

BACKGROUND REPORT

March 2005

for Big Creek Provincial Park
Spruce Lake Protected Area



Ministry of Water, Land
and Air Protection
Parks Division

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Preface

This Background Document provides an information resource base on Big Creek Provincial Park and Spruce Lake Protected Area. It covers natural and cultural resources, recreation and tourism values and opportunities, and the history of planning and management of the area. The Background Document also identifies key issues for management planning. While not an exhaustive resource atlas, this report provides sufficient background information for BC Parks and the Big Creek Provincial Park and Spruce Lake Protected Area management planning team to address plan issues and provide management direction.

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Figure 1: Provincial and Regional Context

Introduction

Big Creek Provincial Park (67,962 ha) was established in 1995 through recommendations of the Cariboo-Chilcotin Land-Use Plan. Since then the July 2004 Draft Lillooet Land and Resource Use Management Plan has designated the large contiguous land area to the south of Big Creek Provincial Park as the Spruce Lake Protected Area (71,274 ha). The two areas form a continuous protected land base of 139,236 hectares stretching from the lower reaches of Tyaughton and Gun Creeks and extending north over the height of land into major portions of the upper drainages of Big Creek and Nadila Creeks. The connecting natural habitats and established tourism and recreational use linkages between these protected areas has dictated that the two areas be combined for park management and planning considerations. For these purposes, the combined unit is referred to as the Big Creek Park/Spruce Lake Protected Area.

Spruce Lake Protected Area is approximately 150 km north of Whistler and 95 km west of Lillooet. Access from Pemberton is via the Hurley Forest Service Road to Gold Bridge or from Lillooet along Carpenter Lake. From Gold Bridge, a logging road is travelled for approximately 12km to the start of the Gun Creek/Spruce Lake Trail at Jewel Creek. The southern drainages may also be accessed via logging and mining roads. Many of these roads require a four wheel drive vehicle. Spruce Lake serves as a primary destination and entry point into the southern region of the area with trail and float plane access.

Williams Lake is the closest regional centre to Big Creek Provincial Park, approximately 100 kilometres northeast of Big Creek. A rough logging road provides access to the trail head at the north end of the park.

This document builds on previous inventory and planning work carried out for Big Creek Provincial Park and Spruce Lake Protected Area to provide a comprehensive compendium of available information for the combined Big Creek Park/Spruce Lake Protected Area. It includes descriptions of natural, recreational and cultural resources, analysis of existing and potential tourism, recreation and resource uses, and an overview of key management concerns. Where necessary information relevant to only one park will be presented separately. Much of the information has been condensed from a variety of studies, reports and government records. Government staff, conservation groups, public and commercial recreation users and groups, tenure holders and stakeholders have provided up to date information on activities in the area.

The document will be used by park staff, staff of other agencies, and the general public as a basic source of information for the area and a framework for further studies and information collection. It will provide context for setting short- and long-term management objectives and resolving management issues. All of the information is presented in a form that is intended to be easily understood by the layperson. The document is accompanied by appendices of relevant corresponding data and the reference sources used for information gathering.

Planning and Management History

The Chilcotin Ranges have long been recognized as having provincially outstanding conservation and recreation resources and have for decades been the focus of intense public interest for wilderness preservation.

As early as 1937, the Vancouver Natural History Society advocated the establishment of a large wilderness, covering much of what is now included in the combined Big Creek Park and Spruce Lake Protected areas. Over time the proposal was called the Charlie Cunningham Wilderness after the local guide and outfitter who had originally drawn up the boundaries for the area. The Charlie Cunningham Area included the southern half of the area that is now in Big Creek Park and most of the current Spruce Lake Protected Area.

By the early 1970s pressure was growing for protection of the area, primarily through local guides and outfitters, notably Chilco Choate and Pat and Sally Garrard. In response, in 1973 BC Parks carried out an examination of potential park areas in the Chilcotin Ranges and concluded that while the Charlie Cunningham area exhibited outstanding wilderness values, extensive mineral tenures, forestry values, grazing rights and private land interests precluded its consideration for park designation. The Outdoor Recreation Council of British Columbia conducted a concurrent study which led to a recommendation in 1976 to the Environment and Land Use Committee that a Class A Park be established over the area.

Through the 1970s, public pressures continued to grow and, in 1979, fourteen British Columbia outdoor groups joined to form the Coalition to Protect the Southern Chilcotin Mountains. A proposal by the Coalition in 1981 to protect the wilderness core of the Charlie Cunningham area was rejected by the Environment and Land Use Committee in favour of continued multiple use. The Coalition later evolved into the Southern Chilcotin Mountains Wilderness Society, which continues to be a strong advocate for the area.

Mounting public concerns over potential mining and logging impacts to the area forced the Ministry of Forests to form the Spruce Lake Integrated Resource Management Planning (IRMP) Committee in 1981 to develop criteria for resource and recreation use for a 112,784 hectare Spruce Lake Resource Management Area (RMA). The Resource Management Area covered the main valleys surrounding Spruce Lake. The IRMP, comprised of representatives of government agencies, commercial tourism and resource operators, and public conservation-recreation groups, zoned the area on the basis of compatibility between mining and forest development interests and conservation and wilderness recreation values.

Zones included initial forest harvesting of lower main valleys, longer term developments in Bonanza Creek, upper Relay Creek and portions of Paradise Creek, and potential future consideration of forest removal in the high value recreation areas such as upper Tyaughton Creek, upper Gun Creek and the environs of Spruce Lake. In time logging proceeded into a number of the drainages including Slim Creek, lower Gun Creek, Relay Creek and Paradise Creeks.

Under another set of zoning criteria, mining could essentially occur anywhere in the area with more stringent environmental safeguards recommended for high recreation use and visually

sensitive areas. Although there continued to be varying levels of mineral exploration through the 1980s and early 1990s, no mineral extraction roads beyond pre-existing roads into Taylor and Bonanza Creeks were developed.

The IRMP also proposed the creation of a small ecological reserve in Gun Creek to conserve a portion of local grassland ecosystems. For various reasons, the ecological reserve was not established.

A Map Reserve for ecological reserve purposes was established by the Ministry of Lands, Parks and Housing in 1982 for the Clukata Ridge area. The reserve was cancelled in 1996 after establishment of Big Creek Park.

In the late 1980s the Ministry of Forests came close to setting aside an 81,940 hectare “Spruce Lake Wilderness Area” under a provision of the Forest Act which empowered the Ministry to administer wilderness areas. The Ministry also created strong expectations that the adjacent Big Creek and Taseko areas would likely be considered for Wilderness Area designation. During this same period overriding political pressures to protect the Stein River Valley, however, forced Government to postpone decisions to move forward with Wilderness Area designations in the Chilcotin Mountains.

Also in the late 1980s the Ministry of Environment established a number of vehicle restrictions in the Chilcotin Mountains including the Spruce Lake area. Several areas above 1200 meters were closed to motor vehicles year around. The Spruce Lake area was closed from June 1st to November 30th. Vehicle use for industrial or commercial purposes was allowed through special permit

In the early 1990s Government initiated the Parks and Wilderness for the 90s process to promote public discourse and input into future designation of provincial parks and Forest Service Wilderness areas. This process elicited a considerable number of proposals and letters of support for a large protected wilderness in the southern Chilcotin Mountains. The “Parks and Wilderness for the 90s” initiative also refocused the interest of the Ministry of Forests and BC Parks in pursuing wilderness area studies in the South Chilcotin Mountains. Park studies concluded “the Southern Chilcotin is the single most outstanding wilderness not presently protected in the Southern Interior of the province”.

The Parks and Wilderness for the 90s exercise led to a growing awareness that comprehensive land use planning would be required to properly consider park and wilderness proposals in relation to the many other competing land use interests. Government established a Commission of Resources and Environment to oversee regional land use planning and, in 1992, the Cariboo-Chilcotin Land Use Plan process was initiated as one of the first to be undertaken in the province.

Big Creek Provincial Park and South Chilcotin Park were established in July, 1994 as two of a number of parks and protected areas arising from the 2 year land use planning exercise. As a result of a Government review of the Land Use Plan, Big Creek and South Chilcotin units were combined in October, 1994 into a single 66,600 hectare park called Big Creek Park. Most of the land within the Cariboo-Chilcotin portion of the Charlie Cunningham area that did not fall within these parks was designated as a backcountry core of a Special Resource Development

Management Zone. A sustainable resource management plan is being developed for this zone with objectives and strategies allowing for multiple resource uses including timber harvesting, mining and range use while retaining the backcountry condition of the landscape.

A Background Document was prepared for Big Creek Park in 1996 as an information base for a follow up park management planning process and, in the following year, a Management Direction Statement (MDS) was developed. The MDS provides interim management direction until a proper and full management planning process can be initiated at some later time.

In 1992 Cabinet approved a number of “Protected Area Strategy” Study Areas in the Kamloops Forest Region including a large area surrounding Spruce Lake. A no staking reserve was established in 1994 to prevent further mineral tenure acquisition until land use decisions were made. In November 1995 the Lillooet Land and Resource Management Planning (LRMP) process commenced. To meet government’s limit of 18% of land area for combined existing protected areas (parks, ecological reserves and recreation areas) and formal study areas, the size of several of the study areas was reduced. Leckie, Slim, Nichols and part of the Bonanza Creek drainage were removed from the Spruce Lake Study Area.

In March of 2001, the LRMP Table submitted two land use options to Government. The “Conservation” option included a 71,400 hectare Spruce Lake Protected Area that incorporated Slim, Leckie and part of Bonanza Creek drainages. The “Communities” option had a smaller 42,767 hectare Spruce Lake Protected Area. Government approved in principle the Conservation option and on April 18th, 2001 established the Spruce Lake Protected Area by order-in-council under the Environment and Land Use Act.

A change in Government led to a review of the most recently approved LRMPs. In June 2001, a newly designated agency, the Ministry of Sustainable Resource Management, was assigned to examine previous work of the Lillooet LRMP in context with a number of new land use policies, such as the working forest, the Heartland Economic Strategy, a two-zone land use system for mining, and results-based forestry and mining legislation. In the course of the review, two “discussion drafts” were released for review and comment from plan participants, First Nations, stakeholder groups, and Government agencies.

The results of the public consultation process were internally reviewed by Government. In July of 2004 a revised draft of the Lillooet LRMP was released. The draft proposes amended boundaries for the Spruce Lake Protected Area: approximately 80% of it (~56,000 hectares) will become a Class A Provincial Park; the remaining 20% (~14,600 hectares) in Slim, Eldorado and Paradise Creeks will be designated as “mining/tourism permitted no commercial forestry” areas. Eight other protected areas (Bridge River, Cerise, Fred Antoine, French Bar, Gwyneth Lake, Marble Canyon, Skihist Park Extension, Yalakom) and one study area (Arthur Seat) have also been proposed.

Government recognized that First Nations must be brought into the process and has committed to review the LRMP work with the various Bands in the area. Consultations are ongoing and until agreements are reached with First Nations, land and resource use in the Lillooet area will continue to be managed under existing government jurisdictions and regulations.

The primary reasons for park designation are:

- Transition from wet coastal to dry interior ecosystems
- Adjoins Big Creek Park
- Wildlife Habitat (grizzly bear, bighorn sheep; mountain goats)
- Wildflowers
- Broad valleys and interconnected alpine basins for long backpacking or horse riding trips
- Well-preserved Mesozoic marine fossils.

(Ministry of Sustainable Resource Management, 2004)

See Appendix 1 for a Chronology of Key Events Leading to Park and Protected Area Designations

Park Establishment and Legislation

Big Creek Provincial Park:

Big Creek Provincial Park was established through Order-in-Council as a Class A Provincial Park under the Park Act in 1995, as recommended in the Cariboo-Chilcotin Land Use Plan (1994). The Park Amendment Act applies to Big Creek Park to allow for continued grazing use.

Spruce Lake Protected Area:

The Spruce Lake Protected Area was established through Order-in-Council 524 on April 18th, 2001 under the Environment and Land Use Act, directing that the area be managed as a park as defined in the Park Act. Under this Order-in-Council, existing rights and tenures other than commercial logging and mining can continue subject to an approved Park Management Plan and other appropriate legislation.

Management Direction from Land Use Plans

Big Creek Provincial Park:

Big Creek Park was designated as a Class A Provincial Park, as recommended in the Cariboo-Chilcotin Land Use Plan (1994). A follow up implementation planning process set forth a number of tenure and land-use provisions for the new protected areas in the region, including Big Creek Park:

1. A protected area, regardless of subsequent designation, is land on which the dominant ecological values should be protected and that uses, such as recreation, cattle grazing, hunting, trapping and backcountry tourism will be allowed.
2. Hunting and trapping will continue to be allowed in new protected areas, regardless of subsequent designation by the Province.

3. Many of the major, new protected areas are available, in principle and where appropriate, for commercial tourism and recreation.
4. Existing, approved levels of cattle grazing will continue in all protected areas, the maximum level of animal unit months (AUMs) in protected areas will be set at the existing level of authorized AUMs as of October 24, 1994.
5. No private land will be included within protected areas unless the government negotiates a mutually agreed purchase. Existing landowner use, development and access rights will be unaffected by the protected areas.
6. Protected area boundaries have been adjusted to exclude mineral and placer tenures located adjacent to the periphery of protected areas.

Spruce Lake Protected Area:

Upon review of land use options proposed in the Lillooet LRMP, Government approved the designation of a 71,347 hectare protected area surrounding Spruce Lake.

Revisions to the LRMP in July 2004 have proposed amended boundaries for the Spruce Lake Protected Area, with approximately 80% of the land (~56,000 hectares) assigned for eventual designation as a Class A Provincial Park, and the remaining 20% (~14,600 hectares) to be removed from the Protected Area in Slim, Eldorado and Paradise Creeks and designated as “mining/tourism permitted no commercial forestry areas”.

Government has an obligation to ensure that its land use decisions take into consideration aboriginal rights and title. Some 30 First Nations have communities or areas of traditional use within the Lillooet LRMP area. At time of writing, consultations are ongoing and until they are concluded, land and resource use in the Lillooet area will continue to be managed under existing government jurisdictions and regulations. Through this consultation process, LRMP directions may be changed, however, for purposes of this document the key objectives arising from the LRMP that apply to use and management of the Spruce Lake Protected area are presented. (Ministry of Sustainable Resource Management, 2004)

Lillooet LRMP: Section 4.2.3: Mountain Goat

Objectives:

3. Manage resource development and use activities within winter/kidding range by reducing or eliminating disturbance and displacement of mountain goats
4. Restrict disturbance or displacement of goats from recreational and tourism related human disturbance including both air and ground based mechanized forms of recreational access (e.g., cat skiing machines, snowmobiles, helicopter and fixed wing aircraft) within currently identified and suspected winter and kidding ranges (see Mountain Goat map). In no circumstances is use of current permanent helipads and common air transit routes near settlement areas (e.g., Lillooet, Lytton, Gold Bridge) and destination resorts (e.g., Tyaughton Lake) to be restricted

Lillooet LRMP: Section 4.3.3: Grizzly Bear

Objectives:

6. Maintain the suitability of critical grizzly bear habitats, and ensure these habitats have adequate security and thermal cover associated with them
9. Minimize negative interactions between grizzly bears and recreational activities in identified watersheds
10. Manage recreation and tourism developments to minimize bear/human conflicts and limit impacts on grizzly bear populations and habitat

Lillooet LRMP: Section 4.5: Protected Areas

Objectives:

1. Manage park use to conserve ecological values
2. Complete park management planning on a priority basis
3. Manage park use to maintain the quality of visitor experience
4. Manage types and modes of recreation to minimize conflicts among users
5. Manage protected areas to achieve a balance between ecological integrity, commercial tourism opportunities, and general park visitors
6. Honour pre-existing rights and tenures in new protected areas
7. Ensure that uses that are compatible with protected area designation, and which predate its legal designation (e.g., hunting, fishing, various types of recreation), continue to be accommodated within the protected area
8. Ensure that the time periods, quality or type and amount of access are consistent with the objectives and prescribed character of the protected area
9. Manage forest health factors (e.g., disease, insect infestation, noxious weeds) to an acceptable risk level, where they pose a significant risk to resources and/or values
10. Manage pre-existing *Range Act* tenures in new protected areas as prescribed in the *Park Amendment Act*
11. Evaluate suitability of protected areas as sources of irrigation water for adjacent agricultural land
12. Consider Table 3 “Management Categories and Key Issues” in management plans for new protected areas

Natural Values

Provincially, the conservation and recreation values of the Big Creek Park/Spruce Lake Protected Area are rated extremely high, capturing the key protected area attributes of the Southern Chilcotin and Central Chilcotin Ecosystems. The combination of Big Creek Provincial Park and Spruce Lake Protected Area protects a continuum of habitats ranging through the core of the southern and central Chilcotin Ranges, providing a major contribution to the provincial protected area system.

Climate

Big Creek Park/Spruce Lake Protected Area comes under the influence of air masses from three directions: wet coastal air from the west, cold plateau air from the north and dry interior air from the east. Situated on the lee side of the main Coast Mountain Ranges, the area receives less precipitation either as rain or snow than the mountain areas to the west.

The location of Big Creek Park/Spruce Lake Protected Area adjacent to the Chilcotin plateau means that most of the park area has continental influences in climate. Winters are cool and dry in the lower elevations, becoming colder, moister and harsher away from the plateau. In the highest sub-alpine and alpine areas of both parks winter precipitation is in the form of abundant snow, with snow packs staying into the spring and summer months.

Summer temperatures are moderately cool on the plateau and cold in the mountains with frequent convection showers. The growing season is short throughout, but particularly so in the sub-alpine and alpine areas. Frost can be expected in most months at the lower elevation, and especially at either end of the growing season, in late spring and late summer. In the alpine frost is expected daily. Wind is often present in both parks throughout the year as it is funnelled through the deep valleys.

Spruce Lake Protected Area is influenced by warmer Pacific air in winter that moderates temperatures somewhat. However, in summer warm air from the interior helps to raise temperatures and produces less precipitation. The lowest elevations of the protected area in lower Gun and lower Tyaughton Creek valleys are the warmest and driest parts of the two protected areas.

Table 1: Climate Normals, 1971-2000

Big Creek, BC

	J	F	M	A	M	J	J	A	S	O	N	D	Year
*Ave.	-10.2	-6.4	-1.6	2.6	7.6	10.6	13.3	12.9	8.9	3.0	-4.1	-10.1	2.2
*Max.	-3.0	1.4	5.7	9.8	15.2	18.1	21.1	20.9	16.9	10.1	2.4	-3.1	9.6
*Min.	-17.3	-14.2	-8.8	-4.7	-0.1	3.0	5.3	4.8	0.8	-4.1	-10.5	-16.9	-5.2
**Rain	1.7	0.8	1.0	8.4	25.5	51.1	51.4	43.6	24.3	14.3	1.9	1.9	225.8
**Snow	21.6	15.0	11.8	5.8	1.5	0.1	0	0	2.7	6.3	19.8	27.2	111.7
**Total	23.3	15.7	12.8	14.2	27.0	51.2	51.4	43.6	27.0	20.6	21.7	29.1	337.4

Shalath, BC

	J	F	M	A	M	J	J	A	S	O	N	D	Year
*Ave.	-1.8	1.1	5.3	9.9	14.1	18.1	21.0	20.8	15.7	9.7	3.2	-0.7	9.7
*Max.	1.1	4.6	10.00	15.7	20.4	24.5	27.8	27.2	21.0	13.8	5.8	1.6	14.5
*Min.	-4.6	-2.4	0.5	4.0	7.8	11.8	14.2	14.3	10.2	5.7	0.5	-3.0	4.9
**Rain	43.7	34.6	28.9	20.4	24.8	27.0	31.2	29.2	26.6	51.2	71.9	44.4	436.9
**Snow	31.6	13.7	3.7	0.2	0	0	0	0	0	0.9	9.1	22.5	81.7
**Total	78.3	48.3	32.6	20.6	24.8	27.0	31.2	29.2	26.6	52.1	81.1	66.9	518.6

*Daily Temperatures, °C, **Rainfall mm, Snowfall cm., Total Precipitation mm

Source: Environment Canada Canadian Climate Normals 1971-2000.

The closest climate stations situated in the vicinity of the Big Creek Park/Spruce Lake Protected Area are Big Creek (1175 m) and Shalath (243.8 m). The Big Creek station reflects conditions through much of the lower portions of Big Creek Park. The Shalath station at 243 metres is 1000 metres below lower Gun Creek and warmer than Spruce Lake Protected Area. The general climate pattern of the station is similar to that of the area under study.

Physiography

Big Creek Park/Spruce Lake Protected Area encompasses an array of landscapes that together represent southern and central portions of the Chilcotin region of the province. The area stretches north over the Southern and Central Chilcotin Mountains into the vast expanse of the forested Chilcotin Plateau country. South-western boundaries extend into the steep-sided valleys and sharply serrated peaks of the Coastal Mountain Ranges.

The gently sloping valleys and dome-shaped mountains which typify the Chilcotin Ranges form the core physiographic features of the southern portion of the area. The rounded profile of the mountains is evidence of intense glaciation in an area of largely sedimentary rocks during the last ice age. Some of the higher peaks such as Mt. Warner (2834 m) have a comparatively rugged relief resulting from recent alpine glaciation. Cardtable Mountain (2523 m), Mt. Sheba (2550+ m) and Castle Peak (2491 m) are outstanding examples of remnant basalt-capped sedimentary formations of the Southern Chilcotin Ranges. Dil-Dil Plateau is a unique feature that has abrupt sides dropping down to the relatively flat surface of the Chilcotin Plateau.

Retreat of valley glaciers and subsequent stream erosion of fault-guided valleys have created the major drainages and tributaries of the area. Leckie, Slim and upper Gun Creeks surge down steep sided valleys of the Coastal Mountains. Sub-alpine and alpine lakes and tarns occur at the headwaters of many of the drainages. The headwaters of Nadila Creek is a classic glacial cirque basin with very steep head walls surrounding Vic Lake. Spruce, Lorna and Warner Lakes are the largest lakes in the area. The southerly draining Tyaughton, Gun and Relay Creeks flow from the Chilcotin Mountains with comparatively broader valley bottoms and gentler gradients.

Big Creek and Nadila Creeks, draining north and west, also have their headwaters in glaciated mountain valleys. Big Creek winds its way through a steep-sided, flat-bottomed valley forming the eastern boundary of Big Creek Park while Nadila Creek gathers tributaries from all parts of the gently rolling plateau area that forms the bulk of the northern portion of the park.

Geology

Big Creek Park/Spruce Lake Protected Area is situated in an area of complex geology that straddles the boundary between the southeast Coast Mountains and the Chilcotin Plateau. The geological history is one of ancient ocean deposits, tectonic plate movement, faulting and mixing of rocks and layers of rocks, deposition of sedimentary rocks in shallow-marine basins, upwellings of granitic rocks and lavas flows. The story of how these rocks formed, exactly where they came from and the sequences in which they were mixed, moved or thrust over each other is still evolving. Landscape features in Big Creek Park /Spruce Lake Protected Area reflect the many complex geological formations that underlie them.

Two assemblages of rocks that originated on oceanic plates beyond the ancient western North American continental margin reflect the oldest part of the geological history of the area. Ocean floor basaltic volcanic rocks and deep-water sedimentary rocks (mainly chert) of the Carboniferous to Middle Jurassic age (340 – 157 Ma) comprise the Bridge River Terrane. Late Triassic to Middle Jurassic (230 – 166Ma) sedimentary and volcanic rocks form the Cadwallader Terrane. The Bridge River rocks represent the remnants of a large ocean basin that were scraped off the top of a down-going oceanic plate that subducted beneath the oceanic basin where Cadwallader sediments were collecting. As a result of this subduction an arc of volcanoes and associated sedimentary basins, represented by the rocks of Cadwallader Terrane, developed on the overriding plate.

Rocks of the Bridge River terrane are found in the southeast of Spruce Lake Protected Area through Pearson Creek ridge and they are inferred to lie under many of the other formations. Rocks of the Cadwallader terrane occur from Eldorado Creek through the east side of the Spruce Lake valley, across Tyaughton Creek and northwest along the higher slopes of Castle Peak ridge.

Another important group of sedimentary rocks, known as the Tyaughton-Methow Basin, was deposited on top of the older rocks of the Bridge River and Cadwallader terranes. They consist of clastic sedimentary rocks (e.g. sandstone, shale, conglomerate) that formed in a system of mainly shallow-marine basins in the upper Middle Jurassic to mid-Cretaceous (about 158 – 95 Ma). The Tyaughton-Methow basin includes the Relay Mountain Group (upper Middle Jurassic to Lower Cretaceous) and the mid-Cretaceous Taylor Creek and Jackass Mountain groups. Parts of the Relay Mountain Group are rich in fossils (mainly *Buchia* pelecypods; also ammonites and inoceramid bivalves). The mid-Cretaceous rocks also contain fossils (mainly ammonites) but they are not nearly as abundant. It was probably this Jura-Cretaceous time period that the rock assemblages of the Big Creek Park/Spruce Lake Protected Area became tied to the North American continental margin.

Sedimentary rocks of Tyaughton-Methow basin origin are found in the heart of Spruce Lake Protected Area through Upper Gun and Tyaughton Creeks and Relay and middle Tyaughton Creeks. They also form the height of land from Lorna Lake to Vic Lake in Big Creek Park. Non-marine volcanic rocks and local volcanic-derived sedimentary rocks occur from upper Big Creek northwest to Tosh Creek. This Upper Cretaceous (92 – 80 Ma) Powell Creek formation represents a continental margin volcanic arc that formed above the Tyaughton-Methow basin in response to subduction of an oceanic plate to the west.

The serrated mountains in the Slim, Leckie and upper Gun creeks are underlain by granitic rocks that are a characteristic feature of the Coast Mountains. The Dickson-McLure batholith is of Late Cretaceous age (about 92 Ma) and probably related to the Powell Creek formation. Numerous smaller granitic plutons to the northeast range from 92 Ma to about 40 Ma (Late Eocene), and are generally younger from southwest to northeast. A small granitic intrusion south of Lorna Lake is Middle Eocene in age (about 44 Ma or a bit older). These granitic rocks are all components of the continental margin magmatic arc related to subduction of oceanic rocks along the plate boundary to the west. This is a similar process to that still going on today and generating volcanic rocks such as Mt. Baker and Mt. St. Helens

Volcanic rocks of Early to Middle Eocene (58 – 50 Ma) age formed in several small volcanic centres scattered through the Big Creek Park/Spruce Lake Protected Area. The most spectacular exposures are found at Mount Sheba, on the north side of Gun Creek, with more on Clukata Ridge and in Tosh Creek valley. Eocene volcanic rocks also occur in the central part of Big Creek Park

The youngest rocks are those that cover two thirds of Big Creek Park including the Dil-Dil Plateau and north. They are part of the great lavas flows of 16 – 1 million years ago that formed the extensive Chilcotin plateau. Outlying remnants of these lava flows occur along lower Tosh Creek and in the area of Teepee, Relay and Cardtable mountains. On Relay Mountain the basalts are up to 350 metres thick, and they form spectacular cliffs on the east side of Dil-Dil Plateau.

Faults that formed in two separate time periods are an important feature of the geologic history in the Big Creek Park/Spruce Lake Protected Area. Thrust faults, marking the location where one group of rocks was pushed on top of another, formed mainly in mid-Cretaceous time (100 – 90 Ma). The NW-trending faults around Elbow Mountain are of this type, as are most of the faults within and bounding Cadwallader terrane rocks in the upper Tyaughton Creek area. Younger (80 – 40 Ma), northwest-trending strike-slip faults, where adjacent rock units slid past one another, occupy many of the long, linear northwest-trending valleys in the area. The most prominent of these is the Yalakom fault, which extends northwest from the Fraser River crosses through Big Creek Park north of Dash Hill. The rocks on the southwest side of this fault have been moved about 115 kilometres to the northwest compared to those on the northeast.

Fossils are an important feature of Big Creek Park/Spruce Lake Protected Area and demonstrate the marine origin of many of the sedimentary rocks. Well-preserved Late Triassic marine fossils (ammonites and bivalves) are found around Castle Peak. They were used in constructing the Triassic fossil zonation that became the standard for expressing the age of marine Triassic rocks in Canada. Lower and Middle Jurassic rocks in this same general area are also locally rich in fossils (mainly ammonites). The Relay Mountain Group is in part extremely rich in Upper Jurassic and Lower Cretaceous fossils (mainly *Buchia* pelecypods with some ammonites). These fossils have been used in constructing global Upper Jurassic and Lower Cretaceous fossil zonations. Fossil-rich parts of the Relay Mountain Group are found around upper Relay Creek, Elbow Mountain and on the low bluffs northwest of Spruce Lake.

Soils

The soils of Big Creek Park/Spruce Lake Protected Area are developed largely on a base of glacial material under cold, wet conditions and acidic dystic brunisols are common. On steeper slopes in the mountain areas parent material is colluvium and regosols predominate. Level areas at high elevation where there is some moisture, such as in Graveyard Valley, brunisols have developed. In areas where water accumulates and drainage is poor rego gleysols have developed.

