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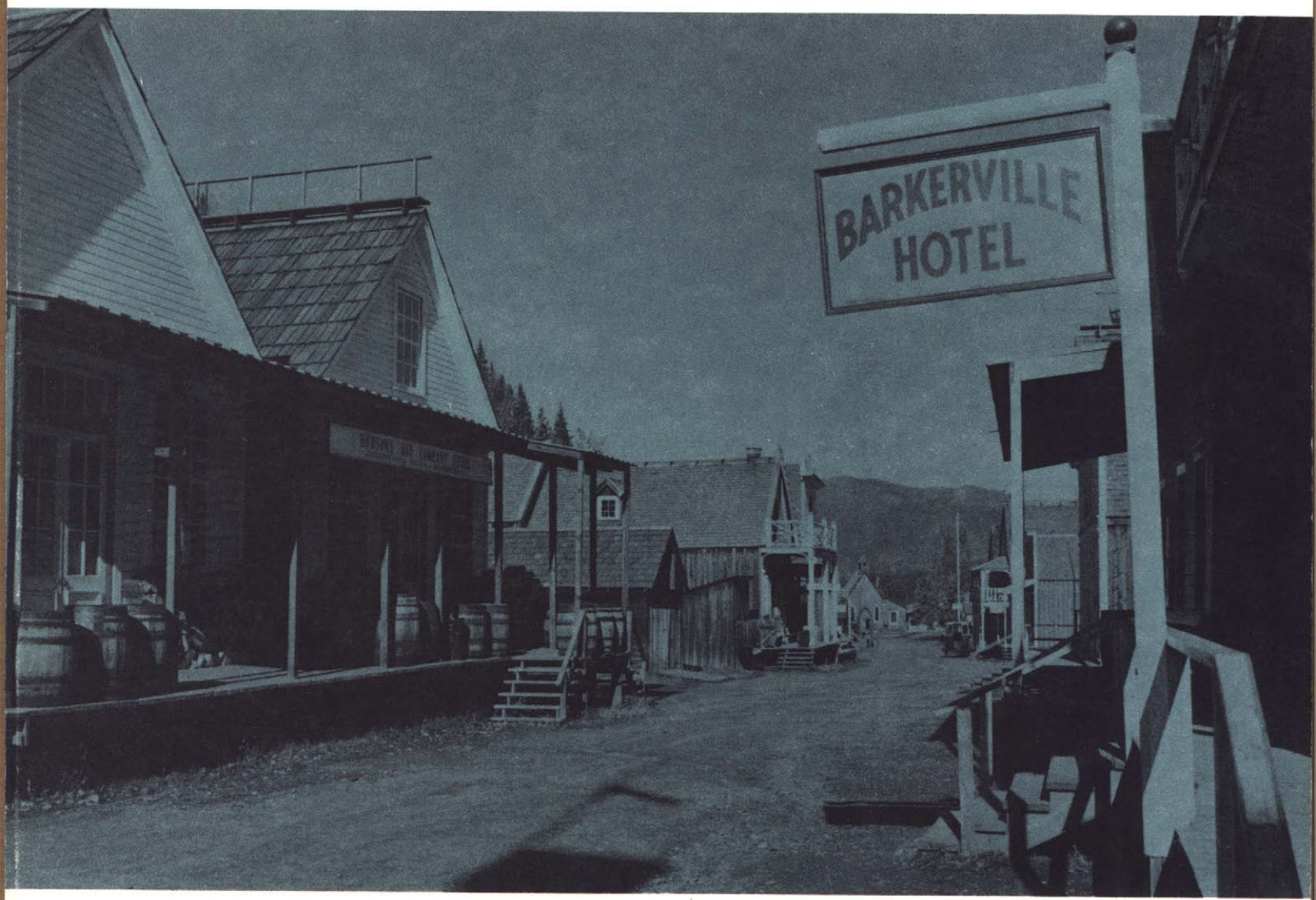
Soils of the Barkerville area, British Columbia

Report No. 40 | British Columbia Soil Survey | 1985



Canada

Cover photo: Barkerville historic park

Soils of the Barkerville area, British Columbia

by
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Report No. 40 of the
British Columbia Soil Survey

Land Resource Research Institute
Contribution No. 82-35

(Map sheets 93 H/SW and 93 H/NW)

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PREFACE

This report and the soil maps it contains (map sheets 93 H/SW and 93 H/NW in the National Topographic System) cover about 650 000 ha of land lying northeast of Quesnel.

The report describes the characteristics of the soils and map units, their location, and extent. It gives short accounts of the history and natural features of the map area. The soil maps show the distribution of the soils. The soil survey was undertaken to provide an inventory of land resources through the Canada Land Inventory (CLI) program. Land capability maps were published during the 1970s. Manuscript soil and terrain maps at a scale of 1:50 000 covering this map area and surrounds are available from the B.C. Ministry of Environment.

This publication is one of a series (Valentine and Schori 1980; Lord and Mackintosh 1982; Lord 1984; Gough, in preparation; Maxwell, in preparation; and Valentine et al., in preparation), covering the Cariboo-Chilcotin region. These publications provide soils information on the region by presenting maps at scales of 1:100 000 and 1:125 000, legends, and textual descriptions in which simplified map units, extended map legends, and simple map unit symbols are used.

GENERAL DESCRIPTION OF THE AREA

Location and extent

The surveyed area (Fig. 1) is included in both the Interior Plateau and the Columbia Mountains of central British Columbia. The area extends from 53° to 54° north latitude and from 121° to 122° west longitude (excluding map sheet 93 H/14). It comprises an area of approximately 650 000 ha. The village of Wells (Plate II c) and the historic community of Barkerville (Plate II d) lie approximately 70 km east of the city of Quesnel.

History and resources

Although Alexander Mackenzie was the first white man to explore the interior country in 1792 and Simon Fraser introduced the fur trade in 1808, few settlers arrived until the Cariboo gold rush of 1859. The first gold was discovered at Cariboo Lake, then at Keithley Creek and thence on the Old Gold Field Trail to Barkerville (Plate I a) (Lindsay 1958). Trade and settlement increased with the completion in 1864 of the Cariboo Road from Yale to Quesnel and received further impetus from construction of the British Columbia Railway (formerly the Pacific Great Eastern Railway) to Quesnel in 1919.

With the exception of some parts of the Fraser Basin, climatic limitations throughout the mountain and plateau areas severely limit the range of crops that can be grown within the map area. Only forage crops are produced in most sections. Hardy varieties of vegetables suited to cool season conditions can be grown at a few favored locations. Logging operations form the leading industry in the area at present. The industry includes lumber and planer mills and chip and pulp mills located outside the area at Quesnel and Williams Lake.

Recreational pursuits include fishing, hunting, hiking, camping, and boating. Bowron Lake Park (Plate I d, Plate II a) is famous for canoeing and hiking, and the historic site of Barkerville (Plate II d) is being restored to its former state as a gold rush center.

Physiography

The survey area lies mainly in the Quesnel Highland and Cariboo Mountains, as defined by Holland in 1964 (Holland 2nd ed. 1976) and modified by Campbell et al. (1973). Included are portions of the Fraser Basin, Fraser Plateau, McGregor Plateau, and the Rocky Mountain Trench (Fig. 2). The Willow and Bowron rivers are the main drainage channels for the map area and are tributary to the Fraser River. Bowron, Stony, Indianpoint, Sandy, and Spectacle lakes, and portions of Isaac and Lanezi lakes are large water bodies within the Barkerville area.

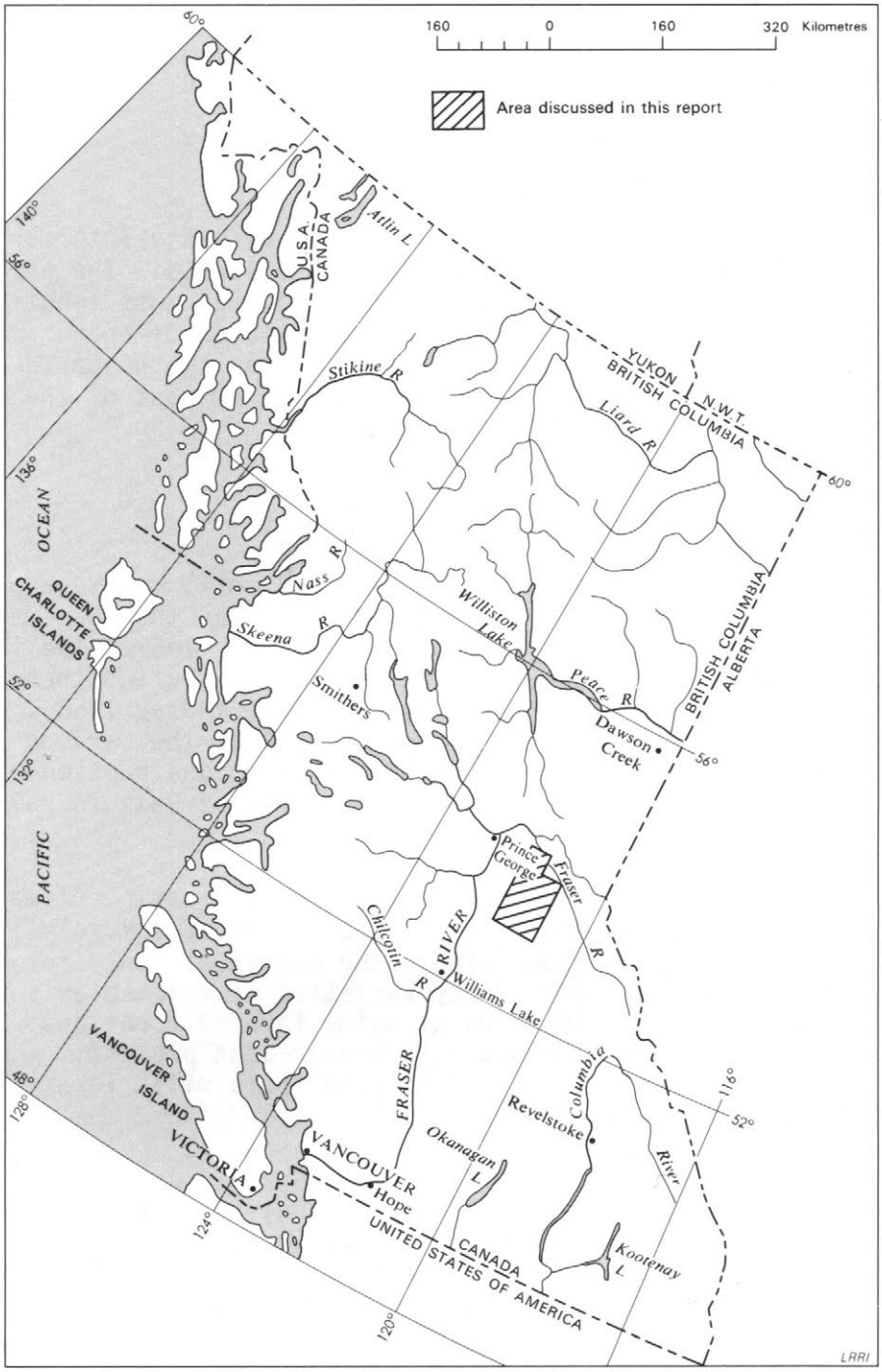


Fig. 1. Location of the Barkerville map area in British Columbia.

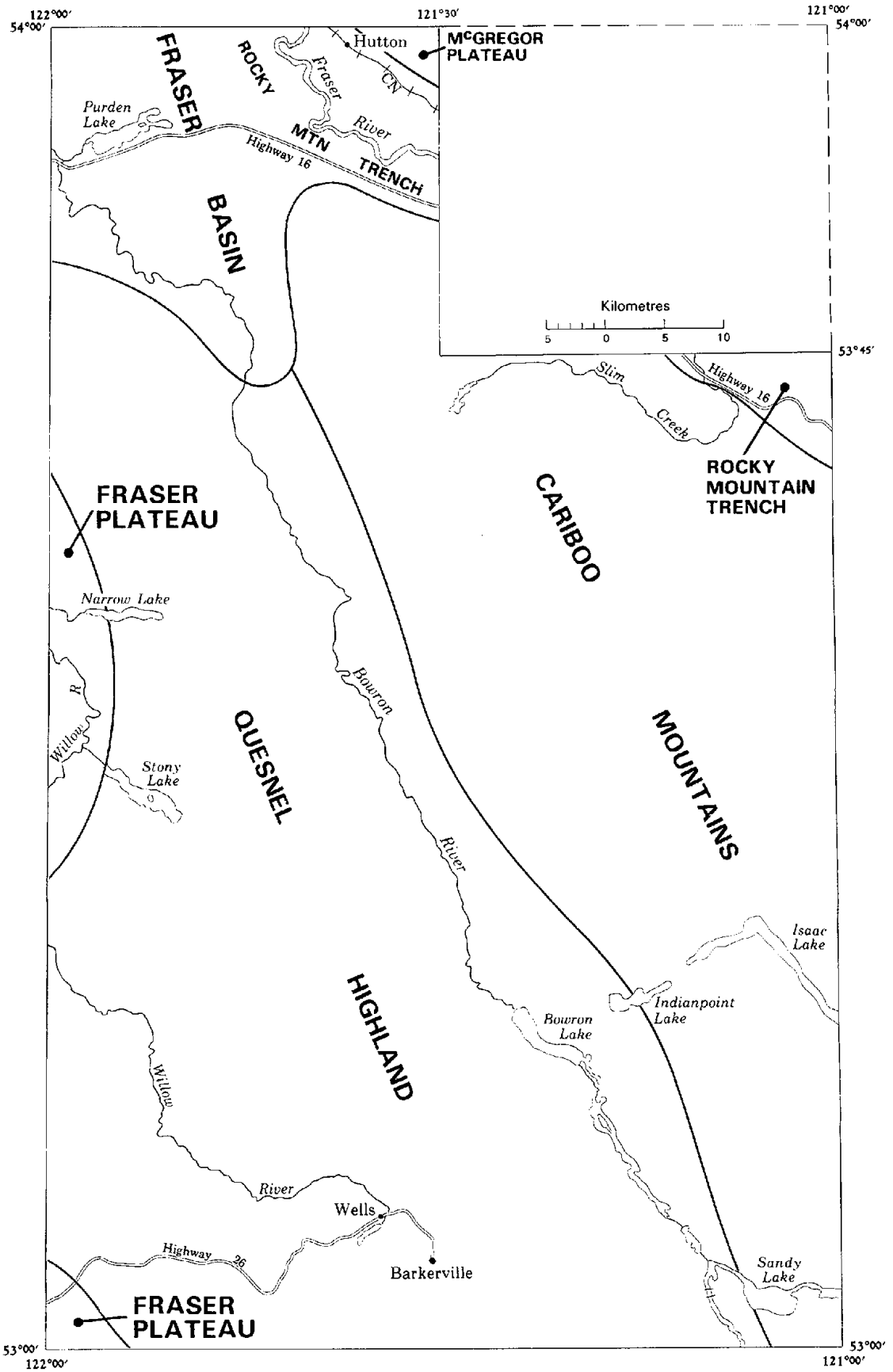
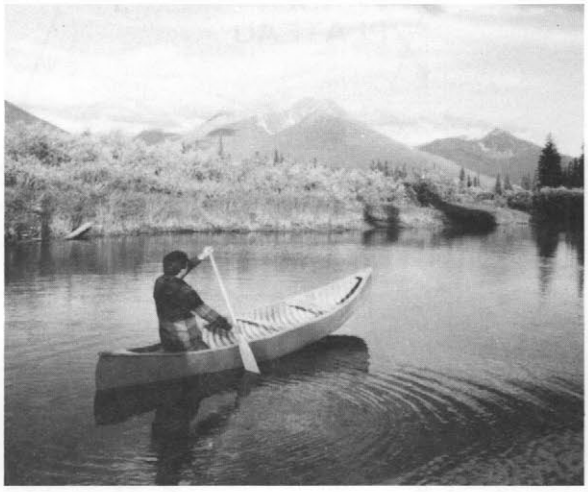


Fig. 2 Physiography and drainage in the Barkerville map area (modified from Holland).

a

b



d

c

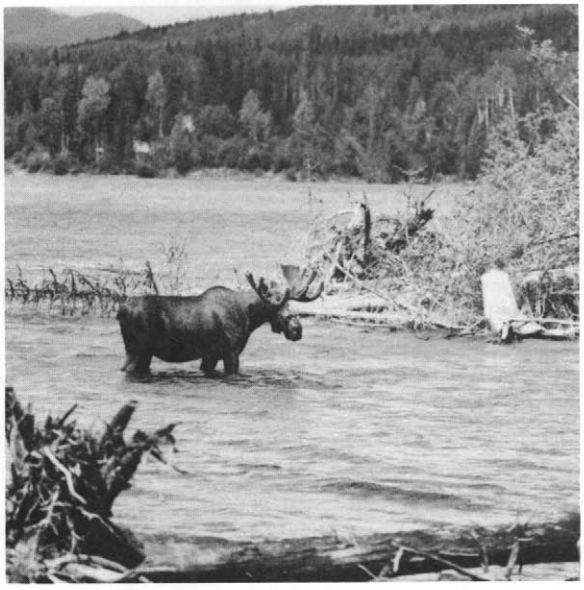
Plate I

a. Stagecoach on the Gold Trail to Barkerville.

b. Bearpaw Ridge and Yanks Peak soils above Isaac Lake.

c. Peatlands (Catfish Creek soils) on the floodplain of the Bowron River.

d. Canoeing in Bowron Lake Provincial Park.



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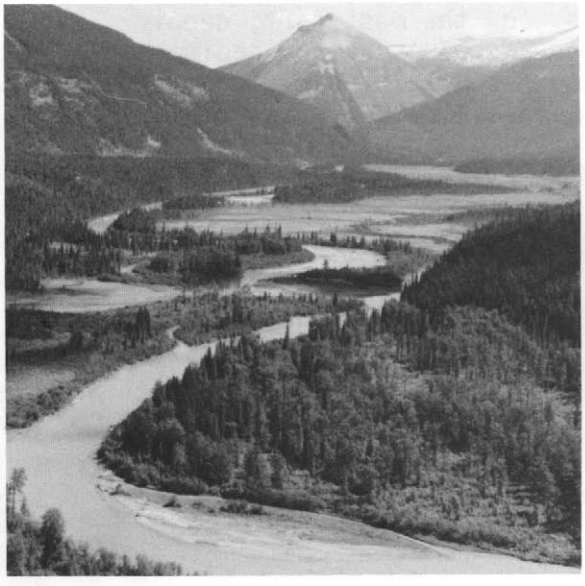

b

d

Plate II

a. Bull moose in Bowron Lake Park.

b. Ptarmigan and Catfish Creek soils on glaciofluvial materials and wetlands in the valley of Cariboo River.

c. Barkerville soils on mine tailings at Wells, B.C.

d. Historic Barkerville on Williams Creek, source of placer gold.

Throughout the map area the landscapes are diverse, ranging from the rolling drumlinized surface of the Fraser Plateau, through the highly dissected plateau remnants of the Quesnel Highland, to the rugged Cariboo Mountains, where some peaks exceed 2400 m. A small segment of the flat-bottomed valley of the Rocky Mountain Trench adjoins the Fraser Basin and the McGregor Plateau in the northeastern part of the area.

Bedrock geology

The bedrock geology of the study area has been mapped and described by the Geological Survey of Canada (1959, 1974). A generalized map showing the location and extent of the various bedrock types is presented in Fig. 3. This figure shows the majority of the area covered by a blanket of unconsolidated geological materials. In general, the Fraser Plateau and the Quesnel Highland are underlain by flat-lying basalt, sandstone, and conglomerate. Limestone and quartzite formations comprise many peaks in the highland. Rock formations in the Cariboo Mountains and much of the Quesnel Highland are complex and include quartzites, limestones, phyllites, and shales.

Although the Rocky Mountain Trench is, for the most part, deeply filled with glacial drift materials, ridges and exposures of sedimentary rock outcrop in the valley. The widespread dispersal and mixing of these rock types by glacial action have tended to minimize their individual influence on soil development. But some effects can be noted, especially when the directions and origins of ice flow (Fig. 4) as described by Tipper (1971) are considered.

Surficial geology and soil parent materials

Although Tipper (1971) provided valuable information on glacial deposits and Pleistocene history for much of central British Columbia, his study did not include the Barkerville map area. The materials in the Barkerville area are described and classified according to the Canada Soil Survey Committee (1978). The various types of surficial deposits that occur within the survey area are fluvial, lacustrine, morainal, organic, and colluvial.

Fluvial deposits

Fairly extensive areas of river terraces and floodplain deposits have formed adjacent to the river and stream systems within the survey area. They vary in their extent and mode of formation and are characterized by level to gently sloping topography. Each successive terrace is separated by a steep escarpment. On the lower terraces the land surface is often interrupted by postglacial stream meanders up to a depth of several metres. Fluvial deposits are parent materials for soils of the Barkerville, Fontoniko, Guilford, Longworth, McGregor, and Tumuch soil associations.

