

- much of the natural vegetative cover has been modified through agricultural initiative over the long history of settlement here.
- no wilderness remains, but some natural areas remain that are of significance for wildlife.
- recreational demand is moderate, and is focussed upon fishing and hunting.

**REGIONAL LANDSCAPE #35: CHILCOTIN PLATEAU**

**LOCATION:** Central interior.

**GENERAL DESCRIPTION:**

A mid-elevation, generally forested, flat to rolling dryland plateau that is relatively undissected.

**ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:**

**1. Physiography:**

- generally flat to rolling terrain, largely between 1300 and 1700 metres a.s.l.
- surface is formed of extensive, undissected lava flows, with occasional abrupt incision by eastward flowing rivers.
- average elevation increases gradually westward, toward contact with the coastal mountains.
- three large shield volcanoes are prominent above the plateau surface; these rise to 2500 metres and are topographic anomalies in the landscape, although they are likely linked to the geological history of the plateau surface.
- olivine basalt is frequently exposed as rocky promontories and along river banks.

**2. Hydrological Patterns:**

- dendritic and deranged drainage patterns, except in vicinity of shield volcanoes, where a radial pattern is evident.
- small shallow lakes and wet meadows dot the plateau.

**3. Ecoregions:**

- corresponds to the Chilcotin Plateau ecoregion and the southern portions of the Nechako Plateau and Nazko Upland ecoregions of the Fraser Plateau Ecoregion.
- climate is dry and moderately hot in summer; in winter, it is cold and dry, with a light to moderate snow accumulation.

#### 4. Biogeoclimatic Zonation:

- a pattern of four zones:
  - the lower areas, particularly along the Chilcotin River and upstream tributaries, are classed as the Interior Douglas Fir zone.
  - much of the plateau is classed as the Sub-Boreal Pine/Spruce zone: extensive even aged-stands of lodgepole pine blanket much of the mid-elevation terrain.
  - there are large areas of higher elevation forestlands classed as Engelmann Spruce/Subalpine Fir zone.
  - the highest elevation areas, generally above 1900 metres are classed as Alpine Tundra zone; the summits of the shield volcanoes are above treeline.

#### 5. Fauna:

- mule deer and California bighorn sheep are the common ungulates, the latter on the eastern slopes of the shield volcanoes.
- moose are plentiful throughout the forest and wetlands of the mid- and low elevations.
- Woodland caribou utilize the high, rolling shield volcanoes as well as adjacent pine forests and wetlands.
- cougars, black bears, coyotes, and wolves are fairly common.
- some grizzly bears may be found in the more remote, higher areas.
- the small lakes provide excellent breeding and nesting habitat for diverse waterfowl, including species such as the white pelican.

#### OTHER CONSIDERATIONS:

- ranching and forestry are the dominant economic activities; these occupy much of the land base.
- fishing, hunting, and other resorts are commonly based at the lakes throughout the plateau.
- outside designated parks, some wilderness remains; particularly on the shield volcanoes.
- recreational demand is fairly strong, and is focused upon fishing and hunting; growing interest in wilderness trekking in the shield volcanoes area.

## REGIONAL LANDSCAPE #36: FRASER BASIN

LOCATION: Central interior.

## GENERAL DESCRIPTION:

A low relief, flat to rolling, generally forested, sub-boreal plateau.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- generally flat or gently rolling terrain, largely between 500 and 1000 metres a.s.l.
- surface is further incised by the Fraser River and tributaries.
- the erosion product of an ancient Fraser River which flowed northward.
- within the basin are outliers of the old plateau surface as well as areas which were occupied by glacial lakes during the waning of the Pleistocene; these latter areas are very flat and feature varved clay deposits.
- glacial drift covers much of the surface of the basin.
- numerous drumlins, eskers, and related periglacial forms.

2. Hydrological Patterns:

- dendritic and deranged drainage patterns.
- many lakes of all sizes; most are fairly shallow and tend to be eutrophic.
- several of the major tributaries of the Fraser join the river in the centre of the basin.

3. Ecoregions:

- corresponds to the Nechako Lowland ecoregion of the Fraser Plateau Ecoregion.
- climate is relatively dry and moderately hot in summer; in winter, it is moderately cold and moist, with a medium to heavy snow accumulation.

4. Biogeoclimatic Zonation:

- the landscape is uniformly classed as the Sub-Boreal Spruce zone.
- small outliers of the old plateau surface, in being of slightly higher elevation, are classed as Engelmann Spruce/Subalpine Fir zone, but these are very minor occurrences.
- the actual cover of the area is a mix of forest and cultivated lands.

### 5. Fauna:

- moose are plentiful throughout the forest and wetlands of the landscape.
- some woodland caribou are found on the eastern perimeter, adjacent to the mountain ranges.
- black bears, coyotes, grizzly bears and wolves are fairly common; although the latter two have been extirpated from farmed or settled areas.
- the many lakes and marshes provide excellent breeding and nesting habitat for diverse waterfowl.

### OTHER CONSIDERATIONS:

- ranching and forestry are the dominant economic activities; these occupy much of the land base.
- fishing, hunting, and other resorts are commonly based at the lakes throughout the plateau.
- outside designated parks, little wilderness remains.
- recreational demand is fairly strong, with the emphasis being on fishing and hunting.

### REGIONAL LANDSCAPE #37: NECHAKO PLATEAU

LOCATION: Central interior.

### GENERAL DESCRIPTION:

A gently hilly, forested, sub-boreal landscape with an abundance of lakes, many of which are very large and elongated.

### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

#### 1. Physiography:

- generally elevations range between 1300 and 1700 metres a.s.l.; terrain is a mix of rolling and gently hilly areas.
- flat or gently dipping Tertiary lava flows cover older volcanic and sedimentary rocks.
- glacial drift and glacial erosion/deposition features (meltwater channels, eskers, drumlins, etc.)
- monadnocks (summits of erosion resistant rock) are prominent features projecting as distinct hills above the average topography of the plateau.
- division between this landscape and Fraser Basin is difficult to discern; very gradual transition.

## 2. Hydrological Patterns:

- numerous large, medium-sized and small lakes occupy the plateau.
- large lakes are typically elongated; many have lengths of over 100 km.
- many of the smaller lakes are eutrophic.

## 3. Ecoregions:

- includes much of the Babine Upland ecosection of the Fraser Basin Ecoregion, and the Nechako Plateau, the Bulkley Basin, and the Nazko Upland ecosections of the Fraser Plateau Ecoregion.
- climate is relatively dry and warm in summer; in winter, it is moderately cold and moist, with a medium to heavy snow accumulation.

## 4. Biogeoclimatic Zonation:

- a pattern of three zones:
  - the most widespread is the Sub-boreal Spruce zone; all the lower elevation areas.
  - many hilltops and the slopes of the higher ridges are classed as Engelmann Spruce/Subalpine Fir zone.
  - the highest summits areas (in excess of 1800 metres) are classed as Alpine Tundra zone.

## 5. Fauna:

- moose are plentiful throughout the forest and wetlands of the landscape.
- some woodland caribou are found roaming the higher elevations of the southern perimeter.
- black bears, coyotes, grizzly bears and wolves are fairly common; although the latter two have been extirpated from farmed or settled areas.
- cougars are found in the higher, more remote areas.
- the many lakes and marshes provide excellent breeding and nesting habitat for diverse waterfowl.

## OTHER CONSIDERATIONS:

- forestry is the dominant economic activity; some ranching, mining and commercial recreation (lake based) also occur.
- fishing, hunting, and other resorts are commonly based at the lakes throughout the plateau.
- outside designated parks, little wilderness remains.
- recreational demand is fairly strong, with the emphasis being on fishing and hunting.

## REGIONAL LANDSCAPE #38: BULKLEY - TAHTSA RANGES

LOCATION: Central interior; lee side of coast mountains.

## GENERAL DESCRIPTION:

A landscape of rolling, gently sloped mountains of moderate elevation and relief, as a transition between plateau to the east and more rugged terrain to the west; an interior, sub-boreal rainshadow climate.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- groups the Tahtsa Ranges and the eastern portion of the Bulkley Ranges.
- the eastern portion of the Hazelton Ranges.
- the terrain contains some significant relief, but generally the relief is moderate, slopes are not rugged, and there are large tracts between 1500 and 2000 metres a.s.l. that are rolling.
- bisected east-west by major valleys, which are continuations from the adjacent plateau landscape.

2. Hydrological Patterns:

- source area for Bulkley and Morice Rivers.
- bisecting valleys in southern section tend to be filled with long lakes, which extend from/to the eastward plateau landscape.
- some glaciers on the northeasterly faces of the higher summits, but these are relatively minor.

3. Ecoregions:

- consists of the Bulkley Ranges ecoregion of the Fraser Plateau Ecoregion and a leeward peripheral portion of the Kitimat Ranges ecoregion of the Coastal Gap Ecoregion.
- climate is a blend of rainshadow effect, interior, continental influences, and mountain regime: cool, dry, short summers; cold winters with moderate snowfall.

4. Biogeoclimatic Zonation:

- a pattern of three zones:
  - low elevation areas (the lowest valleys and the eastern periphery) are classed as the Sub-boreal Spruce zone.
  - most dominant zone is Engelmann Spruce/Subalpine Fir, occupying the mid-to-high elevation areas.
  - the highest summits areas (in excess of 1800 metres) are classed as Alpine Tundra zone; occupies approx. 30% of the landscape.

**5. Fauna:**

- moose are plentiful throughout the forest and wetlands of the landscape.
- some bighorn sheep and mountain goat.
- black bears, cougars, coyotes, grizzly bears and wolves are fairly common.
- the lower elevation lakes and marshes provide some breeding and nesting habitat for diverse waterfowl.
- major drainage systems are among the most important in Province for migratory salmon.

**OTHER CONSIDERATIONS:**

- forestry is the dominant economic activity; some mining and much mineral exploration also occur.
- some fishing and hunting guiding occur.
- due to limited access and relatively low timber values, considerable wilderness remains even outside designated parks, particularly at the mid- and high elevations.
- recreational demand is fairly light, with the emphasis being on fly-in fishing and hunting; demand can be expected to grow as an important wilderness resource area for the central part of the Province.

**REGIONAL LANDSCAPE #39: NASS RANGES**

**LOCATION:** Central latitude; adjacent to coastal mountains.

**GENERAL DESCRIPTION:**

A relatively rugged mountain area that, in terms of climate and biotic patterns/variety, is transitional between coastal influences and sub-boreal interior influences.

**ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:****1. Physiography:**

- comparably rugged to the coastal mountains to the west but these ranges tend to be arranged in definite north-south ridges and valleys, and the summit areas are serrate.
- unlike coast mountains, largely underlain by sedimentary and volcanic rocks, with some intrusive granite.
- peaks average 2200 to 2500 metres a.s.l.
- high relief, as valley bottoms occur as low as 300 metres a.s.l.
- highest peaks are about 3000 metres a.s.l.

## 2. Hydrological Patterns:

- cirques and cirque glaciers are common on the north and eastern sides of ridges.
- few lakes: only in the peripheral valleys separating this landscape from adjacent landscapes, eg. Burnie Lakes.

## 3. Ecoregions:

- coincides with the Nass Ranges Ecoregion, except that this ecoregion is delineated to include the broad Kitsumkalum Valley north of Terrace.
- climate is principally coastal: mild moist summers, and wet, moderately cold winters with substantial snow accumulations.

## 4. Biogeoclimatic Zonation:

- a pattern of three zones, with some occurrence of a fourth zone:
  - in the north, in the low elevation areas of north and east oriented valleys, Interior Cedar-Hemlock zone occurs, but this is more associated with the adjacent lowland landscape than the Nass Ranges.
  - generally the low elevation areas are occupied by the Coastal Western Hemlock zone.
  - mid- to upper slopes are classed as Mountain Hemlock zone; this extends to treeline at about 1800 metres a.s.l., although commonly the terrain is too rugged below this to support forest.
  - the upper elevations are classed as Alpine Tundra.
- each of the three principle zones occupies about 30% of the area of the landscape.

## 5. Fauna:

- in forested valleys mule deer, grizzly bear, black bear and wolves are relatively common.
- mountain goat are very common on the high ridges.
- most streams are important for salmon.

## OTHER CONSIDERATIONS:

- forestry dominates the tributary valleys, while the Skeena Valley is occupied by settlement, transportation, and forestry operations.
- many natural areas and some wilderness areas remain in remoter areas.
- recreational demand is limited by access conditions: focus is on hunting (using forest access roads), and fishing in the streams, the Skeena River, and the peripheral lakes.



## REGIONAL LANDSCAPE #40: NASS BASIN

LOCATION: Central latitude; between coast mountains and interior mountains.

## GENERAL DESCRIPTION:

An intra-montane, densely forested, semi-coastal lowland area of rolling and hilly terrain.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- largely lies between 300 metres and 800 metres a.s.l.
- generally low relief, but there are isolated mountain blocks occurring within the lowland.
- apart from the mountain blocks, the terrain is flat or gently rolling, with pronounced northwesterly trending glacial grooves.
- predominately underlain by volcanic rocks, but covered with considerable glacial till.
- the basin is surrounded by mountains of strong, rugged relief and steep slopes; these define the limits of the basin.
- a major feature of the basin is the recent (300 years) Aiyansh-Tseax lava flow which covers a large part of the southwest.

2. Hydrological Patterns:

- the drainage pattern is an intricate system of parallel streams.
- many small, elongated lakes and some medium-sized lakes occur in the glacially scoured trenches.

3. Ecoregions:

- corresponds to the Nass Basin Ecoregion.
- climate is transitional between the coast and the interior: cool moist summers; cold, relatively wet winters with heavy snow accumulation.

4. Biogeoclimatic Zonation:

- the basin itself is classed as the Interior Cedar-Hemlock zone.
- isolated hills and mountains occurring within the basin display a pattern of two zones:
  - Engelmann Spruce/Subalpine Fir at mid-elevations and up to treeline (approx. 1600 metres a.s.l.).
  - Alpine Tundra on the higher mountain tops.