In the alpine, cold temperatures inhibit weathering and the development of soil. There are many unstable areas and large areas of bare rock. Frost action has created extensive areas of patterned ground on Dil-Dil Plateau and rock stripes are reported on the Dash Hill plateau.

Mount Meager, west of the park and protected area in the upper Lillooet River valley, erupted about 2,120-2,670 years ago sending ash in a north easterly to south easterly direction. The measurable white ash layer is now known as Bridge Creek ash and where it occurs, as in Spruce Lake Protected Area, it modifies the soils through podsolisation.

Water

Water is an important component of both parks in Big Creek Park/Spruce Lake Protected Area, and each park represents very different forms of watersheds. Topography, precipitation and sources of the creeks all play a part in shaping the water courses.

Big Creek Park:

Big Creek Park is characterised by a multitude of water bodies in the form of creeks, lakes, ponds and wetlands. The park includes a large part of the upper Big Creek watershed, but lacks the headwaters of most of the major tributaries. Graveyard, Sluice, Grant and Tosh Creeks flow directly from the upper reaches of the park into Big Creek, which forms the eastern border. Nadila Creek gathers the waters of the West Nadila, Bear, Fire and Scallon creeks before flowing north out of the park to join Big Creek.

The creeks are fed by water stored in glaciers and snow in the Chilcotin Ranges and at their upper reaches abundant glacial silt gives them a cloudy appearance. Lorna Lake, at the southernmost point of the park, is a 2 kilometre long, blue-green, deep glacial lake and the largest body of water in the park. Big Creek rises in the mountains to the south of the lake, outside the park. Vic Lake is a deep glacier-fed lake at the headwaters of Nadila Creek and Nadila Lake is the largest of a string of lakes in a flat, steep-sided valley downstream to the northeast. North of Nadila Lake Nadila Creek enters a small canyon and flows over an attractive series of rapids. As the creeks flow out onto the gentle topography north of the Dil-Dil plateau area they slow down in meandering and braided courses.

Small ponds and wetlands are found throughout the park both in association with the creeks and as extensive wetland areas. The northern third of the park has large areas of low-lying meadows

with extensive areas of interconnected wetlands. Many marshes are successional evidence of overgrown eutrophic lakes.

Spruce Lake Protected Area

In contrast to Big Creek Park, the topography of Spruce Lake Protected Area is rugged with steep-sided valleys generally trending towards the southeast. Extensive alpine areas supply abundant water to all the creeks in the park. In the southeast, fast-flowing Slim, Leckie and upper Gun Creeks rise from the wet coastal mountains, while in the north east Gun, Tyaughton, and Relay Creeks and their tributaries flow more gently through the broader valleys of the drier Chilcotin Ranges.

Sub-alpine and alpine lakes and tarns, including South Slim, Leckie, Warner, Trigger and Hummingbird Lakes, occur at the headwaters of Slim, Leckie and Upper Gun Creeks. Spruce Lake sits in the high pass between the Gun and Tyaughton valleys, draining northwards in a steep, narrow valley to Tyaughton Creek. Warner Lake is a milky glacial blue, while Trigger is less milky and Hummingbird less yet. Spruce and Leckie are very clear. Wetlands and braided channels are typical of the upper reaches on all the southern creeks as well as upper Tyaughton Creek. Steep, fast-flowing creeks flow in all directions from the high alpine areas of the Eldorado-Taylor basin area in the south east portion of the protected area.

Vegetation

No in-depth scientific studies have been conducted of the flora of the park. Available information has been gathered from short studies in limited areas for special purposes, single day studies, generic data and anecdotal evidence. See Appendix 3 for lists of some species and plant communities found or expected in the park.

Forests and plant communities in Big Creek Park/Spruce Lake Protected Area generally reflect the leeward-rainshadow climate of the Chilcotin Plateau and Ranges. The position in the transition between northern and southern influences is indicated in the number of plant species that have been found to be at the southern limits of their range and yet others at the northern limits of their range. Temperature extremes and moderate to low precipitation rates combined with the very varied geology of the area create unique and diverse vegetation associations. The most notable are the lush grasslands and meadows in alpine and subalpine and large areas of aspen and mixed aspen - conifer forests occurring in Tyaughton, Gun and Relay Creek valleys.

Forests are characteristically fire patterned, comprising successional stages of Engelmann spruce, sub-alpine fir and Douglas- fir forests. Large expanses of lodgepole pine forest are found in the lower parts of the Big Creek drainage, as well as in flatter ground in Gun and Tyaughton Creeks. Extensive stands of white bark pine forests fringe the timberline in many valleys of Big Creek Park/Spruce Lake Protected Area. Sub-alpine meadowland and alpine tundra form the dominant habitats of the upper valley basins and mountain ridges. Large areas of marshes and spruce bogs occur in the extreme northern Chilcotin Plateau portion of the area.

Big Creek Park/Spruce Lake Protected Area covers several biogeoclimatic subzones and variants in three ecosections: Chilcotin Plateau, Central Chilcotin Ranges and Southern Chilcotin Ranges. See Table 2. The wide variety of plant communities found in the park and protected area are described below in relation to each subzone and variant.

Table 2: Ecosections and Biogeoclimatic Zones occurring in Big Creek Park/Spruce Lake Protected Area:

Ecosection	BGC Zone	Big Creek Park		Spruce Lake Protected Area	
		Zone	Area (ha)	Zone	Area (ha)
Chilcotin Plateau	Montane Spruce (MS)	MS	16069		
	Sub-boreal Pine-Spruce (SBPS)	SBPS	8572		
Central Chilcotin Ranges	Alpine Tundra (AT)	AT	16769	AT	16,737*
	Engelmann Spruce-Sub-alpine Fir (ESSF)	ESSF	26244	ESSF	7,558*
	Montane Spruce (MS)			MS	1,350*
Southern Chilcotin Ranges	Alpine Tundra (AT)			AT	27,898*
	Engelmann Spruce-Sub-alpine Fir (ESSF)			ESSF	15,116*
	Montane Spruce (MS)			MS	1,350*
	Interior Douglas-fir (IDF)			IDF	1,092

*Two variants of these BGC Zones occur in Spruce Lake Protected Area. Amounts assigned to each are estimates.

AT: Alpine Tundra Zone

ATunp: Undifferentiated Alpine Tundra Parkland Subzone

This subzone occurs in the southern, mountainous portion of Big Creek Park and throughout the many ranges of the Spruce Lake Protected Area, above 2000 m elevation, where it represents over 60% of the land base. It occurs in both the Central Chilcotin Ranges and the South Chilcotin Ranges Ecosections.

Permanent snow, including glaciers, occurs on the peaks and ridges surrounding Vic Lake in Big Creek Park, and on Warner Ridge and the south western ranges of Spruce Lake Protected Area. Large areas of bare rock, steep scree slopes and avalanche chutes are found throughout the alpine. The cool, short growing season at these elevations means that any vegetation is of dwarf form and has a very brief flowering period.

The transition position of Big Creek Park/Spruce Lake Protected Area combined with small changes in topography and aspect creates an especially wide variety in the vegetation cover in the alpine. Low shrubs, a profusion of herbs, many mosses and colourful lichens are found in a wide variety of extensive meadow areas. Scrub, willow and bog birch dominate meadows on drier sites, while pink and white mountain-heathers indicate a more mesic site. Sedge meadows fill wetter sites and stunted trees or krummholz occur at lower elevations.

Figure 2: Biogeoclimatic Zones (2002) and Major Biotic Features

Field work completed in 1977 for a Master's Thesis identified 19 plant communities in the combined alpine-sub-alpine study area of Little Paradise, upper Relay, upper Graveyard, Two Lakes basin and Dash Hill area. 2 tree communities, 9 shrub communities (6 tall shrub and 3 alpine dwarf shrub), 7 meadow communities and one rock-talus-lichen terrain unit. Plants are listed by community. (Selby, 1980) The vegetation pattern was shown to be complex and interwoven between alpine and sub-alpine areas, reflecting the situation found in the higher elevations of both Big Creek Park and Spruce Lake Protected Area. See Appendix 2A.

Big Creek Park:

The alтай fescue grasslands of Clukata Ridge represent a very special community at the southern boundary of the range of alтай fescue (*Festuca altaica*). A 1982 Ecological Reserve proposal described the ridge area from Grant Creek to Tosh Creek as having “an outstanding diversity of alpine and sub-alpine plant communities including some rare plants and unusual timberline scrub made up of aspen” (Roemer, 1981). 18 distinct plant communities are described that indicate the diversity of the plant communities: from forested to shrub, herb, grass and alpine plants. Plants are listed for each community. See Appendix 2B.

The exposed rock and thin soils of the Dil-Dil Plateau have created a unique extensive area with a sparse tundra vegetation cover. Dry alpine species with abundant mosses, lichens and sub-boreal species occur there. Alpine tundra meadows are also extensive north of Dash Hill, where rock stripes are common. On lower alpine slopes stunted tree forms are found including large areas of krummholtz.

Spruce Lake Protected Area:

Glaciers and large unvegetated areas are found in the southwest portion of the protected area in the higher elevations of upper Slim, Leckie and Gun Creek valleys. Alpine meadows are most extensive in the Upper Relay, Little Paradise, Bonanza and Taylor valleys creating spectacular floral displays in the short summer season. Meadows in other alpine areas are no less spectacular, but less extensive. See Appendix 2C.

ESSF: Engelmann Spruce-sub-alpine fir Zone

This zone occurs below the Alpine Tundra in both Big Creek Park and Spruce Lake Protected Area. This zone typically has a continuous forest cover of conifers, including various combinations of Engelmann spruce, sub-alpine fir and, on drier sites, whitebark pine and lodgepole pine. At the highest elevations the forest thins out to parkland with clumps of trees in widespread meadows that interweave with similar alpine communities. There are extensive areas of wind-blown clumps of bushy conifers called krummholz throughout the zone.

The ESSF xv2 variant (Very Dry Very Cold 2 Engelmann Spruce- Sub-Alpine Fir Variant) is widespread through the Chilotin plateau. Big Creek Park and Spruce Lake Protected Area are the only protected areas to include representative areas of this variant. 75% of the variant occurs in Big Creek Park and 25% in Spruce Lake Protected Area.

White-flowered rhododendron is the most common shrub in the zone, and black huckleberry, grouseberry and false azalea frequently occur. Subalpine meadows include heath-dominated

meadows, flower meadows and grasslands. Snow often lingers in heath-dominated meadows providing abundant moisture for a variety of mountain-heathers. Flower meadows often contain swaths of Indian hellebore, arrow-leaved groundsel, paintbrush, Sitka valerian and other flowering herbs.

A large area in the Graveyard Creek-Relay Creek-Paradise valley-Dash Hill area has been grazed by sheep and cattle since the 1930's. Cattle grazing continues in the area on a rest-rotation basis. The original vegetation composition is not known. A plant study in 1977 indicated "strong affinities with both the Spatsizi Plateau to the north and the North Cascades to the south indicate the transitional nature of the area." Impacts of grazing activity include trampling damage, elimination of species and introduction of weedy species. (Selby, 1980)

ESSFvx2: Very Dry Very Cold 2 Engelmann Spruce- Sub-Alpine Fir Variant

Big Creek Park:

The ESSFvx2 variant occurs on the lower slopes of upper Big Creek, Sluice, Grant, Tosh and Graveyard valleys and extends northward to just north of Mt. Tom. In the lee of the Coast Mountains, these forests are drier and have a larger than usual amount of lodgepole pine. Extensive sub-alpine meadow systems are found on the lower edges of Dil-Dil Plateau, around Twin Lakes and north of Dash Hill. Small areas of grassland meadows occur on drier ridges along the south side of the middle reaches of Big Creek valley. Big Creek, Graveyard, Grant and Tosh Creeks take winding courses through wide areas of wetlands and meadows. Interconnected wetlands and open meadows are widespread throughout the plateau area west of Mt. Tom in the Nadila and West Branch Nadila valleys.

Spruce Lake Protected Area:

The ESSFvx2 variant is limited to the upper portions of Relay Creek, Little Paradise Creek, upper Paradise Creek and upper Tyaughton Creek. In Tyaughton Creek it also occurs on the north side only of the west-east portion of the valley. Significant stands of pure whitebark pine occur in upper Paradise Creek, and particularly on the north east and north side of Tyaughton Creek. Shrubs are not common in this dry variant but herbs are common. Sub-alpine meadows connect with those spreading down from the alpine on north-facing slopes of Relay Creek and Paradise Creek. Grasslands cover the lower south-facing slopes of Relay Creek where it leaves the protected area. Valley-bottom wetlands are not so extensive as in Big Creek Park, being restricted to the upper portions of Tyaughton Creek.

ESSFdv: Dry Very Cold Engelmann Spruce-Subalpine Fir Subzone

Spruce Lake Protected Area:

This drier ESSF subzone occurs below the ESSFvx2 in Tyaughton valley, and below the Alpine Tundra in Gun, Leckie and upper Slim valleys. This reflects the topography, elevation and drier climate of the Spruce Lake Protected Area. The protected area has a significant 66 % representation of the provincial total protected.

This is the dominant forested ecosystem of the main valleys through the centre of the protected area. It covers the south side of the middle Tyaughton Creek valley, over the Spruce Lake valley into middle Gun Creek valley, in lower Leckie and Slim Creek valleys and on the higher slopes of lower Gun Creek. It is also found immediately below the alpine on all outer slopes of the Eldorado-Taylor basin area.

The forests in the protected area are open and dominated by sub-alpine fir and Engelmann spruce, with lodgepole pine and whitebark pine in varying amounts. Stands of pure whitebark pine occur on the dry south-facing slopes in all the valleys. White-flowered rhododendron and black huckleberry dominate the shrubby understory, except in drier sites where common juniper, black huckleberry, arctic lupine and pinegrass are dominant.

Parkland occurs as clumps of trees with lush meadows, grassland and heath, often blending into the alpine meadows above. Grasslands are found on the dry south east and south facing slopes west of Spruce Lake and on the south-facing slopes above middle Gun, Tyaughton and Relay Creeks. Gun and Leckie creeks meander through long wetland areas along the valley bottoms and wetlands ring the southern end of Spruce Lake. The only large lakes in the protected area, Warner, Trigger, Hummingbird and Spruce, are found in this variant.

MS: Montane Spruce Zone

The Montane Spruce Zone is represented by two subzones in the Big Creek Park/Spruce Lake Protected Area. Each park and protected area has a different subzone reflecting the different moisture regimes they experience. This zone is characterized by short, warm summers and cold winters with a moderately deep snow cover.

MSxv: Very Dry Very Cold Montane Spruce Subzone

The cold, dry conditions that occur in the lee of the Coast and Chilcotin Ranges create special characteristics in this variant of the Montane Spruce Zone that are not found elsewhere through the range of this zone.

Big Creek Park:

This subzone is found throughout the Chilcotin plateau and in Big Creek Park it covers the mid reaches of Fire Creek, Nadila Creek and Big Creek. In the valley of Big Creek it also extends as a broad finger well up into the ESSFxv2 subzone. It is characterised by large areas of lodgepole pine, with mixed lodgepole pine-hybrid white spruce stands. The understory vegetation consists of crowberry and grouseberry with carpets of feathermoss, other mosses and lichens covering the ground. In the cold climate in the lee of the mountains trees are generally small, often less than 20 m when mature. Many areas of dense, twisted trees and areas of boulders make travel difficult. An unusual band of mixed white spruce-cottonwood riparian area along the west side of Big Creek is almost ten kilometres long. Interconnected wetlands throughout the creek valleys consist of a complex mix of swamps, shrub-carrs, fens and shallow open water, often edged with wet meadows.

Spruce Lake Protected Area:

MSdc1: Dry Cold 1 Montane Spruce Variant

This drier Montane Spruce variant occurs below ESSFdv on the south-facing slopes of middle Tyaughton Creek and the lower slopes of lower Gun Creek, Leckie and Slim Creeks. It is also found as a thin band below the ESSF on the south-facing slopes of the Pearson Creek ridge. Forests are open with mixtures of lodgepole pine, varying amounts of Engelmann spruce and sub-alpine fir and little understory vegetation. On north-facing slopes Engelmann spruce and sub-alpine fir form dense stands, while Douglas-fir and lodgepole pine are found on drier sites with bluebunch wheatgrass, common juniper, kinnikinnick and balsamroot. Unusual combinations of conifers are found on the dry south-facing slopes of Tyaughton Creek including varying mixtures of Douglas-fir, lodgepole pine, sub-alpine fir, spruce and whitebark pine. Scattered ponderosa pine are also found, where they are at the western and near the northern extent of their range. Extensive grasslands occur on the steep south-facing slopes of Tyaughton Creek; through the middle Gun Creek valley they extend down from those identified in the adjacent ESSF subzone.

SBPS: Sub-boreal Pine/Spruce Zone

SBPSxc: Very Dry Cold Sub-boreal Pine/Spruce Subzone

The cold, dry conditions that occur in the lee of the Coast and Chilcotin Ranges create special characteristics in this variant of the Sub-boreal Pine/Spruce Zone that are not found elsewhere through the range of this zone.

Big Creek Park:

This area of interconnected forested wetlands occurs in association with slow moving channels and the many creeks throughout the zone. Large areas of boulder fields create rough openings and make travel in the area difficult. Lodgepole pine, hybrid white spruce and subalpine fir occur in mixed, often dense, stands occur throughout. Common juniper, prickly rose, soopolallie and willows are common shrubs, while kinnikinnick, fireweed and wild strawberry are common herbs. Bands of riparian areas are found around the edges of the wetlands and follow the channels and creeks, while natural hay meadow complexes create openings.

Interior Douglas-fir Zone

IDFdk2: Dry Cool 2 Interior Douglas-fir Variant

Spruce Lake Protected Area:

This driest of the ecosystems in the two parks is found in the lowest portions of Gun Creek valley. It is a system that is not well represented in protected areas. Forests are open and dominated by lodgepole pine with Douglas-fir regeneration. Birch-leaved spirea and falsebox are found in an understory dominated by pinegrass. Pure Douglas-fir stands with an understory of saskatoon, birch-leaved spirea and bluebunch wheatgrass occur on dry south-facing slopes.

Influences on Ecosystem Structure and Values

Many factors influence the structure and patterns of ecosystems in Big Creek Park/Spruce Lake Protected Area. High elevations, severe climate, thin soils and a short growing season present special ecological conditions over extensive areas. Historical and current livestock grazing, guiding with packhorses, public and commercial recreation activities and past mining activity are just some activities that have impacted parts of these special areas. They present particular problems for park managers and the maintenance of natural values.

The sub-alpine and alpine meadows in the upper Relay, Little Paradise and Paradise valleys have a history of livestock grazing since 1939. As many as 4300 sheep were trailed to the area every spring until 1964 from the Lac du Bois area of Kamloops. Since 1967 the Relay-Paradise-Graveyard area has been used by cattle from Gang Ranch for summer grazing, with very large numbers in early years and considerably decreased use in recent years. Graveyard Creek is known to have had cattle grazing since 1945. The impact of this grazing history has been severe in some areas, with many non-native plant species introduced. It was particularly harsh on the vegetation and soils of the higher elevation areas. The original vegetation composition is not known and cannot be accurately reconstructed from the present assembly of plants. (Selby, 1980)

Grazing continues throughout the lower elevation wetland-meadow and grassland areas of Big Creek Park. Shrub-carr communities and areas where cattle congregate before leaving the park in the fall are noted as being heavily used by cattle. Naturally hummocky ground becomes more hummocky with heavy cattle use and Kentucky bluegrass has invaded. Range Use Plans indicate strategies for moving cattle to the meadow communities so they do not concentrate in these more fragile areas. Summer grazing by small numbers of cattle continues in the area of Relay, Paradise and Graveyard Creek valleys.

Public and commercial recreation activities that have impacted plant communities include multiple trails, off-trail use, creek crossings and camping areas. On the south-facing grasslands slopes of Tyaughton Creek multiple trails and horse grazing have disturbed large areas of this particularly unusual and fragile area. Previous mineral prospecting activity created many of the access roads and trails into the Taylor-Eldorado basins area of Spruce Lake Protected Area. Guided horseback trips and individual horseback riding have both increased in the past twenty years. Inappropriate horse management around lunch stops and camping areas has led to concentrated areas of over grazing. Erosion concerns have been noted from the increasing numbers of mountain bikes on trails. Horses, vehicles, and, possibly, aircraft floats may introduce invasive non-native species of plants and/or their microbes.

Wildlife

Big Creek Park/ Spruce Lake Protected Area provides rich and diverse habitats for a variety of wildlife associated with high-elevation mountain and plateau habitats. Lush alpine and sub-alpine meadows, broad upland valleys and extensive shrubby wetlands are only a few of the habitats available. Cold, long winters restrict the variety of species, but the quality of habitats

attracts large numbers of some species, especially during the short summer and fall seasons. This provides visitors with some outstanding wildlife viewing opportunities.

In-depth studies have not been undertaken for many wildlife species and information about their abundance and distribution is gleaned from trapper and guide-outfitter information and anecdotal evidence. Red and blue-listed species are discussed separately below.

See Appendix 3 for a species list. See Figure 3.

Mammals

Many species of large mammals are found in the mountains of the combined Big Creek Park/Spruce Lake Protected Area. Some essential habitat elements make those areas particularly important, including: lush alpine meadows, salty mineral springs, rocky escape terrain, wind-swept and snow-free areas and isolation from human activity or development. Mountain goats share habitat with mule deer and grizzly bear are found with California bighorn sheep and moose. In the Eldorado-Taylor-Cinnabar Basin area of Spruce Lake Protected Area grizzly bear share habitats with mule deer and mountain goats. The variety of habitats in other parts of each park supports a very wide diversity of mammals.

Mountain goats:

Mountain goats are included on the 1999 provincial Identified Wildlife Management Strategy list and require special management considerations. (Forest Practices Code of British Columbia, 1997) Some of the densest populations of mountain goats in BC are found in the lee of the Coast Mountains and Big Creek Park/Spruce Lake Protected Area boasts good numbers. Mountain goats require undisturbed areas for birthing and rearing, for foraging near escape terrain and for thermal and security cover. In winter they move short distances to forested areas on south and western-facing open slopes or wind-blown ridges. These elements are all found in the highest portions of Big Creek Park/Spruce Lake Protected Area. In areas where heliskiing occurs, there must be a 1500 metre separation between helicopters and goat wintering ranges.

Big Creek Park:

Mountain goats spend summers in the mountain ridges of the south west part of the park, wintering on Warner Ridge over to Powell Pass and towards Taseko Lakes outside the park.

Spruce Lake Protected Area:

The Eldorado Mountain area is rated as exceptional habitat for goats. At over 70 head of animals, this is the largest concentration west of the Fraser River. Mountain goat winter range and associated significant range is also found on the west-facing slopes of Gun Creek from lower Windy Pass to lower Eldorado Creek. On the ridge from Mount Sheba to the Warner Pass area goats and California bighorn sheep winter together in their preferred habitats. The upper elevations of the southern mountain ridges provide important winter range through upper Gun Creek, Leckie Creek and upper Slim Creek valleys.

Goat surveys have not been completed since 1986, at about the time that heliskiing started in the winter ranges. It is strongly believed that the goat population has declined in the Slim-Leckie area and new surveys are planned. Wildlife managers have worked with the heliskiing company to close down ski trails in highly sensitive areas and to create no-fly zones. A fuel reloading site outside the park at the end of the road in Slim Creek is situated in a place where helicopters cannot avoid repeat flying over winter ranges.

Moose:

The moist forests, shrubby forests, swamps and wetlands of Big Creek Park/Spruce Lake Protected Area, support important numbers of moose in the summer, where they feed on twigs, grass and foliage. They are particularly numerous in the Big Creek Park area where extensive surveys were conducted in the 1980s and 1990s.

Big Creek Park:

The northern portion of the park has regionally significant moose winter ranges in the extensive wetlands along Fire, Nadila, West Nadila, Scallon and Big Creek valleys as well as southeast of Mount Tom. Moose from many surrounding valleys winter here, migrating from the subalpine meadows, alpine meadows and tundra areas where they have spent the summer. Winter population densities are as high as 2.8 / km. sq. compared to the regional high winter range average of 0.8/km.sq. It is not unusual to come across a large moose in summer in the wide open tundra of the Dil-Dil plateau. Guide-outfitters report unusually large sizes of antlers indicating the health and size of some animals.

Spruce Lake Protected Area:

Moose habitat is found in the valley bottoms and wet meadows of Gun Creek and Tyaughton Creek.

Mule deer:

Big Creek Park/ Spruce Lake Protected Area is an important area for mule deer in the summer and fall, when very large numbers may be found, especially in Big Creek Park. The open forests, clearings and wetlands provide abundant shelter and forage.

Big Creek Park:

The mid-elevation grasslands and sub-alpine meadows are important mule deer summer areas. Lower elevation meadows in the north of the park that have been burned to encourage regrowth and seed for cattle grazing in future years are particularly attractive to them. Guide-outfitters report large numbers of trophy size animals in the park. Mule deer winter in lower elevations of the Chilcotin River valley to the Fraser River benches.

Spruce Lake Protected Area:

Mule deer are very visible in the summer months, especially around Spruce Lake and Gun Creek grasslands and in the subalpine. Isolated pockets of deer winter range are found in the park but it is not known if any deer stay through the winter. Important migration corridors through eastern portions of the park bring deer from lower elevation winter ranges through Lone Valley Creek to Tyaughton Creek and through Dash Creek to upper Relay Creek. Deer collared on the Fraser River have been found later in the year on Cardtable Mountain. The Douglas-fir forests on lower Gun Creek and south of the park are also mule deer winter range.

Other species:

Black bear are found throughout Big Creek Park/Spruce Lake Protected Area feeding in meadows, riparian areas avalanche chutes and grassy south-facing slopes. Cougar are present in both park and protected area but numbers are unknown. Bear and cougar use the upper portions of the park as escape terrain away from contact with cattle. Wolves travel through the north and west portions of the Big Creek Park from Mount Tom to the Tete Hill, Groundhog and Nadila Creek area. It has been reported that there are two packs of twenty animals that use the park and surrounding area.

Hoary marmot, pika and Columbia ground squirrels are just some of the smaller mammals found in the sub-alpine and alpine meadows and edges. All are active for only very short periods in the warmest summer months. They make up an important part of the diet of golden eagles.

A wide variety of small furbearers occur in Big Creek Park/ Spruce Lake Protected Area including lynx, beaver, mink and muskrat. The Big Creek Spruce-cottonwoods area and Scallon Meadows are two important habitat areas. Marten are found in low numbers using large blocks of undisturbed, slightly wetter ESSF forests.

Birds

The high elevations habitats with short growing season found in Big Creek Park/Spruce Lake Protected Area do not support a large variety of bird species. However, the extent of some of the special habitats mean that there are high numbers of certain species. Species that are able to forage for food through the harsh winter conditions are resident year-round, such as seed-eaters, predators, scavengers and those that glean insects from bark. The short season of open water and

Figure 3: Significant Wildlife Use

low productivity in most of the larger lakes mean that waterfowl species are limited. No in-depth studies of bird populations have been conducted in Big Creek Park/Spruce Lake Protected Area; information has been assembled from general texts and reports and from lists created on short-duration visits and other anecdotal data.

Alpine areas provide habitat for horned lark and American pipit that arrive as snow is melting and leave before the first snows arrive. Rock, white-tailed and willow ptarmigan are permanent residents; Spruce Lake Protected Area is the southern limit for willow ptarmigan. Franklin's, blue and ruffed grouse are residents of the high-elevation spruce-fir forests along with red crossbills, white-winged crossbills, gray jay, Steller's jay and pine grosbeaks. Whitebark pine areas provide abundant food for a variety of birds, the most notable being the Clark's nutcracker. The seeds of whitebark pine are wingless, so cannot be carried any distance by the wind. Nutcrackers feast on the seeds, gathering as many as a hundred seeds in pouches in their throats; the seeds are disgorged in batches into underground caches. Abandoned or forgotten caches provide the seeds needed for new generations of trees.

A variety of birds of prey are reported to include bald eagle, gyrfalcon, rough-legged hawk, Swainson's hawk, northern harrier and red-tailed hawk. Cliffs provide nesting sites for golden eagles that feed on large rodents such as hoary marmots and Columbian ground squirrels. Prairie falcon adult and juveniles have been seen near Spruce Lake. Great gray owl and great horned owl are year-round residents, as are three-toed, black-backed, pileated and hairy woodpeckers.

Chickadees, nuthatches, pine siskin, golden-crowned and ruby-crowned kinglet are common throughout the forested areas. American dippers are present in many of the creeks. In the northern portion of Big Creek Park, riparian areas provide habitat for waterfowl and shorebirds and waterfowl are seen in migration on the larger ponds; common loons are seen and thought to nest on the lake between lower Scallon and Nadila Creeks. Hermit and Swainson's thrushes, American robin, magnolia warbler and yellow-rumped warblers are only a few of the summer visitors known to nest. See Appendix 3.

