

MANAGEMENT PLAN

May, 1999



for Duffey Lake
Provincial Park



BRITISH
COLUMBIA

Ministry of Environment,
Lands and Parks
BC Parks Division

Duffey Lake
Provincial Park

MANAGEMENT
PLAN

Prepared by:

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Approved by:



Drew Carmichael
District Manager

Date: June 10 1999



Denis O'Gorman
Assistant Deputy Minister

Date: 990610

PARK VISION

Duffey Lake Park will continue to be an important part of the parks system on both a regional and provincial level. While the park is relatively small, its key habitat components, unique setting in the transition zone between the coast mountains and the dry interior, and recreational opportunities will make this area a favourite for both destination visitors and the travelling public.

Should resource and rural development increase in nearby areas, Duffey Lake Park's varied habitats for bear, deer, goats, raptors and other wildlife, particularly on the north-west side, will become even more important in providing wildlife the necessary food, cover and shelter to sustain populations in the region.

The park will continue to have high water quality, sustained fish populations and together with the wetland habitats, continue to be a high quality aquatic ecosystem.

Duffey Lake Park will continue to be important for First Nation traditional use and cultural values. BC Parks, together with the First Nation's communities, will ensure that significant cultural sites within the park are protected from development impacts and that recreation activities in the park are respectful of the environment and First Nation traditional use.

Visitors to the park will be attracted to the low-impact recreational opportunities including day-use and multi-day activities. The park will provide the travelling public with roadside rest areas and short walking trails. Nature interpretation and wildlife viewing will be excellent through much of the year. Small boats will often be seen on the lake as visitors enjoy the peaceful nature of Duffey Lake. Trails to areas within and outside the park will attract those wishing to experience the alpine and sub-alpine areas of the park as well as those areas outside the park boundaries. The park will offer a strategic camping opportunity along the Duffey Lake Road.

ACKNOWLEDGEMENTS

A variety of people, agencies, stakeholders, non-government organisations and First Nations have all contributed to the preparation of this management plan:

Original drafts of the Duffey Lake Management Plan were prepared through the former South Coast Regional Planning Services by Greg Chin, Regional Planner under the direction of Mel Turner, Regional Planning Services Manager.

Terra Firma Environmental Consultants conducted further research and updated the original drafts to current BC Parks standards under the direction of Brian Bawtinheimer, Senior Park Planner, Garibaldi/Sunshine Coast District. A draft copy was presented to various agencies, stakeholders and the general public in early 1998. The staff at BC Parks Garibaldi/Sunshine Coast District (under the direction of Drew Carmichael, District Manager) and at BC Parks Headquarters (through the co-ordination of Roger Norrish, Management Planning Co-ordinator) contributed comments and suggestions towards the development of the plan.

The N'Quat'qua First Nation of D'Arcy, B.C. and the Lil'wat First Nation (Mt. Currie Indian Band) were vital in preparation and review of the plan to ensure First Nations cultural values and traditional use in the park are respected and protected.

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PLAN HIGHLIGHTS

The Duffey Lake Provincial Park Management Plan addresses a number of issues that affect the long term management of the park. Outlined below are key initiatives that BC Parks will strive to complete during the life of this plan¹. These items were determined to be of priority through input from the public, land management agencies, First Nations, and non-government organisations. These initiatives will contribute significantly towards protecting the natural, cultural and recreational values of Duffey Lake Provincial Park as well as contributing towards maintaining the vision of this park and its role within British Columbia's system of protected areas. As such, BC Parks will ensure the protection of park values, particularly values associated with wildlife, vegetation, water quality and cultural values by;

- Undertaking a fish and habitat survey of the lake in conjunction with BC Environment in order to determine the condition of existing stocks and devise a management strategy to ensure the long term viability of fish populations.
- Preparing a wildlife strategy with the local community, First Nations, and government agencies with emphasis on protecting grizzly, black bear, deer² and mountain goat habitats.
- Developing a trail plan within the park to link with the existing trail network outside the park (e.g. Common Johnny trail, old silver mine to east of park, etc.) and examining the feasibility of developing trail access to the sub-alpine lake east of Mt. Rohr and a trail along the south shore of the Duffey Lake.
- Reviewing the existing small capacity cartop boat launch and parking lot near the east end of the lake. Examine options for improvements to access and parking.
- Developing a 40 - 50 unit easy-access campground at the gravel pit on the west end of the park off the main highway.
- Developing a closure and rehabilitation plan for the old Forest Service campground and implement once the new camping facility is operational, camping opportunities are developed outside the park, or when site impacts or safety considerations at the existing campground warrant closure.

¹ While key items are identified, it should be noted that the completion of all items is subject to funding and funding procedures. As such, items are prioritized and completed as funding permits. As well, all development within Provincial Parks are subject to the BC Parks Impact Assessment Policy.

² Duffey Lake Park occurs along the transition between the interior and coastal B.C. and contains biogeoclimatic zones associated with each. As such, it is probable that both Columbian black-tailed deer and Rocky Mountain mule deer occur in and around the protected area. This plan will refer to deer as being either or both of these sub-species.

- Encouraging the Ministry of Transportation and Highways to develop viewpoints and rest stops for highway travellers as part of their future highway upgrades.
- Develop an interpretation plan with emphasis on the wildlife habitat features on the north shore.



Plate 1.
View east towards the lake outlet.

INTRODUCTION

The Management Planning Process

A management plan is an administrative document that guides park management for a five to ten year term³. It sets out guidelines and actions for the management of the natural, cultural and recreational values of a park. Duffey Lake Provincial Park is known for significant recreation and conservation values and this management plan strives to protect natural values while allowing for appropriate recreational opportunities or facilities.

The process for preparing a management plan involves a careful analysis of the overall goals of the protected area, use patterns, and management objectives. Through the planning process, various options for managing the protected area are developed and assessed. In choosing the most appropriate option, the intent is to protect natural values from damage while offering recreational use within the protected area.

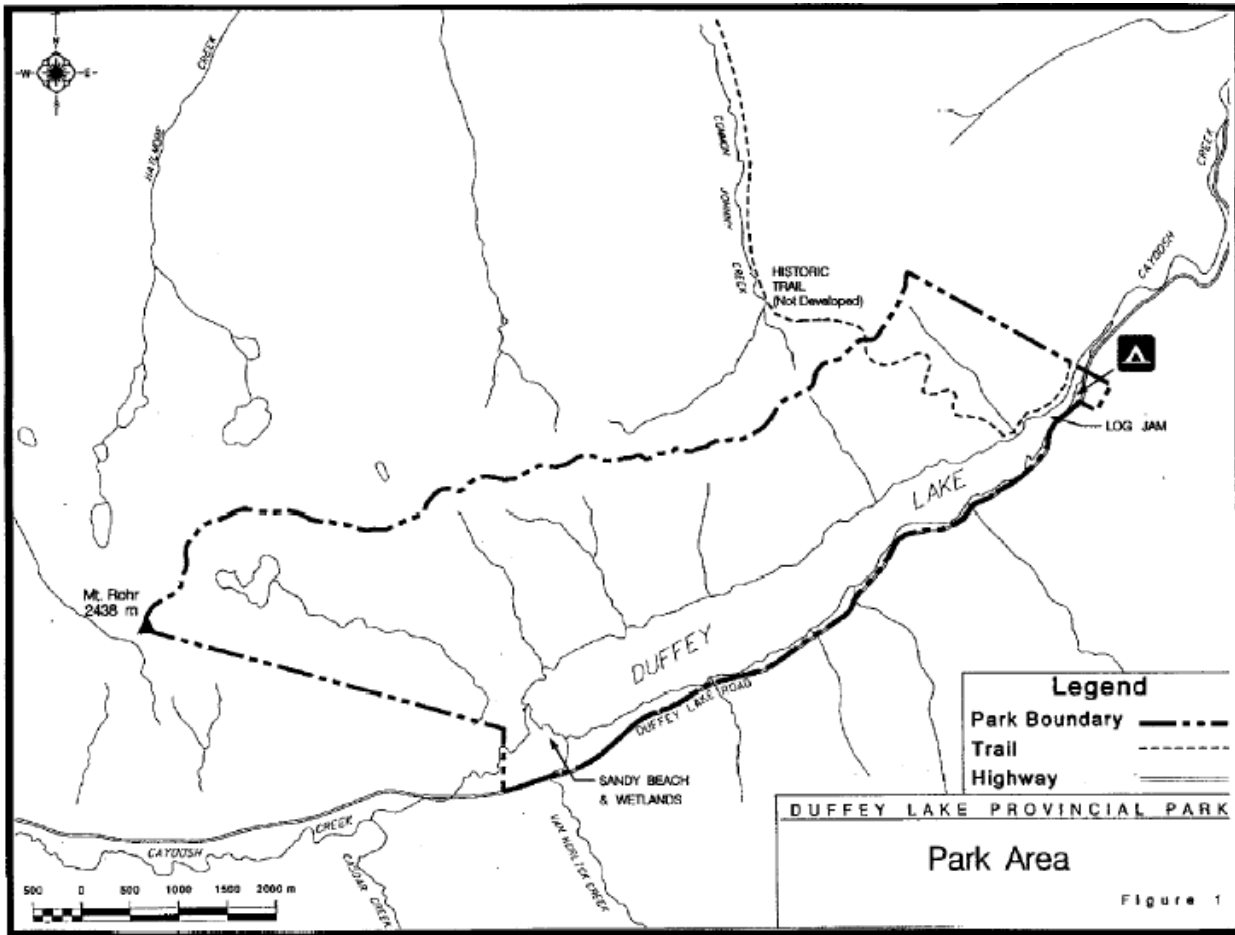
Management plans are prepared with a high degree of public involvement. The general public and stakeholder groups have opportunities to review management planning documents and provide comments to BC Parks through a variety of means including public meetings and mail-outs. Similarly, BC Parks consults with First Nations, other levels of government and other provincial government agencies in the development and review of management plans. In certain instances, public advisory committees help prepare the management plan and often function as a partner with BC Parks in implementing the plan and monitoring progress.

Background Summary

Duffey Lake Provincial Park, established in 1993, comprises 2,379 hectares of the Leeward Pacific Ranges Ecosection in the Coast Mountains Region of British Columbia (Fig. 1). The park is centred around picturesque Duffey Lake, located along Duffey Lake Road (Highway 99) about 35 kilometres east of Pemberton, nearly mid-way to Lillooet. It is about a two and a half hour drive from Vancouver. The Duffey Lake Road is a scenic highway that forms part of an automobile tour route called the Coast Mountain Circle. This route forms a 700 kilometre circle from Vancouver and takes from two to four days to enjoy all the sites along the route.

³ While management plans are initially developed to guide the management of a protected area for a 5 to 10 year period, a number of factors will influence how long the plan will be valid. Should this management plan still provide appropriate management direction for Duffey Lake Park after 10 years, and still be appropriate with respect to the goals and vision of this protected area, the plan may still be deemed appropriate until such a time that updating or re-writing is required.

Fig. 1 Park Area



The Duffey Lake/Cayoosh Creek Valley was historically used as a travel route between the Lillooet First Nations on Lillooet Lake and the Stl'atl'imx First Nation on the Fraser River. The area is an important hunting, trapping and gathering area for First Nations people.

As the forest industry developed in the area, road access became possible. For many years the Duffey Lake Forest Service Road provided access for back road recreationalists including hunters, fishers, backcountry hikers and backpackers. With the development of Whistler as a world class four season resort, more tourists were brought into the region and use of the Duffey Lake Road increased. Road upgrading and paving in the fall of 1991, and provincial highway designation and maintenance, resulted in tourists travelling the route in greater numbers in all seasons.

Various features in Duffey Lake Provincial Park have been identified as significant. The alpine area below Mount Rohr was considered of high significance due to the sheltered valley topography, alpine and sub-alpine vegetation and the large alpine lake. The slopes on the north side of Duffey Lake have high habitat values for black bear and very high capability for grizzly bears as well as deer and mountain goat. The lake itself was ranked moderately significant as a recreation feature, with only one limited use beach area, but has high scenic values. Interpretive features include historic trails on the north slope, evidence of an old trapper's cabin and traplines, goat movement corridors along the ridge, and the diverse mixture of coastal and interior vegetation species. The park contains four biogeoclimatic zones: the Interior Douglas-fir Zone, the Coastal Western Hemlock Zone, the Englemann Spruce - Subalpine Fir Zone and the Alpine Tundra Zone.