#### 5. Fauna:

- mule deer, grizzly bear, black bear and wolves are relatively common.
- most streams are important for salmon.
- the small lakes support some waterfowl populations.

#### OTHER CONSIDERATIONS:

- forestry dominates the low elevation areas of the basin.
- some natural areas and wilderness remain, but most are allocated to forestry, with the exception of the higher hills and mountains.
- recreation demand is low and mainly limited to hunting, some fishing, and some geologically-oriented tourism.

#### REGIONAL LANDSCAPE #41: SUB-BOREAL SKEENA MOUNTAINS

LOCATION: Central to northern latitudes; southwestern part of northern interior.

#### GENERAL DESCRIPTION:

A mountainous landscape of the northern interior, with a dominance of highly folded sedimentary rocks, and a system of northwesterly trending parallel valleys.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- rugged, serrate peaks and ridges.
- northwesterly trending fold axes.
- moderate relief: 800 - 2300 metres a.s.l.
- absence of volcanic, limestone, and granitic rocks.
- mineralization is considered to be very limited.
- principle rocks are black, fine-grained argillite, shale, dark greywacke.
- complex folding is common.
- strong glacial impact: cirques and U-shaped valleys.

##### 2. Hydrological Patterns:

- rectangular drainage pattern with few lakes.
- the major rivers, the Nass and the Skeena, follow zig-zag routes through the mountains.
- some glaciers and small icefields on the higher summits.

### 3. Ecoregions:

- Western and Eastern Skeena Mountain Ecosections of the Skeena and Omineca Mountains Ecoregion.
- climate is influenced by Pacific, Arctic, and continental forces: moisture is evenly distributed through year; summers are cool; winters are very cold, with moderate to heavy snow accumulation.

### 4. Biogeoclimatic Zonation:

- two patterns occur, one is more dominant in the west and southwest, the second occurs in the north, east and northeast.
- pattern 1:
  - Interior Cedar-Hemlock at low elevations.
  - Engelmann Spruce/Subalpine Fir at mid elevations to treeline at 1600 metres a.s.l.
  - Alpine Tundra on the mountain tops and ridges.
- pattern 2: same as Pattern 1 except:
  - Mountain Hemlock at low elevations, instead of Cedar Hemlock.

### 5. Fauna:

- grizzly and black bear are common, as are wolves.
- moose and mule deer are common at low elevations, and mountain goat are found at the higher elevations.
- rivers are significant salmonid habitats.

### OTHER CONSIDERATIONS:

- little economic activity, except dispersed guide-outfitting and trapping.
- southern and western peripheral valleys have been accessed for timber.
- significant coal deposits have been identified on the northern periphery of the landscape.
- extensive wilderness remains.
- low demand for recreational access at this time; primary activities are fishing and hunting; extensive alpine is potential attraction but lack of low elevation lakes is a detraction.

## REGIONAL LANDSCAPE #42: SPATSIZI UPLANDS

LOCATION: Northern interior.

## GENERAL DESCRIPTION:

A boreal landscape of both folded sedimentary mountains and highly dissected plateau, with deep valleys, relatively gentle slopes, and extensive rolling alpine areas.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- includes the northern portion of the Skeena Mountains and the dissected, moderate relief Spatzizi Plateau.
- Skeena Mountains consist of folded sedimentary ranges, with relief from 800 metres to 2300 metres; overall these mountains are not rugged; and feature extensive areas of rolling alpine, with some serrate peaks projecting above.
- the Spatsizi Plateau has an upper surface of about 1500 to 1800 metres a.s.l. and valleys as low as 700 to 900 metres a.s.l.; slopes are usually steep but not precipitous; the upper surfaces are flat or gently rolling, with transition to the more broken mountainscapes to the south, east, and north.

2. Hydrological Patterns:

- the area is well drained, with few lakes.
- glacial ice is not a significant element.

3. Ecoregions:

- corresponds to the southeastern 2/3rds of the Southern Boreal Plateau ecoregion of the Northern Mountains and Plateaus Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

4. Biogeoclimatic Zonation:

- a pattern of three biogeoclimatic zones:
  - Boreal White and Black Spruce at low elevations.
  - Spruce/Willow/Birch at mid elevations.
  - Alpine Tundra over the extensive areas above 1300 metres a.s.l.

5. Fauna:

- grizzly bear, black bear, and wolves are abundant, particularly in the valleys.

- moose are the most abundant ungulate, but some localized populations of mule deer also occur in drier areas.
- thimhorn sheep (Stone), woodland caribou, and mountain goat are plentiful in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

OTHER CONSIDERATIONS:

- the dominant economic activities are guide-outfitting and wilderness tourism.
- interest has developed in recent years in large coal deposits found on the southern periphery of this landscape.
- apart from Spatsizi Park, which occupies the majority of the landscape, the balance remains in a wild or semi-wilderness state.
- recreational demand is moderate for backcountry experience, especially in terms of hunting and wildlife viewing.

REGIONAL LANDSCAPE #43:      **SOUTH OMINECA MOUNTAINS**

LOCATION:   Northern central interior.

GENERAL DESCRIPTION:

A transitional northern mountain area of moderate relief; mountains are not typically rugged in appearance and, toward the south, the landscape merges with a dissected plateau surface.

ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- terrain is a mix of rolling to mountainous conditions of low to moderate relief.
- southwards this landscape merges with the central interior plateau; southern relief is generally from 700 metres to 1300 metres.
- northwards this landscape becomes increasingly rugged and relief increases; summits commonly reach 2000 metres and more.
- ridges and summits below 2000 metres a.s.l. are glacially rounded, whereas above they are serrate.
- central belt has a predominantly granitic core with the eastern and western belts being comprised of sedimentary, volcanic and metamorphosed sedimentary rocks.
- high mineralization is typical.

## 2. Hydrological Patterns:

- medium-sized lakes are found regularly throughout the mountain valleys.
- several very long lakes are found along the southern periphery.

## 3. Ecoregions:

- coincides with the Omineca Mountains eco-section of the Skeena and Omineca Mountains Ecoregion.
- climate is influenced by both Arctic and continental forces: moisture is evenly distributed through year; summers are cool; winters are very cold, with moderate to heavy snow accumulation.

## 4. Biogeoclimatic Zonation:

- two patterns of biogeoclimatic zones are apparent: the first is typical of the south, east and west peripheries of the landscape; the second is typical of the interior of the landscape unit.
- pattern 1:
  - Mountain Hemlock at low elevations (valley bottoms).
  - Engelmann Spruce/Subalpine Fir at mid elevations to about 1500 metres a.s.l.; the most dominant zone.
  - Alpine Tundra above 1500 metres.
- pattern 2:
  - same as #1, except valley bottoms are occupied by the Boreal White and Black Spruce zone.

## 5. Fauna:

- grizzly and black bear are common, as are wolves.
- moose and mule deer are common at low elevations, and mountain goat are found at the higher elevations.
- rivers are significant salmonid habitats.

## OTHER CONSIDERATIONS:

- primary economic activities are forestry (major valleys only), mineral exploration, and guide-outfitting.
- extensive wilderness remains outside of conservation designations.
- low recreational demand: primarily hunting and fishing.

## REGIONAL LANDSCAPE #44: NORTH Omineca Mountains

LOCATION: Northern interior.

## GENERAL DESCRIPTION:

A rugged boreal mountain landscape; more diverse topography and more rugged than adjacent mountain areas.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- highest and most rugged portion of the Cassiar-Omineca Mountains (also known as Kaska Mountains).
- typical relief ranges from moderate to high: from 1000 metres to 2700 metres; highest peaks attain 2900 metres a.s.l.
- ridges and summits below 2000 metres a.s.l. are glacially rounded, whereas above they are serrate.
- central belt has a predominantly granitic core with the eastern and western belts being comprised of sedimentary, volcanic and metamorphosed sedimentary rocks.
- high mineralization is typical.

2. Hydrological Patterns:

- small to medium sized lakes are found throughout many of the mountain valleys, often in clusters.
- little permanent ice, although year round snow packs remain on the north slopes of many of the peaks.

3. Ecoregions:

- southern part of the Cassiar Ranges eco-section of the Northern Mountains and Plateaus.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

4. Biogeoclimatic Zonation:

- there is a pattern of three zones, but the majority of the landscape, being of relatively high latitude and elevation, occurs within the latter two:
  - Boreal White and Black Spruce zone in the lower, peripheral valleys.
  - Spruce-Willow-Birch zone in the majority of mountain valleys and dominating the slopes to 1600 metres a.s.l.
  - Alpine Tundra above 1600 metres a.s.l.

5. Fauna:

- grizzly bear, black bear, and wolves are abundant, particularly in the valleys.

- moose are the most abundant ungulate, but some localized populations of mule deer also occur in drier areas.
- thimhorn sheep (Stone), woodland caribou, and mountain goat are plentiful in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

**OTHER CONSIDERATIONS:**

- the dominant economic activities are mineral exploration, guide-outfitting and wilderness tourism.
- much of the landscape remains in a wild or semi-wilderness state; access is difficult.
- recreational demand is moderate for backcountry experiences, especially in terms of hunting and wildlife viewing.

**REGIONAL LANDSCAPE #45: WILLISTON TRENCH**

**LOCATION:** Northern central interior.

**GENERAL DESCRIPTION:**

The broader southern end of the North Rocky Mountain Trench; a wide mid-elevation valley amid the northern mountains that is now largely occupied by the Williston Reservoir; differentiated from northern component by climax vegetation, reservoir, valley width.

**ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:****1. Physiography:**

- part of the northern half of the largest interior structural lineament in the Province, running virtually the entire north-south length.
- this is the widest portion of the northern Trench (10 - 30 km.).
- continental glaciation scoured the valley and deposited considerable morainal materials; rivers subsequently incised their routes through the centre of the valley; reservoir now occupies the incised area within the broader valley.
- terrain is generally flat to rolling and of low relief.
- average elevation range is 700 to 1000 metres a.s.l.

**2. Hydrological Patterns:**

- dominance of Williston Reservoir, the largest fresh water body in the Province (over 200 km. in north-south length).



### 3. Ecoregions:

- classed as part of the Omineca Mountains ecoregion of the Skeena and Omineca Mountains Ecoregion.
- climate is influenced by both Arctic and continental forces: moisture is evenly distributed through year; summers are cool; winters are very cold, with moderate snow accumulation.

### 4. Biogeoclimatic Zonation:

- the terrestrial environment is classed as in the Sub-Boreal Spruce zone.

### 5. Fauna:

- grizzly and black bear are common, as are wolves.
- moose and mule deer are common.

### OTHER CONSIDERATIONS:

- forestry is the dominant economic activity.
- entire landscape is affected by the reservoir: visual and wildlife values especially.
- recreational demand is low to nil: shoreline is unstable and in general the landscape is not inherently attractive for recreation.

### REGIONAL LANDSCAPE #46: NORTHERN ROCKY MOUNTAIN TRENCH

LOCATION: Northern interior.

### GENERAL DESCRIPTION:

The majority of the northern component of the Province's Rocky Mountain Trench; a wide mid-elevation valley amid the northern mountains; differentiated from southern component by climax vegetation, natural condition, and narrower valley width.

### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

#### 1. Physiography:

- majority of the northern half of the largest interior structural lineament in the Province, running virtually the entire north-south length.
- this portion of the northern Trench is varies on average from 5 to 15 km. wide.

- continental glaciation scoured the valley and deposited considerable morainal materials; rivers subsequently incised their routes through the centre of the valley.
- terrain is flat to rolling, and is of low relief.
- average elevation range is 700 to 1000 metres a.s.l.

#### 2. Hydrological Patterns:

- drained southwards and northwards by the Finlay River and the Ketchika River respectively.
- both rivers have pronounced meandering channels and are joined by many tributaries entering from the Rocky Mountains and the Cassiar-Omineca Mountains.
- drainage is poor due to low gradients.

#### 3. Ecoregions:

- included within the Cassiar Ranges and the Kechika Mountains ecosections of the Northern Mountains and Plateaus Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

#### 4. Biogeoclimatic Zonation:

- the Boreal White and Black Spruce zone dominates this landscape.
- there is extensive muskeg.

#### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant, particularly in the valleys.
- moose are the most abundant ungulate, but some localized populations of mule deer also occur in drier areas.

#### OTHER CONSIDERATIONS:

- guide-outfitting and trapping are the dominant activities.
- resource competition is relatively low.
- recreational demand is low due to low attractiveness of the landscape.

## REGIONAL LANDSCAPE #47: CENTRAL ROCKY MOUNTAINS AND FOOTHILLS

LOCATION: Northeastern central interior.

## GENERAL DESCRIPTION:

The segment of the Rocky Mountains and Foothills that has the least pronounced relief and ruggedness; a sub-boreal area of relatively modest mountains and hills, arranged in distinct ridges, and separated by broad U-shaped valleys.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- this landscape is a combination of the Hart Ranges, the less rugged southern part of the Muskwa Ranges, and the Foothills adjacent to these mountains.
- part of extensive physiographic belt running the length of the Province caused by folding and faulting of sedimentary rocks.
- this landscape is considerably less rugged and of less elevation than landscapes to the north or south.
- few castellated peaks; many rounded ridges and summits.
- maximum elevations do not generally exceed 2500 metres a.s.l.
- Foothills are less distinctive than northern counterpart; ridges are shorter, rounded, less prominent.

2. Hydrological Patterns:

- distinctive trellis and rectangular drainage patterns characteristic of the Rocky Mountains in general.
- no major lakes (except east arm of the Williston Reservoir).
- small lakes are scattered throughout at all elevations.
- limited occurrence of permanent ice: some minor glaciers in the southwest.

3. Ecoregions:

- corresponds to the Central Rocky Mountains Ecoregion.
- climate is sub-boreal; influenced by both Arctic and continental forces: moisture is evenly distributed through year; summers are cool; winters are very cold, with moderate to heavy snow accumulation.