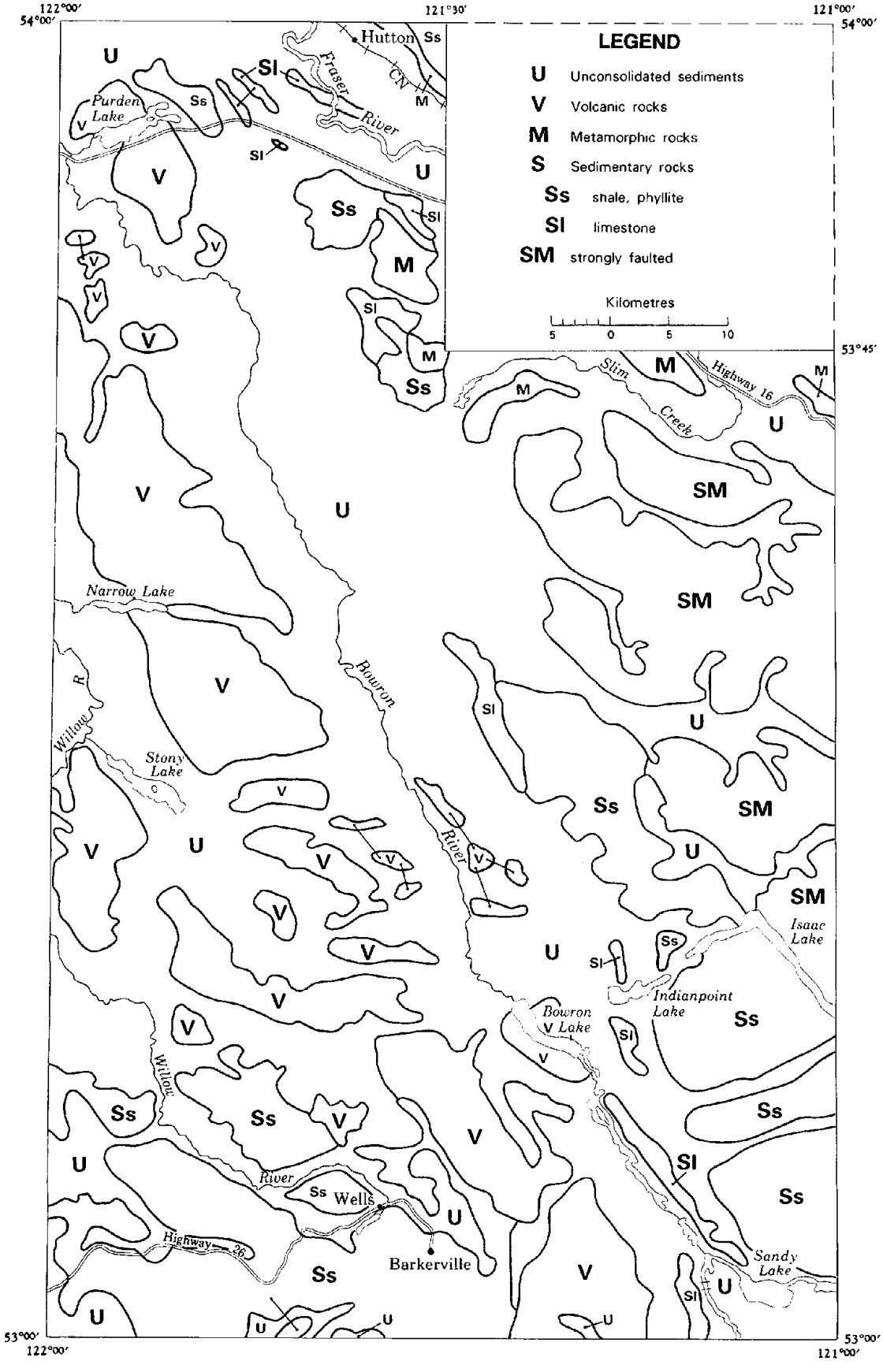

Fig. 3 Generalized bedrock geology.

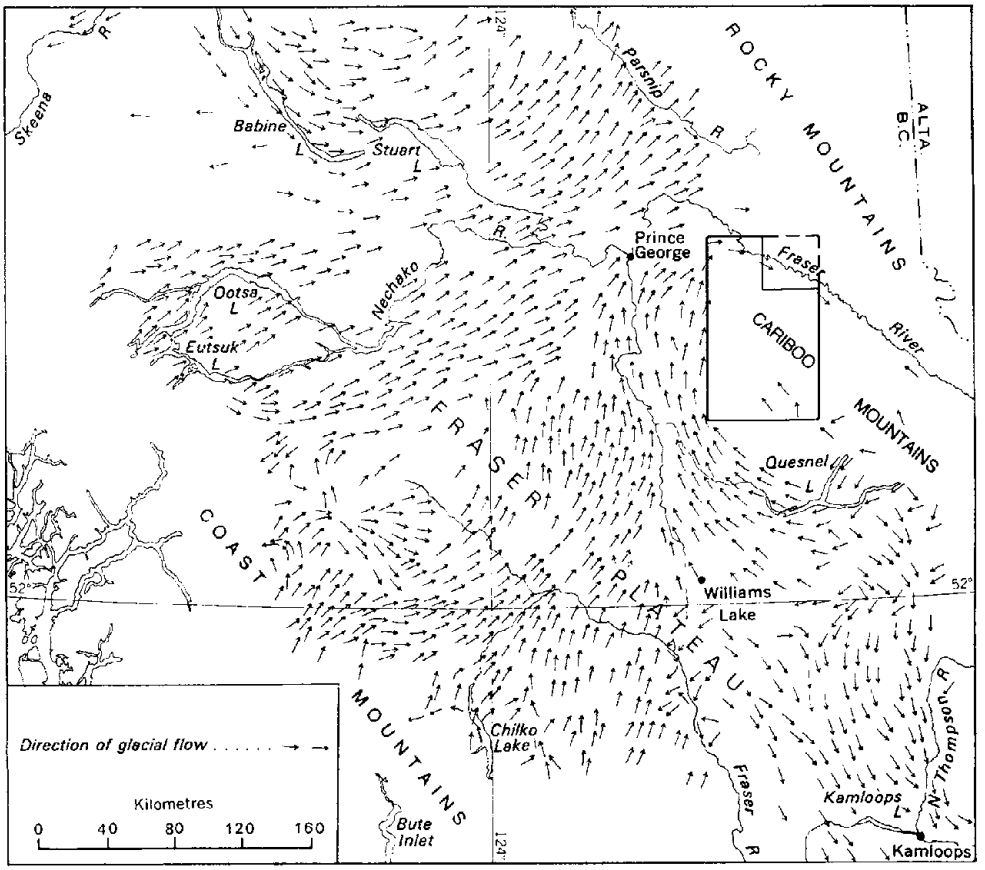

Fig. 4 Direction of ice movement in central British Columbia

Glaciofluvial deposits are widespread throughout the Fraser Plateau and Rocky Mountain Trench areas. They are in close association with morainal deposits. Their complex interrelation with the till deposits precludes, in some instances, mapping areas of pure fluvial materials. For the most part, the deposits appear to be recessional; however, areas of esker-kame complexes, pitted plains, and minor kame terraces occur. Texturally, the glaciofluvial deposits are gravels, gravelly sands, and gravelly loamy sands. Loamy sand and sandy loam textures predominate on the lower terraces and their depth is often shallow over the underlying gravels. Roaring soils occur on gravelly material deposited on the lower plateau slope. Ramsey soils occupy parts of some mountain valleys. Toneko soils occur on upper terraces along the Fraser River and are closely associated with Ptarmigan soils (Plate II b) in the Trench.

Lacustrine deposits

The lacustrine deposits of the Barkerville survey area are predominantly of glaciolacustrine origin (Tipper 1971). These are primarily sediments deposited near the upper limits of the glacial lakes and in small ponding basins in mountain valleys. In the northwestern section of the survey area, clayey Aleza and Pineview soils occur in the Fraser Basin with silty Bednesti soils. Raush soils are confined to the Rocky Mountain Trench and major tributaries of the Fraser River. Throughout the highlands and mountains, silty soils of the Bowes Creek Association occupy former ice-dammed lakes at relatively high elevations.

Morainal deposits

Most of the surface areas of the Fraser and McGregor plateaus are covered by morainal (till) deposits. These deposits are generally sandy loam and loam textured. They occur as blankets or veneers overlying the bedrock, with minor areas of drumlinized till. The soils that occur on morainal deposits in the Fraser Plateau region include Deserters, Dragon, Dunkley, and Dominion associations. In the Quesnel Highland and Cariboo Mountain regions the Captain Creek, Lanezi, Spakwaniko, Torpy River, Wendle, and Yanks Peak (Plate I b) associations have formed on morainal materials.

Organic deposits

Organic deposits occur throughout the map area in poorly drained depressions. The materials are moderately decomposed for the most part in the Chief and Catfish Creek (Plate I c) soil associations.

Colluvial deposits

In the survey area colluvial deposits occur most commonly in the Quesnel Highland and Cariboo Mountains. The underlying bedrock from which these deposits are derived influences the nature of the soil parent materials. The Hah Creek soils, which tend to be sandy textured and noncalcareous, have developed from volcanic and metavolcanic bedrock materials. Metamorphic rock types form the principal parent materials of Bearpaw Ridge (Plate I b) and Dezaiko soils. These soils are slightly calcareous and sandy or loamy in texture. Kenneth soils have developed from the weathered products of sedimentary and metasedimentary bedrock and tend to be loamy textured and moderately to strongly calcareous.

Table 1. Selected climatic data

Station	Location	Elev. (m)	Mean temperature (°C)			Mean precipitation (mm)		Growing degree-days[1]	Freeze-free period[2] (days)	Average annual snowfall (cm)	Climatic moisture balance[3] (mm)
			Annual	Jan.	July	Annual	May-Sept.				
Aleza L. AES	5407 N 12204 W	625	3.1	-12.4	15.2	931	337	1173	87	374	-30
Barkerville AES*	5304 N 12131 W	1274	1.4	- 9.8	12.3	1149	474	738	49	582	+165
Bowron L. AES*	5315 N 12125 W	945	3.0	-10.5	13.2	834[e]	380	964	55[e]		
Bowron L. N.	5316 N 12127 W	922			13.7	1051	419	845	55		
Bowron clear	5353 N 12200 W	741	3.4	-11.3	14.9	948[e]	385	1190	58		+18
Dome Cr. AES*	5345 N 12110 W	648	3.0	-10.9	14.7	931	358	1052	63	283	-40
Driscoll	5345 N 12126 W	694			14.3	908[e]	399	1128	76		+78
Hiyu	5358 N 12148 W	732			14.7	800[e]	378	1200	103		+79
Horsefly L.*	5323 N 12117 W	788	4.2	- 8.7	15.2	724	390	1248	105	193	-128
Prince George AES*	5353 N 12240 W	673	3.3	-11.8	14.9	621	288	1191	78	233	-68
Williams Lake A	5209 N 12208 W	941	4.0	-10.2	15.7	402	207	1322	92	153	-157
Willow	5326 N 12201 W	942	1.9	-13.4	13.2	811[e]	334	868[e]	50	581	

[1]Growing degree-days: degree-days accumulated above 5°C.
[2]Freeze-free period: days above 0°C.
[3]Climatic moisture balance: moisture deficit (-) or surplus (+).
*Most reliable.
[e]Estimate.
Reference: Personal communication - G.E. Cheesman, Waste Management, B.C. Ministry of Environment.

Climate

Data supplied by Cheesman (1980) (Table 1) indicate that the general trends of climate within the survey area are governed largely by elevation, latitude, and position in relation to the mountains of the region.

The climate within the survey area is strongly influenced by the presence of the Quesnel Highland and Cariboo Mountains. Precipitation increases sharply with elevation and proximity to the western side of the Cariboo Mountains. Snowfall also shows a marked increase with increasing elevation and proximity to the western slopes of the Cariboo Mountains in the area of Barkerville.

Vegetation

The vegetation of the ecological zones of the Cariboo forest region has been described on a broad scale by Krajina (1969) and by Annas and Coupé (1979). Four of the eight biogeoclimatic zones occur in the Barkerville survey area. A biogeoclimatic zone is defined as a geographical area in a broadly homogeneous macroclimate under which vegetation, soils, and nutrient cycling form similar patterns. Figure 5 shows the distribution of the zones according to current ecological information in the Barkerville map area. Botanical and common names of plant species are from Vascular Plants of British Columbia (Taylor and McBryde 1977), except for a few common names used by Annas and Coupé (1979).

Subboreal spruce zone

The subboreal spruce zone (SBS) occupies the extreme eastern extent of the Fraser Plateau and lower-elevation portions of the Quesnel Highland and main river valleys. White spruce (Picea glauca) and alpine fir (subalpine fir) (Abies lasiocarpa var. lasiocarpa) are the characteristic trees. Other tree species such as Rocky Mountain Douglas fir (Douglas fir) (Pseudotsuga menziesii var. glauca), lodgepole pine (Pinus contorta var. latifolia), trembling aspen (Populus tremuloides), common paper birch (Betula papyrifera var. papyrifera), and black cottonwood (Populus balsamifera subsp. trichocarpa) are common. The well-developed shrub layer on moist sites includes western thimbleberry (Rubus parviflorus subsp. parviflorus), birch-leaved spirea (Spiraea betulifolia subsp. lucida), Rocky Mountain maple (Acer glabrum var. douglasii), velvet-leaved blueberry (Vaccinium myrtilloides), and prickly rose (Rosa acicularis subsp. sayi). Herbs common to the zone are wild sarsaparilla (Aralia nudicaulis), large round-leaved rein orchid (Platanthera orbiculata), dwarf red blackberry (Rubus pubescens), and showy aster (Aster conspicuus). Mature mesic sites are dominated by a carpet of mosses.

Engelmann spruce - subalpine fir zone

The Engelmann spruce - subalpine fir zone (ESSF) occupies a large part of the survey area, mainly in the Quesnel Highland and mountain areas. Subalpine fir and Engelmann spruce (Picea engelmannii) are the characteristic and most dominant trees. The very well developed shrub layer includes white-flowered rhododendron (Rhododendron albiflorum), blueberries

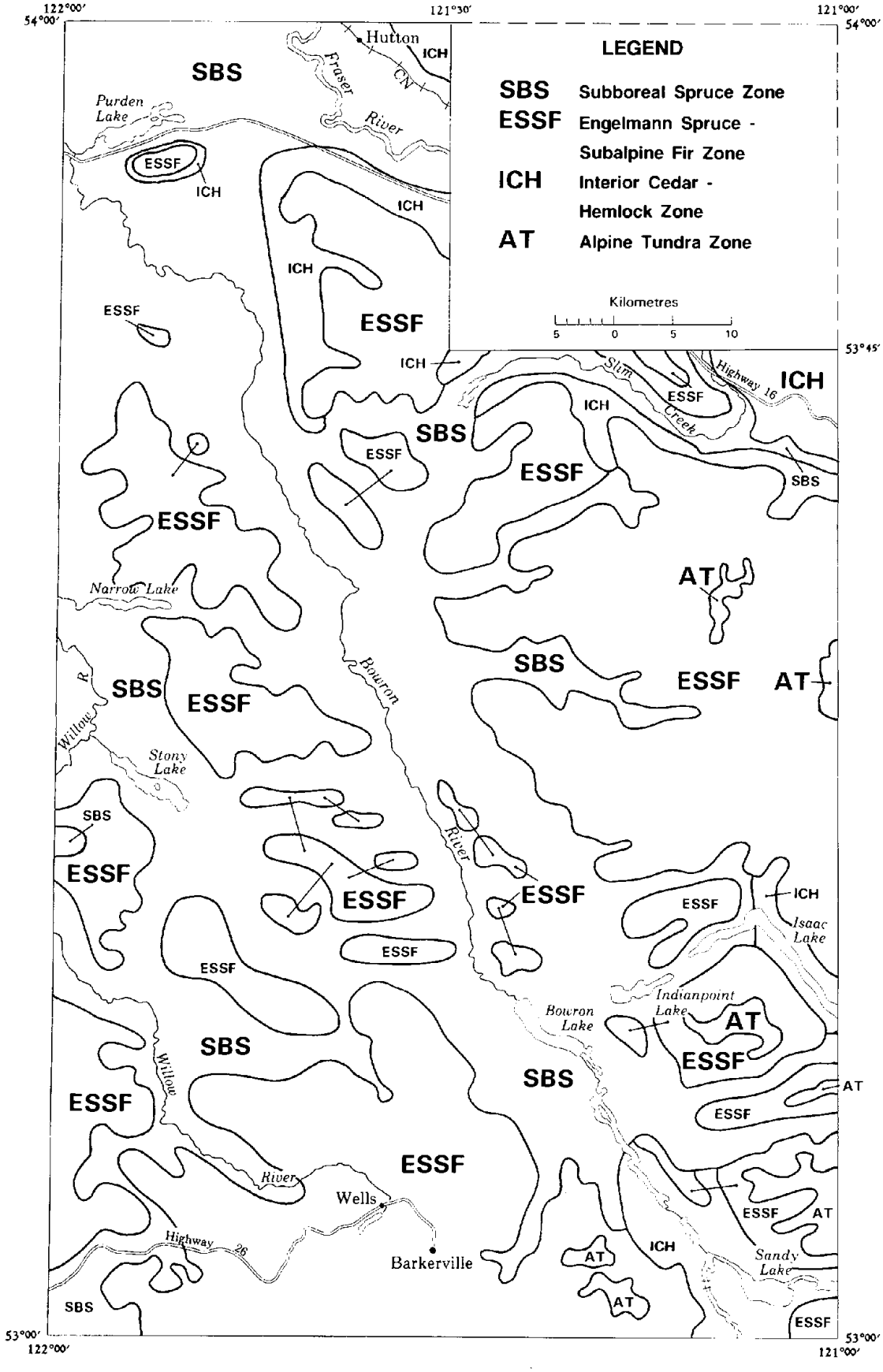

Fig. 5. Biogeoclimatic zones.

(Vaccinium spp.), Sitka mountain alder (Alnus viridis subsp. sinuata), and devil's-club (Oplopanax horridus). The herb layer, also well developed, contains Sitka valerian (Valeriana sitchensis subsp. sitchensis), oak fern (Gymnocarpium dryopteris var. disjunctum), Canadian bunchberry (Cornus canadensis), and simple-stemmed twistedstalk (Streptopus roseus var. curvipes).

Interior cedar-hemlock zone

Within the map area the interior cedar-hemlock zone (ICH) occupies a few areas in the Cariboo Mountains and Rocky Mountain Trench at elevations below 1200 m. The most common trees are western red cedar (Thuja plicata), western hemlock (Tsuga heterophylla), white spruce, Douglas fir, lodgepole pine, and black cottonwood. Where the canopy is sufficiently open, the shrub and herb layers are well developed. Where the canopy is more closed, a nearly continuous carpet of mosses occurs.

Alpine tundra zone

The alpine tundra zone (AT) covers a small but significant portion of the survey area. The only tree species occurring in this zone are subalpine fir, whitebark pine (Pinus albicaulis), lodgepole pine, and Engelmann spruce. The shrub layer is poorly developed: dwarf willows (Salix spp.) and common juniper (Juniperus communis subsp. alpina) are common. The zone is perhaps best known for the richness and variety of herbaceous flora and plant communities.

SOIL SURVEY METHODS AND MAPPING PROCEDURES

The soil surveys conducted under the Canada Land Inventory (CLI) (Canada Land Inventory 1970b) had a common objective and well-defined guidelines that have been followed in preparing this report (Working group on soil survey data 1983). For detailed accounts of survey methods and mapping procedures used, interested readers or users unfamiliar with soil reports are referred to A Soil Mapping System for Canada: Revised (Mapping systems working group 1981), to The Soil Landscapes of British Columbia (Valentine et al. 1978), and to recent soil survey reports of British Columbia, in particular to Soil Report No. 25 (Valentine and Schori 1980).

Methods and conditions discussed in Report No. 25 in the sections "Survey and mapping procedures" and "Reliability" apply closely to the Barkerville survey. In the Barkerville report the scale of the published soil map is 1:100 000. Soils are classified and defined according to guidelines established by the Canada Soil Survey Committee (1978). The definition of soil association used in this report is the same as that in Report No. 25; viz., a soil association is a group of related soils developed on similar parent materials, which differ because of different soil water regimes, or because of variations in other characteristics such as depth to bedrock. A soil association occurs when climatic conditions are similar, usually within one physiographic area or vegetation zone. Although a soil association is named after its most common soil, it contains several other different but related soils. The full range of soils is not represented in every part of the landscape where a soil association occurs. Each soil association is shown on the map by one or more map units, each of which is given a particular combination of letters and numbers.