Since the park was only recently established, there are few facilities and developed recreational opportunities. Currently, the park is primarily a stop-off for Highway 99 travellers. The only existing facilities are a rough gravel boat launch at the east end of the lake suitable for small car-top boats, and the five unit rustic campsite (formerly a Forest Service Recreation Site).

Relationship to Other Land Use Planning

Duffey Lake Provincial Park borders the boundaries for the Lower Mainland Protected Areas Strategy, completed in 1997. The park area also falls within the Lillooet Timber Supply Area and lies adjacent to the Lillooet Land and Resource Management Plan (LRMP) area. The Lillooet LRMP process is currently underway. Previously, the park was identified as a study area under the Provincial Parks and Wilderness for the 90's program. The area was also identified in the Squamish Lillooet Regional District's (SLRD) Official Community Plan (OCP). Recommendations from the OCP were examined by the Province and in 1993, the area was designated a Provincial Park under the newly established Protected Areas Strategy.

The Squamish Lillooet Regional District prepared a Duffey Lake Corridor Plan in 1992 and is also currently updating the Area C Official Community Plan. Lands to the east of the park, in the Melvin Creek drainage, are being considered for a ski resort proposal under the Commercial Alpine Ski Policy process. The proponents have a Memorandum of Understanding giving them exclusive map designation for the area to

conduct studies and access the land and preventing any other land dispositions and other ski resort proposals for the same area.

The park lies within the traditional territories of the N'Quatqua First Nation, the Mt. Currie Indian Band and the Cayoose Creek Band. The N'Quatqua First Nation at D'Arcy is involved in treaty negotiations over traditional lands which include the park. In their "Statement of Interests - Land and Resources" submission to the treaty table, the N'Quatqua registered their interest in administering various activities on traditional lands (e.g. issuance of commercial backcountry recreation, co-management of parks, archaeological research in parks, etc.). The provincial, federal and First Nation parties at the table are working to a late 1998 completion date on the substance of the agreement.

At this time, the Mt. Currie and the Cayoose Creek Bands are not involved in the treaty process.

Planning Issues

This management plan will examine four key issues; adequacy of boundaries, defining appropriate levels of development, protection of the visual integrity of the park and possible expansion of the highway.

Boundaries

The boundaries of the park were established through the Protected Areas Strategy and were intended to conserve and protect Duffey Lake and its adjacent environment. The management plan will evaluate the present park boundaries to ensure natural, cultural and outdoor recreation values are adequately protected. As well, BC Parks will need to work with other agencies to manage conservation and recreation values that extend beyond park boundaries

Protecting Natural and Cultural Values While Providing Recreational Opportunities

The role of the park and quality of park opportunities determines the desired level of development and use. There is potentially a wide range of development possibilities from high use front country developments such as campgrounds, to low use wilderness trails. The level of development will be based on recreational needs and opportunities provided by other parks and recreation sites in the public and private sector together with the need to protect conservation values such as important wildlife habitat. To accomplish this, and to protect the integrity of natural values and ensure appropriate park stewardship, impact assessments are required. Prior to construction or implementation, all development activities are subject to the BC Parks Impact Assessment Process

Protecting the Visual Integrity of the Park

As the park is surrounded by active logging and traversed by a highway, there are a number of visual issues to consider. To maintain visually appealing park experiences, it is important to develop a strategy to minimise visual impacts from uses on the adjacent land.

Duffey Lake Road

The highway receives increasing use, which may result in future expansion or widening of the road. As the approved highway plan right-of-way incorporates portions of the south shore and lake, important values such as the remaining old-growth pockets along the shore may be susceptible. As well, key pullouts and access points to facilities such as the boat launch may be within the right-of-way. BC Parks will need to play a key role in reviewing any proposed highway development plan that will affect the park as well as work with the Ministry to determine key access points for park visitors.

THE ROLE OF THE PROTECTED AREA

Provincial and Regional Context

Duffey Lake Park is situated in the Coast Mountains on a transportation route that links the South Coast to the south-central Interior (Fig. 2). Although important, the route provides access secondary to the Fraser Canyon route. Pemberton and Lillooet, which are nearly equidistant to the park, are the nearest major communities and service centres. The major land uses in the region are mining, logging and recreation. There is a current proposal to develop a destination ski resort in the Melvin Creek drainage, approximately 6 km east of the park. Hunting and fishing historically have been popular, primarily with local communities, given the abundance of wildlife in the region.

The Duffey corridor has become a popular travel route because of high scenic values and tourism potential. In recent years, the summer recreational traffic volume has increased to about 800 vehicles per day. With increased visits to Duffey Lake Park, management of the conservation and recreation values will become even more significant.

Joffre Lakes Provincial Park is also located in the corridor. In addition to protecting important conservation values, Joffre Lakes Park provides backcountry wilderness camping and trails. In addition, there are several Ministry of Forest recreation sites which provide rustic camping opportunities along the roadside, between Duffey Lake and Lillooet. Several other backcountry recreation destinations exist in the vicinity including Stein Valley Nlaka'pamux Heritage Park, Cerise Creek and Blowdown Creek, which offer hiking and backcountry skiing opportunities.

Protected Area Roles

Conservation

In keeping with the goals of the provincial park system (Appendix A), the main conservation role of Duffey Lake Provincial Park is to protect a representative portion of the Leeward Pacific Ranges ecosection and to protect important wildlife habitats, particularly for goats and bears. The Duffey Lake area contains some of the flora, fauna, landforms and waters which are characteristic of the region, and typifies transitional vegetation between coastal and interior climates. Some significant features represented in the park include the alpine environment of Mount Rohr and the waters of Duffey Lake.

Figure 2. Regional Context

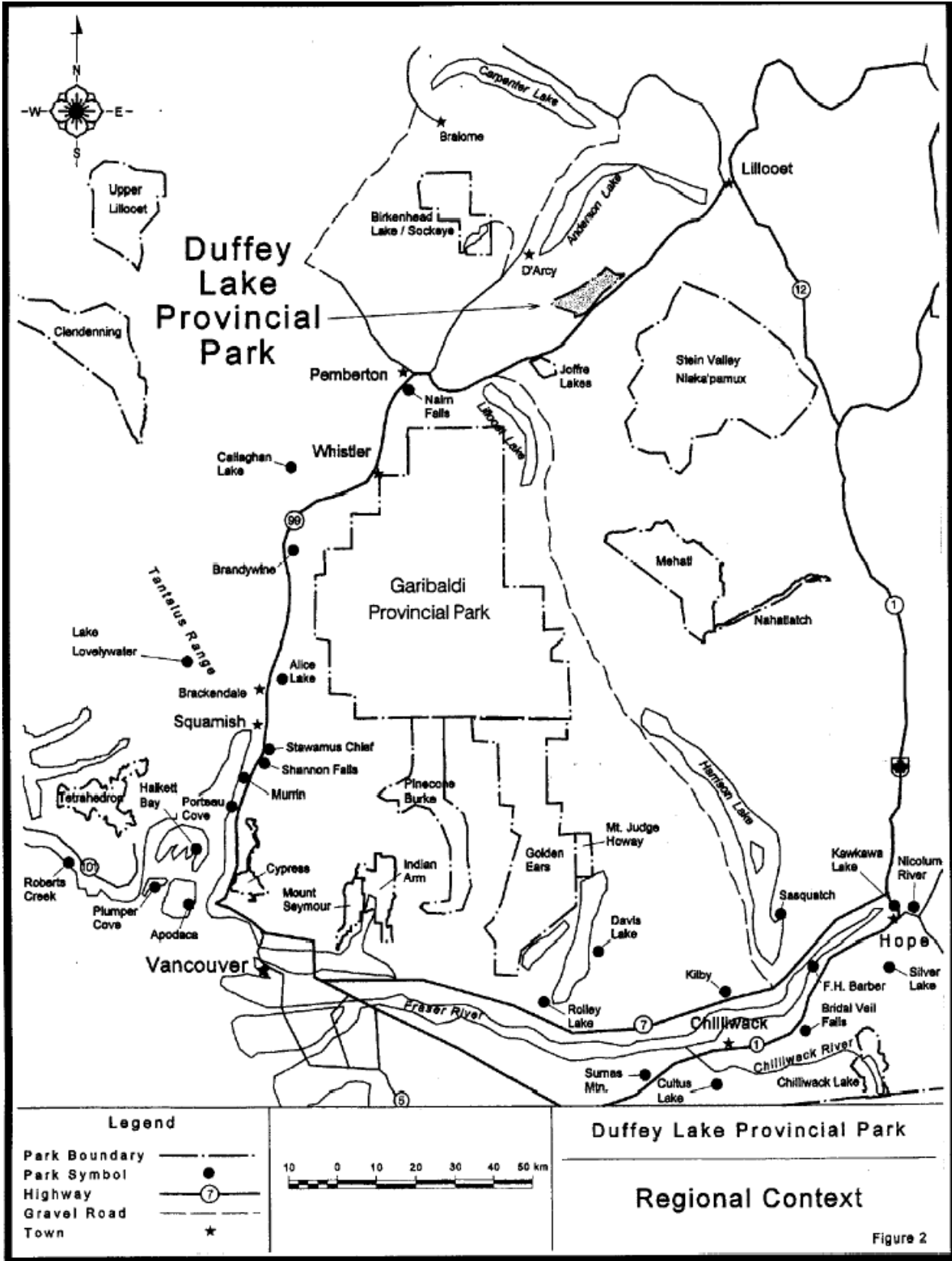


Figure 2

Tourism and Outdoor Recreation

In keeping with the recreation goals of the provincial park system, Duffey Lake Provincial Park serves the main role of protecting British Columbia's outstanding recreation resources by;

- providing regional and travel corridor recreation opportunities
- contributing to holiday destination opportunities

The park serves the regional and local communities with a variety of outdoor recreation opportunities and services, as well as providing basic needs for the travelling public.

The role of a holiday destination is related to the opportunities available in the park in conjunction with the many other opportunities available in the surrounding area, such as the backcountry opportunities at Stein Valley Nlaka'pamux Heritage Park, Joffre Lake Provincial Park, Cerise Creek and Blowdown Creek and upper Cayoosh drainages. This role will be fully realised over time as visitation increases to the park and the surrounding area.

Vision Statement

The purpose of the vision statement is to identify the role and function of the park at least 50 years into the future, beyond the life of the management plan. A clear vision for the park is important to ensure the park maintains its role in the system and to guide long term management decisions when reacting to changing demands or incorporating new approaches to conservation and recreation management:

Duffey Lake Park will continue to be an important part of the parks system on both a regional and provincial level. While the park is relatively small, its key habitat components, unique setting in the transition zone between the coast mountains and the dry interior, and recreational opportunities will make this area a favourite for both destination visitors and the travelling public.

Should resource and rural development increase in nearby areas, Duffey Lake Park's varied habitats for bear, deer, goats, raptors and other wildlife, particularly on the north-west side, will become even more important in providing wildlife the necessary food, cover and shelter to sustain populations in the region. The park will continue to have high water quality, sustained fish populations and together with the wetland habitats, continue to be a high quality aquatic ecosystem.

Duffey Lake Park will continue to be important for First Nation traditional use and cultural values. BC Parks, together with the First Nation's communities, will ensure that significant cultural sites within the park are protected from development impacts

and that recreation activities in the park are respectful of the environment and First Nation traditional use.

Visitors to the park will be attracted to the low-impact recreational opportunities including day-use and multi-day activities. The park will provide the travelling public with roadside rest areas and short walking trails. Nature interpretation and wildlife viewing will be excellent through much of the year. Small boats will often be seen on the lake as visitors enjoy the peaceful nature of Duffey Lake. Trails to areas within and outside the park will attract those wishing to experience the alpine and sub-alpine areas of the park as well as those areas outside the park boundaries. The park will offer a strategic camping opportunity along the Duffey Lake Road.



Plate 2.

View west from Duffey Lake towards Joffre Lakes Park with
Mount Matier in the centre of the photo.

RELATIONSHIP WITH FIRST NATIONS

The N'Quatqua First Nation and the Lil'wat First Nation (Mt. Currie Indian Band) recognise the Duffey Lake area as part of their traditional territories. The Cayoose Creek Indian Band likely have overlapping interests in the park. BC Parks has limited information on the values of the park's resources and features as they relate to First Nations' culture and heritage.

Currently, the N'Quatqua First Nation is involved in treaty negotiations with senior levels of government. First Nations' contributions to this management plan are recognised and understood to be without prejudice to future treaty negotiations. At this time the Mt. Currie and the Cayoose Creek Bands are not involved in the treaty process.