Reptiles and Amphibians

Few reptiles and amphibians are able to survive the harsh winter conditions found in Big Creek Park/Spruce Lake Protected Area. Common garter snake and Western terrestrial garter snake have been reported. Western toad, spotted frog and long-toed salamander are reported from the lower elevation wetlands of Big Creek Park.

Fish

More inventory is needed to determine the types and abundance of fish species, and to delineate upstream limits of species. Rainbow trout and bull trout are recorded from most of the larger creeks, with bull trout seeming to stay higher up in creek systems to avoid competition with rainbow trout.

Big Creek Park:

Resident rainbow trout populations are found in Lorna, Vic and Nadila Lakes, Tosh, Grant and Sluice Creeks and are recorded for at least the lower parts of Nadila, W. Nadila and Fire Creeks. Important spawning habitat is reported in the wide floodplain and point bars area of upper Big Creek. Lorna Lake has char.

Spruce Lake Protected Area:

Bull trout are known to be resident in the full length of Gun Creek. Rainbow trout are present in Spruce, Trigger, Hummingbird and Warner Lakes. Mountain whitefish are recorded in Spruce Lake and Gun Creek, while kokanee originate out of Carpenter Lake.

Insects

Little is known about the insect populations in any provincial parks or protected areas, although most visitors are aware that they are there. Many insects fly up to mountain tops in large numbers to mate, the females staying for brief visits only before returning to their favoured habitat below. Bristly tachinid flies, flower flies, sarcophagid flies, blow flies and swallowtail butterflies are but a few. Ladybird beetles congregate in alpine areas before hibernating together under boulders in large groups. Grizzly bears are known to feed on beetles and moths in the sub-alpine.

Many insects are considered pests in the forests of the park and protected area. Mountain pine beetles attack lodgepole pine trees in some numbers every year, but may build up to very large numbers in mature lodgepole forests. British Columbia has experienced several landscape level events in the last 100 years. Infested trees are magnets for a variety of woodpeckers, some of which strip large sections of bark off infested trees to reach the larvae.

Red- and Blue-listed Species

Red- and Blue-listed plant and animal species are recorded by the Conservation Data Centre (CDC) within Big Creek Park/Spruce Lake Protected Area. See Table 3 below.

A number of local strategies have been identified for managing these species at risk:

- The 1994 Cariboo-Chilcotin Land Use Plan recommendation #80 states: “Habitat requirements of grizzly bears and the other species at risk in the region should be determined through research and inventory programs, as a basis for providing information into subsequent planning processes...”.
- The Draft Lillooet LRMP (2004) document has the following goal for species at risk: “Healthy populations with sufficient habitats across their natural ranges.”

The Identified Wildlife Management Strategy has useful management guidelines for some of the species found in the area.

Table 3: Recorded listed¹ species, as provided by the Conservation Data Centre (CDC).

Name	List Status	Locations	Needs
Plants			
Birdfoot Buttercup <i>Ranunculus pedatifidus</i> ssp. <i>Affinis</i>	Red	Big Creek Park: West Nadila Creek; Spruce Lake PA: Castle Peak	Moist meadows, montane to alpine
Oniongrass <i>Melica bulbosa</i> var. <i>bulbosa</i>	Red	Big Creek Park: Unknown Spruce Lake PA: Gun Creek	Mesic to dry meadows, grassy slopes, steppe to subalpine
Small-fruited Willowherb <i>Epilobium leptocarpum</i>	Blue	Big Creek Park: Graveyard Creek, headwaters Spruce Lake PA: Unknown	Moist meadows, streambanks, montane – alpine zones
Mammals			
Fisher	Red	Big Creek Park: Known Spruce Lake PA: Known	Low elevation riparian systems with older forest, snags and downed wood; corridors with cover
California bighorn sheep	Blue	Big Creek Park: Tosh valley to Elbow Mountain Spruce Lake PA: Little Paradise to Gun-Lizard Ck-Mt Sheba	Open, productive grassy areas, thermal cover, with steep escape terrain and limited disturbance.
Grizzly bear	Blue	Big Creek Park: Big, Graveyard, Tosh, Grant, Nadila valleys Spruce Lake PA: Little Paradise, Paradise, Windy pass, Gun, Pearson Ck ridge	Large undisturbed areas, lush meadows, berry sites, whitebark pine, safe denning sites
Wolverine	Blue	Big Creek Park: Known Spruce Lake PA: ?Known	Remote, undisturbed areas; boulder talus slopes
Fish			
Bull trout	Blue	Big Creek Park: Big, Sluice, Grant, Tosh; Lorna Lake Spruce Lake PA: Gun Ck. System;	Clean, cold water; large deep water for overwintering.

¹ Red- and Blue-listed species are determined by the Conservation Data Centre and the Wildlife Branch using internationally accepted criteria: provincial abundance, estimated occurrences, range, trends, protected occurrences, and threats. A ranking from 1-5 has been established, with red-listed species being 1-2 and blue-listed 3 or 3-4.

The Red List includes species or sub-species that are designated as threatened or endangered under the Wildlife Act, or are candidates for that designation. Blue-listed species are vulnerable taxa that could become candidates for the Red List, or taxa suspected of being vulnerable but information is lacking to put them in another category.

Plants

The four CDC plant records for Big Creek Park/Spruce Lake Protected Area were made in 1977, 1980 and 1981. Little is known about the extent or distribution of the plants or the threats to their viability.

Record tree information:

Spruce Lake PA:

Information about exceptional trees is also tabulated by CDC. The following large tree is recorded from “Southwest aspect, level valley bottom at toe of slope in Tyaughton Creek.”

- Lodgepole Pine: 9'5"/2.87 m CBH, 65'/19.8 m tall, 25'/7.62 m average crown spread.

Mammals

Fisher

The old spruce-cottonwoods area in the middle reaches of Big Creek and the wetland forests in the northern portion of Big Creek Park provide good habitat for fisher. Numbers are unknown but they are reported to be present as a viable population.

California bighorn sheep

Bighorn sheep are common but not abundant throughout an extensive area that covers the higher areas of both parks. In general the bighorn sheep are resident in the area, a situation unique to these herds. The plant communities described in the 1982 Clukata Ridge Ecological Reserve proposal indicate the range of suitable habitats available for bighorn sheep. See Appendix 2.

Big Creek Park:

In Big Creek Park California bighorn sheep use Nadila Lake, Mount Vic, Vic Lake, Powell Pass, Tosh Creek, Clukata Ridge, Dorrie Peak, Grant Creek, Sluice Creek, Lorna Lake, Elbow Pass, Elbow Mountain, and parts of Dil-Dil Plateau during the summer. These areas offer steeper south-facing slopes, rocky cliffs as escape terrain and grassland areas. The south-facing Tosh Creek area is a key productive area.

There is some known migration of sheep from Big Creek Park to the upper Taseko valley and there is an important migration corridor across upper Relay Creek. The sheep population in Big Creek Park is critically low and careful management of activities will be needed to bring numbers up.

Spruce Lake Protected Area:

Bighorn sheep populations in the protected area are stable and healthy. In areas where heliskiing occurs, there must be a 1500 metre separation between helicopters and bighorn sheep wintering areas. Sheep are found east to Mt. Sheba, over the ridges of the upper Tyaughton valley into Little Paradise and along the Tyaughton ridge towards Castle Peak. Waterholes in escape terrain

are important for sheep use of the dry tundra areas e.g. on Mt Sheba. Lambing is known to occur in the Lizard Creek area.

Most sheep summering in Spruce Lake PA migrate to winter habitats in the southern end of Big Creek Park (e.g. Tosh Creek, Elbow Mountain and the Lorna Lake Ridge) where sun keeps the snowpack on the slopes somewhat reduced.

Grizzly Bear

Grizzly bears require large, relatively undisturbed areas containing critical habitat elements for feeding, bedding and denning. Critical habitat elements of about 1 – 5 ha provide a disproportionately large amount of forage requirements such as glacier lilies, whitebark pine, skunk cabbage and berries. Late spring is spent on avalanche slopes, moving higher as summer progresses to wetter forest riparian sites, meadows and wetlands where there is abundant vegetation. There are few options for fishing in either park. Grizzlies are known to forage for marmots and pika by tearing holes in their burrows. Whitebark pine seeds are an especially important part of a grizzly bear's food in both parks.

A grizzly bear core region straddles both Big Creek Park and Spruce Lake Protected Area providing all the habitat elements needed by grizzly bears across all seasons. The area is self-contained and largely undeveloped and is to be managed as one unit. It is important to maintain linkages between populations to maintain genetic continuity and to avoid displacement from their preferred habitat. There is only a low mortality risk from human disturbance.

In a study of grizzly bear habitat in Pukeashun Provincial Park it was stated: "The greatest probable threat to denning grizzly bears is off-trail, high-elevation snowmobiling within 200 m of den sites." (Serrouya, 2004) Heli skiing is also known to impact denning grizzly bears and especially in early March when they first move out of their denning sites. A March 2004 wildlife survey in Spruce Lake Protected Area found skiers preparing to ski down a slope unaware of two grizzly bears seen on the lower slope by the wildlife surveyors.

An on-going large-scale grizzly bear study is focused on determining the population, density, distribution and connectivity in the southern Coast Ranges including both Big Creek Park and Spruce Lake Protected Area. (Apps, 2003). A concurrent project encourages people from the Lillooet area and beyond to report bear sightings. It has four goals: confirm the presence of grizzly bears in the Lillooet area; gain preliminary information on the number of sows with cubs; gain preliminary information on bear-human interactions; and raise public awareness of grizzly bear issues. (Senger, 2003).

Spruce Lake Protected Area:

The 2004 Draft Lillooet LRMP Plan indicates three distinct grizzly bear population units, one of which is the South Chilcotin Ranges that includes Spruce Lake Protected Area. All three population units are designated as threatened and no hunting is allowed. It is estimated there are 55 grizzly bears in Management Unit 5-4 which includes Big Creek Park. (BC Parks, 1996). Estimates of numbers in Spruce Lake PA are shown in Table 4.

Table 4: Spruce Lake PA: Current and target grizzly bear populations:

Spruce Lake Protected Area		
Population Unit	Current Population (Est.)	Target Population
South Chilcotin Ranges	55	110
Identified Watersheds (19)	Current Number	*Target Number
2. Spruce (including Tyaughton, Bonanza, Paradise, Little Paradise)	4.3	5.5
6. Gun (including Leckie and Slim)	4.5	7.1

* Target number is 75% of the mid-point of capability range for each Identified Watershed

**Source: Draft Lillooet Land and Resource Management Plan 2004. MSRM, Kamloops, BC

Spruce and Gun Creeks have high rankings because of the least difference between current and target populations. The connectivity of Spruce Lake Protected Area to Ts'il'os Provincial Park is also important.

Wolverine

Undisturbed wilderness in remote settings are the preferred habitats for the elusive wolverine. Seasonal movements in search of food mean that they can be found in a variety of places depending on the season. Young are born and raised near natal dens in large boulder talus slopes; in summer alpine tundra and krummholz slopes are preferred, where they prey on hoary marmots. Animals move down to forested areas in winter in a large home range. Snowmobile and helicopter-assisted activities have negative impacts on wolverine. There is a noteworthy population of wolverines in Big Creek Park.

Bull trout

Bull trout require clean, cold, well-oxygenated water in stream areas with a steep gradient. Ground water seepage channels are also sometimes used for spawning and large, deep pools are needed for overwintering. Spawning, foraging and wintering habitats may be some distance apart so it is important that the connections between all habitat requirements are protected. Bull trout are known to be resident in the full length of Gun Creek in Spruce Lake Protected Area.

Cultural Values

First Nations

The area of Big Creek Park/Spruce Lake Protected Area is known to have been used by First Nations peoples for at least the past 300 years, and possibly for as long as thousands of years. The area falls within the territory of three Nations: Tsilhqot'in, St'at'imc (Lillooet), and Secwepemc (Shuswap). The Secwepemc band with stated interest in the area is Esket (Alkali Lake) Band. Tsilhqot'in territory is centred on the middle Chilcotin and Chilco River watersheds and surrounding lands. In the southeast it stretches to the west side of the Fraser River opposite the confluence of Bridge River and includes all of Big Creek Park/Spruce Lake Protected Area. Spruce Lake Protected Area is at the far northern extent of the St'at'imc territory, which stretches as far south as the middle of Harrison Lake. Big Creek Park is at the far western edge of the vast Secwepemc territory.

Five Bands of the Tsilhqot'in Nation are the closest First Nation communities to Big Creek Park: Tl'etinqox (Anaham), Yunest'in (Stone), Tl'esqox (Toosey), Xení Gwe'tin (Nemiah) and Tsi Del Del (Redstone). A detailed Tsilhqot'in Traditional Use Study (TUS) involving all these communities was completed in 2001. The information gathered represents the time period since 1940.

The Tsilhqot'in TUS provides useful information about plant, animal and fish species, use of the land and activities in Big Creek Park/Spruce Lake Protected Area. The Tsilhqot'in are Athapascan-Carrier people whose origins are thought to have been in the southern Yukon. Some people fished and spent the winter on the lower Chilcotin River and the Fraser River among Secwepemc people, and the two groups are known to have intermarried. Simon Fraser noted the difference between their language and "manner" and that of the Secwepemc on his journey down the Fraser River on 1st. June 1808. When he returned on 26 July 1808 he commented that the Tsilhqot'ins were back "and came on purpose to have a sight of us" (Tsilhqot'in National Government, 2001). Communication between the Tsilhqot'in and St'at'imc to the south was obviously also well-established as information about Simon Fraser's whereabouts had been passed up and down the Fraser River basin. A possible route for that communication could have been via ancient pathways now known to have gone through Spruce Lake Protected Area and Big Creek Park.

The Tsilhqot'in eked out a subsistence existence from year to year depending on both local food sources and trade goods. Life was only easy every fourth year when salmon were most abundant, and in the intervening years they depended on trade for some of their basic food supplies. When a fort was established at Fort Chilcotin in 1829 at the confluence of the Chilco and Chilcotin Rivers they were not interested in participating in the fur trade. They realised that fur trading could take away from their subsistence gathering in those lean years. The Fort closed in 1844.

Before 1862 the Tsilhqot'in was estimated to be about 1500. The smallpox epidemic of 1862-3- decimated all First Nations populations and changed their distribution. Secwepemc peoples abandoned their settlements on the west side of the Fraser River and in the lower Chilcotin. Tsilhqot'in people gradually took over those lands. It is estimated that there were only about 450

Tsilhqot'in in 1906. The influenza epidemic of 1918-1919 further reduced the population. By 1984 numbers had risen back to 1598. (Tyhurst, 1984).

Graveyard valley is named for the graves that are found there, but the reason for the graves is not clear. The Tsilhqot'in TUS attributes them to the smallpox epidemic of 1862, as graves of people from Alexis Creek. They have also been attributed to the last battle with an outside nation in 1890-1900 (Joe Alphonse, Tsilhqot'in National Government). The Tsilhqot'in and the Lillooet had regular contact on hunting and gathering areas and for trade. Their relations are described as "unfriendly and frequently violent" and people often had skirmishes. (Tyhurst, 1984). A spot on a tributary of Bridge River was described by James Teit as identifying the boundary between both groups and the Fraser River Secwepemc. In 2003 a joint "Bury the Hatchet" ceremony between the Tsilhqot'in and the Lillooet was held in Graveyard Creek.

The Tsilhqot'in hunted in the Big Creek Park area for big game. Deer and mountain goats were valued for their meat and hides while wool and horns from goats were used for salmon spears. Bighorn sheep were not hunted very much. Special ceremonies were performed before hunting grizzly and black bear as bears were considered to be too human-like. They valued the meat, fat, hides and fur. Moose did not move into the area until about 1920. (Tyhurst, 1984).

Hoary marmots were very important in the lives of the Tsilhqot'in, using their skins for robes and blankets and as trade goods. They were hunted in late summer or early fall after they had hibernated; the meat was smoked and the fat particularly prized. Dash Hill, Cardtable Mountain, Eldorado Mountain, Teepee Mountain, and Graveyard Creek are known hunting sites.

Beaver and muskrat were trapped for their meat and fur and mink for their fur. Porcupine were killed occasionally as were "rabbits" (presumably snowshoe hare). This was considered "starvation food", the meat being used in soups and the fur for blankets.

Fishing was most important in the big rivers of the area, but trout were caught in lakes and creeks. Game birds included ruffed, spruce and blue grouse while waterfowl were also mentioned, including mallard, Canada goose, willow and white-tailed ptarmigan. Birds' eggs were also valued.

Berry picking and bulb digging in the high country took planning and energy to accomplish and was usually done in larger groups. Spring beauty, or Indian potato, was an important staple and Cardtable and Eldorado Mountain are specifically mentioned as collecting areas. Yellow avalanche lily, wild onion, chocolate lily, balsamroot, dandelion and prickly-pear cactus are also mentioned. Kinnikinnick, soapberry, saskatoon, chokecherry and low bush blueberry were gathered for food and also for their medicinal properties. Whitebark pine seeds or "pinion seeds" were roasted and eaten, while the inner bark of lodgepole pine and white spruce was scraped and eaten.

Many plant and tree species were used for medicinal purposes. Indian hellebore was an important medicinal plant, called "poison plant". The roots were boiled and used as a decoction to prevent hair loss and dandruff, for bathing for arthritis, and as an emetic. Lodgepole pine sap was used for colds and balsam fir bark for asthma and TB.

Trade between the Tsilhqot'in and Bella Coola First Nations is known to have been an important part of the yearly cycle. Items traded included marmot skin robes, dressed buckskins and dried berries, all of which they could have harvested in Big Creek Park/Spruce Lake Protected Area.

The Tsilhqot'in travelled by horse or on foot, establishing a network of trails that now form much of the present trail system in Big Creek Park/Spruce Lake Protected Area. Major routes were along trails from Hanceville and Taseko Lakes to Bridge River. They left upper Big Creek via Elbow Pass to Tyaughton Creek, Spruce Lake and Gun Creek, and through Warner Pass to Gun Creek. Trails also connected Taseko valley through Iron Pass to upper Big Creek. Further trails dropped down into the Yalakom valley (Tyhurst, 1984). Camping spots were defined by the presence of quality water, with Graveyard Creek valley being especially important.

The Tsilhqot'in TUS Map of all activities indicates use of specific areas in Big Creek Park/Spruce Lake Protected Area:

Big Creek Park:

Activity polygons and scattered activity point sites cover the extensive creek and meadow systems in the northern portion of the park and the mountain areas in the south. There is a concentration of point sites in the Graveyard Creek upper Big Creek area.

Spruce Lake Protected Area:

Activity polygons are shown throughout the eastern half of the protected area. Activity point sites are scattered throughout the same area from Spruce Lake to Tyaughton Lake and Relay Creek. There is a concentration of activity point sites around Spruce Lake, in upper Tyaughton Creek and in Little Paradise Basin.

Non-aboriginal

Ranching History

Livestock grazing, by cattle from ranches outside the boundaries, has occurred in the northern portion of Big Creek Park since the early 1900s. From 1939 to 1964, 4300 domestic sheep were herded every May from the grasslands of Lac du Bois Grasslands Park northwest of Kamloops to the Little Paradise, upper Relay, upper Graveyard, Two Lakes basin and Dash Hill area. On the return to Lac du Bois in the fall lambs were culled from the herd at Clinton and shipped down to Ashcroft to be sent to markets in the Lower Mainland.

Big Creek Park:

Scallon Meadows property was pre-empted by Pat Scallon and his family, who homesteaded a ranch on lower Big Creek, before the first World War. Cabins were built and hay was put up before trailing cattle home for the winter. Gus Piltz, after whom the nearby peak is named, bought Scallon Meadows from the Scallons. The meadows stayed with Piltz's Sky Ranch until bought by Ray and Mary Thomson in the 1980s. Sky Ranch range was not used at that time.

Mining History

Prospecting in the Big Creek Park/Spruce Lake Protected Area started in the early 1900s with many trails cut and camps established with pack horses. Grant Creek in Big Creek Park and the Eldorado-Cinnebar basin area were two such sites. The Gun Creek trail was created and used to service mining activity in the upper Taseko valley, in particular the Taylor Windfall gold mine. Two women, one called Dolly Moore, packed gold from the mine to the processing plant at Gold Bridge. The trail up Gun Creek and over Warner Pass was maintained by the government in the late 1920s to 30s and was kept open all year long.

Big Creek Park:

Oil exploration by CanPet Explorations of Calgary took place in the 1960s in the area of Graveyard valley. A Beaver plane crashed into Lorna Lake in 1961 or '62 killing all four geologists on board. The plane was hauled out by a bulldozer driven up Big Creek valley, in confined places driving through the creek bed itself. The bulldozer tracks are still visible at the lake. The plane was repaired and is known to be still flying on Vancouver Island. A trespass airstrip of unknown age is noted "south of the Grant and Tosh Creek junctions." (MDS 1999) (Bonner, Bliss and Henry. 1995)

Spruce Lake History

The W. D. Trail from Spruce Lake to Tyaughton Creek is named in honour of W. A. "Big Bill" Davidson, a Bridge River valley pioneer. He built Little Gun Lake Lodge in 1933 and later a lodge on Spruce Lake, this one for VIP hunters and fishermen. He used his many horses to pack supplies in to the Taylor Windfall Mine in the Taseko valley via Warner Pass.

Guiding History

Chilco Choate was a well-known Guide-Outfitter in the Big Creek Park area from 1955 until 1992 using horses and occasionally snowmobiles. His areas of use included Graveyard, Tosh, Grant and Big creeks and Lorna Lake. He cut and recut many trails during the 1950s to 1970s.

The first Guide-Outfitting territory in British Columbia was granted in the Spruce Lake area in the late 1880s and has been operated since then on various sizes of territory. From 1954 it was operated by Pat Garrard who established a series of base camps on Spruce Lake, in Eldorado valley, Tyaughton valley and at Grant Creek and many other smaller camps. Big game hunting was the main activity. The license was purchased by Chilcotin Holidays Ltd. In 1991 and the emphasis was changed to all-season wilderness adventure tourism.

Commercial Recreation

Spruce Lake Wilderness Adventures was the first commercial company to establish in Spruce Lake Protected Area, offering guided backcountry ski tours in 1982. Their first cabin was built in 1985 at 2100m.

Outdoor Recreation and Tourism Values

The Big Creek Park/South Chilcotin Protected Area is considered one of the most significant wilderness areas in southern British Columbia and is recognized provincially for its scenery and wilderness recreation opportunities. Early recreation interests related primarily to big game hunting with heavy reliance on horse access. While hunting remains an important use of the area, other activities have become popular. The many features, open terrain, scenic vistas, and extensive interconnecting trails create exceptional attractions for wilderness backpacking and horseback riding. The richly diversified and stimulating environments provide tremendous appeal for photography, wildlife viewing and nature study. The area has also become a winter destination for ski touring, heli-skiing and snowmobiling.

Float plane access, particularly into Spruce Lake, has long been used as a means of getting into the core of the area. Other modes of recreation access are becoming popular including snowmobiling, heli-skiing and mountain biking. The area has also long been used by guides and outfitters, and tourism operators continue to provide primary services for public access and recreation enjoyment. The highest level of use is in the Spruce Lake Protected Area where there is easier access and a greater variety of facilities. The area is used by local residents and to a major extent by visitors from the Lower Mainland, Whistler and other southern regions of the province. There is increasing visitation from other provinces, the United States and Europe.

Recreation Questionnaire

A Recreation Questionnaire was sent to known user groups and individuals, both public and commercial, as part of research for this Background Report. Questions were general in nature, no lists of potential answers were offered, and no specific numbers were asked for. The questionnaire gave the authors an overall view of the values appreciated in both Big Creek Park and Spruce Lake Protected Area, areas of use, seasons of use, concerns of users, and trends that potentially could affect users' future enjoyment. Fifty responses were received in time for analysis for this document. A further half-dozen arrived subsequent to the analysis and are included in the participant listing but not in the analysis.

Responses from the questionnaire are inserted throughout this and the following three sections of the Background Report. Charts and Tables are presented for Big Creek Park and Spruce Lake Recreation Area separately and numbered RQ 1-A and B, RQ 2-A and B, etc., corresponding to the number of each of the questions. They are, therefore, not necessarily in numerical order within the text. Not all questions lent themselves to graphical analysis and text information is summarised instead.

The graphs and tables represent responses from groups and individuals, including commercial tourist operators. Some responses were specific and some were more general; some respondents had many answers while others had a single answer. Some did not answer all questions. In most of the analyses an answer had to appear at least three times before it was included in the analysis. For each graph or table there is an introductory summary and notes for particularly unusual or thoughtful comments. The primary benefit of the questionnaire is that it reveals patterns;

individual responses are less useful for management planning. See Appendix 4 for the complete questionnaire and a listing of all respondents.

Outdoor Recreation Features

A report of the Protected Areas Strategy (*A Protected Areas Strategy for BC. Outdoor Recreation in BC: Supply and Demand; Issues and Trends*) describes what people value for outdoor recreation in BC, and indicates current (1994) trends that relate to these themes. Big Creek Park/Spruce Lake Protected Area provides recreation settings and opportunities that are among these themes.

Responses to the Recreation Questionnaire confirm that visitors particularly appreciate the special landscapes, features, wildflowers and wildlife found throughout Big Creek Park/Spruce Lake Protected Area.

Distinctive Landscapes and Special Features

The serrated peaks of the coastal mountains of the Slim, Leckie and southern Gun ranges contrast with the more rounded ranges in the Grant, Tosh and Nadila creeks area and the Gun, Tyaughton and Relay creeks area. Basalt-capped prominences are striking features above the sedimentary rocks of Castle Peak, Cartable Mountain and Mount Sheba.

High ridges that extend between Big Creek Park and Spruce Lake Protected Area offer dramatic vistas over the immediate surroundings as well the further Coastal Mountains and Chilcotin Plateau. Extensive fossil beds with very well-preserved specimens are found in many places in these same locations, especially in Tyaughton valley, below Castle Peak, in Gun Creek at Mount Sheba and on Elbow Mountain.

Attractive valleys terminating in alpine basins and low passes are found between these ranges: Big, Graveyard, Tosh, Grant and upper Nadila in Big Creek; Relay, Tyaughton, Gun, Leckie and Slim in Spruce Lake PA. The eight scenic lakes found in Big Creek Park/Spruce Lake Protected Area are major park attractions. Each has a different type of setting, adding to their appeal.

Big Creek Park:

The extensive basalt plateau and tundra areas of Dil-Dil Plateau and Dash Hill in Big Creek Park are a special attraction for their patterned ground features and associated alpine flora. Dil-Dil Plateau, Clukata Ridge, upper Big Creek valley, Graveyard Valley and Lorna Lake are only a few of the areas in the southern mountainous areas of the park where visitors can appreciate the spectrum of plant associations. Exploring the extensive wetlands in the northern portions of the park is not as easy, but is rewarding for those who venture there.

In Big Creek Park, Vic Lake is a high alpine tarn surrounded by mountains, while lower down Nadila Creek, Nadila Lake is situated on the edge of Dil-Dil Plateau. It is surrounded by dark spruce-balsam forests and has a very northern, boreal feel. Lorna Lake, in a deep glacially-scoured valley and sub-alpine setting, is a popular destination.

Spruce Lake Protected Area:

Alpine bowls among mountain peaks are attractive all year in accessible Eldorado, Cinnabar, Taylor Basins, but are especially attractive for winter activities in Leckie Range (south of Leckie Creek) and Gun-Leckie Ranges.

Lizard Lake is a smaller glacier-fed lake high up in the headwaters area of Tyaughton Creek. Gun Creek is the link between Hummingbird, Trigger and Warner Lakes in a setting between the serrated Coast Mountains and the rounded Chilcotin Ranges. Spruce Lake has wet meadows, large grassy openings in a southerly aspect with vistas of the Coast Mountains.

Nature Appreciation and Wildlife Viewing

The variety of types of alpine and sub-alpine meadows, open forests, grasslands, wetlands, creeks and lakes creates a spectacular area for appreciation of plants and associated bird life, small mammals and insects. Opportunities also abound for observing numbers of larger wildlife, including California bighorn sheep, mountain goat, grizzly bear, black bear, moose, mule deer and hoary marmot, as well as upland birds (ptarmigan and grouse), raptors, woodpeckers and owls.

Big Creek Park:

Some questionnaire respondents referred to Dil-Dil Plateau as the “Serengeti of British Columbia” in recognition of the outstanding opportunities for wildlife viewing. Guide-outfitters refer to the size and grandeur of the moose and mule deer in promoting their businesses.

