

# BACKGROUND DOCUMENT

December 2004

for Pukeashun Provincial  
Park



BRITISH  
COLUMBIA

Ministry of Water, Land  
and Air Protection  
Parks Division



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# Preface

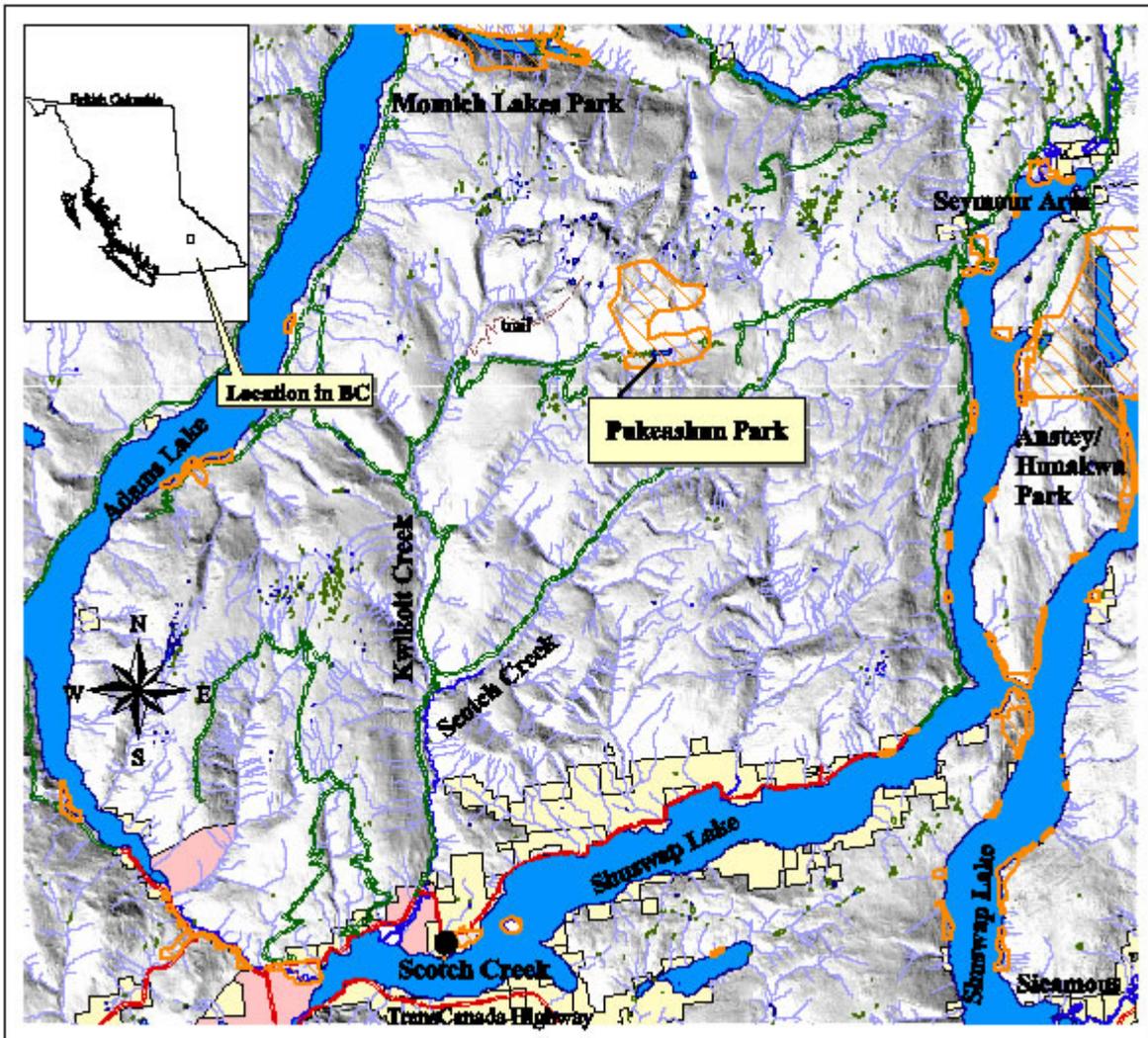
This Background Document provides an information resource base on Pukeashun Provincial Park. It covers natural and cultural resources, recreation and tourism values and opportunities, and the history of planning and management of the area. The Background Document also identifies key issues for management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

## Acknowledgements

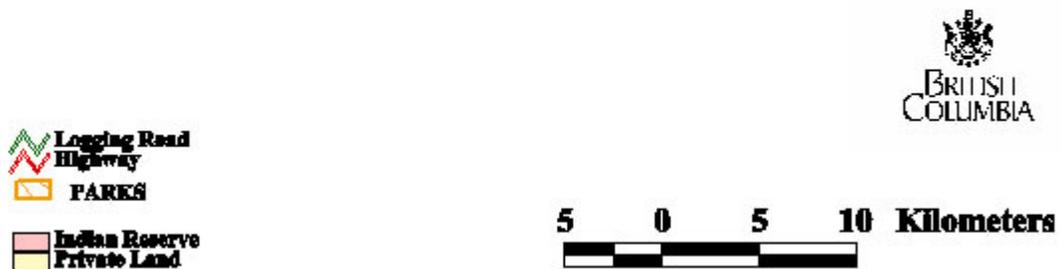
This Background Document was prepared by Frances Vyse of Mariposa Trails in Kamloops. Phil Holman, Forest Ecosystems Planning in Kamloops assisted with the document preparation and developed the maps.

Peter Weilandt, Elaine Gustafson and Ron Routledge provided technical assistance and/or review.

We particularly appreciated the assistance given by staff at all the provincial agencies with an interest in the park and surrounding areas, Andreas Artz of Little Shuswap Indian Band, Peter Ernst of Powderhounds Cat-skiing & Snowmobiling, and all the park users and stakeholders who willingly shared their knowledge and interest in the park.



**Figure 1: Provincial and Regional Context**



# Introduction

Pukeashun Provincial Park encompasses 1,779 hectares of steep ridges, high-elevation forests and alpine areas in the dissected uplands between Adams Lake and Seymour Arm of Shuswap. In the headwaters of Scotch Creek, it contains a deep east-west valley with important wetlands and the small Grizzly Lake.

The park protects important high-elevation habitats from a deep wetland valley through old growth forest to the extensive alpine meadows where Mt. Pukeashun rises up to 2,252 metres. Mountain caribou and grizzly bear habitat is found throughout.

Access to the park is by logging roads from both the south and the east. It is 42 kilometres north of Scotch Creek, a small community on the north shore of the west, or main, arm of Shuswap Lake and 30 kilometres west of the community of Seymour Arm. See Figure 1.

## Planning and Management History

Pukeashun Provincial Park was originally identified as an Area of Interest under the Protected Areas Strategy process of the Kamloops Forest Region in 1993. The area covered was considerably larger than the present boundaries, including all the alpine and sub-alpine on the Pukeashun ridge, and extending over Lichen Mountain to Scotch Creek in the south.

The Pukeashun Area of Interest was included in the proposed Protected Areas package for the Okanagan-Shuswap Land Resource Management Plan (OS LRMP). This sub-regional land use plan was developed from 1995-2000 for the area covering the Salmon Arm, Vernon and Penticton Forest Districts. The elements of the plan were approved through a consensus-based process by a large group of people representing government agencies and a variety of public interests. The plan provides strategic direction and guidance to lower level plans by way of a number of management zones, along with goals and objectives to guide the activities in each zone.

## Park Establishment and Legislation

Pukeashun Provincial Park was included in the package of protected areas agreed to by the OS LRMP and identified in the plan completed in September, 2000. The OS LRMP was approved by Cabinet on 13 January, 2001.

Pukeashun Provincial Park was designated as a Goal 1 Protected Area under the Environment and Land Use Act in 2001 and converted to a Class A Park in 2004.

# Management Direction from Land Use Plans

Part 5 of the OS LRMP provides specific and general management guidelines for recommended protected areas. Some specific directions that pertain to Pukeashun Park include:

The OS LRMP states (Part 5, p. 5-6):

- “1. Logging (except for forest health reasons), mineral and energy exploration and development are not allowed in protected areas.”
- “2. All existing liens, charges and encumbrances other than those applying to commercial logging, mining or energy exploration and development will continue to be authorized through park use permits (PUPs)...”
- “4. Allocation of new tenures will be subject to the direction provided by the management plan for the protected area. Proposals for new areas will respect existing uses.”
- “8. Activities within protected areas are to respect conservation values, particularly the needs of red-and blue-listed species.”

The OS LRMP also states (Part 5, p. 5-19):

- “No new tenures will be issued without a public consultation process, and not until a “Management Direction Statement” or “Management Plan” is in place. This does not apply to replacement tenures to cover existing (grandparented) uses.”

The OS LRMP also provides specific management guidelines for the identified (Part 5, p.5-24):

## “ Pukeashun

- 1) The proposed management category is “Wilderness”. [Note: There is a conflict between the proposed management category and the continued use of snowmobiles.]
- 2) Consider the impact of snowmobile use on wildlife.”

The OSLRMP also established Resource Management Zones separate from protected areas. Pukeashun Park is situated within the winter range portion of the Wildlife: Caribou Resource Management Zone (RMZ). Management in this zone includes provisions for maintaining forest cover and forage in areas outside the park. It also includes provisions for reducing conflicts between caribou and recreation through access management. Snowmobiling, heli-skiing and cat-skiing are particularly mentioned.