Once formal treaty agreements have been reached with the First Nations, this management plan will be reviewed to determine whether it is in compliance with the Treaties. If it is not in compliance, then this management plan will be revised accordingly. Changes will be done through an open public review process so everyone understands what these changes mean to the park and its use.



Plate 3.

View of old-growth forests at the mouths of Van Horlick Creek (left) and Cayoosh Creek (right).

PROTECTED AREA ZONING

Introduction

Zoning is used in park planning to develop general management guidelines for areas of a park on a geographical and ecological basis (Appendix B). Duffey Lake Provincial Park is divided into two zones: the Intensive Recreation Zone and the Natural Environment Zone (Fig. 3).

Zones

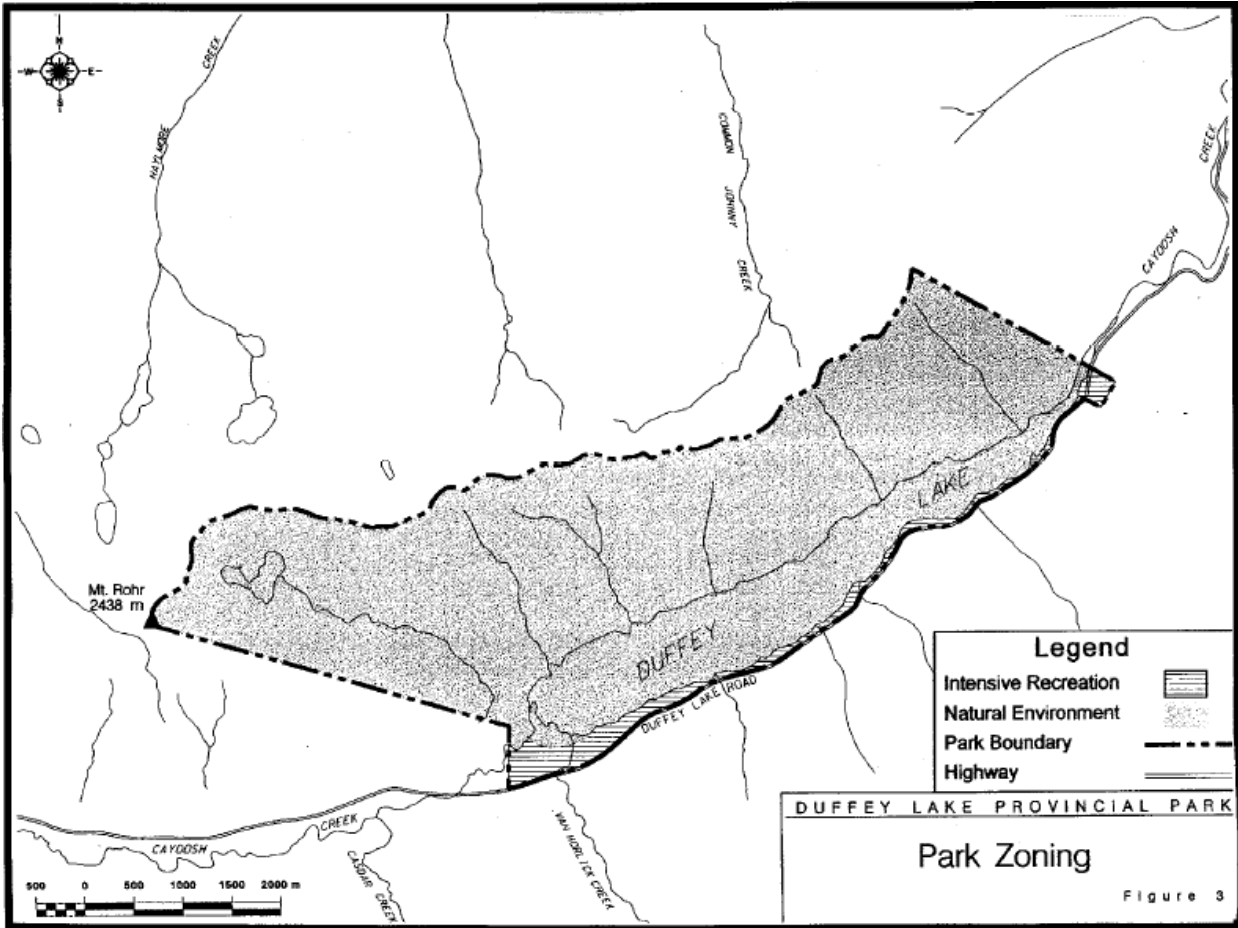
Intensive Recreation Zone

The management objective of this zone is to provide for a variety of high use and readily accessible visitor services and facilities. This zone covers less than 5% of the park, and includes the highway corridor, the proposed day use area and campground at the west end of the park, the car-top boat launch at the east end of the lake, and the proposed trail and rest stops along the south shore. The current campground at the east end of the lake may remain, be changed to day use or be closed to rehabilitate the site. A variety of day use opportunities appropriate for high levels of use and camping will be provided for the travelling public and for the local communities.

Natural Environment Zone

The objective of this zone is to provide accessible backcountry outdoor recreation activities in a largely undisturbed natural environment. This zone encompasses all but an approximate 5% of the park, including Duffey Lake and the surrounding ridge and alpine area. The zone will be managed for low to moderate recreational use with trails being the primary form of development. The area on the north side of the lake is a high use bear corridor with highly significant wildlife habitat. The wetlands at the west end and the lake and the log jam at the east end of the lake are sensitive environments which require protection.

Fig. 3 - Zoning Map



NATURAL AND CULTURAL VALUES MANAGEMENT

Introduction

The management of natural and cultural values in the park will be based upon the *Park Act*, Park and Recreation Area Regulations, ministry policies and the role of the park in the overall system of provincial parks and protected areas in British Columbia.

The Protected Areas Strategy conservation goals and BC Parks' recreation management goals will be met by protecting natural, cultural and outdoor recreation values, monitoring conditions and visitor use and working co-operatively with others.

Land and Resource Tenures

There is one recreational lease that pre-dates the park. Located in a visually prominent area along Duffey Lake, the lease includes an area with high wildlife habitats and values. The lease lot includes a simple A-frame cabin. This lease expires in 2005.

The Ministry of Transportation and Highways (MOTH) formally had a BC Lands Act "Notation" for a site for gravel storage, now within the park. The highway has an established right-of-way and the boundaries of Duffey Lake Provincial Park abut this right-of-way. Expansion of the road would not likely infringe on the park along the shoreline but may impact important ecological components such as the old-growth pockets as well as shoreline recreational opportunities.

Objective: To protect the existing land area of the park and to review land use activities in adjacent drainages to ensure wildlife and recreational values that are considered "trans-boundary" are incorporated in land use development planning.

Actions:

- Continue to honour the current recreation lease but acquire when it expires or when there is a willing vendor.
- Play a key role in reviewing any proposed highway development that will affect values associated with the park. Co-operate with the Ministry of Transportation and Highways to ensure any highway expansion is undertaken in a way that minimises impacts to values adjacent to the park.
- Provide advance notice to the Ministry of Transportation and Highways as to when they must cease utilising their temporary storage uses at the gravel storage area under their previous BC Lands Act "Notation".

- Review development plans in adjacent areas to ensure values associated with the park that may cross the park's administrative boundaries (such as wildlife and recreation values) are considered and incorporated.

Water

There is very little information available on the water resources of the park. The primary water body of the park is Duffey Lake, which covers roughly 365 hectares with a shoreline perimeter of about 16 kilometres. The maximum depth measured is 84 metres, with a mean depth of 38 metres. Two large creeks, Cayoosh and Van Horlick Creeks, supply the lake. Cayoosh Creek flows from west to east and has a small wetland at the inlet to the lake. Cayoosh Creek continues east of the lake just beyond the large log jam. Van Horlick Creek is a 21 kilometre long creek that flows into the lake just south of the Cayoosh Creek inlet. The main sources of water for these creeks come from the significant amounts of direct run-off and snow meltwater that is characteristic of the region. Both creeks lie mostly outside the park boundaries. Numerous ephemeral and intermittent streams flow into Duffey Lake from the slopes on the north side of the park.

Objective: To maintain the park watersheds in their natural condition free from contaminants or pollution.

Actions:

- Further develop a baseline inventory of water quality and flows.
- Review development plans for areas adjacent to the park and work with resource companies (such as forest and mining companies) and related government agencies to minimise the impacts on water quality.
- Ensure sanitary facilities are properly designed, located and monitored within the park.
- Ensure park developments are constructed and maintained so as to minimise soil erosion and surface water flow.
- Provide the public with information on water use ethics.

Vegetation

There are small pockets of primarily Douglas-fir and Englemann Spruce old growth forests remaining in the park. The majority of old growth is along the south side of the lake beside the highway and at the mouths of Van Horlick and Cayoosh Creeks. Some mature fir forests containing very large veteran trees exist on the north slopes.

There are wetland environments at the mouths of Van Horlick and Cayoosh Creek. This area is within the floodplain and should not be developed due to potential impacts on the wetland ecosystems. This area contains white spruce and true fir on permanently waterlogged soil as well as an abundance of horsetail making the area a very important wildlife habitat area.

Objective: To protect the park vegetation as a natural dynamic ecosystem allowing natural processes to run their course where possible and ensure that sensitive areas such as the spruce-horsetail site are protected.

Actions:

- Formulate a fire management plan in conjunction with BC Environment and the Ministry of Forests.
- Protect the integrity of the old growth forests which are critical wildlife habitats and endangered ecosystems. Consider impacts to old-growth ecosystems within the park when examining development plans or new recreational facilities.

Wildlife

Wildlife values in the Cayoosh Range are considered very high. Mountain goat occur in provincially significant numbers and there is an important goat movement corridor from Van Horlick Creek to the sub-alpine habitat north-west of Duffey Lake. The avalanche tracks north-west of the lake become snow-free earlier than the forested areas and are used by grizzly bears in the early spring and summer to feed on the new vegetation. A bear movement corridor exists in the alpine pass to Common Johnny Creek. Other common wildlife species that occur throughout the area include deer, black bear, small fur bearing animals and upland game birds. There is waterfowl habitat at both ends of Duffey Lake that is considered locally important. Spotted owl were inventoried in drainages immediately to the south of the park, and may occur within the park. Osprey and Great Blue heron have been reported at Duffey Lake.

Objective: To maintain the existing diversity of wildlife species in the park.

Actions:

- Prepare a wildlife strategy with the local community, First Nations and other agencies with emphasis on protecting grizzly bear, black bear and mountain goat habitat.
- Ensure any new trails or facilities planned will be sensitive to the critical habitats of wildlife and their migration corridors. In particular, conserve the use of the north slope for bear and other wildlife movement and deter visitor use of the area, particularly in spring and summer.
- Maintain the existing hunting closure.

Aquatics

Little information exists regarding fish and other aquatic values within the park. Rainbow trout is the primary species fished in Duffey Lake. Mountain whitefish are present, but uncommon, in the lake while the creeks are reported to contain Dolly Varden char, and/or Bull trout, a blue listed species⁴.

Objective: To manage Duffey Lake for a self-sustained recreational fishery in conjunction with the Provincial Fisheries program.

Actions:

- Complete a fish and spawning habitat survey of the lake and creek mouths in order to determine the composition and condition of existing stocks.
- Maintain recreational fishing opportunities by working with the Fish and Wildlife Branch to develop a fisheries management strategy for the park.
- Consider research projects that examine aquatic values in Duffey Lake and streams within the park to increase BC Parks knowledge of these values and assist in filling information gaps.

Cultural Values

There are no recorded archaeological sites in the park but as was mentioned in the background history, Duffey Lake has significance in the oral history of the Stl'atl'imx Nation.

Objective: To identify, present and protect significant cultural features and values including traditional use patterns by First Nations in the park area.

⁴ BLUE LIST: Includes any indigenous species or subspecies (taxa) considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

To develop ongoing communication and working relationships with First Nations' people whose traditional territories include the park.

Actions:

- Develop communication channels and good working relationships with all First Nations with traditional uses within the park.
- Work with First Nations to identify and inventory traditional use areas, cultural, spiritual or sustenance resources. Develop strategies that will allow for the continued practice of traditional activities by present and future generations of First Nations people in relationship to the lands within the park.
- Discuss with First Nations the areas of special spiritual and cultural interest they have identified and how BC Parks will recognise and protect those aboriginal cultural features found in the park.

Visual Values

Numerous visual features occur outside the park boundaries and are susceptible to development impacts. Forest harvesting has occurred to the south of the park on the lower elevation slopes and is expected to be ongoing well into the future. Harvesting is visible from most areas of the park but these areas appear to be slowly greening up with new forests.