There are two types of map units: a single map unit and a compound map unit. A single map unit contains soils from only one association, e.g., Deserters Association (D). The map unit D comprises dominantly deep, moderately well drained Luvisolic soils derived from gravelly loamy till; the map unit D(E) is similar to D except that there are significant inclusions of eroded soils. A compound map unit contains soils from two (or three) associations, e.g., Deserters (D) and Ramsey (R) associations. The map unit D-R comprises dominantly deep, moderately well drained soils derived from gravelly loamy till, with significant inclusions of gravelly, stony, excessively drained soils (R) derived from glaciofluvial materials. For definitions of terms used in soil science refer to Glossary of Terms in Soil Science (Canada Soil Survey Committee 1976).

The soil associations of the Barkerville area may be broadly grouped within three main physiographic areas: the Fraser Basin (including a small portion of the Rocky Mountain Trench), the Fraser Plateau, and the Quesnel Highland - Cariboo Mountain section.

SOIL ASSOCIATIONS OF THE FRASER BASIN

The basin is composed predominantly of basalt and andesite bedrock with inclusions of sedimentary rocks in the Rocky Mountain Trench. For the purpose of this report, a small portion of the Rocky Mountain Trench is included with the Fraser Basin. The topography is nearly level or gently rolling but becomes steep where the terrain is deeply incised by the Fraser River and its tributaries. Glacial lake sediments occur to elevations of 920 m in the principal river valleys and extend far upstream in the tributary valleys of the Bowron and Willow rivers. Soil parent materials are glaciolacustrine, fluvial, and glaciofluvial with minor amounts of morainal and organic materials. The soil associations that occur primarily within the Fraser Basin area are Aleza, Bednesti, McGregor, and Pineview. Ramsey and Roaring soils are described here but they also occur in plateau areas. In the Rocky Mountain Trench the interior cedar-hemlock zone is associated with Catfish Creek, Guilford, Kenneth, Longworth, Ptarmigan, Raush, and Toneko soils.

The associations of the Fraser Basin physiographic area are arranged and described in the same way as they are shown on the map legend. Profile descriptions and analyses of common or typical soils are given in the Appendix. The map units of each association are described briefly below.

Aleza Association (AZ)

The Aleza Association consists of clayey soils developed on glaciolacustrine materials. The soils occur at elevations of less than 1000 m on nearly level and depressional lands. The association predominates in less than 1% of the map area.

The mean annual precipitation is 300-400 mm. The freeze-free period is less than 89 days and there are 1030-1309 growing degree-days above 5°C. Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce, Douglas fir, trembling aspen, and common paper birch - occur with a ground cover of blueberries, Oregon boxwood (Paxistima myrsenites), pine grass (Calamagrostis rubescens), and mosses.

The parent material of the Aleza soils is nonstony clay or clay loam. The soils are poorly drained, are slowly pervious, and have a subaquic soil moisture regime.

The most common soils of the association are Orthic Luvic Gleysols. These soils have thin surface horizons and subsoils that are grayish brown clay overlying olive colored, stratified, clay textured parent material. A complete profile description of an Orthic Luvic Gleysol of the Aleza Association, from Soils of the Prince George Area (Dawson, in preparation), is given in the Appendix.

Bednesti and Pineview soils are somewhat more silty in texture and better drained than Aleza soils.

Soils of the Aleza Association were first mapped in the Aleza Lake area (Hortie et al. 1970). These Gleysolic soils have some limited value in the production of forage, hay, and browse.

Map units

Two compound map units, AZ-CF and AZ-CC, occur in the area.

AZ-CF Aleza-Chief (2080 ha): One large area of the map unit lies at the western end of Narrow Lake where soil development ranges from Gleysols through Terric Mesisols to Typic Mesisols of the Chief Association.

AZ-CC Aleza - Catfish Creek (2000 ha): This map unit occurs mainly as small areas along the upper limits of the glacial laking basins. Fibric phases and Fibrisols are common.

Bednesti Association (B)

The Bednesti Association consists of fine-loamy soils developed on silty stratified glaciolacustrine deposits. The soils occur on level to strongly sloping lands that are concentrated along the valley of the Fraser River. For the most part, the Bednesti soils are found near the margins of former lake basins at elevations ranging from 700 to 1100 m. The association predominates on less than 1000 ha within the Barkerville map area. However, it is an important component of the Fraser Basin landform lying north and west of the survey area.

The mean annual precipitation is 300-400 mm. The freeze-free period is 50-89 days and there are 1030-1309 growing degree-days above 5°C. Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce, Douglas fir, trembling aspen, and common paper birch - occur with a ground cover of blueberries, Oregon boxwood, pine grass, and mosses.

Although the parent material of the Bednesti soils is generally nonstony silty loam or fine sandy loam, stones occur where shallow deposits overlie till. The soils are moderately well drained, are moderately pervious, and have a subhumid to humid soil moisture regime.

The classification of the dominant soil of the association is Brunisolic Gray Luvisol. Podzolic Gray Luvisols frequently develop on the coarse loamy deposits. Under thin litter horizons of needles, twigs, and leaves, the typical profile has a grayish surface horizon underlain by a yellowish brown, silty horizon and a thick, well developed silty horizon containing some clay. The grayish, stratified parent material is often

calcareous. A complete profile description of a Podzolic Gray Luvisol of the Bednesti Association, from Soils of the Prince George Area (Dawson, in preparation), is given in the Appendix.

The Bednesti soils were first described and mapped near Prince George by Kelley and Farstad (1946). The soils have since been recognized in numerous reports dealing with soils of the north central interior. Recent soil association names (such as Bowes Creek) for these silty, erodible, lacustrine soils recognize the need for differentiating the climatic and vegetational zones in which they occur.

Areas of the Bednesti Association are harvested for timber, or farmed in map units that are accessible and of suitable topography.

Map units

Two map units occur in the Barkerville map area: a single unit, B, and its eroded phase, B(E).

B Bednesti (330 ha): This map unit occurs near Hutton on the Fraser River in fairly small, widely dispersed delineations. Topography is mostly gently sloping with some areas of moderate slopes.

B(E) Bednesti, eroded phase (530 ha): The map delineations of the eroded phase are near the Grand Canyon of the Fraser River. Active mudslides and bank failures are common on the extremely eroded and gullied river banks and 20-60% of the map unit may be dissected by deep, steep-walled gullies.

Catfish Creek Association (CC)

The Catfish Creek Association consists of soils developed on moderately decomposed organic deposits in the Rocky Mountain Trench and scattered throughout the mountain valleys in numerous small to medium areas. Topography is depressional and nearly level. Elevations range from 600 to 1500 m. The association is dominant in 1.5% of the map area.

The mean annual precipitation is from 620 to over 1150 mm. The freeze-free period is 50-89 days and there are 670-1169 growing degree-days above 5°C.

Catfish Creek soils occur most frequently in the interior cedar-hemlock zone. Vegetation is restricted to a sparse tree cover of black spruce (Picea mariana) and lodgepole pine with common Labrador tea (Ledum groenlandicum), other shrubs, herbs, sedges, and mosses.

The parent material of the soils is accumulated organic material, generally in a semi-decomposed state, with inclusions of fibric materials. The soils are very poorly drained,are slowly pervious, and have a peraquic soil moisture regime.

The most common soils of the Catfish Creek Association are Typic Mesisols. They have fibric organic material in the surface horizons overlying mesic and humic organic horizons and mineral material at depth. A complete description of a Terric Fibric Mesisol of the Catfish Creek Association, from the Rocky Mountain Trench area (Maxwell, in preparation), is given in the Appendix.

Soils of the Catfish Creek Association, which are similar to Moxley soils (Hortie et al. 1970), were first described in the Rocky Mountain Trench.

Map units

Two map units, CC and CC-SW, are identified in the survey area.

CC Catfish Creek (2760 ha): This map unit occurs as small areas of dominantly Organic soils dispersed throughout the eastern portions of the area. Fibric peat inclusions are common.

CC-SW Catfish Creek - Spakwaniko (6400 ha): Shallow Terric Organic soils and Gleysols (Spakwaniko) occupy about 30% of the map unit in association with the deeper Catfish Creek soils.

Guilford Association (GF)

The Guilford Association consists of sandy and loamy soils developed on recent fluvial deposits. The terrain is mainly gently sloping with some steep terrace escarpments. Elevations are generally below 1000 m. This association predominates in less than 1% of the map area.

The mean annual precipitation is 800-1000 mm, the freeze-free period is 50-90 days, and there are 780-1169 growing degree-days above 5°C.

The Guilford Association occurs mainly in the interior cedar-hemlock zone. Western red cedar, white spruce, and Douglas fir are the main trees. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone.

The fluvial parent materials of Guilford soils range in texture from silt loam to sandy loam. Stones and gravel may occur in moderate amounts. The soils are moderately well to imperfectly drained, are moderately to slowly pervious, and have a subaquic soil moisture regime.

The most common soils of the Guilford Association are Cumulic Regosols. Gleyed Cumulic Regosols occur throughout the association in imperfectly drained sites. The soil profile generally contains bands of grayish brown material between layers of yellowish brown soil parent material. A complete description of a Gleyed Cumulic Regosol is from the Rocky Mountain Trench (Maxwell, in preparation), where the association was

first described and named. A Guilford soil is described in the Appendix. Guilford soils are very similar to the McGregor soils described by Hortie et al. (1970).

Guilford soils are valuable for agricultural crops in some areas but in many cases they are susceptible to flooding.

Map units

There are two map units identified in the Barkerville area: one single, GF, and one compound, GF-LO.

GF Guilford (1290 ha): Guilford soils have formed mostly on the active portion of stream floodplains but may contain up to 40% of more stable areas of Luvisols or Gleysols.

GF-LO Guilford-Longworth (410 ha): One area of this map unit occurs near Dome Creek in the valley of the Fraser River. Brunisolic Gray Luvisols of the Longworth Association occupy 30-40% of the unit with Guilford soils on loamy-textured, terraced, fluvial materials.

Kenneth Association (KE)

The Kenneth Association consists of loamy soils developed on colluvial materials derived mainly from limestone bedrock within the Rocky Mountain Trench. The terrain is moderately to very strongly sloping. Elevations are generally below 900 m. The association is a minor one that predominates in less than 1% of the map area.

The mean annual precipitation is about 800 mm, the freeze-free period is less than 90 days, and there are less than 1310 growing degree-days above 5°C.

The association occurs in the interior cedar-hemlock zone where western red cedar, western hemlock, and white spruce are the dominant trees. Shrubs and herbs such as Rocky Mountain maple, blueberries, Oregon boxwood, Canadian bunchberry, and mosses are characteristic of the zone.

The parent material of the Kenneth Association is loamy calcareous colluvium. Stones or gravel occur in moderate amounts. The soils are rapidly drained, are rapidly pervious, and have a humid soil moisture regime.

The most common soils in the association are Orthic Eutric Brunisols. They have a reddish brown solum underlain by the yellowish brown parent material. The Kenneth soils were not fully described or sampled in the survey area.

Map units

A single map unit, KE, occurs in the map area.

KE Kenneth (1120 ha): Areas of this map unit may contain up to 40% inclusions of lithic soils and bedrock outcrops, particularly on the steeper slopes. The few occurrences of the unit were delineated in the Rocky Mountain Trench near the Grand Canyon of the Fraser River.

Longworth Association (LO)

The Longworth Association consists of loamy soils developed on fluvial materials in the Rocky Mountain Trench. The terrain is gently to moderately sloping. Elevations are below 900 m near the Fraser River. The association is of limited extent in the Barkerville map area and appears only as a subdominant soil association in some Guilford and Toneko map units. The mean annual precipitation is about 900 mm, the freeze-free period is less than 75 days, and there are less than 1170 growing degree-days above 5°C.

Longworth soils are found in the interior cedar-hemlock zone where western red cedar, western hemlock, and white spruce are the dominant trees. The parent materials of the association are sandy and loamy fluvial deposits. Stones or gravel may be present. The soils are well drained, are moderately pervious, and have a humid to subhumid soil moisture regime. Soils of the Longworth Association occur with the Regosolic Guilford soils and the more strongly developed Toneko soils. Within the Longworth Association both Brunisolic Gray Luvisols and Luvisolic Humo-Ferric Podzols occur.

Longworth soils were first described and mapped in the Rocky Mountain Trench (Hortie et al. 1970) as Bisequa Podzols (Luvisolic Humo-Ferric Podzols) developed on acidic sandy fluvial deposits on terraces of the Fraser River. A Gleyed Podzolic Gray Luvisol is described from a site in the Trench; the description is given in the Appendix. Where the topography is suitable, Longworth soils produce good crops of forage, hay, and hardy vegetables.

McGregor Association (MG)

The McGregor Association consists of loamy soils developed on fluvial deposits near Stony Lake. Elevations are below 1000 m. The association occupies less than 1000 ha in the map area but is more extensive on floodplains of the Fraser River in the Quesnel and Prince George areas.

The mean annual precipitation is about 800 mm. The freeze-free period is about 50 days and there are 1030-1169 growing degree-days above 5°C.

Vegetation is typical of river floodplains. Black cottonwood, willows, and Sitka mountain alder are common, with a rich ground cover of herbs, shrubs, and grasses. The parent material of the McGregor soils is sandy to loamy in texture and neutral to alkaline in reaction. Although the predominant terrain form is a nearly level terrace, undulating and ridged landforms occur. Most of the soils are imperfectly drained, are moderately pervious, and have a subhumid to perhumid soil moisture regime. Seasonally high water tables and periods of inundation are common.

Soils of the McGregor Association are classified as Regosols. Orthic and cumulic subgroups occur but a Gleyed Cumulic Regosol is considered to predominate. The profile is variable in textures and colors of horizons, and in degree and intensity of gleying and mottling. A profile description of a Gleyed Cumulic Regosol, from Soils of the Prince George Area (Dawson, in preparation), is given in the Appendix.

Although some McGregor soils are farmed, many sites in the floodplain are subject to flooding. McGregor soils were first separated out of the Fraser alluvial complex during the soil survey in the Rocky Mountain Trench (Hortie et al. 1970).

Map units

Only one map unit, MG-CF, is recognized and mapped in the area.

MG-CF McGregor-Chief (730 ha): The delineations of the map unit show considerable variability in textures and internal drainage. Organic materials (Chief) are common associates and occupy about 30% of the unit.

Pineview Association (P)

The Pineview Association consists of clayey and fine-loamy soils developed on glaciolacustrine deposits. The deposits are near the Fraser River at elevations between 600 and 870 m. Pineview soils occur on nearly level to rolling land. The association predominates in less than 1% of the Barkerville map area but has extensive occurrence near Prince George.

The mean annual precipitation is 300-400 mm. The freeze-free period is 60-89 days and there are 1030-1309 growing degree-days above 5°C. Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce, Douglas fir, trembling aspen, and common paper birch - occur with a ground cover of blueberries, Oregon boxwood, pine grass, and mosses.

The parent materials of the Pineview soils are nonstony, clayey, and fine-loamy lacustrine materials. The soils are imperfectly to moderately well drained, are slowly pervious, and have a subhumid to perhumid soil moisture regime.

Most of the soils included in the Pineview Association are classified as Gleyed Gray Luvisols. These imperfectly drained soils have good structure in the surface horizons but the heavy clay subsoils are structureless, strongly gleyed, and mottled. The parent material is neutral in reaction. A complete profile description of a Gleyed Gray Luvisol of the Pineview Association, from Soils of the Nechako - Francois Lake Area (Cotic et al. 1976), is given in the Appendix. Pineview soils are more poorly drained and heavier textured than other associated Gray Luvisols.

Soils of the Pineview Association support agricultural crops in the cleared areas on favorable topography. However, most of the map units are logged or under forest.

The Pineview soil series was first described and mapped by Kelley and Farstad (1946).

Map units

One map unit, P-B, is recognized in the area.

P-B Pineview-Bednesti (5400 ha): This map unit occurs near Hutton and north of Purden Lake. About 30-50% of the unit is silty Bednesti soil. Gleyed soils and Gleysols are fairly common.

Ptarmigan Association (PM)

The Ptarmigan Association consists of gravelly sandy-skeletal soils developed on glaciofluvial materials. The terrain is mainly gently to moderately sloping with minor areas that are nearly level or have strong slopes. Elevations range from less than 900 to nearly 1200 m. This association predominates in 5.7% of the map area.

The mean annual precipitation ranges from 834 to 1051 mm, the freeze-free period is 50-59 days, and there are 670-1169 growing degree-days above 5°C. The soils of the association occur principally in the interior cedar-hemlock zone. Western red cedar, white spruce, and Douglas fir are the main trees. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone.

The parent material of the Ptarmigan soils is sandy-skeletal glaciofluvial material that is calcareous at depth. Stones and cobbles are common. The soils are well drained, are moderately pervious, and have a subhumid soil moisture regime.

The most common soils of the Ptarmigan Association are Orthic Humo-Ferric Podzols. They have a grayish surface horizon with a reddish brown subsoil underlain by the yellowish brown parent material. A complete description of an Orthic Humo-Ferric Podzol of the Ptarmigan Association, from soil report area No. 41 (Maxwell, in preparation), is given in the Appendix.

The Ptarmigan soils were first described near McBride in the Rocky Mountain Trench (Maxwell, in preparation). Ptarmigan soils are very similar to soils of the Ramsey Association.

Map units

Three map units of the Ptarmigan Association occur in the Barkerville map area, one simple, PM, and two compound, PM4-GF and PM-CC.

PM Ptarmigan (20 210 ha): This map unit may contain 20-30% of silt loam or sandy loam Regosols of the Guilford Association.

PM4-GF Ptarmigan 4-Guilford (8600 ha): Delineations of this unit contain soils with interbedded lenses of silt and fine sand, plus significant inclusions (20-40%) of Guilford soils. The map unit is extensive in the valley of the Bowron River.

PM-CC Ptarmigan - Catfish Creek (8180 ha): Map delineations of this unit contain about 30-50% inclusions of very poorly drained Typic Mesisols (Catfish Creek).

Ramsey Association (R)

The Ramsey Association consists of sandy-skeletal and coarse-loamy soils developed on glaciofluvial materials near the transition from the Fraser Basin to plateau areas. The soils occur on nearly level and hummocky lands in the valleys of the Willow River and Big Valley and Lightning creeks. Elevations are about 1000 m. The association predominates in 2% of the map area.

The mean annual precipitation is 400-750 mm. The freeze-free period is 30-59 days and there are 1030-1169 growing degree-days above 5°C. Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce and common paper birch - occur with a ground cover of blueberries, Oregon boxwood, and mosses.

The parent materials of the Ramsey soils are variable in origin and form. They include recessional outwash, deltas, terraces, and kames. The soils are well to rapidly drained, are rapidly pervious, and have a humid soil moisture regime.

The classification of the soils is Orthic Humo-Ferric Podzol. These leached soils have thin surface horizons of grayish and reddish sandy loam. Subsoils are yellowish brown, gravelly loamy sand that overlie very gravelly material. The complete profile description of an Orthic Humo-Ferric Podzol of the Ramsey Association, from Soils of the Nechako - Francois Lake Area (Cotic et al. 1976), is given in the Appendix.

Roaring soils occur on similar materials but are classified as Dystric Brunisols. Ptarmigan soils are similar to Ramsey soils but occur in a milder, wetter environment.

Ramsey soils are forested and are used mainly for logging purposes. The Ramsey soil was first named and described by Mackintosh et al. in the Quesnel area in 1965 (unpublished manuscript).

Map units

One single unit, R, and four compound units, R-CF, R-BW, R-D, and R-CP-CF, are described.

R Ramsey (3240 ha): The map delineations of this unit are quite pure, containing no more than 15-20% Organic soils or areas of till. The topography is rolling and hummocky in valleys of the Willow River and its tributaries.

R-CF Ramsey-Chief (4770 ha): Within the hummocky and depressional parts of this map unit, poorly drained soils and organic deposits may constitute 30-50% of the soil components.

R-BW Ramsey - Bowes Creek (3080 ha): Variable amounts (20-40%) of silty Bowes Creek soils are associated with sandy-skeletal soils of the Ramsey Association in tributary stream valleys west of the Bowron River.

R-D Ramsey-Deserters (740 ha): This minor map unit contains 30-50% of till-derived soils (Deserters) in the Swift River watershed.

R-CP-CF Ramsey - Captain Creek - Chief (1650 ha): These three soil associations occur in an intricate pattern within the map unit on hummocky, ridged terrain in headwater valleys of the Willow River; Captain Creek and Chief soils each occupy about 30% of the map unit.

Raush Association (RH)

The Raush Association consists of clayey soils developed on glaciolacustrine deposits in the Rocky Mountain Trench. The terrain is gently to moderately sloping. Elevations are generally less than 900 m near the Fraser River. The association predominates in less than 1% of the Barkerville map area.

The mean annual precipitation is about 900 mm, the freeze-free period is 75-89 days, and there are 1030-1169 growing degree-days above 5°C.