The park is also within the high-moderate habitat suitability portion of the Wildlife: Seymour Grizzly Bear Resource Management Zone (RMZ) established by the OS LRMP (Part 4). Management in this zone includes provisions for protecting and providing foraging, cover and connectivity. There are also provisions to “Minimize negative interactions between grizzly bears and commercial tourism and recreation developments”.

Development of the Park Management Plan will be guided by BC Parks' management policies and by the direction provided by the OS LRMP. The Plan will be developed through a public consultation process and will include all stakeholders and agencies.

# Natural Values

## Climate

Pukeashun Provincial Park covers an area above 1500 metres on the wet plateau between Adams Lake and Seymour Arm of Shuswap Lake. The climate in the park is characterized by long, cold winters and short cool summers. Precipitation falls mainly as snow from October until May, and frost can be expected every month. Mid-winter snow depths exceed two metres except in the occasional low snow winter. Low cloud and fog are common in the area, especially in winter.

## Physiography

The park is situated between steep-sided Adams Lake and Seymour Arm of Shuswap Lake in the western portion of the Shuswap Highlands complex. Steep-sided, rounded ridges typical of the area rise to a series of peaks, the highest of which is Pukeashun Mountain. A deep east-west trending valley holds Grizzly Lake and extensive wetlands that extend beyond the park boundaries. The ice sheet that scoured the ridges smooth also deposited deep glacial deposits on the lower slopes, particularly in the Grizzly Lake valley.

## Geology and Soils

The northern portion of the park is underlain by bedrock of the Pukeashun Sheer Zone that stretches from Adams Lake to Seymour Arm. These rocks are part of the Shuswap Complex, a series of formations that have undergone extreme deformation and metamorphism. In this area they consist of Early Tertiary Pukeashun granites. It is thought that the rocks consist of a series of upthrust Precambrian sedimentary and probable volcanic rocks that have undergone regional metamorphism.

The area below the highest peaks consists of older metamorphic rocks of the Eagle Bay Assemblage dating to the early Cambrian. Two such areas lie on either side of the Grizzly Lake fault from Adams Lake to Seymour Arm. Another fault follows the line of the main ridge in the park trending south west from Pukeashun Mountain.

Slopes in the park are steep with coarse-textured soils with good drainage. Soils are Humo-Ferric Podsols. Deep organic soils are common in the Grizzly Lake valley wetlands.

## Water

Pukeashun Park is part of the upper watershed of the Scotch Creek basin. The park area is an important, summer flow-contributing segment of the watershed. Narrow, steep-sided streams direct water flow from the high Pukeashun plateau into the flat-bottomed valley of Grizzly Lake and into upper Kwikwit Creek. Numerous small streams flow down the north-facing slopes from the Lichen Mountain area on the south side of the valley.

Grizzly Lake and extensive ponds and wetland complexes cover about 320 hectares in a deep, 4 kilometre long east-west valley in the southern portion of the park. They form one of the headwaters of both Scotch and Kwikoit Creek. Kwikoit Creek flows west and south to eventually join Scotch Creek while a tributary of Scotch Creek itself flows eastwards into the main creek.

## Vegetation

No in-depth scientific studies have been conducted of the flora of the park. Available information has been gathered from single day studies, conducted as part of the preparation of this document, generic data and anecdotal evidence. See Appendix 4 for lists of species found or expected in the park.

## Terrestrial

Pukeashun Park contains high-elevation vegetation communities ranging from wetland plants in the south to extensive alpine meadows in the north. It is situated in the Shuswap Highlands Ecoregion. Two of the 14 Biogeoclimatic Zones in British Columbia are represented in the park, including the Engelmann –Spruce-Sub-Alpine Fir Zone (ESSF) and the Alpine Tundra Zone (AT). Biogeoclimatic zones are areas that share a common climate that influences soil, vegetation, and wildlife. See Figure 2.

Three subzones or variants of the ESSF occur in the park:

ESSFwc2: Northern Monashee Wet-Cold Engelmann Spruce- Sub-Alpine Fir Variant

ESSFwcp: Wet cold Engelmann Spruce- Sub-Alpine Fir Woodland Subzone

ESSFwcp: Wet cold Engelmann Spruce- Sub-Alpine Fir Parkland Subzone

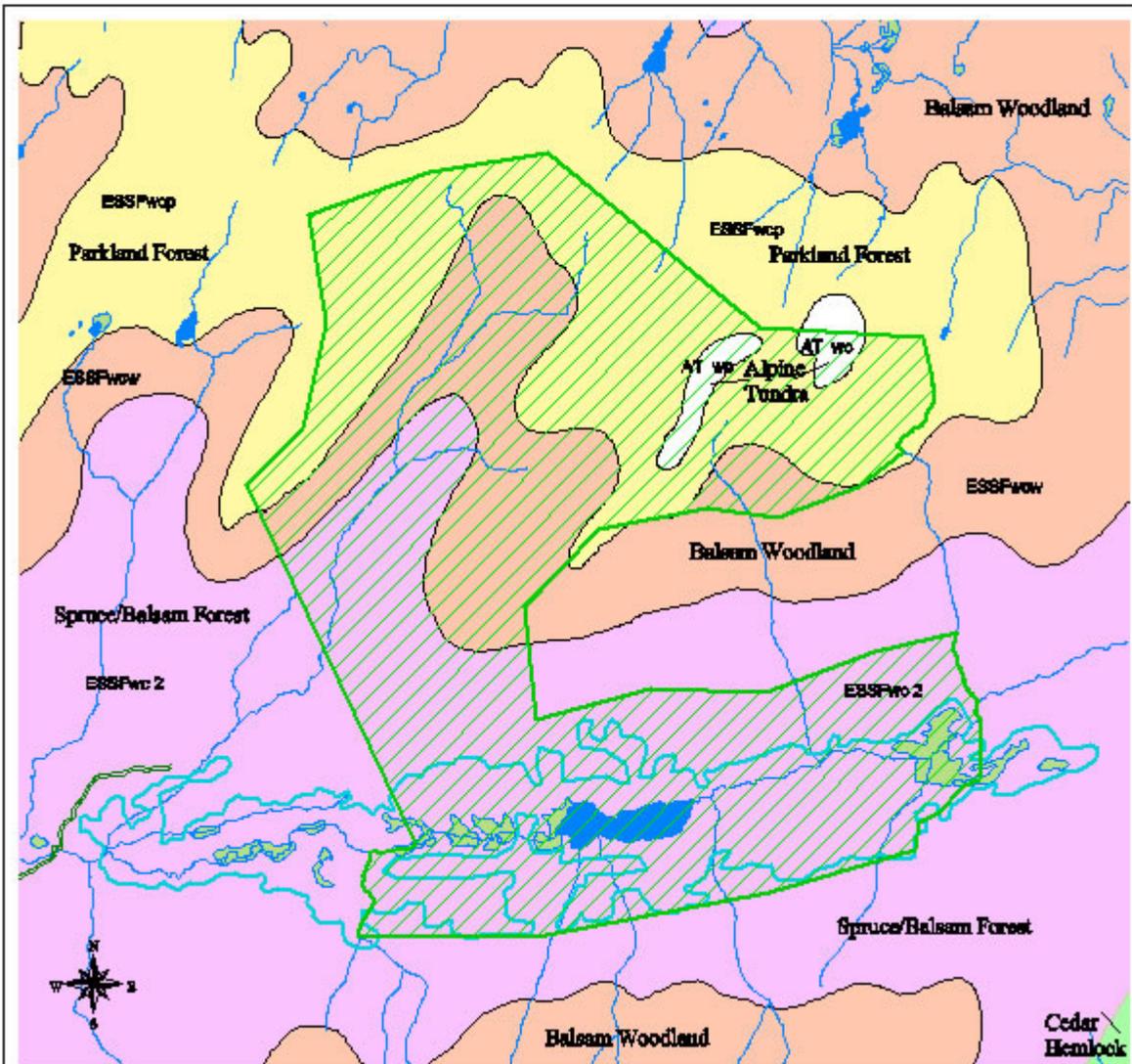
See Table 1.

Table 1. Distribution of Variants in Pukeashun compared to the S. Interior Region

Subzone/Variant	Park, hectares	S Interior Region, hectares
ATwc	36	116,432
ESSFwcp	358	230,752
ESSFwcp	519	158,797
ESSFwc 2	867	450,895
<b>Total</b>	<b>1,779</b>	<b>7,474,423</b>

Micro-climatic changes, soil depth and texture, topography, and aspect all play important roles in the plant communities within each variant in the park. All the forests outside of the wetlands and Grizzly Lake are classified as over 140 years old with a small stand of spruce-balsam above the east end of Grizzly Lake over 250 years old.

Balsam-fir dominates in the higher elevation forests where black huckleberry and white rhododendron are the main shrubs. Herbs expected include Sitka valerian, mountain arnica, wood-rush, mountain hairgrass with some partridge-foot and mountain heathers. This forest gradually opens out into the gently sloping, extensive ESSFwcp parklands where flower meadows are interspersed with clumps of small trees. The slopes of Pukeashun Mountain support two areas of Alpine Tundra vegetation.