4. Biogeoclimatic Zonation:

- a pattern of four biogeoclimatic zones dominates this landscape:

- Mountain Hemlock occurs in many of the low elevation valleys, although in some the Boreal White and Black Spruce zone occurs.
- Engelmann Spruce/Sub-alpine Fir zone, dominating the mid-elevations, is the most pervasive climax forest type.
- Alpine Tundra occurs above 1800 metres, however its extent is very limited except in the most northern and southern parts of the landscape.

#### 5. Fauna:

- grizzly and black bear are common, as are wolves.
- moose and mule deer are common at low elevations, and mountain goat are found at the higher elevations.
- some woodland caribou occur in the Hart Ranges.
- mule deer occur in the drier sites at lower elevations.
- mountain goat, Rocky Mountain elk, white-tailed deer and Stone's thornhorn sheep occur but are not common.

#### OTHER CONSIDERATIONS:

- forestry (lower elevations) and coal mining are the primary economic activities; some guide-outfitting also occurs.
- there remain considerable natural and wilderness areas outside of existing parks, however these tend to be at the higher elevations.
- recreational demand is moderate to strong for backcountry experiences, lake-based activities, and hunting and fishing.

#### REGIONAL LANDSCAPE #48: MUSKWA RANGES

LOCATION: Northeast sector of Province; the northernmost component of the Rocky Mountains.

#### GENERAL DESCRIPTION:

The boreal, comparatively rugged northern landscape of the Rocky Mountains, with extensive alpine tundra and long, U-shaped valleys leading into and through the mountains.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- characteristic stratified sedimentary rocks of the Rocky Mountains.
- spectacular fold and fault features.

- considerable exposure of bedrock projecting as tall, serrate ridges and triangular or castellated peaks.
- quartzite and limestone underlie many of the high peaks.
- strong alpine and valley glaciation.
- elevation range: 800/1000 metres a.s.l. up to 3000/3200 metres a.s.l.
- mountains are similar in physical proportions and appearances to the Continental Ranges to the south.
- deep glacial drift in most of the valleys.

#### 2. Hydrological Patterns:

- many small glaciers and icefields.
- medium-sized and small lakes occur throughout; often then occur in groupings
- many lakes tend to reflect the azure blue characteristic of glacial meltwater.
- numerous waterfalls tumble from hanging valleys to the main valley streams.

#### 3. Ecoregions:

- coincident with the Muskwa Ranges eco-section of the Northern Rocky Mountains Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

#### 4. Biogeoclimatic Zonation:

- a pattern of three biogeoclimatic zones:
  - Boreal White and Black Spruce at low elevations (peripheral valleys only).
  - Spruce/Willow/Birch at mid elevations (interior valleys and lower slopes.
  - Alpine Tundra over the extensive areas above 1700 metres a.s.l.
- the dominant vegetative covers are alpine and, in the valleys, subalpine shrubs; forest cover is confined to the lower elevation valley bottoms only.

#### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant, particularly in the valleys.
- moose are the most abundant ungulate, but some localized populations of mule deer also occur in drier areas.
- thinhorn sheep (Stone), woodland caribou, and mountain goat are plentiful in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

**OTHER CONSIDERATIONS:**

- the dominant economic activities are guide-outfitting, highway based tourism, fly-in rustic resorts, and wilderness tourism.
- some mineral deposits have been developed in the past, and some continue to attract interest.
- much of this landscape remains in a wild or wilderness state.
- recreational demand is strong, especially for fishing, hunting, wildlife viewing, and highway touring, but actual visitation is light: the landscape is highly attractive for recreation but accessibility is limited.

**REGIONAL LANDSCAPE #49: NORTHERN FOOTHILLS**

**LOCATION:** Northeast sector of the Province; between the northern end of the Rocky Mountains and the northern Great Plains.

**GENERAL DESCRIPTION:**

A boreal landscape of hills and serrate peaks and ridges organized in long north-south axes and separated by relatively wide U-shaped valleys; lower elevation and less relief than adjacent Rocky Mountains.

**ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:****1. Physiography:**

- an east-west series of distinct, usually serrate north-south ridges and peaks, separated by relatively broad, flat-bottomed valleys.
- transition between the Rocky Mountains and the Alberta Plateau of the Great Plains.
- sedimentary rocks displaying pronounced stratification.
- folded along northwesterly trending axes but cut occasionally by southwesterly dipping thrust faults.
- lack of uniformity in the east-west dimension.
- ridges and peaks attain heights of 2000 to 2300 metres a.s.l.
- visually similar to Rocky Mountains but smaller scale mountains and hills; relief is low to moderate.

**2. Hydrological Patterns:**

- distinct trellis drainage pattern.
- few lakes; some small lakes occur in groupings.

- small glaciers in the adjacent Rocky Mountains send meltwater to the few lakes in this landscape.

### 3. Ecoregions:

- coincides with the Muskwa Foothills ecosection of the Northern Rocky Mountains Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

### 4. Biogeoclimatic Zonation:

- a pattern of three biogeoclimatic zones:
  - Boreal White and Black Spruce at low elevations (lowest elevation valleys only).
  - Spruce/Willow/Birch at mid elevations (most valleys and lower slopes).
  - Alpine Tundra over the extensive areas above 1700 metres a.s.l.
- the dominant vegetative covers are alpine and, in the valleys, subalpine scrub; forest cover is confined to the lower elevation valley bottoms only.

### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant, particularly in the valleys.
- moose are the most abundant ungulate, but some localized populations of mule deer also occur in drier areas.
- thinhorn sheep (Stone), woodland caribou, and mountain goat are plentiful in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

### OTHER CONSIDERATIONS:

- the dominant economic activities are guide-outfitting, highway based tourism, fly-in rustic resorts, and wilderness tourism.
- some mineral deposits have been developed in the past, and some continue to attract interest.
- much of this landscape remains in a wild or wilderness state.
- recreational demand is moderately strong, especially for fishing, hunting, wildlife viewing, and highway touring, but actual visitation is light: the landscape is moderately attractive for recreation but focal points and accessibility are limited.

## REGIONAL LANDSCAPE #50: PEACE PLATEAU

LOCATION: Northeast sector of Province; east of northern end of Rocky Mountains.

## GENERAL DESCRIPTION:

A boreal plateau landscape; part of the Great Plains of the central interior of North America; minimal relief, except where rivers have incised the plateau.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- classified as the Alberta Plateau; consists of the Peace Lowland flanked north and south by the Sikanni-Beaton Plateau and the Kiskatinaw Plateau respectively.
- flat and gently rolling upland surface.
- largely between 900 and 1200 metres.
- major rivers are incised into the plateau surface to depths ranging up to 150 metres; slopes are relatively steep; the Peace River has eroded the glacial till surface to produce a lowland within the overall plateau.
- veneer of glacial till covers much of the landscape; little bedrock is exposed.

2. Hydrological Patterns:

- Peace River is a major feature.
- drainage is typically well organized and dendritic.
- small and medium-sized shallow lakes are relatively common, except in the central part of lower elevation.
- river and stream routes are often meandering, with these meanders being deeply entrenched in the landscape.

3. Ecoregions:

- generally corresponds to the Alberta Plateau Ecoregion.
- Arctic and Great Plains are the dominant climatic influences: moderately warm, dry summers; cold winters with light to moderate snow accumulation.

4. Biogeoclimatic Zonation:

- virtually the entire landscape is uniformly classed as one zone: Boreal White and Black Spruce.
- there are some pockets of higher terrain on the western periphery which are classed as sub-alpine, but these are anomalies.
- much of the southern part of this landscape is extensively cultivated as ranch and farmland.



- northwards and westwards (towards the mountains) continuous forests of small dimension northern spruce, pine, and deciduous species dominate.

#### 5. Fauna:

- black bear and wolves are abundant throughout, and grizzly bears are found in the remoter areas.
- moose are the most abundant ungulate, and in the Peace River area mule deer and white-tailed deer also occur in abundance.
- some bison have been reintroduced.
- White spruce grouse and ruffed grouse are frequently observed.

#### OTHER CONSIDERATIONS:

- Forestry, petroleum and natural gas exploration/development, and agriculture are the most extensive economic activities
- many natural sites remain, but little wilderness remains.
- recreational demand is low, and primarily focused upon hunting and highway touring; some canoeing/rafting potential exists along major rivers.

#### REGIONAL LANDSCAPE #51: FORT NELSON LOWLAND

LOCATION: Northeastern corner of Province.

#### GENERAL DESCRIPTION:

An extensive and uniform boreal plain with considerable muskeg and wetland, and numerous small shallow lakes.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- general elevation is about 600 metres with some higher areas (remnant plateau surfaces) occurring at about 900 metres a.s.l.
- flat lying sedimentary area which is lower in elevation than the Peace River Plateau to the south.
- mesas, buttes, and "island" plateaus are contained within this lowland.
- classified as southern part of Great Slave Plain.

##### 2. Hydrological Patterns:

- the Liard River is a major feature.

- except for the major rivers, the drainage is poorly organized, dendritic, and most streams take highly convoluted routes.
- hundreds of small lakes dot the landscape, particularly toward the northeast.
- extensive wetlands and muskeg.

### 3. Ecoregions:

- largely corresponds to the Fort Nelson Lowland Ecoregion.
- climate is semi-arid and cold: winters are long and dominated by the Arctic air mass; summers are cool and short.

### 4. Biogeoclimatic Zonation:

- virtually the entire landscape is classed as the Boreal White and Black Spruce zone, with some peripheral areas of higher elevation being within the Spruce-Willow-Birch zone.
- much of the landscape is covered with muskeg and other poorly drained ground conditions; forest cover is thin in most areas.

### 5. Fauna:

- moose is the most abundant ungulate here.
- scattered herds of woodland caribou winter throughout.
- some mule deer are found in the Fort Nelson and Muskwa River valleys.
- black bears and wolves are widespread and common; grizzly bears occur throughout but are not common.
- in the forest stands, spruce grouse are found, while ruffed grouse are found in riparian and trembling aspen areas.
- the extensive wetlands, ponds, and lakes provide excellent summer habitat for ducks, grebes, coots, shorebirds, and sandhill cranes.

### OTHER CONSIDERATIONS:

- petroleum/natural gas exploration has covered the landscape with survey lines, but other than this impact and ongoing exploration, there is little extensive economic activity.
- hunting, fishing and trapping occur throughout.
- much of the landscape remains in a semi-wilderness state, although crisscrossed by survey lines.
- the area has a very low recreational appeal, and demand to visit is very low; in future some visitation might focus upon waterfowl viewing opportunities at some specific locations of relatively greater attractiveness.

## REGIONAL LANDSCAPE #52: LIARD UPLANDS

LOCATION: Northeast sector of Province, on northern boundary.

## GENERAL DESCRIPTION:

A boreal, well dissected plateau area of low to moderate relief, with rounded and flat-topped summits and forested gentle slopes and ridges.

## ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

1. Physiography:

- a combination of the Liard Plateau/Ranges (north of Liard River), the southwest portion of the Hyland Highland, and the Rabbit Plateau (south of Liard River).
- dissected plateau terrain is rolling to moderately mountainous.
- relief is generally between 700 and 1700 metres a.s.l.
- highest peak is about 1860 metres a.s.l.
- underlain by folded sedimentary rocks.
- dissected upland surfaces, with rounded and flat ridges and summits and relatively gentle slopes.
- heavily glaciated by continental ice, but little evidence of cirque or valley glaciation: no serrate ridges and valleys are V-shaped from stream erosion.

2. Hydrological Patterns:

- Liard River is a major feature.
- small lakes are scattered throughout the western and southwestern parts of this landscape, but there is an absence of lakes in the majority of it.
- dendritic drainage pattern.
- some hot springs throughout.
- no glaciers or year round snow fields.
- bisected by the Liard River, a major river system.

3. Ecoregions:

- includes the Liard Upland ecoregion and the northernmost segment of the Muskwa Ranges ecoregion of the Northern Rocky Mountains Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

4. Biogeoclimatic Zonation:

- a pattern of three biogeoclimatic zones:
  - Boreal White and Black Spruce at low elevations - Spruce/Willow/Birch at mid elevations; this is the most dominant zone (perhaps 60% of the landscape).

- Alpine Tundra in the limited areas above 1700 metres a.s.l.
- major fires have eliminated much of the scrub forest cover in extensive areas.

#### 5. Fauna:

- grizzly bear, black bear, coyotes and wolves are abundant.
- moose are the most abundant ungulate in low elevation areas, but some localized populations of mule deer also occur in the drier low elevation areas.
- woodland caribou are relatively common in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

#### OTHER CONSIDERATIONS:

- the dominant economic activities are forestry (western low elevation areas) guide-outfitting, highway based tourism, and fly-in rustic resorts.
- a proposal to develop the Liard River into a hydroelectric reservoir would result in major environmental change.
- much of this landscape remains in a wild or wilderness state.
- recreational demand is light at present and mainly oriented to fishing and hunting; future interest could develop in the hot springs and other relatively undiscovered features of this landscape.

#### REGIONAL LANDSCAPE #53: LIARD PLAIN

LOCATION: Northern boundary of the Province.

#### GENERAL DESCRIPTION:

A flat and rolling northern plain of low relief and covered by boreal forest.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- low elevation on average: 800 to 1200 metres a.s.l.
- terrain is generally very flat, although it becomes gently hilly in the east.
- surrounded by dissected plateaus and folded mountains which rise to considerably greater elevations.

- present surface is largely the product of Pleistocene glacial processes.
- a thick mantle of glacial drift covers the plain; major rivers have incised their routes approximately 15-35 metres into this.
- many peri-glacial features: drumlins, eskers, etc.

#### 2. Hydrological Patterns:

- Liard River is a major feature.
- dendritic drainage pattern.
- bisected by the Liard River.
- many small shallow lakes; elongated shape due to glacial scouring of land.
- most streams follow meandering routes.
- special feature: flooded compound eskers (Liard Eskers).