Raush soils occur in the interior cedar-hemlock zone where western red cedar, western hemlock, and white spruce are the dominant trees. Parent materials of Raush soils are moderately calcareous, stratified, glaciolacustrine clay and silt. The soils are moderately well to imperfectly drained, are moderately to slowly pervious, and have a humid to perhumid soil moisture regime.

The most common soils of the association are Orthic Gray Luvisols. They have a grayish surface horizon and a compact brown subsoil that is underlain by the yellowish brown parent material. A complete description

of a Brunisolic Gray Luvisol of the Raush Association by Maxwell (report in preparation), from the Rocky Mountain Trench area, is given in the Appendix.

Raush soils were first named and described in the McBride area (Hortie et al. 1970).

The soils are well suited to mixed farming and produce good crops of grains, forages, and pasture.

Map units

Two map units, one single, RH, and one compound, RH-TO, occur.

RH Raush (480 ha): There are two delineations of this map unit near Dome Creek. Gleyed subgroups and Gleysols are common in the unit. Raush soils are similar to Pineview soils.

RH-TO Raush-Toneko (3030 ha): Map delineations of this unit contain about 30% inclusions of the sandy glaciofluvial soil of the Toneko Association. Two areas, one strongly eroded, are near Dome Creek.

Roaring Association (RG)

The Roaring Association consists of sandy-skeletal and coarse-loamy soils developed on glaciofluvial materials. The soils occur on hummocky and ridged lands of stream valleys and basins intermediate between the Fraser Basin and the uplands of the plateau. The elevation ranges from 800 to 1200 m. The association predominates in less than 1% of the map area.

The mean annual precipitation is 400-750 mm. The freeze-free period is 50-74 days and there are 1030-1169 growing degree-days above 5°C.

Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce, Douglas fir, trembling aspen, and common paper birch - occur with a ground cover of blueberries, Oregon boxwood, pine grass, and mosses.

Much of the landform of Roaring soils consists of complex, esker-kame terrain composed of stratified sands and gravels. The materials are generally stony and acid in reaction. The soils are well to rapidly drained, are rapidly pervious, and have a subhumid to humid soil moisture regime. The classification of the soils is Dystric Brunisol with the eluviated subgroup predominating in most units. These leached soils have a thin surface horizon of grayish sandy loam. Subsoils are yellowish brown gravelly loamy sand that overlies very gravelly material. The complete profile description of an Orthic Dystric Brunisol of the Roaring Association, from Soils of the Nechako - Francois Lake Area (Cotic et al. 1976), is given in the Appendix. Soils of the Ramsey and Ptarmigan associations are similar to Roaring soils but are Podzols rather than Dystric Brunisols.

Roaring soils are used mainly for logging. The Roaring name was first used in 1965 in the Quesnel area by Mackintosh et al. (unpublished manuscript).

Map units

Two map units are recognized, RG and RG-CF.

RG Roaring (2850 ha): This map unit has hummocky and ridged terrain. As much as 20% of the soils may be clayey or loamy textured where ice-contact features such as crevasse fillings and esker landforms contributed to a complex landscape pattern.

RG-CF Roaring-Chief (1490 ha): Map delineations of this unit may contain as much as 30-50% Organic soils (Chief), Gleysols, and gleyed soils.

Toneko Association (TO)

The Toneko Association consists of sandy soils developed on glaciofluvial materials in the Rocky Mountain Trench. The terrain is mainly gently to moderately sloping with occasional strong to steeply sloping, eroded surfaces. Elevations are generally less than 900 m. The association predominates in 3.3% of the map area.

The mean annual precipitation is about 900 mm, the freeze-free period is 75-89 days, and there are 1030-1169 growing degree-days above 5°C.

The Toneko Association occurs mainly in the interior cedar-hemlock zone where western red cedar, western hemlock, and white spruce are the dominant trees. Shrubs and herbs such as Rocky Mountain maple, blueberries, Oregon boxwood, Canadian bunchberry, and mosses are characteristic of the zone.

The parent materials of Toneko soils are noncalcareous, fine-loamy sands of glaciofluvial or fluvial origin. Stones and gravel may occur in moderate amounts. The soils are well drained, are moderately pervious, and have a subhumid soil moisture regime.

The most common soils of the association are Orthic Humo-Ferric Podzols. The soils have a grayish surface horizon and reddish brown subsoil that is underlain by the yellowish brown parent material. A complete description of an Orthic Humo-Ferric Podzol by Maxwell (report in preparation), from the Rocky Mountain Trench area, is given in the Appendix.

Toneko soils were first named and described in the upper Fraser River valley (Hortie et al. 1970).

Toneko soils are important in the production of timber in the Rocky Mountain Trench region.

Map units

There are five map units of the Toneko Association associated with the valley of the Fraser River: TO, TO(E), TO-PM, TO-LO, and TO4-LO.

TO Toneko (2080 ha): This map unit consists of deep, medium sands associated with lacustrine soils adjacent to streams within the Fraser River drainage system.

TO(E) Toneko (eroded) (4680 ha): Map delineations of the unit contain 40-60% eroded soils on strongly gullied terrain containing steep-sided ravines. Large areas of this unit occur near Dome Creek.

TO-PM Toneko-Ptarmigan (2100 ha): An area of this map unit occurs in the Slim Creek valley and contains 20-30% of gravelly, sandy, glaciofluvial materials (Ptarmigan soils).

TO-LO Toneko-Longworth (590 ha): One area that contains significant inclusions (20-40%) of Brunisolic Gray Luvisols (Longworth) is near Dome Creek in the Trench.

TO4-LO Toneko-Longworth (11 740 ha): A number of large map areas of this unit adjoin the Fraser River in the vicinity of the Grand Canyon. These areas may contain more than 40% of finer textured soils which were described as the silty clay loam Hutton series in Soils of the upper part of the Fraser Valley in the Rocky Mountain Trench of British Columbia (Hortie et al. 1970).

SOIL ASSOCIATIONS OF THE FRASER PLATEAU

For the purpose of this report, the rolling, partly drumlinized till plain lying below elevations of 1500 m is considered part of the Fraser Plateau (Fig. 2). Till deposits are extensive and fairly thick over volcanic bedrock. The composition of the till is influenced, in part, by local glaciation from the Cariboo Mountains.

The boundaries of the Fraser Plateau, as modified from Holland's 1964 report (2nd edition 1976) by Campbell et al. (1973), leave only two small segments of the plateau, one near Stony Lake and the other near Wingdam, within the Barkerville map area. The soil associations included in this eastern extension of the plateau are Chief, Deserters, Dominion, Dragon, and Dunkley. These associations, with their typical soil profiles and map units, are described in this section of the report.

The following section of the report, which deals with the soils of the Quesnel Highland and Cariboo Mountains, describes soil associations that are typical of more rugged, high-relief terrain. A number of these associations are also mapped in steeper, more mountainous parts of the Fraser Plateau.

Chief Association (CF)

The Chief Association consists of Organic soils developed mainly on sedge peat materials, associated with fen types of peat landforms. The soils occupy depressional or very gently sloping areas generally below elevations of 1200 m. The map areas are small and are in the Stony Lake section along the extreme eastern boundary of the plateau. They predominate in less than 1% of the map area.

The mean annual precipitation is 300-750 mm. The freeze-free period is 30-89 days and there are 780-1309 growing degree-days above 5°C.

The fens are mostly nonforested, with a vegetative cover of sedges and grasses. Vegetation on bogs is black spruce, lodgepole pine, ericaceous shrubs, and mosses. The soils are very poorly drained and have an aquic moisture regime.

The Chief Association includes a wide range of organic materials in various states of decomposition. Most profiles are classified as Mesisols but Fibrisols predominate in some areas. The surface tier of a typical profile is composed of 5-20 cm of fibric moss peat or sedge peat material that overlies more decomposed layers of dark brown, acidic organic materials.

Organic soils have been recognized and mapped since the days of the first surveys in the Interior Plateau (Kelley and Farstad 1946; Farstad and Laird 1954). At that time, three kinds of groundwater soils - muskeg, meadow, and shallow muck - were described in the Prince George area. Although some of these soils are still grouped under the name "Chief Association," in the Barkerville report the name is used mainly to identify some organic landforms in which Mesisols and Fibrisols occur.

Many soil areas of the Chief map unit are used by wildlife and for livestock grazing. Some units produce hay from native sedge vegetation or from seeded grasses.

Although a detailed description of a soil of the Chief Association is not included in this report, the profile described under the Catfish Creek Association is quite typical of many soils in the Chief Association.

Map units

One map unit, CF, is recognized in the survey area.

CF Chief (1650 ha): Small map delineations of this map unit occur in the subboreal spruce zone. The unit includes variable amounts of Humic Mesisols, terric subgroups, and Gleysols in the vicinity of Stony Lake.

Deserters Association (D)

The Deserters Association consists of gravelly loamy soils developed on morainal materials over topography ranging from moderate to very steep slopes. The elevations range from 750 m to about 1200 m. The Deserters Association predominates in 4.1% of the map area.

The mean annual precipitation is 300-750 mm. The freeze-free period is 30-74 days and there are 780-1169 growing degree-days above 5°C.

Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce, Douglas fir, trembling aspen, and common paper birch - occur with a ground cover of blueberries, Oregon boxwood, pine grass, and mosses.

The parent materials of Deserters soils are clay loam and sandy loam till, generally gravelly, and more than 1 m thick over bedrock. Areas of drumlinized landform may have a surface capping of 30-75 cm of gravelly, washed materials. Materials are mainly neutral and free from lime to depths of about 1 m. The soils are moderately well to well drained, are moderately to slowly pervious, and have a humid to subhumid soil moisture regime.

The dominant soils are Brunisolic Gray Luvisols, but Podzolic Gray Luvisols and gleyed subgroups are common. The soils have brownish surface horizons and grayish brown subsoils. A complete profile description of a Gleyed Brunisolic Gray Luvisol of the Deserters Association, from Soils of the Nechako - Francois Lake Area (Cotic et al. 1976), is given in the Appendix.

The soils are largely under forest that is currently being cut for pulpwood and sawlogs.

The Deserters Association was first identified and characterized in the Prince George area by Dawson (report in preparation).

Map units

Of the four map units in the Barkerville map area, one is single, D, and three, D-DN, D-R, and D-RG, are compound.

D Deserters (10 990 ha): Most delineations of this map unit contain drumlinized terrain in which 15-30% of the soils may be sandy and gravelly. Orthic Gray Luvisols occupy drier aspects and Humo-Ferric Podzols occur at higher elevations near Stony Lake.

D-DN Deserters-Dragon (10 660 ha): This map unit generally lies on mid to upper slopes of ridges, below the shallower, more rocky Dragon map units. Most delineations carry a significant component (30-60%) of these Podzolic soils developed on colluvium.

D-RG Deserters-Roaring (3140 ha): This unit occurs on subdued, hummocky terrain near Stony Lake. The coarse-textured Dystric Brunisols of the Roaring Association occupy about 30-40% of the unit.

D-R Deserters-Ramsey (2030 ha): Southeast of Stony Lake this map unit occupies hummocky, pitted terrain that contains significant amounts (30% or more) of gravelly Podzolic soils (Ramsey).

Dominion Association (DO)

The Dominion Association consists of fine-loamy soils developed on morainal materials. These soils have extensive occurrences to the immediate west of the Barkerville area (Dawson, in preparation). Elevations range from 920 to 1200 m. The association predominates in less than 1% of the map area.

The mean annual precipitation is 400-750 mm. The freeze-free period is 60-89 days and there are 1030-1309 growing degree-days above 5°C.

Lodgepole pine is a common tree, but other species characteristic of the subboreal spruce zone - white spruce, Douglas fir, trembling aspen, and common paper birch - occur with a ground cover of blueberries, Oregon boxwood, pine grass, and mosses.

The parent material of the Dominion soils is gravelly, loamy, and neutral in reaction. The soils are well drained, are moderately pervious, and have a humid soil moisture regime.

The predominant soil, a Luvisolic Humo-Ferric Podzol, has brownish silty surface horizons, and gravelly loam subsoil and parent material. A complete profile description of a Luvisolic Humo-Ferric Podzol of the Dominion Association, from Soils of the Prince George Area (Dawson, in preparation), is given in the Appendix.

Dominion soils are similar to Dunkley soils in kind of parent material and profile development. Both of these associations have limited occurrence in the Barkerville map area.

Dominion soils were first recognized and described in the Prince George area by Dawson (report in preparation).

The heavily forested soils of the association are logged for pulpwood and sawlogs.

Map units

Two map units, DO and DO-P, occur in the western part of the map sheet.

DO Dominion (2910 ha): This map unit is limited to two areas near Purden Lake. Topography is moderately sloping.

DO-P Dominion-Pineview (2770 ha): Dominion soils occur with 20-40% clayey lacustrine soils of the Pineview Association in two large areas near Purden Lake. Elevations here are close to the upper limits of the large glacial lake that formerly occupied the basin.

Dragon Association (DN)

The Dragon Association consists of loamy and sandy soils developed on colluvial and morainal materials. The soils occur on strongly sloping terrain above elevations of 900 m. The Dragon Association occurs in scattered areas at the highest elevations in the southwestern portion where it predominates in less than 1% of the map area.

The mean annual precipitation is 300-750 mm. The freeze-free period is 30-49 days and there are 670-1029 growing degree-days above 5°C.

Engelmann spruce and subalpine fir are the dominant and characteristic trees of the subalpine fir zone. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

The parent material is generally shallow (less than 1 m) colluvium that is derived from bedrock of variable composition. The soils are well drained, are moderately pervious, and have a humid to perhumid soil moisture regime.

The classification of the soils is Humo-Ferric Podzol with the orthic subgroup dominating in most areas with lithic soils and bedrock. The soils have thin grayish surface horizons. The subsoils are reddish brown sandy loams and loams that overlie gravelly loamy materials. A complete profile description of an Orthic Humo-Ferric Podzol of the Dragon Association, from Soils of the Nechako - Francois Lake Area (Cotic et al. 1976), is given in the Appendix.

These high-elevation soils are logged in some areas for pulpwood and sawlogs. Dragon soils were first recognized in the Prince George area.

Map units

One map unit, DN, occurs in the Barkerville map area.

DN Dragon (4850 ha): The delineations of this map unit are associated with up to 50% Brunisolic Gray Luvisols and lithic phases on abraded ridge crests and mountainous terrain.

Dunkley Association (DU)

The Dunkley Association, represented by a number of delineations of one map unit (DU), occurs north of Stony Lake. This map unit is the southern limit of the much more extensive Dunkley soil area to the

northwest, described in the Prince George map area by Dawson (report in preparation). The map unit occupies 1.6% of the Barkerville map area.

Dunkley soils are developed on fine-loamy, somewhat stony morainal material. The dominant soil is a moderately well drained Luvisolic Humo-Ferric Podzol, occurring on moderately sloping and ridged topography.

The profile description is similar to that of the Dominion soil (described in this report).

Map units

One map unit, DU, occurs in the map area.

DU Dunkley (10 470 ha): This map unit is confined to undulating and gently rolling terrain in the Willow River valley. One map delineation that includes steeply sloping river banks is strongly eroded in places.

SOIL ASSOCIATIONS OF THE QUESNEL HIGHLAND AND CARIBOO MOUNTAINS

Within the Barkerville map area, elevations of the Quesnel Highland and Cariboo Mountains range up to 1950 and 2400 m respectively. The highland is composed primarily of quartzite, quartzose phyllite, slate, argillite, and conglomerate bedrock with large inclusions of limestone in the northeastern portion. The topography is strongly rolling and steep. The parent materials of the soils are derived primarily from morainal, colluvial, and fluvial deposits. These materials are generally shallow, with bedrock outcrops occurring along stream banks and ridge tops. The Cariboo Mountains are composed mainly of sedimentary and metamorphosed sedimentary bedrock. Colluvial materials and shallow veneers of till are the main sources for parent materials of the soils.

The highest elevations of the highlands and mountains are occupied by the Engelmann spruce - subalpine fir zone and the alpine tundra zone. Associated with these zones are soils of the Bearpaw Ridge, Dezaiko, Yanks Peak, and Wendle associations, and the Rockland land type. Midslope positions and toeslopes of mountain ridges are dominated by morainal blankets that form the parent materials of the Captain Creek, Lanezi, Spakwaniko, and Torpy River associations. Vegetation of the subboreal spruce zone is common in these sites.

The valley floors, alluvial fans, and floodplains of streams are sites for Barkerville, Bowes Creek, Fontoniko, and Tumuch soils as well as Organic soils and inclusions of Guilford and Ramsey soils. These lower-elevation areas are occupied by the interior cedar-hemlock zone or by the subboreal spruce zone.

The associations are arranged and described in the same way as they are shown on the map legend. Profile descriptions and analyses of common or typical soils are given in the Appendix. Descriptions of map units are given below.

Barkerville Association (BK)

The Barkerville Association consists of fine-sandy and sandy-skeletal soils developed on reworked fluvial (anthropogenic) materials. The terrain is mainly level to gently sloping, but is extremely sloping where the materials overlie bedrock in the BK2 map unit. Elevations range from 900 to 1200 m. The association predominates in less than 1% of the map area.

The mean annual precipitation is about 1150 mm, the freeze-free period is 30-49 days, and there are 780-1029 growing degree-days above 5°C.

The Barkerville soils occur in the interior cedar-hemlock zone. Western red cedar, white spruce, and Douglas fir are the main trees. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone.

The parent materials of the Barkerville soils are fine sandy mine tailings (Plate II c) or coarse, angular debris remaining after placer gold-mining operations. Bedrock outcrops are common in the steeply sloping terrain of the BK2 unit. The soils range from rapidly to poorly drained, are rapidly to slowly pervious, and have a subhumid to aquic soil moisture regime.

The most common soils of the Barkerville Association are Orthic Regosols. They have quite uniform yellowish brown materials throughout. A detailed description of a soil of the Barkerville Association is not given in this report.

The presence of Barkerville soils (Plate II c) serves to indicate the sites of early gold-rush activity and of present-day mining operations. The soils were identified and mapped in the Barkerville area (Plate I a).

Map units

There are two single map units, BK1 and BK2, identified in the Barkerville Association.

BK1 Barkerville (2170 ha): Map delineations of this unit consist of fine sandy loam placer-mine tailings overlying Organic and Gleysolic soils in valley bottoms near Barkerville.

BK2 Barkerville (350 ha): This map unit consists of steep-sided, "sluiced-out" areas where the original fluvial material has been extracted by placer mining until only angular rock fragments or the bedrock floor remain.

Bearpaw Ridge Association (BR)

The Bearpaw Ridge Association consists of sandy-skeletal and loamy soils developed on colluvial deposits. The terrain is moderately to strongly rolling with areas of steep to very steep slopes. Elevations range above 1400 m. This association is dominant over 1.6% of the map area.

The mean annual precipitation is greater than 1150 mm, the freeze-free period is less than 49 days, and there are less than 780 growing degree-days above 5°C.

The Bearpaw Ridge Association commonly occurs in the Engelmann spruce - subalpine fir zone. Subalpine fir and Engelmann spruce are the dominant and characteristic trees. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

The parent materials are sandy-skeletal and loamy colluvial materials. Stones occur in varying amounts. The soils are moderately well drained, are moderately pervious, and occur under humid to subhumid soil moisture regimes.

The soils of the association include both Humo-Ferric Podzols and Dystric Brunisols. They have dark gray surface horizons and a reddish brown subsoil that overlies the yellowish brown parent material. The description of an Eluviated Dystric Brunisol of the Bearpaw Ridge Association, from near the Barkerville historic site, is given in the Appendix. Some logging is carried out on these soils.

Bearpaw Ridge soils were first described in the Prince George area (Dawson, in preparation).

Map units

There are five map units of the Bearpaw Ridge Association: one single unit, BR, and four compound units, BR-CP, BR-RO, BR-TP, and BR-SW.

BR Bearpaw Ridge (7390 ha): Delineations of this map unit occur throughout the area, but primarily in the northern and eastern sections where the soils are associated with shallow materials of mountain ridges and midslopes. Torpy River soils and Rockland may occur in the unit.

BR-CP Bearpaw Ridge - Captain Creek (6020 ha): The delineations of this map unit contain 30-50% of the gravelly loamy Captain Creek soils.

BR-RO Bearpaw Ridge - Rockland (15 450 ha): This map unit contains more than 30% bedrock outcrop (Rockland). The very steep to extreme slopes are frequently modified by avalanche tracks.

BR-TP Bearpaw Ridge - Torpy River (42 000 ha): Delineations of this map unit contain 20-40% of sandy and loamy Torpy River soils.

BR-SW Bearpaw Ridge - Spakwaniko (4530 ha): The few areas of this map unit include poorly drained soils (Spakwaniko) on northerly slope aspects. Gleysols and Sombric Brunisols comprise about 30% of the unit.