Spruce Lake Protected Area:

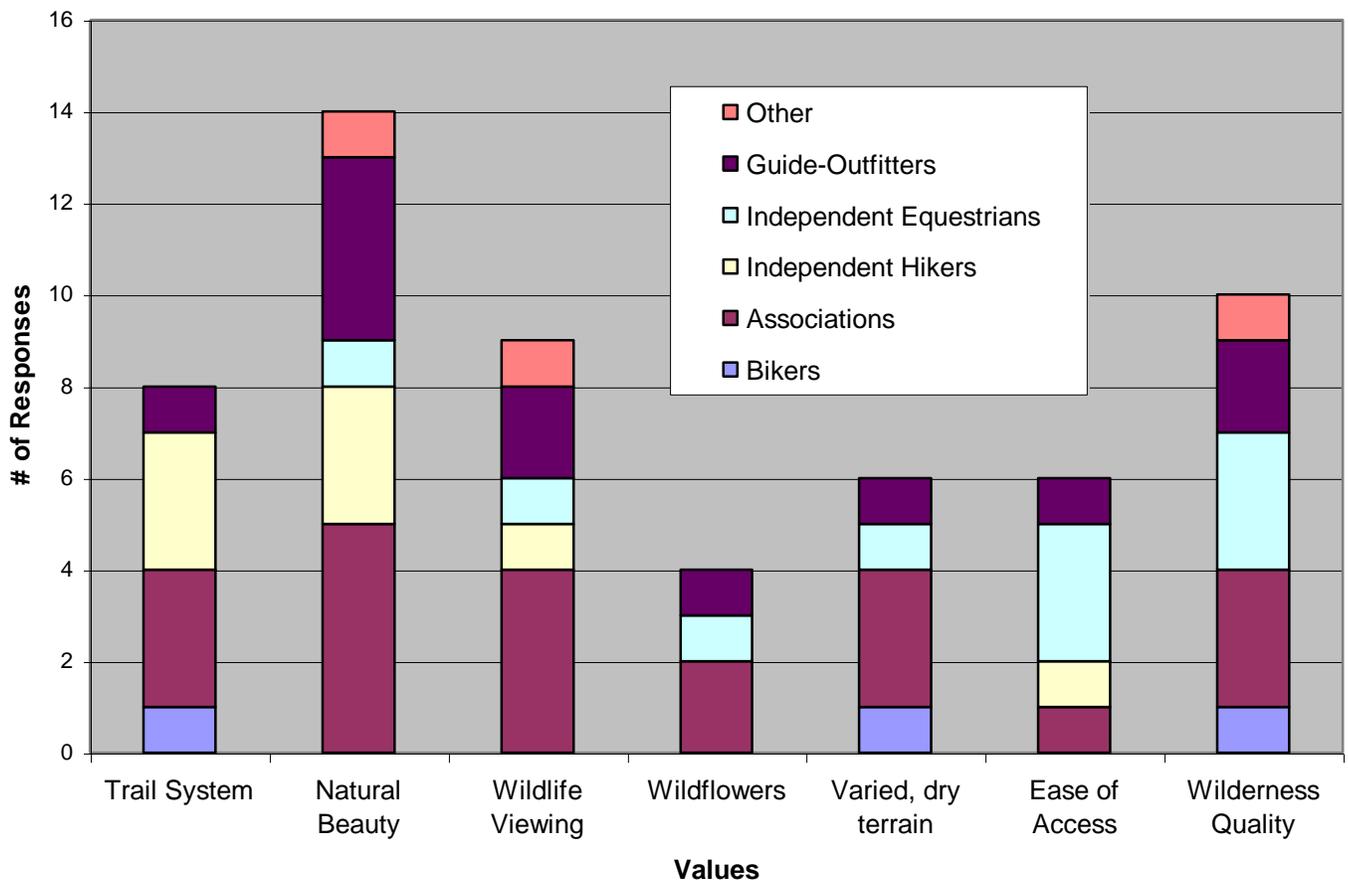
The mountains and basins of the Eldorado, Cinnabar and Taylor valleys are considered by some to be the most spectacular place in British Columbia for plant appreciation and photography. Wildlife viewing in the area is held in a similar regard. The expanses of grasslands leading through dry forests to the alpine in Gun and Tyaughton valleys provide opportunities to appreciate a variety of ecosystems in a short distance. Lakes, creeks, swamps and wetlands add to the variety.

Figure RQ 1-A: Features Valued in Big Creek Park

Summary:

Twenty-five of the 29 Big Creek respondents provided the reasons that draw them to this park for recreation. We have termed these reasons, values. Most listed multiple values – a value had to be mentioned at least three times in responses to be shown in the chart below. We have classified the values into the groupings below. The top four values were, in descending order, natural beauty (56%), wilderness quality (40%), wildlife viewing (36%), and the trail system (32%). The dry terrain and ease of access (particularly for independent equestrians) accounted for 24% each. The only other chartable value, at 15%, was the wildflowers.

Big Creek: Values
N = 25



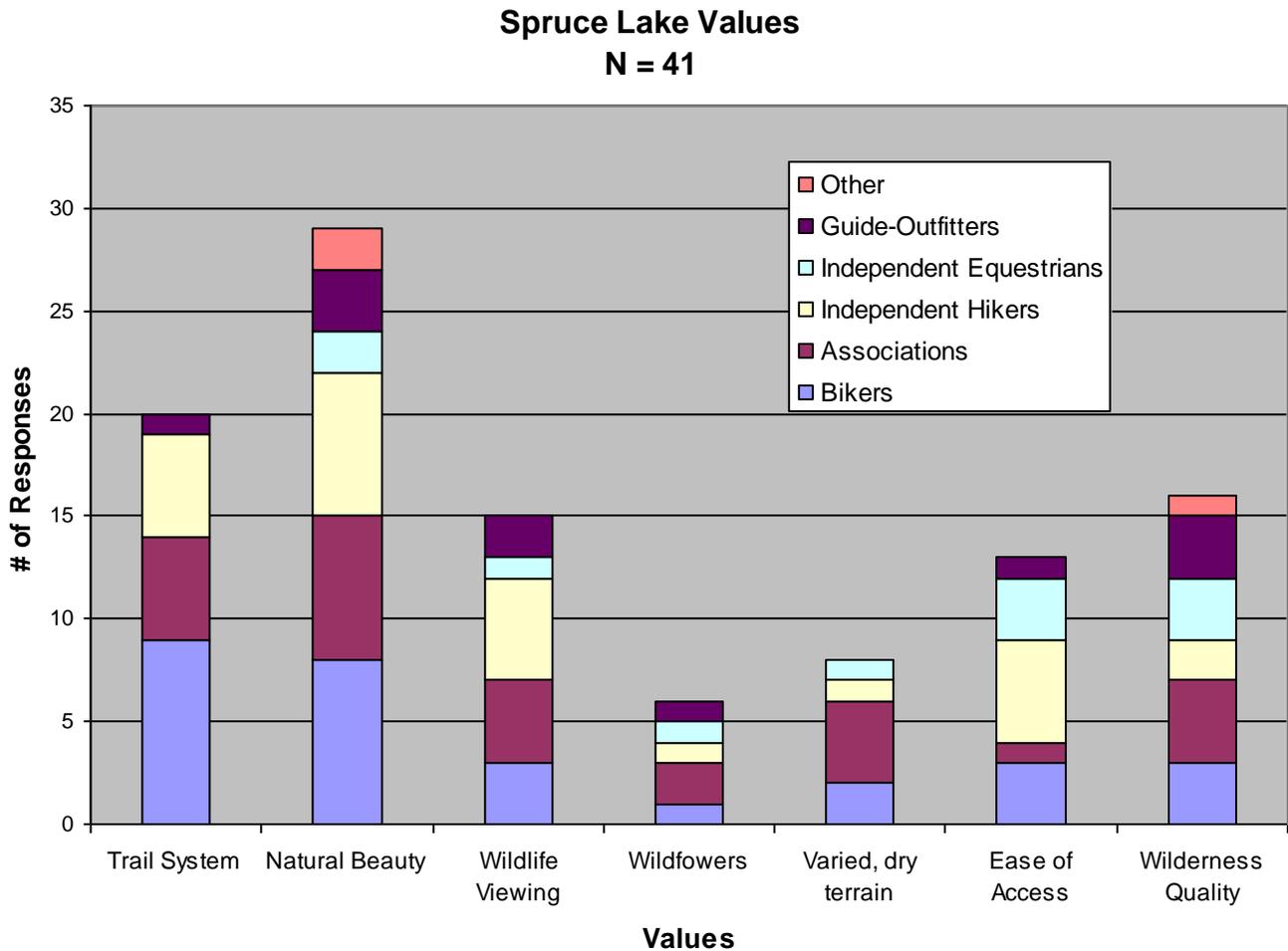
Notes: some other specific reasons given include...

- Legend of cowboy country with endless trails
- Fossils
- Good hunting

Figure RQ 1-B: Features Valued in Spruce Lake Protected Area

Summary:

Forty-one of the 46 Spruce Lake respondents provided the reasons that draw them to this park for recreation. We have termed these reasons, values. Most listed multiple values – a value had to be mentioned at least three times in responses to be shown in the chart below. We have classified the values into the groupings below. The top five values were, in descending order, natural beauty (71%), trail system (49%), wilderness quality (39%), wildlife viewing (37%), and ease of access (32%). The dry terrain and wildflowers accounted for 20% and 15% respectfully.



Notes: some other specific reasons given include...

- “best single point-to-point riding in North America”
- old cultural item – cabins, mines
- geology
- lots of wetlands
- loop trips

Winter activities

Big Creek Park:

The isolation from large population centres combined with many opportunities for snowmobiling and backcountry skiing outside of the park mean that winter use of the park is not heavy. The accessible terrain in the northern portion of the park offers opportunities for snowmobiling.

Spruce Lake Protected Area:

The accessible, extensive alpine bowls and slopes in the upper Gun, Leckie and Slim ridges and valleys provide winter outstanding wilderness experiences for backcountry skiing, snowmobiling and heli-skiing. The Eldorado-Taylor basin area provides a smaller area with similar opportunities for winter activities.

Visual Values

Mountain scenery in Big Creek Park/Spruce Lake Protected Area varies from serrated peaks to rounded ridges and isolated spires to interesting local geological forms. A variety of colourful sedimentary rock formations with basalt cappings rising above dark green forests create particularly attractive mountain scenery. Each of the many accessible large valleys throughout the area offers a different visual experience. Extensive alpine and sub-alpine meadows in wide bowls throughout the mountains provide a riot of colour during the summer months. Grasslands and open forests in the valley bottoms add to the ease of travel and offer many opportunities to admire vistas.

Outdoor Recreation and Tourism Opportunities

Big Creek Park/Spruce Lake Protected Area offers a wide variety of backcountry recreation opportunities for both independent visitors and tourists with commercial companies.

Accessible Backcountry Recreation

Big Creek Park/Spruce Lake Protected Area can be reached from many access points, especially in the south. The relatively easy terrain for hiking, horseback riding and mountain biking is often mentioned in the responses to the Recreation Questionnaire. Visitors can have a mountain wilderness experience without being far from home. Broad valleys and interconnected alpine basins with loop trail possibilities are suitable for long backpacking or horse riding trips. Ease of travel, opportunities for viewing wildlife, for appreciating wildflowers and for fishing in mountain streams and lakes add to the appeal.

Figure 4: Recreation Features and Opportunities

Big Creek Park

Access to the park in the north is by gravel roads and logging roads from Highway 20 at Hanceville and Riske Creek followed by a long gentle hike or horseback ride. In the south access is by logging roads from Tyaughton Lake and Relay Creek followed by hiking or horseback riding into the mountains.

Spruce Lake Protected Area

Proximity to the local communities of Bralorne, Gold Bridge and Lillooet, the growing Whistler-Pemberton area, as well as the Lower Mainland and southern interior populations create a potential for increasing use of Spruce Lake Protected Area. Access points around the park provide opportunities for making trips into different parts of the protected area. There are many opportunities for setting up a base from which to hike over several days, or for setting off on week-long forays into other areas. Spruce Lake is a destination for many visitors after a short hike or ride up Gun Creek valley, or a flight from Tyaughton Lake. Views around the lake are spectacular and there are many opportunities for exploring on day hikes.

Wildlife Viewing

Wildlife viewing is an important component of both public and commercial tourist visitors to Big Creek Park/Spruce Lake Protected Area. Almost a quarter of Big Creek Park questionnaire respondents reported wildlife viewing as an activity; the lower percentage in Spruce Lake Protected Area may reflect the large number of individual responses in that area from mountain bikers who use the park for the downhill experience rather than for natural values appreciation. Many of the guide-outfitting operations promote their business using the spectacular opportunities to view a large variety of wildlife.

Hiking

Opportunities for hiking a variety of distances over varied terrain on durable, gentle trails appeals to a wide spectrum of visitors. Trips can be planned for one or two days or for one or two weeks, and circle trips where no trail is repeated add to the appeal. The Eldorado-Taylor basin area is particularly popular because of accessibility to gentle terrain and alpine flower meadows among spectacular mountain scenery. See Figures RQ 3A & B: Areas Used.

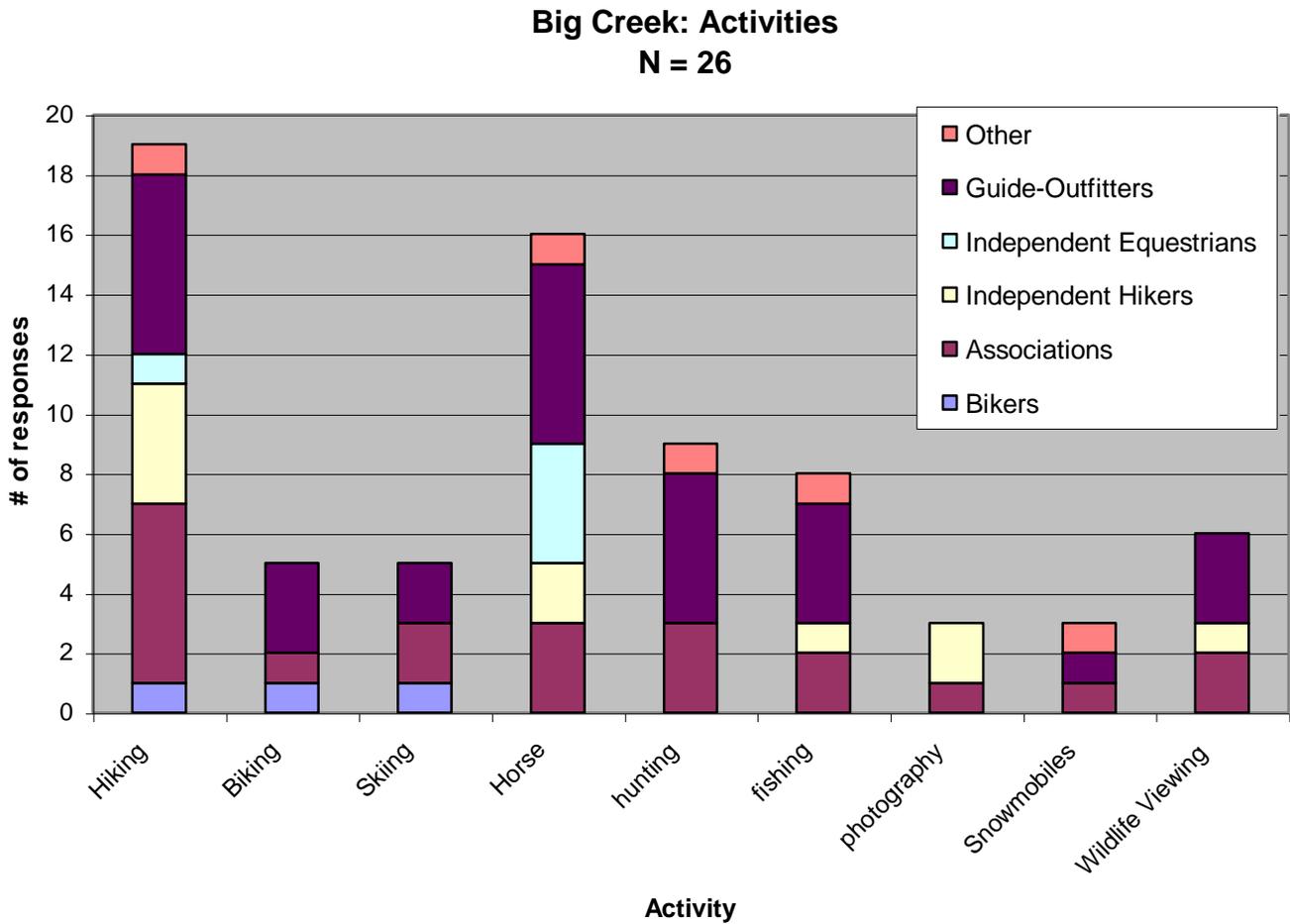
Fishing

Fly fishing in remote lakes and creeks in spectacular settings is available for visitors travelling by foot, on horseback or by float plane. Motors are not allowed on Spruce Lake, bait is banned and barbless hooks must be used. The daily quota for trout/char is set at 2 to protect the fishery. Lorna has char and Vic and Nadila lakes have small rainbow trout.

Figure RQ 2-A: Activities by User, Big Creek Park

Summary:

Twenty-six of the 29 Big Creek respondents listed recreational activities that they participated in, in this area. Most listed multiple activities – an activity had to be mentioned at least three times to be shown in the chart below. Only one mountain biker dealt with Big Creek. The top two activities were, in order, hiking (66%), and horse packing (62%). Hunting and fishing were close at 36% and 31%; the other activities ranged from 23% to 12% - the lowest percent charted. It must be noted that Guide-Outfitters generally listed the activities that they provided commercially rather than their own activities.



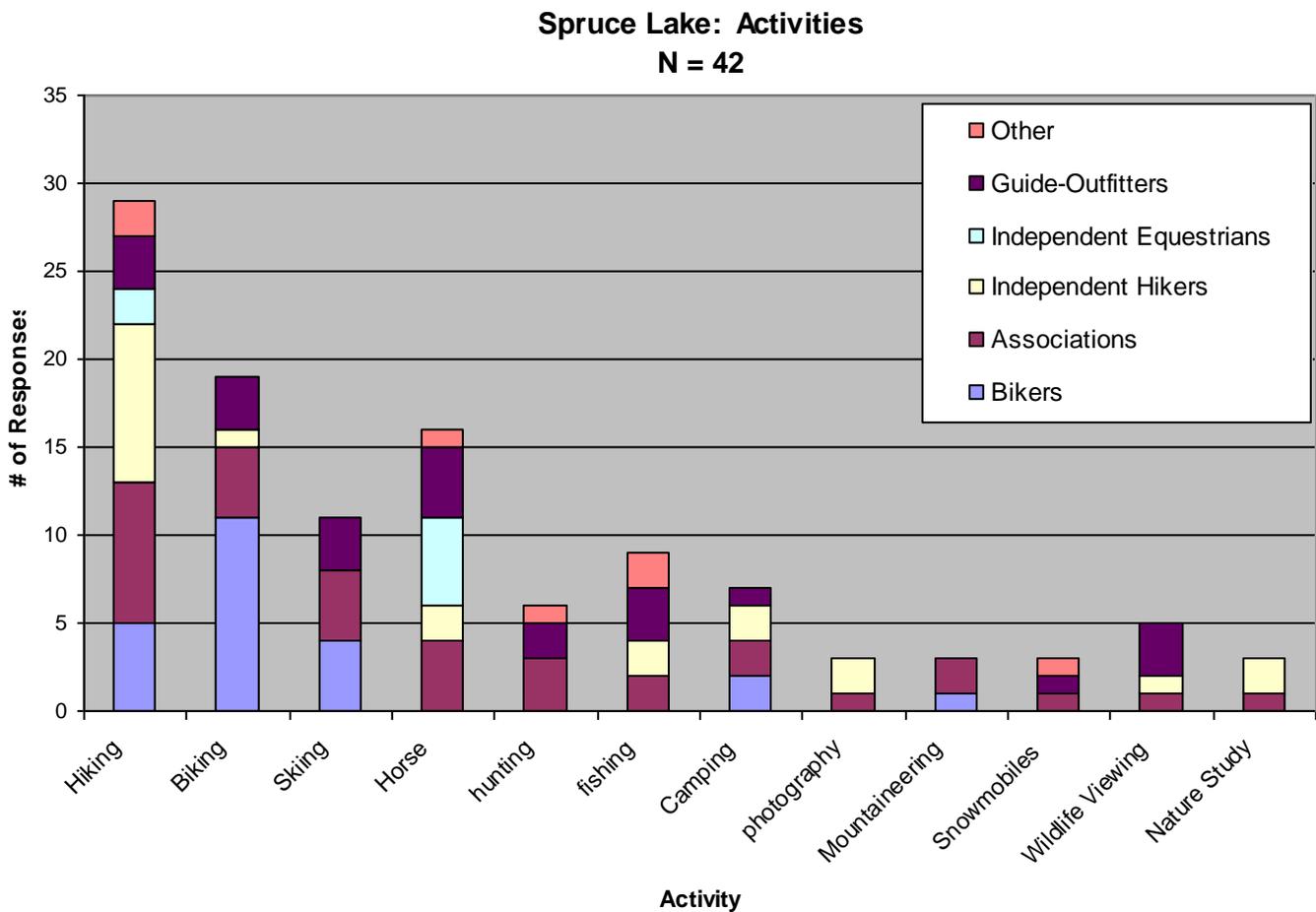
Note: Additional activities included:

- “ATV and snowmobiling in the Tourism-Mining Zone”
- Hut rentals
- Commercial air service
- Canoeing
- Mountaineering

Figure RQ 2-B: Activities by User, Spruce Lake Protected Area

Summary:

Forty-two of the 46 Spruce Lake respondents listed recreational activities that they participated in, in the protected area. Most listed multiple activities – an activity had to be mentioned at least three times to be shown in the chart below. The top four activities – and the only four to be mentioned in 10% or more of the responses - were, in order, hiking (69%), biking (45%), horse packing (38%), and skiing (26%) with fishing close behind (21%). Eight other responses were given accounting for no more than 17% and no less than 7%. It should be noted that Guide-Outfitters generally listed the activities that they provided commercially rather than their own activities.



Note: Additional activities included:

- “ATV and snowmobiling in the Tourism-Mining Zone”
- Hut rentals
- Commercial air service
- Canoeing
- Mountaineering
- Trail running

Winter activities:

Backcountry Skiing:

The deep snow and alpine bowls of the Taylor-Eldorado basins area are a popular destination for both public and commercial backcountry skiing. Slim Creek and Little Slim Creek have been used for backcountry skiing for many years.

Snowmobiling

The extensive alpine bowls and slopes between upper Gun Creek and Leckie Creek and in the Slim Creek area have been a popular public snowmobiling area for many years. The Taylor-Eldorado basins area is also popular for both public and commercial activities.

Tourism

Big Creek Park/Spruce Lake Protected Area has been a tourism destination for many years, with increasing use in the last decade. Guide-outfitters originally offered hunting opportunities and have expanded to include wildlife viewing, nature appreciation and photography as interest in those activities has increased. The popularity of mountain biking, and particularly the thrill of downhill biking, has added to the popularity of the Spruce Lake Protected Area. Some commercial operators offer their permitted cabins for use by the public.

Guide-Outfitting

Guide-outfitters offer a range of activities for their clients besides hunting, including horseback riding, angling, wildlife viewing and photography. Most offer fixed roof accommodation from which daily trips are made, some offer cabin-to-cabin rides. Hunting is promoted as offering a wide variety of species, trophy-sized animals, remote settings, and challenging wilderness.

Packing

Riding with packhorses provides a more rustic experience for tourists, with sleeping accommodation on tent platforms or the ground. Activities offered include horseback riding, angling, wildlife viewing and photography.

Backcountry skiing

Spruce Lake Protected Area

Three commercial operators offer backcountry skiing tours in Taylor-Eldorado basins area, Slim and Lower Slim Creeks area and in Gun Creek-Deer Pass-Tyaughton Creek area.

Snowmobiling

Snowmobiling tours are offered by two commercial operators in the Taylor-Eldorado basins area and Slim Creek area.

Heliskiing

Commercial heliskiing is offered in the extensive alpine bowls and slopes between upper Gun Creek and Leckie Creek, in the Slim Creek area and the Taylor-Eldorado basins area. Actual areas of use depend on weather and snow conditions.

Existing Facilities and Services

Facilities and services in Big Creek Park/Spruce Lake Protected Area have evolved over many years, largely as the needs of commercial guide-outfitters and packers have developed. All the trails predate the establishment of Big Creek Park/Spruce Lake Protected Area with many following old trails established by First Nations, early miners and guide-outfitters. Trails generally follow the major valleys where travel is gentler. In the popular mountain areas of the park and protected area they are used by hikers, horseback riders, pack trains of horses and riders, and mountain bikers. All trails are jointly used by public and commercial visitors. See Figures 4 and 6 for locations of trails and facilities.

Respondents to the Recreation Questionnaire had a wide variety of comments about facilities and services. The need for more trail signs was mentioned frequently, while some would like to see more pit toilets, improved campsites, more trails and possibly some shelters. See Figures RQ 7 A & B.

Parks Facilities and Services:

Big Creek Park:

There are two old 4-wheel drive roads entering the park from the north, one along Fire Creek, and one into the Scallon Meadows area. Both provide access for guide-outfitters to their base camps. There is also a large network of unmaintained trails following many of the major creeks in the park with wilderness, backcountry and walk-in camping, but no facilities provided. Trails in Spruce Lake Protected Area also provide access to the park from the south. Trails are unmarked and often very wet and muddy throughout the season. Pelleted feed is required for horses, to reduce the possibility of spreading weeds.

Spruce Lake Protected Area

Trails are found in all the major valleys through the protected area, following old routes established by First Nations, miners and guide-outfitters. Many old roads in the Taylor-Eldorado basins area are evidence of the mining exploration that occurred in that area. The popularity of

this area led to the publication of a trail map by the Ministry of Forests in 1992 with descriptions of the main trails, including names. A similar 2003 map by a number of volunteer organisations uses the same trail names. See Table 5 for some named trails in Spruce Lake Protected Area.

Table 5: Some named trails in Spruce Lake Protected Area.

Spruce Lake Protected Area			
Trail	Area	Distance	Elevation
Gun Creek	Jewel Bridge to Taylor Pass	31.5 km	1150 m up
Warner Pass	Trigger Lake to Warner Pass	10 km	750 m up
Spruce Lake	Gun Creek to Spruce Lake	2.5 km	200 m up
High Trail	Spruce Lake (S) to S. end Tyaughton Lake	20 km	600 m up 1700 m down
W.D. Trail	Spruce Lake (N) to Tyaughton Creek Trail	5 km	60 m up 120 m down
Tyaughton Cr. Trail	Park boundary (Mud Ck.) to Elbow Pass	32 km	600 m Lizard Ck to Elbow Pass

Wilderness, backcountry and walk-in camping are available, but no facilities are provided. Six sites have an opportunity to cache food and some may have a rustic picnic table and pit toilet. All sites are user-maintained. These sites are at the following locations:

- North end of Spruce Lake
- South end of Spruce Lake
- Gun Creek Grassland
- Hummingbird Lake
- Trigger Lake
- Jewel Bridge

No-impact camping is allowed in the alpine and for backcountry ski camping. Fishing or angling is available with an appropriate licence. Swimming is allowed but lake water is very cold.

Commercial Facilities and Services

Eleven commercial tourism operators are permitted to use Big Creek Park/Spruce Lake Protected Area for a variety of activities. Two of the operators have a series of base camps that may include cabins, barn, shed, pit toilets, tent platforms or horse corrals. All of the camps have been in use for many years and have been upgraded or rebuilt over time. They are not for general public use but some are available for rent and they are available to the public in an emergency. Two rescue caches are located on upper Gun and upper Leckie creeks by a heliskiing company for emergency purposes.

Float Plane Service

Float plane service to Spruce Lake is available for a range of activities including access for landowners at the lake, for guided and public hiking, mountain biking, fishing and hunting. Service is provided to Warner and Lorna Lakes for guided and public hiking, mountain biking and fishing.

Individual property owners on Spruce Lake use their own planes for access to the lake. A commercial tourism operator uses another private float plane service under their Park Use Permit to take supplies in to Spruce Lake.

Figure RQ 7-A: Facility/Use Comments by User, Big Creek Park

Summary:

Twenty-one of the 29 Big Creek respondents commented on the current facilities in, and uses of, Big Creek Park. Responses have been organized into four broad categories: use level, facilities, signs, and other. Evaluations of use varied from “almost too much...” to “current use about right” to “room for lots more”. There was a desire for some simple enhanced wilderness facilities e.g. pit toilets, improved campsites, more trails and possibly some shelters. Only one respondent considered resorts acceptable; many more were adamantly against them. There was significant support for some trail signs.