**Figure 2: Biogeoclimatic Zones & Major Biotic Features**

- Pukashan Park
- Wetland complex with forest patches
- Alpine tundra wet cold
- Engelmann spruce - subalpine fir forest wet cold 2
- Engelmann spruce - subalpine fir parkland
- Engelmann spruce - subalpine fir woodland
- Interior cedar hemlock wet cool 1



700 0 700 1400 Meters

In the lower elevation ESSFwc2 variant, spruce dominates with open stands on the south-facing slopes above Grizzly Lake. The understory should include white-flowered rhododendron, black huckleberry, oval-leaved blueberry, false azalea, oak fern, Sitka valerian, five-leaved bramble, rosy twisted-stalk, and one-flowered foamflower. A ground survey on the lower slopes of the park noted many snags, arboreal lichens and a rich understory of tall falsebox.

Extensive, rich wetland areas cover most of the valley bottom on either side of Grizzly Lake, in part created by cold air pooling and frost pocketing that limits conifer establishment and growth. Small patches of spruce and balsam fir occur in higher and better-drained areas.

## **Freshwater**

A limited vegetation survey of the Grizzly Lake valley showed that fen-wetlands are the most frequent ecosystems (Thompson. 2004). Shore sedge – Buckbean – Hook-moss, Narrow-leaved cotton-grass – Peat-moss, Narrow-leaved cotton-grass – Shore sedge, Beaked sedge – Water sedge and Tufted clubrush – Star moss are the most common site associations. The survey also noted a number of wetland sequences with an unusual variety on the south side of the valley. See Appendix 4.

## **Wildlife**

Some wildlife species are resident in the park, while others use the area seasonally for varying periods. The diversity of wildlife is less than that expected to be found in the Shuswap Highland Ecosection since the park is limited to higher elevation spruce and subalpine fir forests, parkland and alpine vegetation types.

There has been no comprehensive study of the fauna in the park and most of the evidence is anecdotal. First Nations users, the Secwepemc peoples, have recorded values in a report about old trails and their use. “Trout were fished in Grizzly Lake, moose, caribou, deer, and elk were hunted, and the meat dried while camping in this area.” (Running Horse Consultants. 2001).

A broad scale assessment of mountain caribou (*Rangifer tarandus caribou*) habitat suitability and grizzly bear (*Ursus arctos*) denning, spring, and fall habitat within and adjacent to the park was undertaken in August and September, 2004 (Serrouya. 2004). The study included an evaluation of the potential effects of activities within or adjacent to the park. See Appendix 4.

See Appendix 5 for lists of species found or expected in the park.

## **Mammals**

Perhaps the most visible mammals found in the park include red squirrels, hoary marmots, pika, deer mice, shrews, and voles. These small mammals support bigger carnivores, especially marten. The Secwepemc report trapping marten in the past and the current trapline holders trap them in a cyclic use of the area.

Other furbearers such as weasels, mink, lynx, fisher, wolverine and bobcat may be present, but in low numbers due to the unsuitable dominant habitat types. Larger carnivores such as grizzly bear, black bear and wolves are known to pass through the park on a seasonal basis. Mule deer and moose are regular summer and fall park users, with the potential for the occasional mountain caribou, elk, and mountain goat drifting through. In researching for this document there were conflicting reports of either a lone elk or a mountain caribou wintering in the Scotch Creek area, possibly for the past eight years. There was also a report from a snowmobiler of seeing caribou tracks in 1990 on the north end of Pukeashun Mountain heading north towards Humamilt Lake.

## **Mountain Caribou**

The upper park area is listed as winter caribou habitat by the OS LRMP but MWLAP sources indicate a recent-decade, very low level of caribou use coming south from Celista Mountain. The report from the 2004 assessment states that much of the habitat in and surrounding Pukeashun Provincial Park qualifies as suitable caribou habitat (Serrouya. 2004). It also indicates that factors operating at scales larger than the Park, including an abundance of predators such as wolves, alternate prey such as moose, and fragmented habitat, are likely inhibiting caribou from making regular use of the Pukeashun area.

The immediate area around Pukeashun Mountain consists of a relatively continuous patch of old forest with abundant caribou forage, however, between this area and the nearest area regularly used by caribou, the landscape is heavily fragmented by early seral stands. The Pukeashun area is also becoming less remote due to increased backcountry recreation facilitated by industrial forestry access. Since it has been shown that snowmobiles displace caribou in some other B.C. areas, continued use of snowmobiling in or around Pukeashun would likely hamper attempts for caribou to re-colonize the park.

## **Grizzly Bear**

The park is in the high-moderate habitat suitability portion of the Seymour Grizzly Bear Resource Management Zone (RMZ) established by the OS LRMP (Part 4). The report from this summer's assessment indicates that the MWLAP "anecdotal wildlife observation database" has no records of sightings in or near Pukeashun Provincial Park (Serrouya. 2004). It did report "during the aerial reconnaissance we noted a set of bear tracks (likely grizzly bear) in the snow on the north side of Pukeashun Mountain, although this is only a single observation based on limited search effort." Private individuals have reported seeing grizzly bears and scat in the park.

The report also indicates that "the park contains habitat to help sustain local grizzly bear populations. Alpine and subalpine areas contained vegetation communities that provide spring and summer grizzly bear forage".

At present winter recreation is the most intensive human activity that might affect grizzly bears within the park, since summer uses are currently very low. The greatest probable threat to denning grizzly bears is off-trail, high-elevation snowmobiling within 200 m of den sites.

## **Birds**

The upper spruce and subalpine fir forests, and the alpine areas of this wet belt are not expected to be rich in numbers of species. Gray jays, Clark's nutcrackers, ravens, and a few passerine birds have been reported from the parkland and alpine, with the possibility of white-tailed ptarmigan in the true alpine. American pipits and horned larks may also be found in spring migration.

The larger woodpeckers may be found in small numbers in all the forested areas, while small passerine birds such as kinglets, juncos, red crossbills, hermit thrushes and chickadees may be found in the lower forests. Spruce grouse would be associated with forest-wetland interface areas. The wetlands associated with Grizzly Lake may support Barrow's goldeneye and spotted sandpipers and Grizzly Lake may support common loons.

## **Reptiles**

No reptiles are likely present in the park, although garter snakes and alligator lizards are found at similar elevations and in similar habitats.

## **Amphibians**

Long-toed salamander may be found in the small ponds and wetlands of the Grizzly Lakes valley. Other possible amphibians present include western toads and spotted frogs.

## **Fish**

A wild population of rainbow trout resides in Grizzly Lake. These trout are reportedly small, likely as a result of nutrient poor, cold waters. Trout are widely distributed in the Scotch Creek watershed. Sockeye, coho, and chinook salmon spawn in Scotch Creek up to a point about 18 kilometres from the park.

## **Insects**

Insect populations in the park are not documented, but can be expected to include species typical of the wet spruce and subalpine fir, parkland and alpine habitats identified within the park.

# Cultural Values

## First Nations

Little detailed study has been completed of the ways of life of the early Indians of the Shuswap area. George Dawson used ancient Indian trails and collected anecdotal information while doing geological surveys from 1877-1890; David Mitchell, a fisheries biologist in the area from 1888-1920, included important general information in his 1925 report to the Pacific Salmon Commission (Mitchell. 1925).

The local bands have recently embarked on various studies to compile information about traditional uses and historical trails. The 2001 report “Significant Trails within Little Shuswap Indian Band’s Area of Interest” (Running Horse Consultants. 2001) provides an overview of much of the known information about use in the area north of Shuswap Lake up to Pukeashun Park. Grizzly Lake and Pukeashun Mountain are mentioned many times as the end point of the ancient Scotch Creek Trail, although signs of the actual trail are hard to find in most of it’s length.

The area now known as Pukeashun Park was a significant place for early Indians living in the Adams River and Shuswap Lake area. The Little Shuswap, the Adams Lake and the Neskonlith Bands relied on the annual salmon run in the Adams Rivers for their basic sustenance. The outlying lands around Adams and Shuswap Lakes were divided up among the various families in the three bands. One family in the Little Shuswap Indian Band still uses the Grizzly Lake valley area. Many other Band members report using the area from Scotch Creek north to Grizzly Lake, Pukeashun and over to Humamilt Lake.

Spring and summer were spent gathering food plant material, with hunting and trapping in the fall. Foods collected included: trout, moose, caribou, deer and elk, blueberries and huckleberries. There are references to caribou and bear tracks

Some Shuswap names:

Pukeashun Mountain can be translated as “white rock.”

Kwikoit (Kwhe-koit) means “Slick sawing too & for with {wind}” and was used in reference to Scotch Creek.

## Non-aboriginal

The development of the fur trading industry in the area encouraged Indians to trap and trade furs with the Hudson’s Bay Company with a devastating effect on local wildlife populations. The rise of gold mining in the Seymour Arm and Columbia areas in the 1860s brought waves of people through the area south of Pukeashun. Gold was panned in Scotch Creek for a short while. Interest in other minerals again brought miners into the area to stake claims in the 1920s and 1930s.

The completion of the Canadian Pacific Railway in 1887 along the south side of Shuswap Lake created a new demand on the natural resources of the area as huge quantities of cord wood were cut to supply the steam locomotives.

The Dominion Forest Service built fire guards and access trails in the area south of Pukeashun in the 1920s that were later developed and extended as sheep trails. Pukeashun Mountain is identified on a 1934 BC Forest Service map as a sheep trail destination, and a piece of trail is shown in a similar location to the present access trail. Just how much sheep grazing occurred on the mountain is unclear.

