pine-common moss	seral (infrequent fire disturbance)	poor	moose, goat	associated rock outcrops, escape terrain, limited summer range.
V1,2	lodgepole pine-squashberry-pink peavine	early seral	medium	moose, deer	variable soil moisture status.
V3	spruce-squashberry-sarsaparilla-pink wintergreen	advanced fire seral	medium	moose, deer	long term browse on these moist sites.
WL1,2,4	spruce-arnica-queen's cup-feathermoss	climax	medium to poor	moose, deer	short term usefulness after fire.
WL3	lodgepole pine-squashberry-pink peavine	early seral	poor	goat, moose	very steep slopes.
O1,2	black spruce-horsetail-sphagnum moss	climax	variable	moose	important component of moose habitat (variable abundance of browse species).

* No data available, extrapolated from closest association.

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APPENDIX I

Descriptions and Analyses of Soil Profiles

Analytical Methods

pH measurements were made on 1:1 soil:water suspensions for mineral soils, and 1:5 soil:water suspensions for organic soils (5). pH was also determined using a 1:5 soil : M/100 $CaCl_2$ solution (4) modified by shaking one half hour instead of 5 days. An 1L 245 pH meter and a combination electrode was used for all pH measurements. Soil organic matter was determined by the wet combustion method as described by Grewelling and Peach (5).

Total nitrogen was determined using the method described by Bremner (3). Laverty's method (8) modified by John (6) was used to determine acid soluble and available phosphorus. Color development was made following John's (7) procedure.

Exchange capacity was determined using the method described by Peach (12). The ammonium acetate extract was analysed for exchangeable cations using a Techtron AA4 atomic absorption spectrophotometer. Oxalate Extractable Iron and Aluminum were determined using the method of McKeague and Day (10) and Pyrophosphate iron and aluminum were determined following procedures described by McKeague (11) and Bascomb (2).

Sulphur analyses were made following the procedure of Bardsley and Lancaster (1). Manganese values were obtained by analysing the extract from 1:5 soil. Calcium chloride suspensions used for pH determination.

The perchloric-nitric acid digestion for copper and zinc were made following the procedure of Lundbland (12) and analyses were made using a Techtron AA4 atomic absorption spectrophotometer.

(1) SULPHUR

Bardsley, C. E., and J. D. Lancaster. Determination of reserve sulphur and soluble sulphates in soils. Soil Science Society of America Proceedings. Vol. 24, No. 4, 1960.

(2) PYROPHOSPHATE IRON AND ALUMINUM

Bascomb, C. L. Distribution of pyrophosphate extractable iron and organic carbon in soils of various groups. J. Soil Science. Vol. 19, No. 2, pp 251-268. 1958.

(3) NITROGEN

Bremner, J. M. Determination of nitrogen in the soil by the Kjeldahl method. Journal of Agricultural Science. Vol. 55, No. 1, 1960.

(4) pH 1:5 CALCIUM CHLORIDE

Clark, J. S., The extraction of exchangeable cations from soils. Canadian Journal of Soil Science. Vol. 45, No. 3, pp 322, 1965. Modified by shaking for one half hour.

(5) pH 1:1 ORGANIC MATTER

Grewelling, Thomas and Micheal Peach. Chemical soil tests. Cornell Experiment Station Bulletin 960. New York State College of Agriculture, Ithaca, New York.

(6) PHOSPHORUS

John, M. K. Soil Analysis procedure in use in Kelowna for determination of available phosphorus. British Columbia Department of Agriculture, Kelowna, B. C. 1963.

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McKeague, J. A., and J. H. Day. Dithionite and oxalate-extractable Fe and Al as aids in differentiating various classes of soils. Canadian Journal of Soil Science. Vol. 46, No. 1, pp 13-22. 1966.

(11) PYROPHOSPHATE FE AND AL

McKeague, J. A. An evaluation of 0.1 M pyrophosphate and pyrophosphate-dithionite in comparison with oxalate as extractants of the accumulation products in Podzols and some other soils. Canadian Journal of Soil Science. Vol. 47, No. 1. pp 95-99. Modified by analysing the extracts using a Techtron AA4 atomic absorption spectrophotometer.

(12) CATION EXCHANGE CAPACITY AND EXCHANGEABLE CATIONS

Peach, M., L. T. Alexander, L. A. Dean, and J. F. Reed. Methods of soil analysis for soil fertility investigation. U. S. D. A. Circular No. 757. Washington, D. C. 1957.

Total phosphorus was analyzed using the digestion procedure of Lundblad (9) and the color development procedure described by John (7).

MANGANESE

The centrifugate from the 1:5 soil calcium chloride solution used for pH measurement was analyzed for manganese using the Techtron AA4 Atomic Absorption Spectrophotometer.

LOCATION: 124° 08'W/54° 08'

SOIL NAME: Alix

CLASSIFICATION: Orthic Dystric Brunisol

PARENT MATERIAL: Gravelly glaciofluvial deposits

DRAINAGE: Rapidly drained

Profile Description:

ELEVATION: 2650 feet

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	1-0					Abundant		Raw to decomposed forest litter
Bm	0-7	10YR5/4 D 7.5YR4/4 M	Sandy loam	Weak fine to medium subangular blocky	Very friable	Abundant		
BC	7-11	10YR6/3 D 4/4 M	Gravelly sandy loam	Weak fine subangular blocky	Very friable	Abundant		
II C1	11-20	Variegated	Sandy fine gravel	Single-grained	Loose	Common		
II C2	20+	Variegated	Sandy fine gravel	Single-grained	Loose	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
67/268	L-H	1-0	11:11	4.7	4.1	99.0	1.52	37.69	21.22	6.44	0.07	3.00	30.73	75.42	36.7	-	-			60.0	136.1									
269	Bm	0-7	2:46	5.9	4.9	1.8	0.10	10.6	1.49	0.20	0.01	0.14	1.84	9.02	19.9	0.71	0.66			115.3	276.6	3.8	13.6	79.4						
270	BC	7-11	1:42	6.2	5.0	-	-	-	1.93	0.20	0.01	0.15	2.29	5.95	38.0	0.55	0.40			145.6	227.0	1.7	20.0	79.9						
271	II C1	11-20	1:31	6.0	5.1	-	-	-	2.94	0.51	0.01	0.14	3.60	5.66	62.8	0.30	0.19			19.8	50.7	1.5	22.5	42.8						
272	II C2	20+	1:11	6.0	5.1	-	-	-	3.03	0.71	0.01	0.17	3.92	5.90	65.7					8.6	24.8	1.5	23.8	42.7						

LOCATION: 124° 01'W/53° 49'N

Profile Description:

SOIL NAME: Alix

PARENT MATERIAL: Gravelly glaciofluvial deposits

ELEVATION: 3300 feet

CLASSIFICATION: Degraded Dystric Brunisol

DRAINAGE: Rapidly drained

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	2-0					Abundant		Raw to decomposed forest litter
Ae	0-½	10YR7/1 D 6/1 M	Gravelly loamy sand	Single-grained	Soft	Abundant		
Bm	½-6	10YR5/4 D 7.5YR4/4 M	Gravelly loamy sand	Weak fine subangular blocky	Soft	Abundant		
CB	6-11	2.5Y5/4 D 2.5Y4/4 M	Gravelly sand	Single-grained	Loose	Common		
C	11-19	10YR5/2 D 4/2 M	Gravelly sand	Single-grained	Loose	Occasional		
II C	19+	Variegated	Stony sandy gravel	Single-grained	Very weakly cemented	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT C
66/301	L-H	1-0	16.69	4.6	4.1	104.83	1.17	35.5	8.75	2.17	0.12	1.33	12.37	105.19	11.65	-	-			-		-								
302	Ae	0-½	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
303	Bm	½-6	2.72	5.7	4.9	2.38	0.05	31.5	1.03	0.30	0.04	0.10	1.47	10.37	14.18	0.77	1.06			160.21		6.2								
304	CB	6-11	1.21	6.0	4.9	1.84	0.02	28.4	1.19	0.38	0.04	0.10	1.71	6.48	26.39	1.26	0.52			157.9		3.0								
305	C	11-19	0.96	6.1	5.0				1.19	0.40	0.04	0.10	1.73	5.50	31.45	0.56	0.43			63.8		3.3								
306	II C	19+	0.81	6.1	5.0				1.19	0.55	0.05	0.15	2.74	6.20	44.19					33.3		3.0								

LOCATION: 125° 39'/54°29'

Profile Description:

SOIL NAME: Babine

PARENT MATERIAL: Lacustrine clay overlying till

ELEVATION: 2500 feet

CLASSIFICATION: Orthic Gray Wooded

DRAINAGE: Well to moderately well drained

SLOPE & ASPECT: NE 4%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	2-0					Abundant		
Ae	0-2	10YR6/2 D 4/3 M	Clay loam	Moderate medium platy	Hard	Abundant		
AB	2-5	10YR7/2 D 4/3 M	Silty clay to silty clay loam	Moderate coarse platy to moderate medium angular blocky	Very hard	Abundant		
Bt1	5-14	10YR6/2 D 4/2 M	Clay-heavy clay	Strong coarse prismatic	Very firm	Common	Few fine faint	Many clay skins;coatings along cracks
Bt2	14-23	10YR6/2 D 4/2 M	Clay-heavy clay	Strong coarse prismatic	Very firm	Occasional	Few fine faint	Many clay skins;coatings along cracks
C	23-27	10YR6/3 D 4/3 M	Silt loam (silty clay loam)	Stratified	Friable	Occasional		
IIC	27+	10YR5/3 D 4/3 M	Clay loam till	Pseudoplaty	Extremely firm	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	pH 1:1 H_2O	pH 0.01M $CaCl_2$	OM	N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
353A	LH	2-0	12.87		6.18	94.83	0.950	57.91												108.8	186.2	71.11									
B	Ae	0-2	1.73	6.2	5.74	3.37	0.107	18.27	8.80	2.43	0.04	1.98	12.25	18.74	65.37					233.9	317.4	3.31				12.0		1.50	49.74	48.76	6.10
C	AB	2-5	1.52	5.7	5.08	2.68	0.087	17.82	6.90	2.74	0.04	0.81	10.49	15.59	67.29					40.61	81.22	2.28				9.39		0.54	46.49	52.97	8.75
D	Bt1	5-14	2.25	5.8	5.14	1.29	0.075	10.00	12.07	4.67	2.17	0.32	19.23	19.12	100					2.05	5.12	2.30				2.81		1.77	38.23	60.00	20.35
E	Bt2	14-23	2.35	5.6	4.82	1.29	0.073	10.25	13.00	6.08	0.23	0.24	19.55	22.46	87.04					2.05	19.25	10.24				1.54		0.43	43.99	55.58	17.85
F	C	23-27	1.63	5.7	4.99				8.13	3.90	0.24	0.13	12.40	13.27	93.44					2.54	142.2	17.79				1.02		38.30	33.63	28.07	14.54
G	IIC	27+	1.94	6.4	6.02				10.50	5.55	0.32	0.18	16.55	16.06	100					2.04	91.7	7.39				1.53					

LOCATION: 125° 44'W/54° 17'N

Profile Description:

SOIL NAME: Barrett

PARENT MATERIAL: Basal till

ELEVATION: 3100 feet

CLASSIFICATION: Orthic Gray Wooded

DRAINAGE: Moderately well drained

SLOPE & ASPECT: S 18%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0							
Ael	0-5	10YR7/2 D 45/2 M	Gravelly loam	Moderate coarse platy in upper part and fine subangular blocky in lower part	Friable	Abundant		
Ae2	5-10	10YR7/2 D 45/3 M	Gravelly loam	Moderate fine to medium subangular blocky	Friable	Abundant		
ABgj	10-13	10YR6.5/2 D 4.5/3 M	Gravelly loam to gravelly clay loam	Moderate fine to medium subangular blocky	Firm	Abundant	Few fine faint	
Btgj1	13-16	10YR6/3 D 3.5/3 M	Gravelly clay loam	Moderate fine to medium subangular blocky	Firm	Common	Few fine distinct mottles	
Btgj2	16-20	10YR5/3 D 3.5/4 M	Gravelly clay loam	Moderate medium angular blocky	Firm	Occasional	Few fine faint	Common clay skins
BC1	20-27	10YR5.5/3 D 3.5/4 M	Gravelly clay loam	Moderate medium angular blocky	Firm	Occasional		Some clay skins and/or coatings
BC2	27-34	10YR5/3 D 3.5/3 M	Gravelly clay loam	Moderate, medium subangular blocky to pseudoplaty	Firm	Occasional		Some clay skins and/or coatings
C1	34-42	10YR5.5/3 D 3.5/3 M	Gravelly loam to gravelly clay loam	Pseudoplaty	Very firm	Occasional		Organic coating along cracks
C2	42+	10YR5.5/3 D 3.5/4 M	Gravelly loam to gravelly clay loam till	Pseudoplaty	Very firm	None		Organic coating along cracks

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/579	L-H	1-0	11.11	4.3	3.93	112.54	1.222	53.42	24.94	5.39	0.17	2.22	32.72	16.01	28.20					57.8	74.4	63.33	8.06	72.22							
580	Ael	0-5	1.01	6.0	5.16	1.06	0.043	14.19	3.79	1.29	0.08	0.18	5.34	9.23	57.85					24.3	67.4	4.55	10.35	69.94			46.42	40.22	13.36	7.46
581	Ae2	5-10	1.32	5.9	5.10	0.81	0.033	14.24	4.71	1.73	0.08	0.16	6.68	10.44	63.98					18.2	118.0	3.55	11.91	51.42							
582	ABgj	10-13	2.56	6.0	5.00	0.63	0.035	10.57	9.49	3.65	0.11	0.29	13.54	18.12	74.72					13.5	130.2	4.36	11.54	56.41							
583	Btgj1	13-16	3.63	6.0	4.99	0.78	0.036	12.50	12.69	5.37	0.17	0.39	18.62	25.56	72.85					10.4	111.4	6.48	28.24	63.47			27.42	39.39	33.19	11.70
584	Btgj2	16-20	3.73	6.2	5.17	0.78	0.033	13.64	16.08	6.67	0.22	0.43	23.40	28.87	81.05					8.8	119.2	4.67	32.16	65.61			27.63	37.44	34.93	14.54
585	BC1	20-27	3.63	6.7	5.80	0.57	0.024	13.75	16.32	6.66	0.22	0.35	23.55	27.53	85.39					3.3	191.7	6.48	33.42	69.43			29.36	40.69	29.95	12.54
586	BC2	27-34	3.41	7.4	6.19															3.1	253.4	6.46	32.32	67.22			31.75	39.49	28.76	11.83
587	C1	34-42	3.09	7.5	6.38															2.9	273.2	4.38	31.96	70.87			32.26	39.20	28.54	12.57
588	C2	42+	1.21	7.8	6.70															3.2	278.3	3.04	30.87	71.89			31.69	39.96	28.35	12.20

LOCATION: 125° 45'W/54° 17'N

SOIL NAME: Barrett

CLASSIFICATION: Rego Humic Gleysol

PARENT MATERIAL: Basal till

DRAINAGE: Poorly drained

Profile Description:

ELEVATION: 2950 feet

SLOPE & ASPECT: In depression

HORIZON	DEPTH IN – CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
Om	14-6					Abundant		
Oh	6-0					Abundant		
Ah	0-5	10YR2/1 M	Loam	Massive	Sticky	Common		
ACg1	5-9	2.5Y/4.5 M	Gravelly loam to gravelly clay loam	Massive	Plastic	Occasional	Common medium distinct 7.5YR4/4 M	Thin Ah inter-layers
ACg2	9-15	2.5Y5/2 M	Gravelly loam to gravelly clay loam	Massive	Plastic	None	Many medium distinct 10YR4/4 M	Thin Ah inter-layers
Cg1	15-21	2.5Y5/2 M	Gravelly loam	Massive	Slightly plastic	None	Many fine faint 7.5YR5/6 M	
Cg2	21-23	2.5Y5/2 M	Gravelly loam to gravelly sandy loam	Massive	Slightly plastic	None	Common fine faint 10YR5/4 M	
Cg3	23-30	2.5Y5/2 M	Gravelly loam	Massive	Slightly plastic	None	Common fine faint 10YR5/4 M	
Cg 4	30+	2.5Y5/2 M	Gravelly loam to gravelly clay loam	Massive	Slightly plastic	None	Common fine faint 10YR5/5 M	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE Fe %	OXALATE Al %	PYROPHOS Fe %	PYROPHOS Al %	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/224	Om	14-6	17.65	6.0	5.49	79.88	1.408	32.91	77.65	20.00	0.64	0.49	98.78	134.25	73.58					9.65	19.77	32.94	26.47	63.83							
225	Oh	6-0	16.55	6.1	5.63	57.74	1.279	26.19	84.85	18.65	0.54	0.45	104.49	139.03	75.16					12.70	27.16	25.64	42.25	99.07							
226	Ah	0-5	13.12	6.3	5.87	29.20	0.888	19.07	61.76	15.84	0.47	0.62	78.69	101.30	77.68					32.13	91.06	9.00	83.14	157.24							
227	ACg1	5-9	4.17	7.0	6.18	2.19	0.174	7.29	22.40	6.69	0.22	0.43	29.74	31.94	93.11					99.58	350.01	4.95	18.49	136.72							
228	ACg2	9-15	3.20	7.1	6.33	1.46	0.086	9.81	17.75	5.57	0.16	0.34	23.82	23.51	100					8.67	>400	3.10	18.68								
229	Cg1	15-21	2.35	7.2	6.75				13.82	4.84	0.14	0.32	19.12	18.37	100					4.50	337.76	3.58	40.94	64.74							
230	Cg3	23-30	2.56	7.2	6.66															2.36	339.47	1.03	30.51	73.59							
231	Cg4	30+	3.74	7.3	6.57															2.80	334.04	2.59	29.31	75.73							

LOCATION: 123° 59'W/54° 06'N

SOIL NAME: Barrett

CLASSIFICATION: Gleyed Gray Wooded

PARENT MATERIAL: Basal till

DRAINAGE: Imperfectly drained

Profile Description:

ELEVATION: 2650 feet

SLOPE & ASPECT: In depression

HORIZON	DEPTH IN – CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1½-0					Abundant		
Aegj	0-8	2.5Y6/2 D 2.5Y5/2 M	Loam	Weak fine to moderate medium subangular blocky	Friable	Abundant	Common distinct 10YR5/6	Scattered gravel
ABgj	8-16	2.5Y5/2 D 2.5Y4.5/2 M	Gravelly loam to gravelly silt loam	Moderate medium subangular blocky and angular blocky	Firm	Common	Common distinct 10YR4/4	
Btgj1	16-25	10YR4/2 M	Gravelly clay loam	Moderate medium to coarse angular blocky	Firm	Occasional	Common distinct 10YR4/4	
Btgj2	25-32	10YR4/2 M	Gravelly loam to gravelly clay loam	Moderate medium to coarse angular blocky	Firm	Occasional	Few distinct 10YR4/4	
BC	32-38	2.5Y4/2 M	Gravelly loam	Moderate medium to coarse angular and subangular blocky	Firm			
C	38+	2.5Y4/2 M	Gravelly loam till	Massive grading to pseudoplaky with depth	Firm			