Big Creek Facilities/Use Level				
Category	Use Levels	Facilities	Signs	Other
Bikers	Level of use up & down - accept it;	pit toilets at a few major campsites	signage would be nice	Bear caches & planned firewood cutting
Associations	Big Creek still OK (bad road)	no resorts, buildings, services	could use some trail signs	
		control # of permanent horse structures / provide earth toilets and gravel tent pads at heavily used campsites	improved signage needed	mitigation -rehabilitate some bad roads, e.g. Relay Creek road, for 2-wheel drive, might reduce pressure on popular areas
	Room for lots more useage		signs and trails	emergency hut in Slim
				need rec plan for trail use and for commercial use
	Almost too much use as it is. Leave it as it is!!	NO RESORTS!		
	Current use about right			Relay Ck Rd - maintain for pickup to old MoF campsite; parking for horse trailers at Big Creek Park trailhead
	Big Creek less travelled - more remote			
			Signage	
	more areas open for horse camping	no resorts or additional services	more signage re: trail etiquette and sharing the area	more bear caches / geological and interpretive signs or brochures

Independent Hikers		resorts outside the park / shelters associated with trail system (even if only for emergencies)		
	No more buildings, trails, signage, etc	Definitely NO resorts in park		
		Need more trails and campsites for independent users with no commercial tenure		
		consider moderate-prices, backcountry ski accom. Limited to small area and camouflaged into the environment		
Independent Equestrians	BC could handle more hikers in southern portion			trail wear and lack of forage restricts horse use to present level
	keep it a "backcountry" experience			
Guide-Outfitters		NO signs, services, resorts: this is a wilderness area		
	Room for more	need more trails, signs, fixed roof accommodations		
	# of commercial operators and camps at maximum capacity; no room for increased grazing / trails for horse users has room for growth	improved recreation sites needed for public visitors	more trail signs: Park boundary, no mechanized use, stay on trails; all non-park signs to be removed (advertising, depletes wilderness feeling)	
	Level of horse use not sustainable (i.e. grazing/trail maintenance)			
		more facilities/use possible if uses are compatible		

Figure RQ 7-B: Facility/Use Comments by User, Spruce Lake Protected Area

Summary:

Thirty-seven of the 46 Spruce Lake respondents commented on the current facilities in, and uses of, Spruce Lake Protected Area. Responses have been organized into four broad categories: use level, facilities, signs, and other. Few addressed the use of the Protected Area which may have been because of their comments fitting more logically into the concerns and issues question. Evaluations of use were varied “almost too much...” to “room for lots more”. There was a desire for some simple enhanced wilderness facilities e.g. pit toilets, improved campsites, more trails and possibly some shelters. An approximately equal number found fixed roof accommodation to be desirable or acceptable as were adamantly against them. There was significant support for some trail signs.

Spruce Lake Facilities				
Category	Use Levels	Facilities	Signs	Other
Bikers	current is appropriate - no more			
		pit toilets at a few major campsites	signage would be nice	Bear caches & planned firewood cutting
		lots of room - needs resorts and services		
			trail signs needed	
			Trail signage needed	
				Suggest bikes, horses, human-powered use is appropriate
	could handle more low-impact use			
	There is room for more use		more trailhead signs and route markers	
Associations		provide earth toilets and gravel tent pads at heavily used campsites		control # of permanent horse structures
	Room for lots more usage	emergency hut in Slim	signs and trails	
		facilities in Spruce Lake and Eldorado, Taylor and Cinnabar Basins need facilities to accommodate and control visitor use - washrooms, bear caches		
	Almost too much use as it is. Leave it as it is!!	NO RESORTS!		

	Current use about right			
	ever-increasing population backcountry travellers particularly in Spruce lake area			Originally game trails (1970s) - became highways made by several Trail Rides guide outfits
			Signage	limit commercial operations
		Adequate - no new facilities needed - some need improvement		
		no resorts or additional services	more signage re: trail etiquette and sharing the area	more bear caches / more areas open for horse camping / geological and interpretive signs or brochures
				trail guides or maps needed for orientation and wayfinding
Independent Hikers		Need more trails and campsite		
		resorts outside the park		shelters associated with trail system (even if only for emergencies)
		No more buildings, trails, signage, etc; Definitely NO resorts in park		
		Outhouses may be needed; Taylor Basin cabin inadequate; need couple of campsites in Taylor Basin - properly set up would reduce erosion in other areas	Signage re: rules e.g. cutting wood, where horses can go, camping etc.	
	keep it the way it is	consider moderate-prices backcountry ski accom. Limited to small area and camouflaged into the environment		
		perhaps some emergency shelters		More trails and access would spread out use
			more maps, signs	more trails, huts - better maintained
			information kiosks and park maps needed	
Independent Equestrians	way too much access by planes and helicopters			
	present use OK			

	SpLk at its maximum use now			trail wear and lack of forage restricts horse use to present level
	keep it a "backcountry" experiences			
Guide-Outfitters	Room for more	need more fixed roof accommodations	need more signs	need more trails
	# of commercial operators and camps at maximum capacity; no room for increased grazing		Signs: Park boundary, no mechanized use, stay on trails; all non-park signs to be removed (advertising, depletes wilderness feeling).	Air traffic: far exceeds what should have been allowed; air supported mountain bikers eliminated or restricted to a certain area / # of public visitors growing - improved recreation sites needed for them / trails for horse users has room for growth - need to grow our numbers to stay afloat .
	Conflicts - disorganisation and incorporation of some of the users (rather than level of use) / Level of horse use not sustainable (i.e. grazing/trail maintenance)	room for more development of public accommodation	Much better trail signage	trails: reopen old, develop some new ones to help maintain limited interaction among users
		more facilities/use possible if uses are compatible		
Other		No further structures permitted	Signs: nothing lasts too long before pulled out or ripped off; more pamphlets/maps with directions indicating camp anywhere but well off of main trails	trail improvements
			Signs: nothing lasts too long before pulled out or ripped off; more pamphlets/maps with directions indicating camp anywhere but well off of main trails	

Figure 5: Spruce Lake Protected Area: Spruce Lake Detail

Visitor Activity Areas

Areas of most intense summer activity are quite localised around a few areas. Once away from those areas visitors appreciate the solitude of the wilderness setting. In winter most activity is confined to the mountains of the southwest part of Spruce Lake Protected Area. Respondents to the Recreation Questionnaire indicated their preference for the accessible alpine bowls of the Taylor-Eldorado basins area in Spruce Lake Protected Area and the mountain areas that straddle between the protected area and Big Creek Park. By far the most use occurs in the months of May to September. Winter activity is limited to public and commercial backcountry skiing, snowmobiling and heli-skiing.

See Figures RQ 3-A & B: Areas Used and Figures: RQ 4 A & B: Seasons of Use.

Big Creek Park:

The largest centre of activity in the lower half of the park is the Bear Creek Camp area operated by a guide-outfitter. This is the base camp for backcountry trips by horseback for hunting or wildlife viewing.

Lorna Lake is a destination for many backcountry hikers and horse riders. It is also a popular fishing lake and the starting point for downhill biking to either Spruce Lake in Spruce Lake Protected Area or through Big Creek Park to access points on Big Creek. Float planes bring visitors from Spruce Lake or from outside the park for fishing, day hikes, guided hikes or longer backpacking trips.

Graveyard Creek is used by visitors to both the park and the protected area as part of longer loop trails or on the way down Big Creek. Dil-Dil plateau is a destination for some visitors to appreciate the peri-glacial features, associated plants and views. Clukata Ridge is visited as part of longer trips for nature appreciation. The Dash Hill area is used mainly by visitors from the Relay Creek area.

Spruce Lake Protected Area:

Spruce Lake is the main centre for hikers and horse riders arriving by Gun Creek valley or for visitors arriving by float plane. It is also the site of two organised public campgrounds, two commercial recreation operations and a number of private cabins. See Figure 5.

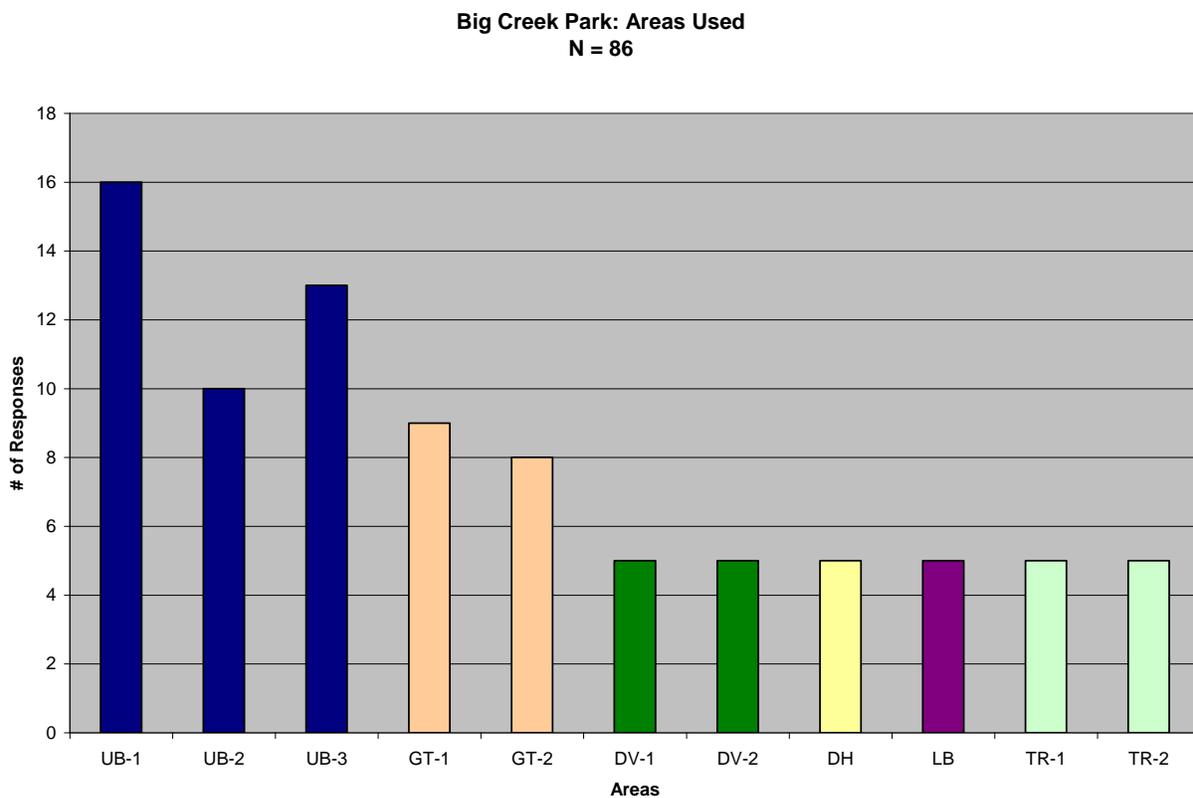
The closely linked Eldorado, Taylor and Cinnebar Basins in the south east of the protected area are popular destinations for day hikes, for camping and hiking, for group camps and for starting backcountry trips of various lengths.

Tyaughton Creek valley provides a popular gradual trail access from the trailhead at the park boundary and from the Spruce Lake area. Trails lead to Lorna Lake and the Big Creek valley, to Graveyard valley, Castle Peak and Cardtable Mountain, and Paradise valley. It is used by hikers, horseback riders and downhill mountain bikers.

Figure RQ 3-A: Areas Used, Big Creek Park

Summary

All of the 29 Big Creek respondents indicated the areas they used in Big Creek Park. Responses included specific locations and general areas; in the case of general areas more specific sites within each area were inferred for the purposes of creating the chart below. An area had to be mentioned at least three times in responses to be shown in the chart. The most popular areas were Upper Big Creek (45%) and Grant and Tosh Creeks (20%). Dil-Dil Plateau and Vic Lake, Dash Hill and Lower Big Creek are visited by considerably fewer respondents. Some respondents indicated that they use the passes in Big Creek Park to access recreation opportunities in the Upper Taseko River area.

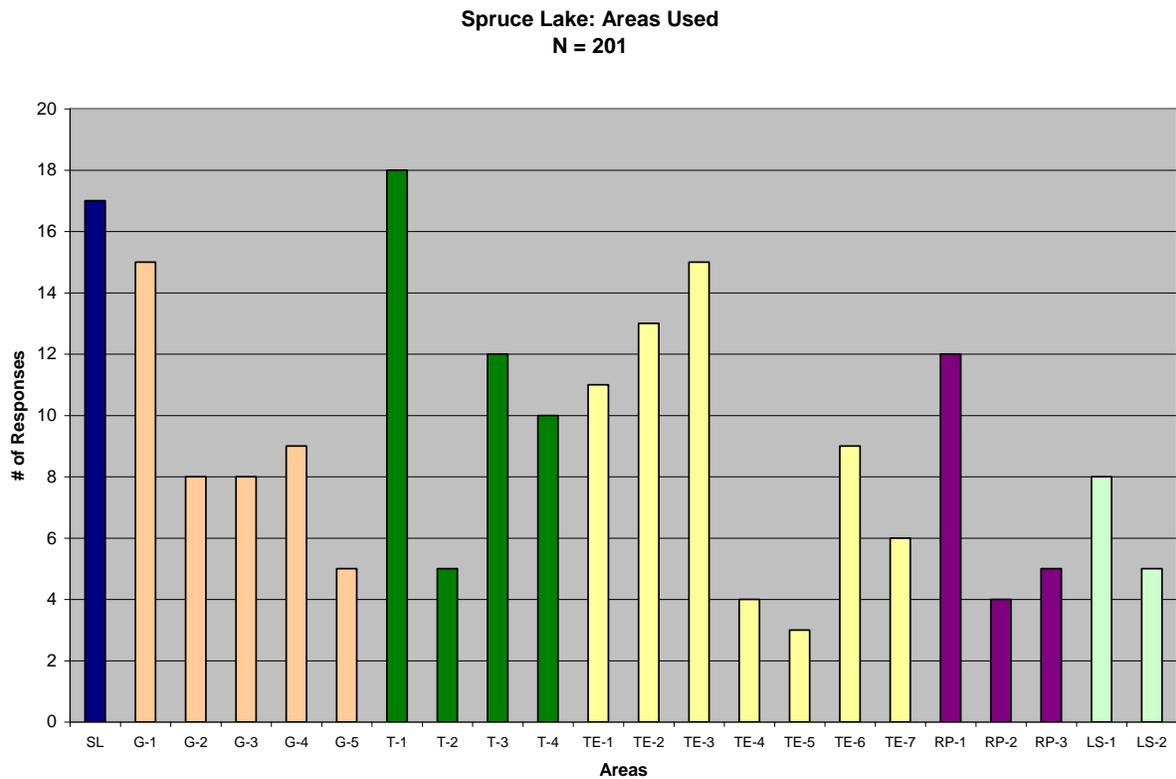


AREAS			
UB-1	Upper Big - Lorna Lake	DH	Dash Hill
UB-2	Upper Big - Upper Big Creek	LB	Lower Big - Lower Big Creek Park
UB-3	Upper Big - Graveyard Creek	TR-1	Taseko River - Powell Creek
GT-1	Grant & Tosh - Grant Creek	TR-2	Taseko River - Iron Pass
GT-2	Grant & Tosh - Tosh Creek		
DV-1	Dil-Dil-Vic - Dil-Dil		
DV-2	Dil-Dil-Vic - Vic Lake		

Figure RQ 3-B: Areas Used, Spruce Lake Protected Area

Summary

All of the 46 Spruce Lake respondents indicated the areas they used in Spruce Lake Protected Area. Responses included specific locations and general areas; in the case of general areas more specific sites within each area were inferred for the purposes of creating the chart below. An area had to be mentioned at least three times in responses to be shown in the chart. The most popular areas were Taylor-Eldorado (30%), Tyaughton Creek (28%) and Gun Creek (22%). The Relay Creek area (10%) and Leckie-Slim area (6%) are visited by considerably fewer respondents. The number of respondents indicating they use the Spruce Lake area (8%) seems to be very low in comparison to known activity in that area.



Areas			
SL	Spruce Lake	TE-2	Taylor-Eldorado - Taylor Basin
G-1	Gun Creek - Gun Creek	TE-3	Taylor-Eldorado - Eldorado Basin
G-2	Gun Creek - Trigger Lake	TE-4	Taylor-Eldorado - Eldorado Mountain
G-3	Gun Creek - Hummingbird Lake	TE-5	Taylor-Eldorado - Bonanza Basin
G-4	Gun Creek - Warner Lake	TE-6	Taylor-Eldorado - Windy Pass
G-5	Gun Creek - Warner Pass	TE-7	Taylor-Eldorado - Pearson Creek Trail
T-1	Tyaughton Creek - Tyaughton Creek Trail	RP-1	Relay-Paradise - Relay Creek
T-2	Tyaughton Creek - Lizard Creek	RP-2	Relay-Paradise - Paradise Creek
T-3	Tyaughton Creek - Deer Pass Trail	RP-3	Relay-Paradise - Little Paradise Creek
T-4	Tyaughton Creek - Elbow Pass	LS-1	Leckie-Slim - Slim, Leckie, Wolverine
TE-1	Taylor-Eldorado - Cinnebar Basin	LS-2	Leckie-Slim - Taylor Pass

Figure RQ 4-A: Seasons of Use, Big Creek Park

Summary:

Twenty-seven of the 29 Big Creek respondents indicated which seasons/months that they recreated in the park. Answers often spread throughout the year in response to different activities, e.g. hiking and skiing. The only clear message is that Big Creek Provincial Park is used throughout the year by a number of different users. Although visitor numbers will change significantly from season to season, the park has no “rest period” where visitors are completely absent.

Category / Month	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
Bikers	Yellow	Yellow	Yellow	Yellow								
Associations	Orange	Orange	Orange	Orange								
Independent Hikers							Green	Green	Green	Green		
Independent Equestrians				Cyan	Cyan	Cyan	Cyan	Cyan	Cyan	Cyan		
Guide-Outfitters	Pink	Pink	Pink									
Other							Blue	Blue	Blue	Blue		

Figure RQ 4-B: Seasons of Use, Spruce Lake Protected Area

Summary:

Forty-three of the 46 Spruce Lake respondents indicated which seasons/months that they recreated in the park. Answers often spread throughout the year in response to different activities, e.g. hiking and skiing. The only clear message is that Spruce Lake Protected Area is used throughout the year by a number of different users. Although visitor numbers will change significantly from season to season, the park has no “rest period” where visitors are completely absent.

Category / Season	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Independent Bikers	Yellow											
Associations	Orange											
Independent Hikers						Green	Green	Green	Green	Green		
Independent Equestrians				Cyan								
Guide-Outfitters	Pink											
Other							Blue	Blue	Blue	Blue		

Park Visitor Profiles

Independent visitors to Big Creek/Spruce Lake Protected Area are largely local people, from the Lower Mainland, or from other parts of southern British Columbia. Commercial tourists are from the Lower Mainland, British Columbia, the United States, and abroad, especially Europe. A 1989 survey taken at Spruce Lake indicated that the “average” visitor was a 34 – 50 year old male from the Lower Mainland with an average income of \$50,000 staying for one or two days. (Ministry of Forests and Lands. 1988)

A guide in Big Creek Park reports that until 2001 almost 80% of clients were from the US and 20% from Europe; now only 10 % are from the US and 90% are from Europe. The drop in US visitors is related to fear of terrorism and the currency exchange; the rise in European visitors is partly attributable to the currency exchange and partly to more aggressive marketing there.

A guide-outfitter in Spruce Lake Protected Area reports their client base includes “all classes of ages, income, education and profession. Families, friends, work associates, couples, singles ... (and)... both genders”. (Chilcotin Holidays Ltd. 1994)

Visitor Use Trends: Past; Present; Future

The Recreation Questionnaire question “*Compared to other areas that you use for this activity(ies), what level of use would you describe as taking place in Big Creek or South Chilcotin Provincial Parks? (Low, Medium, High)*” brought a mix of responses depending on whether the reader thought it was asking about their use or the amount of use in general in the park. We had hoped to obtain information about the latter.

Respondents to the Questionnaire suggested that there would be increased use as the area becomes more popular. They also saw a trend towards more conflict between commercial operations and independent users.

Big Creek Park:

Independent visitors will continue to use the park for hunting and horseback use from the north and alpine hiking, climbing, ski touring and wildlife viewing from the south. Commercial tourists will enjoy guided backcountry horse trekking, hunting and wildlife viewing from the north.

Spruce Lake Protected Area:

Independent visitors and those using commercial tourism operations will continue to grow in numbers as the area becomes known. “Adventure” activities such as mountain bike riding, alpine hiking, climbing, ski touring and wildlife viewing continue to increase in popularity.

Figure RQ 5-A: Perceived Level of Use in Big Creek Park

Summary:

Twenty-three of the 29 Big Creek respondents assessed the level of use in the park in comparison to other areas that they used for similar recreational activities. There may have been confusion in the minds of some respondents who thought the question referred to the level of their personal use or with commercial operators who gave the level of their commercial use of the area. Many respondents gave a range varying by season or activity. Note that no-one considered the level of use to be high.

	Low	Medium	High
Bikers	Yellow		
Associations	Orange	Orange	
Independent Hikers	Light Green	Light Green	
Independent Equestrians	Light Blue	Light Blue	
Guide-Outfitters	Pink	Pink	
Other	Blue	Blue	

Figure RQ 5-B: Perceived Level of Use in Spruce Lake Protected Area

Summary:

Forty-two of the 46 Spruce Lake respondents assessed the level of use in the park in comparison to other areas that they used for similar recreational activities. There may have been confusion in the minds of some respondents who thought the question referred to the level of their personal use or with commercial operators who gave the level of their commercial use of the area. The most commonly cited level of use was medium although nine respondents considered the use as high. It is noteworthy that exactly half of the controversial bike community felt the use was low, the highest figure of any category.

	Low	Medium	High
Independent Bikers	Light Green	Light Green	Light Green
Associations	Light Blue	Light Blue	Light Blue
Independent Hikers	Pink	Pink	
Independent Equestrian		Yellow	Yellow
Guide-Outfitters		Orange	Orange
Other	Purple	Purple	Purple

Figure RQ 8-A: Trends in Management and Recreation in Big Creek Park

Summary:

Twenty-four of the 29 Big Creek respondents offered their thoughts on trends that would have impacts on Big Creek Park. The most common trend identified was increased use as the area becomes more popular. A number suggested a larger biking audience which may entail separate trails. A few see a trend towards conflict between commercial operations and independent users, or a demand for more comforts and services. One respondent noted that overlapping of non-compatible uses decreases wilderness values and increases risk.

Big Creek Trends	
Category	Trends
Bikers	Less desire for motorized use; more desire for longer loop trails and less 2-3 blitz's from drop off zones.
Associations	popularity of mountain bikes / commercial rec tenures / increasing horse use
	inevitable increased use
	A few City people that would keep us out of our own back yard
	separate trails for bikes / nature conservancies for grizzlies
	Outdoor companies such as TLH (<i>Heliskiing</i>) that parachute in with their business and give nothing back to maintain the area
	Excessive commercial recreation causing crowding; loss of public access - road closures
	Commercial operations trying to force out recreationalists
	more logging and mining / more fly-ins
Independent Hikers	additional human pressures / hunting may decline / forest management issues / mining probably not tolerated / horse and backpacking increase
	Access: Pressure for more, easier access.
	Increased use
	more mechanization of Whistler/Tyughton area e.g. helicopter hiking / skiing - should be outside the park
Independent Equestrians	way too much access by planes and helicopters
	BC Parks will have to show willingness to maintain wilderness and conservation values - limit use of resource - maybe cutbacks

	increased facilities and comfort demands
	too many signs at SpLk, too many helicopter and planes / packing in supplies for hikers and bikers who otherwise would only be I for day-use
Guide-Outfitters	Less riding, more mountain biking
	"Healthy lifestyle" trend means increasing numbers of people to the area; Whistler commercialized-overpopulated, people migrating north. Boom in bike industry - looking for more aggressive trails. Few (<i>non-guided</i>) groups are environmentally friendly - need for education on trail etiquette - we constantly pick up after them
	Education and cooperation as key tool in park management a positive trend - continue; incompatibility - more attitude of some members of groups. Backcountry mountain biking: relatively new, gaining popularity world wide; educate and cooperate rather than promoting differences. (Examples cited)
	Bureaucrats - inc in all fees, US/Can\$ exchange, no grizzly tags, no inc in moose tags, 2-yr ahead bookings-difficulty of making a living;
	increased marketing = increased use / overlapping of non-compatible uses decreases wilderness values and increases risk / continued pressure for easier or mechanized access (plane, 4x4, etc.) reduces quality of wilderness /
Other	Overuse by commercial businesses. Tend to bring in larger groups to certain areas that cannot stand that constant abuse.

Figure RQ 8-B: Trends in Management and Recreation in Spruce Lake Protected Area

Summary:

Thirty-eight of the 46 Spruce Lake respondents offered their thoughts on trends that would have impacts on Spruce Lake Protected Area. The most common trend identified was increased use as the area becomes more popular. Many also identified a demand for motorized use of the park; others suggest a larger biking audience. And many see a trend towards more conflict between commercial operations and independent users.

Spruce Lake Trends	
Category	Trends
Bikers	more people / demands for motorized
	Less desire for motorized use; more desire for longer loop trails and less 2-3 blitz's from drop off zones.
	logging, mining / private tours
	logging, conflicts between users
	Private operators limiting public access, Chilcotin Holidays
	motorized access in winter increasing / very little personal horse use - mostly commercial
	More motor sports / govt favouring industrial destruction
	increase in use
	Exclusive commercial tenure will force determined users to ignore tenure - more illegal motorized use
Associations	popularity of mountain bikes / commercial rec tenures / increasing horse use
	inevitable increased use / mitigation -rehabilitate some bad roads, e.g. Relay Creek road, for 2-wheel drive, might reduce pressure on popular areas / improved signage needed
	A few City people that would keep us out of our own back yard
	separate trails for bikes / nature conservancies for grizzlies
	Outdoor companies such as TLH (<i>Heliskiing</i>) that parachute in with their business and give nothing back to maintain the area
	Excessive commercial recreation causing crowding; loss of public access - road closures
	increased use / increased access by helicopter or plane
	Commercial operations trying to force out recreationalists
	more people / commercial operators will want more facilities

	more logging and mining / more fly-ins
	possible component of National Hiking Trail would increase use
Independent Hikers	Increased use
	additional human pressures / hunting may decline / forest management issues / mining probably note tolerated / horse and backpacking increase
	Access: Pressure for more, easier access.
	increasing pressure for mineral exploration; increasing recreation pressure as city grows - Sea to Sky Highway
	more mechanization of Whistler/Tyughton area e.g. helicopter hiking / skiing - should be outside the park
	overuse and user conflict is possible / apparently Utah restricts biking, hiking to alternate days
	tourism development on border of park = loss in wilderness values
Independent Equestrians	way too much access by planes and helicopters
	air traffic issues
	BC Parks will have to show willingness to maintain wilderness and conservation values - limit use of resource - maybe cutbacks
	increased facilities and comfort demands
	too many signs at SpLk, too many helicopter and planes / packing in supplies for hikers and bikers who otherwise would only be in for day-use
Guide-Outfitters	Less riding, more mountain biking
	"Healthy lifestyle" trend means increasing numbers of people to the area; Whistler commercialized-overpopulated, people migrating north. Boom in bike industry - looking for more aggressive trails. Few (<i>non-guided</i>) groups are environmentally friendly - need for <u>education</u> on trail etiquette - we constantly pick up after them
	Education and cooperation as key tool in park management a positive trend - continue; incompatibility - more attitude of some members of groups. Backcountry mountain biking: relatively new, gaining popularity world wide; educate and cooperate rather than promoting differences. (Examples cited)
	increased marketing = increased use / overlapping of non-compatible uses decreases wilderness values and increases risk / continued pressure for easier or mechanized access (plane, 4x4, etc.) reduces quality of wilderness /

Other	licences & public conflicts over access and sites
	Overuse by commercial businesses. Tend to bring in larger groups to certain areas that cannot stand that constant abuse.

Economic Contributions of the Park

The Ministry of Water, Land and Air Protection has completed regular economic analyses of the economic benefits of parks. The latest study, *Economic Benefits of British Columbia's Provincial Parks, September, 2001* provides an overview of the types of contributions, and the substantial amounts of those contributions, that parks make to the economy. The study reports on actual visitor activity within parks, but notes that substantial contributions are also made by non-market benefits such as non-market benefits derived from recreation activity and the ecological services provided by parks.

Direct economic effects related to park visitors that were measured were: groceries, vehicle fuel, other recreational services, meals and repair services. Other direct economic effects were related to: BC Parks Operations, Contractor Operations, and Youth Employment Program. See Table 6.