Objective: To protect the viewing opportunities from within the park.

Actions:

- Encourage forest companies, the Ministry of Forests, and the Ministry of Transportation and Highways to employ appropriate Landscape Management techniques in clear recognition of the high scenic values.
- Work with the Ministry of Transportation and Highways to develop viewing opportunities and rest stops along the south lake shore as part of future highway upgrades. These areas should take into consideration optimum wildlife viewing potential.

OUTDOOR RECREATION OPPORTUNITIES MANAGEMENT

Introduction

Duffey Lake Provincial Park, through this management plan, strives to achieve a balance between recreational use and the conservation of natural values. When facilitating recreational opportunities, BC Parks tries to accommodate a wide spectrum of park users. Outdoor recreation opportunities range from intensive use facilities such as campground and picnic sites to low-impact activities such as nature study.

The access strategy for the park is a key consideration to balancing conservation and recreation. In the park, vehicle access will be limited to the west and east ends of the lake with foot access provided by trails emanating from these two staging areas. These are the most appropriate sites for vehicle access given historic use of the area, conditions of terrain and the relative absence of special conservation features.

Outdoor Recreation Opportunities and Facilities

The following summary outlines each opportunity, its objective and the facilities or services required, as illustrated in the Proposed Development Map (Figure 4).

Frontcountry Camping

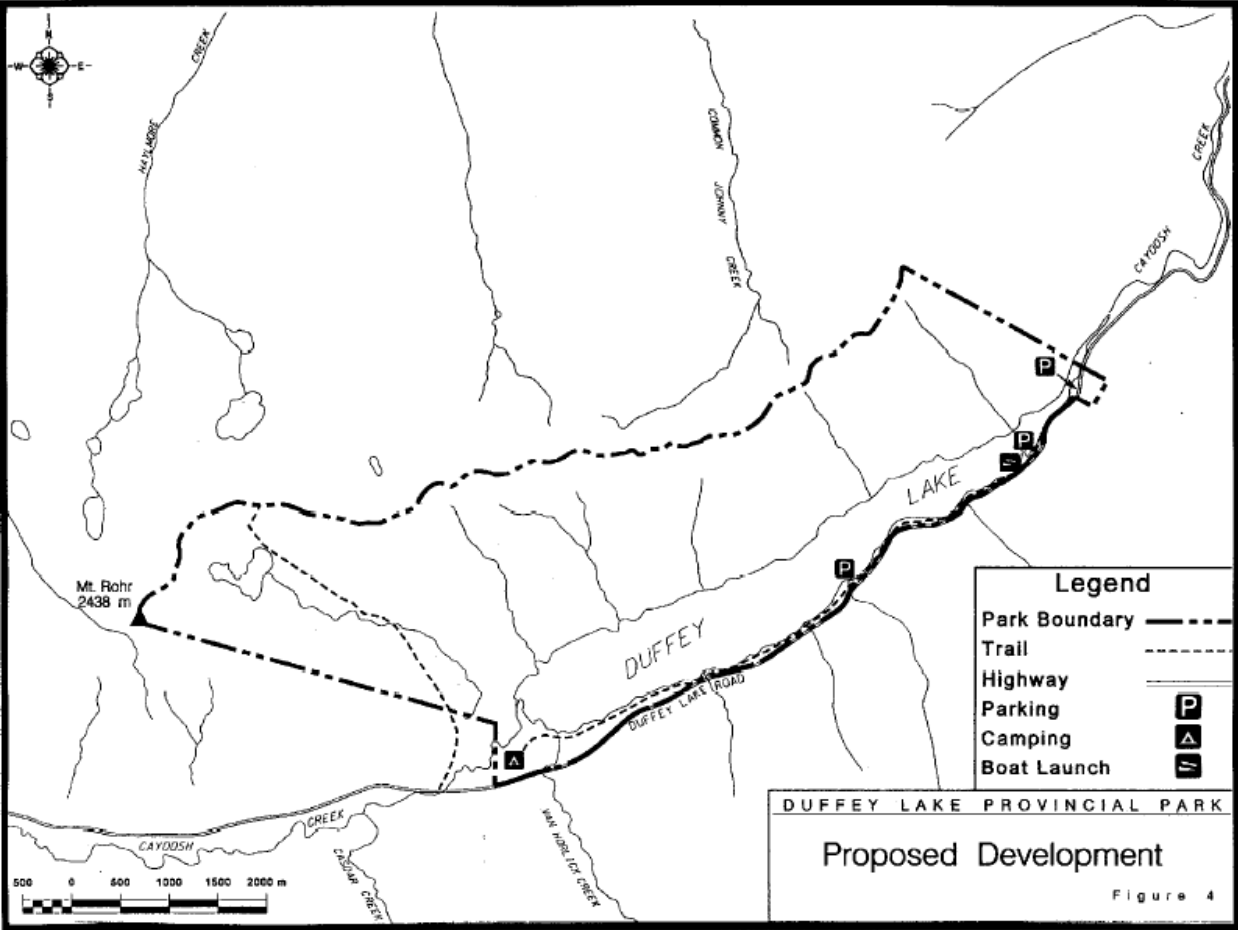
The campsite in the park was formerly a Forest Service Recreation Site offering five rustic camping units with tables, firepits and toilets. The travelling public uses this site en route to other destinations. Access road design and the site conditions severely restrict large campers and recreational vehicles, so use of the site is limited.

Objective: To offer easy access camping opportunities for highway travellers and holiday destination visitors.

Actions:

- Construct a 40-50 unit campground at the gravel storage area at the west end of the lake for those people travelling the Duffey Lake Road or for those who wish a base to explore the park and adjacent lands.

Figure 4 - Proposed Development



- Develop a closure and rehabilitation strategy for the existing campground at the east end of the lake. Implement the closure and rehabilitation plan once the new campground is operational or if environmental impacts or safety concerns at the existing site warrant closure. As well, implement the closure and rehabilitation plan if other camping opportunities outside the park become available.

Hiking and Backpacking

No developed trails exist in the park; however, local residents and organised mountaineering groups are known to access the backcountry, including hikes along the mountain ridge at the height of land north of the lake.

Objective: To encourage a range of hiking opportunities from short level interpretive trails to more arduous hikes that reach higher elevations.

Actions:

- Construct, if feasible, an access trail from the west side of the park to the high alpine of Mt. Rohr. Although the north slope is used extensively by bear, a trail along the east side of the creek may impact bears minimally if it can avoid high quality bear habitat.
- Develop trail access along the south shore of the lake that would connect with any developed rest stops, viewing areas and the campground.
- Ensure bear-human conflict prevention procedures are implemented.
- Assess trail linkage opportunities with projects outside the park (e.g. Common Johnny Creek over the divide, the old mining road trails to the east).

Angling

Duffey Lake is generally used for casual day fishing by passing tourists. It is not a fishing destination. The lake contains small rainbow trout which offer good family fishing and boating opportunities.

Objective: To provide a high quality experience based on a self-sustained fishery.

Actions:

- Provide a fisheries information board near the boat launch which could inform visitors about regulations, conservation measures and species identification and informally monitor catch success to assess catch effort of fisherman.

Boating

A boat launch is located near the east end of the lake along the highway, which receives an increasing amount of use for small boats and canoes. The west side of the lake is also infrequently used for launching canoes. Boating at this lake is often a family activity, and offers viewing and fishing experiences.

Objective: To provide low impact and safe boating opportunities.

Actions:

- Maintain the existing small capacity car-top boat launch area.
- Apply for and implement under 10 horsepower motor restrictions.
- Provide boating safety literature on information board at the boat launch.

Picnicking

The park is used primarily by tourists travelling through the Duffey Lake corridor, who may stop for a short break at the campsite on the east end of the lake, and at informal pull-offs along the lake. The park is not generally a destination stop for picnicking, but provides informal opportunities to do so.

Objective: To provide a variety of picnicking opportunities.

Actions:

- Develop trail access along the south shore with picnic facilities at rest stops along this shoreline, including highway pull-outs.
- Determine capability of existing campground to withstand day use only, as opposed to closing it entirely for rehabilitation.

Commercial Recreation Opportunities

BC Parks will consider issuing Park Use Permits for commercial recreational opportunities in Duffey Lake Park. Any commercial recreational activities must meet BC Park's principles of low impact, of benefit to the recreational experience, as well as meeting the criteria outlined in the BC Parks Impact Assessment Process.

Objective: To provide park visitors with commercial recreational opportunities that benefit the visitor's enjoyment and experience in the park without impacting on other visitor's experiences.

Actions:

- Consider, if demand warrants, issuing Park Use Permits for controlled, non-mechanised and low-impact commercial wildlife viewing opportunities. Such opportunities would be limited to no more than 6 people per party.
- Consider, if demand warrants, applications for commercial angling guiding. Proposals must be low-impact, small numbers per party, and subject to conservation of fish populations.
- Consider, if demand warrants, applications for non-mechanised commercial hiking and backpack guiding providing proposals do not adversely affect park values.

Access Strategy

There are several access points to the park (one at each end of the park), one pull off to launch boats and two pull-outs along the lake side of the highway. All are gravel pull-outs and likely do not meet standards. Most vehicles parking in these areas are stopped for short periods. The avalanche hazard at many sites along the highway is high, which requires careful consideration and planning of any formalised rest-stops.

Objective: Develop safe and facility-oriented access points to allow enjoyment of the park, with minimal environmental impact.

To provide safe and adequate parking facilities to allow maximum enjoyment of the recreational opportunities in the park.

Actions:

- Determine best vehicle access points based on proposed development plan, and deactivate other vehicle access sites not required under the plan for park purposes.
- Liaise with the Ministry of Transportation and Highways to determine the access points from the highway, that would be best from a safety and feasibility perspective.
- Examine options for parking, including review of the existing areas used, in conjunction with safety and resource impact concerns.

Management Services

Parks Headquarters and Service Yard

The Parks headquarters and service yard will continue to be located at Alice Lake Provincial Park with a small service base to be developed at Duffey Lake, in conjunction with the proposed campground development.

Site and Facility Design Standards and Locations

All sites and facilities developed for public use will meet the design standards of BC Parks. Factors to be considered when determining appropriate facilities and locations include visual aesthetics, safety, durability, operational efficiency, and ensuring site locations are not environmentally sensitive. All facility development is subject to BC Parks' Impact Assessment Process.

Safety and Health

Every normal precaution will be taken to ensure the safety and health of visitors to Duffey Lake Provincial Park. The water supply in the park will be tested monthly and any new toilet systems will meet Ministry of Health guidelines. All high use areas will have periodic safety inspections to ensure reasonable care is taken. In the event of hazardous conditions or emergencies, appropriate action will be taken as defined in the Emergency Procedures Manual for the park. Regional emergency services could be contacted by having information relayed through the Park Facility Operator or BC Parks staff, once facilities and use warrant a regular presence in the area.

COMMUNICATIONS

Introduction

Proper communications regarding the park, its values, and facilities is vital for visitors wishing to experience the values within Duffey Lake Provincial Park. Information for the park should be available onsite as well as through BC Parks offices. Accurate information regarding the park is needed to ensure visitors have a positive, safe experience while respecting natural and cultural values.

Marketing and Promotion

As very few people are aware of the park, the first step in promotion when adequate facilities are available, would be to identify through standard park signs that Duffey Lake is now a provincial park and also to ensure the park is included in standard BC Parks information brochures and maps. Information Centres in the local communities should be contacted and provided with information on the park so they can appropriately advise tourists and residents of the opportunities available in the park. As formal facilities are developed, information shelters will be provided at the campground, the main day use parking area and the boat launch area.

Public Information

Objective: To emphasise ecological systems, encourage environmental ethics and educate the public on recreational and environmental safety issues through an information strategy for Duffey Lake Provincial Park.

Actions:

- Develop an in-park information strategy that includes information shelters at strategic locations in the park including parking areas and campgrounds.
- Develop an interpretive plan that focuses on natural and cultural features within the park.
- Provide clear information by way of maps and brochures that outline recreational opportunities and facilities as well as outlining sensitive areas within the park where recreational activities are not appropriate.

PLAN IMPLEMENTATION

Prioritising of the main natural and cultural values and outdoor recreation opportunities management proposals is necessary to effectively implement this management plan. All actions listed below are subject to funding, human resources, and the BC Parks Impact Assessment Policy. As such, the actions have been organised into high priority actions, task or project actions, and ongoing or monitoring tasks.