Bowes Creek Association (BW)

The Bowes Creek Association consists of loamy soils developed on silty and clayey glaciolacustrine materials. These soils occur on gentle to strong slopes with some extremely sloping eroded phases. Bowes Creek soils are generally found between 800 and 1500 m elevation on terraces along the Bowron and Fraser rivers and in small, local, laking basins scattered throughout the survey area. The association is dominant in 4.6% of the map area.

The mean annual precipitation exceeds 1150 mm, the freeze-free period ranges from 50 to 80 days, and there are 780-1169 growing degree-days above 5°C.

The Bowes Creek soils occur in the interior cedar-hemlock zone. Western red cedar, white spruce, and Douglas fir are the main trees. Shrubs and herbs such as Rocky Mountain maple, blueberries, Oregon boxwood, Canadian bunchberry, and mosses are characteristic of the zone.

The parent material of the Bowes Creek soils is nonstony silt loam and silty clay loam, which is moderately calcareous. The soils are imperfectly drained, are slowly pervious, and have a perhumid soil moisture regime.

Brunisolic Gray Luvisols are the most common soils of the association. These soils have a thin surface horizon and a subsoil that is yellowish brown silty clay overlying brown silt loam. The description of a Gleyed Brunisolic Gray Luvisol of the Bowes Creek Association, from soil survey report area No. 41 (Maxwell, in preparation), is given in the Appendix.

Bowes Creek soils are similar to Bednesti soils but occur in the milder, wetter environment associated with the interior cedar-hemlock zone.

Map units

Five map units are recognized: two single units, BW and BW(E), and three compound units, BW-LO, BW-CC, and BW-PM.

BW Bowes Creek (7230 ha): The map unit occurs as a number of fairly small areas near the Bowron River and its tributaries. Eroded phases may occupy 20% of the unit. The topography is generally gently to strongly sloping with occasional very strong to extreme slopes.

BW(E) Bowes Creek (eroded phase) (12 400 ha): The numerous long narrow delineations of the eroded phase occur primarily along the Bowron River and its tributaries. Although base slopes may be gentle to moderate, 20-60% of the area of the map unit is dissected by deep, steep-sided gullies.

BW-LO Bowes Creek - Longworth (7060 ha): Approximately 30% or more of the map unit is occupied by loamy fluvial Longworth soils. The topography is gentle to moderate in the Kenneth Creek valley.

BW-CC Bowes Creek - Catfish Creek (1710 ha): Twenty to 50% of the map unit is occupied by Organic soils (Catfish Creek) and gleyed soils. Slopes are very strong to gentle and nearly level in the main area of occurrence, the Kenneth Creek valley.

BW-PM Bowes Creek - Ptarmigan (1330 ha): Approximately 30% of this map unit consists of gravelly sandy Ptarmigan soils. Portions of the unit are strongly eroded and dissected.

Captain Creek Association (CP)

The Captain Creek Association consists of loamy-skeletal soils developed on morainal materials. The soils generally occupy lower slope positions above elevations of 1200 m. The association is dominant over 18.1% of the map area.

The mean annual precipitation is more than 1150 mm, the freeze-free period is less than 49 days, and there are less than 780 growing degree-days above 5°C.

The Captain Creek Association occurs in both the interior cedar-hemlock and the Engelmann spruce - subalpine fir zones. Western red cedar, white spruce, and Douglas fir are the main trees of the cedar-hemlock zone. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone. Subalpine fir and Engelmann spruce are the dominant trees of the subalpine fir zone. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

The parent materials of the Captain Creek soils are loamy-skeletal morainal deposits. Topography is generally moderately to strongly sloping with occasional areas that are extremely to very steeply sloping. The soils are moderately well drained, are moderately pervious, and have a perhumid soil moisture regime.

The most common soils of the association are Orthic Humo-Ferric Podzols although Podzolic Gray Luvisols also occur. Podzolic soils have a grayish surface horizon with a yellowish brown subsoil that overlies the brown parent material. A description of an Orthic Humo-Ferric Podzol from near the mining community of Wells is given in the Appendix.

Soils of the Captain Creek Association provide much of the timber cut in the area.

These soils were first described in the Prince George area (Dawson, in preparation).

Map units

The seven map units of the Captain Creek Association include one single unit, CP, and six compound units, CP-SW, CP-BR, CP-HC, CP-TP, CP-R, and CP-PM.

CP Captain Creek (66 220 ha): In this unit, 20-40% of the soils may include lithic phases or gleyed subgroups of Podzolic soils.

CP-SW Captain Creek - Spakwaniko (13 330 ha): Many of the areas of the map unit are confined to long, moderate slopes with northerly aspects. They exhibit a unique pattern of vegetation in which treeless communities of Sitka mountain alder, devil's-club, Sitka valerian, and other herbs and shrubs are interspersed among dense stands of Engelmann spruce and subalpine fir. The soils under these shrub communities are Gleysols or Sombric Brunisols (Spakwaniko, Hah Creek) which comprise 30-40% of the unit.

CP-BR Captain Creek - Bearpaw Ridge (25 090 ha): The thicker morainal parent material of the Captain Creek soils is associated with 30-50% of shallow colluvial materials (Bearpaw Ridge) on moderate to steep slopes.

CP-HC Captain Creek - Hah Creek (1890 ha): Delineations of this map unit contain variable amounts (20-40%) of the sandy morainal and colluvial parent materials of Hah Creek soils. The areas are small, of limited occurrence, and located mainly on seepage sites of lower slopes.

CP-TP Captain Creek - Torpy River (3490 ha): From 30 to 50% of this map unit of the upper Bowron valley contains gravelly sandy soils (Torpy River).

CP-R Captain Creek - Ramsey (4760 ha): The few delineations of this map unit occupy tributary valleys of the Willow River. From 20 to 30% coarse-textured soils on glaciofluvial materials (Ramsey) occur with Captain Creek soils on irregular hummocky terrain.

CP-PM Captain Creek - Ptarmigan (2500 ha): The soil components and landforms of this map unit are similar to those of the CP-R unit. The few areas are in the vicinity of Barkerville historic site.

Dezaiko Association (DZ)

The Dezaiko Association consists of loamy-skeletal and sandy soils developed on shallow colluvial or morainal deposits. The terrain is mainly moderately to strongly sloping with occasional areas that are gently or extremely sloping. This association generally occurs above 1500 m elevation throughout the survey area. It is dominant over 15.9% of the map area.

The mean annual precipitation is greater than 1150 mm, the freeze-free period is less than 49 days, and there are less than 780 growing degree-days above 5°C.

The vegetation is generally that of the Engelmann spruce - subalpine fir zone. Subalpine fir and Engelmann spruce are the dominant and characteristic trees. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

The parent materials of the Dezaiko soils are loamy-skeletal and sandy colluvial veneers. Stones may occur in moderate amounts. These soils are moderately well drained, are moderately pervious, and have a subhumid to humid soil moisture regime.

The most common soils of the Dezaiko Association are Orthic Humo-Ferric Podzols, lithic phase. Dezaiko soils have a grayish surface horizon and a reddish brown subsoil which overlies the dark yellowish brown parent material. A complete description of an Orthic Humo-Ferric Podzol, lithic phase, from a site near Pinegrove in the Barkerville area, is given in the Appendix. Dezaiko soils supply limited volumes of timber from logging operations in the Quesnel Highland area.

The Dezaiko Association was first named and described in the Prince George area (Dawson, in preparation).

Map units

Four map units are described for the Dezaiko Association: one single, DZ, and three compound, DZ-YP, DZ-RO, and DZ-CP.

DZ Dezaiko (83 610 ha): Map delineations of the unit contain up to 40% bedrock outcrops in some areas.

DZ-YP Dezaiko - Yanks Peak (11 340 ha): This map unit contains 40-60% sandy soils on morainal materials (Yanks Peak). The unit occurs in the upper forested zone and often extends into the subalpine zone of shrubs and stunted trees.

DZ-RO Dezaiko - Rockland (7370 ha): Delineations of this map unit contain 40% or more bedrock outcrops. This unit occurs at the highest elevations, often extending into the alpine tundra zone.

DZ-CP Dezaiko - Captain Creek (560 ha): One area of this map unit in the upper Bowron valley contains 30-50% Captain Creek soils. These latter soils are deep and are associated with seepage sites on lower slopes.

Fontoniko Association (FN)

The Fontoniko Association consists of sandy soils developed on fluvial fan deposits throughout the highland and mountain areas. Elevations range from 1000 to 1500 m. The numerous small map areas predominate in less than 1% of the map area.

The mean annual precipitation is 830-1150 mm, the freeze-free period is 30-59 days, and there are 670-1029 growing degree-days above 5°C.

The soils commonly occur in both the subboreal spruce and interior cedar-hemlock zones. In the subboreal spruce zone, Engelmann spruce and subalpine fir with Douglas fir are common trees with a ground cover of blueberries, Oregon boxwood, and mosses. Western red cedar, white spruce, and Douglas fir are the main trees of the cedar-hemlock zone. Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic ground cover species.

Parent materials of the Fontoniko soils are loamy sand and sandy loam fluvial deposits. Stones or gravel may occur in moderate amounts. The soils have a light gray surface horizon and reddish brown subsoil underlain by the yellowish brown parent material.

Fontoniko soils are mainly Eluviated Dystric Brunisols but Orthic Humo-Ferric Podzols are of frequent occurrence. Profile descriptions are similar to those described under the Ramsey Association. A detailed profile description is not given in this report. The soils were first described in the Bowron River area, east of Prince George (Dawson, in preparation).

Map units

A single unit, FN, with a number of small delineations was recognized in the Barkerville map area.

FN Fontoniko (3650 ha): Numerous small fan-shaped areas are mapped in the valleys of the Quesnel Highland and Cariboo Mountains; most of these occur as stream deltas along major drainageways.

Hah Creek Association (HC)

Soils of the Hah Creek Association have loamy-skeletal and sandy textures and are developed on colluvial and morainal materials. The terrain is very strongly sloping. Elevations range between 1200 and 1800 m. Within the Barkerville map area this association is a subdominant one and as such, Hah Creek soils appear only as significant associates of map units.

The mean annual precipitation is greater than 1150 mm, the freeze-free period is less than 49 days, and the number of growing degree-days above 5°C is less than 780.

Hah Creek soils commonly occur in the Engelmann spruce - subalpine fir zone where these two tree species predominate.

The parent material of the soils ranges from sandy loam to loam in texture. Some stones and gravel are present. The soils are moderately well to imperfectly drained, are slowly pervious, and have a perhumid soil moisture regime.

Hah Creek soils are of limited extent in the map area. Their main occurrence is as subdominant inclusions with the Torpy River Association on seepage slopes of the highlands between the Bowron and Willow rivers. They also occur as lesser components of a map unit of the Captain Creek Association. The Hah Creek Association contains moderately well drained to poorly drained soils including Sombric Humo-Ferric Podzols, Gleyed Regosols, and Gleysols. They are usually found on north-facing slopes in seepage sites under a vegetation cover of Sitka mountain alder, devil's-club, common cow-parsnip (Heracleum spondylium subsp. montanum), and other moisture-loving herbs.

A Gleyed Sombric Brunisol, described in this report under the Spakwaniko Association, is similar to some soils of the Hah Creek Association. Hah Creek soils were first named in the Bowron River area.

Lanezi Association (LZ)

The Lanezi Association consists of loamy soils developed on morainal materials. Topography is mainly gently to strongly rolling and occasionally extremely sloping. Elevations range from 1000 to 1800 m. This association is dominant over 8.3% of the map area.

The mean annual precipitation is 1150 mm or greater, the freeze-free period is 30-49 days, and there are less than 780 growing degree-days above 5°C.

Soils of the Lanezi Association occur predominantly in the interior cedar-hemlock zone. Western red cedar, white spruce, and Douglas fir are the main trees. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone.

The parent material of the Lanezi soils ranges from loam to clay loam morainal material that is acid to neutral in reaction. Stones or gravel are present in moderate amounts. The soils are moderately well drained, are moderately pervious, and have a perhumid soil moisture regime.

The most common soils of the association are Luvisolic Humo-Ferric Podzols. They have a grayish surface horizon with a yellowish brown subsoil overlying the olive brown parent material. A complete description of a Podzolic Gray Luvisol of the Lanezi Association, from Soil Survey Report Area No. 41 (Maxwell, in preparation), is given in the Appendix.

Lanezi soils were first recognized and described by Dawson (report in preparation) in the interior cedar-hemlock zone.

The soils of the Lanezi Association provide a substantial percentage of the timber logged in the area.

Map units

There are five map units in the Lanezi Association: a single unit, LZ, and four compound units, LZ-WD, LZ-TP, LZ-PM, and LZ-BW.

LZ Lanezi (31 320 ha): A number of large areas of this unit occur in the drainage basin of the Bowron River from its source to its confluence with the Fraser River. Lanezi soils predominate on moderately to strongly rolling terrain.

LZ-WD Lanezi-Wendle (10 050 ha): Map delineations of the unit contain 30-50% shallow soils on metamorphic bedrock (Wendle). This unit has moderately to strongly sloping topography; its extent is limited to a few isolated uplands near Purden Lake.

LZ-TP Lanezi - Torpy River (2130 ha): Areas of this unit contain 30-50% sandy loam soils of the Torpy River Association. Topography is moderately to strongly sloping. This unit occurs primarily along Isaac Lake.

LZ-PM Lanezi-Ptarmigan (7910 ha): About 30% of thin gravelly veneers and deep gravelly soils (Ptarmigan) occur throughout the map unit. The main occurrence is on the western part of the Bowron Lake system.

LZ-BW Lanezi - Bowes Creek (2460 ha): About 20-40% of this map unit contains loamy Brunisolic Gray Luvisols of the Bowes Creek Association. A few areas occur near Indianpoint Lake on gently sloping topography.

Rockland (RO)

The Rockland land type (RO) refers to those areas where bedrock outcrops at the surface and dominates the map unit. Soil development is confined to minor areas having more than 10 cm of soil material over consolidated rock. The terrain is usually steep and ridged, and frequently includes precipitous cliffs. This unit is most common in the subalpine environment of the Quesnel Highland and Cariboo Mountains. It occupies 2.2% of the map area.

Map units

One map unit, RO, is recognized.

RO Rockland (14 390 ha): Steep, often precipitous slopes, characterize this land type of mountain ridge crests and escarpments.

Spakwaniko Association (SW)

The Spakwaniko Association consists of loamy soils formed on colluvial and morainal materials in mountainous areas. The soils generally occupy seepage sites on north-facing slopes. Terrain is moderately sloping. Elevations range above 1000 m. The association is a minor one and predominates in less than 1% of the map area.

The mean annual precipitation is greater than 1149 mm, the freeze-free period is 30-49 days, and there are less than 780 growing degree-days above 5°C.

Spakwaniko soils occur in both the interior cedar-hemlock and Engelmann spruce - subalpine fir zones. Western red cedar, white spruce, and Douglas fir are the main trees of the cedar-hemlock zone. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone. Subalpine fir and Engelmann spruce are the dominant and characteristic trees of the subalpine fir zone. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

Parent materials of Spakwaniko soils are loamy, morainal and colluvial deposits. Stones or gravel may be present. The soils are imperfectly and poorly drained, are slowly pervious, and have a perhumid soil moisture regime. They commonly occupy seepage sites on northerly slope aspects.

The most common soils of the Spakwaniko Association are Orthic Humic Gleysols and Gleyed Sombric Podzols. They have very dark brown or black surface horizons underlain by gleyed subsoils. A Gleyed Sombric Humo-Ferric Podzol is described from near the community of Stanley. The profile description is given in the Appendix. The Spakwaniko soils were first described in the Barkerville area.

Map units

Although only one map unit, SW, is recognized in this report, Spakwaniko soils are important subdominant components of the CC-SW and CP-SW units.

SW Spakwaniko (830 ha): Soils in map delineations of this unit may consist of 20-40% of Organic soils such as Catfish Creek and gleyed soils of the Hah Creek Association.

Torpy River Association (TP)

The Torpy River Association consists of gravelly loamy and sandy soils developed on morainal materials. The terrain is strongly to steeply sloping on middle to lower mountain slopes. Elevations range from 900 to 1500 m. Torpy River soils are dominant in 5.7% of the map area.

The mean annual precipitation is 1149 mm or more, the freeze-free period is 30-49 days, and there are less than 780 growing degree-days above 5°C.

Torpy River soils occur mainly in the Engelmann spruce - subalpine fir zone. Subalpine fir and Engelmann spruce are the dominant and characteristic trees. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses. Stunted and twisted trees in a rich herbaceous flora, typical of the lower alpine tundra zone, are quite common.

Parent materials of Torpy River soils are gravelly loamy and sandy morainal materials. The soils are well to moderately well drained, are moderately pervious, and have a humid soil moisture regime.

The most common soils of the association are Orthic Humo-Ferric Podzols. They occur with gleyed Podzolic soils and Ferro-Humic Podzols. The Torpy River soils were first identified in the Rocky Mountain Trench area.

Map units

Five map units are described in the survey area: one single, TP, and four compound, TP-TC, TP-LZ, TP-HC, and TP-SW.

TP Torpy River (17 710 ha): The strongly to steeply sloping areas of this unit are distributed throughout the map area. They frequently adjoin the higher-elevation units of the Dezaiko Association.

TP-TC Torpy River - Tumuch (2930 ha): The few areas of this map unit occur in the Bowron River valley on lower valley slopes and bottomlands where fluvial deposits (Tumuch soils) are significant components (30-50%) of the unit.

TP-LZ Torpy River - Lanezi (1720 ha): This unit is of limited extent in the survey area, being confined to the upper Bowron River valley and Rocky Mountain Trench. The primary associates, soils of the Lanezi Association, occupy 30% or more of the map unit on rolling morainal landforms.

TP-HC Torpy River - Hah Creek (14 110 ha): Sombric Humo-Ferric Podzols of the Hah Creek Association are associated with the Torpy River soils in much the same way as in the CP-HC map unit. They occur in 20% or more of the map unit.

TP-SW Torpy River - Spakwaniko (810 ha): Gleysols and gleyed soils comprise 20-40% of this minor map unit.

Tumuch Association (TC)

The Tumuch Association consists of sandy-skeletal soils developed on fluvial materials in high mountain valleys. The terrain is predominantly gently sloping with occasionally moderate and nearly level slopes. Elevations are mainly greater than 1200 m. The association predominates in 1.3% of the map area.

The mean annual precipitation is greater than 1149 mm, the freeze-free period is 30-49 days, and there are less than 780 growing degree-days above 5°C.

Tumuch soils occur in both the interior cedar-hemlock and Engelmann spruce - subalpine fir zones. Western red cedar, white spruce, and Douglas fir are the main trees of the cedar-hemlock zone. Shrubs and herbs such as Rocky Mountain maple, Oregon boxwood, blueberries, Canadian bunchberry, and mosses are characteristic of the zone. Subalpine fir and Engelmann spruce are the dominant and characteristic trees of the subalpine fir zone. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

The parent materials of the Tumuch soils are sandy-skeletal fluvial deposits, which are strongly acid. Stones and gravel may occur in moderate amounts. The soils are well to imperfectly drained, are moderately pervious, and have a humid to subhumid soil moisture regime.

The most common soils of the association are Orthic Humo-Ferric Podzols, although Gleyed Orthic Regosols and Rego Gleysols occur frequently. Tumuch soils have a grayish surface horizon with a reddish brown subsoil underlain by the yellowish brown parent material. Tumuch soils were first identified in the survey area. They are not described in greater detail in this report.

Map units

Two map units, TC and TC-CC, are identified in the survey area.

TC Tumuch (6090 ha): A number of small narrow areas of this unit occur in the upper reaches of tributary streams of mountain valleys. Soil drainage characteristics, textural range, and soil development generally vary greatly.

TC-CC Tumuch - Catfish Creek (2110 ha): This map unit is similar in landform and position to the TC unit but contains significant amounts (30-50%) of Organic soils (Catfish Creek) and Gleysols.

Wendle Association (WD)

The Wendle Association consists of shallow loamy soils developed on veneers of morainal material. The terrain is moderately to very steeply sloping. Elevations range from 900 to 1500 m in the Purden Lake and Bowron River areas. The association predominates in less than 1% of the map area.

The mean annual precipitation is between 800 and 1149 mm, the freeze-free period is 30-59 days, and there are 670-1169 growing degree-days above 5°C.

The Wendle soils occur in the Engelmann spruce - subalpine fir zone where these two species are the dominant and characteristic trees. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses.

Parent materials of the association are shallow gravelly loamy morainal materials that are calcareous. Stones or gravel may occur in moderate amounts. The soils are well drained, are moderately pervious, and have a perhumid soil moisture regime.

The most common soils of the Wendle Association are Orthic Humo-Ferric Podzols, lithic phase. They have a grayish surface horizon and a reddish brown subsoil underlain by the yellowish brown parent material. A complete description of an Orthic Humo-Ferric Podzol of the Wendle Association, from the Rocky Mountain Trench (Maxwell, in preparation), is given in the Appendix.