#### 3. Ecoregions:

- corresponds to the Liard Plain Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

#### 4. Biogeoclimatic Zonation:

- one zone dominates most of the plain:
  - Boreal White and Black Spruce.
- Spruce/Willow/Birch occurs on the higher elevations hills scattered throughout the plain, as well as being increasing dominant as the plain merges with the surrounding landscapes.
- the forest cover is remarkably continuous and uniform over large areas.

#### 5. Fauna:

- black bear, coyotes and wolves are abundant.
- moose are the most abundant ungulate in low elevation areas, but some localized populations of mule deer also occur in the drier low elevation areas.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

#### OTHER CONSIDERATIONS:

- the dominant economic activities are forestry (western low elevation areas) guide-outfitting, and highway based tourism.
- a proposal to develop the Liard River into a hydroelectric reservoir would result in major environmental change.
- much of this landscape remains in a wild or wilderness state.
- recreational demand is oriented to hunting and fishing.

**REGIONAL LANDSCAPE #54: CASSIAR MOUNTAINS**

**LOCATION:** Northern interior; this is the north half of the Cassiar-Omineca Mountain system.

**GENERAL DESCRIPTION:**

A moderately rugged, but varied series of boreal mountain ranges; distinctive for the mixture of broad, high and low elevation valleys, rugged and rounded ridge systems, boreal climate, and extensive blocks of contiguous alpine tundra.

**ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:****1. Physiography:**

- composed of a central granitic belt with sedimentary and metamorphosed sedimentary rocks on the east and sedimentary and volcanic rocks on the west.
- considerably geological variety throughout.
- major valleys are U-shaped with tributary hanging valleys.
- summits and ruggedness diminish toward the north and northwest.
- diverse topographic patterns (lack of overall pattern).
- high mineralization.
- relief ranges from 700/1000 metres a.s.l. to 2500/2900 metres a.s.l.
- many peaks and ridges are sharply scalloped by glaciers, particularly on the north and northeastern faces.

**2. Hydrological Patterns:**

- general absence of glaciers and icefield, however permanent snow packs remain year round on northfacing slopes.
- many mid-sized lakes occur in the valleys, often as groups.

**3. Ecoregions:**

- encompasses the Cassiar Ranges, Kechika Mountains, and Tuya Range ecosections of the Northern Mountains and Plateaus Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

#### 4. Biogeoclimatic Zonation:

- there is a pattern of three zones, but the majority of the landscape, being of relatively high latitude and elevation, occurs within the latter two:
  - Boreal White and Black Spruce zone in the lower, peripheral valleys.
  - Spruce-Willow-Birch zone in the majority of mountain valleys and dominating the slopes to 1600 metres a.s.l.
  - Alpine Tundra above 1600 metres a.s.l.

#### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant.
- moose and mule deer are abundant in the lower valleys.
- thinhorn sheep (Stone), woodland caribou, and mountain goat are plentiful in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

#### OTHER CONSIDERATIONS:

- the dominant economic activities are mining, mineral exploration, guide-outfitting and wilderness tourism.
- much of the landscape remains in a wild or semi-wilderness state; access is difficult.
- recreational demand is moderate for frontcountry and backcountry experiences, especially in terms of fishing, hunting and wildlife viewing; components of this landscape are highly attractive for recreation but remain relatively undiscovered at this time.

#### REGIONAL LANDSCAPE #55: STIKINE - YUKON PLATEAUS

LOCATION: Northwestern interior.

#### GENERAL DESCRIPTION:

A topographically diverse boreal landscape, consisting of a series of rolling plateaus and dissected uplands, in contrast to the adjacent mountainous landscapes to the south, east, and west.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- western and northern components of this varied landscape are more dissected than the southern, central and eastern parts.

- relief ranges from broad valleys of about 650 metres a.s.l. to rolling upper surfaces of 1800 metres a.s.l.
- large scale shield volcanoes of similarly gentle relief rise amid the plateau surface.
- entire landscape has been heavily affected by Pleistocene glaciation.

#### 2. Hydrological Patterns:

- numerous small and medium sized lakes are found throughout, particularly concentrated in the broad low elevation and flat plateau areas.
- the northern part features a number of very large, elongated lakes and, of these, those on the west side are fed by glacial meltwaters originating in the coastal mountains.
- drainage patterns are a mixture of dendritic and deranged.

#### 3. Ecoregions:

- encompasses the Stikine Plateau, the northwest part of the Southern Boreal Plateau, the west part of the Tahltan Highland, and southwest part of the Tuya Range, and the Teslin Plateau ecoregions of the Northern Mountains and Plateaus Ecoregion.
- Arctic is dominant climatic influence: cool, short, relatively dry summers; very cold, long, relatively dry winters.

#### 4. Biogeoclimatic Zonation:

- there is a pattern of three zones, which occur in roughly equal portions and each over large contiguous areas:
  - Boreal White and Black Spruce zone in the lower, peripheral valleys.
  - Spruce-Willow-Birch zone in the majority of mountain valleys and dominating the slopes to 1600 metres a.s.l.
  - Alpine Tundra above 1600 metres a.s.l.

#### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant.
- moose and mule deer are abundant in the lower valleys.
- thimhorn sheep (Stone), woodland caribou, and mountain goat are plentiful in the mid to higher elevations.
- upland birds commonly seen include willow ptarmigan and ruffed grouse.

#### OTHER CONSIDERATIONS:

- the dominant economic activities are mining, mineral exploration, guide-outfitting and wilderness tourism.
- much of the landscape remains in a wild or semi-wilderness state; access is difficult.



- recreational demand is light to moderate for backcountry experiences; main interests are fishing, hunting and wildlife viewing; components of this landscape are highly attractive for recreation but remain relatively undiscovered.

#### REGIONAL LANDSCAPE #56: BOUNDARY RANGES

LOCATION: Northern west perimeter of the Province; interior half of coastal ranges (west facing half is in State of Alaska).

#### GENERAL DESCRIPTION:

A belt of northern mountainous terrain that is increasingly rugged westward, contains a variety of boreal, coastal, and sub-boreal climates, has a very high relief and is capped by extensive icefields and glaciers.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- a core of intrusive granitic rock, flanked along the eastern margin by sedimentary and volcanic rocks.
- terrain becomes increasingly rugged and of higher relief westward.
- granite is extensively exposed as jagged peaks and steep-sided mountains.
- nunatuks: peaks that project through and above icefields.
- relief ranges from under 100 metres (the major east-west valleys) to over 3000 metres a.s.l.
- northernmost part of the Coast Ranges, far more rugged than the Kitimat Ranges to the south.
- Mt. Edziza shield volcano occurs as a large scale special feature, or anomaly in this landscape.

##### 2. Hydrological Patterns:

- major rivers (eg. Stikine, Taku, Iskut) are antecedent to the rise of this mountain chain, and their paths run from the interior through these mountains to the coast.
- numerous, very extensive icefields and glaciers (one system of ice is about 150 km. long).
- many of the rivers and streams are charged by glacial meltwaters.
- small and mid-sized lakes are found throughout, at low and mid elevations.

### 3. Ecoregions:

- principally encompasses the Boundary Ranges Ecoregion (except St. Elias component), the east portion of the Tatshenshini Basin Ecoregion, as well as the west portion of the Tahltan Highland ecosection of the Northern Mountains and Plateaus Ecoregion.
- climates are highly varied: some valleys are strongly influenced by the Pacific regime, some by the Arctic regime, others by the interior sub-boreal regime: generally conditions are very cold in winter, with heavy snow accumulations, while summers are short and moist.

### 4. Biogeoclimatic Zonation:

- a complex series of patterns of zones, often occurring in close proximity:
  - 1: Coastal Western Hemlock in valley bottoms  
Mountain Hemlock on lower slopes  
Alpine Tundra (and ice) dominating the majority of area.
  - 2: Interior Cedar/Hemlock in valley bottoms  
Engelmann Spruce/Subalpine Fir on lower slopes  
Alpine Tundra (and ice) dominating the majority of the area.
  - 3: Sub-Boreal Spruce in valleys and lower slopes  
Engelmann Spruce/Subalpine Fir on lower to mid-elevation slopes.  
Alpine Tundra dominating mid to upper elevation areas.
  - 4: Boreal White and Black Spruce at lower elevations.  
Spruce-Willow-Birch at mid elevations.  
Alpine Tundra at upper elevations.

### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant, particularly in the valleys.
- blacktail deer are found in the lower riparian areas close to the coast.
- moose and mule deer are found in the inland valleys.
- thimhorn sheep (mainly Stone, but Dall as well in the northwest) and woodland caribou roam the inland mountain areas, while mountain goat are plentiful in the mid to higher elevations throughout.

### OTHER CONSIDERATIONS:

- the dominant economic activities are mining, mineral exploration, guide-outfitting (big game) and wilderness tourism; some forestry operations are planned for the lower valleys (eg. Stikine).

- much of the landscape remains in a wild or semi-wilderness state; access is difficult.
- recreational demand is light to moderate for backcountry experiences; main interests are fishing, hunting, adventure tours, and wildlife viewing; components of this landscape are highly attractive for recreation but remain relatively.

#### REGIONAL LANDSCAPE #57: ST. ELIAS MOUNTAINS

LOCATION: The northwestern corner of the Province.

#### GENERAL DESCRIPTION:

Extremely rugged mountain block bisected by a wide valley of low relief; a high variety of climates and vegetative patterns are displayed (Arctic, Pacific coast) in a relatively compact area.

#### ENVIRONMENTAL CHARACTERISTICS AND CLASSIFICATIONS:

##### 1. Physiography:

- similar in general ruggedness, relief, and physical character to the Boundary Ranges landscape.
- mountains are highly serrate and steep sided.
- nunatuks are common (i.e. peaks "islanded" by icefields).
- highest peaks in Province occur here.
- relief: near sea level to 5000 metres.
- rocks are principally sedimentary and volcanic, with occasional granitic intrusions (forming the higher peaks).
- the Duke Depression is a belt of broad, smooth slopes, almost plateau-like in character; separates this landscape from the Boundary Ranges landscape.

##### 2. Hydrological Patterns:

- Tatshenshini River is a major feature.
- rivers are glacially fed.
- in the major valleys, the rivers take highly braided paths.
- numerous and extensive icefields and glaciers.
- few lakes.

##### 3. Ecoregions:

- the mountain portion is classed as part of the Boundary Ranges Ecoregion, while the lower elevation area is classed as the Tatshenshini Basin ecoregion of the Northern Mountains and Plateaus Ecoregion.

- climates are determined by the Arctic regime and proximity to the Pacific: summers are short and cool, dry inland and moist westward; winters are cold with heavy snow accumulations.

#### 4. Biogeoclimatic Zonation:

- there are two general patterns of zones occurring in close proximity:
  - 1: Coastal Western Hemlock in Tatshenshini valley.  
Boreal White and Black Spruce on lower slopes.  
Alpine Tundra (and ice) dominates.
  - 2: Boreal White and Black Spruce in inland lower areas.  
Spruce-Willow-Birch on lower inland slopes.  
Alpine Tundra dominates.
- it is noteworthy that much of the land is devoid of forest: the lower valleys tend to be dominated by the braided rivers, alpine treeline occurs at about 800 metres a.s.l., and the steepness of many slopes is prohibitive of sufficient soil accumulation for tree growth.

#### 5. Fauna:

- grizzly bear, black bear, and wolves are abundant in the valleys and the tundra.
- moose are found in the inland valleys.
- thinhorn sheep (both Stone and Dall) and woodland caribou roam the inland mountain areas.
- mountain goat are plentiful in the mid to higher elevations throughout.

#### OTHER CONSIDERATIONS:

- the dominant economic activities are mining, mineral exploration, guide-outfitting and wilderness tourism.
- much of the landscape remains in a wild or semi-wilderness state; access is difficult away from the main river corridors and the Duke Depression.
- recreational demand is light to moderate, with the emphasis being on backcountry experiences; main interests are hunting, adventure tours, and wildlife viewing; the open nature of this landscape means that the wilderness experience can be easily disrupted.

\* \*

**SECTION 3: IMPLEMENTATION****3.1 Levels of Landscape Representation**

As suggested in Section 1.3, pursuit of sufficient landscape representation necessitates evaluation of the levels of representation currently achieved or potentially achievable. Three broad levels are recognized for the British Columbia Parks System, and these are defined as follows:

**(a) Satisfactory:**

This is the ideal; it is the complete or near to complete representation according to the requirements of the description of each regional landscape. At a minimal level, most or all of the environmental characteristics must be included within one or more provincial parks or comparable designations to the degree that there is a reasonable assurance that the natural elements and systems will be sustainable on a long term basis within the defined boundaries.

**(b) Partial:**

A landscape is partially represented when some but not most of the environmental characteristics of that landscape are protected within one or more provincial parks or comparable designations to the degree that the long term sustainability of the natural systems is reasonably assured. Partial representation may be an interim step until additional landscape characteristics can be embraced within the parks system.

**(c) Zero:**

A condition of zero representation exists when few or none of the typical environmental characteristics of a landscape are contained within the provincial parks system or a comparable designation on a scale that would assure long term sustainability.

While the satisfactory level of representation is the ideal, based upon the system goal, it is clear that achievement of this level for every landscape may not be attainable by following a single strategy or standard of representation. Some landscapes are extensively urbanized, settled, cultivated, or committed to industrial or commercial resource uses. In such situations, the acquisition of sufficient land areas to satisfactorily represent the landscapes in the parks system may not be achievable. Nevertheless it will remain important to document the level of

success achieved in each such "difficult" landscape, and to seek to add to this success as circumstances permit.

### 3.2 Strategies for Representation

To achieve the ideal of satisfactory representation of each regional landscape, there are various strategies available.

#### **Single, Contiguous Class 'A' Provincial Park:**

The normal strategy of representing each landscape is to protect a satisfactory sample within a single, large provincial park of Class 'A' status.