High Priority Actions

- Ensure sanitary facilities are properly designed, located and monitored within the park.
- Ensure park developments are constructed and maintained so as to minimise soil erosion and surface water flow.
- Protect the integrity of the old growth forests which are critical wildlife habitats and endangered ecosystems. Consider impacts to old-growth ecosystems within the park when examining development plans or new recreational facilities.
- Ensure any new trails or facilities planned will be sensitive to the critical habitats of wildlife and their migration corridors. In particular, conserve the use of the north slope for bear and wildlife movement and deter visitor use of the area, particularly in spring and summer.
- Develop communication channels and good working relationships with all First Nations with traditional uses within the park.
- Work with First Nations to identify and inventory traditional use areas, cultural, spiritual or sustenance resources. Develop strategies that will allow for the continued practice of traditional activities by present and future generations of First Nations people in relationship to the lands within the park.
- Discuss with First Nations areas of special spiritual and cultural interest they have identified and how BC Parks will recognise and protect those aboriginal cultural features found in the park.
- Work with the Ministry of Transportation and Highways to develop viewing opportunities and rest stops along the south lake shore as part of future highway upgrades. These areas should take into consideration optimum wildlife viewing potential.
- Construct a 40-50 unit campground at the gravel storage area at the west end of the lake for those people travelling the Duffey Lake Road or for those who wish a base to explore the park and adjacent lands.
- Develop a closure and rehabilitation strategy for the existing campground at the east end of the lake. Implement the closure and rehabilitation plan once the new campground is operational or if environmental

impacts or safety concerns at the existing site warrant closure. As well, implement the closure and rehabilitation plan if other camping opportunities outside the park become available.

- Develop trail access along the south shore of the lake that would connect with any developed rest stops, viewing areas and the campground.
- Ensure bear-human conflict prevention procedures are implemented.
- Apply for and implement under 10 horsepower motor restrictions.

Task or Project Actions

- Provide advance notice to the Ministry of Transportation and Highways as to when they must cease utilising their temporary storage uses at the gravel storage area under their previous BC Lands Act “Notation”.
- Further develop a baseline inventory of water quality and flows.
- Provide the public with information on water use ethics.
- Formulate a fire management plan in conjunction with BC Environment and the Ministry of Forests.
- Prepare a wildlife strategy with the local community, First Nations and other agencies with emphasis on protecting grizzly bear, black bear and mountain goat habitat.
- Complete a fish and spawning habitat survey of the lake and creek mouths in order to determine the composition and condition of existing stocks.
- Construct, if feasible, an access trail from the west side of the park to the high alpine of Mt. Rohr. Although the north slope is used extensively by bear, a trail along the east side of the creek may impact bears minimally if it can avoid high quality bear habitat.
- Assess trail linkage opportunities with projects outside the park (e.g. Common Johnny Creek over the divide, the old mining road trails to the east).
- Provide a fisheries information board near the boat launch which could inform visitors about regulations, conservation measures and species identification and informally monitor catch success to assess catch effort of fisherman.
- Provide boating safety literature on information board at the boat launch.

- Develop trail access along the south shore with picnic facilities at rest stops along this shoreline, including highway pull-outs.
- Determine capability of existing campground to withstand day use only, as opposed to closing it entirely for rehabilitation.
- Determine best vehicle access points based on proposed development plan, and deactivate other vehicle access sites not required under the plan for park purposes.
- Liaise with the Ministry of Transportation and Highways to determine the access points from the highway, that would be best from a safety and feasibility perspective.
- Examine options for parking, including review of the existing areas used, in conjunction with safety and resource impact concerns.
- Develop an in-park information strategy that includes information shelters at strategic locations in the park including parking areas and campgrounds.
- Develop an interpretive plan that focuses on natural and cultural features within the park.
- Provide clear information by way of maps and brochures that outline recreational opportunities and facilities and outline sensitive areas within the park where recreational activities are not appropriate.

Ongoing or Monitoring Actions

- Continue to honour the current recreation lease but acquire when it expires or when there is a willing vendor.
- Play a key role in reviewing any proposed highway development plan that will affect values associated with the park. Co-operate with the Ministry of Transportation and Highways to ensure any highway expansion is undertaken in a way that minimises impacts to values adjacent to the park.
- Review development plans in adjacent areas to ensure values associated with the park that may cross the park's administrative boundaries (such as wildlife and recreation values) are considered and incorporated.
- Review development plans for areas adjacent to the park and work with resource companies (such as forest and mining companies) and related government agencies minimise the impacts on water quality.
- Maintain the existing hunting closure.

- Maintain recreational fishing opportunities by working with the Fish and Wildlife Branch to develop a fisheries management strategy for the park.
- Consider research projects that examine aquatic values in Duffey Lake and streams within the park to increase BC Parks knowledge of these values and assist in filling information gaps.
- Encourage forest companies, the Ministry of Forests, and the Ministry of Transportation and Highways to employ appropriate Landscape Management techniques in clear recognition of the high scenic values.
- Maintain the existing small capacity car-top boat launch area.
- Consider, if demand warrants, issuing Park Use Permits for controlled, non-mechanised and low-impact commercial wildlife viewing opportunities. Such opportunities would be limited to no more than 6 people per party.
- Consider, if demand warrants, applications for commercial angling guiding. Proposals must be low-impact, small numbers per party, and subject to conservation of fish populations.
- Consider, if demand warrants, applications for commercial hiking and backpacking guiding providing proposals do not adversely affect park values.

Appendix A

BC Provincial Parks System Goals

The British Columbia Provincial Parks System has two mandates:

- To conserve significant and representative natural and cultural resources
- To provide a wide variety of outdoor recreation opportunities

CONSERVATION GOALS

Goal 1 Representativeness

To protect viable, representative examples of the natural diversity of the province, representative of the major terrestrial, marine and freshwater ecosystems, the characteristic habitats, hydrology and landforms, and the characteristic backcountry recreational and cultural heritage values of each ecosection.

Goal 2 Special Features

To protect the special natural, cultural heritage and recreational features of the province, including rare and endangered species and critical habitats, outstanding or unique botanical, zoological, geological and paleontological features, outstanding or fragile cultural heritage features, and outstanding outdoor recreational features such as trails.

RECREATION GOALS

Goal 1 Outdoor Recreation Holiday Destination Opportunities

The Provincial Parks System will include appropriate outdoor recreation lands and facilities providing for the use and enjoyment of major outdoor recreation destinations in British Columbia.

Goal 2 Tourism Travel Route Opportunities

The Provincial Parks System will include, as a complement to other suppliers, outdoor recreation lands and facilities in association with major provincial travel corridors to ensure that travelling vacationers are supplied with a basic network of scenic stop-offs.

Goal 3 Regional Recreation Opportunities

The Provincial Parks System will include, as a complement to other suppliers, land and facility-based opportunities for outdoor recreation distributed in association with British Columbia's natural geographic regions in order that British Columbians are assured a basic supply of outdoor recreation services close to home.

Goal 4 Backcountry Recreation Opportunities

The Provincial Parks System will build the province's reputation for backcountry recreation by protecting and managing our most outstanding wilderness areas. Some sites may feature adventure tourism, while in other areas, the wilderness would remain untouched.

Appendix B

BC Parks Zoning Policy and Descriptions

	Intensive Recreation	Natural Environment
OBJECTIVE	To provide for a variety of readily accessible, facility-oriented outdoor recreation opportunities.	To protect scenic values and to provide for backcountry recreation opportunities in a largely undisturbed natural environment.
USE LEVEL	Relatively high density and long duration types of use.	Relatively low use but higher levels in association with nodes of activity or access.
MEANS OF ACCESS	All-weather public roads or other types of access where use levels are high (see "Impacts" below).	Mechanized (power-boats, snowmobiles, all terrain vehicles), non-mechanized (foot, horse, canoe, bicycle). Aircraft and motorboat access to drop-off and pickup points will be permitted.
LOCATION	Contiguous with all-weather roads and covering immediate areas, modified landscapes or other high-use areas.	Removed from all-weather roads but easily accessible on a day-use basis. Accessible by mechanized means such as boat or plane.
SIZE OF ZONE	Small; usually less than 2,000 ha.	Can range from small to large.
BOUNDARY DEFINITION	Includes areas of high facility development in concentrated areas.	Boundaries should consider limits of activity/facility areas relative to ecosystem characteristics and features.

RECREATION
OPPORTUNITIES

Vehicle camping, picnicking, beach activities, power-boating, canoeing, kayaking, strolling, historic and nature appreciation, fishing, snowplay, downhill and cross-country skiing, snowshoeing, specialized activities.

Walk-in/boat-in camping, power-boating, hunting, canoeing, kayaking, backpacking, historic and nature appreciation, fishing, cross-country skiing, snowmobiling, river rafting, horseback riding, heli-skiing, heli-hiking, and specialized activities.

Special Feature	Wilderness Recreation	Wilderness Conservation
To protect and present significant natural or cultural resources, features or processes because of their special character, fragility and heritage values.	To protect a remote, undisturbed natural landscape and to provide backcountry recreation opportunities dependent on a pristine environment where air access may be permitted to designated sites.	To protect a remote, undisturbed natural landscape and to provide unassisted backcountry recreation opportunities dependent on a pristine environment where no motorized activities will be allowed.
Generally low.	Very low use, to provide solitary experiences and a wilderness atmosphere. Use may be controlled to protect the environment.	Very low use, to provide solitary experiences and a wilderness atmosphere. Use may be controlled to protect the environment.
Various; may require special access permit.	Non-mechanized; except may permit low frequency air access to designated sites; foot, canoe (horses may be permitted).	Non-mechanized (no air access); foot, canoe (horses may be permitted).
Determined by location of special resources; may be surrounded by or next to any of the other zones.	Remote; not easily visited on a day-use basis.	Remote; not easily visited on a day-use basis.
Small; usually less than 2000 hectares.	Large; greater than 5,000 hectares.	Large; greater than 5,000 hectares.

Area defined by biophysical characteristics or the nature and extent of cultural resources (adequate to afford protection).

Defined by ecosystem limits and geographic features. Boundaries will encompass areas of visitor interest for specific activities supported by air access. Will be designated under the *Park Act*.

Defined by ecosystem limits and geographic features. Will be designated under the *Park Act*.

Sight-seeing, historic and nature appreciation. May be subject to temporary closures or permanently restricted access.

Backpacking, canoeing, kayaking, river rafting, nature and historic appreciation, hunting, fishing, cross-country skiing, snowshoeing, horseback riding, specialized activities (e.g. caving, climbing).

Backpacking, canoeing, kayaking, river rafting, nature and historic appreciation, fishing, cross-country skiing, snowshoeing, horseback riding, specialized activities (e.g. caving, climbing).

	Intensive Recreation	Natural Environment
FACILITIES	<p>May be intensely developed for user convenience.</p> <p>Campgrounds, landscaped picnic/play areas, trail accommodation or interpretative buildings; boat launches, administrative buildings, service compounds, gravel pits, disposal sites, wood lots; parking lots, etc.</p>	<p>Moderately developed for user convenience. Trails, walk-in/boat-in campsites, shelters, accommodation buildings may be permitted; facilities for motorized access e.g. docks, landing strips, fuel storage, etc.</p>
IMPACTS ON NATURAL ENVIRONMENT	<p>Includes natural resource features and phenomena in a primarily natural state but where human presence may be readily visible both through the existence of recreation facilities and of people using the zone. Includes areas of high facility development with significant impact on concentrated areas.</p>	<p>Area where human presence on the land is not normally visible, facility development limited to relatively small areas. Facilities are visually compatible with natural setting.</p>
MANAGEMENT GUIDELINES	<p>Oriented toward maintaining a high quality recreation experience. Intensive management of resource and/or control of visitor activities. Operational facilities designed for efficient operation while remaining unobtrusive to the park visitor.</p>	<p>Oriented to maintaining a natural environment and a high quality recreation experience. Visitor access may be restricted to preserve the recreation experience or to limit impacts. Separation of less compatible recreational activities and transportation modes . Designation of transportation may be necessary to avoid potential conflicts (e.g. horse trails, cycle paths, hiking trails).</p>
EXAMPLES OF ZONING	<p>Campground in Rathtrevor Beach Park; Gibson Pass ski area in E.C. Manning Park.</p>	<p>Core area in Cathedral Park; North beach in Naikoon Park.</p>

Special Feature	Wilderness Recreation	Wilderness Conservation
Interpretative facilities only, resources are to be protected.	Minimal facility development for user convenience and safety, and protection of the environment e.g. trails, primitive campsites, etc. Some basic facilities at access points, e.g. dock, primitive shelter, etc.	None.
None; resources to be maintained unimpaired.	Natural area generally free of evidence of modern human beings. Evidence of human presence is confined to specific facility sites. Facilities are visually compatible with natural setting.	Natural area generally free of evidence of modern human beings.
High level of management protection with ongoing monitoring. Oriented to maintaining resources and, where appropriate, a high quality recreational and interpretative experience. Active or passive management depending on size, location, and nature of the resource. Visitor access may be restricted to preserve the recreation experience and to limit impacts.	Oriented to protecting a pristine environment. Management actions are minimal and not evident. Managed to ensure low visitor use levels. Visitor access may be restricted to protect the natural environment and visitor experience.	Oriented to protecting a pristine environment. Management actions are minimal and not evident. Managed to ensure low visitor use levels. Visitor access may be restricted to protect the natural environment and visitor experience.
Tidepools in Botanical Beach Park; Sunshine Meadows in Mount Assiniboine Park.	Quanchus Mountains Wilderness in Tweedsmuir Park; Wilderness Zone in Spatsizi Park.	Central Valhalla Wilderness in Valhalla Park; Garibaldi Park Nature Conservancy area.