## **Outdoor Recreation and Tourism Values**

### **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. Pukeashun Park provides recreation settings and opportunities that are among these themes.

### **Backcountry Recreation**

Pukeashun Park is situated on the eastern end of a series of steep ridges in a relatively remote area on the plateau north of the west arm of Shuswap Lake. Access to the park is by narrow logging roads for 42 kilometres from Scotch Creek community to an old cutblock almost 2 km west of the park boundary. At 35 kilometres a steep Forest Service trail leads to a gently sloping alpine ridge that allows access east to the park.

Pukeashun Park is

- a setting for summer backcountry recreation
- a setting for specialized backcountry winter recreation

The road from the main logging road into the old cutblock is very rough. In summer the hike in to Grizzly Lake is on gentle terrain and provides an opportunity to appreciate a high elevation lake and extensive wetlands.

The length of the drive to the start of the hiking trail at 35 km, and the strenuous hike needed to reach the alpine area in the park, preclude most hikers from making the journey right into the park. However, these distances and obstacles do not prevent ATV and snowmobile enthusiasts from accessing the alpine areas, or from entering Grizzly Lake valley.

### **Nature Appreciation and Wildlife Viewing**

BC's diversity of wildlife habitat and populations are important recreation features, some of which are found in Pukeashun Park. It is recognised that there is increased interest in non-consumptive uses of wildlife, including viewing. Some studies predict bird watching and nature

study as fast growing among “baby boomers” in the future. The alpine flower meadows of the park are much appreciated by hikers who have been in the area.

Pukeashun Park is:

- a setting for appreciation of high elevation natural features

## **Visual Values**

The alpine area of the park is a riot of colour in summer months and a spectacular snow-draped landscape in winter offering almost limitless opportunities for exploration and appreciation. In winter the snow landscape of the multi-peaked alpine area is said to be spectacular. The alpine ridges and peaks provide views in all directions across the southern section of the Shuswap plateau: towards Shuswap Lake in the south and east, towards Adams Lake in the west, and down to the Humamilt and Momich Lake valleys in the north.

Pukeashun Park is:

- a setting for appreciation of alpine and wetland landscapes
- a setting for appreciation of surrounding landscapes

## **Outdoor Recreation and Tourism Opportunities**

The remote nature of Pukeashun Park, with rugged access and only a small alpine area in the park itself, limit the kind of opportunities there might be for the variety of activities normally found in this type of landscape. Access is along sometimes rough gravel roads that end in areas of former logging activity. A 6-kilometre Forest Service trail to the alpine areas west of the park is very steep with a further two kilometres to the park boundary.

The 2002 Shuswap Tourism Opportunity Strategy prepared for the Salmon Arm Economic Development Corporation and Columbia–Shuswap Regional District (Marilyn Chisholm and Associates, 2002) included the larger Pukeashun area and provides useful information about recreation and tourism opportunities. Ten recreation and tourism activities were identified as highly suitable opportunities for the Shuswap region as a whole, but only four had any reference to Pukeashun Park and area: snowmobiling, mountain biking, horseback riding, and cabin system.

Mountain biking and snowmobiling were both rated as having low potential for commercial development while horseback riding and cabin system were rated as moderate. The lack of steep terrain is cited as limiting the development of heli-skiing and cat-skiing in the North Shuswap. The distant nature of the area and the difficulty of access were mentioned as constraints to development of all activities. Comments from the Strategy document are included in each section below.

## **Snowmobiling**

Snowmobiling is a very popular activity in the area north of the community of Scotch Creek on Shuswap Lake. Participants mainly come from the area extending from Kamloops to Salmon Arm and from Falkland to the North Shuswap.

Three plateau and mountain areas rising north from the east arm of Shuswap Lake provide a variety of snowmobiling opportunities. Crowfoot Mountain, the most southerly area, has a well-developed trail and cabin system and is accessible to all users. Lichen Mountain, just south of Pukeashun Park, is a little more remote and attracts those who want to be away from the popular trails at Crowfoot.

The Pukeashun area has been used by small groups of snowmobilers since 1970. It has seen increasing use in recent years as snow machines have become more powerful, able to go longer distances, and climb steeper hills. Snowmobilers use the ridges and bowls in the highest portion of the park and are particularly attracted to the challenges found on the steeper slopes. The area referred to as “Seven Peaks” (Figure 3), is considered unique and the “cream” of the three local areas. It is rated as an advanced intermediate to expert area and is regularly used by about 30-40 people in small groups.

Snowmobilers use the Grizzly Lake valley as well as the alpine, riding in from the west end or down from Lichen Mountain. It is not clear how many use this area.

## **Hiking**

It is difficult to quantify the numbers of hikers who go into Pukeashun Park. It is an occasional destination for local hiking groups. The 6 km long, steep Forest Service access trail makes it difficult to reach the park easily, and makes for a very long day hike. Organised hiking groups, and more serious hikers, tend to prefer similar areas with easier access and less obvious logging activity. There is some potential for backpacking over the ridge to the north, with a destination of Momich Lakes Park or Humamilt Lake.

## **Wildlife Viewing**

Although there is no organised wildlife viewing tourism in the Pukeashun Park area, people engaged in outdoor activities within the park usually mention their encounters with or viewing of wildlife. This anecdotal evidence forms much of the present knowledge of the wildlife populations of the park.

The alpine parkland and alpine areas and the Grizzly Lake valley have some potential as remote areas for bird watching, plant discovery and wildlife viewing. The best opportunities for viewing wildlife in Pukeashun Park are during the brief summer and fall months from July to September when most wildlife is active. Snowmobiling and the proposed cat-skiing provide only limited opportunities to view the wildlife that is active in winter.

The difficulty of access to Pukeashun Park limits the opportunities to those people who are interested in making the effort. At present it is mostly local people who visit for the purpose of going for a hike, to ride ATVs, or to snowmobile.

## **Hunting**

Grizzly Lake valley and the lower slopes of the park are used to hunt for moose, deer and bear.

## **Fishing**

The amount of fishing done at Grizzly Lake is unknown at present. There is an opportunity for a walk-in catch and release trout fishery at Grizzly Lake for 6-8" rainbow trout.

## **Existing Facilities and Services**

There are no facilities in Pukeashun Park.

The main access to the park is via the gravel Scotch Creek and Kwikoit Creek Forest Service Road #670. The last 10 kilometres are along a deactivated forest access road #683 which requires the use of high-clearance 4x4 vehicles. Parking is in an old cutblock landing, from which visitors make their own way into the park. There is no defined trailhead, though a rough ATV track has been cut into the Grizzly Lake valley.

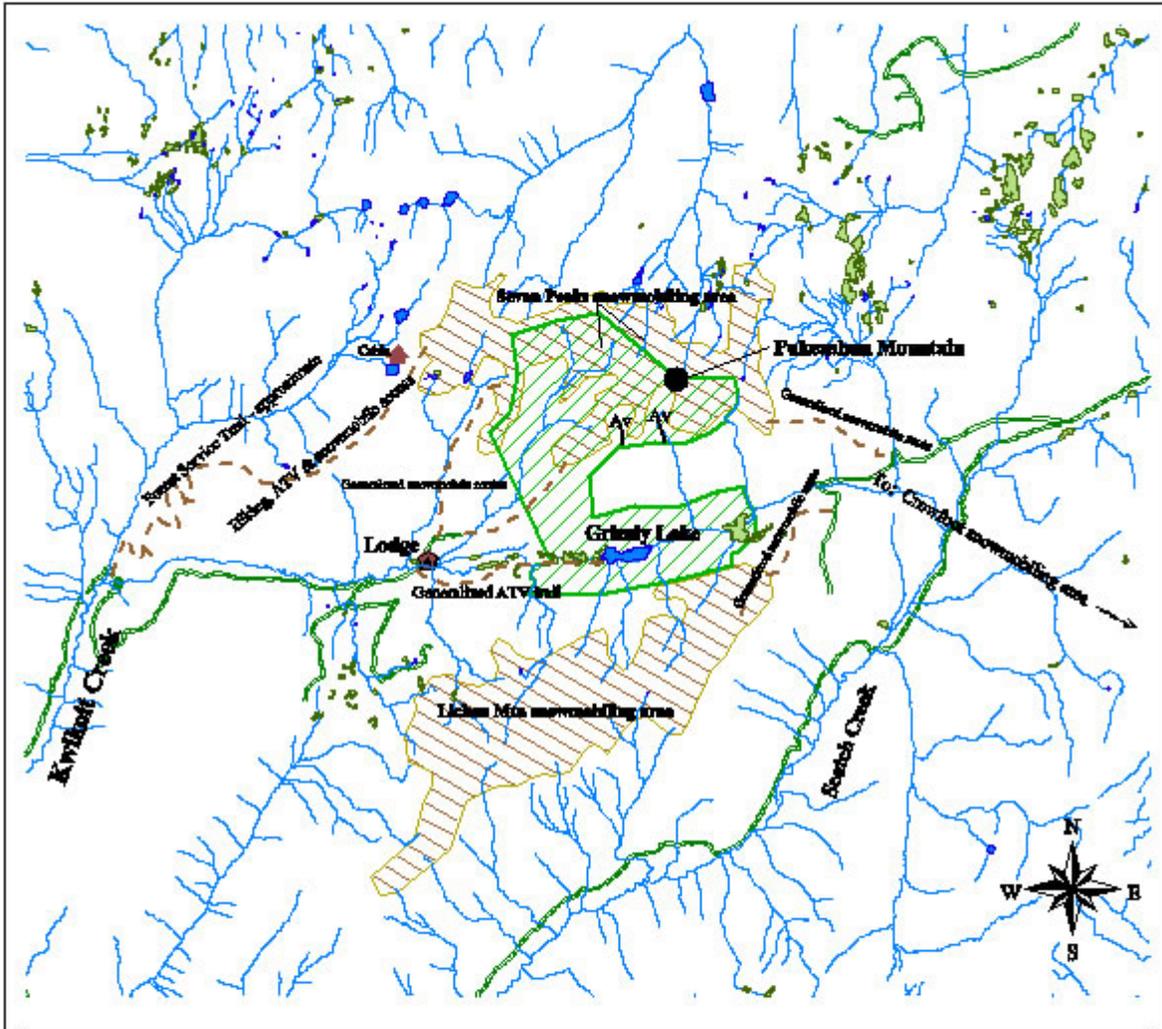
A Forest Service trail leads off the #670 road 10 kilometres west of the park up a long ridge that heads to the north east. This provides a longer but better-defined access for hikers in the summertime. Once at the height of land access into the park is through the extensive, open alpine areas.