Map units

One single map unit of the Wendle Association, WD, occurs in the Barkerville map area.

WD Wendle (4610 ha): From 20 to 40% of the map unit may contain bedrock outcrop and the deeper soils of the Lanezi and Dominion associations. The unit occupies a number of isolated ridgetops in the highlands of the Bowron River valley.

Yanks Peak Association (YP)

The Yanks Peak Association consists of gravelly loamy soils developed on morainal materials in subalpine areas of the mountains (Plate I b). The terrain is moderately to steeply sloping. Elevations range from 1500 to higher than 2000 m. The association is dominant over 5% of the map area.

The mean annual precipitation is more than 1149 mm, the freeze-free period is 30-49 days or less, and there are less than 780 growing degree-days above 5°C.

The soils of the association occur in both the Engelmann spruce - subalpine fir zone and alpine tundra zone. Subalpine fir and Engelmann spruce are the dominant and characteristic trees of the subalpine fir zone. The well-developed understory includes white-flowered rhododendron, blueberries, devil's-club, Sitka valerian, Canadian bunchberry, and mosses. Trees such as subalpine fir, whitebark pine, and Engelmann spruce survive only at the lowest levels of the alpine tundra zone. They occur here only in a stunted form with willows and common juniper. The herbaceous flora is rich and varied, including many species of grasses, sedges, and small shrubs.

The parent materials of the Yanks Peak soils are gravelly, loamy, acidic, morainal materials that include colluvium. Stones or gravel occur in moderate amounts. The soils are well drained, are moderately to rapidly pervious, and have a humid soil moisture regime.

The most common soils of the association are Orthic Humo-Ferric Podzols. However, Sombric Podzols and Regosols occur in most areas and predominate in some delineations. Podzolic soils have a grayish surface with a reddish brown subsoil and yellowish brown parent material. A complete description of an Orthic Humo-Ferric Podzol, from Yanks Peak in the Quesnel Highland (Sneddon 1969), is given in the Appendix. In addition, a lithic phase of a Sombric Humo-Ferric Podzol (Sneddon 1969) is described in the Appendix.

Yanks Peak soils are similar to some soils of the Paxton Mountain (or Paxton) Association mapped in the mountain areas southeast of Prince George and in the Rocky Mountains (Vold et al. 1977), but these latter soils are developed on more calcareous materials.

Most areas where these soils predominate have good recreational values.

Map units

Two map units, YP and YP-RO, occur in the Barkerville map area.

YP Yanks Peak (1040 ha): Delineations of this map unit contain lithic phases, Sombric Podzols, and bedrock outcrops (Rockland) that occupy less than 40% of the map unit.

YP-RO Yanks Peak - Rockland (31 770 ha): The highest elevations in the map area occur in this map unit. As much as 30-60% of the unit may be occupied by bedrock outcrop (Rockland) and shallow lithic soils.

LAND USE

The maps comprising the Canada Land Inventory (CLI) show the land or soil capability for various purposes. Maps showing land capability for forestry are at a scale of 1:125 000, as are the maps showing the soil

capability for agriculture. Land capability for recreation and wildlife (waterfowl and ungulates) are shown on the maps at a scale of 1:250 000. At these scales the information is suitable for regional planning but is too generalized for more detailed site evaluation.

No attempt is made in the present report to provide maps showing soil interpretations for any sector of natural resources. However, derived and interpretive maps can be made available following the publication of this report. A wide range of such maps, including those showing texture groups, drainage, geological materials, and wetlands, can be produced by Agriculture Canada from original soil information. The following sections on agriculture, forestry, wildlife (ungulates), wildlife (waterfowl), and recreation give brief supplementary information on soil or land capability of the Barkerville area.

Agriculture

Under the CLI system, climate provides the basic limitations for agriculture (Canada Land Inventory 1965, 1976). Selected climatic data were collected in the area through a network of short-term stations and related to the few established stations in or near the map area (Table 1). Table 2, from a report published by Air Studies Branch (1981), defines climatic capability classes in interior British Columbia.

Data from stations at Barkerville and Bowron Lake (Table 1) show freeze-free periods of 47-55 days and growing degree-days above 5°C that range from 738 to 845. Under these conditions the range of crops is limited to forage production and, in favorable years, some cool-season-loving vegetables such as lettuce, peas, spinach, and cabbage.

Within the Fraser Basin and Rocky Mountain Trench areas, climatic capability classes may be as high as Class 2, permitting the growth of a wide range of crops such as potatoes, cauliflower, cereal grains, and forage crops. However, the most favorable soils in this environment, Bednesti, McGregor, Guilford, and Pineview, are restricted to classes 3 to 5 in soil capability for agriculture by limitations of wetness, undesirable soil structure, or low permeability. Soils in the Barkerville map area are generally unsuitable for grazing due to severe climatic and environmental limitations. Maps showing soil capability for agriculture were not completed for the Barkerville area (map sheets 93 H/NW and 93 H/SW).

Table 2. Climatic capability for agriculture classes in interior British Columbia

	Freeze-free period (base 0°C) (days)	Growing degree-days (above 5°C)	Climatic moisture deficit (mm)	Climatic moisture surplus ratio
Class 1	90 - 119	1310 - 1504	< 40	< 0.33
Class 2	75 - 89	1170 - 1309	40 - 115	0.34 - 0.55
Class 3	60 - 74	1030 - 1169	116 - 190	0.56 - 0.75
Class 4	50 - 59	1030 - 1169	191 - 265	0.76 - 1.00
Class 5	30 - 49	780 - 1029	266 - 340	> 1.00
Class 6	< 30	670 - 779	341 - 415	
Class 7	< 30	< 670	> 415	

Climatic moisture deficit: the negative difference between May-September precipitation and potential evapotranspiration.
Climatic moisture surplus: the positive difference between May-September precipitation and potential evapotranspiration expressed as a ratio.

Forestry

The CLI map Land Capability for Forestry, Barkerville 93 H/SW (1982) groups all soils on this map sheet into one or more of six classes (Class 1 was not identified in the map area), based on inherent ability to grow commercial timber (Kowall 1971). The map shows, for each map delineation, the land capability classes, the limiting factors, and the tree species indicators. The productivity range of each class is based on the mean annual increment of the best species adapted to the site at or near rotation age. Productivity classes are expressed as cubic metres per hectare per year as follows:

Class 1.....> 7.8
Class 2.....6.4-7.7
Class 3.....5.0-6.3
Class 4.....3.6-4.9
Class 5.....2.2-3.5
Class 6.....0.8-2.1
Class 7.....< 0.8

Class 2 is of minor occurrence, appearing only on certain Fontoniko, Ptarmigan, and Lanezi map units and on seepage areas with exceptionally favorable moisture regimes. Class 3 lands are confined to lower-elevation receiving slopes and valley bottomlands with favorable soil texture and moisture relationships. Included are most of the map units of the Bowes Creek, Lanezi, Ptarmigan, Roaring, Ramsey, and Dunkley soil associations, and some map units that are dominated by Captain Creek and Torpy River soils. In some cases soil moisture is limiting, but mainly it is a combination of soil factors that cumulatively lower the capabilities for production of lodgepole pine and white spruce.

Class 4 is the dominant capability class in the Quesnel Highland portion of the map area. Most of the Captain Creek, Deserters, and Torpy River map units, and much of the Bearpaw Ridge, Lanezi, and Dezaiko soil areas, are limited to Class 4 by cold temperatures. Lodgepole pine with Engelmann spruce, white spruce, and some subalpine fir are the dominant tree species.

Class 5 predominates in the Cariboo Mountains, both on valley slopes and in map units on mid to upper ridge positions. In the Quesnel Highland this class, in combination with Class 6 on mountain ridges, reflects the severe limitations of the shallower rocky soils and restrictive climate. In these areas soil associations such as Dezaiko, Bearpaw Ridge, and Dragon form the principal map units.

Alpine and subalpine areas provide very severe restrictions to tree growth. Many map units of the Yanks Peak and Rockland associations are devoid of trees or contain scattered clumps of stunted subalpine fir and Engelmann spruce. Most higher-elevation map units of Bearpaw Ridge and Dezaiko associations are dominated by Class 6 and Rockland units (Class 7).

Wildlife

Ungulates

Land capability for wild ungulates in the Barkerville area is shown on part of the CLI publication Land Capability for Wildlife - Ungulates, McBride 93 H (1974). Steep mountainous and plateau lands are rated mainly Class 5 and 6 for moose and caribou, whereas high-elevation subalpine and alpine areas of Yanks Peak and Rockland map units have substantial inclusions of land rated as Class 4 for caribou and mountain goat. The most common limitations are excessive snow depths, shallow soils, and adverse climate.

Class 2, the highest land capability class in the area, occurs on a few sites in the valley of the upper Bowron River. Here, some map units of the Catfish Creek and Ptarmigan soil associations provide good habitat for summering and wintering populations of moose.

Important Class 3 summer range for moose is on a large Toneko-Ptarmigan map unit in Slim Creek valley and on Ptarmigan and Ptarmigan - Catfish Creek units in the upper Cariboo River - Spectacle Lakes region. Many moose and most of the deer in the area winter on Ptarmigan map units along the lower Bowron River and on Toneko and Guilford units in the Rocky Mountain Trench. A few south-facing slopes of the Bearpaw Ridge - Rockland map unit within Bowron Lake Provincial Park provide valuable winter range for moose.

Waterfowl

Limitations of topography, climate, and elevation severely restrict the capability of lands in the area to produce or sustain waterfowl. The CLI publication Land Capability for Wildlife - Waterfowl, McBride 93 H (1970a) rates three areas as Class 5: a Toneko 4 - Longworth map unit surrounding Toneko Lake in the Rocky Mountain Trench, a McGregor-Chief unit on Stony Lake, and a Ptarmigan unit on Swan Lake in Bowron Lake Provincial Park.

With the exception of a large Class 3S marsh at the south end of Bowron Lake, the remaining wetlands and lakes are rated only as Class 6. The Bowron Lake marsh is comprised of Organic soils and Gleysols of the Catfish Creek - Spakwaniko map unit. It is not only a productive area but also serves as an important migration stop for Canada geese.

Recreation

Land capability for outdoor recreation within the survey area is shown in the CLI publication Land Capability for Recreation, McBride 93 H (1973). Recreational activities are confined almost entirely to valley bottomlands, shorelines, and water bodies. Map units dominated by soil associations that are developed on coarse-textured fluvial materials are generally rated Class 5 - moderately low capability. Exceptions are map units of the Ptarmigan and Fontoniko soil associations along the Bowron River and Lightning Creek, and in Bowron Lake Provincial Park. In these

cases Class 3 and 4 capabilities are associated with camping, wildlife viewing, and water activities.

Historic sites such as Barkerville, old mine diggings, and others, are located on or associated with the Barkerville map unit.

The Yanks Peak Association includes mostly open, high-elevation lands near or above timberline. The Class 5 capability of this map unit reflects a moderately low rating associated with dispersed activities that include hiking, viewing, and mountaineering.

DERIVED AND INTERPRETIVE MAPS

Agriculture Canada is able to produce maps based on the soil information presented here. These may be either interpretive, like those indicating the soil capability for wildlife, or they may be derived from the original soil information, such as those displaying texture, slope, or drainage features. They can be made because the original boundaries and map unit symbols are stored in a computer as part of the Canada Soil Information System (CanSIS).

Soil maps are drafted by the Cartography Section in the Land Resource Research Institute of Agriculture Canada, Ottawa. As part of the procedure, map unit symbols and the location of map unit boundaries are recorded in a computer. The soil map is therefore stored in its color-printed form, or as a black-and-white printout from the computer. In conjunction with the computer map there is also a list of all the map unit symbols and the areas they cover. This list is called the map index linkage. Therefore, Agriculture Canada has the means to list, by these symbols, all the map units of a soil map, and to reproduce the map itself as lines and symbols on paper or film. This system provides the capability to produce additional types of derived or interpretive maps as the need arises.

It is possible that a map showing only the different types of geological materials is required. The procedure involves replacing the original map unit symbol by a new symbol that indicates the type of geological material. The same boundaries are retained, with the exception of those that have the same new symbols on either side. In this case the boundary is deleted. No new boundaries are added.

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APPENDIX. DESCRIPTIONS AND ANALYSES OF THE SOILS

This appendix lists, in alphabetical order, profile descriptions of most of the soils in the Barkerville area. Some descriptions, with their accompanying chemical and physical data, were drawn from adjoining soil survey report areas, usually from where the soils were first named and described.

Standard methods of soil analyses (McKeague 1976) were followed in the respective federal or provincial laboratories concerned with the survey projects. Further details are in soil survey reports or may be ascertained by contacting the specific agency.

ALEZA SOIL

Location: Lat. 53°52'N Long. 122°40'W NTS: 93G15 Surveyor: AD Agency: BCMA Kelowna Year of survey: 1965

Identification: BC Soil Survey Report 23 (unpublished) Classification: Orthic Luvic Gleysol (1978) Landform and parent material: clayey glaciolacustrine blanket

Drainage: poorly drained Slope and aspect: 1% simple depressional to level Elevation: 675 m Additional notes: This soil is part of the Pineview association; sulfur averages 10-15 ppm in subsoil horizons; mottles are few, faint in Aeg horizon, distinct in Btg1, Btg2, Btg3 horizons, and common, distinct in Cgj horizon

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L	8-2					abundant
F-H	2-0					abundant
Ah	0-8	very dark gray (10YR 3/1 d)	silt loam	moderate, medium-coarse platy	friable	abundant
Aeg	8-18	dark gray (5Y 4/1 d)	clay	strong, medium-coarse angular blocky	firm	plentiful
Btg1	18-36	brown (10YR 4/3 d)	heavy clay	strong, coarse prismatic	very firm	plentiful
Btg2	36-56	brown (10YR 4/3 d)	heavy clay	strong, coarse prismatic	very firm	few
Btg3	56-76	brown (10YR 4/3 d)	heavy clay	strong, coarse prismatic	very firm	few
Cgj	76+	brown (10YR 4/3 d)	heavy clay		very firm	

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	Cation exchange, meq/100 g					Particle size distribution (%)			Pl (ppm)
				CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	
L	4.5	31.7	1.80									99
F-H	4.5	23.7	1.62									157
Ah	4.6	12.2	0.87	68.7	16.0	29.5	0.3	0.3				33
Aeg	4.9	1.7	0.14	42.7	18.3	11.9	0.2	0.3				7
Btg1	5.4	1.0	0.08	60.4	24.9	20.3	0.3	0.4				2
Btg2	5.9	0.6	0.06	48.3	22.1	16.6	0.3	0.4				1
Btg3	6.3	0.5	0.05	43.2	20.7	14.4	0.4	0.5	0	30	70	2
Cgj	6.5			36.8		11.7	0.4	0.4	1	24	75	1

BEARPAW RIDGE SOIL

Location: Lat. 53°05'N Long. 121°43'W NTS: 93H4 Surveyor: TL Agency: AC, Vancouver Year of survey: 1980

Identification: BC Soil Survey Report 40 Classification: Eluviated Dystric Brunisol (1978) Landform and parent material: loamy colluvial

Drainage: moderately well drained Slope and aspect: 10% ENE Elevation: 1500 m Additional notes: Profile 9337-80; from 30 cm the content of shaly, weathered rock fragments increases sharply with depth. 5 km N of Stanley on east slope of Mt. Nelson

Vegetation: Picea engelmannii, Abies lasiocarpa, Alnus spp., Lonicera spp., Veratrum viride

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence
Ae	0-5	gray (10YR 5/1 d)	loam	moderate-strong, medium-coarse subangular blocky	firm, sticky, plastic
Bm	5-20	light brownish gray (10YR 5/2 d)	silt loam	moderate, medium-coarse sub-angular blocky	slightly hard, sticky
BC	20-30	grayish brown (2.5Y 5/2 d)	shaly loam	moderate-strong, medium sub-angular blocky	slightly hard, sticky
R	at 100	dark grayish brown (2.5Y 4/2 d)	shaly rock		

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)			P1	P2
		Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	(ppm)	(ppm)
Ae	4.4												
Bm	4.5	0.3	0.1	5.74	1.7	0.7	0.0	0.0	38	50	12	16	16
BC	4.3								35	49	16		
R	4.9												

BEDNESTI SOIL

Location: Lat. 54°01'N Long. 122°54'W NTS: 93J2 Surveyor: AD Agency: BCMA, Kelowna Year of survey: 1965

Identification: BC Soil Survey Report 23 (unpublished) Classification: Podzolic Gray Luvisol (1978) Landform and parent material: silty lacustrine blanket

Drainage: moderately well drained Slope and aspect: 2% S Elevation: 760 m Additional notes: Sulfur ranges from 5 to 10 ppm below L-H horizon

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	5-0					abundant
Ae	0-5	light brownish gray (10YR 6/2 d)	silt loam	weak, fine subangular blocky	very friable	abundant
Bf	5-23	light yellowish brown (10YR 6/4 d)	silt loam	weak, fine subangular blocky	very friable	abundant
AB	23-41	light gray (10YR 7/2 d)	silt loam	moderate, medium-coarse sub-angular blocky	firm	plentiful
Bt	41-66	pale brown (10YR 6/3 d)	silt loam	moderate, medium-coarse sub-angular blocky	firm	few
BC	66-76	pale brown (10YR 6/3 d)	silt loam	moderate, medium-coarse sub-angular blocky	firm	few
C1	76-102	pale brown (10YR 6/3 d)	silt loam	coarse pseudo-blocky	friable	
C2	102+	pale brown (10YR 6/3 d)	silt loam		friable	

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	Oxalate (%) Fe	Oxalate (%) Al	Cation exchange, meq/100 g CEC	Ca	Mg	K	Na	P1 (ppm)
L-H	4.2	34.5	0.83								57
Ae	4.1	1.9	0.09			16.8	2.7	0.4	0.4	0.1	94
Bf	4.7	1.2	0.06	1.0	0.6	13.2	2.5	0.2	0.1	0.1	148
AB	4.8	0.5	0.01			8.1	3.8	0.6	0.2	0.1	21
Bt	4.9	0.4	0.02			13.0	7.3	1.2	0.2	0.1	14
BC	4.9	0.4	0.02			13.2	8.0	1.2	0.1	0.1	13
C1	5.1			0.5	0.3	13.4	8.2	1.4	0.2	0.1	11
C2	5.2					12.2	7.8	1.5	0.2	0.2	10

BOWES CREEK SOIL

Location: Lat. 54°10'N Long. 121°20'W NTS: 93I3 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Gleyed Brunisolic Gray Luvisol (1978) Landform and parent material: lacustrine clay

Drainage: imperfectly drained Slope and aspect: 8% SW Elevation: 768 m Additional notes: Profile RM78P29; airphoto A23586-163; rooting depth 120 cm; clay films are many, moderately thick, and occur in voids, channels and on ped surfaces of Btg and CBkg horizons

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-F-H	4-0					abundant
Ael	0-3	white (10YR 8/1 m)	silty clay	weak-moderate, fine subangular blocky	very firm, hard	few
Bm	3-29	yellowish brown (10YR 5/4 m)	silty clay	weak-moderate, fine subangular blocky	very firm, hard	plentiful
Ae2	29-47	grayish brown (10YR 5/2 m)	clay	moderate, medium angular blocky	very firm, very hard	plentiful
Btg1	47-83	dark brown (10YR 4/3 m)	heavy clay	weak, coarse subangular blocky	very firm, extremely hard	very few
Btg2	83-100	dark brown (10YR 4/3 m)	heavy clay	moderate, coarse angular blocky	firm, extremely hard	very few
CBkg	110-126+	dark brown (10YR 4/3 m)	heavy clay	moderate, coarse angular blocky	firm, extremely hard	

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)			
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay
L-F-H	4.0	48.1	1.3	36.5			128.3	25.4	5.8	5.7	0.1				
Bm	4.0	1.9	0.2	11.8	0.7	0.4	34.6	1.6	0.8	0.3	0.1	3	40	57	
Ae2	4.1	0.5	0.1	8.4			28.6	4.5	2.3	0.4	0.1	1	32	67	26
Btg1	5.2	0.2	0.0				36.6	21.3	6.3	0.9	0.1	0	22	78	
Btg2	6.7		0.0				33.2	17.3	5.9	0.7	0.1	2	35	63	
CBkg	7.5		0.0				29.5	30.3	5.6	0.6	0.2	1	22	76	12

CAPTAIN CREEK SOIL

Location: Lat. 53°06'N Long. 121°35'W NTS: 93H4 Surveyor: TL Agency: AC, Vancouver Year of survey: 1980

Identification: BC Soil Survey Report 40 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: loamy morainal and colluvial

Drainage: well drained Slope and aspect: 12% E Elevation: 1300 m Additional notes: Profile 9330-80; Mosquito Creek Mine road, above sewage lagoon

Vegetation: Abies lasiocarpa, Pinus contorta, Populus tremuloides, Vaccinium membranaceum, Vaccinium caespitosum, Salix spp., Cornus canadensis, Veratrum viride, Valeriana sitchensis, mosses, lichens

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L	7-5	mosses, twigs, needles				
F	5-2	semi-decomposed, layered				
H	2-0	decomposed, yellow mycelia				
Ae	0-5		silt loam	weak, moderate subangular blocky	loose, slightly plastic	abundant
Bf	5-13	strong brown (7.5 YR 4/6 m)	silt loam	weak, coarse-medium sub-angular blocky	friable, plastic	abundant
Bm1	13-20	dark brown (7.5YR 4/4 m)	silt loam	weak, coarse-medium sub-angular blocky	friable, plastic	few
Bm2	20-30		silt loam	weak, coarse-medium sub-angular blocky	plastic	few
BC	30-50	dark brown (7.5YR 4/4 m)	sandy loam			

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%) Fe	Pyrophos. (%) Al	Cation exchange, meq/100 g CEC	Ca	Mg	K	Na	Particle size distribution (%) Sand	Silt	Total clay	P1 (ppm)	P2 (ppm)
Ae	3.6	2.1	0.1	19.4	0.2	0.1	13.6	1.1	0.2	0.1	0.0	37	58	5	3	8
Bm	4.8	2.2	0.1	20.3	0.3	0.2	7.9	0.3	0.1	0.1	0.0	43	49	8	4	8
BC	5.2	0.7	0.0	10.3	0.1	0.1	3.8	1.1	2.0	0.0	0.0	49	47	4	7	23

CATFISH CREEK SOIL

Location: Lat. 53°35'N Long. 120°50'W NTS: 93H10 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Terric Fibric Mesisol (1978) Landform and parent material: organic blanket

Drainage: very poorly drained Slope and aspect: 0.5% level Elevation: 914 m Additional notes: Profile RM 78 P31; airphoto A 21589-121; between McBride and Penny 3.2 km W off Yellowhead Hy.