Departures from this conventional strategy may be justified on the basis of the ecological or recreational significance of a given landscape, of the representation role provided by other protective designations, or of the degree of competing land and resource interests. These alternative strategies are as follows:

#### **(a) Replication:**

The regional landscapes vary tremendously in their ecological characteristics. Some landscapes encompass ecological values (vegetative patterns, animal habitats, etc.) that might be better protected by setting aside more than a single area that satisfies the representation goal. This is most true in areas under the extensive land or resources development pressures. In such instances, replication of representative areas would help ensure the sustainability of particularly sensitive characteristics.

Regional landscapes differ strongly in their inherent appeal to the general public for recreational and educational visitation. This is an important consideration in establishing a system of parks, because parks - particularly provincial parks - are natural environments set aside for public appreciation and enjoyment. Consideration of this factor modifies the requirements of satisfactory representation for each landscape. For those landscapes with little public appeal, a base level of satisfactory representation will probably suffice. Conversely, those landscapes with high appeal will require replicated representation in order to accommodate the anticipated level of public interest in visiting such areas. For these, in association with distinct access routes and destination areas, it is important that there is sufficient replication to satisfy the public's interest as well as to help protect ecological values from overuse.

**(b) Comparable Designations:**

Other land conservation designations may contain representative samples of regional landscapes. To the extent that they do, the need or priority for action in the establishment of a provincial park to represent the same landscape may be reduced considerably. Such alternative designations must provide for or promise comparable levels of environmental protection and public outdoor recreation.

In British Columbia, the provincial parks system under the authority of the Park Act is the most important and the leading vehicle for landscape representation, in relation to public appreciation and enjoyment. Under this statute only Class 'A' Parks are sufficiently protected to satisfy the goal of representing landscapes. Other designations, such as Recreation Areas, offer substantially less protection. However these may contribute to landscape representation and should be considered as candidates or nominees for landscape representation. They reduce the need or priority to seek further representative areas for the parks system.

Outside the Park Act, the only designations providing for both public recreation and environmental conservation are:

- (1) **National Parks (National Parks Act):**  
These provide for ecological protection and public outdoor recreation to level equivalent to Class 'A' Provincial Parks. There are presently five such areas in British Columbia.
- (2) **National Park Reserve (National Parks Act):**  
Such a reserve serves as a suitable candidate or nominee for landscape representation, until such time as it is designated as a full National Park. One area presently exists in British Columbia.
- (3) **Regional Parks (Regional Parks Act):**  
This statute provides for comparable protection and levels of recreation. Some regional parks may be of sufficient size that they perform a landscape representation role.

**(c) System of Partially Representative Areas**

Some entire landscapes and the lower elevations of many other landscapes are dominated by private lands or by commercial interests in land and resources. In many landscapes, economic land values tend to be highest and most concentrated in the valley bottoms; this is particularly true in the southern half of the province. In these instances, achievement of



satisfactory landscape representation by the creation of a single, all-encompassing park may not be attainable in the short or the long term.

Rather than suspend any planned effort to succeed at landscape representation in such areas, the compromise solution is to deliberately create a system of smaller parks in the landscape. These parks may range in size considerably. Each must be partially representative of the complete spectrum of landscape characteristics, and there should be overlap and replication between the sites in terms of the characteristics represented. With this strategy it is also essential that the inter-relationship of the individual parks be identified to the public.

(d) **Landscape Vista:**

For some landscapes, particularly lowlands that have been extensively urbanized, cultivated or modified by industrial/resources development, the identification of significant natural areas to even partially represent the characteristics of the natural environment is difficult. In such areas of the province, it may only be possible to identify and designate relatively small parcels as parks, and these are likely to serve more as sites of intensive recreation than as even partially representative natural areas.

Therefore, in such landscapes, although not a substitute for landscape representation, it will be appropriate to provide parks that offer vistas. From such sites, it is possible to interpret and explain the general character of the landscapes, both in their natural state and in their contemporary man-modified condition.

### 3.3 Landscape Representation Criteria

In order to proceed toward accomplishing the program goal, it is necessary to assess the levels of representation provided by existing parks and that might be provided by candidate areas for park designation.

The landscape descriptions presented in Section 2 of this report can be used as general guides for the assessment of representation. With these descriptions and with the following basic criteria, existing parks and candidate areas can be evaluated.

- (a) **Topographic pattern(s):**  
Inclusion of the typical variety of landforms, configurations (including shorelines), slopes, and



general terrain.

- (b) **Elevational range:**  
Inclusion of the average, full range of elevations.
- (c) **Common or dominant physical features:**  
Inclusion of a reasonable sampling of the most common and pervasive physical features identified with the landscape.
- (d) **Rivers and streams:**  
Inclusion of the typical patterns or occurrences of flowing water in a natural (undisturbed, uncontaminated) condition and, where possible, complete watersheds.
- (e) **Water bodies:**  
Inclusion of typical patterns or occurrences of tidal waters, lakes, and permanent ice in a natural condition.
- (f) **Biogeoclimatic zones and subzones:**  
Inclusion of viable samples of the typical biogeoclimatic zones, including the associated subzones and the spectrum of commonly associated vegetative communities, in a size and configuration that will ensure ecological sustainability.
- (g) **Faunal habitats:**  
Inclusion of the full diversity of habitats for each the major mammal species and the typical resident and migratory bird species that are common to the various elevations of the landscape. These should be of sufficient size and configuration that their viability is not threatened by adjacent land uses or foreseeable events.
- (h) **Animal populations:**  
Inclusion of viable populations of the major mammals (land and marine) and typical resident and seasonal birds common to the landscape.
- (i) **Aquatic habitat and aquatic life:**  
Inclusion of typical aquatic and intertidal habitat and viable populations of native fish species, other aquatic life, and intertidal life.
- (j) **Overall natural conditions:**  
There should be a generally high degree of freedom from disturbance from humans and human endeavours. As near as

possible, representative areas should reflect the condition of the natural environment that would have prevailed prior to European colonization.

- (k) Overall integrity of boundaries:  
The proposed, attainable boundaries of an area should be sufficient to encompass and protect ecological values, including wildlife and wildlife habitat.

For each of these criteria, an area can be ranked as offering zero, low, moderate, or high satisfaction. Consideration of the cumulative rankings will permit a conclusion regarding overall level of representation achieved by an area, as well as identify landscape characteristics that require further attention. It is recognized that evaluation of the satisfaction of these criteria will often be based on subjective or incomplete information.

#### 3.4 Assigning Priorities

The goal of the parks system representing the diverse natural environments of British Columbia is an ideal. Toward attaining the ideal, it is necessary to pursue representation of all the regional landscapes to the extent that is practical. As such, the goal serves as a benchmark against which progress can be measured.

There is a wide array of landscapes that should be represented in the parks system. As these must be dealt with in an orderly fashion, it is appropriate to consider their relative priority. The fundamental considerations must be urgency (i.e. are the environmental opportunities for representation swiftly diminishing?) and importance (for outdoor recreation, ecological values and environmental education).

The following general factors affect the relative priority for satisfying the representation of each landscape:

The degree to which a landscape is already represented, either in the provincial parks system or in a comparable conservation system;

The relative attractiveness to the public of the landscapes;

The biological/ecological importance of protecting characteristics of a given landscape;

The relative abundance and availability of lands within each landscape to satisfy representation (i.e. urgency); and

L A N D	S C A P E S	Supply of Representative Areas	Overall Level of Representa- tion	Major Weaknesses & Considerations	Plausible Completion Strategies
4		small parks; large park	partial	-marine areas -forest types -faunal habitat -eco-sustain- ability	Improve bound- aries.  Replication  Expand system of parks.
5		large park	satis- factory		Improve bound- aries.
6		small parks	partial	-contiguity -river -bio-diversity -natural areas -estuary -shorelines	Expand system of parks.  Replication.  Landscape vistas.
7		large parks + rec. areas; small parks	satis- factory		
8		small parks	zero	-contiguity -fiord -topo-diversity -bio-diversity -marine area -shorelines	Major park.  Expand system of parks.
9		large parks; small parks	satis- factory	-low elevations	Improve boundaries.
10		small parks	zero	-all aspects	Major park.  Expand system of parks.

LANDSCAPES	Supply of Representative Areas	Overall Level of Representation	Major Weaknesses & Considerations	Plausible Completion Strategies
11	large rec. area	satisfactory		Upgrade status.
12	large rec. areas	satisfactory		Upgrade status.
13	large park	satisfactory		
14	large park reserve	satisfactory		Upgrade status (federal govt.)
15	large rec. area	satisfactory	-geologic features	Expand system of parks
16	large parks; med.rec.area; small parks	satisfactory		
17	nil	zero	-all aspects	Major parks. Replication.
18	small park	zero	-all aspects	Major park.
19	small parks + rec. area	partial	-contiguity -topo-diversity -bio-diversity -faunal habitat -eco-sustainability -rec.demand	Expand system of parks. Replication.

L A N D	S C A P E S	Supply of Representative Areas	Overall Level of Representa- tion	Major Weaknesses & Considerations	Plausible Completion Strategies
20		nil	zero	-all aspects	Landscape vistas.  Expand system of parks.
21		small parks; med.parks	partial	-contiguity -rec.demand	Expand system of parks.  Landscape vista.
22		med.rec.area	partial	-topo-diversity -bio-diversity -faunal habitat -eco-sustain- ability -waterbodies	Expand system of parks.
23		med.rec.area; small parks	partial	-contiguity -topo-diversity -faunal habitat	Major parks.  Expand system of parks.
24		large parks; large wild. conserv.; small parks	satis- factory		Improve bound- aries.
25		large wild. conserv.; med. park; small parks	partial	-topo-diversity -low elevations -bio-diversity -faunal habitat	Improve bound- aries.  Upgrade status.  Expand system of parks.

L A N D	S C A P E S	106			
		Supply of Representative Areas	Overall Level of Representation	Major Weaknesses & Considerations	Plausible Completion Strategies
26		large parks; large rec.area; small parks	satisfactory		
27		small parks; med. park	partial	-faunal habitat -contiguity -eco-sustainability	Improve boundaries.  Expand system of parks.  Landscape vistas.
28		small parks	partial	-faunal habitat -wetlands -eco-sustainability -topo-diversity -bio-diversity -rec. demand	Expand system of parks.  Replication.  Landscape vistas.
29		large rec. area	partial	-faunal habitat -topo-diversity -bio-diversity	Improve boundaries.  Upgrade status.
30		large parks; small parks	satisfactory		
31		large parks	satisfactory		
32		large park; small parks	satisfactory		
33		small parks	zero	-all aspects -rec. demand	Major park.  Expand system of parks.

L A N D	S C A P E S	Supply of Representative Areas	Overall Level of Representa- tion	Major Weaknesses & Considerations	Plausible Completion Strategies
34		small parks + rec. area	partial	-topo.diversity -bio.diversity -eco.sustain- ability -contiguity -faunal habitat	Major park. Expand system of parks. Replication.
35		periphery of large park	zero	-all aspects	Major park.
36		small parks; large park	satis- factory		
37		small parks; portion of large park	satis- factory		
38		portion of large park	satis- factory		
39		small parks	zero	-all aspects	Major park.
40		nil	zero	-all aspects -low rec.demand	Expand system of parks.  Landscape vista.
41		nil	zero	-all aspects	Other designation. Major park.
42		large parks	satis- factory		

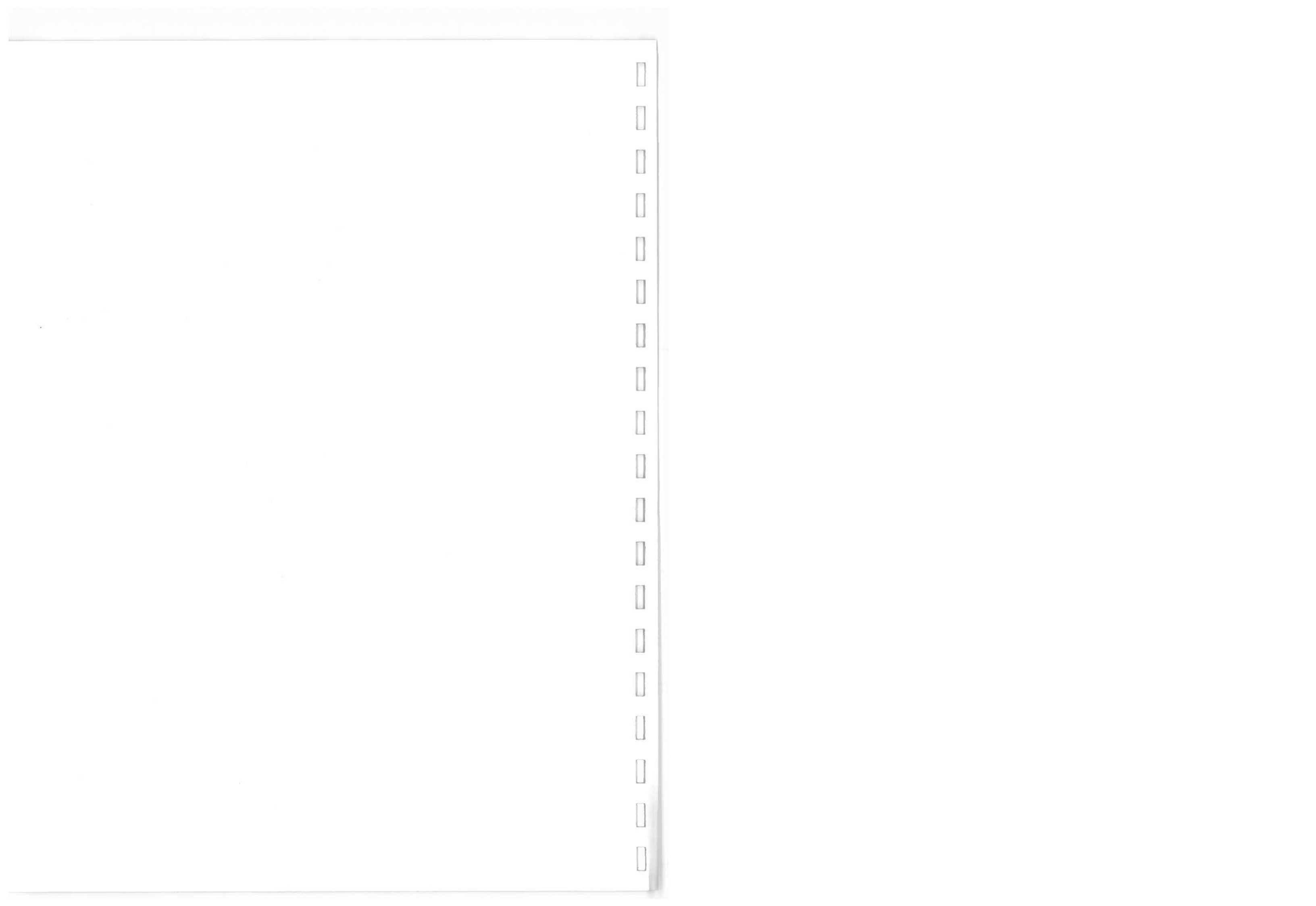
LANDSCAPES	Supply of Representative Areas	Overall Level of Representation	Major Weaknesses & Considerations	Plausible Completion Strategies
43	nil	zero	-all aspects	Major park. Expand system of parks.
44	nil	zero	-all aspects	Major park.
45	nil	zero	-all aspects -low rec.demand	Landscape vista.
46	nil	zero	-all aspects -mod.rec.demand	Major park.
47	large park; large rec.area	satisfactory		Upgrade status.
48	large rec.area; large parks	satisfactory		Upgrade status.
49	portion of large park	partial	-topo.diversity -bio.diversity -faunal habitat	Major park
50	small parks	partial	-contiguity -topo.diversity -bio.diversity -eco.sustainability.	Major park. Expand system of parks.
51	small parks	partial	-contiguity -topo.diversity -bio.diversity -eco-sustainability -low rec.demand	Expand system of parks. Other designation.
52	small park	zero	-all aspects	Major park.