The #670 Road is not always passable for the full length in winter since ploughing is at the option of the logging company.

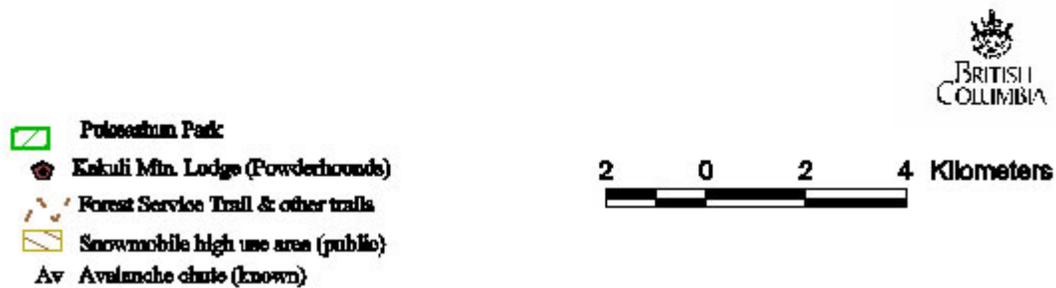
The new 12-bedroom Kekuli Mountain Lodge has been built about two kilometres west of the park boundary to accommodate visitors to a new cat-skiing operation slated to start in January, 2005. Powderhounds Cat-skiing will offer multi-day packages for cat-skiing from the lodge. The area under their license can accommodate two cats with a total of 24 clients using a variety of ski areas during their stay. Trail clearing and other preparations are ongoing for the opening of the operation.

## **Visitor Activity Areas**

The amount of outdoor recreation activity in the park is unknown. Two particular areas of the park are known to have some activity.



**Figure 3: Recreation Features and Opportunities**



## **Alpine Areas**

The alpine areas of the park see the most known use, from November to April for snowmobiling, and in late June-September for occasional hiking and ATV riding. Braided ATV trails have been reported in the alpine meadows adjacent to the park.

## **Grizzly Lake valley**

ATVs are ridden into the Grizzly Lake valley in the southern part of the park on a regular basis, many for access to hunt and fish. A trail has been cut into the park and flagged from the west side and another cut through forested areas between wetlands towards Grizzly Lake. Flagging tape found on high branches suggest the area is also used by snowmobiles in winter.

## **Park Visitor Profiles**

Visitors to Pukeashun Park tend to be people from the Kamloops-Shuswap area with prior knowledge of the area. The difficulty of access for hiking precludes all but the fittest, though many of the visitors seem to be either retired or approaching retirement. The average age of snowmobilers is 36 years old.

## **Visitor Use Trends: Past; Present; Future**

There has been no formal study of visitor use at Pukeashun Park, but the Kamloops Snowmobile Association estimates that there were over 3000 snowmobile days in the Pukeashun-Lichen Mountain area. They anticipate an annual growth rate of 5% in snowmobile days. The number of snowmobilers using Pukeashun Mountain has been estimated at 30-40, usually on weekends.

There is a demand among older tourists for backcountry experiences associated with quality accommodation. The 2001 Shuswap Tourism Opportunity Strategy (Marilyn Chisholm and Associates, 2001) provides only a little information about backcountry use in the study area. It does, however, offer some insight into the potential for attracting tourists.

Visitors to the North Shuswap area go there to enjoy the amenities offered around Shuswap Lake and the Adams River, with peak numbers during the months of July and August. In winter snowmobilers visit, with highest numbers on weekends and over the Christmas season. Every fall visitors flock to the Adams River to watch spawning salmon, with as many as 60,000 visitors in the peak years. However, few of those visitors stay on in the North Shuswap area.

There is a large variety of accommodations and services scattered throughout the small communities of the area that rely on these visitors and that could benefit from new tourism opportunities. At present visitors come independently, renting their own accommodation and taking care of their own needs.

There are few resorts or organised outdoor recreation providers in the North Shuswap and no organised group to plan for new tourism opportunities. New opportunities suggested in the

Tourism Opportunity Strategy include snowmobiling, horseback riding and ATV riding, all in the Crowfoot Mountain area.

Pukeashun Park is remote from the population centres in the North Shuswap and is not generally known or appreciated, even among local residents. The Powderhounds Cat-skiing operation proposed to start in January, 2005 has the potential to generate some increase in visitors to the area during the winter season. Unless it was to be heavily promoted as a destination for summer backcountry adventure tourism, the number of visitors using the park is not likely to rise substantially.

## **Economic Contributions of the Park**

### **Snowmobiling**

The 2002 Kamloops Snowmobile Association report estimates that snowmobilers in the Pukeashun-Lichen Mountain area have an economic impact conservatively estimated at \$600,000.00 annually. They anticipate a growth rate of 5% annually. Economic contributions include: snowmobile sales, sales tax, gasoline sales, restaurant, accommodations, grocery stores, repair shops. These contributions occur during the winter season when other tourism business is limited.

### **Wildlife Viewing**

Wildlife viewing is limited in the area. There could be some economic benefit to the local community if backcountry tours were made from the new Kekuli Mountain Lodge during the summer and fall months. The benefits would be similar to those from the cat-skiing operation.

### **Cat-skiing**

The authors of the 2002 Shuswap Tourism Opportunity Strategy prepared for the Salmon Arm Economic Development Corporation and Columbia–Shuswap Regional District (Marilyn Chisholm and Associates. 2002) did not include cat-skiing in their analysis. They cited lack of steep terrain as limiting the development of heli-skiing and cat-skiing in the North Shuswap.

The report: Analysis of Socio-Economic Benefits of Helicopter and Snowcat Skiing in British Columbia, 2001 (Brent Harley and Associates. 2001), indicates that the main benefits to local communities as reported by the operators include “purchases of food and beverage supplies, equipment and business supplies, staff accommodation and other related business services, as well as sources of employment.” The operators consider that there are other spin-off benefits such as the stimulus to create other business opportunities and creating local jobs.

Local residents generally agreed with the economic benefits of these operations, but were less supportive of the social and environmental roles they played in their communities. Concerns included “disputes between visitors and residents, land use conflicts, the safety and security of residents and diminishing the quality of local environments”.

The Powderhounds Cat-skiing operation proposed to take place in and around the park may provide some limited economic benefits to the North Shuswap area. Visitors will stay at the Quaaout Lodge at Squilax on their way to and from cat-skiing at a time when visitor numbers are usually low. There would also be some opportunities for local employment at the new Kekuli Mountain Lodge operated by Powderhounds Cat-skiing. Some of the spin-off benefits cited in the above reports, such as purchase of equipment and business supplies, staff accommodation and other related business services, as well as sources of employment, could be found in the local North Shuswap communities.

The company would like an access cat trail through the park above the west end of Grizzly Lake valley. The trail would allow them a shorter route to and from their skiing areas, saving both time and money.

## **Significance in the Protected Area System**

Pukeashun Park is a small park that protects a high elevation pass, a lake with forested slopes, subalpine parkland and alpine tundra. Large wetlands occur in Grizzly Lake valley with associated exceptionally large old growth spruce and subalpine fir. The undisturbed lake and wetland sequence across the lower park is rare for the ESSFwc2.

This is the only park to protect undisturbed high-elevation features in the southern portion of the Shuswap Highlands Ecoregion. Similar areas at nearby Lichen and Crowfoot Mountains have been heavily developed by forestry activities and recreation trails.

Pukeashun Park provides opportunities for natural heritage appreciation in an alpine and sub-alpine environment similar to those found in the Trophy Mountains area of Wells Gray Park.

Pukeashun Park also has intrinsic and vicarious values appreciated throughout the province.

## **Land Tenures, Occupancy Rights, and Resource Uses**

### **Tenures, Rights and Resource Uses in the Protected Area**

Park designation ensures that all existing liens, charges, and encumbrances other than those applying to commercial logging, mining, or energy exploration and development will continue to be authorized through issuance of park use permits. This policy recognizes all existing land act tenures, Special Use Permits, trapping licenses and other legal tenures and rights.

## **Trapping Licenses**

Two trapping licence territories intersect within the park: Traplines 0336T005 and 0336T006. (Figure 4.) The licence area has been trapped in a cycle of years of rest and return, with marten being the single target species.