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CuCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
69/1	L-H	1½-0	14.42	5.3	5.10		1.245	35.68	18.88	5.72	0.18	1.08	25.86	55.05	46.29					78.38	108.13	14.87									
2	Aegj	0-8	1.01	5.8	4.84	0.45	0.040	6.55	2.91	1.30	0.08	0.73	4.52	6.61	68.38					24.65	80.81	1.26							42.30	44.73	12.97	1.48
3	ABgj	8-16	2.46	6.2	5.24	0.46	0.038	8.03	6.01	3.52	0.11	0.26	9.91	11.83	83.77					7.69	251.03	3.07							30.03	47.57	22.36	6.81
4	Btgj1	16-25	3.52	6.9	5.90		0.034	6.79	10.97	6.81	0.24	0.30	18.22	17.99	100					2.69	215.32	1.29							41.92	29.13	28.55	19.81
5	Btgj2	25-32	3.09	7.3	6.32	0.40	0.031	7.45	11.22	6.70	0.27	0.25	18.44	16.97	100					2.06	231.93	2.58							39.81	32.25	27.94	16.57
6	BC	32-38	2.56	7.6	6.63				9.62	5.26	0.25	0.19	15.32	13.85	100					2.40	235.89	2.56										
7	C	38+	2.35	7.9	7.01				7.68	3.89	0.19	0.20	11.96	11.20	100					3.07	271.23	3.38							49.54	28.94	21.52	12.75

LOCATION: 124° 30'W/54° 07'N

SOIL NAME: Berman

PARENT MATERIAL: Lacustrine silts

Profile Description:

ELEVATION: 2250 feet

CLASSIFICATION: Orthic Gray Wooded

DRAINAGE: Well drained

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	½-0							
Ae1	0-3	10YR6.5/3 D 4.5/3 M	Silt to silt loam	Moderate to strong medium platy	Slightly hard	Abundant		Leaves, twigs and some well decomposed organic material
Ae2	3-7	10YR7/2.5 D 5/3 M	Silt to silt loam	Moderate medium platy	Slightly hard to hard	Abundant		
Bt1	7-14	10YR7/2.5 D 5/3 M	Silt loam	Moderate fine to medium angular to subangular blocky	Slightly hard	Common		Common clay skins
Bt2	14-19	10YR7/3 D 5/3 M	Silt loam	Moderate fine to medium angular to subangular blocky	Slightly hard	Common		Common clay skins
BC	19-24	10YR7/2.5 D 5/3 M	Silt loam	Weak fine subangular to angular blocky	Slightly hard	Common		Some clay skins
CB	24-29	10YR7/2 D 5.5/3 M	Silt loam	Weak fine subangular blocky	Slightly hard	Common		
C1	29-36	10YR7/2 D 5.5/3 M	Silt loam	Varved silts	Slightly hard	Occasional		
C2	36+	10YR7/2 D 5.5/3 M	Silt loam to silty clay loam	Varved silts	Slightly hard	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM I	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
67-341	L-H	½-0	12.87	6.2	5.3	82.6	1.63	29.4	45.15	10.38	0.07	2.93	58.53	104.52	56.0					46	214		16.1	194.7								
342	Ae1	0-3	2.56	6.3	5.1	2.1	0.08	16.0	4.31	1.54	0.05	0.93	6.83	14.51	47.1					197	610	1.5	12.1	142.6							
343	Ae2	3-7	1.94	6.9	5.2	0.5	0.04	7.4	3.67	1.27	0.04	0.45	5.44	11.25	48.3					58	130	1.0	10.2	70.0				6.83	80.78	12.39	2.23
344	Bt1	7-14	2.67	6.4	5.4			9.2	9.53	2.46	0.09	0.25	12.33	16.30	80.9					12	200	0.8	25.9	60.6				1.16	78.07	20.77	6.53
345	Bt2	14-19	2.88	6.6	5.6				12.14	3.09	0.13	0.23	15.59	15.59	100					4	391	1.5	26.7	59.2				0.71	81.93	17.36	6.60
346	BC	19-24	2.56	6.8	5.8				12.31	3.08	0.17	0.22	15.76	17.04	92.7					2	600	1.5	30.3	62.8							
347	CB	24-29	2.35	7.3	5.9				10.64	2.86	0.15	0.22	13.87	15.26	87.4					2	600	1.5	27.1	58.9							
348	C1	29-36	1.94	7.6	6.3				10.19	3.36	0.21	0.21	13.77		88.2					2	700	1.1	32.6	70.6				0.13	84.33	15.54	6.03
349	C2	36+	2.14	8.1	6.9				12.77	2.86	0.21	0.20	16.04		100.0					2	700	1.5	29.3	70.0							

LOCATION: 124° 17'W/54° 26'N

Profile Description:

SOIL NAME: Berman

PARENT MATERIAL: Lacustrine silts

ELEVATION: 2250 feet

CLASSIFICATION: Orthic Humic Gleysol

DRAINAGE: Poorly drained

SLOPE & ASPECT: Level

HORIZON	DEPTH IN – CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-F	4-3					Abundant		Leaves, twigs, some partly decomposed
H	3-0					Abundant		Decomposed plant remains
Ahe	0-5	10YR3/1 M	Silty loam	Weak medium subangular blocky	Sticky	Abundant		
ABg	5-9	5Y4.5/1 M	Silty loam	Weak to moderate medium platy	Sticky	Common	Many fine distinct 5YR4/3 M	
Bgtj	9-15	5Y5/2 M	Silty loam	Weak to moderate subangular blocky	Sticky	Occasional to common	Common fine faint 5YR4/3 M	
Ckg1	15-22	5Y5/2 M	Silty loam	Weak fine to medium subangular blocky	Sticky	Occasional	Few fine faint 5YR4/4 M	Slight efferv.
Ckg2	22-28	5Y5/3 M	Silty clay loam	Massive	Firm	Occasional		Slight efferv.
Ckg3	28-33	2.5Y5/2 M	Silt loam	Massive with stratifications	Firm	Occasional		Slight efferv.
Ckg4	33-40	2.5Y5/2 M	Silt loam	Massive with stratifications	Firm	Occasional		Strong efferv.
Ckg5	40+	2.5Y4.5/2 M	Silt loam	Massive with stratifications	Firm	None		Strong efferv.

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/295	L-F	4-3	11.86	7.0	6.49	74.87	1.326	32.75	74.72	17.00	0.41	1.90	94.03	90.90	100					43.07	177.86	31.0	22.09	192.96							
296	H	3-0	17.37	7.1	6.67	92.80	1.777	30.29	117.37	24.98	0.55	12.58	155.48	136.90	100					36.15	279.34	46.0	23.47	255.28							
297	Ahe	0-5	2.88	7.7	6.97	5.53	0.244	13.16	26.75	7.30	0.14	0.48	34.67	28.05	100					5.56	65.84	8.0	32.15	75.87							
298	ABg	5-9	1.42	8.1	7.27	0.64	0.046	8.07	11.36	4.67	0.11	0.29	16.43	10.82	100					0.81	91.28	5.75	17.24	64.91			9.11	75.25	15.64	6.79
299	Bgtj	9-15	2.04	8.0	7.36	0.64	0.038	9.82	7.35	9.39	0.17	0.22	17.13	14.16	100					1.12	277.55	2.5	49.74	72.70			1.28	75.13	23.59	11.81
300	Ckg1	15-22	2.56	8.3	7.56															0.92	31.28	56.75	56.41	94.87						
301	Ckg2	22-28	1.83	8.5	7.70															0.81	3.56	72.5	34.88	78.92			0.00	65.31	34.69	12.18
302	Ckg3	28-33	1.52	8.5	7.62															1.02	5.07	64.0	36.29	78.68						
303	Ckg4	33-40	1.32	8.5	7.67															1.01	8.51	62.5	33.94	75.99						
304	Ckg5	40+	1.42	8.5	7.67															0.71	7.10	64.0	34.48	80.12			0.00	79.31	20.69	7.62

LOCATION:

SOIL NAME: Causqua

CLASSIFICATION: Brunisolic Gray Wooded

PARENT MATERIAL: Steepland till (shallow colluvium over till)

DRAINAGE: Well drained

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0							
Bm	0-10	5YR6/4 D 4/4 M	sl	1 m sbk	mfr	ra	nil	fingerings of Bm into Ae
Ae	10-15	10YR6/4 D 5/4 M	sl	1 tn pl	mfr	rc	nil	
AB	15-19	10YR5/3 D 4/3 M	ls		mfr	rc	nil	
Bt	19-27	10YR5/3 D 4/2 M	sicl	2 m sbk	mvfi	roc	nil	
C	27+		scl	M	mvfi	roc	nil	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	pH 1:1 H_2O	pH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT
22/70	L-H	2-0	13.38	6.6	6.0	73.92	1.76	24.5	6.8	17.00	.23	3.45	27.48	111.10	24.73					46.83	143.90					14.0					
23/70	Bm	0-10	2.35	5.7	4.98	1.98	.106	10.9	6.14	1.32	.049	.650	8.60	14.41	59.68	1.29	0.49			5.94	9.72					24.1					
24/70	Ae	10-15	1.42	5.8	5.31	.75	.039	11.2	5.83	.786	.046	.181	6.84	9.60	71.25					1.83	15.31					19.8					
25/70	AB	15-19	2.46	6.1	5.80	.85	.031	15.9	6.66	1.05	.056	.174	7.94	9.99	79.48					1.23	20.80					17.9					
25/70	Bt	19-27	1.94	7.1	6.52				10.19	2.59	.053	.158	12.99	14.01	92.72					0.61	42.81					4.6					
27/70	C	27+	1.73	7.2	6.50				9.16	2.31	.076	.153	11.70	11.95	97.91	0.96	0.58			1.22	57.48					6.1					

LOCATION: 123° 48'W/53° 45'N

Profile Description:

SOIL NAME: Cobb

PARENT MATERIAL: Ablation till

ELEVATION: 3300 feet

CLASSIFICATION: Bisequa Humo-Ferric Podzol

DRAINAGE: Well drained

SLOPE & ASPECT: S 15%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-F	2-0					Abundant		Raw to partially decomposed litter
Ae	0-1	10YR7/2 D 6/2 M	Sandy loam	Single-grained	Loose	Abundant		
Bf1	1-6	10YR5/6 D 7.5YR4/4 M	Sandy loam	Weak fine subangular blocky	Very friable	Abundant		
Bf2	6-12	10YR5/6 D 4/4 M	Sandy loam	Weak fine to medium subangular blocky	Very friable	Abundant		
AB	12-20	10YR6/25 D 5/2 M	Sandy loam	Weak medium subangular blocky	Very friable	Common		
C1	20-31	10YR6/2 D 5.5/2 M	Gravelly sand	Single-grained	Loose	Occasional		
BA	31-42	10YR6/2 D 4.5/2 M	Sandy loam	Moderate medium to coarse subangular blocky	Friable to firm	Occasional		Few clay films
Bt	42-50	10YR6/3 D 4/2 M	Sandy loam or loam	Moderate coarse blocky	Firm	Occasional		Common clay films
C2	50-60	10YR5.5/2 D 4/2 M	Sandy loam or loam	Massive	Firm			
IIC	60+	10YR5.5/2 D 4/2 M	Sandy loam or loam till	Massive grading to pseudoplaty with depth	Firm			

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE Fe %	OXALATE Al %	PYROPHOS Fe %	PYROPHOS Al %	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
66/282	L-H	2-0	11.73	4.8	4.3	83.72	0.09	43.8	9.50	2.88	0.09	1.05	13.52	106.33	12.72					68.0											
283	Ae	0-1																													
284	Bf1	1-6	2.09	6.0	5.1	1.60	0.05	20.7	1.43	0.48	0.05	0.19	2.15	8.17	26.32	0.97	0.80			136.0		4.6									
285	Bf2	6-12	1.52	6.2	5.3	0.73	0.03	15.4	1.37	0.48	0.06	0.14	2.05	6.09	33.36	0.81	0.56			72.8		7.1									
286	AB	12-20	0.76	6.3	5.4				2.86	0.81	0.06	0.13	3.86	5.29	72.97					10.1		2.0									
287	C1	20-31	0.86	6.5	5.8				3.46	1.38	0.06	0.12	5.02	5.65	88.85					4.7		3.3									
288	BA	21-42	1.01	6.5	5.9				4.75	3.45	0.12	0.15	8.47	8.03	100.					1.9		4.3									
289	Bt	42-50	1.52	6.5	6.0				6.51	3.76	0.14	0.26	10.67	11.72	91.04					1.4		4.3									
290	C 2	51-60	2.04	6.7	6.1				7.12	4.06	0.14	0.26	11.60	11.68	99.32	0.29	0.07			2.1		2.0									
291	IIC	60+	1.42	6.6	6.1				5.78	3.48	0.13	0.23	9.62	10.65	90.33					2.0		3.3									

LOCATION:

Profile Description:

SOIL NAME: Cronin

PARENT MATERIAL: Glacial till

ELEVATION:

CLASSIFICATION: Alpine Dystric Brunisol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D. MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
Ah	0-3	7.5YR3/2	gsl	2 f gr	mvfr	ra	nil	Variable depth 1-6"
Ahe	3-6	7.5YR3/3	gsl	2 f gr	mvfr	ra		
Ae(Aeh)	6-7	7.5YR4/3	gsl	1 f gr	mvfr	ra		Variable in thickness
Bm1	7-11	7.5YR4/4	gsl	1 f sbk	mfr	ra		
Bm2	11-17	7.5YR4/3-4	gsl	1 f sbk	mfr	rc		
C1	17-25	7.5YR4/3	gsl	M	mfi	rc		
C2	25-31	7.5YR4/3	gsl	M	mfi	roc		
C3	31+	7.5YR4/3	gsl	M	mfi	ro		

LOCATION: 126° 36'W/54° 01'N

Profile Description:

SOIL NAME: Crystal

PARENT MATERIAL: Ablation till

ELEVATION: 2550 feet

CLASSIFICATION: Degraded Dystric Brunisol

DRAINAGE: Well to rapidly drained

SLOPE & ASPECT: S 5%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-F	1-0							Needles and leaves partly decomposed
Aej	0-½		Sandy loam	Moderate fine granular	Soft	Abundant		
Bm1	½-5	10YR5.5/3 D 3.5/3 M	Sandy loam	Moderate fine granular	Soft	Abundant		
Bm2	5-9	10YR5/3 D 3.5/3 M	Sandy loam	Moderate fine granular	Soft	Abundant		
C1	9-14	10YR6/2 D 4/2 M	Sand	Single-grained	Loose	Common		
C2	14-20	10YR6/2 D 4/2 M	Gravelly loamy sand	Weak fine subangular blocky	Soft	Common		
C3	20-29	10YR6/2.5 D 4/2 M	Gravelly sandy loam to gravelly loamy sand	Moderate fine subangular blocky	Soft	Common		
C4	29+	10YR6/2.5 D 4.5/3 M	Gravelly loamy sand	Single-grained	Soft	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/248	L-F	2-0	10.38	4.6	4.14	96.88	1.286	43.70	22.08	4.53	0.24	2.98	29.83	39.46	75.60					54.09	75.06	5.0	7.45	65.68									
249	Bm1	½-5	1.32	5.6	5.17	0.98	0.033	17.27	1.52	0.20	0.05	0.16	1.93	6.08	31.74					159.07	279.64	2.03	10.13	63.33									
250	Bm2	5-9	1.01	6.0	5.34	0.36	0.021	10.05	1.52	0.30	0.07	0.13	2.02	4.63	43.62					116.16	140.40		10.61	55.56									
251	C1	9-14	0.50	6.1	5.65		0.023		2.41	0.36	0.09	0.14	3.00	4.04	74.26					10.15	26.83	0.75	9.55	43.97									
252	C2	14-20	0.60	6.3	5.84															6.64	36.52		10.81	43.26									
253	C3	20-29	0.81	6.7	6.10															4.74	90.73	2.52	13.61	52.17									
254	C4	29+	0.50	6.7	6.26															2.91	86.43		14.07	52.01									

LOCATION: 125° 40'W/54° 15'N

Profile Description:

SOIL NAME: Dahl

PARENT MATERIAL: Shallow colluvium or till overlying acidic bedrock

ELEVATION: 3500 feet

CLASSIFICATION: Orthic Dystric Brunisol

DRAINAGE: Rapidly to well drained

SLOPE & ASPECT: S 44%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0					Abundant		Forest litter
Bm1	0-4	10YR5/3 D 7.5YR4.5/4 M	Sandy loam to loam	Moderate fine to medium granular	Very friable	Abundant		Scattered angular gravel
Bm2	4-7	10YR5/3 D 7.5YR4.5/4 M	Sandy loam to loam	Moderate fine to medium granular	Very friable	Abundant		Scattered angular gravel
CB	7-13	10YR5.5/3 D 4/3 M	Sandy loam to loam	Moderate fine to medium subangular blocky	Very friable	Abundant		Scattered angular gravel
IIC1	13-19	10YR6/3 D 4.5/3 M	Stony loam to stony sandy loam	Moderate fine to medium subangular blocky	Friable	Common		Angular stones and gravel
IIC2	19-24	10YR6/3 D 4.5/3 M	Stony loam to stony sandy loam	Moderate fine to medium subangular blocky	Friable	Common		
R	24+							

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
68/497	L-H	1-0	13.38	6.8	6.80	101.08	2.643	22.18	79.37	9.78	0.07	3.83	93.05	105.41	88.27					25.40	130.39	57.82	16.44	164.40						
498	Bm1	0-4	1.42	5.5	5.15	2.88	0.093	17.96	6.09	0.89	0.04	0.37	7.39	12.36	59.79	0.47	0.30			1.83	4.06	5.07	12.93	65.92						
499	Bm2	4-7	1.11	5.5	5.01	1.93	0.067	16.72	4.43	0.76	0.03	0.25	5.47	10.81	50.60	0.48	0.33			1.52	4.85	5.31	14.91	69.51						
500	CB	7-13	1.11	5.7	5.37	1.26	0.051	14.31	4.68	0.82	0.04	0.18	5.72	9.33	61.31					1.21	5.76	3.54	36.40	89.74						
501	IIC1	13-19	1.11	5.9	5.71	1.20	0.048	14.58	5.56	0.76	0.05	0.11	6.48	9.43	68.72	0.38	0.29			1.52	8.09	4.30	18.20	71.28						
502	IIC2	19-24	1.52	5.9	5.79				9.27	1.27	0.07	0.14	10.75	13.41	80.16					1.12	17.06	2.79	24.36	65.99						
503	R	24+				NOT SAMPLED																								

LOCATION:

Profile Description:

SOIL NAME: Decker

PARENT MATERIAL: Colluvium over bedrock

ELEVATION:

CLASSIFICATION: Degraded Dystric Brunisol

DRAINAGE: Well drained

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0							
Aej	0-½							
Bm	½-7½	10YR5/3 D 5YR3/4 M	gsl	1 m sbk	mfr	rc		Scattered bleaching along root channels
C	7½-19½	10YR6/2 D 5/3 M	gsl	1 m sbk	mfr	rc		
R	19½+	shattered bedrock						

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
1/70	L-H	1-0	8.46			64.64	1.22	30.7	51.19	6.81	.11	2.17	60.28	88.28	68.28					39.15	55.31									
2/70	Bm	½-7½	1.52	5.7	5.04	2.10	.085	14.3	4.26	0.51	0.05	0.50	5.32	11.77	45.20	0.84	0.81			4.37	9.64					9.75				
3/70	C1	7½-19½	1.11	5.5	5.15	.81			3.94	0.77	0.05	0.17	4.93	9.45	52.17	0.56	0.40			3.84	12.23					42.5				
4/70	R	19½+																												

LOCATION: 126° 25'W/53° 55'N

Profile Description:

SOIL NAME: Deserters

PARENT MATERIAL: Basal till

ELEVATION: 3400 feet

CLASSIFICATION: Gleyed Brunisolic Gray Wooded

DRAINAGE: Imperfectly drained

SLOPE & ASPECT: NW 24%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0					Abundant		Forest litter in different stages of decomposition
Ae	0-1	10YR7/2 D 6/2 M	Sandy loam	Single-grained	Loose	Abundant		
Bml	1-6	10YR6/3 D 4/4 M	Sandy loam to loam	Moderate fine to medium granular	Very friable	Abundant		
Bmgj	6-12	10YR6/3 D 4/3 M	Sandy loam to loam	Weak to moderate fine granular	Very friable	Abundant	Few fine faint 10YR4/4 M	
Aegj	12-19	10YR7/2 D 4.5/3 M	Gravelly loam	Weak fine subangular blocky	Very friable	Common	Common fine distinct 7.5YR5/6 M	
ABg	19-24	10YR7/2 D 5/3 M	Gravelly loam	Weak to moderate medium subangular blocky	Friable	Occasional		
Btgj1	24-29	10YR6/2 D 4/3 M	Gravelly loam	Moderate fine to medium subangular and angular blocky	Firm	None	Common fine distinct 7.5YR4.5/4M	Common clay skins
Btgj2	29-35	10YR7/3 D 4/3 M	Gravelly loam	Moderate fine to medium subangular and angular blocky	Very firm	None	Few fine distinct 7.5YR4.5/4 M	Common clay skins
BCgj	35-43	10YR7/2 D 4/3 M	Gravelly loam	Moderate medium subangular blocky to pseudoplaty	Very firm	None	Few fine faint 7.5YR5/4 M	Some clay skins
C	43+	10YR7/2 D 4.5/3 M	Gravelly loam till	Pseudoplaty	Very firm	None		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/184	L-H	2-0	10.13	4.6	4.35	79.79	1.269	36.47	26.87	3.74	0.22	1.38	32.21	72.80	44.24					36.45	50.66	1.70	8.26	63.32							
185	Ae	0-1	1.11	4.6	4.02	2.82	0.085	19.25	1.72	0.45	0.09	0.24	2.50	11.05	22.62					54.60	83.92	2.53	7.08	36.65							
186	Bml	1-6	1.73	5.1	4.46	2.14	0.089	13.92	2.03	0.64	0.09	0.24	3.00	12.26	24.47					46.80	75.28	4.83	11.44	60.53							
187	Bmgj	6-12	1.21	5.2	4.57	0.84	0.029	16.70	2.43	0.74	0.10	0.19	3.46	8.91	38.83					15.08	52.12	2.53	11.89	53.14							
188	Aegj	12-19	1.42	5.4	4.71	0.28	0.021	7.71	4.97	1.71	0.20	0.18	7.06	10.52	67.11					4.56	58.32	3.55	17.75	58.32				43.27	37.83	18.90	4.42
189	ABg	19-24	1.62	5.5	4.75	0.28	0.018	9.00	6.20	1.96	0.13	0.16	8.45	10.75	78.60					4.67	78.26	3.56	16.77	54.11							
190	Btgj1	24-29	2.04	5.8	5.28															5.20	124.49	3.57	20.41	59.95							
191	Btgj2	29-35	2.04	5.9	5.37															3.47	129.59	2.55	22.45	64.54				42.03	34.17	23.80	10.68
192	BCgj	35-43	1.73	6.5	5.95															2.03	180.06	2.54	23.40	71.97							
193	C	43+	1.94	6.6	6.00															1.43	214.07	2.55	24.21	73.14				41.76	35.54	22.70	11.24

LOCATION: 124° 37'W/54° 02'N

Profile Description:

SOIL NAME: Deserters

PARENT MATERIAL: Basal till

ELEVATION: 3300 feet

CLASSIFICATION: Brunisolic Gray Wooded

DRAINAGE: Well drained

SLOPE & ASPECT: SE 7%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0							
Ae1	0-½	10YR6/2 D 5/2 M	Sandy loam	Moderate fine granular	Very friable	Abundant		
Bm1	½-7	10YR4.5/3 D 3/3 M	Sandy loam to loam	Strong fine to medium subangular blocky	Very friable	Abundant		
Bm2	7-14	10YR5.5/3 D 4/3 M	Gravelly sandy loam to loam	Strong fine to medium granular	Very friable	Abundant		
Ae2	14-19	10YR6/2 D 4.5/2 M	Loam to gravelly loam	Moderate fine subangular blocky	Friable	Common		
Ae3	19-23	10YR6/2 D 4.5/2 M	Loam to gravelly loam	Moderate fine subangular blocky	Friable	Common		
AB	23-28	10YR7/2.5 D 4/2.5 M	Loam to gravelly loam	Moderate fine angular to sub-angular blocky	Friable	Occasional		
Bt	28-36	10YR6/3 D 4/2 M	Loam to gravelly loam	Moderate to strong medium angular blocky	Firm	Occasional		Common clay films
BC	36-46	10YR7/3 D 4/3.5 M	Loam to gravelly loam	Weak to moderate fine angular blocky	Friable	Occasional		
C	46+	10YR7/2.5 D 4/2.5 M	Loam to gravelly loam till	Pseudoplaty	Friable	None		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/214	L-H	½-0	8.93	3.8	3.96	76.66	1.020	43.60	11.98	3.33	0.14	2.18	17.63	63.59	27.72					168.84	260.34	12.5	8.44	80.61							
215	Bm1	1-7	2.56	5.7	5.16	2.72	0.071	22.20	4.10	0.69	0.05	0.58	5.42	13.83	39.19	0.82	0.98			230.76	74.00	3.33	13.08	90.25							
216	Bm2	7-14	2.46	6.0	5.46	1.72	0.053	18.83	4.82	0.87	0.06	0.40	6.15	12.24	50.25	0.61	0.84			194.67	362.71	2.56	15.88	80.69							
217	Ae2	14-19	1.11	6.3	5.86	0.41	0.025	9.60	4.85	1.41	0.08	0.27	6.61	7.77	85.07	0.35	0.36			9.91	78.87	1.01	16.94	35.89							
218	Ae3	19-23	1.32	6.4	5.96	0.36	0.021	10.10	6.08	2.06	0.09	0.24	8.47	9.32	90.88						158.06	1.27	23.56	38.50							
219	AB	23-28	1.32	6.5	6.00	0.28	0.020	8.25	6.59	2.53	0.15	0.27	9.54	10.54	90.51					3.55	209.73	1.27	24.57	38.00							
220	Bt	28-36	1.73	6.5	5.90				8.34	3.28	0.16	0.30	12.08	13.19	91.58					6.92	189.22	2.29	30.26	40.18							
221	BC1	36-41	1.94	7.0	6.40															1.63	223.25	2.29	47.40	42.56							
222	BC2	41-46	1.73	7.0	6.52															1.63	266.54	3.56	34.59	42.47							
223	C	46+	1.62	7.0	6.28															1.63	283.52	1.02	31.50	42.43							

LOCATION: 124° 50'W/54° 00'N

Profile Description:

SOIL NAME: Dragon

PARENT MATERIAL: Shallow colluvium and till overlying acidic bedrock

ELEVATION: 3700 feet

CLASSIFICATION: Orthic Humo-Ferric Podzol

DRAINAGE: Rapidly to well drained

SLOPE & ASPECT: SE 20%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0					Abundant		Well preserved to decomposed plant remains
Ae	0-2	10YR7/1 D 5.5/2 M	Sandy loam	Weak fine subangular blocky	Loose	Abundant		
Bf1	2-3½	10YR5/4 D 4/3 M	Sandy loam	Moderate fine to medium subangular blocky	Very friable	Abundant		
Bf2	3½-8	10YR5/5 D 7.5YR4/4 M	Sandy loam to loam	Moderate fine to medium subangular blocky	Very friable	Abundant		Scattered gravel
BC1	8-13	10YR6.5/3 D 5/3 M	Gravelly sandy loam	Moderate fine to medium subangular blocky	Very friable	Common		
BC2	13-18	10YR6.5/3 D 6/3 M	Gravelly sandy loam	Moderate fine to medium subangular blocky	Very friable	Common		
C	18-22	10YR6/2 D 5/2 M	Gravelly sandy loam	Medium subangular blocky to pseudoplaty	Friable	Occasional		
R	22+		Bedrock					

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
67/406	L-H	2-0	8.45	4.7	3.9	102.2	1.21	31.1	22.45	2.93	0.04	2.00	27.42	106.98	25.6					42	54		9.5	42.0							
407	Ae	0-2	2.14	4.8	3.7	3.0	1.14	27.5	2.45	0.26	0.01	0.22	2.94	12.35	23.8					7	14	7.7	3.10	19.2							
408	Bf1	2-3½	2.99	5.5		3.5			1.39	0.15	0.01	0.18	1.73	14.08	12.3	0.95	0.58			51	99	9.0	8.2	47.6							
409	Bf2	3½-8	3.53	6.0		2.9	0.07	23.3	1.45	0.16	0.01	0.13	1.75	13.52	12.9	0.92	0.95			44	93	9.1	13.2	51.8							
410	BC1	8-13	1.63	6.0					0.81	0.15	0.01	0.11	1.08	9.35	11.6	0.50	0.61			66	112	6.4	15.2	28.7							
411	BC2	13-18	1.21	6.0					0.71	0.10	0.03	0.11	0.93	5.87	15.8	0.55	0.38			27	62	5.1	17.7	24.0							
412	C	18-22	1.01	6.1												0.39	0.28			28	62		16.7	25.3							

LOCATION: 125° 51'W/54° 21'N

SOIL NAME: Driftwood

CLASSIFICATION: Dark Gray Wooded

PARENT MATERIAL: Basal till

DRAINAGE: Well to moderately well drained

Profile Description:

ELEVATION: 2450 feet

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
Ap1	0-4	10YR3.5/2 D 2/1.5 M	Loam	Strong fine granular	Soft	Abundant		
Ap2	4-6	10YR4/2 D 3/2 M	Loam	Strong fine to medium granular	Soft	Abundant		
Ae	6-10	10YR6.5/2 D 5.5/3 M	Gravelly loam	Moderate to strong fine sub-angular blocky	Slightly hard	Common		
AB	10-15	10YR6.2/2.5D 5/3 M	Gravelly clay loam	Moderate to strong medium sub-angular and angular blocky	Slightly hard	Common		Some clay skins
Bt1	15-19	10YR6/2 D 4/3 M	Clay loam to gravelly clay loam	Moderate to strong medium angular blocky	Hard	Common		Common clay skins
Bt2	19-26	10YR5/3 D 3.5/3 M	Clay	Strong medium to coarse angular blocky	Very hard to extremely hard	Occasional		Many clay skins
Bt3	26-31	10YR6/3 D 3.5/3 M	Gravelly clay loam	Moderate medium angular blocky	Very hard to extremely hard	Occasional		Common clay skins
CB	31-35	10YR5.5/3 D 4/3 M	Gravelly clay loam	Pseudoplaty to moderate medium subangular blocky	Very hard	Occasional		Some clay skins
C1	35-42	10YR5/2.5 D 2.5/3 M	Gravelly clay loam	Pseudoplaty	Very hard	Occasional		
C2	42+	10YR5/2.5 D 2.5/3 M	Gravelly clay loam	Pseudoplaty	Very hard	None		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
68/569	Ap1	0-4	3.95	6.0	5.49	16.50	0.668	14.33	22.74	3.84	0.09	0.40	27.07	39.43	68.65					8.8	23.9	1.56	22.87	197.25									
570	Ap2	4-6	2.67	6.1	5.61	8.79	0.342	14.91	14.12	2.63	0.11	0.26	17.12	25.54	67.03					10.8	28.7	4.62	14.89	178.65									
571	Ae	6-10	1.21	6.3	5.59	1.11	0.053	12.08	4.64	1.85	0.23	0.09	6.81	10.15	67.09					1.8	20.2	3.80	14.93	55.67							33.44	48.00	18.56	2.30
572	AB	10-15	1.52	6.0	5.20	0.81	0.052	9.04	5.85	2.94	0.21	0.10	9.10	13.31	68.37					2.0	25.9	3.05	23.86	62.18							22.19	48.87	27.96	5.36
573	Bt1	15-19	2.04	5.7	4.48	0.93	0.048	11.25	6.89	4.85	0.44	0.16	12.34	19.64	62.82					2.6	24.4	5.61	34.18	73.47							21.63	41.70	36.67	14.03
574	Bt2	19-26	3.09	5.5	4.21	0.94	0.055	10.00	9.02	7.28	0.68	0.22	17.20	26.79	64.20					4.1	27.8	6.44	55.67	77.32							20.54	34.32	45.14	20.64
575	Bt3	26-31	2.99	5.6	4.43															3.6	27.5	6.44	47.89	72.09									
576	CB	31-35	2.46	5.9	4.95															2.6	87.1	7.68	46.88	76.80							25.97	42.27	31.76	18.40
577	C1	35-42	1.94	7.3	6.44															1.0	178.5	10.19		85.88							25.55	37.91	36.54	15.21
578	C2	42+	1.52	7.9	6.93															1.1	228.4	7.87	36.04	81.22									

LOCATION:

SOIL NAME: Hagwilget

PARENT MATERIAL: Alluvial fan

Profile Description:

ELEVATION:

CLASSIFICATION: Orthic Regosol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	3-0							Mainly cottonwood willow, and hazelnut leaves
C1	0-9	10YR5/3 M	fsl	1 m sbk	mfr	ra		
IIC	9-14	10YR4/2 M	ls	0-Sg	ml	rc		
IIIC	14-25	10YR4/2 M	sil	2 m sbk	mfi	rc		
IVC	25+	variegated	s	0-Sg	ml	roc	f z f	sand relatively fine

LOCATION:

SOIL NAME: Kispiox

CLASSIFICATION: OHFP

PARENT MATERIAL: Steepland colluvium

DRAINAGE: Well drained

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	6-4							
F-H	4-0				mfr	ra		gravitational movement has disrupted Ae
Ae	0-2	5YR5/3 D	grit. sil	0	mfr	ra		depth of Bf highly variable
Bf	2-9	5YR6/4 D 4/4 M	grit. sil	1 m sbk	mfr	ra		
CB	9-16	10YR6/3 D 5/4 M	Sl (stony)		ml	roc		
C1	16-32	10YR4/2 D 4/2 M	gls	0 to Sg	mvfr	roc		occasional fragments of till, fragmental pieces of shale
C2	32-44+	10YR4/2 M	gls (stony)	0 to Sg				

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE Fe %	OXALATE Al %	PYROPHOS Fe %	PYROPHOS Al %	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
42/70	L	6-4	8.93	4.8	4.16	91.93	.453	55.9	26.14	4.58	.076	3.88	34.68	76.71	45.21					49.02											
43/70	F-H	4-0	10.13	4.2	3.64	97.77	1.02	55.6	23.35	3.19	.11	1.65	28.30	98.05	28.86					44.05											
44A/70	Ae	0-2					NOT SAMPLED																								
44/70	Bf	2-9	1.83	5.8	5.21	1.91	.102	10.8	7.99	1.59	.043	.284	9.91	14.02	70.68	1.12	0.39	1.10	0.38	26.58						6.1				
45/70	CB	9-16	1.42	6.0	5.41	1.15	.064	10.4	5.58	2.52	.046	.40	8.54	11.56	73.88					2.23	12.37					13.2				
46/70	C1	16-32	1.63	6.4	6.09				7.32	4.14	.071	.163	11.69	12.65	92.41	0.76	0.20	0.11	0.06	2.03	53.86					17.3				
47/70	C2	32-44+	1.83	6.6	6.17															2.04	97.76					8.7				

LOCATION:

Profile Description:

SOIL NAME: Kitsguecla

PARENT MATERIAL: Sandy glaciofluvial deposits over glacial till

ELEVATION:

CLASSIFICATION: Degraded Dystric Brunisol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0							
Aej	0-½	10YR6/2 M	fsl	0	ml	ra		
Bm	½-12	5YR4/4 M	sl	1 m sbk	mvfr	ra		
C1	12-18	5YR4/2 M	ls	Sg	ml	rc		
C2	18-41	variegated	s	Sg	ml	roc		
IIC	41+	10YR4/3 M	sicl	M	mvfi	ro	C 2 d	very compact till

LOCATION:

Profile Description:

SOIL NAME: Kitsuns

PARENT MATERIAL: Colluvium over basic bedrock

ELEVATION:

CLASSIFICATION: Orthic Sombric Brunisol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	3-0							
Ah	0-7	5YR3/2 D 2/1 M	1	2 f gr	mvfr	ra		
Bm	7-18	5YR4/4 M	fsl	1 m sbk	mfr	roc		
C	18-29	10YR4/2 M	fsl	1 m sbk	mfr	rc		bedrock fragments common
R	29+			bedrock				bedrock has variable fracturing

LOCATION:

Profile Description:

SOIL NAME: Kitwanga

PARENT MATERIAL: Ablation till

ELEVATION:

CLASSIFICATION: BiHFP

DRAINAGE: Moderately well drained

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1½-0							
Ae	0-1½	10YR7/1 D 6/1 M						
Bf	1½-7½	5YR5/6 M	fsl	1 m sbk	mfr	rc		
BC	7½-12½	10YR5/6 M	gsl	1 m sbk	mfr	rc		
Ae	12½-23½	10YR4/2 M	gsl	1 m sbk	mfr	roc		
Bt	23½-30½	10YR4/2 M	sil	2 m sbk	mvfi	roc		
C1	30½+	10YR4/2 M	sl	M	mefi		f 1 f	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
48/70	L-H	1½-0	8.70	4.1	3.59	73.70			9.57	2.89	.17	4.24	16.87	80.25	21.02											360.0						
49/70	Ae	0-1½	NOT SAMPLED																													
50/70	Bf	1½-7½	2.67	5.5	4.58	2.27	.073	18.0	.51	.25	.059	.16	.979	14.07	6.96	1.89	1.11	0.30	0.45	37.37	65.71					19.0						
51/70	BC	7½-12½	1.83	5.8	4.89	1.69			1.22	.32	.122	.188	1.85	9.06	20.42				-	44.30	72.30					23.4						
52A/70	Ae	12½-23½	1.21	5.8	5.42	.84			3.74	0.96	0.05	0.12	4.87	8.02	60.72					3.04	27.63					34.4						
52/70	Bt	23½-30½	1.32	6.0	5.70	.75	.034	12.8	6.74	1.42	.085	.088	8.33	9.19	90.64					3.04	71.94					16.2						
53/70	C1	30½+	1.94	6.3	5.92				10.81	2.22	.087	.066	13.18	11.75	100	0.77	0.43			3.87	61.64					8.2						

LOCATION:

SOIL NAME: Kwun

CLASSIFICATION: BiHFP

PARENT MATERIAL: Glacial till

DRAINAGE: Moderately well drained

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	6-4							
F-H	4-0							
Ae	0-1	10YR6/1 D		1 m sbk	mvfr	ra		intermittent
Bf	1-8	10YR5/4 D 4/4 M	fsl	1 m sbk	mfr	ra		
BC	8-15	10YR4/3 M	sl	1 m sbk	mfr	ra		
Ae	15-27	Matrix 10YR4/3 M 5/3 M	sl	t vtnpl	mfr	ra	f2f	
Btgj	27-35	10YR4/2 M	sicl	2 m sbk	mvfi	roc	c2d	
Cgj	35+	10YR4/2 M mottles 10YR4/1	sicl		mvfi	roc	c2d	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
15/70	L	6-4		1.5	4.4															90.0	99.0										
16/70	F-H	4-0	12.61	1.5	5.1	97.64	1.36	4.16	54.05	6.88	0.29	2.09	63.31	112.16	56.45																
17/70					NOT SAMPLED											1.23	0.31			12.35	24.29	2.27									
18/70	Bf	1-8	1.21	6.0	5.30	2.03	.0896	13.1	6.43	2.45	0.08	0.19	9.15	14.12	64.8					6.56	18.27	2.02				13.1					
19/70	BC	8-15	0.91	6.3	5.51	1.44			4.24	2.22	0.10	0.18	6.75	10.88	62.04					2.01	48.74	1.26				13.6					
20A/70	Ae	15-27	0.50	6.3	5.63				4.02	2.93	.055	.156	6.62	9.47	69.90					3.83	71.65	2.52				8.6					
20/70	Btgj	27-35	0.91	6.4	5.81				9.33	4.74	.089	.110	14.37	3.81	100	0.65	0.31			2.84	102.84	2.03				9.6					
21/70	Cgj	35+	1.32	6.5	6.10																										

LOCATION: 124° 34'W/54° 03'N

SOIL NAME: Mapes

CLASSIFICATION: Orthic Regosol

PARENT MATERIAL: Sandy valley trains and deltas

DRAINAGE: Rapidly drained

Profile Description:

ELEVATION: 2250 feet

SLOPE & ASPECT: NE 9%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	½-0							forest litter
Ah	0-2	10YR4.5/2 D 3/3 M	Sand	Single-grained	Loose	Abundant		
AC	2-4	10YR5.5/2 D 4/3 M	Sand	Single-grained	Loose	Abundant		
C1	4-10	Variegated	Sand	Single-grained	Loose	Common		
C2	10-19	Variegated	Sand	Single-grained	Loose	Common		
C3	19-28	Variegated	Sand	Single-grained	Loose	Occasional		Few Fe stains
C4	28+	Variegated	Sand	Single-grained	Loose	None		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
67/301	L-H	½-0	10.18	4.9	4.5	72.2	1.25	33.5	18.84	7.71	0.18	2.38	29.11	88.81	32.8					55	63		9.10	84.0						
302	Ah	0-2	1.94	6.0	5.0	2.8	0.11	14.4	3.77	0.46	0.09	0.41	4.73	10.37	45.6					158	240	2.5	12.2	101.9						
303	AC	2-4	1.42	6.1	5.1	0.7	0.03	12.5	2.33	0.46	0.09	0.15	3.03	6.42	47.2					85	122	2.5	9.6	65.9						
304	C1	4-10	1.21	6.1	5.2				2.94	0.56	0.08	0.13	3.71	5.59	66.4					22	37		9.6	50.6						
305	C2	10-19	1.32	6.3	5.9				3.75	1.01	0.09	0.13	4.98	6.41	77.7					8	34	2.5	10.6	43.1						
306	C3	19-28	1.32	6.6	5.7				3.90	1.01	0.09	0.15	5.15	6.32	81.5					6	65	0.5	10.9	49.4						
307	C4	28+	1.21	6.7	5.8				3.54	1.01	0.11	0.17	4.83	5.92	81.6					5	63	1.3	13.2	50.6						

Profile Description:

LOCATION: 126° 55'W/54° 12'N

SOIL NAME: Morice

PARENT MATERIAL: Kame terraces

ELEVATION: 2700 feet

CLASSIFICATION: Degraded Dystric Brunisol

DRAINAGE: Rapidly drained

SLOPE & ASPECT: NE 22%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LF	1-0					Abundant		Forest litter
Aej	0-½	10YR6/2 D 5/1 M	Gravelly sand	Weak fine granular	Loose	Abundant		
Bm	½-5	10YR5/3 D 3.5/3 M	Gravelly sand	Weak fine granular	Loose	Abundant		
BC	5-9	Variegated	Gravelly sand	Single-grained	Loose	Common		
C1	9-17	Variegated	Gravelly sand	Single-grained	Loose	Common		
C2	17-27	Variegated	Gravelly sand	Single-grained	Soft	Occasional		
C3	27-36	Variegated	Gravelly sand	Single-grained	Soft	Occasional		
C4	36+	Variegated	Gravelly sand	Single-grained	Soft	None		Thin silty band (½-1")

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE Fe %	OXALATE Al %	PYROPHOS Fe %	PYROPHOS Al %	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FI CL
69/256	LF	1-0	8.46	5.8	5.51	33.98	0.746	26.42	36.23	4.62	0.33	2.28	43.46	58.90	73.97					73.75	107.92	23.86	14.37	284.71							
257	Bm	½-5	1.42	5.4	4.83	1.85	0.046	23.28	0.71	0.20	0.04	0.14	1.09	5.78	18.86					183.57	405.68	2.28	8.11	168.61							
258	BC	5-9	0.81	5.7	5.34	0.64	0.023	16.00	0.71	0.15	0.04	0.10	1.00	3.02	33.11					66.03	135.09	1.01	10.33	56.20							
259	C1	9-17	0.70	5.9	5.84				0.70	0.14	0.03	0.10	0.97	2.09	46.41					19.33	38.47	2.52	11.83	52.87							
260	C2	17-27	0.50	6.0	5.58				0.80	0.14	0.04	0.11	1.09	2.20	49.55					14.57	31.26	1.01	16.08	53.52							
261	C3	27-36	0.30	5.9	5.69															15.45	33.30	4.51	16.55	54.41							
																				4.03	22.08	5.80	24.95	52.93							

LOCATION:

SOIL NAME: Moricetown

CLASSIFICATION: MHFP

PARENT MATERIAL: Sandy valley train outwash

DRAINAGE: Rapid

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN – CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	4-3							
F-H	3-0							
Bf 1	0-5	5YR6/4 D 4/4 M	fsl	1 msbk	mfr	ra		some indication of Ae
Bf 2	5-11	10YR5/6 M	lfs		mfr	ra		
C1	11+	10YR4/2 M	med. s	Sg	ml	roc		sand for another 28"

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLA
70/70	L	4-3	7.53	5.5		88.17			3.66	7.05	.228	4.73	15.67	72.62	35.35							55.92									
71/70	F-H	3-0	11.53	5.3	4.76	86.04	1.57	31.4	50.55	6.57	.178	3.12	60.42	111.52	54.18					66.81	108.01	24.50				107.0					
72/70	Bf 1	0-5	1.63	5.8	5.32	1.70	.116	8.5	3.46	0.51	0.051	.269	4.29	11.08	39.72	1.40	0.76	0.26	0.22	115.35	309.97	3.18				81.3					
73/70	Bf 2	5-11	1.01	6.1	5.50	1.14	.065	10.2	4.75	0.41	0.061	0.155	5.38	8.54	63.00	1.54	0.74	0.15	0.14	190.40	253.54					14.6					
74/70	C1	11+	1.11	6.6	6.01				5.36	.35	.045	.179	5.93	7.33	80.90	1.06	0.71	0.08	0.09	20.53	76.34	4.43				12.1					

LOCATION:

SOIL NAME: Natlan

CLASSIFICATION: Mini Humo-Ferric Podzol

PARENT MATERIAL: Colluvium over bedrock

DRAINAGE: Well

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	5-3							moss and needles
F-H	3-0					ra		decomposed moss and needl
Ae	0-½	10YR7/2 M				ra		
Bf	½-11	5YR4/6 M	1	1 m sbk	mfr	rc		
C	11-16	10YR4/3 M	1	1 m sbk	mfr	roc		rock fragments common
R								C material in fractures f some depth

LOCATION: 123° 59'W/54° 02'N

Profile Description:

SOIL NAME: Nechako

PARENT MATERIAL: Fluvial deposits

ELEVATION: 2200 feet

CLASSIFICATION: Orthic Gray Wooded

DRAINAGE: Moderately well drained

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0					Abundant		
Ae1	0-3	10YR7/2 D 7.5YR4/2 M	Silt loam	Weak fine platy	Soft	Abundant		
Ae2	3-7	10YR7/2 D 4/2 M	Silt loam	Weak fine platy	Soft	Abundant		
Bt1	7-17	10YR6/4 D 4/3 M	Silt loam	Moderate fine to medium subangular blocky	Slightly hard	Common		Three silty clay loam bands ¼ to ½ inch thick
Bt2	17-22	10YR7/3 D 4/2 M	Silt loam	Moderate medium subangular blocky	Slightly hard	Common		
BC	22-26	10YR7/3 D 4/3 M	Silt loam	Moderate fine subangular blocky	Slightly hard	Common		
IICgj	26-31	10YR6/3 D 5/2 M	Very fine sandy loam	Weak fine subangular blocky	Soft to slightly hard	Occasional	Common distinct 10YR5/6 M	
IIICgj	31+	Variegated	Sand	Single-grained	Loose	Occasional	Common distinct 10YR5/6 M	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
66/331	L-H	1-0	13.61	5.8	5.7	74.88	1.42	30.5	32.45	5.56	0.06	2.48	40.55	96.44	42.05					70.9										
332	Ae1	0-3	6.21	5.7	5.0	1.72	0.07	13.5	3.40	0.90	0.04	0.56	4.90	11.52	42.53					161.2		5.3					18.7	74.5	6.8	2.3
333	Ae2	3-2	1.27	6.0	5.2	0.36	0.04	5.8	4.25	1.42	0.06	0.32	6.05	8.81	68.67					23.1		5.1								
334	Bt1	7-17	2.46	5.8	5.4	0.56	0.04	9.1	7.68	3.51	0.09	0.50	11.78	16.39	71.87					32.4		7.9					12.9	67.9	19.2	10.8
335	Bt2	17-22	2.25	6.1	5.6	0.56	0.03	11.0	8.08	4.14	0.16	0.33	12.71	16.67	76.24												1.8	80.5	17.7	6.5
336	BC	22-26	2.56	6.2	5.6				9.13	4.95	0.26	0.30	14.64	18.97	77.17					17.7		5.4								
337	IICgj	26-31	1.73	6.4	5.8				6.18	3.15	0.23	0.17	5.78	12.72	76.49					10.4		2.8					31.7	56.9	11.4	5.4
338	IIICgj	31+	0.81	6.5	5.9				3.18	2.07	0.08	0.12	9.73	6.55	83.21					7.4		2.5								

LOCATION: 125° 26'W/54° 20'N

Profile Description:

SOIL NAME: Nechako

PARENT MATERIAL: Fluvial deposits

ELEVATION: 2850 feet

CLASSIFICATION: Gleyed gray wooded

DRAINAGE: Imperfectly drained

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	2-1							Needles and living moss
F	1-0					Abundant		Partly decomposed forest litter
Ae	0-4	10YR6/3 D 4.5/3 M	Silt loam	Moderate fine platy	Very friable	Abundant		
Aegj	4-9	10YR5/3 D 4/3 M	Silt loam	Strong fine to medium platy	Very friable	Common	Few, fine faint 5Y4/4 M	
ABgj	9-14	10YR5/2.5 D 4/2 M	Silt loam	Moderate fine pseudoplaty or subangular blocky	Very friable	Common	Common fine faint 5YR3/2 M	
Btg	14-23	2.5Y4/2 M	Silt loam	Moderate fine subangular blocky	Friable	Occasional	Common fine distinct 7.5Y4/4 M	
Cg	23-32	2.5Y4/2 M	Silt loam	Pseudoplaty	Very friable		Common fine distinct 7.5Y4/4 M	
IICg	32+	5YR3/4 M	Gravelly sand	Single-grained	Loose			Fe - stains

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
69/240	L	2-1	8.93	4.9		74.86	1.004	43.25													124.18	23.96								
241	F	1-0	11.86	4.4	3.97	89.22	1.230	42.07	26.85	4.85	0.46	3.13	35.29	80.09	44.06					104.59	107.39	22.71	5.03	27.41						
242	Ae	0-4	2.15	6.1	5.55	0.85	0.059	8.34	10.73	2.70	0.12	0.11	13.66	15.89	85.97					10.11	93.98	2.30	16.34	60.01			50.62	38.29	11.09	
243	Aegj	4-9	1.94	6.3	5.68	0.70	0.032	12.75	9.48	2.61	0.10	0.08	12.27	13.06	93.95					6.42	152.91	2.80	14.53	58.62						
244	ABgj	9-14	2.35	6.4	5.70	0.85	0.051	9.67	10.54	2.77	0.12	0.09	13.52	15.05	89.83					3.17	112.59	2.81	17.14	58.85						
245	Btg	14-23	2.25	6.6	5.77		0.049		10.74	2.66	0.13	0.09	13.62	14.82	91.90					5.38	150.31	1.02	20.19	62.63			34.16	48.49	17.35	
246	Cg	23-32	1.94	6.7	5.87				8.66	2.61	0.12	0.09	11.48	12.39	92.66					5.81	132.01		19.62	51.73			9.11	75.24	15.65	
247	IICg	32+	1.83	6.8	6.12				6.36	2.24	0.09	0.09	8.78	10.51	83.54					3.26	39.20	5.60	10.95	48.88						

LOCATION:

SOIL NAME: Oona

CLASSIFICATION: OHPP

PARENT MATERIAL: Colluvium over bedrock

DRAINAGE: Well drained

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1½-0							
Ae	0-1	10YR6/2 D	sl	1 msbk	mfr	rc		
Bf	1-10	10YR4/4	sl	1 msbk	mfr	roc		
C1	10-25	10YR5/2	stony sl		mvfr	roc		fragmental pieces of till included
R	25+		- some shattering in bedrock -					

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
90/70	L-H	1½-0	10.62	4.6		100.66	1.27	21.9	20.57	2.96	.100	1.66	25.29	68.94	36.68					60.29	71.90											
91A/70	Ae	0-1					NOT SAMPLED																									
91/70	Bf	1-0	2.56	5.6	4.75	3.08	.081	22.0	0.51	0.21	0.07	0.59	1.38	12.27	11.25	1.21	1.07	0.21	0.43	37.64	68.20					66.7						
92/70	C1	10-25	1.73	5.6		1.63			1.32	.52	.062	.176	2.08	8.55	24.33			0.14	0.179	55.95	71.21											
93/70	R	25+					NOT SAMPLED																									

LOCATION: 125° 34'W/54° 27'N

Profile Description:

SOIL NAME: Oona

PARENT MATERIAL: Shallow colluvium overlying basic bedrock

ELEVATION: 3500 feet

CLASSIFICATION: Mini Humo-Ferric Podzol

DRAINAGE: Rapidly drained

SLOPE & ASPECT: NE 42%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0							Raw and decomposed forest litter
Bhf	0-3	10YR3.5/3 D 7.5YR3/2 M	Gravelly sandy loam to loam	Moderate fine to medium granular	Soft	Abundant		angular fine gravel
Bf1	3-6	10YR4/3 D 7.5YR4/4 M	Gravelly sandy loam to loam	Moderate fine to medium granular	Soft	Abundant		
Bf2	6-10	10YR5/4 D 7.5YR4.5/4 M	Gravelly sandy loam to loam	Moderate fine to medium granular	Soft	Abundant		
Bm	10-15	10YR5/3.5 D 7.5YR5/4 M	Gravelly sandy loam to loam	Moderate fine to medium granular	Soft	Abundant		
BC	15-24	10YR5.5/3 D 4/3 M	Gravelly loam	Moderate fine subangular blocky	Soft	Abundant		
C	24-32	10YR6.5/3 D 5/3 M	Gravelly loam	Moderate fine subangular blocky	Soft	Common		
IIC	32-38	10YR5.5/4 D 7.5YR4.5/4 M	Gravelly loam till	Pseudoplaty	Very hard	Occasional		
R	38+							

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM	N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
68/504	L-H	1-0	10.62	4.5	4.17	110.98	1.233	52.21	18.81	4.42	0.07	2.21	25.51	102.41	24.91					41.59	64.16	13.27	4.98	71.90							
505	Bhf	0-3	5.82	6.1	5.76	11.24	0.223	29.24	25.13	2.44	0.04	1.06	28.67	41.95	68.93	0.91	0.93			339.68	400	5.29	11.64	121.16							
506	Bf1	3-6	4.17	5.7	5.17	4.89	0.125	22.72	11.59	2.34	0.04	0.60	14.57	28.14	51.78	0.78	0.85			279.18	400	4.43	16.15	95.58							
507	Bf2	6-10	3.31	5.5	4.61	4.76	0.098	28.16	6.59	1.55	0.03	0.71	8.88	22.98	38.64	0.73	0.77			13.4	30.0		19.37	86.52							
508	Bm	10-15	2.89	5.4	4.43	2.64	0.074	20.68	5.92	1.35	0.04	0.66	7.97	21.74	36.66	0.67	0.65			92.6	180.0		19.81	83.86							
509	BC	15-24	2.15	5.5	4.54	1.69	0.049	20.00	7.41	1.34	0.07	0.41	9.23	15.98	57.76	0.41	0.28			29.9	138.9		19.15	72.27							
510	C	24-32	3.09	5.4	4.32	2.05	0.071	16.76	4.64	0.71	0.07	0.25	5.67	18.53	30.60	0.40	0.56			74.7	126.2	0.77	21.91	64.69							
511	IIC	32-38	3.41	5.5	4.52											0.40	1.10			36.2	83.8	0.52	26.11	73.16							

LOCATION: 124° 38'W/54° 08'N

Profile Description:

SOIL NAME: Ormond

PARENT MATERIAL: Shallow colluvium and till overlying basic rock

ELEVATION: 2900 feet

CLASSIFICATION: Lithic Orthic Dystric Brunisol

DRAINAGE: Rapidly drained

SLOPE & ASPECT: NE 14%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0							Forest litter
Bm1	0-3	10YR5.5/3 D 7.5YR4/2 M	Gravelly loam to gravelly sandy loam	Weak to moderate subangular blocky	Very friable	Abundant		
Bm2	3-7	10YR5/3 D 5YR3.5/3 M	Gravelly loam	Weak to moderate subangular blocky	Very friable	Abundant		
Bm3	7-11	10YR5/3 D 5YR3.5/3 M	Gravelly loam	Weak fine subangular blocky	Slightly hard	Abundant		
C	11-18	10YR6.5/2 D 3.5/3 M	Gravelly loam till	Pseudoplaty	Hard	Common		
R	18+		Basaltic rock					

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
67/394	L-H	1-0	6.61	5.2	4.2	13.9	1.60	19.6	15.35	3.84	0.08	1.36	20.63	44.70	46.2					10.3	186.6		13.6	64.0							
395	Bm1	0-3	3.89	6.1	4.8	18.0	0.94	11.1	3.22	0.71	0.01	0.56	4.50	17.89	25.2	0.79	0.92			88	150.6	6.7	14.0	08.8							
396	Bm2	3-7	3.20	6.2	4.8	5.0	0.25	11.6	2.22	0.59	0.01	0.23	3.05	16.56	18.4	0.77	0.96			104.5	194	5.2	14.7	71.0							
397	Bm3	7-11	2.88	6.2	4.7	3.3	0.17	11.0	2.98	1.46	0.05	0.24	4.73	16.53	28.6	0.70	0.70			118.8	242	9.0	16.2	64.3							
398	C	11-18	2.44	6.2	4.9	1.9	0.13	8.5	3.80	2.30	0.08	0.20	6.44	12.58	51.2	0.56	0.46			54.3	159	7.7	12.5	44.8							

LOCATION: 125° 56'W/53° 49'N

Profile Description:

SOIL NAME: Ormond

PARENT MATERIAL: Shallow colluvium overlying basic rock

ELEVATION: 3200 feet

CLASSIFICATION: Lithic Rego Dark Gray

DRAINAGE: Rapidly drained

SLOPE & ASPECT: S 60%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LF	2-1							Leaves and stems partly decomposed
H	1-0							Decomposed plant remains
Ah	0-4	10YR3.5/2 D 2.5/2 M	Gravelly sandy loam	Strong fine to medium granular	Loose	Abundant		Angular gravel
Ahe	4-12	10YR4/2 D 3/1 M	Gravelly sandy loam	Strong fine to medium granular	Loose	Abundant		
AC	12-18	10YR4.5/3 D 3/2.5 M	Stony loamy sand	Moderate fine granular	Loose	Common		Angular stones and gravel
R	18+							

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/276	LF	2-1	12.36	6.6	6.00	77.53	2.260	19.90	82.25	12.13	0.08	3.19	97.65	98.73	98.91					65.73	400	29.21	28.37	344.1								
277	H	1-0	9.17	6.9	6.52	50.02	1.557	18.64	76.42	9.93	0.08	2.95	89.38	90.93	98.30					92.79	> 400	17.47	41.48	470.8								
278	Ah	0-4	6.84	6.7	6.16	20.94	0.896	13.56	46.80	4.80	0.05	0.16	51.80	55.74	92.93					149.6	> 400	4.54	43.00	410.0								
279	Ahe	4-12	5.37	6.4	6.25	13.89	0.632	12.75	34.14	4.00	0.05	0.09	38.28	43.40	88.20					97.47	306.6	4.48	61.64	318.7								
280	AC	12-18	3.84	6.3	5.97	6.71	0.320	12.16	19.73	2.74	0.04	0.83	23.34	27.67	84.35					83.07	201.4	5.97	33.23	236.2								

LOCATION: 124° 13'W/54° 16'N

SOIL NAME: Peta

CLASSIFICATION: Degraded Dystric Brunisol

PARENT MATERIAL: Sandy glaciofluvial deposits

DRAINAGE: Rapid

Profile Description:

ELEVATION: 2700 feet

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0					Abundant		
Ae	0-½	10YR6/2 D 3.5/2 M	Sandy loam	Weak to moderate fine subangular blocky	Soft	Abundant		Incipient to 2" thick
Bm1	½-6	10YR5/4 D 3/3 M	Sandy loam	Weak to moderate fine subangular blocky	Soft	Abundant		
Bm2	6-10	10YR6/4 D 4/3 M	Loamy sand	Weak fine subangular blocky	Soft	Abundant		
IIC1	10-20	Variegated	Sand	Single-grained	Loose	Common		Some fine gravel
IIC2	20+	Variegated	Coarse sand	Single-grained	Loose	Occasional		Some fine gravel

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
67/274	L-H	½-0	11.61	4.2	3.6	86.2	1.17	42.8	16.41	1.79	0.10	2.38	20.68	92.52	22.4					63.6	67.0		17.0	72.5							
275	Ae	0-½	0.70	4.2	3.7	2.84	1.21	13.6	0.60	0.25	0.04	0.18	1.07	12.28	8.7					88.1	191.3	2.5	10.8	49.1							
276	Bm1	½-6	2.25	5.8	4.8	1.04	.078	8.7	1.64	0.31	0.05	0.20	2.20	8.78	25.1	0.59	0.72			>300	>500	2.4	19.4	88.2							
277	Bm2	6-10	1.73	6.1	5.0	0.70			2.19	0.41	0.04	0.28	2.92	7.17	40.7	0.55	0.56			203.5	366.2	2.3	20.9	78.8							
278	IIC1	10-20	1.21	6.2	5.1				2.23	0.25	0.03	0.22	2.74	5.49	49.9	0.72	0.51			51.9	146.8	0.8	21.8	43.0							
279	IIC2	20+	0.81	6.3	5.2				2.82	0.71	0.04	0.25	3.82	5.66	67.5					11.1	43.3	1.5	30.2	42.8							

LOCATION: 125° 34'W/54° 12'N

Profile Description:

SOIL NAME: Pinkut

PARENT MATERIAL: Colluvium over till

ELEVATION: 2600 feet

CLASSIFICATION: Degraded Eutric Brunisol

DRAINAGE: Well drained

SLOPE & ASPECT: S 44%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LF	1½-1							Leaves and twigs
H	1-0							Decomposed plant remains
Bm1	0-6	10YR5/3 D 3.5/3 M	Gravelly sandy loam	Moderate fine to medium granular	Very friable	Abundant		
Bm2	6-11	10YR5.5/3.5 D 3/4 M	Gravelly sandy loam	Moderate fine to medium granular	Very friable	Abundant		
Aej	11-17	10YR6/3 D 4/3 M	Gravelly loam to gravelly sandy loam	Moderate fine subangular blocky	Friable	Abundant		
AB1	17-25	10YR6.5/3 D 4.5/3 M	Gravelly loam to gravelly sandy loam	Moderate fine subangular blocky	Friable	Abundant		
AB2	25-34	10YR6.5/3 D 4.5/3 M	Gravelly loam to loam	Moderate fine to medium subangular blocky	Firm	Common		
Btj	34-45	10YR5.5/3 D 3.5/4 M	Gravelly loam to loam	Moderate fine to medium subangular blocky	Firm	Common		
IIC	45-56	Variegated	Gravelly loamy sand	Structureless	Hard (weakly cemented)	Occasional		
IIIC	56+	10YR5/3 D 3.5/3 M	Gravelly loam till	Pseudoplaty	Extremely hard			

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	OM %	N %	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
68/612	LF	1½-1	13.64	6.2	5.84	105.8	1.994	30.79	68.18	8.81	0.06	3.35	80.40	137.8	58.34					50.0	100	30.68	14.21	182.3								
613	H	1-0	2.30	6.7	5.99	114.3	1.110	59.76	47.31	5.37	0.03	1.38	54.09	73.66	73.43					27.3	138.1	9.21	22.25	184.1								
614	Bm1	0-6	1.01	6.5	5.98	1.98	0.058	19.83	4.55	0.96	0.01	0.57	6.09	10.16	59.94	0.56	0.43			180.3	377.8		11.11	61.87								
615	Bm2	6-11	1.11	6.3	5.57	1.36	0.043	18.37	3.67	0.95	0.03	0.50	5.15	4.62	53.53	0.61	0.42			161.8	366		10.36	75.83								
616	Aej	11-17	1.21	6.5	5.76	0.62	0.026	13.85	4.76	1.27	0.03	0.46	6.52	9.99	65.27					55.7	121.4		12.90	61.49								
617	AB1	17-25	1.32	6.5	5.84	0.56	0.023	13.91	5.61	1.46	0.04	0.36	7.47	10.71	69.75					12.2	50.7		15.20	48.63								
618	AB2	25-34	2.46	6.5	5.70				6.72	1.99	0.05	0.37	9.13	11.89	76.79					4.6	49.7	3.07	27.66	54.82								
619	Btj	34-45	1.83	6.4	5.57				7.99	2.42	0.08	0.44	10.93	14.70	74.35					3.0	76.4	1.27	29.02	56.01								
620	IIC	45-56	0.60	6.3	6.17				3.77	1.01	0.04	0.15	4.97	7.12	69.80	0.64	0.46			5.2	42.8		18.11	48.54								
621	IIIC	56+	0.70	6.4	6.06															2.5	100.7	0.50	25.18	53.87								

LOCATION: 124° 06'W/54° 05'N

Profile Description:

SOIL NAME: Prairiedale

PARENT MATERIAL: Lacustrine silts

ELEVATION: 2250 feet

CLASSIFICATION: Dark Gray Wooded

DRAINAGE: Well drained

SLOPE & ASPECT: Level

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
Ap	0-5	10YR4/2.5 D 3/2 M	Silt loam	Strong medium to fine granular	Soft	Abundant		
Ae	5-9½	10YR7/2 D 5/3 M	Silt loam	Strong fine to medium platy	Slightly hard	Common		
Bt1	9½-17	10YR6/3 D 4/3 M	Silt loam	Strong fine to medium angular blocky	Hard to very hard	Common		Clay films
Bt2	17-24	10YR7/3 D 5/3 M	Silt loam to silty clay loam	Moderate fine angular blocky	Hard	Occasional		Clay films
C	24-30	10YR7/2 D 5.5/3 M	Silt loam	Stratified	Very friable	Occasional		
Ck1	30-38	10YR7/2 D 5.5/3 M	Silt loam	Stratified	Very friable	Occasional		Slight efferv. with HCL
Ck2	38+	10YR7/2 D 5.5/3 M	Silty clay loam	Stratified	Friable	Occasional		Slight efferv. with HCL

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
67/334	Ap	0-5	3.30	5.4	5.6	61.9	0.29	12.5	14.10	3.41	0.22	0.22	17.95	24.29	73.9					27	98	3.8	22.2	75.7							
335	Ae	5-9½	1.94	6.6	5.7	0.7	0.05	8.5	5.40	2.75	0.11	0.10	8.36	10.40	80.4					4	163	2.0	13.8	51.0				2.72	85.05	12.23	0.15
336	Bt1	9½-17	3.09	6.4	5.4	0.7			8.56	6.18	0.25	8.20	15.19	21.29	71.3					2	201	14.3	29.1	60.6				1.44	74.96	23.60	8.64
337	Bt2	17-24	2.77	7.5	6.6				9.76	7.19	0.44	0.23	17.62	19.12	92.2					2	363	14.0	31.3	66.0					74.52	25.48	12.02
338	C	24-30	2.14	8.2	7.0				8.68	6.36	0.44	0.19	15.67	15.42	100					1	136	5.0	31.2	67.4				0.51	79.45	20.04	1.33
339	Ck1	30-38	1.94	8.3	7.0				12.33	6.22	0.33	0.19	19.07	13.56	100					1	135	11.5	30.6	76.5							
340	Ck2	38+	2.04	8.3	7.0				13.98	6.02	0.41	0.22	20.63	12.86						2	>300	20.5	26.5	72.7					70.60	29.40	12.62

LOCATION: 125° 28'W/54° 14'N

Profile Description:

SOIL NAME: Ramsey

PARENT MATERIAL: Gravelly glaciofluvial deposits

ELEVATION: 3700 feet

CLASSIFICATION: Orthic Humo-Ferric Podzol

DRAINAGE: Rapidly drained

SLOPE & ASPECT: S 9%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	2-0							Forest litter
Ae	0-4	10YR6/2 D 5/2 M	Gravelly loamy sand	Moderate medium granular	Soft	Abundant		
Bfh	4-8	7.5YR5/6 D 5YR4/4 M	Gravelly loamy sand	Moderate medium granular	Soft	Abundant		
Bf	8-16	10YR5/6 D 7.5YR4/4 M	Gravelly sand	Weak medium granular	Loose	Abundant		
IIC	16+	Variegated	Sandy gravel	Single-grained	Loose	Common to Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/232	LH	2-0	12.36	5.0	4.76	103.4	1.598	37.54	37.53	5.28	0.09	1.62	44.52	92.90	47.92					33.82	54.49	17.5	8.71	151.6								
233	Ae	0-4	1.21	4.6	4.28	2.76	0.056	28.63	2.43	0.56	0.06	0.12	3.17	10.96	28.92					26.72	49.59	1.27	5.82	30.87								
234	Bfh	4-8	3.84	4.8	4.36	5.50	0.052	61.38	0.31	0.16	0.05	0.21	0.73	24.82	2.94					158.8	230.5	11.68	16.10	59.71								
235	Bf	8-16	1.62	5.3	4.79	1.63	0.041	23.00	0.51	0.10	0.05	0.11	0.77	8.37	9.20					64.53	139.2	3.30	15.50	55.13								
236	IIC	16+	0.70	5.4	5.16		0.040		0.70	0.15	0.03	0.06	0.94	3.79	24.80					20.74	387.7	1.26	14.35	37.76								

LOCATION: 124° 17'W/54° 21'N

Profile Description:

SOIL NAME: Roaring

PARENT MATERIAL: Esker (complex) deposits

ELEVATION: 2600 feet

CLASSIFICATION: Orthic Dystric Brunisol

DRAINAGE: Rapidly drained

SLOPE & ASPECT: S 25%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	½-0							Forest litter
Ah	0-1	10YR4/2 D 3/2 M	Gravelly loamy sand	Weak medium granular	Soft	Abundant		
Bm	1-6	10YR5/3 D 3/3.5 M	Gravelly loamy sand	Weak fine subangular blocky	Soft	Abundant		
C1	6-14	Variegated	Gravelly sand	Single-grained	Loose	Abundant		
C2	14+	Variegated	Gravel and sand	Single-grained	Loose	Abundant		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/281	LH	½-0	9.89	6.2	5.4	68.24	3.11	30.2	56.37	7.25	0.12	3.43	67.17	78.02	86.1					68.7	134.6		15.4	178.6							
282	Ah	0-1	1.52	6.5	5.5	4.86	1.61	17.5	8.22	1.37	0.03	1.34	10.96	14.54	74.3					111.7	573.6	5.1	12.7	137.0							
283	Bm	1-6	1.52	6.0	5.1	2.43	0.104	13.6	4.37	0.51	0.04	0.58	5.50	10.62	51.8	0.57	0.30			154.8	>500	8.8	14.2	129.4							
284	C1	6-14	1.21	6.4	5.9				4.45	0.51	0.03	0.38	5.37	9.13	58.8	0.70	0.51			58.7	288.4	1.3	14.2	70.8							
285	C2	14+	1.11	6.3	5.8				3.74	0.56	0.05	0.37	4.72	7.08	66.7	0.54	0.22			22.7	48.5	1.3	17.9	59.4							

LOCATION: 126° 50'W/54° 55'N

Profile Description:

SOIL NAME: Saunders

PARENT MATERIAL: Basal till

ELEVATION: 4500 feet

CLASSIFICATION: Bisequa Humo-Ferric Podzol

DRAINAGE: Well drained

SLOPE & ASPECT: SE 26%

HORIZON	DEPTH IN – CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	1-0							Raw to decomposed plant remains
Ae	0-2	10YR7/2 D 7.5YR6/2 M	Sandy loam to loam	Strong fine to medium granular	Very friable	Abundant		
Bfh	2-7	10YR5/5 D 5YR4/4 M	Sandy loam to loam	Strong fine to medium granular	Very friable	Abundant		
Bf	7-13	10YR5.5/4 D 7.5YR5/6 M	Gravelly sandy loam to gravelly loam	Moderate fine to medium granular	Very friable	Common		
AB	13-22	10YR6/3 D 4.5/3 M	Gravelly loam	Moderate fine subangular to angular blocky	Friable	Common		
Bt1	22-30	10YR6/3 D 4/3 M	Gravelly loam	Moderate fine to medium angular blocky	Firm	Occasional		Clay films
Bt2	30-41	10YR6/3 D 4/3 M	Gravelly loam	Moderate fine to medium angular blocky	Firm	Occasional		Clay films
C	41+	10YR6/2.5 D 5Y5.5/1 M	Gravelly loam	Pseudoplaty	Firm			

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/333	LH	1-0	14.42	5.0	4.95	113.5	1.483	44.40	35.01	4.65	0.27	5.38	45.31	83.78	54.08					125.8	143.6	4.0	8.30	76.66							
334	Ae	0-2	2.67	5.0	3.60	3.72	0.140	15.40	2.26	0.46	0.10	0.25	3.07	20.63	14.88					8.73	15.40	1.25	7.70	39.01							
335	Bfh	2-7	5.04	5.1	3.88	7.03	0.210	19.71	2.21	0.27	0.13	0.12	2.73	29.05	9.40	2.33	1.04			14.71	28.47	5.00	19.70	115.5				28.02	41.16	30.82	13.09
336	Bf	7-13	3.74	5.3	4.05		0.119		1.04	0.16	0.07	0.11	13.8	18.47	7.47	3.07	1.02			18.67	45.13	5.00	25.16	132.2							
337	AB	13-22	2.99	5.8	4.18				0.82	0.15	0.07	0.13	1.17	15.19	7.70					13.49	60.25	2.25	30.12	150.6				37.66	28.71	33.63	17.34
338	Bt1	22-30	2.25	5.5	4.00				0.82	0.28	0.06	0.13	1.29	12.79	10.09					45.50	100.2	2.50	33.74	136.7				35.66	30.05	34.29	18.13
339	Bt2	30-41	2.04	5.4	3.93				1.22	0.37	0.11	0.14	1.84	11.62	15.83					55.61	127.5		34.44	127.5				36.03	29.94	34.03	18.06
340	C	41+	1.94	5.3	3.98				1.33	0.40	0.06	0.14	1.93	9.95	19.40	0.62	0.57			48.42	133.5		35.93	207.7				40.89	29.00	30.11	14.32

LOCATION:

Profile Description:

SOIL NAME: Savory

PARENT MATERIAL: Glaciofluvial gravels

ELEVATION:

CLASSIFICATION: Orthic Humo-Ferric Podzol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0							Alpine fir needles and blueberry plants
Ae	0-2	10YR7/1	sl		ml	ra		
Bfh	2-9	10YR5/6	gsl	1 m sbk	mvfr	ra		
BC	9-14	10YR4/3	gsl	Sg	ml	roc		
C	14+	variegated	gls	Sg	ml	roc	f 2 f	

LOCATION:

SOIL NAME: Slug

CLASSIFICATION: MHFP

PARENT MATERIAL: Alluvial fan

DRAINAGE: Rapid

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1½-0							
Ae	0-½	10YR7/2 D						Ranges from ½ to 2"
Bf	½-7½	10YR5/6 D	fsl	1 m sbk	mfr	ra		
C1	7½-15½	10YR5/3 D	sl	1 m sbk	mfr	ra		
IIC	15½-27½+	variegated	sgr	Sg	ml	roc		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
62/70	L-H	1½-0	8.70	4.6	3.92	87.29	1.07	47.3																							
63A/70	Ae	0-½							NOT SAMPLED																	460.0					
63/70	Bf	½-7½	2.04	5.7	4.69	2.16	.056	22.8								1.18	0.86									42.9					
64/70	C1	7½-15½	1.21	6.0	5.27	0.75										0.58	0.63									54.1					
65/70	IIC	15½-27½	.81	5.6	5.00																					47.9					

LOCATION:

Profile Description:

SOIL NAME: Slug

PARENT MATERIAL: Alluvial fan

ELEVATION:

CLASSIFICATION: Orthic Regosol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN – CM.	COLOR DRY O MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0							
Ahj	0-6	10YR3/2-3/3	l	1fgr	mfr	ra		Brownish color related to reddish bedrock
C1	6-18	10YR4/4	vfsl	2 m sbk	mfr	ra		Some indication of melanization(Bm)
IIC	18-27	variegated	sgr		ml	roc		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
54/70	L-H	1-0	12.61	5.4	4.87	100	3.43																			84.0						
55/70	Ahj	0-6	2.88	5.4	4.49	8.09	.423	11.1	9.57	1.38	.055	.388	11.39	24.85	45.84											46.0						
56/70	C1	6-18	2.15	5.5	4.55	2.96			3.27	.67	.051	.133	4.12	15.27	26.98											30.6						
57/70	IIC	18-27+	1.42	5.4	4.67																					39.6						

LOCATION: 125° 39'W/54° 28'N

SOIL NAME: Slug

CLASSIFICATION: Orthic Dystric Brunisol

PARENT MATERIAL: Alluvial fan deposits

DRAINAGE: Rapidly drained

Profile Description:

ELEVATION: 2400 feet

SLOPE & ASPECT: S 6%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LH	½-0							Needles and twigs
Bm1	0-3	5YR5/3 D 3/3 M	Loam to sandy loam	Moderate fine to medium granular	Very friable	Abundant		
Bm2	3-6	5YR5.5/3 D 3.5/3 M	Loam to sandy loam	Moderate fine to medium granular	Very friable	Abundant		
BC	6-12	10YR6/3.5 D 3.5/3 M	Sandy loam	Weak fine subangular blocky	Very friable	Abundant		
C1	12-15	10YR6/2.5 D 5/2 M	Gravelly loamy sand	Single-grained	Loose	Abundant		
C2	15-24	10YR6/2.5 D 5/2 M	Loamy sand to gravelly loamy sand	Weak fine subangular blocky	Loose	Common		
IIC	24+	Variegated	Gravel and sand	Single-grained	Loose	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM	PPM Mn	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
68/466	L-H	½-0	10.62	4.9	4.41	92.05	1.159	46.07	27.66	7.06	0.12	26.27	61.11	94.23	64.85						84.51	33.19									
467	Bm	0-3	2.25	5.5	4.86	2.17	0.067	18.81	3.46	1.41	0.02	0.55	5.44	14.42	37.73	0.72	0.55			322.0	>400	3.83	13.55	95.86							
468	Bm2	3-6	2.04	5.8	5.14	1.41	0.042	19.52	3.96	0.83	0.02	0.38	5.19	12.28	42.26	0.54	0.53			285.7	>400	2.30	18.62	79.08							
469	BC	6-12	1.21	6.0	5.57	0.81	0.022	21.36	4.55	0.89	0.03	0.31	5.78	9.59	60.27					93.11	170	2.28	21.00	60.73							
470	C1	12-15	1.01	6.3	5.63	0.73	0.025	16.80	4.93	0.82	0.03	0.25	6.03	8.80	68.52	0.39	0.27			34.34	74.24	4.29	22.22	56.82							
471	C2	15-24	1.01	6.5	5.92				5.18	0.82	0.03	0.21	6.24	8.75	71.31					18.48	59.60	1.52	21.97	52.27							
472	IIC	24+	0.81	6.6	6.32															9.78	34.17	2.27	22.18	53.68							

LOCATION: 126° 04'W/54° 02'N

Profile Description:

SOIL NAME: Snodgrass

PARENT MATERIAL: Kame

ELEVATION: 2700 feet

CLASSIFICATION: Orthic Dark Gray

DRAINAGE: Rapidly drained

SLOPE & ASPECT: SW 9%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
Ah	0-4	10YR3.5/2 D 2.5/1 M	Gravelly sandy loam	Strong fine to medium granular	Soft	Abundant		
Ahe	4-7	10YR4/2 D 3/1.5 M	Gravelly sandy loam	Strong fine to medium granular	Soft	Abundant		
Bm	7-11	10YR4.5/3 D 7.5YR3.5/2 M	Gravelly loamy sand	Moderate fine to medium sub-angular blocky	Soft	Abundant		
BC	11-16	10YR5.5/3 D 4/3 M	Stony loamy sand	Moderate fine to medium sub-angular blocky	Soft	Abundant		
C	16-23	10YR6/3 D 3/3.5 M	Stony loamy sand	Single-grained	Soft	Common		
IIC	23+		Gravel and sand mixed with stones	Very weakly cemented	Slightly hard	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/281	Ah	0-4	4.06	6.5	6.08	11.34	0.569	11.56	22.79	2.45	0.07	0.88	26.19	28.20	92.87					38.92	124.3	3.90	28.62	318.6							
282	Ahe	4-7	3.20	6.2	5.76	6.98	0.363	11.15	12.90	1.36	0.03	0.56	14.85	20.04	74.10					32.71	63.47	4.89	22.19	296.7							
283	Bm	7-11	2.67	5.9	5.35	4.06	0.197	11.94	5.16	0.84	0.05	0.31	6.36	13.26	47.96					61.09	118.0	4.88	20.53	183.5							
284	BC	11-16	1.83	6.0	5.53	2.05	0.103	11.52	4.58	0.79	0.05	0.29	5.71	9.58	59.60					52.95	101.3	2.29	24.95	100.5							
285	C	16-23	1.94	6.0	5.50				5.61	0.87	0.05	0.24	6.77	9.80	69.05					35.78	82.06	5.10	29.31	85.37							
286	IIC	23+	1.32	6.2	5.95				5.10	0.76	0.07	0.06	5.99	7.32	81.83					6.89	92.20	2.53	26.60	287.5							

LOCATION:

Profile Description:

SOIL NAME: Shasa

PARENT MATERIAL: Colluvium over bedrock

ELEVATION:

CLASSIFICATION: Lithic Alpine Dystric Brunisol

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	2-0							
Ah	0-4	5YR3/2 M	sil	1 msbk	mfr	ra		
Bm	4-10	5YR3/3 M	stony l		ml	roc		
C1	10-18	10YR4/3 M	stony sl		ml	roc	f 1 f	
R	18+		- shattered bedrock -					

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
58/70	L-H	2-0	7.64	4.7	3.86	67.81	.888	44.5	10.67	2.96	.151	1.83	15.43	66.66	23.15					16.15	18.51	13.99				345.0						
59/70	Ah	0-4	2.78	4.9		8.93	.225	23.0	1.13	.28	.12	.098	1.63	22.30	7.31					4.01	9.04	27.24				20.6						
60/70	Bm	4-10	3.63	5.4	4.26	6.21	.177	20.3	.73	.073	.026	.028	.86	25.07	3.43	1.33	1.14	0.69	0.80	6.11	14.72					12.9						
61/70	C1	10-18	2.46	5.5	4.57	3.28			.082	.030	.077	.041	.023	17.67	.13	0.84	0.86	0.38	0.61	8.30	26.13	5.64				32.3						

LOCATION:

Profile Description:

SOIL NAME: Sidina

PARENT MATERIAL: Colluvial talus

ELEVATION:

CLASSIFICATION: Orthic Regosol

DRAINAGE: Rapid

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0							
Ahj	0-3	10YR4/2 M	l	1 m gr	mrfr	ra		
C	3-10	10YR5/3 M	gl	1 m sbk	mvfr	rc		angular rock fragments common
IIC	10-17	variegated	st. gls		ml	roc		numerous large angular rock fragments
IIIC	17-25	10YR5/3 M	gl	1 m sbk	ml	roc		angular rock fragments
IVC	25+	variegated	st. gls		ml	ro		

LOCATION:

Profile Description:

SOIL NAME: Shegunia

PARENT MATERIAL: Glaciofluvial gravels

ELEVATION:

CLASSIFICATION: Mini Humo-Ferric Podzol

DRAINAGE: Rapid

SLOPE & ASPECT:

HORIZON	DEPTH IN.-CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	4-2							moss
F-H	2-0					ra		
Ae	0-1	10YR6/3 M	sl			rc		
Bf	1-9	5YR5/4 M	gsl	1 m sbk	mvfr	rc		
C	9-19	variegated	gls	Sg	ml	roc		clean stratified s & g
IIC	19+	variegated	gs	Sg	ml	roc		clean stratified s & g

LOCATION:

SOIL NAME: Skeena

PARENT MATERIAL: Steeplant till (Colluvium till)

Profile Description:

CLASSIFICATION: BiHFP

DRAINAGE: Well

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	5-3							
F-H	3-0							
Ae	0-1½	10YR6/3 D			mfr	ra		discontinuous
Bf	½-6½	10YR5/8 M	sl	1 m sbk	mfr	ra		
Ae1	6½-17½	10YR6/2 D 4/2 M	gls		ml	rc		
Ae2	17½-27½	10YR4/1 M	gsl	1 m sbk	mfr	rc		
Bt	27½-34½	10YR4/2 M	cl	3 m abk	mefi	roc		
C1	34½+	10YR4/1 M	cl	m to abk	mefi	roc	flf	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
35/70	L	5-3	9.41	4.5	3.78	94.87			21.97	6.35	.219	5.43	33.97	84.95	39.99					36.65	60.18					230.0				
36/70	F-H	3-0	7.30	4.4	3.56	66.18	1.00	38.4	19.44	2.36	.107	1.05	22.96	85.99	26.70					32.40	41.85					240.0				
37A/70	Ae	0-½							NOT SAMPLED																					
37/70	Bf	½-6½	1.83	5.2	4.50	2.59	.087	17.3	5.11	.97	.055	.178	6.31	15.38	41.03	1.24	0.55	0.39	0.22	109.4	132.3					24.9				
38/70	Ae1	6½-7½	1.52	5.5	5.14	1.09	.046	13.7	5.15	2.33	.081	.14	7.70	11.17	68.93	0.53	0.17	0.11	0.10	2.54	29.75					39.6				
39/70	Ae2	17½-27½	1.73	6.1	5.79	.75	.067	6.5	7.63	3.59	.153	.117	11.49	11.85	96.96					2.54	61.55					24.9				
40/70	Bc	27½-34½	1.94	6.7	6.30				10.19	5.33	.097	.178	15.79	15.60	100					3.06	107.4					5.0				
41/70	C1	34½+	1.83	6.8					9.16	4.94	.087	.180	14.37	13.70	100	0.70	0.48	0.07	0.03	3.05	116.0									

LOCATION:

SOIL NAME: Skins

CLASSIFICATION: MHFP

PARENT MATERIAL: Colluvium over bedrock

DRAINAGE: Well

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1½-0							
Ae	0-2	5YR6/2 D 5YR4/2-4/3 M	sl	1 m sbk	mfr	ra		discontinuous
Bf 1	2-9	5YR5/3 D 5YR4/4 M	sl	1 m sbk	mfr	ra		
Bf 2	9-18	5YR5/3 D 5YR4/3 M	gsl	1 m sbk	mfr	rc		numerous stones
C1	18-34	10YR5/2 D 3/3 M	gsl		mfi	roc	f1f	
R	34+		- shattered bedrock with black coatings along fractures -					

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
80/70	L-H	1½-0	2.67	4.6	3.82	40.66	.734	32.1	6.57	1.64	.154	1.08	9.44	55.88	16.89					26.18	43.12					432.0							
80A/70	Ae	0-2	2.67	4.8	4.13	8.95	.186	27.9	1.75	.564	.118	.332	2.76	26.08	10.58					72.38	117.0					129.4							
81/70	Bf	2-9	3.63	5.3	4.38	5.39	.193	17.1	.73	.073	.088	.135	1.03	10.47	9.84	0.99	1.61	0.65	1.32	24.46	73.02					6.2							
82/70	Bf 1	9-18	3.31	5.5	4.51	3.84			.52	.052	.088	.083	.743	18.29	4.06					23.14	67.15					8.8							
83/70	C1 2	18-34	1.01	5.6	4.66				.51	.020	.086	.066	.682	26.36	2.59	0.63	1.03	0.14	0.36	43.94	93.43					20.7							

LOCATION: 125° 03'W/54° 05'N

Profile Description:

SOIL NAME: Stellako

PARENT MATERIAL: Floodplain deposits

ELEVATION: 2250 feet

CLASSIFICATION: Gleyed Orthic Regosol

DRAINAGE: Imperfectly drained

SLOPE & ASPECT: NE 5% .

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LF	2-0							Leaves, twigs; some partly decomposed
Cgj1	0-5	10YR5/3 D 3.5/3 M	Silt loam	Structureless	Slightly hard	Abundant	Many fine distinct 5YR4/4 D	
Cgj2	5-12	10YR5/3 D 3.5/3 M	Silt loam	Structureless	Slightly hard	Common	Many fine distinct 5YR4/4 D	
Cgj3	12-19	10YR5/3 D 4/3 M	Silt loam	Structureless	Slightly hard	Common	Many fine distinct 5YR4/4 D	
Cgj4	19-25	10YR5/4 D 4/3 M	Silt loam	Structureless	Very friable	Common	Many fine distinct 5YR4/4 D	
Cgl	25+	10YR5/4 D 4/3 M	Silt loam to fine sandy loam	Structureless	Very friable	Occasional	Many fine faint 5YR3/4 M	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/314	L-F	1-0	12.87	6.8	5.75	84.57	1.792	27.83	54.63	25.87	0.32	6.55	87.37	93.66	93.28					174.9	243.8	58.0	13.83	177.7									
315	Cgj1	0-5	1.62	5.9	5.22	1.77	0.063	16.29	5.11	3.96	0.15	0.49	9.71	12.40	78.31					2.74	136.1	0.75	17.78	52.08									
316	Cgj2	5-12	1.83	6.2	5.52	1.21			5.60	5.35	0.22	0.18	11.35	12.94	87.71					1.83	132.3	0.75	17.82	52.19									
317	Cgj3	12-19	1.75	6.5	5.81															2.03	150.5	2.25	18.06	55.95									
318	Cgj4	19-25	1.62	7.1	6.40															2.03	144.3	1.25	15.24	49.29									
319	Cgl	25+	1.52	7.5	6.70															1.09	151.2	4.75	15.99	52.03									

LOCATION: 124° 05'W/54° 01'N

SOIL NAME: Stellako

CLASSIFICATION: Rego Humic Gleysol

PARENT MATERIAL: Floodplain deposits

DRAINAGE: Poorly drained

Profile Description:

ELEVATION: 2200 feet

SLOPE & ASPECT: E 4%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
Om	4-0	5Y2/2 M				Abundant		
Ah-Om	0-4	5Y3/1 M	Silt loam	Massive	Non sticky	Abundant		
Cg1	4-10	5Y3.5/1 M	Silt loam to silty clay loam	Massive	Sticky	Common	Few medium distinct 5YR4/3 M	
Cg2	10-20	5Y5/1.5 M	Silt loam	Massive	Plastic	Occasional	Many fine distinct 5YR4/4 M	
Cg3	20+	5Y5/1 M	Silt loam	Massive	Plastic	Occasional		

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
67/435	Om	4-0	12.36	6.5		49.9	1.70	17.1	56.18	15.51	2.02	0.38	74.09	87.11	85.0					7	21		37.9	48.9								
436	Ah-Om	0-4	9.29	6.7		29.9	1.24	13.8	42.62	17.70	1.62	0.24	62.18	33.42	100					4	30	34.5	47.0	51.9							
437	Cg1	4-10	4.71	7.6		3.1	0.10	17.0	27.49	9.79	0.88	0.16	38.32	34.46	100					3	141	16.5	16.8	57.6							
438	Cg2	10-20	3.41	7.6					19.13	7.34	0.74	0.20	27.41	24.31	100					7	217	6.5	15.8	54.3							
439	Cg3	20+	2.77	7.6																13	270	4.0	20.6	64.2							

LOCATION:

SOIL NAME: Suskwa

PARENT MATERIAL: Kame

Profile Description:

CLASSIFICATION: MHFP

DRAINAGE: Rapid

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	4-2							
F-H	2-0							
Ae	0-1	10YR7/3 D 6/3 M	sl		mfr	rc		Discontinuous
Bf 1	1-5	10YR5/8 M	sl	1 m sbk	mfr	rc		
Bf 2	5-10	10YR4/4 M	gls		ml	rc		fingers of brighter color along root channels
C1	10-22	variegated	gls		ml	roc		dirty gravels
IIC	22+	variegated	sgr		ml	roc		dirty gravels

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn			PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
94/70	L	4-2	12.36	4.7	4.02	100			23.37	4.94	.16	5.08	33.55	72.17	46.49					79.78	127.5					610.0						
95/70	FH	2-0	12.36	4.1	3.31	100	1.27		14.38	3.21	.19	4.04	21.82	87.35	24.98					106.7	130.3					270.0						
96A/70	Ae	0-1							NOT SAMPLED																						
96/70	Bf 1	1-5	2.35	5.7	5.30	1.80	.095	64.7								1.37	0.82	0.32	0.215	32.96	70.11					67.6						
97/70	Bf 2	5-10	2.67	5.2	4.60	2.53	.090	16.3	5.13	1.08	.067	.272	6.55	16.43	39.87	1.50	0.77	0.43	0.215	72.90	112.9					77.5						
98/70	C1	10-22	1.52	6.1	5.82	1.23	11.27	6.60	.96	.96	.066	.21	7.84	9.24	84.85	0.96	0.67	0.13	0.10	48.22						29.4						
99/70	IIC	22+	1.42	6.3	6.06															7.20	51.72					25.4						

LOCATION:

SOIL NAME: Tatin

CLASSIFICATION: BiHFP

PARENT MATERIAL: Steepland till (Colluvium over till)

DRAINAGE: mwd

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	3-2							
F-H	2-0							
Aej	0-½							
Bf	½-8	5YR6/6 D 5YR3/4-4/4 M	fsl	1 m sbk	mfr	ra		influence of downslope
Ae	8-15	10YR6/3	sil	2 m sbk	mfr	roc		gravitational movement
AB	15-20	10YR5/3	sil	2 c sbk	mfi	roc		throughout profile
Bt	20-27	10YR4/2-4/3M	sicl	2 m abk	mvfi	ro		
C1	27+	10YR4/2 M	sicl	m	slfi	ro	f 1 f	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
28/70	L	3-2	11.61	5.1	4.5	100	1.40													16.9	67.5					300.0				
29/70	F-H	2-0	13.89	4.8	4.13	100	1.74		36.67	3.30	.167	2.62	42.76	105.1	40.66					54.1	67.2					755				
30A/70	Aej	0-½							NOT SAMPLED																					
30/70	Bf	½-8	2.15	6.7	6.01	4.23	.129	19.0	14.71	.53	.063	.099	15.40	20.14	76.46	1.31	1.22	0.21	0.13	1.33	4.49					28.1				
31/70	Ae	8-15	1.52	7.1	6.64	1.82	.075	14.1	11.67	.508	.065	.074	12.31	11.93	100	0.44	0.17	0.14	0.13							8.1				
32/70	AB	15-20	1.83	7.3	6.61	1.63	.088	10.7	13.44	.60	.091	.12	14.25	13.87	100					0.71	65.6					6.6				
33/70	Bt	20-27	1.21	7.5	6.76				10.4	.51	.175	.089		10.64	100					0.71	103.2					3.04				
34/70	C1	27+	1.11	7.5	6.86				10.11	.506	.064	.096		10.06	100	0.75	0.58	0.04	0.03	1.21	115.2					2.5				

LOCATION: 124° 29'W/54° 16'N

SOIL NAME: Twain

CLASSIFICATION: Bisequa Humo-Ferric Podzol

PARENT MATERIAL: Basal till

DRAINAGE: Well drained

Profile Description:

ELEVATION: 3500 feet

SLOPE & ASPECT: NE 15%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	3-2							Needles and twigs
FH	2-0					Abundant		Decomposed and semi-decomposed litter
Ae	0-2	10YR6/2 D 4/2 M	Sandy loam	Moderate to strong medium granular	Soft	Abundant		
Bf1	2-7	10YR5/4 D 7.5YR4/4 M	Silt loam	Moderate to strong medium granular	Soft	Common		
Bf2	7-12	10YR6/3.5 D 4/4 M	Silt loam	Moderate fine to medium subangular blocky	Soft	Common		
AB	12-19	10YR7/2 D 4.5/3 M	Silt loam	Strong fine to medium angular and subangular blocky	Friable	Common		Few clay skins in pores
Bt1	19-26	10YR7/2.5 D 3/3.5 M	Gravelly silt loam	Strong medium angular blocky	Firm	Occasional		Common clay skins
Bt2	26-32	10YR7/2.5 D 3/3.5 M	Gravelly silty clay loam	Strong medium angular blocky	Firm	Occasional		Many clay skins
BC	32-42	10YR7/2 D 4/2.5 M	Gravelly loam	Pseudoplaty	Firm	Occasional		Some clay skins
C1	42-49	10YR6/2 D 4/3 M	Gravelly sandy loam to gravelly loam	Single-grained	Friable			
C2	49+	10YR7/2 D 4/2.5 M	Gravelly loam to gravelly sandy loam		Very firm			