Duffey Lake
Provincial Park

BACKGROUND
DOCUMENT

Prepared for:

**Ministry of Environment, Lands and Parks
BC Parks
Garibaldi/Sunshine Coast District
Brackendale, B.C.**

Prepared by:

Terra Firma Environmental Consultants

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INTRODUCTION

Duffey Lake Provincial Park comprises 2,379 hectares and is situated on the leeward side of the Pacific Ranges in the Coast Mountains (Figure 1). The park is centred around the lake, located along Duffey Lake Road (Highway 99), about half-way between Pemberton and Lillooet, and two and a half hours from Vancouver (Figure 2). This highway is very scenic, and forms part of a 700 km circle tour route from Vancouver.

The Duffey Lake/Cayoosh Creek Valley was used as a travel route between the natives of the Stl'atl'imx Nation based around Lillooet Lake and those of the Fraser River around Lillooet. It was considered an important hunting, trapping and gathering area for First Nations people. The aboriginal name for Duffey Lake was "tek" which means "log jam", referring to the natural log jam at the east end of the lake.

Settlement history resulted in Duffey Lake being named after James Duffey of the Royal Engineers, who, in 1860, explored this area. In 1897, gold was discovered in Cayoosh Creek, which led to the development of the Golden Cache Mine.

As the logging industry developed in the area, road access became possible. For many years, the Duffey Lake Road provided access for back road recreationalists including hunters and fisherman. Whistler brought more tourists into the region, some of whom found their way to the Duffey Lake area. The road upgrading of 1991 has resulted in tourists travelling the route in even greater numbers.

In 1990, Duffey Lake was identified as a study area for a potential provincial park and was later included in the Protected Areas Strategy (PAS), which resulted in the area being designated as a Class 'A' Provincial Park in 1993. Several other provincial parks and recreation areas exist within the immediate region including Joffre Lakes Recreation Area, Stein Valley Provincial Park, Nairn Falls Provincial Park and Birkenhead Lake Provincial Park (Figure 2)

Figure 1 Park Area

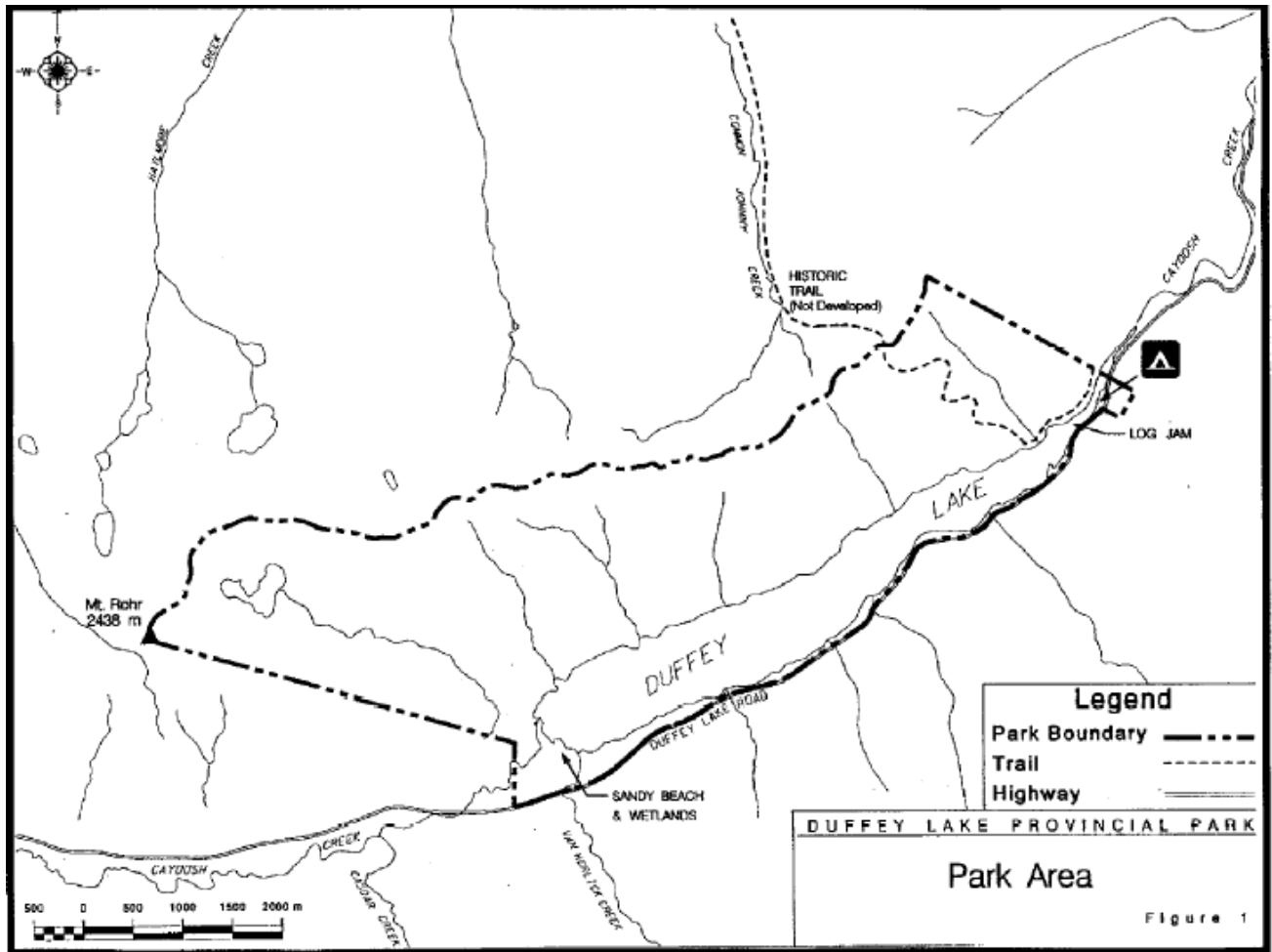
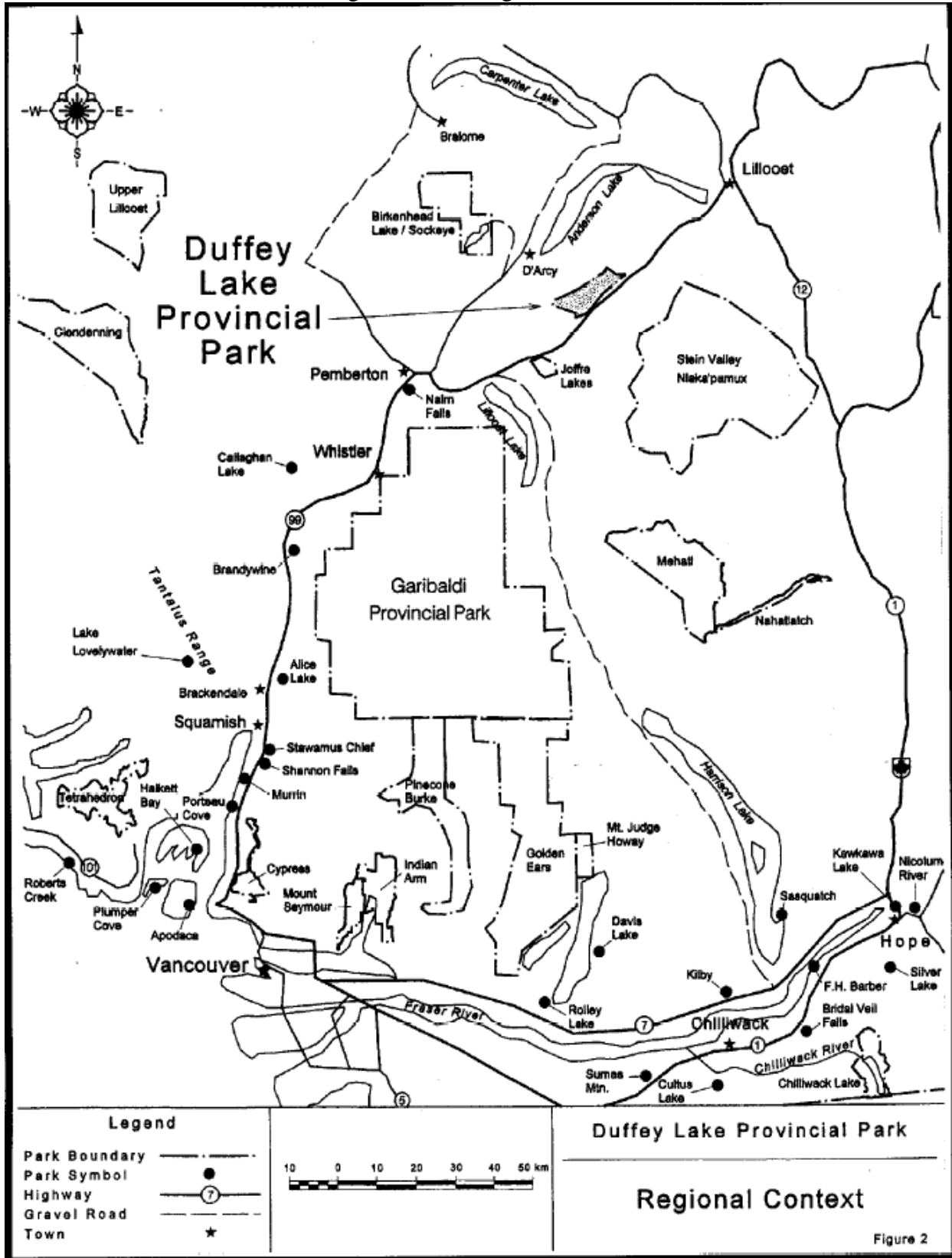


Figure 2 Regional Context



NATURAL AND CULTURAL RESOURCES

Physiography

Duffey Lake Provincial Park is situated generally in the centre of the Leeward Pacific Ranges Ecoregion of British Columbia. This ecoregion is a dry, narrow band leeward of the Pacific Ranges. The northern portion is mainly underlain by granitic rocks with some volcanic intrusions and areas of folded volcanic and sedimentary rocks. The southern portion has a complex geology of folded volcanic and sedimentary rocks with granitic intrusions. Rounded summits below treeline are common, while glaciers and ice fields are minimal.

Duffey Lake lies at an elevation of 1,097 metres a.s.l., while Mt. Rohr, also within park boundaries, reaches 2,438 metres. The park is dominated by the lake and a steep south-facing slope. This north slope is flanked by numerous avalanche chutes and small colluvial fans that rim the north side of the lake. The ridge top is steep and serrated, and poorly accessed. Two main creeks, Cayoosh and Van Horlick, flow into Duffey Lake, and form wetlands at the mouths, due to periodic flooding. The Duffey Lake road forms the southern boundary of the park.

Geology

The Pacific Ranges are the result of up to 181 million years of geological events. They were formed out of a large mass of intrusive igneous rock called the Coast Batholith. Duffey Lake Provincial Park contains a sample of this geologic history. The geology of the park consists of three different geological formations. Two are stratified rock formations, while the third is of plutonic origins. Among the stratified rocks, two formations are recognized: the Hurley Group of the Upper Jurassic Period and the Bridge River (Fergusson Group) of the Triassic/Jurassic period. The Hurley Group is composed of thin-bedded argillite, phyllite, limestone, tuff, conglomerate, andesite, and minor chert. The Bridge River (Fergusson) Group contains greenstone, basalt chert, argillite, phyllite, minor limestone, serpentine and serpentinized peridotite. These two formations are separated by a major fault that begins at Duffey Lake and extends northward to the village of D'Arcy. The plutonic rock in the park is in the form of quartz diorite. It extends north-south paralleling the other formations and the fault.