Table 6: Some Economic Measures for Thompson and Cariboo Districts*

BC Parks Districts	Direct Expenditures	Total GDP			Visitor Expenditures from outside BC	
	Total	Park Visitors	BC Parks**	Total	%	Total
Thompson River	\$54.1	\$34.6	\$6.0	\$40.6	\$32	\$16.0
Cariboo	\$22.7	\$14.3	\$3.1	\$17.4	\$31	\$6.3

* Source: *Economic Benefits of British Columbia's Provincial Parks, September, 2001*

** Includes: Park Operations, Contractor Operations and Youth Employment Program

Many of the visitors from outside the province are from outside Canada. The economic benefits in rural areas of the province are shown to be particularly high as the economic base of those areas is usually very narrow. The report states: "The sustainable nature of parks-derived economic activity is a direct consequence of the stewardship mandate of BC Parks, which should help to ensure that stable and rising levels of economic activity surrounding parks should be available to future generations year after year."

In response to the "less than adequate attention" that tourism received in the Lillooet LRMP process, and to "provide government analysts with a complete picture of the economic importance of tourism", a coalition of tourism operators and tourism associations in the Lillooet region commissioned an economic study in 2001. *Economic Impacts of Tourism in South Chilcotin Mountain Park* was completed by Pacific Analysts Inc. Methodology and results were reviewed by government and accepted. Only commercial tourism operators were surveyed, but some estimates are given of the economic contribution by recreational and independent visitors. "South Chilcotin Mountain Park" is referred to as "Spruce Lake Protected Area" in the Draft Lillooet LRMP and this document.

The report indicates that:

- tourism activity in the South Chilcotin area had been growing by about 7%-10% over the previous five years, (compared to the provincial average of 4% - 5%) and that growth was expected to continue;
- spending in 2000 by tourists at commercial operations was estimated at over \$10.5 million for a total of 32,000 client days;
- over 66% of clients are from outside the province, the majority from overseas
- daily average expenditure in the protected area is over \$320 compared with the provincial average of \$100;
- every dollar of tourism spending increases provincial GDP by 97¢, compared to 90¢ for logging and 85¢ for mining.

Independent visitor use of the park is difficult to determine and the study used an estimate of 5,000 people for an average period of 4 days. Their economic contribution was estimated from average expenditure data in *Economic Benefits of British Columbia's Provincial Parks, September, 2001*, about \$500,000 for the year 2000.

It is estimated that the large numbers of out of province visitors using the commercial tourist operations in Spruce Lake Protected Area spend at least one or two weeks in other parts of the province. Using the provincial average for expenditures, the additional spending amounts to about \$4 million.

The report also discusses the impact of a reduced Spruce Lake Protected Area as indicated in the Community/Industry (CI) group option for the 2001 Lillooet LRMP document. Commercial tourism operators contacted for the economic study indicated that a reduced protected area would have a significant impact on their operations. Concerns centred around the inability to limit access to day visitors, the potential for mineral exploration and logging activity in their high use areas, and the negative impact of taking their visitors through areas open to mining and logging. The “extreme wilderness product” they offer to visitors would “cease to exist”. Operators would be forced to provide a different, lower value product to visitors that would directly impact tourism spending.

Big Creek/Spruce Lake Protected Area is a “postcard type” park that adds to the BC Tourism draw both in Canada, the US and overseas. Proximity of the area to many of the sites for the 2010 Olympics will add to the appeal.

The proximity of the park to the Bralorne and Gold Bridge areas, where properties are being sold as retreats or second homes, and to the Whistler-Pemberton area, where backcountry recreation areas are becoming heavily used, mean that use of the Spruce Lake Protected Area can only increase. The large population centres of the Lower Mainland provide a constantly increasing source of visitors. Improvements to the Hurley River Road would further increase the attraction of the area.

Careful management relating to access and management of use in the three areas proposed as Mining-Tourism Zones will be required to ensure the significant values of the present protected area to the tourism industry are not compromised.

Significance in the Protected Area System

Big Creek Park/Spruce Lake Protected Area together form a continuous protected land base of 139,236 hectares stretching from the lower reaches of Tyaughton and Gun Creeks and extending north through the Coastal Mountain-Chilcotin Ranges divide into major portions of the upper drainages of Big Creek and tributaries.

Provincially, the conservation and recreation values of the Big Creek Park/Spruce Lake Protected Area are rated extremely high, capturing the key protected area attributes of the Southern Chilcotin and Central Chilcotin Ecoregions. The combination of Big Creek Provincial Park and Spruce Lake Protected Area protects a continuum of habitats ranging through the core of the southern and central Chilcotin Ranges to the Chilcotin Plateau, providing a major contribution to the provincial protected area system.

Big Creek Park/Spruce Lake Protected Area encompasses an important range of geological sequences that represent the complexity of the geological history of coastal and interior British Columbia. Significant fossil beds have contributed to the knowledge of fossil formations of their era both nationally and globally.

The parks together represent the transition position on both the north-south divide between the cool plateau and the warm coastal influences and the east-west divide between the dry interior and the moist coastal systems. Large expanses of alpine and sub-alpine meadows and tundra, combined with the variety of the underlying bedrock, creates a particularly rich plant diversity in these high elevation areas. Significant populations of some Red- and Blue-listed species are protected including fisher, California bighorn sheep, wolverine, grizzly bear, bull trout. The relative isolation and variety of habitats contribute to the significance of this core grizzly bear habitat area.

Provincially significant wilderness recreation opportunities are represented for both public and for commercial visitors. The accessible wilderness in fairly easy terrain, with spectacular scenery, open forests, a durable trail network and high elevation fishing is unsurpassed in other protected areas. Big Creek Park/Spruce Lake Protected Area compares in quality to any of the many wilderness parks in British Columbia including Cathedral, Monashee, Manning, Garibaldi, Kwaka, Spatsizi, Assiniboine, Elk Lakes, Hamber, Kokanee Glacier and the Purcells.

Big Creek Park/Spruce Lake Protected Area has important values for First Nations.

Big Creek Park:

Big Creek Provincial Park covers 67,962 ha through a range of ecosystems from AT-ESSF-MS-SBPS. It is the only park in the Cariboo Region to protect the extensive ESSF xc2, with 75% of that variant found in protected areas, and has significant representation of the MS xv and SBSxc variants that are in protected areas. See Table 7. It includes an undisturbed example of alтай fescue grassland community at the southern limits of its range, an unusual 10 kilometre long spruce-cottonwood riparian area in Big Creek and regionally significant wetland complexes.

Regionally significant wintering populations of moose and large summer populations of mule deer include particularly large animals. In conjunction with nearby large protected areas such as Ts'il'os and Churn Creek Provincial Parks, and the special management zones between them, Big Creek Park contributes significant regional ecological values.

Table 7: Biogeoclimatic Subzone and Variant Representation in Big Creek Park/Spruce Lake Protected Area:

PA Name	BGC Subzones & Variants	Total BGC area in BC (ha)	Total BC protected areas in this BGC (ha)	% of BC protected areas in this BGC	Area of this BGC in this PA (ha)	% of total protected areas in this BGC in this PA
Big Creek Park	AT unp	10,681,591	2,527,359	21	16,769	0.66
	ESSF _{xv} 2	140,704	35,221	0.3	26,244	75
	MS _{xv}	889,291	60,828	0.51	16,069	26
	SBPS _{xc}	1058319	33899	0.29	8572	25

PA Name	BGC Subzones & Variants	Total BGC area in BC (ha)	Total BC protected areas in this BGC (ha)	% of BC protected areas in this BGC	Area of this BGC in this PA (ha)	% of total protected areas in this BGC in this PA
Spruce Lake PA	AT unp	10,681,591	2,527,359	21	44,635	1.76
	ESSF _{dv}	111,243	20,627	0.17	13,696	66
	ESSF _{xv} 2	140,704	35,221	0.3	8,977	25
	IDF _{dk} 2	344,161	9,579	0.08	1,092	11
	MS _{dc} 1	49,829	3,271	0.03	2,699	82

Spruce Lake Protected Area:

Spruce Lake Protected Area covers 71,274 ha through a range of ecosystems from AT-ESSF-MS-IDF. It protects 66% of the area of ESSF_{dv} and 83% of the area of MS_{dc}1 variants that are in protected areas. It also has significant representation of the area of ESSF_{xv} and IDF_{dk}2 in protected areas. See Table 7. The warmer and drier climate combined with south-facing slopes leads to unusual plant community associations in some areas with ponderosa pine at its most westerly extension and extensive grassland areas.

Significant areas of sedimentary rocks provide both nationally and globally significant marine fossil deposits as well as contributing to colourful mountain vistas. The park contains many regionally significant rivers, ridges and mountain passes that provide outstanding backcountry recreation experiences. There are outstanding opportunities for appreciating a variety of alpine and sub-alpine meadow systems and viewing a wide range of wildlife. Well-established durable trails and accessible alpine ridges and bowls hospitable to horse use provide many opportunities for a variety of backcountry tours.

Spruce Lake Protected Area along with the Stein Valley Nlaka'pamux Heritage Park provide two large protected areas representing a range of ecosystems from alpine to dry forests in the western portion of the southern interior of the province. The significant broader connections between Spruce Lake Protected Area and Big Creek Park for wildlife habitats and populations, and for recreation opportunities are not found in the Stein. The easy terrain and old established trails in Spruce Lake Protected Area create opportunities for backcountry recreation and tourism not available in the less-accessible and more rugged Stein Valley.

Land Tenures, Occupancy Rights, and Resource Uses

Under the Cariboo-Chilcotin Land Use Plan uses such as recreation, cattle grazing, hunting, trapping and backcountry tourism will be allowed in Big Creek Park. Any activity under licence at the time the plan was approved will continue to be authorized through issuance of park use permits.

Under the Lillooet LRMP protected areas are open to commercial activities, including range and tourism use, under guidance of a management plan.

See Figures 6 and 7 for tenures inside and outside the parks.

Tenures, Rights and Resource Uses in the Protected Area

Park Use Permits

Many pre-existing guide-outfitting and packing activities take place in both Big Creek Park and Spruce Lake Protected Area. Park Use Permits (PUPs) are issued for approved activities based on historical use. A separate PUP is issued for each park and each permit has a specified area, season of use and a range of specified restrictions for each one. Some permits include the use and maintenance of cabins and other structures. No new permits will be issued until management planning is complete.

Some permit areas overlap each other, sometimes with multiple overlaps, especially in the south end of Big Creek Park. Some commercial horseback operators are permitted to graze their horses under their Park Use Permit and must use pelleted seed for their horses in parts of Big Creek Park.

See Table 8 for lists of current PUPs.

Table 8: Park Use Permits

Big Creek Provincial Park			
Company	Purpose	Area	Season
Buchholz, Darryl (Anvil Mountain Guiding, Big Creek Ranch)	Big game guiding and recreational guiding	NW edge Fire Creek, Nadila	Summer Fall
Chilcotin Holidays Ltd.	Big game guiding, angle guiding; hiking & horseback tours	Upper Big, Dash Hill to Dil-Dil to Nadila L.	Summer Fall
Grau, Wilfried, dba Teepee Heart Ranch	Guided horseback trips	Whole of park	Summer
Menhinick, Warren dba Spruce Lake Wilderness Adventures	Recreational guiding for multi- day horseback trips	Upper Big, Graveyard, Grant, Tosh, Upper Nadila Dash Hill	Summer
Saugstad, Clarke Russell	Big game guiding, game camps, tourist guiding	West Nadila N to Nadila Lake, E to Big Creek	Summer Fall
Siegfried Reuter, Taseko Lakes Outfitting	Big game guiding; recreational guiding/horseback riding/hiking trips	Tosh to upper Big to Nadila Lake	Summer Fall
Tyax Air Service Ltd.	General recreational guiding	Lorna Lake	Summer

Spruce Lake Protected Area			
Company	Purpose	Area	Season
Adventure Cross Country	Guided hiking	Eldorado	Summer
Chilcotin Holidays Ltd.	Guided horses, hiking, biking, skiing	Spruce Lake, Gun, Leckie, Tyaughton, Eldorado, Relay/Mud/Paradise	All
Sea to Sky Expeditions	Guided backpacking	Gun Creek, Deer Pass, Lorna Lake, Spruce Lake, Windy Pass	Summer
Spruce Lake Wilderness Adventures	Guided horses, hiking, biking, skiing, rental cabin	Spruce Lake, Gun, Tyaughton, Eldorado, Relay/Mud/Paradise	All
TLH Heliskiing Ltd.	Guided heliskiing	Gun, Leckie, Slim, Eldorado, Taylor, Cinnabar, Bonanza	Winter
Tyax Air Services	Air transportation and guided biking/hiking	Spruce Lake, Warner Lake,	Summer
Tyax Mountain Lake Resort	Guided horses, hiking, biking, skiing	Eldorado, Taylor, Cinnebar Basins	All
Valley Fishing Guides Ltd. (Whistler Air)	Guided fishing	Spruce Lake	Summer

Figure 6: Tenures Inside the Parks

Guide-Outfitting Licences

Four Guide-Outfitting certificate territories cover large areas that include parts of Big Creek Park/Spruce Lake Protected Area. These territories overlap those of the Park Use Permits and the Trappers. Guide-Outfitters are licenced under the Wildlife Act. See Table 9.

Table 9: Guide-Outfitting Licences

Big Creek Provincial Park	
Certificate	Area used in Park
500516	Small section of on north side of lower Fire Creek
500544	South and east of Fire Creek including Dil-Dil; north of Dash Hill
500922	South of Dil-Dil, Tosh Creek-Big Creek to Nadila Lake
500509	South east of Clukata Ridge-Big Creek, south of Dash Hill

Spruce Lake Protected Area	
Certificate	Area used in Park
500509	All the protected area

Trapping Licenses

Trapping licence territories cover large areas that include parts of Big Creek Park/Spruce Lake Protected Area. These territories overlap those of the Park Use Permits and the Guide-outfitters. Traps are licenced under the Wildlife Act. See Table 10.

Table 10: Trapping Licences

Big Creek Provincial Park	
Licence	Area used in Park
TR0504T007	Small section of lower Fire Creek
TR0504T005	Section of middle Fire Creek
TR0504T099	West of West Nadila Creek and North of Dil-Dil Plateau
TR0504T001	South of Dil-Dil Plateau-Nadila Lake and west of Dash Hill
TR0503T100	East and northeast of Dash Hill

Spruce Lake Protected Area	
Licence	Area used in Park
0332T008	All the protected area

Range Tenures

Ministry of Forests Range Section manages grazing tenures in Big Creek Park/Spruce Lake Protected Area through Range Use Permits and Range Use Plans that specify the seasons of use and numbers of cattle in the permit area. Big Creek Park/Spruce Lake Protected Area is only a small part of each of the permit areas. Grazing in the park and protected area usually takes place in the summer and fall. There is to be no livestock access or grazing on Clukata Ridge, an area of special plant associations that was identified as a potential Ecological Reserve until Big Creek Park was established. See Table 11.

Table 11: Range Tenures

Big Creek Park and Spruce Lake Protected Area		
Name	Permit & Unit	Area
Gang Ranch Ltd.	WL1281 Relay Unit Cabin	Upper Big-Graveyard-Dash Hill – upper Dash-Relay-Little Paradise- Paradise
John & Sabine Hoessl	WL1326	Fire Creek to Nadila Creek
John Weetman	RAN071003 Fire Creek Unit	
Gay and Randy Saugstad 50 Bar Ranch Ltd. Walt and Elsie Mychaluk	RAN072199 WL1278 RAN070522 Scallon Unit	North Park boundary through Scallon and Bear creeks to Big Creek
Chilcotin Holidays Ltd. (includes Randy Saugstad horses in Big Creek Park)	RAN072563	Dil-Dil Plateau-Dash Hill south and whole of SL protected area
Spruce Lake Wilderness Adventures		Dil-Dil Plateau-Dash Hill south and whole of SL protected area

Two commercial tourism operators have separate Range Use Permits for horse grazing administered by the Ministry of Forests in Lillooet that cover the same area. The permits specify the total number of days of horse grazing; daily grazing may range from 0-30 head at any one time. The permit area includes part of the southern portion of Big Creek Park and all of Spruce Lake Protected Area, overlapping the Gang Ranch permit in the upper Big Creek and Graveyard Creek areas. Another commercial tourism operator in Big Creek Park also grazes horses under one of those permits.

In some areas of both the park and the protected area there is significant grazing by recreational horseback riders, both public and commercial. It is often associated with use of cabins and camping areas. At present public horse riders do not have Range Use Permits.

Big Creek Park

Livestock grazing is a permitted use in Big Creek Park and permits are administered through the Williams Lake office of the Ministry of Forests. Parts of three Range Units that are largely

outside the park extend into Big Creek Park. Range Use Permits are not issued for cattle grazing in the area of upper Nadila Creek to upper Big Creek. Light and sporadic use occurs in the alpine areas of the Gang Ranch grazing tenure in the park. (South Chilcotin SRMP, 1999). Cattle are moved through Relay Creek to Graveyard and Dash Hill over a six week period in the summer. A cabin in Graveyard Creek is licensed under a special Use Permit.

Drift fences have been constructed in various places in the southern portion of Big Creek Park along Fire Creek, Nadila Creek, near the northern park boundary and in upper Scallon Creek. Drift fences help prevent cattle moving between permit areas or into fragile areas. The park boundary follows a rail fence along the north side of Fire Creek. Range cabins and fenced hayfields at the former Scallon Meadows property are for the use of range managers only.

Mineral Tenures

Big Creek Park

There are two mineral tenures, Eagle 1 and Eagle 2, in the northern portion of Big Creek Park. No work on the tenure holders' part is required to keep them in good standing. There is currently no action underway with the tenure holder.

First Nations Interests

Tsilhqot'in Nation (includes Toosey: Carrier-Chilcotin Tribal Council) has completed a preliminary Traditional Use Study. They have a long-time and continuing interest in and use of the whole area of both Big Creek Park and Spruce Lake Protected Area

Secwepemc Nation (Canoe Creek: Dog Creek and Canoe Creek High Bar; Esketemc: Alkali Lake) territory includes most of Big Creek Park and the north eastern section of Spruce Lake Protected Area (Paradise-Relay area). Esketemc: Alkali Lake Band has expressed an interest in the Big Creek Park area.

Spruce Lake Protected Area:

St'at'imc Nation:

Declaration of the Lillooet Tribe, Spences Bridge, B.C. May 10th, 1911:

As we are in the same position in regard to our lands, etc, and labor under the same disadvantages as the other tribes of B.C., we resolved to join them in their movement for our mutual rights. With this object, several of our chiefs attended the Indian meeting at Lytton on Feb 13th, 1910, and again the meeting at Kamloops on the 6th of Feb last. Thereafter we held a meeting ourselves at Lillooet on the 24th of Feb. last, when the chiefs of all Lillooet bands resolved as follows:

First – That we join the other interior tribes affiliated with the Indian Rights Association of the Coast.

Second – That we stand with them in the demand for their rights, and the settlement of the Indian land question.

Third – That we agree unanimously with them in all the eight articles of their Declaration, as made at Spences Bridge, July, 1910.

The area described includes the whole of Spruce Lake Protected Area.

Patterns of Land Use Next to the Protected Area

Big Creek Park/Spruce Lake Protected Area is surrounded on all sides by activities including forestry, ranching, settlements, and roads. The mountainous area south of Slim Creek and the relatively isolated Taseko River valley area to the west of Big Creek Park are the least developed. Regional and sub-regional land use planning determines the types and levels of use around the parks boundaries.

South Chilcotin Sustainable Resource Management Plan

Big Creek Park:

The South Chilcotin Sub-Regional Management Plan was completed in 1999 after considerable public consultation. The area immediately adjacent to Big Creek Park and to the northern portion of Spruce Lake Protected Area is identified as a Core Backcountry Area, including south of Piltz Peak, Hungry Valley, Upper Dash Valley, Lone Valley and Mud Lakes road. A number of sections of the plan concern activities and issues adjacent to the east side of Big Creek Park.

Viewshed management strategies have been defined for the Recreation Corridor and trail adjacent to Big Creek. Visual Landscape Management Guidelines are in place for areas within 16 kilometres of viewpoints from which panoramic views are appreciated. These include Dash Hill, Mount Tom and Dil-Dil Plateau.

Timber Access, Wildlife Management and Access Management Strategies are in place to direct industrial operations and restrict access in the area. Moose Management strategies are in place to minimize the direct and indirect impacts of industrial activity on moose populations habitat in Upper Dash valley and Hungry valley.

Snowmobiling is prohibited in Hungry Valley wetlands to protect critical moose habitat. ATV and motorcycle use is allowed on the trail through Hungry Valley towards but not into Big Creek Park. There are restrictions on motor vehicle access in alpine areas to protect backcountry values.

Chilcotin Sub-Regional Plan

This plan was started in 2001 and covers all the area to the north and west of Big Creek Park including the Taseko River valley. It has not been completed due to changes in government staffing. Ranching and forest harvesting are the two main activities adjacent to the park, with guide-outfitting and trapping territories over lain. Work has been completed on trails but no final agreement has been made.

Figure 7: Surrounding Tenures and Land Use

Proposed Mining-Tourism Zones

Spruce Lake Protected Area

The 2004 Draft Lillooet LRMP contains a new designation for three areas currently in Spruce Lake Protected Area. Three Mining-Tourism Zones in Slim, Eldorado-Taylor and Paradise Creeks will be designated as “mining/tourism permitted no commercial forestry” areas.

Management Plans for the three Mining-Tourism zones will be guided by the intent of the Memorandum of Understanding between BC Yukon Chamber of Mines, Council of Tourism Associations of BC and the Mining Association of BC. Objective 7 of the Energy and Minerals section of the LRMP states "Encourage mineral exploration and development in mining/tourism zones."

A table of trails for formal Land Act Reserve in the Tourism Opportunities section of the draft LRMP includes trails in Taylor and Cinnabar Basin.

A Management Plan is to be developed for the Mineral-Tourism Zones by mineral and tourism industries, local government and the Ministries of Sustainable Resource Development, Water, Land and Air Protection and Forests. The target date for completion is 2005.

Range Use Plans

Livestock grazing occurs around Big Creek Park/Spruce Lake Protected Area under the same Range Use Plans as described above. They are administered by Ministry of Forests.

Forestry Operations

Areas adjacent to Big Creek Park/Spruce Lake Protected Area have logging roads and cutblocks throughout. Two companies have tenures: Tolko Industries Limited (formerly Riverside Forest Products) around Big Creek Park and Ainsworth Lumber Company Ltd. around Spruce Lake Protected Area.

Tolko Industries Ltd.

Big Creek Park:

The South Chilcotin Sustainable Resource Management Plan includes guidelines for viewshed management, visual management, timber access, wildlife management and moose management that dictate how forestry operations are conducted in the area east of Big Creek Park. Tolko has indicated that “activity will be highly dependent upon the Mountain Pine Beetle (MPB) epidemic and that plans may change as MPB progresses across the landscape.” See Table 12.

Table 12: Tolko Activities Planned in Vicinity of Big Creek Park

Licence and Cutting Permit	Location	Current Status	Management Considerations	Proposed Year of Harvest
A20019 – X53	Piltz Peak	CAT A approved. Roads have been pre-developed.	A few of the blocks are within the viewshed of the park. Cutblock and layout design has incorporated the visual impacts as seen along the Big Creek trail system.	2006. Light levels of MPB are present.
A20019 – X31	Groundhog Creek-Fire Creek	CAT A approved. Roads have been pre-developed.		2006/7. MPB levels unknown at this time.
A20019 – X31	North of park (5800 road).	FDP shapes only.		No planned year of harvest. MPB levels unknown at this time.
A20019 – X31	SE Side of park (Dash Creek)	FDP shapes only.		No planned year of harvest. MPB levels unknown. It is suspected that we are 5+ years away from planning in this area.

Ainsworth Lumber Company Ltd.

The draft Lillooet LRMP document contains restrictions on forest harvesting in mule deer winter range and grizzly bear habitat as well as other guidelines. No information about their plans around Spruce Lake Protected Area was received from Ainsworth Lumber Company Ltd.

Recreation Interests

Recreation interests in the areas surrounding the Big Creek Park/Spruce Lake Protected Area are similar to those already discussed in above sections. Guide-outfitting, adventure tourism and mountain biking websites promote a wide variety of commercial and independent recreation activities that originate in areas around the park and protected area. Many of them also have information about features and amenities in the park and protected area.

Big Creek Park

The Hungry Valley area to the east of Big Creek Park is popular for hunters, fishers, all-terrain riders, snowmobilers. ATV, 4-wheel drive and snowmobile use occurs in the northern portion of the park from outside access roads. The South Chilcotin Resource Management Plan specifies what activities can take place in the area, but personnel to oversee activity is lacking.

Spruce Lake Protected Area

The home base for each of the commercial recreation operators is adjacent to the southern boundary of the protected area and many of their activities start and finish there. Gun Lake and Tyaughton Lake have many recreational properties used as a base for exploring the area by a variety of means. Intensive off-road vehicle use has been directed to the Mud Lake area east of the Tyaughton Creek trail head. Snowmobiling is a popular winter activity and heli-skiing in the park has its base at a lodge on nearby Tyaughton Lake.

Private Property and Intensive Use

Spruce Lake Protected Area

The area adjacent to the southeast border of Spruce Lake Protected Area is the most intensively developed with a mix of private properties, small ranches, woodlots, mineral tenures, lodges, and recreational cottages on Gun and Tyaughton Lake.

Water rights

There are some water licenses on Big Creek north of the park boundary and domestic water intakes on Gun Creek and the southerly creeks draining the Taylor-Eldorado basins area of Spruce Lake Protected Area.

Statutory jurisdictions

Fisheries BC manages non-anadromous fish in the park including the establishment of regulations for seasons of use and catch limits.

Other agencies' interests

Big Creek Park is in the Cariboo Regional District. Information about Tourism Commercial and Resource, Agricultural, Rural, and Rural zoning around Big Creek Park was not received.

Spruce Lake Protected Area is within the Squamish-Lillooet Regional District. A Regional Ideas Symposium conducted in 2004 as part of the development of a Regional Growth Strategy. "Backcountry Use and Access" was rated as a Moderate priority.

BC Parks Operations

Operations, Infrastructure and Facilities

There are no facilities in Big Creek Park/Spruce Lake Protected Area and there is little on-going operations activity until management planning is completed. Irregular patrols are made and in Spruce Lake Protected Area food caches have been constructed in some popular camping places. Park Use Permits have been issued to reflect historical use.

Key Management Issues

The sheer size and geography of Big Creek Park and Spruce Lake Protected Area create challenges for park managers. Issues have been identified by previous planning processes, by Park managers and by other ministry staff. Respondents to a Recreation Questionnaire distributed as part of the preparation of this document also identified a number of issues that concern them. Many of the issues in Big Creek Park/Spruce Lake Protected Area do not fall into a single category. There are a number of instances where they overlap and where creative management actions will be needed to ensure a balance between conservation values, recreation use and resource use.

Management of Ecological Values

Ecological Integrity

The boundaries of both Big Creek Park and Spruce Lake Protected Area do not follow height of land features and there are no complete watersheds in either area, creating problems for habitat management. High elevations, severe climate, thin soils and a short growing season present special ecological conditions over extensive areas with many areas of significant plant associations and areas of unusual plant associations. There is provincial concern about the future health of whitebark pine forests.

Historical and current livestock grazing, past mining activity and public and commercial recreation are just some activities that have impacted, and continue to impact, many parts of this park and protected area. These activities present particular problems for park managers in maintaining natural values. They are also addressed under Recreation Issues.

Some specific management concerns include:

Lack of meaningful ecological information:

- Most existing data is site-specific and based on single visits,
- Management of special ecosystems requires ecological information based on science,

- Restoration of damaged ecosystems requires general and specific ecological information.

Trail braiding, short cuts and off-trail travel by recreational users:

- Destruction of vegetation over large areas on sensitive soils, e.g. Tyaughton Creek grasslands,
- Use of trails when they are wet creates muddy areas and braiding,
- Potential for introduction and spread of non-native species.

Horse use:

- Grazing in known sensitive areas has the potential to reduce plant viability and introduce non-native species,
- Overgrazing in areas around commercial base camps,
- Overgrazing in other camp areas, both commercial and public,
- Hay carried for horse use has the potential for introducing non-native species.

Livestock grazing:

- Historical overgrazing has altered the species composition in some areas,
- Overgrazing by cattle in sites they prefer, e.g. west of Nadila Creek and hummocky soils in wetland areas of Big Creek Park.

Water quality concerns:

- Algae in Spruce Lake detracts from the recreational values of the lake,
- Impact from septic systems and horse use around Spruce Lake,
- Impact of plane use in all lakes.

Management of Wildlife Values

Big Creek Park/Spruce Lake Protected Area provides rich and diverse habitats for a wide variety of wildlife associated with high-elevation mountain and plateau areas. The same conditions that limit plant growth limit the ability of wildlife to withstand outside pressures on them and limit management options. Information on most wildlife species and their distribution in the park and protected area is not sufficient for good management. Inventory of wildlife species in the Southern Interior and Cariboo Regions is not consistent and is a particular concern for management of those species that move between the two regions. Recreation activities impact wildlife species and are also addressed under Recreation Issues.