Vegetation: dominantly sphagnum mosses with minor amounts of Ledum spp., Carex spp., and Picea mariana

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color,* dry (d) moist (m)	Texture	Structure	Consistence	Roots
Of1	0-16	light yellowish brown (10YR 6/4)	(raw sphagnum)			plentiful
Of2	16-30	dark reddish brown (5YR 3/4)	(slightly decomposed)			plentiful
Om	30-60	dark reddish brown (5YR 3/3)				abundant
Oh	60-70	dark reddish brown (5YR 2.5/2)				abundant
11Cg	70+	dark greenish gray (5GY 5/1)	clay	massive	very sticky, very plastic	plentiful

* natural, wet colors

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Cation exchange, meq/100 g				
					CEC	Ca	Mg	K	Na
Of1	3.5	47.9	2.8	17.1		12.5	9.9	6.7	0.9
Of2	3.8	51.5	2.0	26.0	113.9	9.4	3.7	0.6	0.5
Om	4.4	49.0	2.1	23.7	25.4	3.6	1.6	0.0	0.1
Oh	4.7	40.3	0.6		24.1	4.3	1.7	0.0	0.1
11Cg	5.1	1.3	0.2		14.9	5.4	3.1	0.1	0.1

DESERTERS SOIL

Location: Lat. 53°55'N Long. 126°25'W NTS: 93E16 Surveyor: IC Agency: BCMA, Kelowna Year of survey: 1974

Identification: BC Soil Survey Report 22 Classification: Gleyed Brunisolic Gray Luvisol (1978) Landform and parent material: loamy morainal

Drainage: imperfectly drained Slope and aspect: 24% NW Elevation: 1100 m Additional notes: Mottles Bmgj: few, fine, faint; Aegj and Btgj1: common, fine, distinct; Btgj2 and BCgj: few, fine, distinct; clay skins are common in the Bt horizons

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	5-0	forest litter in various stages of decomposition				abundant
Ae	0-2	light gray (10YR 7/2 d)	sandy loam	single grain	loose	abundant
Bm1	2-15	pale brown (10YR 6/3 d)	sandy loam	moderate, fine-medium granular	very friable	abundant
Bmgj	15-30	pale brown (10YR 6/3 d)	loam	weak-moderate, fine granular	very friable	abundant
Aegj	30-49	light gray (10YR 7/2 d)	gravelly loam	weak, fine subangular blocky	very friable	common
ABg	49-60	light gray (10YR 7/3 d)	gravelly loam	weak-moderate, medium subangular blocky	friable	very few
Btgj1	60-74	light brownish gray (10YR 6/2 d)	gravelly loam	moderate, fine-medium subangular blocky	firm	nil
Btgj2	74-85	very pale brown (10YR 7/3 d)	gravelly loam	moderate, fine-medium subangular blocky	very firm	
BCgj	85-106	light gray (10YR 7/2 d)	gravelly loam	pseudo-blocky and pseudo-platy	very firm	
C	106+	light gray (10YR 7/2 d)	gravelly loam	pseudo-platy	very firm	

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Cation exchange, meq/100 g					Particle size distribution %				Pl (ppm)	P2 (ppm)	S (ppm)	Cu (ppm)	Zn (ppm)
					CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay					
L-H	4.3	46.3	1.3	36.5	72.8	26.9	3.7	1.4	0.2					36	51	2	8	63
Ae	4.0	1.6	0.1	19.2	11.1	1.7	0.4	0.2	0.1					55	84	2	7	37
Bm1	4.5	1.2	0.1	13.9	12.3	2.0	0.6	0.2	0.1					47	75	5	11	60
Bmgj	4.6	0.5	0.0	16.7	8.9	2.4	0.7	0.2	0.1					15	52	2	12	53
Aegj	4.7	0.2	0.0	7.7	10.5	4.9	1.7	0.2	0.1	43	38	19	4	5	58	3	18	58
ABg	4.7	0.2	0.0	9.0	10.7	6.2	1.9	0.2	0.1					5	78	3	17	54
Btgj1	5.3													5	124	3	20	60
Btgj2	5.4									42	34	24	11	3	129	2	22	64
BCgj	5.9													2	180	2	23	72
C	6.0									42	36	22	11	1	214	2	24	73

DEZAIKO SOIL

Location: Lat. 53°05'N Long. 121°54'W NTS: 93H4 Surveyor: TL Agency: AC, Vancouver Year of survey: 1980

Identification: BC Soil Survey Report 40 Classification: Orthic Humo-Ferric Podzol, lithic phase (1978) Landform and parent material: loamy morainal and colluvial veneer

Drainage: well drained Slope and aspect: 15% N Elevation: 1500 m Additional notes: Profile 9336-80; 4 km NE of Pinegrove; airphoto BC9355-66; bedrock is basalt (at <50 cm)

Vegetation: Rhododendron albiflorum, Abies lasiocarpa, Picea engelmannii, Vaccinium membranaceum, Veratrum viride, mosses, lichens

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L	4-3	fresh needles, twigs				abundant
F	3-0	semi-decomposed leaves, wood				
Ae	0-5	dark grayish brown (10YR 4/2 m)	sandy loam	moderate, medium-coarse subangular blocky	friable, slightly plastic	few
Bhf	5-8	dark brown (7.5YR 3/2 m)	loam	weak-moderate, fine-medium subangular blocky	very friable, plastic	few
Bf1	8-18	dark brown (7.5YR 3/4 m)	loam	moderate, fine-medium subangular blocky	friable, plastic	few
Bf2	18-31	dark yellowish brown (10YR 4/4 m)	loam	moderate, fine-medium subangular blocky	friable, slightly plastic	few
BC	31+	dark yellowish brown (10YR 4/4 m)	loam	weak, fine subangular blocky	very friable, plastic	few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)		
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay
L	4.0	61.7	0.6	59.3										
Ae	3.3													
Bhf	3.5				1.5	0.2	22.8	0.4	0.2	0.1	0.1	50	39	11
Bf1	3.8				1.3	0.3	12.8	0.3	0.1	0.1	0.0	48	41	11
Bf2	4.1				0.6	0.2	5.9	0.1	0.0	0.1	0.0			
BC	4.2											52	40	8

DOMINION SOIL

Location: Lat. 54°31'N Long. 122°40'W NTS: 93J10 Surveyor: AD Agency: BCMA, Kelowna Year of survey: 1967

Identification: BC Soil Survey Report 23 (unpublished) Classification: Luvisolic Humo-Ferric Podzol (1978) Landform and parent material: loamy morainal blanket

Drainage: well drained Slope and aspect: 10% W Elevation: 780 m Additional notes: clay films are few in the AB horizon and common in BA and Bt horizons

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	5-0					abundant
Ae	0-7	light gray (10YR 7/2 d)	silt loam	single grain	loose	abundant
Bf1	7-25	pale brown (10YR 6/3.5 d)	silt loam	weak, fine subangular blocky	soft	abundant
Bf2	25-40	pale brown (10YR 6/3 d)	sandy loam	weak, fine-medium subangular blocky	soft	abundant
AB	40-65	dark grayish brown (2.5Y 4.5/2 d)	gravelly sandy loam	moderate, medium subangular blocky	slightly hard	plentiful
BA	65-90	dark grayish brown (2.5Y 4.5/2 d)	gravelly loam	moderate, coarse angular blocky	hard	plentiful
Bt	90-115	dark grayish brown (2.5Y 4.5/2 d)	gravelly loam	moderate, coarse angular blocky	hard	few
C	115+	grayish brown (2.5Y 5/2 d)	gravelly loam		hard	

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	Cation exchange, meq/100 g					Particle size distribution (%)				P1	P2	S	Cu	Zn
				CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
L-H	4.5	32.7	1.0	71.8	34.9	5.9	1.2	0.1					18	27		12	99
Ae	3.9	0.9	0.1	9.8	1.5	0.3	0.1	0.0	32	60	8		23	43	10	6	62
Bf1	4.6	0.6	0.1	7.6	1.5	0.2	0.1	0.0					18	74	8	10	58
Bf2	4.6	0.5	0.0	7.4	1.4	0.2	0.1	0.0					15	75	11	13	47
AB	4.6			6.3	1.7	0.4	0.1	0.1						69	8	16	45
BA	4.4			12.2	5.5	1.7	0.2	0.0	37	40	23	8		58	11	32	60
Bt	4.6			14.1	7.4	2.1	0.1	0.1						96	9	29	
C	5.7			13.8	10.0	0.2	0.1	0.1	35	41	24	6			6		59

DRAGON SOIL

Location: Lat. 54°00'N Long. 124°50'W NTS: 93J15 Surveyor: IC Agency: BCMA, Kelowna Year of survey: 1974

Identification: BC Soil Survey Report 22 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: shallow sandy colluvium, acidic bedrock

Drainage: rapidly drained Slope and aspect: 20% SE Elevation: 1230 m Additional notes: Many of the Dragon soils have less than 50 cm of colluvial or morainal material overlying bedrock and are classified as lithic phase

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	5-0					abundant
Ae	0-5	light gray (10YR 7/1 d)	sandy loam	weak, fine subangular blocky	loose	abundant
Bf1	5-7	yellowish brown (10YR 5/4 d)	sandy loam	moderate, fine-medium subangular blocky	very friable	abundant
Bf2	7-20	yellowish brown (10YR 5/4 d)	sandy loam	moderate, fine-medium subangular blocky	very friable	abundant
BC	20-45	brown (10YR 5/3 d)	gravelly sandy loam	moderate, fine-medium subangular blocky	very friable	common
C	45-55	(10YR 6/2 d) light brownish gray	gravelly sandy loam	pseudo-platy	friable	very few
R	55+					

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Oxalate (%)		Cation exchange, meq/100 g					P1 (ppm)	P2 (ppm)	S (ppm)	Cu (ppm)	Zn (ppm)
					Fe	Al	CEC	Ca	Mg	K	Na					
L-H	3.9	60.0	1.2	31.1			107.0	22.4	2.9	2.0	0.0	42	54		9	42
Ae	3.7	1.6	1.1	27.5			12.3	2.4	0.3	0.2	0.0	7	14	8	3	19
Bf1	5.5*	1.7			0.9	0.6	14.1	1.4	0.2	0.2	0.0	51	99	9	8	48
Bf2	6.0*	1.5	0.1	23.3	0.9	0.9	13.5	1.4	0.2	0.1	0.0	44	93	9	13	52
BC	6.0*				0.5	0.5	7.8	0.7	0.1	0.1	0.0	30	70	6	16	26
C	6.1*				0.4	0.3						28	62		17	25

* in water

GUILFORD SOIL

Location: Lat. 53°50'N Long. 121°19'W NTS: 93H14 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Gleyed Cumulic Regosol (1978) Landform and parent material: silty fluvial terrace

Drainage: imperfectly drained Slope and aspect: level Elevation: 655 m Additional notes: Profile RM 786P; airphoto A21590-76; 3 m above Fraser River, 30 m S of Penny Rd.; watertable 3 m; nonstony; mottles in Cgj1 are many, coarse and faint

Vegetation: Picea glauca, Populus balsamifera subsp. trichocarpa, Betula spp., Salix spp., Sambucus racemosa, Lonicera involucrata, Urtica dioica subsp. gracilis var. lyallii, mosses, ferns (including Matteuccia struthiopteris)

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L	1-0	mull humus				abundant
C1	0-1	light brownish gray (2.5Y 6/2 m)	sandy loam	single grain	loose	abundant
Ahb1	1-8	very dark gray (10YR 3/1 m)	sandy loam	weak, fine subangular blocky	very friable	abundant
C2	8-17	very dark grayish brown (10YR 3/2 m)	loam	weak, coarse pseudo-blocky	friable	abundant
C3	17-30	dark grayish brown (2.5Y 4/2 m)	silt loam	weak, coarse pseudo-platy	very friable	few
Ahb2	30-34	very dark gray (10YR 3/1 m)	silt loam	weak, fine pseudo-blocky	friable	abundant
Cgj1	34-44	brown (10YR 5/3 m)	silt	weak, fine pseudo-blocky	very friable	few
Cgj2	44-54	dark grayish brown (2.5Y 4/2 m)	silt	weak, coarse pseudo-blocky	friable	few
Cg	54-140+	dark grayish brown (2.5Y 4/2 m)	silt	weak, coarse pseudo-platy	friable	very few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Cation exchange, meq/100 g					Particle size distribution (%)			S (ppm)
					CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	
L	6.4	41.0		33.1	108.9	59.6	11.5	4.2	0.1				
Ahb1	6.5	5.2	0.3	17.3	23.7	19.2	2.3	0.2	0.0				4.0
C2	6.1	2.3	0.1	18.9	13.3	10.4	1.7	0.1	0.0				1.8
C3	6.1	0.3	0.1	6.4	4.3	3.4	0.6	0.0	0.0	35	63	2	1.1
Ahb2	6.0	3.6	0.2	15.3	22.7	16.9	2.9	0.1	0.0				2.5
Cgj1	5.9	0.9	0.1	12.7	9.2	6.7	1.2	0.1	0.0	10	81	9	1.3
Cgj2	5.9	0.7	0.0	16.1	8.1	6.5	0.9	0.0	0.0	9	83	8	1.4
Cg	6.0	0.3	0.0	5.9	4.8	4.5	0.6	0.0	0.0	10	82	8	1.1

LANEZI SOIL

Location: Lat. 53°48'N Long. 121°19'W NTS: 93H14 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Podzolic Gray Luvisol (1978) Landform and parent material: loamy morainal blanket

Drainage: moderately well drained Slope and aspect: 13% NE Elevation: 850 m Additional notes: Profile RM 785P; airphoto A 21590-48; on Yellowhead Hy.; very stony; seepage present; rooting 60-100 cm

Vegetation: Thuja plicata, Tsuga heterophylla, Abies lasiocarpa, Oplopanax horridus, Aralia nudicaulis, Ribes spp., Tiarella spp., Cornus canadensis, Vaccinium spp.

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L	10-6	forest litter				abundant
F	6-0	dark reddish brown (5YR 3/2)				abundant
Ae	0-6	white (10YR 8/1 m)	silt loam	moderate, medium subangular blocky	friable	plentiful
Bf1	6-16	strong brown (7.5 YR 4/6 m)	silt loam	weak, fine subangular blocky	very friable	plentiful
Bf2	16-26	yellowish brown(10YR 5/8 m)	loam	very weak, fine subangular blocky	friable	plentiful
Bt	26-40	yellowish brown (10YR 5/4 m)	loam	moderate, coarse platy	friable	few
Btj	40-56	light olive brown (2.5Y 5/4 m)	loam	moderate, coarse subangular blocky	friable	very few
BC	56-140+	light olive brown (2.5Y 5/4 m)	loam	strong, coarse platy	firm	very few

PHYSICAL AND CHEMICAL DATA

Horizons	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%) Fe	Pyrophos. (%) Al	Cation exchange, meq/100 g CEC	Ca	Mg	K	Na	Particle size distribution (%) Sand	Silt	Total clay	Fine clay	(ppm)
F	5.3	50.8	2.0	25.7			141.5	76.4	8.7	1.6	0.3					
Ae	3.8	0.6	0.1	11.5			8.8	0.8	0.5	0.1	0.0	35	57	8	3	1.1
Bf1	4.4	2.3	0.1	19.3	1.3	0.3	20.6	2.2	0.6	0.1	0.0	38	51	11	4	0.5
Bf2	4.5	1.3	0.1	18.6	0.9	0.4	14.8	0.5	0.4	0.1	0.0	45	41	14	4	
Bt	4.5	0.9	0.1	17.0			9.2	0.3	0.3	0.1	0.0	38	48	14	2	
Btj	4.5	0.9	0.1	12.0			6.9	0.4	0.2	0.1	0.0	42	46	12	2	
BC	5.1	0.1	0.0	2.3			66.8	2.2	0.6	0.1	0.0	42	46	12	3	

LONGWORTH SOIL

Location: Lat. 53°50'N Long. 121°20'W NTS: 93H14 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Gleyed Podzolic Gray Luvisol (1978) Landform and parent material: silty fluvial

Drainage: imperfectly drained Slope and aspect: 2% level Elevation: 700 m Additional notes: Penny access road, 300 m S of Hy.; airphoto A 21590-75; rooting depth is to 100 cm

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-F-H	3-0	forest litter				abundant
Ae	0-4	reddish gray (5Y 5/2 m)	sandy loam	weak, fine subangular blocky	friable, slightly plastic	plentiful
Bfgj1	4-8	reddish brown (5YR 5/3 m)	loamy sand	weak, fine angular blocky	friable, slightly plastic	plentiful
Bfgj2	8-17	yellowish brown (10YR 5/4 m)	sandy loam	very weak, fine angular blocky	friable, slightly plastic	few
Aeg	17-33	grayish brown (10YR 5/2 m)	silt loam	weak-moderate, fine sub-angular blocky	firm, plastic	very few
Btg	33-83	grayish brown (10YR 5/2 m)	silt loam	moderate-strong, coarse platy	very firm, very plastic	
BCg	83-105+	gray (5Y 5/1 m)	silt loam	moderate-strong, coarse platy	very firm, very plastic	

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)					
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay	Pl (ppm)	S (ppm)
L-F-H	3.9	32.2	1.1	29.6			109.6	2.7	0.9	0.7	0.0						
Ae	3.6	5.0	0.2	21.0			12.5	5.0	2.4	0.6	0.2	25	60	15	5		2.5
Bfgj1	4.0	2.0	0.1	17.1	0.7	0.2	18.0	0.3	0.2	0.1	0.0					0.9	1.1
Bfgj2	4.3	0.9	0.1	13.8	0.4	0.2	9.8	0.1	0.1	0.0	0.0					0.6	0.5
Aeg	4.4	0.5	0.6	8.3			12.0	1.9	0.4	0.0	0.2						0.6
Btg	4.8	0.2	0.1	5.3			14.5	5.4	1.8	0.1	0.1	9	72	19	6		0.4
BCg	5.2	0.3	0.0	7.7			15.3	7.1	2.3	0.1	0.1	5	78	17			0.2

McGREGOR SOIL

Location: Lat. 53°57'N Long. 122°41'W NTS: 93G15 Surveyor: AD Agency: BCMA, Kelowna Year of survey: 1968

Identification: BC Soil Survey Report 23 (unpublished) Classification: Gleyed Cumulic Regosol (1978) Landform and parent material: silty fluvial, terraced

Drainage: imperfectly drained Slope and aspect: 2% Elevation: 570 m Additional notes: Mottles in F-Hb horizon are few, distinct; in IIICk are few, faint; and in VCgjk are few, distinct; colors are 10YR 4/4-5/4; effervescence is weak to very weak throughout the profile