Mineral potential in the area is reflected by adjacent mineral claims and leases over an old silver mine immediately northeast of the park. No claims lie within the park. Mineral potential is low in areas underlain by quartz diorite, which is the basis for the west end of the park. Low to moderate potential corresponds to areas underlain by the Bridge River Group rocks. This occurs in a north-south band over the eastern third of the park, and similarly covers the known silver mine occurrence.

Soils

Although a soil survey has not been conducted within the park, general soils maps of the province indicate that the typical soil type for valleys away from the coast line is a Humo-Ferric Podzol soil. The main climatic influences on this soil type are mild winters, cool to warm summers and moderate to high precipitation. These podzolic soils are well to moderately well-drained with a coarse to medium texture.

Water

There is very little information available on the water resources of the park. The primary water resource of the park is Duffey Lake, about 365 hectares in size, with 16 km of shoreline. Its maximum depth is 84 metres, with a mean depth of 38 metres. Cayoosh and Van Horlick Creeks supply the lake. Cayoosh Creek flows from west to east, with a small wetland at its mouth at the lake. The creek continues at the lake outlet, about 6.7 kilometres to the east, which is just beyond an extensive log jam. Van Horlick and Cayoosh Creek lie mostly outside the park, with direct run-off and snow meltwater as their source.

Climate

Duffey Lake Provincial Park is situated in a transitional area between the Southern Sub-maritime and the Southern Sub-continental climatic regions. The climate of this leeward area of the Coast Mountains range can be generally characterized as having warm, dry summers and cold, wet winters. Where Interior Douglas-Fir biogeoclimatic zones are found, such as in the park, the main factor controlling the climate is the rainshadow created in the lee of topographic barriers. Generally, the average temperature is below 0°C for 3-5 months, and above 10°C for 3-5 months in this zone. Average annual precipitation ranges from 300mm to 750mm, and in the wettest areas to 1000mm. Up to 50% of this may fall as snow. Moisture deficits are common in the growing season, and frosts can occur at any time. The area is appreciably drier and colder than Whistler, located to the southwest.

Summer climate data is unavailable for the site, and the nearest station at Pemberton is substantially lower in elevation. Winter climate records over 8 years (October or November to the end of April, 1981 to 1988) collected at Duffey Lake show the monthly average for daily maximum temperatures are below 0°C for up to seven months of the year. The monthly averages for daily minimums ranges from -6°C to -10°C. The winter season maximum was recorded as high as 18°C, and the minimum as cold as -33°C (MOTH 1997).

Vegetation (Biogeoclimatic Zones)

Duffey Lake Provincial Park contains four biogeoclimatic zones: the Interior Douglas-fir Zone, the Coastal Western Hemlock Zone, the Englemann Spruce - Subalpine fir Zone and the Alpine Tundra Zone (Figure 3). The Coastal Western Hemlock Zone is represented by the Coastal Western Hemlock moist maritime subzone (CWHms1). It covers mainly the lower to mid elevations along the southside of the lake and is characterized by western hemlock (*Tsuga heterophylla*), Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), queen's cup (*Clintonia uniflora*), step moss (*Hylocomium splendens*), and red-stemmed feather moss (*Pleurozium schreberi*).

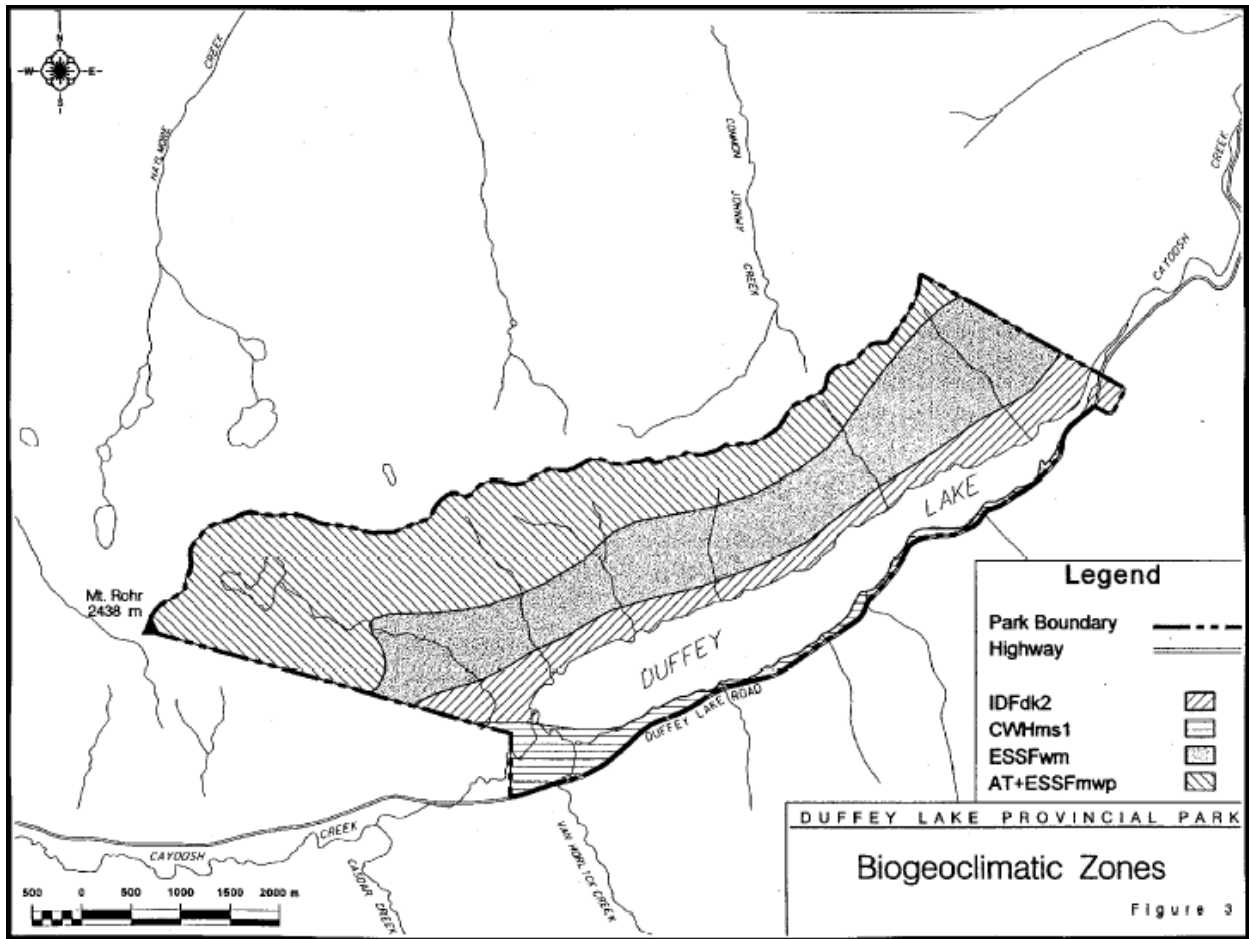
The Interior Douglas-fir Zone is typical of the south-central interior of British Columbia, and fingers into the lee side of the Coast Mountains. It is represented here by the dry/cool subzone (IDFdk2) found in the more well-drained and southerly facing slopes. Generally, this area occupies a narrow band along the northern lower slopes of Duffey Lake. Species that are found in the zone include Douglas-fir (*Pseudotsuga menziesii*) and Amabilis fir (*Abies amabilis*).

The Englemann Spruce-Subalpine fir Zone (ESSF), generally beginning at an elevation of 1,300 to 1,650 meters, is situated directly above the CWH biogeoclimatic zone. This zone contains the ESSFmw (moist warm) lower elevation subzone and the ESSFmwp parkland subzone. Tree species common in this biogeoclimatic unit are subalpine-fir (*Abies lasiocarpa*), Englemann spruce (*Picea engelmannii*) and amabilis fir (*Abies amabilis*). Common shrubs and plants include black huckleberry (*Vaccinium membranaceum*) and the white-flowered rhododendron (*Rhododendron albiflorum*).

The ESSFmwp subzone is transitional between the true alpine and the subalpine. Due to the inhospitable growing conditions which exist at these upper elevations, the trees in this subzone are often stunted (Krummholz form) and few in number. This less-forested subzone consists of clumps of trees interspersed with ESSFmw and AT associated plant species. It is often mapped with the Alpine Tundra zone.

The Alpine Tundra Zone in the park lies above the ESSF zone at elevations usually above 1,800 metres. The low growing season temperatures and very short frost-free period limit the vegetation of this zone to mainly shrubs, herbs, mosses, liverworts and lichens. A significant amount of the Alpine Tundra zone lacks vegetation and is composed of rock. Low deciduous shrubs such as *Salix* species can be found in the lower elevations of the zone, while evergreen-leaved and deciduous dwarf scrub are more common at the middle elevations.

Figure 3 - Biogeoclimatic Zones



There are small pockets of old growth forest, defined as being greater than 250 years old, remaining in the park. The majority is along the south side of the lake beside the highway and at the mouths of Van Horlick and Cayoosh Creeks (Figure 4).

Fish and Wildlife Values

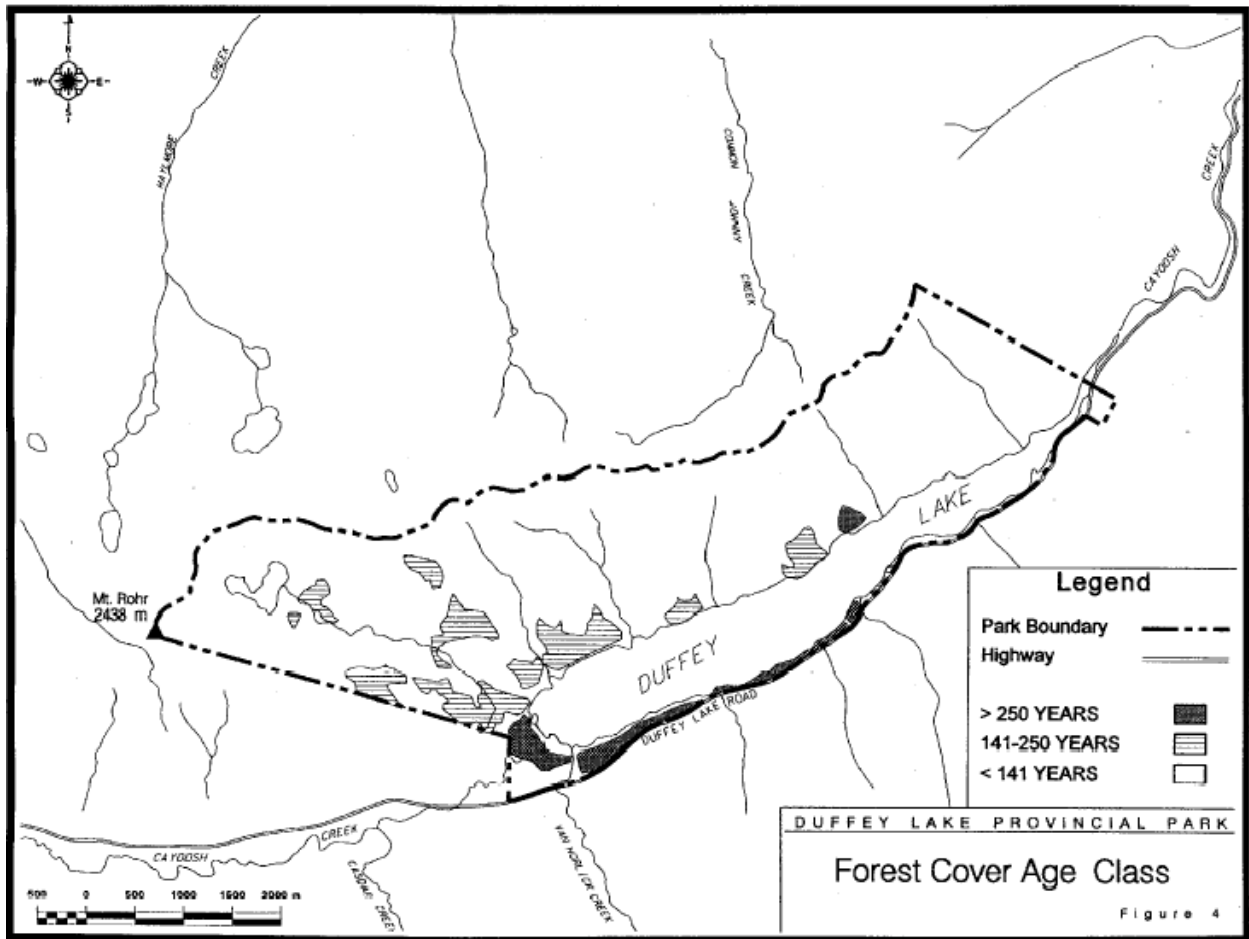
Little is known about the fisheries resources of the park. Rainbow trout and Mountain Whitefish have been caught in Duffey Lake, while the creeks are known to contain Dolly Varden char, and possibly Bull trout. Cayoosh Creek has high spawning potential.