Some issues for management of wildlife include:

Understanding the needs of wildlife populations:

- Identification of critical habitats and population surveys that aid in protecting wildlife are lacking.

Wildlife disturbance by recreational activity, including:

- Impacts of recreational activities on wildlife populations are not understood, e.g.:
 - Disturbance in critical seasons of lambing/calving/fawning/denning,
 - Disturbance in winter ranges of mountain goats,
 - Disturbance in critical habitat areas by helicopters,
- The cumulative impact of many activities over time is not known.

Livestock-wildlife conflicts:

- Impacts of livestock-wildlife interactions is not well understood
- Range tenure holders taking personal action against predators, especially wolves and grizzly bears.

Management for Red- and Blue-listed species

There is a lack of information about Red- and Blue-listed plants in both the park and the protected area. This may reflect the lack of field inventory work, rather than a true absence of taxa or plant communities of concern. Some species require special attention because of their scarcity or rarity but management guidelines exist only for some species, not all. There is a need to balance the conservation of grizzly bear, California bighorn sheep and mountain goat habitat with use of the area (Big Creek Park MDS, 1999; Lillooet LRMP, 2004). Recreation activities impact Red-and Blue-listed species and they are also addressed under Recreation Issues.

Grizzly bear:

- Increased potential for human-bear interaction in the Eldorado-Taylor-lower Tyauthton area where there is a fairly high concentration of grizzly bears and large numbers of visitors,
- Conflicts between grizzly bears and horses/dogs where open country gives good visibility,
- Lack of information on grizzly bear food sources and seasons of use,
- Impact of winter recreation activities in grizzly bear denning.

California bighorn sheep:

- California bighorn sheep numbers are critically low in Big Creek Park,
- Impact of helicopter activity in wintering areas of California bighorn sheep,
- Population recovery phase requires sensitive management.

Fisher and Wolverine:

- Lack of information about these species and their needs hinders best management practices,
- Impact of winter recreation activities in wolverine wintering areas.

Mountain goat:

- Goat populations are thought to have declined in the Slim-Leckie area
- A helicopter refuelling station in Slim Creek, outside the protected area is situated where machines must make multiple flights directly over goat winter range

Fire, Insect and Disease Management

White pine blister rust:

White pine blister rust is present throughout the whitebark pine forests in Big Creek Park/Spruce Lake Protected Area with the potential for widespread loss of trees.

- Implications for grizzly bear populations and other species that rely on pine nuts,
- Potential for planting rust-resistant trees to maintain the food source.

Management for Fossils

There are significant fossil beds in the park that have international importance. The general public is not aware of the variety of fossils, their importance and their value to science. Provincial palaeontologists are concerned that all the important Triassic sequences could be locked up against collection. A compromise was made through the Lillooet LRMP.

- Some significant areas of fossil beds are in the proposed Mining-Tourism Zone,
- Mesozoic strata in the Tyaughton Creek/Gun Creek/Relay Creek area needs further scientific study,
- Collecting should be by permit only with reporting a condition of the permit.

Management of Recreation Use

Responses to the Recreation Questionnaire gave an overall view of the values appreciated by both visitors and commercial tourism operators in both Big Creek Park and Spruce Lake Protected Area. They also indicated areas of use, seasons of use, concerns of users, and trends that potentially could affect users' future enjoyment. Two questions brought a wide variety of comments and suggestions that have been combined into two charts indicating the concerns and issues most often mentioned. See Figures RQ 6-A and RQ 6-B.

In Big Creek Park the three top issues identified involve mountain bikes, float planes and resource extraction concerns; in Spruce Lake Protected Area the top three issues identified involve: mountain bikes, commercial operators and resource extraction concerns. When "mechanised travel" is added to the mountain bike total in Spruce Lake Protected Area, it becomes the most important issue by a large margin.

Many recreation users fear encroachment by resource extraction will damage recreation experiences. Also noted by many was the encroaching use and demand for additional motorized vehicle access to these areas.

Need to Balance Conservation, Recreation Use and Resource Use

Areas of resource sensitivity and areas where recreation uses conflict with those values have not been specifically identified in either Big Creek Park or Spruce Lake Protected Area. The Recreation Questionnaire did not specifically gather that data. Sensitive areas include such areas as alpine meadows, grasslands, wetlands, shale slopes and special plant associations. Issues and potential solutions presented below are based on responses to the questionnaire, and discussions with park users and park managers. Future management planning will determine actions to be taken.

Separating conflicting activities on different trails:

- New trails would need to be created, further impacting conservation values,
- Difficulty of keeping conflicting users on their designated trails,
- Present trails may follow the best routes that have evolved over time.

Camping areas and horse grazing sites:

- Overlapping tenures, increased use by horses, and public horse use have impacted some specific sites, reducing the integrity of the plant systems,
- Overgrazing and uncontrolled camping in Graveyard valley have been identified as an area of particular concern

Off-trail use by hikers, horse riders and hunters

Spruce Lake Protected Area:

- Past overgrazing in the Spruce Lake area has created pockets of weeds,
- Off-trail activity and horse grazing on the Tyaughton valley grassland slopes has disturbed large areas.

Figure RQ 6 & 9-A: Issues in Big Creek Park

Twenty-five of the 29 Big Creek respondents listed what they felt were conflicts, concerns or issues in Big Creek Park. Most listed multiple issues – an issue had to be mentioned at least three times to be shown in the following chart. Only one independent mountain biker dealt with Big Creek.

The top three issues were, in order, bikes (52%), resource extraction (40%) whether logging, mining or both, and planes (36%). Commercial operators and related overgrazing tied at 32%, and horses (28%) followed close behind. Bikes were the highest issue in terms of mention. Mountain bikers worried about their recreation being banned in the area; comments from the other groups ranged from actively supporting such a ban to seeking a resolution of the conflict in other ways e.g. zoning, specific trail restrictions, education, etc. Plane flights into the area resulted in all respondents recommending severe limitations on numbers of flights, timing of flights, and/or locations of flights. Commercial operator issues often dealt with attitudes and behaviours both between operators and other users, and amongst operators. Horse concerns primarily focused on trail damage and bad grazing practices.

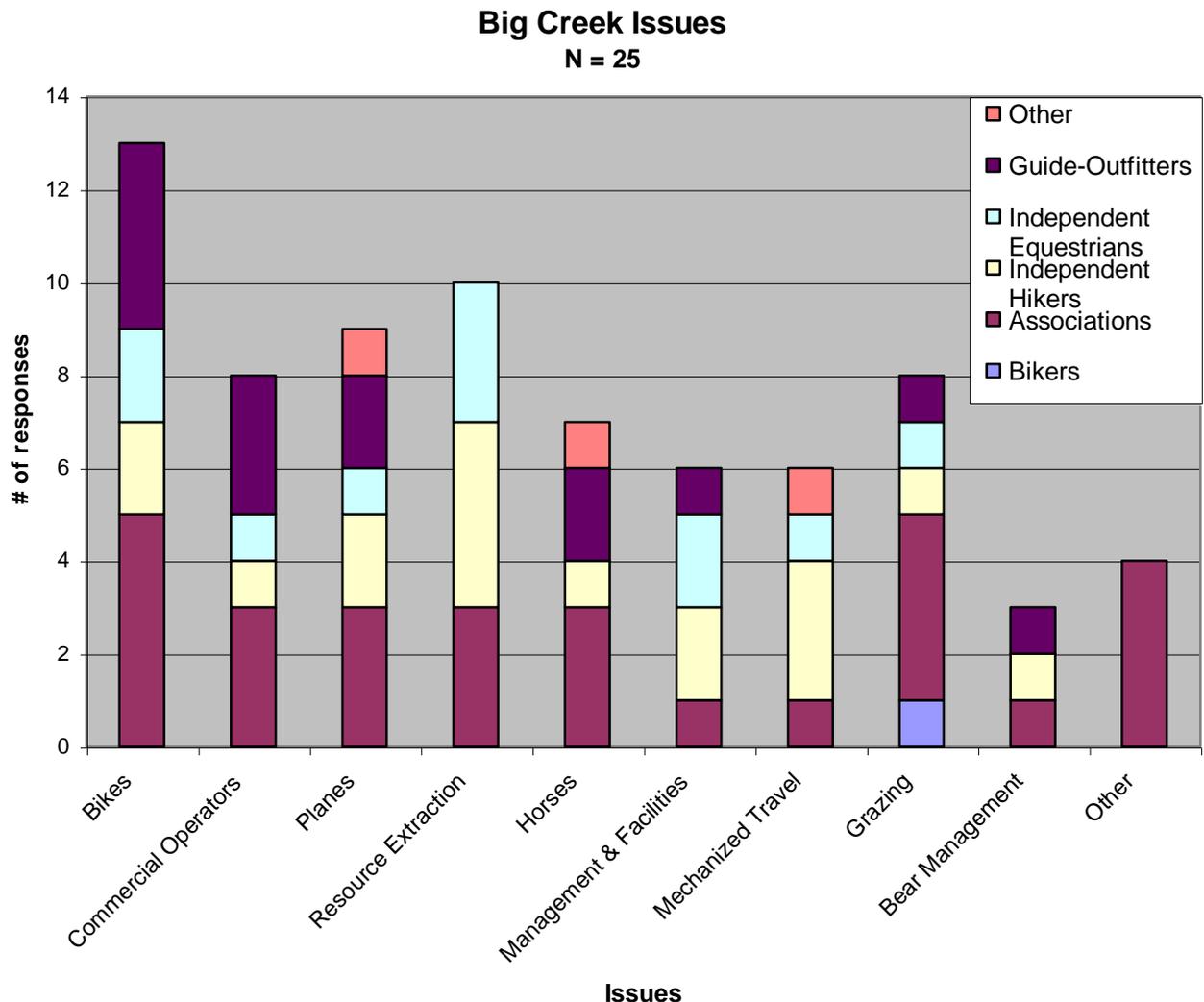
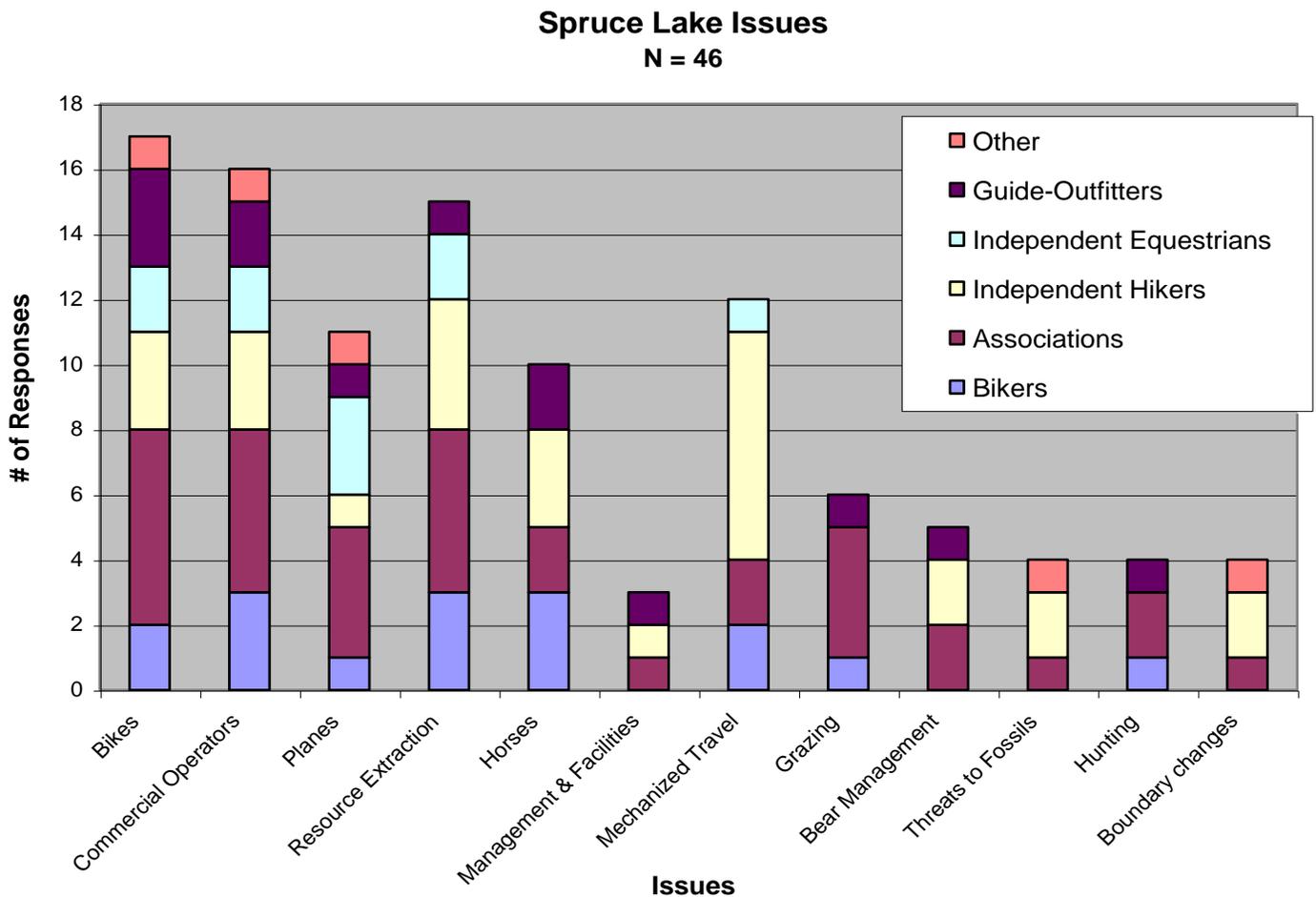


Figure RQ 6 & 9-B: Issues in Spruce Lake Protected Area

All 46 of the Spruce Lake respondents listed what they felt were conflicts, concerns or issues in Spruce Lake Protected Area. Most listed multiple issues – an issue had to be mentioned at least three times to be shown in the following chart.

The top three issues were, in order, bikes (37%), commercial operators (35%), and resource extraction (33%) whether logging, mining or both. Representatives of all six categories of respondents identified mountain bikes and commercial operators as concerns. In the first case, mountain bikers worried about their recreation being banned in the area; comments from the other groups ranged from actively supporting such a ban to seeking a resolution of the conflict in other ways e.g. zoning, specific trail restrictions, education, etc. Commercial operator issues often dealt with attitudes and behaviours both between operators and other users, and amongst operators. Independent users frequently noted hostility shown to them by specific operators

Close behind these top three issues were motorized travel (26%) with most, but not all, favouring its exclusion from Spruce Lake Protected Area; plane/helicopter flights into the area (24%) with all respondents recommending severe limitations on numbers of flights, timing of flights, and/or locations of flights; and horse packing (22%) which primarily focused on trail damage and bad grazing practices. Unsustainable grazing practices and bear management issues related to recreation were the only other concerns that accounted for over 10% of the responses.



Notes relating to Figure RQ 6 & 9 - B: Issues in Spruce Lake Protected Area:

- One respondent noted “underfunding for infrastructure; planning is meaningless without resources”.
- 2 respondents made requests or presented options for snowmobile routes.

Need to Formalize Recreation and Tourism Use and Development

Multiple layers of activities in some areas, use of trails by many forms of recreation and overuse of some lower elevation areas diminish the recreation enjoyment for some visitors to Big Creek Park/Spruce Lake Protected Area. Respondents to the Recreation Questionnaire provided a number of concerns and issues about activities.

Dispersed Recreation

Mountain biking

Mountain biking in both Big Creek Park and Spruce Lake Protected Area receives the lion’s share of complaints from participants in virtually all other recreation activities. Many of these complaints focus on:

- Perceived unsafe activities amongst other park users,
- Suspected vandalism of backcountry cabins and facilities,
- Naiveté with regard to preparedness for wilderness experiences,
- Perception that mountain bikers lack a “wilderness ethic”.

Other independent users:

Commercial operators also came into conflict with independent users through what is perceived as rude and harassing behaviour with the goal - users felt – to discourage them from using the areas.

Big Creek Park:

Unauthorized motor vehicle access

- Logging adjacent to the park creates new access points,
- Access roads into the park are used by permittees creating access control difficulties.

Commercial Recreation

There are significant issues amongst commercial operators who are increasingly in competition with one another on the same or adjacent land. Most common complaints were with regard to other operators’ misuse of the area (e.g. overuse, poor stewardship) and direct conflicts including intimidation.

Float Planes:

Many operators and recreation users complained about the use of planes for flying in users:

- The noise caused by frequent flights,
- Disturbances resulting from the times of the day that flights take place,
- The unprepared nature of many of the passengers with regard to wilderness travel.

The unanimous opinion of those who cited planes as an issue was that the existing level of flights is inappropriate for a wilderness setting.

Overlapping tenures and territories

Commercial recreation activities in Big Creek Park/Spruce Lake Protected Area are regulated by Park Use Permits, Guide-Outfitting tenures and Range Use Permits. Tenures are administered by a variety of government agencies and cover different areas of land. A tenure of one operator may partially or completely overlap that of another operator creating areas of conflict between them. In the southern portion of Big Creek Park south of Dash Hill and Grant Creek, a trapline territory, a guide-outfitting territory and three Range Permits overlap five overlapping Park Use Permits. See Figure RQ ComUse A & B.

- Unresolved overlapping tenure issues create tension between operators,
- Overuse of areas in overlapping tenures impacts ecological values,
- Overuse of areas in overlapping tenures impacts range values for cattle,
- The enjoyment of the park experience by other visitors is diminished .

Commercial Recreation vs. Public Recreation

Commercial tourism operators want to maintain the reasons for their customers coming, e.g. float plane access or the horse riding experience, while the public wants to maintain the pristine nature of the area.

- Areas where commercial and public recreation uses currently, or potentially, conflict with other commercial and public recreation uses:
 - Horses, hikers and mountain bikers using the same trails,
 - Horses and the public using the same trails – dust, smell, poop,
 - Float plane landing and take off at wilderness lakes,
 - Public use of commercial cabins without permission.
- Integrating commercial recreation businesses with public use (winter and summer) – (LRMP doc p.108).
 - Maintaining the sense of wilderness,
 - Maintaining trails as needed,
 - Maintaining business viability in face of increasing fees and changing exchange rates,
 - Insecurity of permitted cabins as park use increases,
 - Snowmobiling-heli-skiing-backcountry skiing conflicts,
 - A feeling by some public recreation users of being “pushed out” by commercial operators.

Winter Activities:

Big Creek Park:

- Snowmobiling activity in the northern portion of the park with no tenure.

Spruce Lake Protected Area:

- Snowmobiling activity in the Slim Creek area with no tenure:
 - Public users need assured access into Upper Slim Creek (LRMP doc p.108),
 - Public users use Griswald Pass to access Lillooet glacier area and Wolverine-Taylor Passes to access Taseko valley.
- Heli-skiing in the high mountains in Slim Creek/Leckie Creek area is using traditional snowmobiling areas:
 - Use the slopes above Gun Lake when fogged in.
- Backcountry skiing in South Slim Creek has been a long time area for independent skiers:
 - Commercial skiing conflicts with public skiing.

Spruce Lake

Spruce Lake is the hub of activity in Spruce Lake Protected Area where many different interests come into contact with each other. A long-term resolution is needed to protect the special values at this popular lake with a wilderness backdrop.

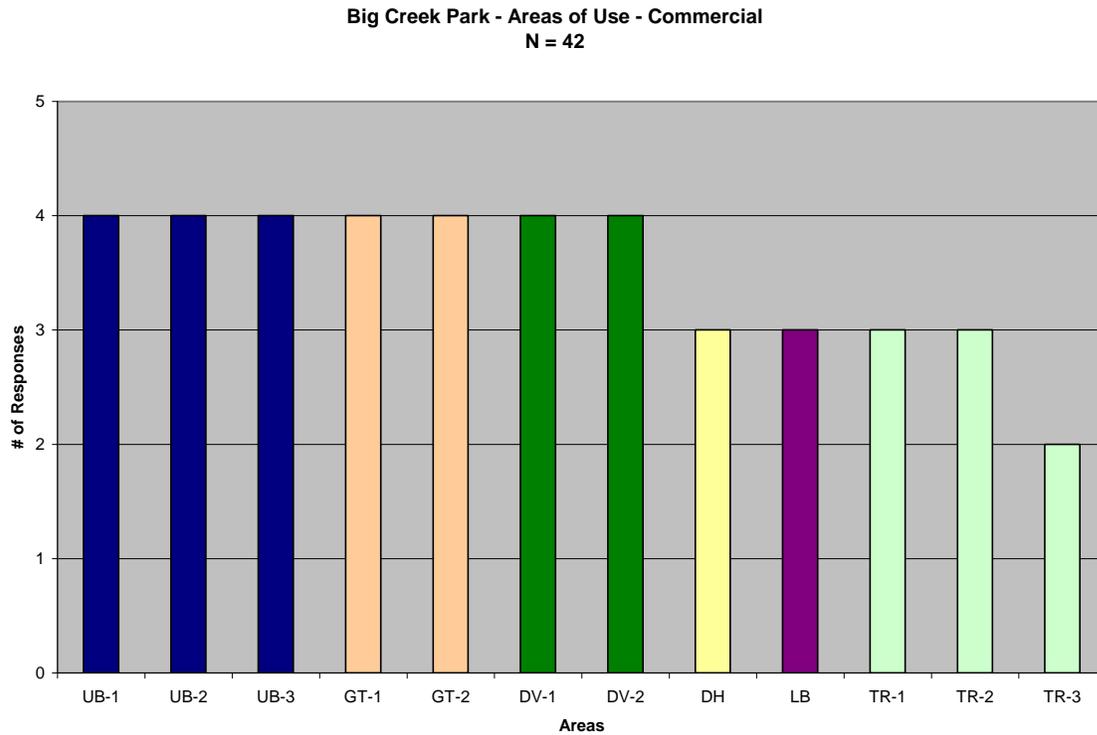
- A “rural” setting rather than “wilderness”,
- Multiple groups arriving for many different activities at the same time,
- Planes landing and taking off in a confined space while people are in belly boats fishing,
- Well-used trails into Tyaughton Creek and Gun Creek run through the area,
- Request to move commercial operation off private property,
- Congestion at the north end of the lake detracts from the wilderness feel:
 - Protected area campsites have a limited ability to absorb public use on the useable crown land,
 - Public horse camping at the protected area campsite puts pressure on space and reduces enjoyment of others,
 - Two commercial recreation operator camps in close proximity to public camping,
 - The only docks for float planes.
- The factor limiting choices for solutions is the amount of available camping at the lake.

Figure RQ ComUse - A: Areas of Commercial Use in Big Creek Park

Number of Operators: 7

Season of Use: All year; most activity May-October.

Known Activities: Hiking (6), horseback riding (6), hunting (4), fishing (4), biking (3), wildlife viewing (3).



AREAS			
UB-1	Upper Big - Lorna Lake	DH	Dash Hill
UB-2	Upper Big - Upper Big Creek	LB	Lower Big - Lower Big Creek Park
UB-3	Upper Big - Graveyard Creek	TR-1	Taseko River - Powell Creek
GT-1	Grant & Tosh - Grant Creek	TR-2	Taseko River - Iron Pass
GT-2	Grant & Tosh - Tosh Creek		
DV-1	Dil-Dil-Vic – Dil-Dil		
DV-2	Dil-Dil-Vic - Vic Lake		

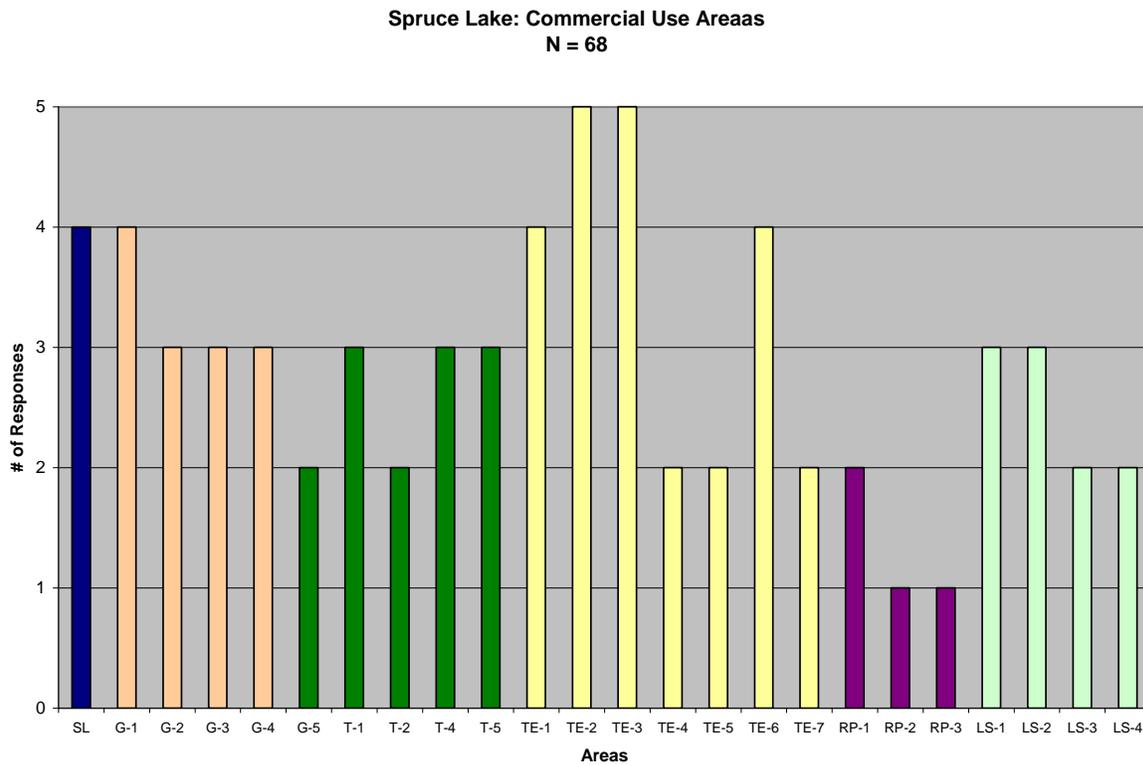
*Data from Recreation Questionnaire, phone discussions, web pages, LWBC tenure applications, “Cooperation and Issues Agreement” (McMaster).

Figure RQ ComUse - B: Areas of Commercial Use in Spruce Lake Protected Area

Number of Operators: 5

Season of Use: All year; most activity where conflicts occur May-October.

Known Activities: Hiking (3), horseback riding (4), fishing (3), biking (3), wildlife viewing (3), skiing (3), hunting (2), snowmobiling (1), camping (1)



Areas			
SL	Spruce Lake	TE-2	Taylor-Eldorado - Taylor Basin
G-1	Gun Creek - Gun Creek	TE-3	Taylor-Eldorado - Eldorado Basin
G-2	Gun Creek - Trigger Lake	TE-4	Taylor-Eldorado - Eldorado Mountain
G-3	Gun Creek - Hummingbird Lake	TE-5	Taylor-Eldorado - Bonanza Basin
G-4	Gun Creek - Warner Lake	TE-6	Taylor-Eldorado - Windy Pass
G-5	Gun Creek - Warner Pass	TE-7	Taylor-Eldorado - Pearson Creek Trail
T-1	Tyaughton Creek - Tyaughton Creek Trail	RP-1	Relay-Paradise - Relay Creek
T-2	Tyaughton Creek - Lizard Creek	RP-2	Relay-Paradise - Paradise Creek
T-3	Tyaughton Creek - Deer Pass Trail	RP-3	Relay-Paradise - Little Paradise Creek
T-4	Tyaughton Creek - Elbow Pass	LS-1	Leckie-Slim - Slim, Leckie, Wolverine
TE-1	Taylor-Eldorado - Cinnebar Basin	LS-2	Leckie-Slim – Taylor Pass

*Data from Recreation Questionnaire, phone discussions, web pages, LWBC tenure applications, “Cooperation and Issues Agreement” (McMaster).

Access

Park Access

- Access Considerations:
 - Provision at trailheads for parking, including horse trailers,
 - Provision for horse access and mechanized use (mountain bikes),
 - Upgrading the Hurley Pass Road to Gold Bridge would substantially increase the numbers of people visiting Spruce Lake Protected Area.
- In considering access management, consideration must be given to previous decisions from access planning and consultation with local community groups before making changes. The intent and purpose of various previous planning processes must be acknowledged, e.g.:
 - Hungry Valley Access Management Plan,
 - Sustainable Resource Management Plans,
 - Taseko Management Plan (Goundhog, Beece).
- The Wildlife Act should not be used to do things that can't be achieved through the Park Act unless absolutely necessary and with prior consultation.
- Access for owners of private land must be taken into consideration in planning.– (LRMP doc p. 108)

Mineral Tenures

There are two mineral tenures in the northern portion of Big Creek Park. This is a non-conforming use in a Provincial Park. At some point there may be negotiation for fair compensation between the Province and the tenure holder, but at present there is no action underway to negotiate with the tenure holder compensation for the properties. The tenure holder could relinquish the claims if they felt so inclined.