## **Guide-Outfitting Licenses**

A guide-outfitter territory includes the park, with the guide relatively new to the area.

## **Leases and permits**

BC Parks issues Park Use Permits for approved activities. No permits have been issued for Pukeashun Park.

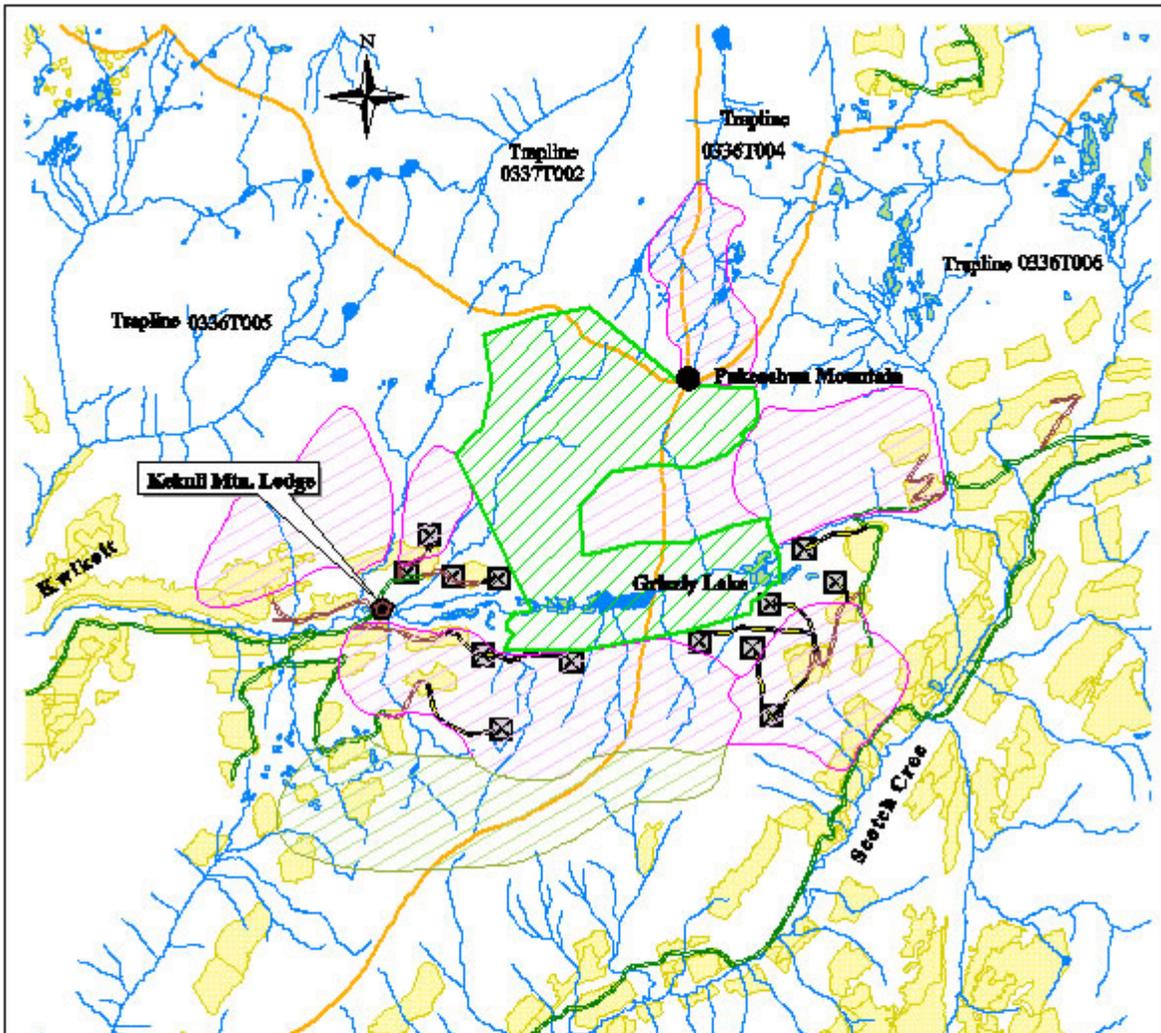
The Powderhounds Cat-skiing operation has an interest in applying for a park use permit to: allow cutting of a winter access trail through the southern portion of the park for cat-skiing; enable cat-skiing activity from Pukeashun Mountain down slopes towards the Grizzly Lake valley

## **First Nations Interests**

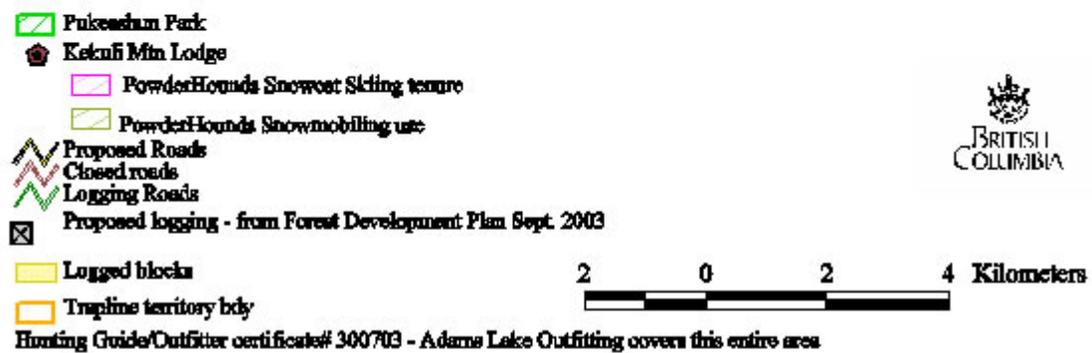
Three Indian Bands have an interest in the area of Pukeashun Park: Adams Lake Band, Little Shuswap Band and Neskonlith Band. Adams Lake and Neskonlith Band have completed a joint Traditional Use Study that indicates long-time and continuing interest in and use of the area. Little Shuswap Indian Band have completed Phase One of their Traditional Use Study and a study of significant trails in their territory.

A draft Memorandum of Understanding between Little Shuswap Indian Band and BC Parks was created in June 2000. Little Shuswap Indian Band have expressed an interest in management and planning of the park. They have also developed a referral process guide for proposed developments in their interest area.

The Little Shuswap Indian Band are partners with Powderhounds Cat-skiing & Snowmobiling in the new cat-skiing operation being developed around Pukeashun Park. Visitors will stay at their Quaaout Lodge in Squilax on the way to and from their cat-skiing holidays. Band members have been employed in the construction of the Lodge adjacent to the park and will be employed there during the winter season.



**Figure 4: Surrounding Land Uses and Tenures**



# **Patterns of Land Use Next to Protected Area**

## **Federated Coop Limited**

Forested lands adjacent to the park on the east, west and south are in the Timber Supply Area of Federated Coop Ltd., of Canoe. Forest Development Plans within a kilometre of the park boundary are referred to BC Parks.

Areas adjacent to the park have logging roads and cutblocks dating back 4-30 years, with none closer than 750 metres from the park boundary. Planning is underway for logging more blocks in the next five years, with many of them closer to or adjacent to the park.

## **Recreation Interests**

Snowmobilers access the park by three routes. They follow a Forest Service trail up a ridge to the west of the park and then through the extensive alpine areas. A small cabin has been erected along the trail. They also make their way up to Pukeashun Mountain and into the Grizzly Lake valley by trails from the end of the road 2 km west of the park. Occasionally snowmobilers ride from Crowfoot Mountain up the slopes east of the park to the top of Pukeashun Mountain.

Snowmobile trails have been established on Lichen Mountain, immediately south of the park, since the 1970s, while a parking area and cabin are more recent additions. Ministry of Forests, Okanagan Shuswap Forest District, Recreation Section is in the process of developing an agreement with the Sorrento Snowmobile Club relating to snowmobile use in this area.

A local hiking guide describes a hike up to the Pukeashun ridge west of the park along the same Forest Service ridge trail used in the winter by snowmobilers. The trail is used mostly by local hikers to access the small lakes and extensive alpine areas. They may or may not hike as far as the park.

All-terrain vehicle activity takes place around the park, but it's full extent is unknown. ATV activity has been documented in the east side of the Grizzly Lake valley as part of the study of plant communities in the Grizzly Lake valley completed for this Background Document. See Appendix 4.

Powderhounds Cat-skiing, hold a 20-year Licence of Occupation (3410067) to use areas to the west, south, east and north east of the park for a cat-skiing operation. They also have a 20-year Lease (3410562) for the purpose of building a Lodge that will be used by their clients during the winter months only. Small groups of up to 24 guests will stay over three nights at a lodge built just outside the west side of the park. Guests will be bussed or helicoptered up to the lodge from their base lodgings at Quaaout Lodge in Squilax. They intend to develop a series of winter access trails to take their clients to and from the skiing areas.

Cariboo-Chilcotin Helicopters is advertising heli-hiking tours to Pukeashun Mountain in association with Quaaout Lodge on their website. This activity is in the development stages and is not approved.

## **Water rights**

There are no water licenses in or near Pukeashun Park and it is not in a Community Watershed.

## **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**

The park is within the Columbia-Shuswap Regional District.

See Figure 4.

# **BC Parks Operations**

## **Operations, Infrastructure and Facilities**

At present there is no infrastructure or facilities in Pukeashun Park.