L	A	N	D	S	C	A	P	E	S																	
				Supply of Representative Areas		Overall Level of Representation		Major Weaknesses & Considerations		Plausible Completion Strategies																
53					small park; med. park	partial				-bio.diversity -eco-sustain- ability	Expand system of parks.															
54					nil	zero				-all aspects	Major park. Replication.															
55					portion of large park	partial				-bio.diversity -topo.diversity -faunal habitat	Major park.															
56					portion of large park; large rec.area	partial				-topo.diversity -bio.diversity -faunal habitat	Major park.															
57					nil	zero				-all aspects	Major parks.															

It is emphasized that the above review is very cursory. It's function is to provide an approximate overview of the present situation relative to the goal. A more detailed analysis is recommended based upon the criteria and process identified earlier in this report.

\* \* \*



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## APPENDIX 1:

## DELINEATING THE REGIONAL LANDSCAPES

## 1. Introduction

Landscapes are a combination of form, texture, colours, and patterns. Form is the first component perceived by most people. Any area can be readily distinguished as either flat, rolling, ruggedly mountainous, and so on. After form, a person is likely to perceive any obvious textures, colours, or patterns, such as the general type of vegetation, any specific terrain features, any pattern to the presence of water bodies, or any characteristic occurrence of wildlife.

Since most people discern landscapes in this manner, and because provincial parks are components of natural environments set aside for people to enjoy, it is important that a parallel method is used to identify regional landscapes for the parks system. As these regional landscapes are multi-disciplinary in character, location of their boundaries requires subjective judgement, as each discipline - geology, physiography, ecology, climate, etc. - tends to describe different sets of regions with differing boundaries.

## 2. General Method

Therefore, in distinguishing regional landscapes for the parks system, the general method used involves the following three steps. Sections 3 and 4 of this Appendix provide additional background information on this process.

- (1) Adjacent regions of obviously different hydrologic and physiographic form were distinguished: for example, rugged mountains, rolling hills, coastal lowland. Both Holland's 1964 analysis of the physiography of British Columbia and the 1986 physiographic map prepared by Mathews (Geological Survey of Canada) were used to guide the location of both definite and arbitrary boundaries. Only those subdivisions based on readily observable distinctions were accepted.
- (2) Within each of these initial physiographic units, the general and relative patterns of ecosystems, terrain features, and hydrologic features were examined. For

this, three references were used: 1:250,000 topographic mapping; the Ministry of Forests' 1988 map of biogeoclimatic zones; and Demarchi's (Ministry of Environment) "Ecoregions" map. Where significant differences were identified within any given landscape, the demarcations of one of the latter two references was used to define the appropriate section of the landscape boundary.

- (3) It was recognized that the actual appearance of landscapes may vary geographically from the various cartographic interpretations used as primary references. Therefore, it was considered appropriate to review the proposed landscape boundaries, derived through steps 1 and 2 above, on the basis of first hand observation of the landscapes. From this review, a number of "fine tuning" adjustments were made to the regional landscape boundaries in order to better reflect observable conditions in the field.

In this exercise, it must be remembered that many subjective judgements are required in the determination of landscape boundaries. Ultimately, the parks system must give greatest value to the characteristics of any particular landscape rather than the boundaries of convenience that display it on a map. Most landscapes are surrounded by broad zones of transition to adjacent landscapes.

### 3. Integration of "Marine Environments" With Landscapes

In the 1982 edition of the "Natural Regions..." technical document, the marine subdivisions of the natural regions were identified as "marine environments". These were defined as:

"... broad divisions of the saltwater environment of coastal British Columbia. Among the three coastal natural regions, there are seven marine environments. These are distinguished on the basis of physical and chemical oceanography, climate, geomorphology (of the ocean floor), and biology. Each marine environment consists of an intertidal zone, a surface zone, a sub-surface aquatic zone, and an ocean floor zone."

When this edition was prepared there were four reasons for separated marine environments from regional landscapes. First, there was (and is) comparatively little knowledge about the geographic distribution of marine environment characteristics, contrasted with the terrestrial environment. Combining the two, it was felt, would tend to obscure and compound this problem.

Secondly, the geographic frameworks for analyzing landscapes were (and are) primarily based on terrestrial perspectives: biogeoclimatic zones, physiographic subdivisions (from S. Holland), and biotic zones. The third reason was that there existed a contemporary program/policy thrust towards underwater parks. It was felt that the distinction of marine environments would give added emphasis in this direction. Finally, the marine environment is regulated by legislation and regulations well beyond the authority of the Park Act, and therefore this statute is more limited in its applicability to marine areas than land areas.

After several years of application of the concepts identified in the 1982 document, it has been concluded the concept of marine environments complicates rather than simplifies the ability of the parks system to meet its goal of representing the diversity of natural environments. There are three considerations in this regard:

- (a) It is considered preferable to seek to represent regional landscapes, whereas previously natural regions, each comprised of one or more landscapes, were the primary object of representation. The marine environments were subdivisions of natural regions, not regional landscapes.
- (b) The provincial parks system is strongly oriented to the public's need for natural settings to appreciate and to enjoy in recreational activities. Therefore, marine areas of interest are invariably closely associated with adjacent land areas. Offshore marine areas are of little recreational or appreciation interest to the general public, certainly from a parks-oriented perspective.
- (c) The system described in the 1982 document creates a difficulty in appreciating the relationship between a coastal landscape and the adjacent marine environment. Where does one stop and the other begin when clearly there is a strong physical and biological interface? For example, discerning between the "fiordland" landscape and the "coastal fiords marine environment" is arbitrary and contrary to the concept of landscapes as integral wholes of the range of environmental characteristics.

At the writing of this 1989 report, it remains important that the parks system should seek to encompass representation of marine environmental characteristics. This can be best achieved by considering these characteristics as essential components of coastal regional landscapes. This helps clarify the description

of these landscapes, because they do not artificially stop at the water's edge.

The one problem that results from this proposal is the treatment distinctly offshore marine characteristics (i.e. those that are considerably removed from any terrestrial environment or foreshore area). There must, in these instances, be arbitrary decisions as to whether such biological and physical characteristics associated with open ocean have any place within the concept of and representation of regional landscapes in the provincial parks system. It is a reasonable argument that part visitors, being largely land-based (even if they are boating or diving), are not inclined to seek recreational or appreciative experiences in these offshore, oceanic areas. These are areas of industrial interest (commercial fishing, shipping) but of marginal direct interest to the general public. Furthermore, the provincial Park Act has significant jurisdictional limitations in such areas.

Therefore, it has been concluded that at this time offshore marine environments should be excluded from the regional landscapes system and from consideration within the provincial parks system. This current procedure is not intended to preclude the future possibility of defining completely marine environments, separate from terrestrial landscapes, where this is considered appropriate. For this edition then, the issue of marine environments has been finally resolved by examining each coastal regional landscape and describing its general association with marine areas and characteristics.

#### 4. Classifications Associated with Regional Landscapes

##### 4.1 Biogeoclimatic Zones

In 1975 the Ministry of Forests adopted the biogeoclimatic system to serve as a framework for ecosystem classification. In this system, climate is considered to be the main environmental influence on ecosystems. In 1988, the Ministry produced an updated and revised provincial mapping of these biogeoclimatic zones. In addition, the Ministry has also been producing more detailed mapping of biogeoclimatic subzones for each of its forest regions.

Climatic factors vary on the provincial scale with elevation, marine influence, and latitude. British Columbia's diverse, often rugged topography, contrasts between the influences of the Pacific Ocean, the Arctic, and the continental landmass, and the long north-south (latitudinal) axis mean that there is a



considerable array of climates. Often there is significant climatic variation within very short distances. Based upon this variety, fourteen ecological zones have been identified. These biogeoclimatic zones and their associated subzones tend to be named for the dominant climax tree species, although many different specific, non-climax, or micro-occurrence ecosystems may be found within any given biogeoclimatic zone.

This system is not well suited to the selection of regionally representative parks in British Columbia because, from the perspective of the general public, each zone occurs in a diverse geographic context, often in differing associations with other biogeoclimatic zones and physical landscape characteristics. Representative sites for biogeoclimatic zones may have little observable relationship to physical, hydrologic, or wildlife patterns in the landscape. Moreover, the distribution of climax tree species may be more theoretical than visible on the ground, particularly by the general public. The general public tends to see specific types of vegetation communities, which may or may not be indicative of the climax forest conditions. This system is designed for foresters, botanists, and resource managers who are focused upon vegetation.

Across the province, there are patterns of associated biogeoclimatic zones. These patterns of associated zones relate to topography and climate. The occurrence of these patterns is an important consideration in the definition of regional landscapes for the provincial parks system.

#### 4.2 Ecoregions

The concept of ecoregions has been advanced by the Ministry of Environment, chiefly spearheaded by the work of Mr. D. Demarchi, a wildlife biologist. This system, including a hierarchy of "Ecodomains", "Ecodivisions", "Ecoregions" and "Ecosections", has been developed in order to enhance understanding of regional patterns of ecosystems, which are particularly relevant to wildlife.

"A regional ecosystem or ecoregion is a geographic area where the ecosystem produced by macroclimate or oceanic currents and physiography (relief and landforms) is sufficiently uniform to permit the development of characteristic types of ecological associations." (Demarchi, 1988).

The fundamental building blocks to the delineation of ecoregions are climate and physiography. Both of these have a diverse

expression across British Columbia. The patterns of climate have largely been extrapolated directly from the biogeoclimatic zones mapped by the Ministry of Forests. The regional associations of these zones, coupled with consideration of wildlife patterns, have then been overlain by S. Holland's 1964 analysis of the physiography of the province. On the basis of this overlay, judgements have been made to identify ecoregions, "based on major physiographic or minor macroclimatic differences" (Demarchi, 1988), and within these ecoregions, "based on minor physiographic differences and macroclimatic subregions". (Ibid.)

In its regionalization of ecosystems and its effort to reconcile these with physiographic divisions, this system has promise for defining regional landscapes for provincial parks. However it has one major shortfall from a parks perspective. This system is not designed to consider what the landscape looks like. In many instances, different ecoregions and ecoregions will have distinctive appearances, but this is not necessarily the case. Likewise, within some ecoregions and ecoregions are significant differences in the appearance of the landscape.

It is also noteworthy that this system has used Holland's analysis of the physiography of the province, rather than a more contemporary treatment. Furthermore, although the ecoregion classification system is not fundamentally a physiographic classification scheme, physiographic names have been given to most of the ecoregions and ecoregions. Regrettably, these names and boundaries often depart from Holland's and from Mathews' more recent physiographic analysis. This results in considerable confusion when cross-relating classifications.

The original purpose of ecoregions was to update the earlier approach of describing "biotic zones" in the Province. Both classification systems are fundamentally concerned with grouping patterns of environmental characteristics that are significant to wildlife, such that the resultant zones are, in essence, wildlife regions within which consistent management strategies may be applied. As regions that reflect wildlife patterns (species occurrence), these ecoregions are useful in the delineation of regional landscapes for the provincial parks system, but because parks have a wider range of purposes than simply wildlife management, they are only one of several criteria that can be considered.

#### 4.3 Physiographic Mapping

For many years the standard reference for physiographic divisions of this province has been Stewart Holland's Landforms of British

Columbia: A Physiographic Outline. This analysis is hierarchical and thorough. Holland first divides the province into four major physiographic divisions, each aligned northwest-southeast and all parallel to one another from west to east. These divisions are then subdivided into units of relatively contiguous form: blocks of mountains, plateaus, etc. Next, these units are further subdivided into individual mountain ranges, plateaus, and so on. This analysis is conveyed in both map and text form, with the latter constituting a significant reference volume of detailed geologic distinctions.

The 1982 edition of Natural Regions and Regional Landscapes for the B.C. Parks System was based on Holland's physiographic analysis. It provided a clear and comprehensive set of boundaries that should be readily recognizable by the general public.