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	5-0					abundant
Ck	0-8	dark grayish brown (2.5Y 4.5/2 m)	fine sandy loam	weak, fine pseudo-platy	very friable	abundant
F-Hb1	8-10	very dark brown (10YR 2/2 m)	fine sandy loam	weak, fine pseudo-platy	very friable	abundant
IICk	10-13	dark grayish brown (2.5Y 4.5/2 m)	fine sandy loam	weak, fine pseudo-platy	very friable	abundant
F-Hb2	13-15	very dark brown (10YR 2/2 m)	fine sandy loam	weak, fine pseudo-platy	very friable	abundant
IIICk	15-43	dark grayish brown (2.5Y 4.5/2 m)	silt loam	weak, fine pseudo-platy	friable	abundant
IVCk	43-51	dark grayish brown (2.5Y 4/2 m)	fine sand	single grain	loose	few
VCgjk	51-64	grayish brown (2.5Y 5/3 m)	very fine sandy loam	weak, medium pseudo-platy	friable	few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)
L-H			
Ck	7.6	1.1	0.80
F-Hb1	7.6	6.2	0.36
IICk	7.6		
F-Hb2	7.7	1.2	0.11
IIICk		0.5	0.05
IVCk	7.7	0.2	0.03
VCgjk	7.7	0.3	0.04

PINEVIEW SOIL

Location: Lat. 53°55'N Long. 123°46'W NTS: 93G13 Surveyor: IC Agency: BCMA, Kelowna Year of survey: 1974

Identification: BC Soil Survey Report 22 Classification: Gleyed Gray Luvisol (1978) Landform and parent material: clayey lacustrine blanket

Drainage: imperfectly drained Slope and aspect: depression Elevation: 815 m Additional notes: Mottles in Btgj horizon are few, distinct; in Btg horizon mottles are common, distinct; in BCgj horizon mottles are few, common, distinct; colors are 7.5YR 4/4 m; many clay flows occur in Btgj and Btg horizons

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
F	6-2					
H	2-0					
Ae	0-10	brown (10YR 4/3 m)	silty clay	moderate, coarse platy	firm	abundant
AB	10-17	light brownish gray (10YR 6/2 m)	clay	moderate, coarse subangular blocky	firm	common
Btgj	17-35	reddish gray (5YR 5/2 m)	heavy clay	strong coarse-very coarse prismatic	very firm	few
Btg	35-50	dark brown (7.5YR 4/4 m)	heavy clay	moderate, medium-coarse angular blocky	firm	few
BCgj	50-65	light brownish gray (10YR 6/2 m)	clay	moderate, medium-coarse angular blocky	firm	few
C	65+	brown (7.5YR 5/2 m)	clay	pseudo-platy	firm	few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Cation exchange, meq/100 g					Particle size distribution (%)			
					CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay
F	4.8	62.0	1.49	45.8	129.4	23.7	8.9	1.9	0.2				
H	4.8	58.2	1.63	40.1	139.7	29.9	13.8	3.3	0.4				
Ae	5.3	1.4	0.11	14.9	18.3	6.9	4.5	0.5	0.1	4	50	46	4
AB	5.5	0.7	0.07	11.2	15.9	6.2	5.2	0.7	0.1				
Btgj	6.1	0.6	0.08	10.4	28.8	10.7	13.3	0.7	0.4	2	30	68	20
Btg	6.6	0.5	0.06	9.9	28.3	9.6	12.9	0.6	0.5				
BCgj	7.0									0	38	62	13
C	7.5												

PTARMIGAN SOIL

Location: Lat. 53°33'N Long. 121°53'W NTS: 93H10 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: glaciofluvial terrace

Drainage: well drained Slope and aspect: 4% NE Elevation: 940 m Additional notes: Profile RM 781 P; airphoto A21589-131; moderately pervious, very stony; rooting depth 2 m

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-F-H	1-0	forest litter				
Ae	0-8	light gray (5YR 7/1 m)	sandy loam	weak, medium platy	friable, slightly hard	plentiful
Bf1	8-25	strong brown (7.5YR 4/6 m)	sandy loam	weak, fine subangular blocky	friable, slightly hard	plentiful
Bf2	25-54	dark brown (7.5YR 3/4 m)	loamy sand	weak, fine subangular blocky	friable, soft	abundant
Bf3	54-91	dark yellowish brown (10YR 3/4 m)	gravelly loamy sand	single grain	friable, soft	few
Bm	91-130	dark brown (10YR 3/3 m)	gravelly loamy sand	single grain	friable, soft	few
BCk	130-150+	olive brown (2.5Y 4/4 m)	gravelly loamy sand	single grain	friable, soft	few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	Pyrophos. (%)		Cation exchange, meq/100 g				P2 (ppm)
				Fe	Al	CEC	Ca	Mg	Na	
L-F-H	4.1	56.6	1.6			176.5	20.0	3.6	0.1	
Ae	3.5	0.4	0.1			11.0	1.5	0.1	0.0	0.5
Bf1	4.3	2.1	0.1	1.4	0.4	17.7	1.3	0.0	0.0	0.4
Bf2	4.7	2.3	0.1	0.9	0.7	19.0	1.4	0.0	0.0	0.3
Bf3	4.9	0.8	0.1	0.4	0.4	9.3	1.5	0.0	0.0	0.1
Bm	6.4		0.0	0.1	0.1	5.7	3.5	0.8	0.0	0.6
BCk	7.5					2.3	7.0	0.2	0.0	0.3

RAMSEY SOIL

Location: Lat. 54°14'N Long. 125°28'W NTS: 93K3 Surveyor: IC Agency: BCMA, Kelowna Year of survey: 1974

Identification: BC Soil Survey Report 22 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: gravelly glaciofluvial

Drainage: rapidly drained Slope and aspect: 9% S Elevation: 1230 m

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	5-0					
Ae	0-10	light brownish gray (10YR 6/2 d)	gravelly loamy sand	moderate, medium granular	soft	abundant
Bhf	10-20	strong brown (7.5YR 5/6 d)	gravelly loamy sand	moderate, medium granular	soft	abundant
Bf	20-40	yellowish brown (10YR 5/6 d)	gravelly loam	weak, medium granular	loose	abundant
IIC	40+	variegated	sandy gravel	single grain	loose	common to few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Cation exchange, meq/100 g					P1 (ppm)	P2 (ppm)	S (ppm)	Cu (ppm)	Zn (ppm)
					CEC	Ca	Mg	K	Na					
L-H	4.8	53.0	1.6	37.5	92.9	37.5	5.3	1.6	0.1	34	54	17	9	152
Ae	4.3	1.4	0.0	28.6	10.9	2.4	0.6	0.1	0.1	27	50	1	6	31
Bhf	4.4	2.8	0.0	61.4	24.8	0.3	0.2	0.2	0.1	158	230	12	16	60
Bf	4.8	0.8	0.0	23.0	8.4	0.5	0.1	0.1	0.1	64	139	3	15	55
IIC	5.2		0.0		3.8	0.7	0.1	0.1	0.0	21	388	1	14	38

RAUSH SOIL

Location: Lat. 53°35'N Long. 120°51'W NTS: 93H10 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Brunisolic Gray Luvisol (1978) Landform and parent material: glaciolacustrine blanket

Drainage: imperfectly drained Slope and aspect: 22% E Elevation: 875 m Additional notes: Rooting depth 120 cm; profile RM 283P; airphoto A21589-121; on Ptarmigan Creek road

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-F-H	10-0	forest litter				
Bm	0-6	dark brown (10YR 4/3 m)	silty clay	weak-moderate, very fine sub-angular blocky	very friable, very plastic	abundant
Ae	6-13	brown (10YR 5/3 m)	silty clay	moderate, medium platy	very friable, very plastic	plentiful
AB	13-40	yellowish brown (10YR 5/4 m)	silty clay	moderate-strong, coarse angular blocky	very firm, hard, very plastic	plentiful
Bt	40-60	dark brown (10YR 4/3 m)	silty clay	moderate-strong, very coarse angular blocky	very firm, hard, very plastic	few
BC	60-80	dark brown (10YR 4/3 m)	silty clay	moderate-strong, coarse angular blocky	very firm, hard, very plastic	few
CB	80-120+	yellowish brown (10Y 5/4 m)	silty clay	moderate-strong, very coarse angular blocky	very firm, hard, very plastic	few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)				Bulk density (g/cm^3)	S (ppm)
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay		
L-F-H	6.8	34.6	1.4	24.9			110.3	65.1	12.0	2.6	0.3						
Bm	4.1	1.1	0.1	10.5	0.3	0.2	34.1	5.2	2.2	0.8	0.1	0	51	49	14		1.2
Ae	4.3	0.6	0.1	7.4			26.4	5.6	3.1	0.5	0.2	1	51	48	15		0.7
AB	5.0	0.4	0.1	6.6			28.4	15.0	5.9	0.5	0.1	0	47	53	19		0.8
Bt	6.0	0.3	0.0	6.7			31.8	21.0	6.1	0.5	0.2	1	43	56	18	0.6	0.5
BC	6.7	0.3	0.0	6.7			27.0	19.1	5.1	0.5	0.2	1	54	45	3		0.4
CB	7.7	0.1					28.0	39.0	4.8	0.6	0.1	0	42	58	13		0.3

ROARING SOIL

Location: Lat. 54°21'N Long. 124°17'W NTS: 93K1 Surveyor: IC Agency: BCMA, Kelowna Year of survey: 1974

Identification: BC Soil Survey Report 22 Classification: Orthic Dystric Brunisol (1978) Landform and parent material: gravelly glacio-fluvial, esker

Drainage: rapidly drained Slope and aspect: 25% S Elevation: 830 m

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H	2-0					
Ah	0-2	dark grayish brown (10YR 4/2 d)	gravelly loamy sand	weak, medium granular	soft	abundant
Bm	2-10	dark brown (10YR 3/3 d)	gravelly loamy sand	weak, fine subangular blocky	soft	abundant
C1	10-35	variegated	gravelly sand	single grain	loose	abundant
C2	35+	variegated	gravelly sand	single grain	loose	abundant

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Cation exchange, meq/100 g					P1 (ppm)	P2 (ppm)	S (ppm)	Cu (ppm)	Zn (ppm)
					CEC	Ca	Mg	K	Na					
L-H	5.4	36.0	3.1	30.2	78.0	56.4	7.2	3.4	0.1	69	135		15	179
Ah	5.5	2.6	1.6	17.5	14.5	8.2	1.4	1.3	0.0	112	574	5	13	137
Bm	5.1	1.3	0.1	13.6	10.6	4.4	0.5	0.6	0.0	155	500	9	14	129
C1	5.9				9.1	4.4	0.5	0.4	0.0	59	288	1	14	71
C2	5.8				7.1	3.7	0.6	0.4	0.0	23	48	1	18	59

SPAKWANIKO SOIL

Location: Lat. 52°59'N Long. 121°50'W NTS: 93A13 Surveyor: TL Agency: AC, Vancouver Year of survey: 1980

Identification: BC Soil Survey Report 32 Classification: Gleyed Sombric Humo-Ferric Podzol (1978) Landform and parent material: loamy morainal

Drainage: imperfectly drained Slope and aspect: 25% SE Elevation: 1435 m

Vegetation: Alnus viridis, Veratrum viride, Athyrium spp., Maianthemum spp., Clintonia uniflora

Additional notes: Profile 9332-80; on logging road on W side of Sovereign Creek; mottles in BCg horizon are many, medium, distinct; the profile is common in this soil association; found in high-elevation "alder patches"

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence
L	5-4	twigs, sticks and leaves			
F	4-3	partially decomposed organic matter			
H	3-0	black, fluffy and friable			
Ah1	0-9	very dark brown (10YR 2/2 m)	loam	moderate, medium subangular blocky	friable, plastic
Ah2	9-16	dark brown (10YR 3/3 m)	silt loam	moderate, coarse subangular blocky	friable, plastic
Bf	16-28	dark yellowish brown (10YR 4/4 m)	silty clay loam	moderate, subangular blocky	friable, very plastic
BC	28-43	grayish brown (2.5Y 5/2 m)	silty clay loam	angular blocky	firm, plastic
BCg	43+	grayish brown (2.5Y 5/2 m)	clay loam	strong, very coarse angular blocky	firm, plastic
C1	@60	pale brown (10YR 6/3 m)	loam	strong, medium pseudo-angular blocky	hard, slightly plastic

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)			P1 (ppm)	P2 (ppm)
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay		
Ah1	3.4	11.5	0.4	15.9			37.1	0.4	0.3	0.2	0.1	31	55	14	103	151
Ah2	3.5	6.8	0.2	17.4			22.7	0.3	0.4	0.2	0.1	31	52	17	93	168
Bf	3.6	2.8	0.1	14.2	0.9	0.2	15.8	0.3	0.1	0.1	0.1	34	51	15	76	129
BCg	4.4	0.5	0.0	10.0												
C1	4.7	0.5	0.0	12.3			8.8	2.4	2.3	0.1	0.1	33	50	17	16	31

TONEKO SOIL

Location: Lat. 53°45'N Long. 121°08'W NTS: 93H11 Surveyor: RM Agency: BCME, Kelowna Year of survey: 1978

Identification: BC Soil Survey Report 41 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: sandy glacio-fluvial

Drainage: well drained Slope and aspect: 14% SSE Elevation: 775 m Additional notes: Profile RM784P; airphoto A21590-46; rooting 140 cm; nonstony, this polypedon is considered as modal for the association

Vegetation: Tsuga heterophylla, Picea glauca, Abies lasiocarpa, Thuja plicata, Aralia nudicaulis, Chimaphila umbellata, Clintonia uniflora, Cornus canadensis, Pyrola spp., mosses

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H-F	10-0	leaf litter				plentiful
Ae	0-4	light gray (10YR 7/1 m)	silt loam	very weak, fine subangular blocky	very friable nonplastic	plentiful
AB	4-6	light brown (7.5YR 6/4 m)	loamy sand	weak, medium subangular blocky	friable, non-plastic	few
Bf1	6-14	yellowish red (5YR 4/6 m)	sandy loam	weak, medium subangular blocky	friable, non-plastic	few
Bf2	14-30	dark yellowish brown (10YR 3/6 m)	sand	very weak, fine subangular blocky	loose	abundant
Bm	30-55	yellowish brown (10YR 5/4 m)	sand	very weak, fine subangular blocky	loose	very few
CB1	55-110	light yellowish brown (2.5Y 6/4 m)	sand	single grain	loose	very few
CB2	110-145+	olive (5Y 5/3 m)	sand	single grain	loose	very few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)			Pl	S
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	(ppm)	(ppm)
L-F-H	3.8						120.9	20.4	3.5	3.9	0.2					
Ae	3.6	0.8	0.0	21.9			11.3	1.4	0.2	0.0	0.0	45	53	2		0.7
AB	4.0	0.2	0.0	5.9			12.1	1.8	0.3	0.0	0.0	85	13	2		0.7
Bf1	4.4	0.7	0.0	20.9	0.5	0.2	11.6	0.9	0.1	0.0	0.0	48	43	9	0.8	
Bf2	4.8	0.5	0.0	16.7	0.2	0.3	6.7	0.5		0.0	0.0	76	23	1	0.5	0.2
Bm	4.9	0.2	0.0	7.3	0.1	0.2	3.6	0.3		0.0	0.0	45	47	8		0.4
CB1	5.1	0.1	0.0	5.9			2.9	0.6		0.0	0.0	52	47	1		1.5
CB2	5.0						3.1	0.7		0.0	0.0	47	47	6		0.8

WENDLE SOIL

Location: Lat. 54°07'N Long. 121°16'W NTS: 93I3 Surveyor: RM Agency: BCME, Kelowna Year of Survey: 1978

Identification: BC Soil Survey Report 41 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: loamy colluvial blanket

Drainage: well drained Slope and aspect: 70% NW Elevation: 792 m Additional notes: Profile RM 78 P31; airphoto A23586-163; rock type: limy calcareous shale

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-H-F	14-0	leaf litter				abundant
Ae	0-15	pale red (2.5YR 6/2 m)	gravelly loam	very weak, fine subangular blocky	friable, loose	plentiful
Bf1	15-32	reddish brown (5YR 4/4 m)	gravelly loam	very weak, fine subangular blocky	friable, soft	plentiful
BF2	32-60	dark brown (7.5YR 4/4 m)	gravelly loam	very weak, fine subangular blocky	friable, soft	plentiful
BC	60-95	olive brown (2.5Y 4/4 m)	gravelly sandy loam			plentiful
BCk	95-120+	light olive brown (2.5Y 5/4 m)	gravelly silt loam			few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)		
					Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay
L-H-F	5.1	47.6	1.8	25.9			262.7	56.2	11.2	4.6	0.3			
Ae	4.2	1.9	0.1	14.5			15.5	2.8	0.4	0.1	0.1			
Bf1	4.6	1.8	0.1	17.0	1.0	0.2	15.3	3.5	0.4	0.1	0.1			
Bf2	4.5	1.9	0.1	17.2	1.0	0.4	14.6	4.1	0.3	0.1	0.1			
BC	6.7	0.6	0.0	11.9			5.5	6.4	0.1	0.1	0.0			
BCk	7.4		0.0				6.7	12.8	0.2	0.1	0.0	36	55	9

YANKS PEAK SOIL (1)

Location: Lat. 52°53'N Long. 121°26'W NTS: 93A4 Surveyor: JS Agency: AC, Vancouver Year of survey: 1968

Identification: BC Soil Survey Report 32 Classification: Orthic Humo-Ferric Podzol (1978) Landform and parent material: sandy loam morainal

Drainage: well drained Slope and aspect: 10% NE Elevation: 1783 m Additional notes: Site 3 Yanks Peak profile from J.I. Sneddon M.Sc. thesis U.B.C. 1968; located 3.2 km N of Yanks Peak; airphoto A22009-123; Midas formation

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-F	2-0	organic litter				
Ae	0-7.5	gray (10YR 6/1 d)	gravelly silt loam	moderate, medium subangular blocky	friable	abundant
Bf	7.5-18	dark yellow. brown (10YR 4/4 d)	gravelly silt loam	moderate, coarse, subangular blocky	friable	plentiful
BC	18-50	grayish brown (2.5Y 5.5/2 d)	gravelly silt loam	moderate, coarse-medium angular blocky	firm	few
C	50+	gray (5Y 5/1.5 d)	gravelly sandy loam			

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Oxalate (%)		Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)				Bulk density (g/cm^3)	S (ppm)
					Fe	Al	Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay		
L-F	3.6	23.6	1.3	17.9					63.5	3.8	2.6	3.9	1.1						0.0
Ae	3.6	2.3	0.3	8.6	0.3	0.1			15.4	0.7	0.5	0.2	0.4	29	56	15	3	1.4	0.0
Bf	3.9	2.0	0.1	15.5	2.9	0.2	2.0	0.3	14.6	0.8	0.1	0.1	0.4	32	54	14	3		0.0
BC	4.2	0.3	0.1	6.2	2.2	0.2	1.0	0.1	4.3	0.9		0.1	0.1	33	51	16	4	1.7	0.0
C	4.4	0.3	0.1	2.7	1.7	0.1	0.4	0.1	4.3	1.9	1.2	0.1	0.1	58	35	7	2		0.0

YANKS PEAK SOIL (2)

Location: Lat. 52°53'N Long. 121°26'W NTS: 93A4 Surveyor: JS Agency: AC, Vancouver Year of survey: 1968

Identification: BC Soil Survey Report 32 Classification: Sombric Humo-Ferric Podzol, lithic phase (1978) Landform and parent material: loamy morainal veneer

Drainage: well drained Slope and aspect: 5% NE Elevation: 1783 m Additional notes: Site 2 Yanks Peak profile from J.I. Sneddon M.Sc. thesis U.B.C. 1968; located 3.2 km N of Yanks Peak; airphoto A22009-123; Midas formation-phyllite and schist

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color, dry (d) moist (m)	Texture	Structure	Consistence	Roots
L-F	4-0	litter of fresh and partly decomposed roots, leaves and stems				
Ah	0-15	very dark gray (N 4/0 d)	gravelly silt loam	weak, fine subangular blocky	friable	abundant
Bf	15-38	dark gray (10YR 4/1 d)	gravelly silt loam	moderate, fine subangular blocky	friable	plentiful
C	38+	very dark gray (5Y 3.5/1 d)	gravelly loam			very few

PHYSICAL AND CHEMICAL DATA

Horizon	pH in $CaCl_2$	Organic C (%)	Total N (%)	C/N	Oxalate (%)		Pyrophos. (%)		Cation exchange, meq/100 g					Particle size distribution (%)				Bulk density (g/cm^3)	S (ppm)
					Fe	Al	Fe	Al	CEC	Ca	Mg	K	Na	Sand	Silt	Total clay	Fine clay		
L-F	4.4	26.4	1.9	13.7					61.0	14.3	6.3	3.0	1.9						
Ah	4.1	4.1	0.6	7.3	0.7	0.2			23.2	3.7	1.3	0.4	0.3	27	57	16	4	1.3	0.0
Bf	4.1	2.2	0.3	6.4	0.8	0.3	0.8	0.1	13.5	1.6	0.6	0.2	0.2	34	50	16	5		0.0
C	4.1	1.2	0.2	5.1	0.8	0.2	1.3	0.1	7.0	0.8	0.5	0.1	0.3	38	47	15	3	1.4	0.0