# **Key Management Issues**

## **Management of Ecological Values**

### **Ecological Integrity**

There is a lack of meaningful ecological information about Pukeashun Park, with detailed site-specific information on species and habitats lacking. The Grizzly Lake valley contains extensive wetland ecosystems that are unusual in the variety of site associations present. The full extent of the wetlands is not within park boundaries.

There is a lack of information about Red- and Blue-listed plants in the park. This may reflect the lack of field inventory work, rather than a true absence of taxa or plant communities of concern.

The size and shape of the park restrict the potential for effectively managing ecosystems within the park. An important piece of terrain connecting the lower valley to the higher slopes was not included in the park. The cumulative effect of developments outside the park impact on ecological values in the park.

## **Potential Management Strategies**

On-going monitoring is needed so important terrestrial and aquatic ecosystems can be effectively managed. An in-depth vegetation study, conducted before the end of August, is needed in the Grizzly Lake valley to determine the complete pattern of wetland ecosystems and to ensure identification of potential Red- and Blue-listed species.

## **Management for Mountain Caribou**

The 2004 assessment report (Serrouya. 2004) indicates that there is abundant winter habitat for mountain caribou in the park and surrounding area, but caribou have not been seen since 1988. Forest fragmentation outside of the park, increased prey numbers, and increasing activity as a result of forest road developments likely contributed to site abandonment. There is an interest in maintaining or increasing the area's suitability for caribou habitat as directed by the OSLRMP.

## **Potential Management Strategies**

Measures that could be taken include managing activity in caribou habitat and maintaining forest cover and forage. Since it has been shown that snowmobiles displace caribou in some other B.C. areas, continued use of snowmobiling in or around Pukeashun would likely hamper attempts for caribou to re-colonize the park.

Caribou conservation mitigation strategies from the assessment report (Serrouya. 2004) include the following:

- localizing habitat disturbances such as clearing and roading,
- avoiding caribou and caribou tracked areas,
- reporting sightings to WLAP, and
- avoiding caribou key habitat overflights.

## **Management for Grizzly Bear**

The 2004 assessment report (Serrouya. 2004) indicates that at present winter recreation is the most intensive human activity that might affect grizzly bears within the park, since summer uses are currently very low. The greatest probable threat to denning grizzly bears is off-trail, high-elevation snowmobiling within 200 m of den sites, although to date, den abandonment or disturbance has not been identified as a limiting factor of grizzly bear populations.

A future serious concern is the potential of increased yearlong access by humans into the Pukeashun area as a result of trails created for motorized recreation or other resource development.

## **Potential Management Strategies**

Given the lack of knowledge of grizzly bear populations and habitat use in the Pukeashun and larger Shuswap Highlands area, the 2004 assessment report recommends an adaptive

management and monitoring approach (Serrouya. 2004). Key aspects to an adaptive process are: 1) commit to monitoring species over the long term (through DNA mark-recapture estimates or collaring programs), and 2) committing to altering management practices and activities as new information arises.

Grizzly bear conservation mitigation strategies from the assessment report include the following:

- limiting access into key habitats during spring and summer by controlling trail construction and placement,
- avoiding helicopter flight routes that overfly the sub-alpine and alpine portions of the Pukeashun area or target wildlife for viewing, and
- managing against bear attractants such as food and garbage at the lodge.

## **Fire, Insect and Disease Management**

Forest insects, disease and wildfire are not a threat to the park or the surrounding forest at present, although a level of balsam bark beetle infestation exists at mid-elevation.

### **Potential Management Strategies**

Continue to monitor the impacts of insects and diseases in the park.

## **Management of Recreation Use**

### **Dispersed Recreation**

There is little information about how much dispersed recreation actually takes place in the park. A trail has been cut through treed patches in the Grizzly Lake valley and there is photographic evidence and anecdotal reporting of ATV use there. Vegetation on organic soils can easily be disrupted with continual ATV use. They are susceptible to rutting, which leads to an increase in erosion and allows weedy species to enter. The forested islands could undergo structural changes. Forest Development Plans indicate new roads will be built and blocks will be cut in the areas of the Grizzly Lake valley outside the park. This will provide even closer access to the valley for ATVs.

ATV trails are also reported in the alpine flower meadows adjacent to the park. Snowmobilers use the alpine areas on a regular basis. The impact of these activities is unknown at present.

### **Potential Management Strategies**

Assessment is needed of the impacts of recreational activity in the alpine areas to determine future access management needs. Wetland ecosystems should be protected by limiting access by recreational vehicles.

## **Commercial Recreation**

A cat-skiing operation is proposed for the area immediately surrounding the west, south and east sides of the park. A destination lodge has been built west of the park boundary. There is a concern that the open road and trails associated with the lodge may attract additional public use, such as ATVs and snowmobiles, into alpine areas and the Grizzly Lake wetland complex.

### **Potential Management Strategies**

Work with the Lodge owners to ensure:

- roads and trails under their tenures cannot be accessed when the lodge is not in operation.
- staff and visitors are educated about the values represented in Pukeashun Park
- the values in the park are acknowledged in cat-skiing promotion.

Snowcat skiing is proposed to take place both around and inside the park. Ski areas and access trails will be created in the forests around the park, and a snowcat access trail is proposed that would cross the park. There would be a cumulative impact of these openings in and around the park on many wildlife species in the park. Research at the nearby Ministry of Forests Sicamous Creek Research Site indicates changes in bird numbers and species composition with forest opening. The proposed openings are all within potential caribou winter and grizzly bear denning habitats, species that are known to be susceptible to disturbance.

Based on the lack of available studies in the literature, the 2004 caribou and grizzly bear assessment report (Serrouya 2004) states an uncertainty of how cat-skiing operations would affect the potential for the Pukeashun area to sustain caribou populations. However, there is likely an increasing relationship between the intensity and extent of a cat-skiing operation and the level of caribou displacement. In other words, if the cat skiing operation were restricted to a single area around the park, it would likely have less impact compared to if a large proportion of the park and surrounding area were subject to skiers and the cat machine.

Caribou displacement from the proposed cross-park cat trail would also be minimal (but cumulative in impact) because of the heavily forested area adjacent to that section, and predictable nature of the snow cat travel.

Cat-skiing and related access routes may also unwillingly result in increased accessibility to the Park's suitable caribou habitat by snowmobile users and ATV summer users.

### **Potential Management Strategies:**

BC Parks policy is that full impact assessments must be done before activities can take place within a provincial park.

The 2004 wildlife assessment report recommends the following specific management practices:

For mountain caribou:

- high-stumping trails to limit summer users,
- avoiding improvements to snowmobile access.

For grizzly bear:

- limiting commercial recreation to winter months,
- minimizing the amount of activity during denning season,
- using predictable and limited routes for cat-ski transport,
- avoiding any newly identified denning sites.

## **User Conflicts**

The OSLRMP designated the park management category as “Wilderness”, but acknowledges there is a conflict between this proposal and the continued use of snowmobiles. There is also a potential conflict between cat-skiing and snowmobiling that may create tensions and impact on park management.

As a condition of obtaining their licence to operate on crown land, the cat-skiing operators were asked to obtain agreement with the snowmobilers about use of the alpine areas. There has been discussion but no agreement to date. This issue is outside the mandate of park managers but the potential tensions between the two groups could impact park management.

### **Potential Management Strategies**

Continue to monitor the situation and request that the cat-ski operators and snowmobilers develop an agreement. Once agreement has been finalised between the groups, define their activity areas and zone appropriately.

## **Park Identity**

Pukeashun Park is not generally known among people in the North Shuswap community, but promotion of the park could have negative consequences. The park boundary creates a definite constraint to ecosystem management and identification of the boundary on the ground will be difficult.

### **Potential Management Strategies**

Do not promote the park as a destination for either casual or commercially-organised visits.

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(See also References listed in the two Assessment Reports in Appendix 3 and Appendix 3)

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Marilyn Chisholm & Associates. 2002. *Shuswap Tourism Opportunity Strategy*. For Salmon Arm Economic Development Corporation and Columbia–Shuswap Regional District.