In 1986, the Geological Survey of Canada published an updated analysis of the Canadian Cordillera, as compiled by W.H. Mathews. This recent physiographic mapping has been accomplished with reliance on both older information (i.e. available to Holland) and more recent information (eg. satellite imagery). Notably this analysis is non-hierarchical. Mathews has mapped

"regions of homogeneous topographic character which are more or less distinct from adjacent areas and have different physiographic expression." (Mathews, 1986).

Also, Mathews has devised boundaries between regions based on a set of clear and consistent criteria that are logical to the average observer. Unlike Holland, Mathews does not rely heavily on geological information (i.e. rock types or ages) to set boundaries.

The consequence is that Mathews' analysis, while yielding many units that are quite similar to Holland's, has produced many boundaries that differ considerably from those of Holland. In terms of defining Regional Landscapes for the parks system, the more recent system should be preferred. While Holland's work will remain an important reference, Mathews' analysis appears to be based on more up-to-date information and provides boundaries that are more likely to be meaningful to the general public.

## APPENDIX 2:

COMPARISON OF THE 1989 REGIONAL LANDSCAPES  
TO THE 1982 EDITION

The following list of proposed regional landscapes has been derived by applying the theory and definitions of Appendix 1, based upon the principles stated in Section 1 of this report. This appendix is of value to those people in possession of the 1982 report: "Natural Regions and Regional Landscapes for B.C.'s Provincial Parks system.

Many of the 1989 regional landscapes are generally similar to their counterparts in the 1982 edition. However there are many boundary adjustments, owing to fresh consideration of contemporary biogeoclimatic, ecoregion, and physiographic mapping. However the substance of most of the landscapes is not significantly different.

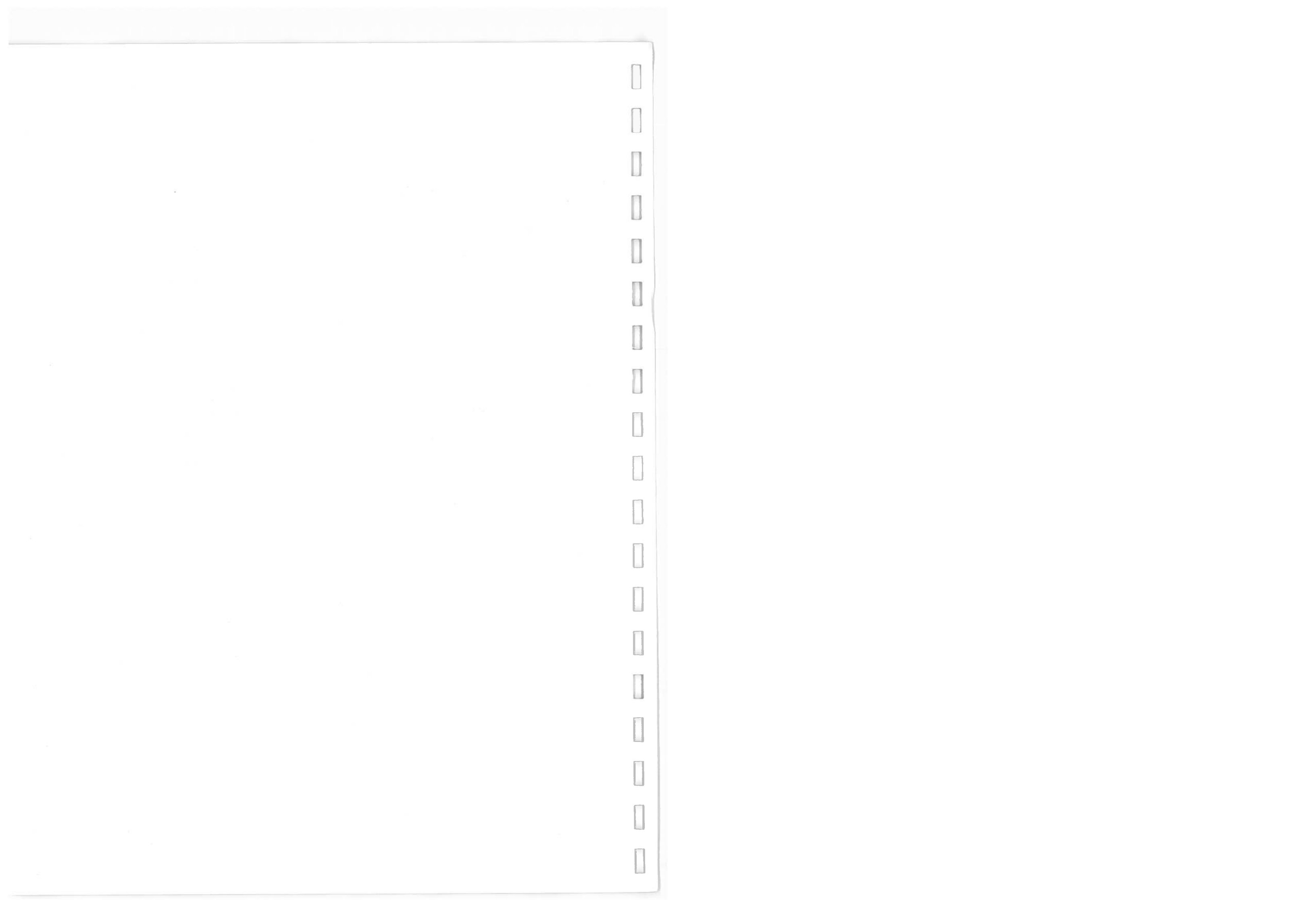
Readers will note that there are now fifty-seven regional landscapes, five more than in the 1982 edition. While some of the previous divisions have been dropped, some new divisions have been created.

NO	REGIONAL LANDSCAPES	COMMENTS
1	Gulf Islands	Similar to B9, except more extensive and including the marine component.
2	Georgia Lowlands	Similar to B8, with marine component.
3	Vancouver Island Mountains	Similar to C14, with marine component.
4	West Coast Plain	Similar to C15, with marine component.
5	Nahwitti Lowland	Same as B11, with marine component.
6	Fraser Flood Plain	Same as B10, with marine component.
7	Skagit-Lower Mainland	Similar to A4.

Mountains		
8	Southern Fiordland	Southern inside coast portion of A3, with marine component.
9	Pacific Ranges	Same as A1.
10	Midcoast Fiordland	Similar to midsection of A3, with marine environment included.
11	Northern Fiordland	Similar to northern part of A3, with marine component included.
12	Northern Coast Lowland	Similar to B12, with marine component.
13	Queen Charlotte Lowland	Similar to B13, with marine component.
14	Queen Charlotte Mountains	Similar to C16, with marine component.
15	Kitimat Ranges	Same as A2.
16	Cascade Ranges	Similar to south portion of A5.
17	Chilcotin Mountains	Similar to A6.
18	Pavillion Ranges	Same as I37.
19	Thompson Plateau	Similar to G33, with elements of G34.
20	Thompson Basin	Portion of G34.
21	Okanagan Basin	Portion of G34.
22	Okanagan Highland	Southwest portion of K39, without area west of Okanagan Lake.
23	Southern Columbia Ranges	Similar to southern portion of E23, including elements of E25.
24	Central Columbia Mountains	Similar to northern portion of

		E23.
25	East Purcell Mountains	Eastern portion of E23 and southeastern portion of E22.
26	North Columbia Mountains	Similar to E22 and E21 combined.
27	East Kootenay Trench	Similar to eastern part of E25, with south part of E24.
28	Southern Rocky Mountain Trench	Similar to E24.
29	Border Ranges	Similar to N47.
30	South Continental Ranges	Similar to N46; south half.
31	North Continental Ranges	Similar to N46; north half.
32	Quesnel-Shuswap Highlands	Similar to K40, with north part of K39.
33	Cariboo Uplands	Similar to G32, with south portion of G30.
34	Central Cariboo Basin	Elements of G34, G29, and G31 that comprise the driest portion of the central interior.
35	Chilcotin Plateau	Similar to G31, without drier portions of southeast.
36	Fraser Basin	Similar to G29, with elements of G30.
37	Nechako Plateau	Similar to G30.
38	Bulkley-Tahtsa Ranges	Similar to F26.
39	Nass Ranges	Similar to F27.
40	Nass Basin	Similar to J38.
41	Skeena Mountains	Similar to southern two thirds of F28.
42	Spatsizi Uplands	Combination of north portion

		of F28 and much of L43.
43	South Omineca Mountains	Similar to D17.
44	North Omineca Mountains	South part of D18.
45	Williston Trench	South part of D20.
46	Northern Rocky Mountain Trench	North park of D20.
47	Central Rocky Mountains and Foothills	Combination of N48, south part of N49, and south half of O50.
48	Muskwa Ranges	Similar to N49.
49	Northern Foothills	North half of O50.
50	Peace Plateau	Similar to P52.
51	Fort Nelson Lowland	Similar to P51.
52	Liard Uplands	Similar to M45.
53	Liard Plain	Similar to H36.
54	Cassiar Mountains	Similar to D18, with D19 included as a transition zone.
55	Stikine-Yukon Plateaus	Combination of L41 and L42.
56	Boundary Ranges	Similar to A7.
57	St. Elias Mountains	Northwestern portion of A7.





The feasibility/cost of acquiring sufficient lands to represent each landscape.

These general factors lead to a simple evaluation process for determining the priority and strategy for achieving satisfactory representation of each regional landscape. This process is outlined as follows:

- Step 1: assess the present level of representation; identify shortcomings;
- Step 2: assess the biological/ecological significance of the need for further landscape representation; consider rarity, fragility, and potential imperilment;
- Step 3: assess the level of public demand for outdoor recreation/education opportunities in the landscape;
- Step 4: consider the availability of undesignated wildlands and natural areas as sources for candidate representative areas;
- Step 5: consider the land use, land value (economic), and land ownership patterns;
- Step 6: consider the relationship of each landscape to adjacent landscapes, in terms of similar characteristics that may already be represented or may be more easily represented in an associated landscape; and
- Step 7: in the context of the other regional landscapes and on the basis of the foregoing assessments and considerations, identify the appropriate strategy and priority for seeking satisfactory representation of the landscape.

### 3.5 Overview of Current Levels of Representation

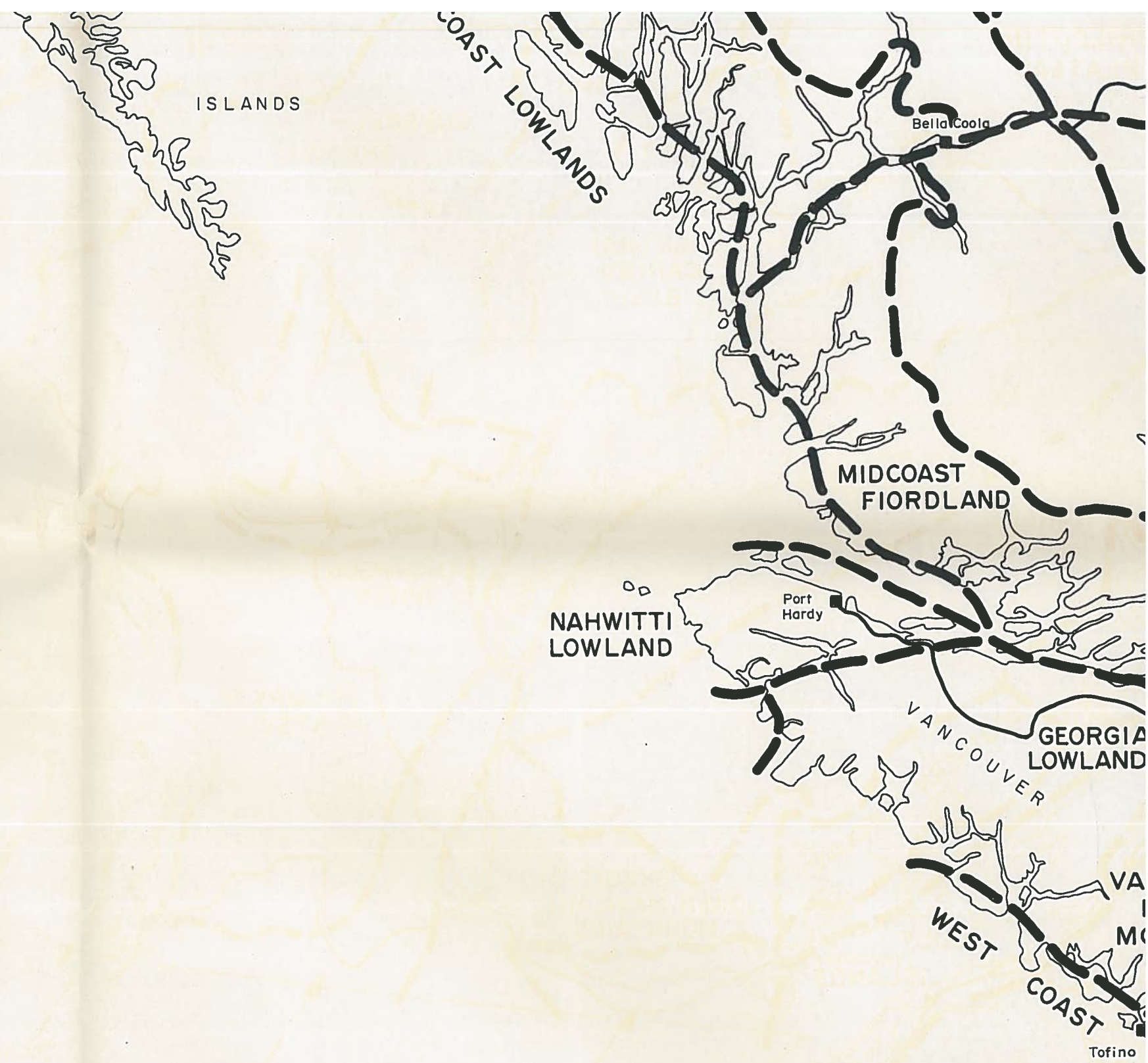
The purpose of this concluding section of this report is to provide an overview of the present level of representation of the regional landscapes and to suggest plausible approaches to completing representation for each landscape.