Planning for Adjacent Lands

Spruce Lake Protected Area

The three zones proposed for removal from Spruce Lake Protected Area are very connected to the remaining protected area. It is important that management planning for the Mining-Tourism Zones, Big Creek Park and Spruce Lake Protected Area be done together to ensure values in the remaining area is not compromised. Many questionnaire respondents fear encroachment by resource extraction while others noted with concern the encroaching use and demand for additional motorized vehicle access to these areas. They expect these activities will damage their recreation experiences.

Park Identity

Some of the issues around inappropriate activities in Big Creek Park/Spruce lake Protected Area may stem from inadequate information about park boundaries, the fragile nature of the park ecosystems, the need for protection of habitat for grizzly bear and other special species. There were conflicting messages in responses to the Recreation Questionnaire: some respondents asked for more trail and information signs; others said signs detracted from the wilderness experience.

- Park boundaries are not clearly identified,
- Need for information signs, maps and brochures to guide visitors around the park and protected area and to inform about conservation, recreation and cultural values,
- Cultural Heritage Conservation for Graveyard Creek is required to protect the site.

Bibliography

General:

Apps, Clayton. 2003. "Grizzly Bear Population Density and Distribution in the Southern Coast Ranges". Project in progress, no report.

Douglas, George W., Del Meidinger and Jim Pojar. 1999. *Illustrated Flora of British Columbia*. Volumes 3, 4, 7. Ministry of Environment, Lands, and Parks; Ministry of Forests. Victoria, BC.

Commission on Resources and Environment. 1994. *Cariboo-Chilcotin Land Use Plan*. Commission on Resources and Environment, Victoria, BC.

Dicer, Pamela and Marian Coope. 2001. *Birds at VNHS 2001 Camp, Cinnebar Basin*. In *Discovery*, Fall 2001, Vol. 30. Vancouver Natural History Society, Vancouver, BC

Eder, Tamara and Don Pattie. 2001. *Mammals of British Columbia*. Lone Pine Publishing, Edmonton, Alberta.

Eng, Marvin. 2003. *Biogeoclimatic Ecosystem Classification (BEC) Metadata*. Ministry of Forests Research Branch, Victoria, BC.

Fish and Wildlife Branch. 1990. A study Area Proposal for the Hungry Mountain Wilderness Area. Ministry of Environment, Northern Interior Region, Williams Lake, BC.

Forest Practices Code of British Columbia. 1997. *Species and Plant Community Accounts for Identified Wildlife*. Victoria, BC.

Lee, Olivia and Wayne Erickson. 2001. *Vascular Plants at VNHS 2001 Camp, Cinnebar Basin*. In *Discovery*, Fall 2001, Vol. 30. Vancouver Natural History Society, Vancouver, BC

Lloyd, Dennis, 2004. *A Guide to Site Identification and Interpretation for the Kamloops Forest Region*. Ministry of Forests, Kamloops, B.C. (Draft)

Ministry of Environment, Lands and Parks, BC Parks Division. 1999. *Big Creek Park: Management Direction Statement*. Victoria, BC.

Ministry of Forests. 1990. *Managing Wilderness in Provincial Forests: A Policy Framework*. Province of British Columbia, Victoria, BC.

Ministry of Forests and Lands. 1988. *Spruce Lake IRMP – Commercial Recreation Management Component (Sub) Plan*. Kamloops, BC.

Ministry of Parks. 1990. *Preserving our Living Legacy: Parks Plan 90: Recreation Goals for BC Parks*. Victoria, BC.

- Ministry of Parks. 1990. *South Chilcotin Mountains Study Area Assessment (Draft)*. Southern Interior Region, Kamloops, BC.
- Ministry of Sustainable Resource Management. 1999. *South Chilcotin Sustainable Resource Management Plan*. Victoria, BC.
- Ministry of Sustainable Resource Management. 2004. *Draft Lillooet Land and Resource Management Plan*. Ministry of Sustainable Resource Management, Victoria, BC.
- Monger, J.W.H. and R.A. Price. 2000. *A transect of the southern Canadian Cordillera from Vancouver to Calgary*. Geological Survey of Canada. Open File No. 3902.
- Parrish, R., R. Coupé and D. Lloyd. 1996. *Plants of the Southern Interior British Columbia*. Lone Pine Press, Vancouver, BC
- A Protected Area Strategy for British Columbia. 1993: *The protected areas component of B.C.'s Land Use Strategy*. Victoria, BC.
- Roemer, Hans. 1982. *Ecological Reserve Proposal Clukata Ridge*. Ecological Reserves Unit. Ministry of Lands Parks and Housing. Victoria, BC.
- St. John, Alan. 2002. *Reptiles of the Northwest. British Columbia to California*. Lone Pine Publishing, Edmonton.
- P. Schiarizza, R. G. Gaba, J. K. Glover, J. I. Garver and P. J. Umhoefer. 1997. *Geology and Mineral Occurrences of the Taseko - Bridge River Area*. Bulletin 100. Geological Services Branch, Ministry of Employment and Investment, Victoria, BC.
- Selby, Corinne J. 1980. *Alpine and subalpine vegetation in the Southern Chilcotin Mountain Rangelands of British Columbia*. MSc. Thesis, Department of Plant Science, University of British Columbia, Vancouver, BC.
- Senger, Susan. 2004. *Lillooet Community Grizzly Bear Inventory Project 2003 Sighting Record Final Summary*. Windwalker Consulting Services, Lillooet BC.
- Serrouya, Rob. 2004. *Assessment of Pukeashun Provincial Park's value towards mountain caribou and grizzly bear habitats and populations*. Ministry of Water, Land and Air Protection. Kamloops, BC.
- Shackleton, D. 1999. *Hoofed Mammals of British Columbia*. Royal British Columbia Museum Handbook. UBC Press, Vancouver, BC.
- Squamish-Lillooet Regional District. 2004. *Regional Growth Strategy: Regional Issues and Goals. Draft for Discussion*. Pemberton, BC.
- Steen, O.A. and R. A. Coupé. 1997. *A Field Guide to Forest Site Identification and Interpretation for the Cariboo Forest Region*. Research Branch, Ministry of Forests, Victoria, BC.

Steen, O.A. and R. A. Coupé. 2001. *Research Supplement 1, ESSFxv2 site series classification*. Research Branch, Ministry of Forests, Victoria, BC.

Tipper, H.W. 1978. *Taseko Lakes (92 O) Map – Area*. Compilation for Geological Survey of Canada. Map OF-534.

Yorath, C.J. 1990. *Where Terranes Collide*. Orca Book Publishers. Victoria, BC.

Recreation and Tourism:

A Protected Area Strategy for British Columbia. 1994. *Outdoor Recreation in BC: Supply and Demand; Issues and Trends*. Victoria, BC.

Brett Harley and Associates Ltd. 2001. *Analysis of Socio-Economic Benefits of Helicopter and Snowcat Skiing in British Columbia*. BC Helicopter and Snowcat Operators Association, Vernon, BC.

Chilcotin Holidays Limited. Undated (1992). *Chilcotin Holidays. Operating Areas by Region*. Chart.

Chilcotin Holidays Ltd. 1994. *Guide Outfitting General Management Plan*. Chilcotin Holidays, Gold Bridge, BC

Ministry of Water, Land and Air Protection. 2001. *Economic Benefits of British Columbia's Provincial Parks*. Victoria, BC.

Pacific Analysts Inc. 2001. *Economic Impacts of Tourism in South Chilcotin Mountain Park*. Victoria, BC.

Viewpoint Recreation and Landscape Consulting. 1995. *Upper Big Creek/Hungry Valley Recreation Inventory*. Victoria, BC.

First Nations:

Alexander, Diane. 1997. *A Cultural Heritage: Overview of the Cariboo Forest Region*. Prepared for Cariboo Forest Region, Williams Lake BC.

Lane, R.B. 1953. *Cultural Relations of the Chilcotin Indians of West Central British Columbia*. PhD Dissertation, University of Washington, Seattle. University Microfilms, Ann Arbor, Michigan, USA.

Tsilhqot'in National Government. 2001. *A Traditional Use Study of Tsilhqot'in Territory*. Prepared for the Aboriginal Lands and Resources Branch, Ministry of sustainable Resource Management, Victoria, BC.

Tyhurst, Robert. 1984. *The Chilcotin. An Ethnographic History*. Draft PhD. Thesis, University of British Columbia, Vancouver, BC.

Cultural:

Bonner, Veera, Irene E. Bliss and Hazel H. Henry. 1995. *Chilcotin: Preserving Pioneer Memories*. Heritage House Publishing Company. Surrey, BC.

Appendices

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Appendix 1:

Chronology of Key Events Leading to Park and Protected Area Designations

1937	The Vancouver Natural History Society proposes a provincial park in the Chilcotin Mountains using a boundary suggested by Charlie Cunningham, a Bralorne based guide-outfitter. The proposal later became known as the “Charlie Cunningham Area”.
1973	BC Parks undertakes a Chilcotin Wilderness Park Study, examining the Chilco Lake, Tchaikazan and Charlie Cunningham areas. Study concludes that “the combination of high mineral potentials, forestry values, grazing interests and various land alienations precludes the establishment of a Class A Park in the Charlie Cunningham area”.
1979	Fourteen outdoor groups join to form the “Coalition to Protect the Southern Chilcotin Mountains”. In 1984 the Coalition incorporates as the Southern Chilcotin Mountains Wilderness Society (SCMWS).
1980’s	Ministry of Forests establishes the Spruce Lake Integrated Resource Management Planning (IRMP) Committee in 1981 to develop criteria for resource and recreation use within the area. The IRMP separates the 112,784 hectare Spruce Lake Resource Management Area (RMA) into zones specifying constraints for extractive resource uses. A small ecological reserve is proposed in Gun Creek but is not established. A Map Reserve for ecological reserve purposes was established for the Clukata Ridge area.
1987	Ministry of Forests proposes an 82,000 ha Wilderness Area surrounding Spruce Lake. Mounting political pressures to protect the Stein Valley curtail follow up Wilderness Area designation for Spruce Lake.
1990-91	The Parks and Wilderness for the 90’s process elicits considerable public support for the Spruce Lake area. BC Parks identifies the Spruce Lake area as one of the most outstanding wilderness parks candidates in the southern Interior of the Province. Ministry of Forests proposes a Wilderness Study for the Spruce Lake area.
1992	Provincial Land Use initiatives supplant the Parks and Wilderness for the 90s process. The Cariboo Land Use Planning process commences. A Cabinet Approved Study Area is designated over the Spruce Lake area, to prevent further development and commitment of resources until the area’s future status can be considered through a regional land use plan.
July 1994	The Commission on Resources and the Environment submits the Cariboo-Chilcotin Land Use Plan, which recommends Big Creek and South Chilcotin Parks.
October 1994	Government reviews the Cariboo-Chilcotin Land Use Plan, and announces the combination of Big Creek and South Chilcotin units into a single 66,600 hectare park. Most of the remaining Cunningham area in the Cariboo Region is designated a Special Resource Development Zone.
1995 – 2001	The Lillooet Land and Resources Management Planning process commences. Table meetings begin in 1996 and carry through to 2001.

March 2001	The Lillooet LRMP Table submits 2 options – Conservation and Community; both options propose large protected areas for Spruce Lake/South Chilcotin Mountains: 71,400 hectares and 42,767 hectares respectively.
April 2001	Government approves the Conservation option in principle and establishes the Spruce Lake Protected Area by Order-in-Council.
June 2001	Newly elected government announces review of the recent land use plans approved by the previous government; socio-economic impact and environmental impact assessments of the Lillooet LRMP are carried out over the following months.
November 2001	Government requests MSRM to complete Lillooet LRMP through a public consultation process, drawing on the work of the planning table but incorporating new land use policies (e.g., results-based regulations; two-zone land use system for mineral exploration and mining; Heartlands Economic Strategy). First discussion draft of the plan is released in December 2001. Second discussion draft, incorporating comments from plan participants, local government and First Nations, is released in March 2002. Public consultation process closes March 31, 2002.
July 2004	<p>Government releases draft Lillooet LRMP document. According to the draft, the boundaries of the Spruce Lake Protected Area will be amended. About 80% of the area will become a Class A provincial park. The remaining ~20%, in Slim, Eldorado and Paradise Creeks, will be designated as “mining/tourism permitted no commercial forestry areas”.</p> <p>Government commits to enter into a comprehensive review and consultation of the LRMP with local First Nations. Consultation is ongoing and until the Plan and First Nations’ interests are reconciled existing land use regulations and designations are in effect.</p>

Appendix 2: Plant Species and Plant Community Lists

A. Master's Thesis study

Selby, Corinne. 1980. *Alpine and subalpine vegetation in the Southern Chilcotin Mountain Rangelands of British Columbia*. MSc. Thesis, Department of Plant Science, UBC.

1. From the Thesis abstract:

“Alpine and subalpine vegetation in the Southern Chilcotin Mountains was studied to characterize the plant communities of the high elevation rangelands in the southern interior of British Columbia. The impacts of grazing on the structure and composition of the vegetation were evaluated.”

2. Main areas of study:

Relay Valley, Relay Basin, Graveyard Valley, Two Lakes Basin and Dash Plateau.

3. Plant Communities Identified

The following plant communities of characteristic species group combinations were identified on the basis of physiognomy, dominant species and similar environmental conditions:

1. Forest: *Picea engelmannii*-*Abies lasiocarpa*
2. Dry forest: *Pinus albicaulis*-*Juniperus communis*
3. Shrub wetland: *Salix barcalyi*-*Carex aquitilis*
4. Alpine shrub wetland: *Salix barrattiana*
5. Shrubland: *Salix brachycarpa*-*Salix barcalyi*
6. Shrubfield: *Salix brachycarpa*-*Festuca* spp.
7. Shrubfield: *Salix brachycarpa*-*Phleum alpinum*
8. Dry shrubland: *Arctostaphylos uva-ursi*-*Amelanchier alnifolia*
9. Dwarf willow shrubland: *Salix cascadiensis*
10. Fellfield: *Dryas octopetala*
11. Alpine grassland: *Dryas octopetala*-*Festuca altaica*
12. Wetland: *Carex aquitilis/rostrata*
13. Late snowbed meadow: *Carex nigricans*
14. Meadow: *Festuca brachyphylla*-*Phleum alpinum*
15. Meadow: *Festuca brachyphylla*
16. Meadow: *Festuca brachyphylla*- *Phleum alpinum*
17. Dry meadow: *Phleum alpinum*-*Carex phaeocephala*
18. Crustose lichen rockland
19. Talus terrain

B. Clukata Ridge Ecological Reserve Proposal, 1982

Roemer, Hans. 1982. *Ecological Reserve Proposal Clukata Ridge*. Ecological Reserves Unit. Ministry of Lands Parks and Housing. Victoria, BC.

Plant Communities:

1. Lodgepole pine-alpine lupine: timberline forests on terraces and foot of south slope
2. Balsam fir-Engelmann spruce: timber line on lower north-facing slopes
3. Trembling aspen-wolf-willow: Low scrub community (to 2m) on steep, south-facing scree at timber line level
4. Windblown, dry west slope on broken rock
5. Very dry, south-facing slopes next to valley bottom wetlands
6. Gravely, very dry, south-facing slopes near and below timberline
7. Wetlands in flat valley bottoms
8. Snowbed and snow seep community at lower elevation
9. Lush meadow in moist draws, medium elevations
10. Willow community in moderately moist draws, depressions, above timberline
11. Wind-swept, flat to sloping sites with good to moderate drainage
12. Flat ridge tops or gentle south and south-east facing slopes with deep soils
13. Gentle north-facing slopes with slight snow accumulations
14. Gentle slopes, wind-exposed and dry
15. Wind-swept, dry ridges and slopes
16. Gentle, north-facing slopes with moderate snow accumulation (discontinuous cover)
17. North-facing slopes, high-elevation snowdrift sites
18. High alpine discontinuous vegetation (ridges and peaks)

C. Plant List, Cinnabar Basin, 2001.

Vancouver Natural History Society

(Lee, Olivia and Wayne Erickson. 2001. *Vascular Plants at VNHS 2001 Camp, Cinnabar Basin*. In *Discovery*, Fall 2001, Vol. 30. Vancouver Natural History Society, Vancouver, BC.)

Appendix 3: Wildlife Species Lists

A. Bird List, Cinnabar Basin, 2001.

Vancouver Natural History Society

(Dicer, Pamela and Marian Coope. 2001. *Birds at VNHS 2001 Camp, Cinnabar Basin*. In *Discovery*, Fall 2001, Vol. 30. Vancouver Natural History Society, Vancouver, BC.)

Appendix 4: Recreation Questionnaire, January-February, 2005.

Recreation Questionnaire Respondents:

Questionnaires were mailed and/or e-mailed to 73 businesses, associations and individuals (11 to Big Creek Park list and 62 to Spruce Lake Protected Area list) in three general groups:

- Commercial Tourism Operators and Guide-Outfitters
- Provincial Associations that had been involved in the Cariboo-Chilcotin Land Use Plan and subsequent Sustainable Resource Management Planning in Cariboo Region and in the Lillooet LRMP.
- Individuals who had been involved in the Lillooet LRMP process.

Most of those mailed a questionnaire were contacted by phone at least once; e-mail reminders were sent to those for whom addresses were available. Some organizations distributed the questionnaire to members, and individuals obtained copies and returned them. Seven responses were received this way.

The following returned the questionnaire:

Commercial Interests (10):

Gus Abel, owner, Tyax Mountain Lake Resort
Kevin Bracewell, Sylvia Waterer, owners, Chilcotin Holidays Ltd.
Darryl Buchholtz - Guide Outfitter, Big Creek Lodge
Joe Hoessl, Owner, Big Creek Lodge/ Spirit Ranch
Dale Douglas, owner, Tyax Air Service Ltd.
Geoff, TLH Heli-Skiing
Wilfried Grau, Guide Outfitter, Teepee Heart Ranch
Vic Hamm, TLH Heliskiing
Warren Menhinick, Guide, Packer, Spruce Lake Wilderness Adventures
Sig Reuter, Trapper, Guide Outfitter, Taseko
Randy Saugstad, Guide Outfitter, Bear Creek Camp, Rancher

Lillooet LRMP (2):

Trevor, Chandler, Facilitator, Landscape Consulting Corporation
Dick McMaster, Tourism Visions Consulting

Associations (14):

Back Country Horsemen of BC, Doris McAdie,
BC Mountaineering Club - Brian Wood
BC Trappers Association - Doug Webb
BC Wildlife Federation - Allen McEwan
Bridge River Valley Snowmobile Association - Wayne Yasinowski
Cariboo Chilcotin Conservation Society - Marg Evans
Federation of BC Naturalists - Bev Ramey
Lillooet Naturalist Society - Glenda Newsted
North Shore Mountain Bike Assoc. - Lee Lau

Pemberton Valley Trails Association - Sean Wolfe, Secretary, group response
Save Our Parkland Society, June Binkert, President, response with FBCN
South Chilcotin Mountains Wilderness Society - Jay MacArthur
Whistler Off-Road Cycling Association - Grant Lamont
Williams Lake Sportsmen's Association - Doug Hill

Mountain Bike Interests (10):

Rod Dagneau, Mountain Bikers,
Peter Glapinto, Bike shop owner in Pemberton, individual
John Inglis, PVTA Director, individual
Anne Kennedy, Pemberton, individual
Grant, Lamont, President, Whistler Off-Road Cycling Assocn
Steve Olmstead, individual
Mike Rothdram, individual
Mark Savard, Red Shred's Bike Shop, Williams Lake
Tony Sittlinger, Pemberton, individual
Randy Symons, Parks & Trails Maintenance Supervisor, Whistler

Interested Individuals (16):

Kris Andrews, Williams Lake
Judy Bohm
Phil Branca, former MoF caretaker Spruce Lake, Bridge River Valley Snowmobile Society
Bert Brink, Emeritus Professor, Plant Sciences, UBC
Chilco Choate, Retired Guide-Outfitter
Bob Dew, Lillooet Communities Coalition
Jack Harder
Louis Helbig
Susannah Hobbs
Karen LaChance-John Rance
John Leighton (formerly Cottage Owners & Associations)
Hank McEwan
Rod MacLeod - individual member PVTA
Thomas McNicholl
Dennis Perry, landowner, Spruce Lake
Betty Weaver, Lillooet (LRMP list)

Individuals contacted, questionnaire not returned (11):

Rick Careless, Wilderness Tourism Association
J H (Jack) Carradice, BC Wildlife Federation
John Courchesne, Lillooet District Community Resource Board
Rudi, Durfeld, Durfield Geological Management Ltd.
John, Edgar Vice President, Four Wheel Drive Association of BC
Charyl Flinton, Cariboo Communities Coalition
Jim Haggart BC Paleontological Society
Don Harrison, Land Use Director, Environmental Mining Association of BC
Robert Hoyer, Landowner Trapper,
John McInnis, Executive Director, Environmental Mining Association of BC
Jamie McKay, Williams Lake Powderkings
Kathryn Molloy, Executive Director, Sierra Club of BC
Fritz Mueller, Chilcotin Ranges Trail System
Russ Oakely, SLRD
Chloe O'loughlin, Executive Director, Canadian Parks and Wilderness Society - BC Chapter
Bill Spencer, Yalakom Ecological Society
Don Sturgess, Gun Lake Ratepayers Association
Catherine Zimmerman, SHARE Cariboo Chilcotin Resources

Questionnaire mailed, not returned, not contacted (17):

Karl Delling, Lillooet District Community Resource Board
Paul, Ehni
Fred Hancock Lillooet District Community Resource Board
Linda Hume, Former CRB Member
Eric Larman, Lillooet District Community Resource Board
Sheila Mclean, SLRD
Chris O'connor, Lillooet District Community Resource Board
Karl Otting, Lillooet District Community Resource Board
Bernard Schulmann, Lillooet District Community Resource Board
Bob Sheridan, Lillooet District Community Resource Board
Kevin, Taylor, Mayor, Town of Lillooet
Dr. Howard Tipper, GSC Emeritus,
Bill Wareham, David Suzuki Foundation
Gordon Weetman, Professor (Emeritus), Silviculture, Faculty of Forestry - UBC
Norma Wilson, Executive Director, Outdoor Recreation Council of BC
Council of Tourism Associations
Pemberton Sportsmen's Association

RECREATION QUESTIONNAIRE:
Big Creek Park/Spruce Lake Protected Area

To: Recreation Users, Big Creek Park/Spruce Lake Protected Area

I am working with Harry Parsons, of Bufo Incorporated, on collecting information for a Background Report on Big Creek Provincial Park and Spruce Lake Protected Area (most of which is proposed to become South Chilcotin Provincial Park). When completed, the Background Report will provide a resource atlas with information on the natural resources, recreation and tourism values and opportunities, cultural values, and land status. The Background Report will provide a reference base and will be used to identify issues for Big Creek/Spruce Lake that may require future management.

Big Creek Provincial Park was designated as a Class A park in 1995 as recommended in the Cariboo-Chilcotin Land Use Plan (1994). The Spruce Lake Protected Area was created by Order in Council under the Environment and Land Use Act in 2001 as a result of the Lillooet LRMP process. The area has been long recognized as having provincially outstanding conservation and recreation resources.

It is important to have a good understanding of values and current recreation use in order to manage these parks. This questionnaire, together with personal contact, will help identify current and potential recreation and tourism use. It is not intended to be a detailed study of daily use, but we hope you can give us sufficient information to enable us to compile a reasonable current picture of activities in the parks.

Please answer the following questions based on your experience with outdoor recreation, and any information or knowledge you have on natural or cultural values, in the area of Big Creek Park and/or Spruce Lake Protected Area, shown on the attached maps. Please use the back of this page or a separate piece of paper. If you are an organization representing many members, please consult your group and send a combined response. Please return this survey and maps by January 31, 2005. A stamped, addressed envelope is included. You will be contacted by phone in January or early February for further discussion. (Interior addresses by Frances; Lower Mainland addresses by Harry).

Thank you very much for your response to these questions. Your local knowledge is a very important source of information for the Big Creek/Spruce Lake Background Report. If you have any questions or comments regarding this survey, please phone Frances Vyse (250-372-8607) for Interior groups and individuals or Harry Parsons (604-886-1992) for Lower Mainland groups and individuals.

Yours truly,

Frances Vyse
[Mariposa Trails](#)

RECREATION QUESTIONNAIRE:
Big Creek Park/Spruce Lake Protected Area

1. What type(s) of recreation use do you participate in?
2. What area(s) do you use? Please indicate area and type of activities on the attached maps.
3. When do you participate in these activities? (Seasons, weekdays/weekends)
4. Compared to other areas that you use for this activity(ies), what level of use would you describe as taking place in Big Creek or South Chilcotin Provincial Parks? (Low, Medium, High)
5. Why do you use Big Creek/South Chilcotin Provincial Parks for this activity(ies)? (E.g. special or unique qualities not available elsewhere; role of this area for outdoor recreation)
6. Is there anything that conflicts with enjoyment of your recreation activities in Big Creek/South Chilcotin Provincial Park?
7. What do you think about present levels of use/facilities in the parks – is there too much or room for more? Should there be any changes in facilities (trails, signs, services, resorts, buildings, etc.)? Please describe.
8. What trends do you feel will affect future recreation use and management in the park?
9. Do you have any concerns or issues that you feel should be addressed? Include in your response any comments you have about impacts on ecosystem values in the parks.
10. Do you have, or do know any sources of, natural history information (wildlife species, cultural items, special areas, geology, fossils, habitats, etc.) that may be of help in compiling information about values to be found in the park?

Appendix 5: Contacts

Government:

Big Creek Park:

Chris Armes, District Range Agrologist, MoF
Ray Coupé, Forest Ecologist, MoF
Glen Davidson, Sec Head Parks & Protected Areas, MWALAP
Marcel Demers, Area Supervisor, MWALAP
Pat Dielman, Wildlife Technician, MWLAP
Tony Fiala, Commercial Rec Manager, LWBC
Bev Frittenburg, Planner, MSRM
Tom Wilkinson, Fish and Wildlife Inventory Specialist, MSRM
Jim, Young, Senior Planning Officer, MWALAP

Spruce Lake Protected Area:

Jim Britton, Sub-Surface Resource Planner, M SRM
Jennifer Eastwood, Stewardship Forester, MoF
Glenn Heyes, Range Officer, MoF, Merritt
Doug Jury, Wildlife Biologist, MWLAP
Steve Maricle, Fish Technician, MWALAP
Dalton Mcarthur, Tenures Forester, MoF, Fort Nelson
Dean Mckinley, A/Commercial Rec Manager, LAWBC
Donna Romain, Ecosystem Biologist, MWALAP
Ron Routledge, Section Head, Recreation, MWALAP
Cecil Simpson, Area Supervisor, MWALAP
John Surgenor, Wildlife Biologist, MWALAP
Peter Weilandt, Senior Planning Officer, MWALAP

Other Government:

Paul Schiarriza, Senior Project Geologist, Geological Survey and Development Branch, B.C.
Ministry of Energy and Mines, Victoria – with special thanks for supplying significant parts of
the text in the geology section.
L. Sheffield, PLanner, Cariboo Regional District

John Rose, retired Park Ranger, Spruce Lake Protected Area

Jeff Alexander, Planning Forester, Soda Creek Division, Tolko Forest Products
Mike, Carson, , Ainsworth Lumber Ltd.

Susan, Senger, Project Coordinator - grizzly bear study, Windwalker Consulting Services

First Nations and Culture:

Joe Alphonse, Administrator, Tsiqlhotin Nation
Veera Bonner, Big Creek, writer
Mary Thomson, former owner, Scallon Meadows

Barry Menhinick, Spruce Lake Wilderness Adventures

Katherine Steig:

Vancouver Natural History Society reports on 2001 VNHS trip to Cinnebar Basin

Appendix 6: Notes from a phone conversation with Mary Thomson

Former owner of Scallon Meadow, 24 February, 2005

The Scallon Meadows History

...as far as I know it, goes like this.

There was a large family of Scallons - who homesteaded a ranch on lower Big Creek - the second bench up from the Chilcotin River ;; it's a gorgeous spot - they were wonderful craftsmen - excellent log work .. their house was taken apart by Lyn Bonner and moved to Farwell Canyon and then later moved down to the Cotton Ranch - maybe you know it?

The Scallons pre-empted the Scallon Meadows I think before the first World War...it's hard to guess just what the range situation was in those days - it's sure a long rough way by team and wagon... they built some cabins and did put up hay there, so I suspect they grazed their cattle on that range and then fed them there before trailing them home in the winter. A couple of the sons were of conscription age and Pat, the Dad, a staunch Irishman, refused to allow them to enlist and they hid out for a couple of years (so the story goes).. for a long time we thought they stayed out at the Scallon Meadows - it should have been a good hiding spot.. but later heard that they had a hide out down the creek from the home place.. I suppose there is no one around these days who really knows.