**Websites:**

BC Helicopter and Snowcat Operators Association, Vernon, BC: <http://www.bchssoa.com/>

British Columbia Snowmobile Federation: <http://www.bcsf.org/>

Columbia Shuswap Regional District: <http://www.csr.d.bc.ca/>

Little Shuswap Indian Band: [http://www.secwepemc.org/little\\_shuswap.htm](http://www.secwepemc.org/little_shuswap.htm)

Powderhounds Catskiing: <http://www.powderhoundscatskiing.com/>

Sicamous Creek Research Forest: <http://www.mountainforests.net/sicamous/sicreek.asp>





# Appendix 1: People Contacted

## People Contacted:

### BC Parks:

Elaine Gustafson  
Peter Weilandt  
Ron Routledge

### Other Government Agencies:

Columbia Shuswap Regional District: Roger Beardmore, Planner; Tom Coombes, Area F. Rep.  
North Shuswap Chamber of Commerce: Larry Vandale  
LWBC, Kamloops: Dean McKinley  
MWLAP, Kamloops: Doug Jury, Kurt Kier, Steve Maricle, John Surgenor  
MSRM, Kamloops: Jim Britton, Harry Gill, Terry MacDonald, Jeff Morgan,  
MSRM, Surrey: Dave Tudhope  
Ministry of Forests, Research, Kamloops: Dennis Lloyd  
Ministry of Forests, Recreation, Kamloops: Jennifer Eastwood  
Ministry of Forests, Okanagan Shuswap Forest District, Recreation: John Glaspie

### Recreation Users:

Crowfoot Snowmobile Club: Jay Boppre  
Kamloops Snowmobile Club: Don Rogers, Alan Hodgson  
North Shuswap Naturalists: Joan King  
Shuswap Outdoors Club: Joe  
Shuswap Naturalists: Ed MacDonald, Mary Tapsen-Jones  
Sorrento Snowmobile Club: Louis Cassman

### Commercial:

Trapline holders: 0336T005 and 0336T006  
Guide Outfitter: Adams Lake Guide Outfitters  
Powder Hounds Cat-skiing & Snowmobiling: Peter Ernst  
Cariboo-Chilcotin Helicopters:  
Federated Coop Limited: Geoff Hislop, Planning Forester

### First Nations:

Little Shuswap Indian Band: Andreas Artz

### Others:

Mike Hanry, retired, BC Parks  
Ed McDonald, Regional Rep, Federation of BC Naturalists  
Phil Rathbone, retired, BC Parks  
Mary Tapsen-Jones, Shuswap botanist  
Joe "contour" Wehle, hiker

## **Appendix 2: 2004 Wetland Vegetation Study**

**Report of 2004 Wetland Vegetation Study in Grizzly Lake Valley.**  
(The complete report is attached as a separate document.)

# **Appendix 3: 2004 Grizzly Bear and Mountain Caribou Studies**

## **Report of 2004 Grizzly Bear and Mountain Caribou Studies**

(The complete report is attached as a separate document.)

# Appendix 4: Species Lists

## Species found or expected in Pukeashun Park

### Plant List

The following lists are in two sections:

- A. Forested and alpine portions of the park
- B. The Grizzly Lake Valley

The lists have been compiled from a variety of sources and are far from complete. The following are some sources:

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

Parrish, R., R. Coupé and D. Lloyd. 1996. *Plants of the Southern Interior British Columbia*. Lone Pine Press, Vancouver, BC.

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### A. Forested and alpine portions of the park

<b>Trees</b>	
Engelmann spruce	<i>Picea engelmannii</i>
Sub-alpine fir	<i>Abies lasiocarpa</i>
<b>Shrubs</b>	
Five-leaved bramble	<i>Rubus pedatus</i>
Falsebox	<i>Pachistima myrsinites</i>
Sitka alder	<i>Alnus viridis</i>
False azalea	<i>Menzesia ferruginea</i>
White-flowered rhododendron	<i>Rhododendron albiflorum</i>
Black huckleberry	<i>Vaccinium membranacium</i>
White mountain-heather	<i>Cassiope mertensiana</i>
Pink mountain-heather	<i>Phyllodoce empitriiformis</i>
<b>Wildflowers</b>	
Mountain arnica	<i>Arnica latifolia</i>
Arrow-leaved groundsel	<i>Senecio triangularis</i>
Sitka valerian	<i>Valeriana sitchensis</i>
White marsh-marigold	<i>Caltha leptosepala</i>
Western Meadowrue	<i>Thalictrum occidentale</i>
Partridge-foot	<i>Leutkea pectinata</i>
Mitrewort sp.	<i>Mitella</i> sp.
Indian hellebore	<i>Veratrum viride</i>
One-leaved foamflower	<i>Tiarella trifoliata</i> var. <i>unifoliata</i>
Rosy twistedstalk	<i>Streptopus lanceolatus</i>

<b>Grasses</b>	
Mountain hairgrass	<i>Vahlodea atropurpurea</i>
<b>Sedges and Rushes</b>	
Black alpine sedge	<i>Carex nigricans</i>
Showy sedge	<i>Carex spectabilis</i>
Wood-rush	<i>Luzula sp.</i>
<b>Ferns</b>	
Oak fern	<i>Gymnocarpium dryopteris</i>
<b>Mosses</b>	
Red-stemmed feather-moss	<i>Pleurozium schreberi</i>
Ragged-moss	<i>Brachythecium sp.</i>
Rock-moss	<i>Racomitrium sp.</i>
Awned haircap moss	<i>Polytrichum piliferum</i>
Heron's bill moss	<i>Dicranum sp.</i>
<b>Liverworts</b>	
Common leafy liverwort	<i>Barbilophozia lycopodioides</i>
Mountain leafy liverwort	<i>Barbilophozi floerkei</i>
<b>Hair Lichens</b>	
	<i>Alectoria sp.</i>
	<i>Bryoria sp.</i>
Clad lichens	

## B. Checklist of Plants in Grizzly Lake Valley

### Tree species

Common name	Botanical name
Engelmann spruce	<i>Picea engelmannii</i>
subalpine fir	<i>Abies lasiocarpa</i>

### Shrub species

Common name	Botanical name
Barclay's willow	<i>Salix barclayi</i>
black twinberry	<i>Lonicera involucrata</i>
willows	<i>Salix spp.</i>

### Herb and low shrub species

Common name	Botanical name
alpine bentgrass	<i>Agrostis humulis</i>
arrow-leaved groundsel	<i>Senecio triangularis</i>
beaked sedge	<i>Carex utriculata</i>
bluejoint	<i>Calamagrostis canadensis</i>
buckbean	<i>Menyanthes trifoliata</i>
common horsetail	<i>Equisetum arvense</i>
dwarf blueberry	<i>Vaccinium caespitosum</i>
few-flowered spike-rush	<i>Eleocharis quinqueflora</i>
fireweed	<i>Epilobium angustifolium</i>
five-leaved bramble	<i>Rubus arcticus</i>
marsh cinquefoil	<i>Comarum palustre</i>
meadow horsetail	<i>Equisetum pratense</i>
mountain hairgrass	<i>Vahlodea atropurpurea</i>
narrow-leaved cotton-grass	<i>Eriophorum angustifolium</i>
Pyrenean sedge	<i>Carex pyrenaica</i>
russet sedge	<i>Carex saxatilis</i>
shore sedge	<i>Carex limosa</i>
subalpine daisy	<i>Erigeron peregrinus</i>
sedges	<i>Carex spp.</i>
sticky false asphodel	<i>Tofieldia glutinosa</i>
swamp horsetail	<i>Equisetum fluviatile</i>
thread rush	<i>Juncus filiformis</i>
timber oatgrass	<i>Danthonia intermedia</i>
tufted clubrush	<i>Trichorum cespitosum</i>
violets	<i>Viola spp.</i>

water sedge	<i>Carex aquatilis</i>
wildrye	<i>Elymus spp.</i>

### **Moss and Lichen species**

Common Name	Botanical Name
glow moss	<i>Aulacomnium palustre</i>
hook-mosses	<i>Drepanocladus spp.</i>
leafy mosses	<i>Mnium spp.</i>
peat mosses	<i>Sphagnum spp.</i>
yellow star-moss	<i>Campylium stellatum</i>

## Wildlife List

The following lists have been compiled from a variety of sources and are far from complete. The following are some sources:

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. Appendix 4 of this document.

Birds	# Sensitivity to disruptions in forest cover *
Spruce grouse	
White-tailed ptarmigan	
Red-naped sapsucker	
Pileated woodpecker	
Olive-sided flycatcher	
Gray jay	
Clark's nutcracker	
Common raven	
Horned lark	
Mountain chickadee	
Boreal chickadee	
Red-breasted nuthatch	#
Brown creeper	#
Winter wren	#
Golden-crowned kinglet	#
Ruby-crowned kinglet	
Townsend's solitaire	
Swainson's thrush	
Hermit thrush	#
American robin	
Varied thrush	
American pipit	
Yellow-rumped warbler	
Townsend's warbler	#
Wilson's warbler	
Chipping sparrow	
Vesper sparrow	
Fox sparrow	
Lincoln's sparrow	
White-crowned sparrow	
Dark-eyed junco	
Pine grosbeak	
Red crossbill	
Pine siskin	
Evening grosbeak	

\* Ernest E. Leupin, Thomas E. Dickinson and Kathy Martin. 2004. *Resistance of songbirds to habitat perforation in a high-elevation conifer forest*. Canadian Journal of Forest Research 34: 1919-1928 (2004).

<b>Mammals</b>	
Moose	<i>Alces alces</i>
Canada lynx	<i>Lynx canadensis</i>
Bobcat	<i>Lynx rufus</i>
Marten	<i>Martes americana</i>
Fisher	<i>Martes pennanti</i>
Mink	<i>Mustela vison</i>
Wolverine	<i>Gulo gulo</i>
Black bear	<i>Ursus americanus</i>
Grizzly bear	<i>Ursus arctos</i>
Gray Wolf	<i>Canis lupus</i>
Common porcupine	<i>Erethizone dorsatum</i>
Deer mouse	<i>Peromiscus maniculatus</i>
Voles	<i>Clethrionomys gapperi</i> ; <i>Microtus sp.</i> ,
Hoary marmot	<i>Marmota caligata</i>
Red squirrel	<i>Tamiascurus hudsonicus</i>
Pika	<i>Ochotona princeps</i>
Shrews	<i>Sorex sp.</i>
<b>Reptiles &amp; Amphibians</b>	
Long-toed Salamander	<i>Abystoma macrodactylum</i>
<b>Fish</b>	
Rainbow trout	<i>Salmo gairdneri</i>