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn	PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/322	L	3-2	12.11	4.5	3.85	116.8	1.252	54.12	11.59	4.04	0.09	2.24	17.96	84.60	21.23					47.09	67.8	35.0	4.48	51.57							
323	FH	2-0	11.11	4.4	3.66	103.9	1.270	47.48	11.49	3.38	0.12	1.60	16.59	79.55	20.85					42.22	56.1	27.0	4.72	53.61							
324	Ae	0-2	1.52	5.5	4.63	2.32	0.078	17.28	5.58	0.81	0.06	0.28	6.73	12.13	55.48					82.23	147.2		5.84	41.88							
325	Bf1	2-7	3.20	6.1	5.06	2.60	0.096	16.02	2.58	0.57	0.07	0.30	3.52	14.80	23.78	0.91	1.20			126.4	288.9	0.25	11.09	113.5			27.36	56.68	15.96		
326	Bf2	7-12	2.35	6.1	4.98	1.38	0.074	10.82	1.33	0.46	0.05	0.28	2.12	10.20	20.78	0.65	0.88			49.03	106.4	2.50	12.79	101.0							
327	AB	12-19	1.94	6.1	4.79	0.47	0.032	8.53	6.63	2.40	0.09	0.30	9.42	13.17	71.53					15.29	185.5		22.94	58.62			17.02	64.25	18.73	3.67	
328	Bt1	19-26	1.94	6.3	5.30				8.36	3.03	0.10	0.29	11.78	12.80	92.03					7.14	279.3		25.74	58.62			20.29	57.60	22.11	7.60	
329	Bt2	26-32	2.25	6.6	5.58				10.23	3.74	0.18	0.31	14.46	14.56	99.31					4.50	337.4		28.37	65.44			19.49	52.46	28.05	15.44	
330	BC	32-42	1.62	6.7	5.71				8.33	3.10	0.12	0.24	11.79	11.83	99.66					4.27	284.5		20.83	53.35							
331	C1	42-49	1.01	6.8	5.80				4.75	1.82	0.13	0.17	6.87	7.49	91.72	0.16	0.10			4.65	176.7		13.6	46.66							

LOCATION: 125° 31'W/54° 14'N

Profile Description:

SOIL NAME: Twain

PARENT MATERIAL: Basal till

ELEVATION: 3800 feet

CLASSIFICATION: Humic Eluviated Gleysol

DRAINAGE: Poorly drained

SLOPE & ASPECT: S 4%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
LF	6-5							
Oh	5-0					Abundant		
Ah	0-4	10YR3/1 M	Silty loam	Moderate medium granular	Very friable	Abundant		
Ahe	4-8	10YR3.5/2 M	Silty loam	Moderate fine platy	Friable	Common		
Aegl	8-12	2.5Y5/2 M	Gravelly loam	Massive	Very firm	Occasional	Few fine faint 10YR5/4 M	
Aeg2	12-18	5Y4.5/1 M	Gravelly loam	Massive	Very firm	Occasional	Common medium distinct 7.5YR5/6M	
Btg	18-24	5Y4/1 M	Gravelly clay loam	Massive	Very plastic			
Cgl	24-34	2.5Y4.5/2 M	Gravelly clay loam	Massive	Plastic		Common medium distinct 10YR5/6 M	
Cg2	34+	2.5Y4.5/2 M	Gravelly clay loam	Massive	Plastic		Common medium distinct 10YR5/6 M	

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
69/305	LF	6-5	11.61	5.8	5.19	46.82	0.878	30.93	32.37	7.21	0.30	2.08	41.96	40.01	100					39.06	56.36	41.00	35.99	93.47								
306	Oh	5-0	8.93	5.6	4.95	32.17	0.680	27.44	25.49	7.04	0.35	0.85	33.73	74.67	45.17					15.25	24.18	11.00	33.77	88.51								
307	Ah	0-4	6.72	5.1	4.51	11.27	0.373	17.43	11.53	2.42	0.12	0.70	14.77	51.01	28.96					4.27	8.11	11.50	61.36	146.7								
308	Ahe	4-8	4.93	5.3	4.44	7.82	0.220	20.61	7.66	2.10	0.13	0.23	10.12	34.85	29.04					3.69	18.78	7.25	35.94	107.5								
309	Aegl	8-12	1.32	5.5	4.88	1.06	0.035	17.34	2.43	0.56	0.06	0.07	3.12	6.80	45.88					1.52	97.27	2.50	11.91	51.93				53.45	36.5	10.02	1.89
310	Aeg2	12-18	1.83	6.4	5.72		0.029		5.60	1.47	0.07	0.12	7.26	8.86	81.94					1.02	115.06	2.50	14.26	50.92							
311	Btg	18-24	2.35	6.8	6.49				11.77	3.32	0.11	0.27	15.47	15.25	100					1.02	142.27	0.25	31.47	64.48				40.71	31.3	27.96	15.90
312	Cgl	24-34	2.46	6.7	6.42															1.02	154.71		37.14	63.53							
313	Cg2	34+	2.46	6.8	6.43															2.05	169.06		37.14	64.55				42.08	30.3	27.57	17.94

LOCATION: 123° 58'W/54° 03'N

Profile Description:

SOIL NAME: Vanderhoof

PARENT MATERIAL: Glaciolacustrine clay deposits

ELEVATION: 2300 feet

CLASSIFICATION: Orthic Gray Wooded (Luvisol)

DRAINAGE: Well to moderately well

SLOPE & ASPECT: SW 4%

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1-0					Abundant		Forest litter
Ae	0-3	10YR6/2 D 5/2 M	Silty clay loam	Massive medium to coarse platy	Slightly hard	Abundant		
AB	3-5	10YR6/2 D 5/2 M	Silty clay loam	Moderate coarse platy	Hard	Abundant		
BA	5-8	10YR6/2 D 5/3 M	Silty clay	Strong coarse columnar	Hard	Common		
Bt1	8-15	10YR4/3 D 3/4 M	Silty clay	Strong coarse prismatic	Hard	Common		Many clay films
Bt2	15-20	10YR4/3 D 3/4 M	Silty clay	Strong coarse prismatic	Hard	Along structure interfaces		Many clay films
BC	20-29	10YR5/3 D 3/3 M	Silty clay	Moderate fine to medium angular blocky breaking vertically in lower part to medium laminations	Hard	Occasional along structure interfaces		Few clay films along structure interfaces, root channels and between laminations
C	29+	10YR5/2-4/3D 4/3-3/3M	Silty clay	Stratified	Hard			

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	P2	S	Cu	Zn	B	Mn		PERCENT SAND	SILT	TOTAL CLAY	FINE CLAY
66/316	L-H	1-0	13.38	6.6	6.5	66.03	1.82	41.6	51.02	18.82	0.75	3.46	73.35	101.9	71.96					128.6											
68/424	Ae	0-3	2.88	6.2	5.6	4.03	0.172	13.60	7.59	4.83	0.13	0.77	13.32	20.40	65.29					165.5		1.03						4.71	62.68	32.61	1.95
68/425	AB	3-5	1.94	6.0	5.5	1.18	0.072	9.44	4.21	3.82	0.13	0.35	8.51	12.37	68.80					40.78											
66/318	BA	5-8	2.67	6.0	5.4	1.19	0.06	15.3	5.60	1.70	0.20	0.46	13.96	18.12	77.02					7.6		5.1						0.98	50.06	48.96	11.95
319	Bt1	8-15	3.25	6.2		0.97	0.05	14.3	7.01	11.05	0.35	0.44	18.85	22.82	82.60					3.0		4.6						0.88	44.75	54.37	15.41
320	Bt2	15-20	3.30	6.8	6.2	0.83	0.05	16.6	7.23	12.19	0.52	0.39	20.33	25.53	74.63					2.3		6.7						0.67	45.68	53.65	14.56
321	BC	20-29	3.36	7.8	6.9				7.21	14.06	0.91	0.34	22.52	26.10	86.28					1.9		7.8						0.31	46.90	52.79	13.24
322	C	29+	2.83	8.0	7.4				8.53	14.19	1.10	0.31	23.12	23.24	99.48					1.2		9.0						0.21	52.02	47.77	11.86

LOCATION:

Profile Description:

SOIL NAME: Utsun

PARENT MATERIAL: Colluvium over acidic bedrock

ELEVATION:

CLASSIFICATION: OHFP

DRAINAGE: Well

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L	5-3							
FH	3-0							
Ae	0-2	10YR7/2 D 10YR5/2 M	sl		mfr	ra		Ae varies from 3" to nil
Bf	2-9	10YR5/6 D 10YR4/4 M	sl	1 m sbk	mfr	ra		scattering of Ae into Bf along root channels
BC	9-15	10YR6/3 D 5/3 M	stony gsl	1 m sbk	ml	rc		
C1	15-27	10YR5/2 D 5/3 M	stony gsl		ml	roc		
R	27+		bedrock					varies in depth lithic profiles common - bedrock fracturing common

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
5/70	L	5-3		1.5	4.4															95.0	95.0											
6/70	FH	3-0	13.38	1.5	4.1	1.00	1.10		12.70	3.17	0.25	5.06	21.18	94.56	22.40					100.3	112.2											
7/70	Ae	0-2	10.13	5.3	4.62	2.28	.0948	13.9	4.63	0.66	0.08	0.39	5.76	13.41	42.95					39.98	64.43					23.7						
8/70	Bf	2-9	3.73	6.1	5.11	3.37	.0983	19.8	3.22	0.41	0.50	0.42	4.10	19.74	20.77	1.54	2.15			43.57	160.7					12.4						
9/70	BC	9-15	0.81	6.1					3.43	0.45	0.07	0.30	4.25	10.21	41.63					55.95	84.68											
10/70	C1	15-27	1.21	5.9	5.56				6.33	1.11	0.12	0.31	7.83	10.07	78.15	0.51	1.19			22.67	82.49					14.2						

LOCATION:

SOIL NAME: Windfall

CLASSIFICATION: MHFP

PARENT MATERIAL: Colluvium

DRAINAGE: Well

Profile Description:

ELEVATION:

SLOPE & ASPECT:

HORIZON	DEPTH IN - CM.	COLOR DRY D MOIST M	TEXTURE	STRUCTURE	CONSISTENCE	ROOTS	MOTTLES	OTHER
L-H	1½-0							
Aej	0-½							Ae varies from 0 to 2" in stabilized sites
Bf	½-11	10YR5/4 D 4/4 M	stony loam	1 msbk	mfr	ra		
C1	11-23	10YR6/4 D 4/4 M	stony fsl	1 msbk	mfr	roc		
C2	23-45+	10YR4/2 M	stony sl		mfr	roc	f 2 f	coarse pieces of fractured bedrock

Laboratory Analyses

LAB. NO.	HORIZON	DEPTH	MOIST %	PH 1:1 H_2O	PH 0.01M $CaCl_2$	% OM	% N	C/N	EXCHANGEABLE BASES M.E. 100G. Ca	Mg	Na	K	SUM	CEC	Sat. %	OXALATE % Fe	OXALATE % Al	PYROPHOS % Fe	PYROPHOS % Al	PPM P1	PPM P2	PPM S	PPM Cu	PPM Zn	PPM B	PPM Mn	PPM	PPM	PERCENT SAND	PERCENT SILT	PERCENT TOTAL CLAY	PERCENT FINE CLAY
66/70	L-H	1½-0	11.60	4.7	4.21	97.4	1.57	35.3	32.58	5.07	.067	2.90	40.62	99.93	40.65					46.87	53.01					340.						
67A/70	Aej	0-½							NOT SAMPLED																							
67/70	Bf	½-11	1.43	5.4	4.44	3.18	.109	16.9	2.94	.507	.040	.253	3.74	17.85	20.95	1.28	0.58			112.5	172.4					44.1						
68/70	C1	11-23	1.73	5.6	4.69	1.73	.079	12.7	1.83	.407	.065	.163	2.47	10.38	23.80	0.77	0.67			76.30	132.2					42.7						
69/70	C2	23-45+	1.21	5.8	5.51				3.44	.86	.096	.241	4.64	8.75	53.03					14.17	50.61					44.0						

APPENDIX II

Vegetation[1]

The following are non-technical definitions of terms, frequently used in publications on vegetation. It is hoped that the reader can familiarize himself with these terms, so that he can benefit more fully from the plant ecological information contained in this report. Less common terms will be explained whenever they are encountered in the report.

The tree cover of an area is primarily a living expression of:

1. the climate
2. the soil
3. the nature of disturbances and the time elapsed between and after these disturbances

If it were possible to eliminate the disturbances, the tree cover would become a direct expression of the climate and the soil. Tree stands undisturbed for a long period of time (usually several hundreds of years) and which reach a condition in which the same species of trees are perpetuated indefinitely, are referred to as climax stands. If such stands grow on sites not modified by an extreme soil condition (as wetness or unusual drought), which favors different species of trees than those growing on more average sites, they reflect the conditions created by the climate and the soil. Such stands are referred to as climatic climax stands. Where extreme soil conditions override the climatic conditions, so that climax stands differing in tree species composition from climatic stands result, often the term edaphic climax (edaphos = bottom or ground) is used.

Areas covered by similar climatic climax stands (possibly with inclusions of edaphic stands, which may resemble different climatic climaxes), are referred to as forest zones.[2] Since forest zones are the biological expression of climate and the soil (geo), they are also called biogeoclimatic zones (Krajina 1965).

In mountainous terrain, due to the change in climate with increasing elevation, the forest zones are arranged in belts between elevational limits. In less accentuated terrain the soil material may become the dominant factor in determining the species composition of climax stands. An intricate network of differing climatic climax stands corresponding with the distribution of soil materials may be expected in this type of terrain.

It will be evident that in the latter type of distribution of climax stands it may become difficult to distinguish between "climatic" and "edaphic" climatic climaxes. However, this is a difficulty in terminology only. It does not indicate a lack of understanding of the site quality. In practice it is important to know what can grow on the site and the classification of such sites is of lesser importance to the land user.

1 Detailed technical description of vegetation to be appended available spring 1973.

2 In forestry, forest zone is sometimes used in a less restricted manner, to indicate an area where any particular combination of tree species occurs or tends to occur.

Areas in which similar patterns in the distribution of forest zones occur are referred to as formations or regions. Minor variations in the distribution of the forest zones due to minor variations in climate or soil materials are often designated as sections.

Areas in which two or more formations, forest zones, sections or other vegetation types blend, are called transitions.

Disturbances (clearing, fire, grazing, logging, etc.) can radically alter the species composition of a stand. With few exceptions, such disturbed sites, if given sufficient time, will develop, through one or more intermediate stages, into a stand of a species composition similar to that of the original climax stand. This process of development towards a climax stand is referred to as secondary succession. The stages through which succession takes effect are called seres or seral stages.

Species other than those forming the local climax stands are called seral species. Through the process of succession, seral species are ultimately replaced by climax species. Seral species which invade recently disturbed sites, thus forming the initial stage of succession, are suitably termed pioneer species.

For interpretive use it is important to know the species of the climax as well as the seral species and which sequence of seral stages culminates in what climax.

APPENDIX III

Climate

Climatological data for the area was obtained from two sources, the Climatology Section, B. C. Land Inventory (CLI) and the Atmospheric and Environmental Services, Canada Dept. of Environment. The data collected by the B. C. Land Inventory is short term and designed to supplement the long term records obtained by A. E. S.

Frost Free Period and Growing Degree Days (from Climatology Section - B. C. Land Inventory (CLI))

STATION	GDD	FROST FREE PERIOD
Skeena Crossing	2091	99
New Hazelton	1994	85
Insect - L/O	1760	108
Andimavl	1775	87
Kitwanga	1453	59
Four Mile L/O	1660	112
Texas L/O	1289	78
Murder Creek	1684	76
Kathlyn	1433	48
Hudson Bay	1319	50
Smithers DOT	1789	84
Smithers CDA	1618	44
Blunt Creek	1557	92
Bulkley 1500	1625	57
Bulkley 1700	1609	43
Bulkley 1900	1679	80
Bulkley 2100	1840	89
Chapman Burn	901	18
Babine Lake DOT	1219	40
Telkwa River	1294	54
Telkwa DOT	1630	35
Barrett Hatt L/O	1557	88
Owen	1228	
Owen L/O	1014	67
Goosly 200	1388	45

For more detailed description as to methodology, data collection, etc., contact Climatology Section, B. C. Land Inventory (CLI), Victoria, British Columbia.

The above are site specific data and are not necessarily representative of large land units in the vicinity of the station. The wide range in frost free periods and growing degree days is significant and has tremendous influence on the various land uses.

The following information is from data collected by A.E.S. Canada Department of Environment.