This application of the principles introduced in the preceding section of this report is preliminary only. It is not based upon a detailed assessment of each park or each landscape. The aim is

to provide a quick "snapshot" of the present situation, together with some general strategy advice.

From this cursory review, it appears that of the fifty-seven landscapes identified, 22 are currently represented to a satisfactory degree, while 19 are partially represented and 16 are not represented at all.

L A N D S C A P E S	Supply of Representative Areas	Overall Level of Representa- tion	Major Weaknesses & Considerations	Plausible Completion Strategies
1	small parks	partial	-contiguity -shorelines -marine area -bio.diversity -eco.sustain- ability -topo.diversity	Expand system of parks.  Landscape vistas.
2	small parks; med. parks	partial	-contiguity -rivers -marine area -faunal habitat -topo.diversity -eco-sustain- ability	Expand system of parks.  Landscape vistas.  Replication.
3	small parks; med. parks; large parks + rec. areas.	satis- factory	-marine areas -faunal habitat	Improve bound- aries.

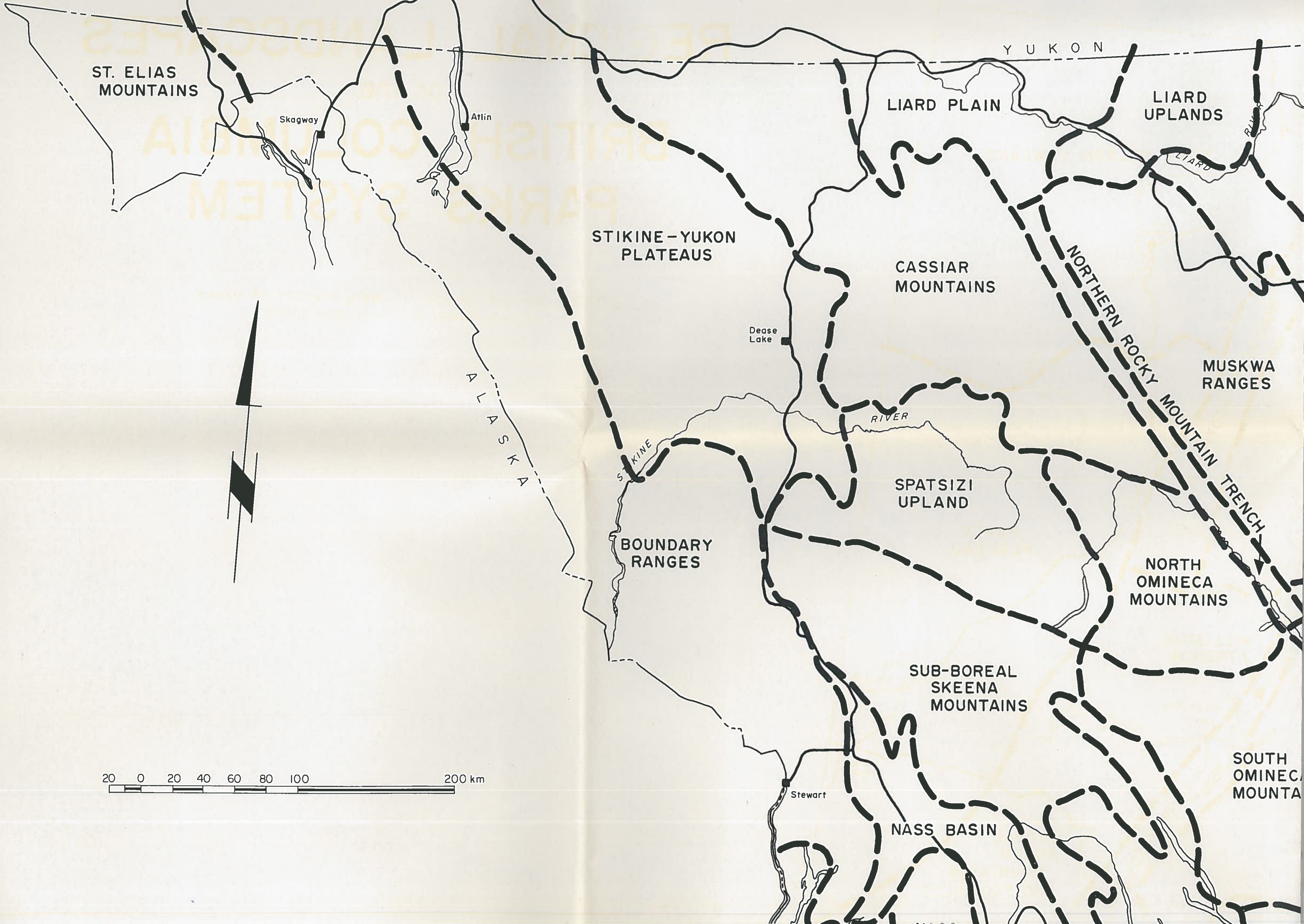


SCHOOL  
BORDER

RESEARCH  
SCHOOL  
BORDER

RESEARCH  
SCHOOL  
BORDER





ST. ELIAS  
MOUNTAINS

Skagway

Atlin

YUKON

LIARD PLAIN

LIARD  
UPLANDS

STIKINE-YUKON  
PLATEAUS

CASSIAR  
MOUNTAINS

NORTHERN ROCKY MOUNTAIN TRENCH

MUSKWA  
RANGES

Dease  
Lake

RIVER

ALASKA

STIKINE

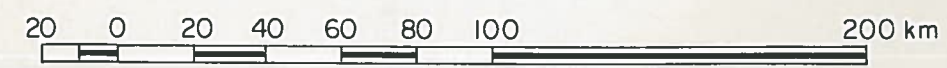
SPATSIZI  
UPLAND

BOUNDARY  
RANGES

NORTH  
OMINECA  
MOUNTAINS

SUB-BOREAL  
SKEENA  
MOUNTAINS

SOUTH  
OMINECA  
MOUNTAINS



Stewart

NASS BASIN



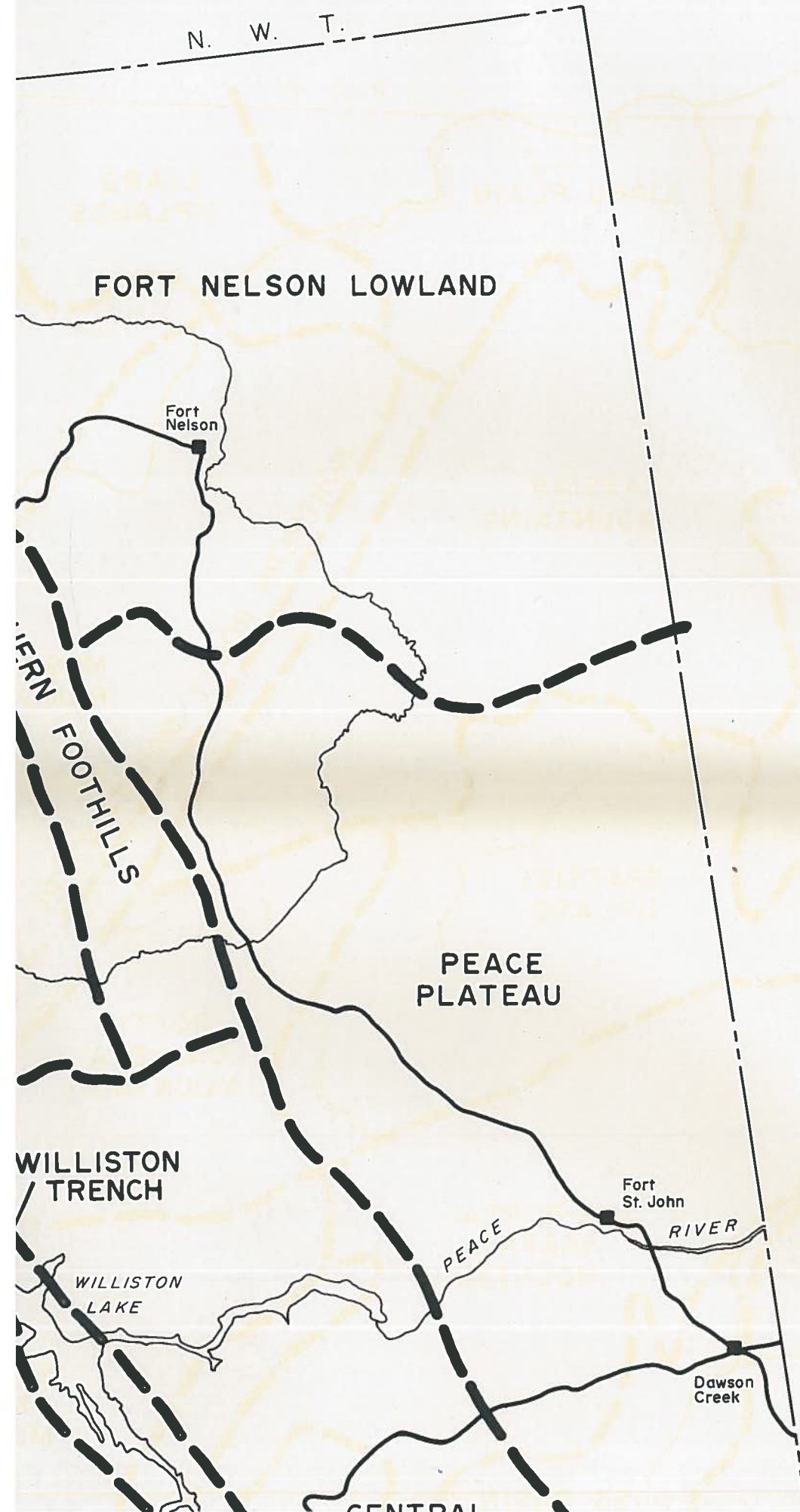
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# REGIONAL LANDSCAPES

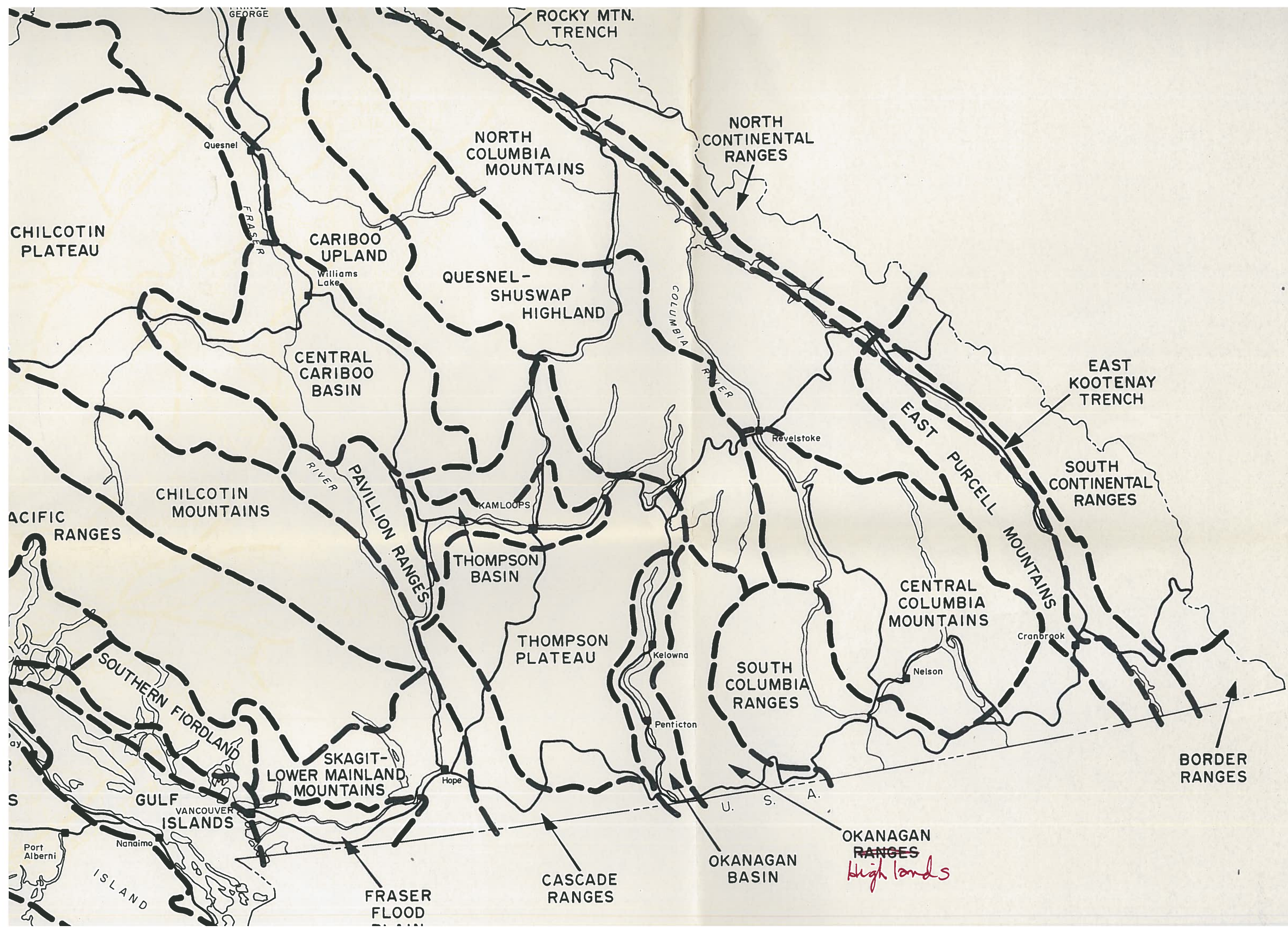
for the

# BRITISH COLUMBIA PARKS SYSTEM

PREPARED FOR: THE BRITISH COLUMBIA MINISTRY OF PARKS  
BY: J. K. YOUDS, PLANNING CONSULTANT







*High lands*