APPROXIMATE ANNUAL 1968		ELEVATION
New Hazelton	22.37	1030
Quick	21.49	1750
Smithers	21.58	1718
Telkwa (McLure Lake)	17.31	2150
Topley Landing	24.42	2360

AVERAGE MONTHLY AND ANNUAL MEAN TEMPERATURES

													Annual
Wistaria	14	19	27	36	46	52	56	55	49	39	27	19	37
Babine Lake	8	16	25	35	44	52	56	55	47	37	26	14	35
New Hazelton	16	22	32	41	50	55	59	57	50	41	30	20	39
Smithers Airport	13	21	29	39	48	53	57	56	50	42	27	18	38
Telkwa	14	20	29	38	47	53	57	56	50	39	27	18	37
Burns Lake	11	20	26	36	45	52	55	55	48	39	26	17	36

Average ppt.		Summer ppt.					
		1.29					
		1.99					
Babine Lake	20.83	1.91					
		1.58					
		1.73					
		8.50					
New Hazelton	18.92	1.17	2.02	2.00	1.66	2.18	= 9.03
Quick 1 yr. only	23.36	0.17	1.15	1.55	3.76	1.27	= 7.90
Smithers (Airport)	20.61	1.31	1.78	1.96	1.42	1.79	= 8.26
Smithers (CDA)	18.88	1.35	1.74	1.88	1.53	1.47	= 7.97
Telkwa	17.00	1.10	1.88	1.87	1.40	1.38	= 7.63
Telkwa (McLure Lake)	17.67	1.11	1.93	1.70	1.40	1.43	= 7.57

APPENDIX IV

DESCRIPTIONS OF LANDFORMS (CORDILLERA AND PACIFIC COAST)

A. General Origin of Landforms (Genetic)

1. Aeolian - materials laid down by wind
   - sand and silt
   - poorly to moderately well sorted

2. Colluvium - loose material accumulated on and at the foot of slopes by the various processes of mass movement (gravity)
   - highly variable textures depending on source material (often boulder-sized material)
   - unsorted to crudely stratified

3. Fluvial (Alluvial) - materials laid down by recent streams and rivers
   - variable textures (few boulders or coarse fragments)
   - moderately well to well sorted and moderately well to well stratified

4. Glacial fluvial - materials deposited by glacial meltwater
   - gravel and sand
   - ranges from well sorted and well stratified to poorly sorted and poorly stratified

5. (Glacial) lacustrine - materials deposited in quiet fresh water
   - sand, silt and clay
   - well sorted and well stratified

6. (Glacial) marine - materials deposited in salt or brackish water
   - variable textured (most often silt, clay and sand)
   - moderately well sorted and moderately well stratified, often containing shells

7. Glacial till (basal) - materials deposited by ice directly without intervening transportation by water
   - variable textures (most often heterogeneous mixture of sands, silts and clays - some often stony and bouldery)
   - unsorted and unstratified

8. Glacial till (Ablation) - materials deposited directly by ice with some modification and transportation by glacial meltwater
   - variable textures (often stony and bouldery)
   - poorly sorted and partially stratified

9. Bedrock - exposed consolidated bedrock of various types
   - no surface mantle

10. Organic - materials of organic origin which accumulate in and around closed basins or moisture receiving positions within the landscape or in cool, moist regimes
    - generally unstratified
    - usually wet

B. Surface Form or Pattern of Landforms (Morphologic)

1. Beach - long, narrow smoothly curving to straight ridges, having generally smooth surfaces (0-30% slopes) occupying areas adjacent to former or present bodies of water
   - when in groups, they are more or less parallel, tending to parallel a present or former shoreline
   - no drainage pattern of significance

2. Channelled (ridge and swale) - characteristic ridge and swale topography (0-10% slopes common)
   - often a pattern or series of closely spaced curvilinear ridges and swales
   - a poorly integrated drainage pattern may be evident connecting swales

3. Delta - relatively level (0-25% slopes) usually triangular shaped form occurring at the mouth of a stream as it enters a lake or ocean
   - may have numerous presently occupied or abandoned channels which appear as an integrated drainage pattern
   - often end abruptly in a fairly steep face where associated with a glacial water body

4. Drumlin(ized) - elongated smooth streamlined hills (cigar-shaped) which most often occur in clusters (5-40% slopes)
   - striking parallelism of arrangement
   - tendency for development of modified trellis drainage pattern

5. Dune(d) - characteristic undulating (5-40% slopes) chaotic assemblages of mounds, ridges and hills with variable size, shape and height depending on the particular kind of dune
   - the duned landscape has a surface of low relief, but with many steep slopes
   - no drainage pattern related to the dune forms themselves, but a non-integrated system connecting intervening swales between dunes is common

6. Eroded (active) or Dissected (non-active) - dissected or eroded by a series of closely spaced gullies or a tightly knit dendritic drainage network (20-80% slopes)

7. Esker(s)-crevasse filling(s) - irregular sinuous round to flat topped ridges (10-50% slopes) which seem to ignore underlying topography
   - steep side slopes common
   - esker oriented in the direction of glacial movement while crevasse fillings can be oriented in any direction, but are commonly straight
   - no drainage pattern

8. Fan - level to steeply sloping (0-50% slopes) fan-like form occurring where a stream runs out onto a level plain or meets a slower stream - no drainage pattern as such, but often marked by variegated current scars, abandoned and presently occupied channels
   - noticeable slope towards the fan toe or apron

9. Fluted - level to gently irregular topography (0-25% slopes) marked by shallow, straight parallel troughs
   - dendritic drainage pattern

10. Hummocky - strongly rolling to steep and hilly (20-60% slopes) with roughly equidimensional hills and hollows
    - non-integrated, deranged drainage pattern common

11. Kame - level to strongly irregular (10-50% slopes) hummocks, mounds and terraces often associated with or adjacent to valley walls. - hills and hollows varying in depth and height
    - often short and discontinuous
    - weakly developed non-integrated drainage pattern

12. Kettle(d) - depression(s) most often steep sided (10-60% slopes) associated with glaciofluvial deposits
    - visible radial drainage pattern into the depression

13. Plain - flat to gently undulating surface form (0-10% slopes)
    - slopes most often simple
    - variable drainage pattern depending on texture of material

14. Talus cone - very steeply sloping (50%+ slopes) roughly cone shaped form at the foot of a steeper slope or rock cliff
    - no drainage pattern

15. Terrace - relatively level (0-5% slopes) flat surface which is terminated by an abrupt change in slope on one or more sides. - often occur in sequence on valley walls or paired on opposite sides of a valley

16. Slump(ed) - crumpled looking chaotic mixture of complex topography at the base of a steep slope. - source of slump (0-70% slopes) while slump itself may be (10-40% complex topography)
    - non-integrated, deranged drainage pattern

17. Meltwater channel - an incised flat bottomed channel often appearing oversized for the present stream which occupies it
    - side walls (10-60% slopes); channel bottom (0-10%)

GLOSSARY

ALLUVIUM - A general term for all deposits of modern rivers and streams.

ASSOCIATION - A sequence of soils of about the same age, derived from similar parent materials, and occurring under similar climatic conditions but having different characteristics due to variation in relief and in drainage.

AVAILABLE NUTRIENT - That portion of any element or compound in the soil that can be readily absorbed and assimilated by growing plants.

AVAILABLE SOIL MOISTURE - The portion of water in a soil that can be readily absorbed by plant roots; generally considered to be that water held in the soil up to approximately 15 atmospheres pressure.

BEARING CAPACITY - The average load per unit area that is required to rupture a supporting soil mass.

BEDROCK - The solid rock that underlies soil and the regolith or that is exposed at the surface.

BOULDERS - Stones which are larger than 24 inches in diameter.

CAPABILITY CLASS, SOIL - A rating that indicates the general suitability of a soil. It is a grouping of subclasses that have the same relative degree of limitation of hazard. The limitation or hazard becomes progressively greater from Class 1 to Class 7.

CAPABILITY SUBCLASS, SOIL - A grouping of soils that have similar kinds of limitations and hazards. It provides information on the kind of conservation problem or limitation. The class and subclass together provide information about the degree and kind of limitation for broad land-use planning and for the assessment of conservation needs.

CARBON-NITROGEN RATIO (C/N RATIO) - The ratio of the weight or organic carbon to the weight of total nitrogen in a soil or in organic material.

CATION EXCHANGE CAPACITY (CEC) - A measure of the total amount of exchangeable cations that can be held by a soil. Expressed in milliequivalents per 100 g of soil.

CLAY - As a soil separate, the mineral soil particles less than 0.002 mm in diameter; usually consisting largely of clay minerals. As a soil textural class, soil materials that contain 40 or more percent clay, less than 45 percent sand and less than 40 percent silt.

COBBLES - Rock fragments 3 to 10 inches in diameter.

COLOUR - Soil colours are compared with a Munsell colour chart. The Munsell system specifies the relative degrees of the three simple variables of colour; hue, value and chroma. For example: 10YR 6/4 means a hue of 10YR, a value of 6, and a chroma of 4.

COMPLEX, SOIL - A mapping unit used in detailed and reconnaissance soil surveys where two or more defined soil units are so intimately intermixed geographically that it is impractical, because of the scale used, to separate them.

COMPACTION - The packing together of soil particles by forces exerted at the soil surface resulting in increased soil density.

CONSISTENCE (SOIL) - The mutual attraction of the particles in a soil mass, or their resistance to separation or deformation. It is described in terms such as loose, soft, friable, firm, hard, stick, plastic, or cemented.

CREEP - Slow mass movement of soil and soil material down relatively steep slopes primarily under the influence of gravity, but facilitated by saturation with water and by alternate freezing and thawing.

DRAINAGE (SOIL) - (1) The rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces. (2) As a condition of the soil, it refers to the frequency and duration of periods when the soil is free of saturation.

EDAPHIC - (1) Of or pertaining to the soil. (2) Resulting from, or influenced by, factors inherent in the soil or other substrate rather than by climatic factors.

EROSION - The wearing away of the land surface by detachment and transport of soil and rock material through the action of moving water, wind or other geological processes.

FRIABLE - Soil aggregates that are soft and easily crushed between thumb and forefinger.

FROST HEAVE - The raising of a surface caused by ice in the underlying soil.

GEOMORPHOLOGY - The study of landforms as they relate to geologic composition and history.

GLEYED SOIL - An imperfectly or poorly drained soil in which the material has been modified by reduction or alternating reduction and oxidation. These soils have lower chromas or more prominent mottling or both in some horizons than the associated well-drained soil.

GRAVEL - Rock fragments 2 mm to 3 inches in diameter.

GROUNDWATER - Water in the soil beneath the soil surface, usually under conditions where the pressure in the water is greater than the atmospheric pressure and the voids are completely filled with water.

HABITAT - The natural environment of an organism.

HORIZON (SOIL) - A layer in the soil profile approximately parallel to the land surface with more or less well-defined characteristics that have been produced through the operation of soil forming processes.

ORGANIC HORIZONS - May be found at the surface of mineral soils or at any depth beneath the surface in buried soils or overlying geologic deposits. They contain more than 30 percent organic matter. Two groups of these layers are recognized:

O - An organic layer or layers developed under poorly drained conditions, or under conditions of being saturated most of the year or on wet soils that have been artificially drained.

Of - Fibric layer, an organic layer which is the least decomposed of all the organic soil materials. It has large amounts of well-preserved fiber that is readily identifiable as to botanical origin.

Om - Mesic layer, an organic layer which is intermediate in decomposition between the less decomposed fibric and the more decomposed humic materials. This material has intermediate values for fiber content, bulk density and water contents. The material is partly altered both physically and biochemically.

Oh - Humic layer, an organic layer which is the most decomposed of all the organic soil materials. It has least amount of plant fiber, the highest bulk density values and the lowest saturated water content. This material is relatively stable having undergone considerable change from the fibric state primarily because of oxidation and humification.

L-F-H- These are organic layers developed under imperfectly to well drained conditions.

L - An organic layer characterized by the accumulation of partly decomposed organic matter.

F - An organic layer characterized by the accumulation of partly decomposed organic matter. The original structures are discernible with difficulty. Fungi mycelia are often present.

H - An organic layer characterized by an accumulation of decomposed matter in which the original structures are indiscernible.

MASTER MINERAL HORIZONS AND LAYERS - Mineral horizons are those that contain less organic matter than that specified for organic horizons.

A - A mineral horizon or horizons formed at or near the surface in the zone of removal of materials in solution and suspension and/or maximum accumulation of organic matter. Included are: (1) horizons in which organic matter has accumulated as a result of biologic activity (Ah); (2) horizons that have been eluviated of clay, iron, aluminum, and/or organic matter (Ae); (3) horizons having characteristics of (1) and (2) above but transitional to underlying B or C (AB or A and B); (4) horizons markedly disturbed by cultivation or pasture (Ap).

B - A mineral horizon or horizons characterized by one or more of the following: (1) an enrichment in silicate clay, iron, aluminum or humus, alone or in combination (Bt, Bf, Bfh, and Bh); (2) an alteration by hydrolysis, reduction or oxidation to give a change in colour or structure from horizons above and/or below and does not meet the requirements of (1) and (2) above (Bm, Bmg).

C - A mineral horizon or horizons comparatively unaffected by the pedogenic processes operative in A and B, excepting (1) the process of gleying, and (2) the accumulation of calcium and magnesium carbonates and more soluble salts (Cca, Csa, Cg and C).

R - Underlying consolidated bedrock, such as granite, sandstone, limestone, etc. The boundary between the R layer and any overlying unconsolidated material is called a lithic contact.

LOWER CASE SUFFIXES

b - Buried soil horizon.

c - A cemented (irreversible) pedogenic horizon.

ca - A horizon with secondary carbonate enrichment where the concentration of lime exceeds that present in the unenriched parent material. It is more than four inches thick and if it has a Ca CO3 equivalent of less than 15 percent it should have at least 5 percent more CaCO3 equivalent, it should have 1/3 more CaCO3 equivalent than IC.

cc - Cemented (irreversible) pedogenic concretions.

e - A horizon characterized by removal of clay, iron, aluminum or organic matter alone or in combination. It is higher in colour value by one or more units when dry than an underlying B horizon.

f - A horizon enriched with hydrated iron. It usually has a chroma of three or more. The criteria for an f horizon (excepting Bgf) are that the oxalate-extractable Fe and Al exceeds that of the IC horizon by 0.8 percent or more (Fe + Al) 0.8% and the ratio of organic matter to oxalate-extractable iron is less than 20. The horizons are differentiated on the basis of organic matter content into: Bf, less than 5 percent organic matter; Bfh, 5 to 10 percent organic matter; Bhf, more than 10 percent organic matter.

g - A horizon characterized by gray colours and/or prominent mottling indicative of permanent or periodic intense reduction. Chromas of the matrix are generally one or less.

h - A horizon enriched with organic matter. When used with A alone, it refers to the accumulation of organic matter and must contain less than 30 percent organic matter. It must show one Munsell unit or value darker than the horizon immediately below or have one percent more organic matter than the IC. When used with A and e it refers to an Ah horizon which has been degraded as evidenced, under natural conditions, by streaks and splotches and often by platy structure.

j - Used as a modifier of e, g, n, and t to devote an expression of, but failure to meet the specified limits to the suffix it modifies.

k - Presence of carbonate as indicated by visible effervescence with dilute HCl.

m - A horizon slightly altered by hydrolysis, oxidation or solution, or all of them to give a change in colour or structure or both. The suffix is used with B to denote a B horizon that is greater in chroma by one or more units than the parent material or that has granular, blocky or prismatic material or that has granular, blocky or prismatic structure without evidence of strong gleying and has (Fe + Al) 0.8%. It may not be used under an Ae horizon but may be used under an Aej horizon. This suffix can be used as Bm or Bmgj.

p - A layer disturbed by man's activities, i.e. by cultivation and/or pasturing. To be used only with A.

s - A horizon with salts including gypsum which may be detected as crystals or veins, or as surface crusts of salt crystals, or by distressed crop growth, or by the presence of salt tolerant plants.

sa - A horizon with secondary enrichment of salts more soluble than calcium and magnesium carbonates where the concentration of salts exceeds that present in the unenriched parent material. The horizon is four inches or more thick. The conductivity of the saturation extract must be at least 4 mmhos/cm and must exceed that of the C horizon by at least one-third.

t - A horizon enriched with silicate clay. It is used with B alone (Bt, Btg, etc.)

HUMMOCKY - Hilly, uneven landscape resulting from deepseated soil movement usually of a rotational nature.

INCLUSION - Soil type found within a mapping unit that is not extensive enough to be mapped separately or as part of a complex.

LANDFORM - Structural configuration of the topography as a result of past and present geological activity.

LEACHING - The removal from the soil of materials in solution.

LIQUID LIMIT (UPPER PLASTIC LIMIT) - The water content corresponding to an arbitrary limit between the liquid and plastic states of consistency of a soil. The water content at this boundary is defined as that at which a pat of soil cut by a groove of standard dimensions will flow together for a distance of half inch under the impact of 25 blows in a standard liquid limit apparatus.

MAPPING UNIT - Any delineated area shown on a soil map that is identified by a number. A mapping unit may be a soil unit, a miscellaneous land-type, or a complex.

MOTTLES - Irregularly marked spots or streaks, usually yellow or orange but sometimes blue. They are described in order of abundance (few, common, many), size (fine, medium, coarse) and contrast (faint, distinct, prominent). Mottling in soils indicates poor aeration and lack of good drainage.

PARENT MATERIAL - The unaltered or essentially unaltered mineral or organic material from which the soil profile develops by pedogenic processes.

PEDOLOGY - Those aspects of soil science involving constitution, distribution, genesis and classification of soils.

PERCOLATION - The downward movement of water through soil.

PERMEABILITY - The ease with which water and air pass through the soil to all parts of the profile. It is described as rapid, moderate or slow.

pH - The intensity of acidity or alkalinity, expressed as the logarithm of the reciprocal of the H+ concentration. pH 7 is neutral, lower values indicate acidity and higher values alkalinity.

PLASTIC LIMIT - The water content corresponding to an arbitrary limit between the plastic and the semisolid states of consistency of a soil.

PLASTICITY INDEX - The numerical difference between the liquid and the plastic limit. The plasticity index gives the range of moisture contents within which a soil exhibits plastic properties.

PROFILE, SOIL - A vertical section of the soil through all its horizons and extending into the parent material.

REACTION, SOIL - The degree of acidity or alkalinity of a soil, which is usually expressed as a pH value. Descriptive terms commonly associated with certain ranges in pH are: extremely acid, <4.5; very strongly acid, 4.5-5.0; strongly acid, 5.1-5.5; moderately acid, 5.6-6.0; slightly acid, 6.1-6.5; neutral, 6.6-7.3; slightly alkaline, 7.4-7.8; moderately alkaline, 7.9-8.4; strongly alkaline, 8.5-9.1; and very strongly alkaline, >9.0.

SAND - A soil particle between 0.05 and 2.0 mm in diameter. The textural class name for any soil containing 85 percent or more of sand and not more than 10 percent of clay.

SEEPAGE - The escape of water downward through the soil. (2) 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.

SILT - Soil mineral particles ranging between 0.05 and 0.002 mm in equivalent diameter. Soil of the textural class silt contains 80 percent silt and less than 12 percent clay.

SLUMP - A deep-seated, slow moving rotational failure occurring in plastic materials resulting in vertical and lateral displacement.

SOIL - The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants. Soil has been subjected to and influenced by genetic and environmental factors of: parent material, climate (including moisture and temperature effects), macro- and micro- organisms, and topography, all acting over a period of time.

SOIL TEXTURE - The relative proportions of the various soil separates in a soil as described by the classes of soil texture.

For convenience, soil textures are grouped together into five classes as follows:

Coarse textured - sands, loamy sand, loamy fine sand
Moderately coarse textured - loamy very fine sand, sandy loam, fine sandy loam
Medium textured - very fine sandy loam, loam, silt loam, silt, sandy clay loam (light)
Moderately fine-textured - clay loam, silty clay loam, sandy clay loam (heavy)
Fine-textured - sandy clay, silty clay, clay

STRATIFIED MATERIALS - Unconsolidated sand, silt and clay arranged in strata or layers.

STRUCTURE - The combination or arrangement of primary soil particles into secondary soil particles, units or peds, which are separated from a adjoining aggregates by surface of weakness. Aggregates differ in grade (distinctness) of development. Grade is described as structureless (no observable aggregation or no definite orderly arrangement: amorphous if coherent, single-grained if noncoherent), weak, moderate, and strong. The aggregates vary in class (size) and are described as fine, medium, coarse, and very coarse. The size classes vary according to the type (shape) of structure. The types of structure mentioned in this report are:

Granular - having more or less rounded aggregates without smooth faces and edges.
Platy - having thin, plate-like aggregates with faces mostly horizontal.
Blocky - having blocklike aggregates with sharp, angular corners.
Subangular blocky - having blocklike aggregates with rounded and flattened faces and rounded corners.

By convention an aggregate is described in the order of grade, class, and type, e.g. strong, medium, blocky and moderate, coarse, granular. In the parent material of soils the material with structural shapes may be designated as pseudoblocky, pseudoplaty, etc. In stratified materials a bed is a unit layer distinctly separate from other layers and is one or more cm thick, but a lamina is similar layer less than 1 cm thick.

TOPOGRAPHY - The shape of the ground surface such as hills, mountains or plains. The soil slopes may be smooth or irregular. The slope classes used in this report are defined as follows:

depressional or nearly level	0 to 0.5
very gently sloping or gently undulating	0.5+ to 2
gently sloping or undulating	2+ to 5
moderately sloping or gently rolling	5+ to 9
strongly sloping or moderately rolling	9+ to 15
steeply sloping or strongly rolling	15+ to 30
very steeply sloping or hilly	30+ to 60
extremely sloping or very hilly	over 60

UNIFIED SOIL CLASSIFICATION SYSTEM (ENGINEERING) - A classification system based on the identification of soils according to their particle size, gradation, plasticity index and liquid limit.

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

WATER-HOLDING CAPACITY - The ability of a soil to hold water. The water-holding capacity of sandy soils is usually considered to be low, while that of clayey soils is high. It is often expressed in inches of water per foot depth of soil.

WEATHERING - The physical and chemical disintegration, alteration and decomposition of rocks and minerals at or near the earth's surface by atmospheric agents.