Wildlife values in the Cayoosh drainage are considered high. Mountain goats occur throughout the Cayoosh Range. There is an important corridor from Van Horlick Creek to subalpine habitat northwest of Duffey Lake. The ridge above the park is a goat corridor, and adjacent alpine meadows are known rutting areas (McCrary, pers. comm.). One large herd of 38 goats was seen in the park on the westernmost avalanche chute above the lake (Aitken, pers. comm.).

The avalanche tracks beside the lake become snow free earlier than the forested areas and are believed to offer high quality grizzly bear habitat. Recent study shows high use in the early spring and summer by black bear and probably grizzly bear, feeding on the new vegetation (McCrary, pers. comm.). The trail on the north slope of the lake is known to be an old bear trail. There is also an alpine pass connecting to Common Johnny Creek which is a wildlife movement corridor. Current studies indicate that grizzly bear numbers appear low, despite optimal habitat, within the park. Their historic use of the park is confirmed by a discovery of a collapsed and excavated grizzly bear den (McCrary, pers. comm.). Grizzly bear are open to a Limited Entry Hunt in the Management Unit (3-16), where three bears are permitted per season. Harvest statistics showed 3 bears taken in 1992 at Texas Creek near Lillooet (1 male LEH, and 1 male and 1 female taken as problem bears by guide-outfitter); and 2 bears harvested in 1996 (2 females, one from Texas Creek, another unrecorded) (Jury, pers. comm.). Sightings of grizzly include one between Texas and Gott Creek in 1995, another at the top of the Haylmore drainage in 1996 (across the divide from Duffey Lake) and a sow and two cubs in the Melvin Creek drainage (just east of Duffey Lake) in September of 1997 (Jury, pers. comm.) Avalanche crews working in the area report common sightings of grizzly in the park until 1992 (Aitken, pers. comm.).

Black bear appear to be moving in to fill the niche as evidenced by greater number of sightings in recent years and recent field study (McCrary, pers. comm.; Aitken, pers. comm.). Other

Figure 4 - Forest Age Classes



common wildlife species that occur throughout the area include deer, small fur-bearing animals and upland game birds. There is waterfowl habitat at both ends of Duffey Lake that is considered locally important.

Outdoor Recreation Features

The Cayoosh Creek drainage and adjacent areas within the park include several significant outdoor recreation features. Among these are the alpine area northeast of Mount Rohr due to the variable topography (eg. hanging valley, ridges), alpine/subalpine vegetation and the large alpine lake; the wetland and beach complex on the west and northwest edge of Duffey Lake; and the outlet of the lake below and including the log jam, which has created a wetland edge for waterfowl, and habitat for fish rearing and shelter. The ridge above Duffey Lake and the lake itself are ranked moderately significant for recreation, due to steepness and limited shoreline access, respectively.

Visual Values

The landscape of Duffey Lake Provincial Park provides mainly three types of visual experiences: enclosure, focal and panorama.

Enclosure - The large mountainous walls surrounding Duffey Lake provide an enclosed visual experience. The trough-like setting makes the mountain ridges, the slopes and the lake the main areas of interest. These always provide an ever-changing blend of form, line, colour and texture. Coniferous stands, deciduous pockets, avalanche tracks, slides, rock faces and the climatic conditions all contribute to a mosaic of visual experiences.

Focal - The landform of the park focuses the viewer to particular features such as the surrounding prominent mountain peaks including Mount Caspar, Mount Duke, Mount Vantage and Mount Rohr. Duffey Lake is also a visual focal point emphasized by the form and lines found within the landscape.

Panorama - Panoramic views are possible from the higher elevation vantage points along the ridge above the lake, as well from the middle of Duffey Lake.

The visual features of the park are adversely affected from outside the park boundary. Forest harvesting has occurred to the south of the park on the lower elevation slopes and is expected to be ongoing for a long time. Harvesting is visible from most areas of the park but these areas appear to be slowly greening up with new forests.

Significant viewpoints identified in the Duffey Lake Corridor Plan include:

- views from the highway at the level access road from the west side of Duffey Lake;
- views from an access point to the lake half way along the lake, used at present as a rest stop and for unauthorized camping;
- views from the boat launch area;
- views from the campsite.

The Mt. Rohr alpine is highly sensitive to visual impacts. As a viewpoint, particularly after trail development from the proposed campground, visual impacts from surrounding land developments should be monitored.

Cultural Values

There are no known archaeological sites in the park but as was mentioned in the background history, Duffey Lake has significance in the oral history of the Stl'atl'imx Nation. About five kilometres away, in an adjacent alpine area above Melvin Creek, recent archaeological work has revealed cultural materials that indicate a campsite location, probably used for hunting or as temporary base camp (Borden Number EdRn-1) (Rousseau, et al. 1992). This site has significance in being one of few sites excavated in this type of ecosystem. Oral history also relates that the alpine areas near Duffey Lake were very important hunting and gathering areas (especially for glacier lily), and the lake may have had ceremonial significance.

Resource Analysis

When looking at the natural values of a B.C. Provincial Park, it is important to consider the role that the significant natural and cultural values of that park contribute to achieving the overall conservation and recreation goals of the BC Parks system. As there are no recorded cultural values, the natural values are solely considered. The natural values in Duffey Lake Provincial Park contribute towards achieving the recreation and conservation goals of the BC Parks system in the following ways:

Conservation Goal Significance

BC Parks Goal 1

Representation

To protect viable, representative examples of the natural diversity of the province.

Duffey Lake contributes to the representation of the Leeward Pacific Ranges Ecoregion. The ecoregion is substantially represented by other protected areas, including Birkenhead Lake Provincial Park, E.C. Manning Provincial Park, Skagit Valley Provincial Park, Coquihalla Summit, Stein Valley

Provincial Park and the Cascade Recreation Area. Duffey Lake Provincial Park contributes by protecting the ESSFmwp and the CWHms1 which were under-represented in protected areas in the Leeward Pacific Ranges.

Recreation Goal Significance

BC Parks Recreation Goal 1

Tourism Travel Routes · To provide parks and services which enhance tourism travel routes.

Duffey Lake Provincial Park already offers some opportunities for the travelling public to enjoy the scenic beauty of the lake through the existing boat launch and highway pull-outs but there is significant potential to provide more opportunities through the development of facilities.

BC Parks Recreation Goal 2

Holiday Destination · To provide park attractions which serve as or improve key destinations for outdoor recreation holidays.

With adequate development and promotion, Duffey Lake could significantly contribute to this provincial goal. To become an outdoor recreation holiday destination, a greater variety of opportunities must be offered, including overnight accommodations. There is a multitude of potential opportunities along the lakeshore and higher elevations of the park for hiking, camping, picnicking, fishing, swimming and nature appreciation.

BC Parks Goal 3

Local Recreation · To ensure access to local outdoor recreation opportunities for all residents of this province.

The local communities of Lillooet, Mount Currie, Pemberton and D'Arcy are served by the recreational opportunities at Duffey Lake.

TENURES, OCCUPANCY RIGHTS AND JURISDICTIONS

Leases and Permits :

Recreational Lease #334170 (BLK A) on the west end of Duffy Lake at L1210, under the Land Act, expiry 2005.

Ministry of Transportation and Highways holds a Notation of Interest - for Gravel Storage (#3405053) with no expiry date.

Ministry of Transportation and Highways has a Sec. 12 Reserve for a Roadway (TRAN3404796) with no expiry.

Guiding :

Guide-outfitter registered for MU 3-16, which is a very large area, guiding is not likely in the park; No Park Use Permit is issued for activity in the park.

Trapping:

Trapline Territory ATN 0210T006 registered to the Mt. Currie Indian Band. It is a large area, of which the park is only a fraction. Trapping in the park is unlikely, and no Park Use Permit exists.

RECREATION OPPORTUNITIES AND FACILITIES

Since the park is only recently established, there are few facilities and developed recreational opportunities. Currently the park is primarily a stop-off for Highway 99 travellers, although existing facilities include a rough gravel boat launch at the east end of the lake suitable for small car-top boats, several rustic camping sites at the east end of the lake and a few informal pull-offs off the highway. Despite the lack of facilities in the park, visitors have been able to enjoy camping, hiking, boating, canoeing, fishing, viewing nature and photography.

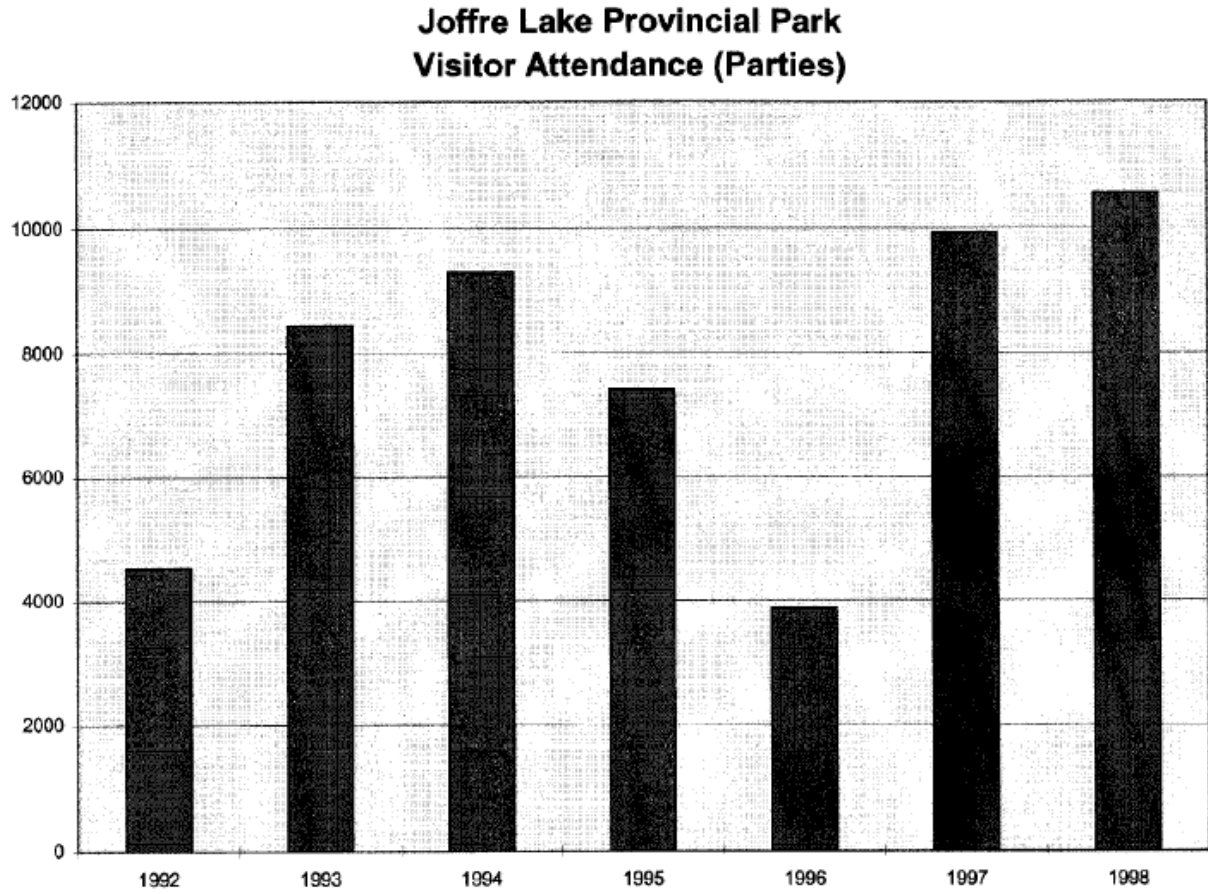
MARKETING ANALYSIS

A review of the existing use levels, use patterns and overall demand is an important aspect of planning effective park programs. Park statistics are not available for Duffy Lake Park at present. Joffre Lake Provincial Park, which lies about 15 kilometres to the west of Duffey Lake, was established primarily for backcountry recreation opportunities but receives significant use by highway travellers. Although park data does distinguish between backcountry and roadside day use, field observations suggest that the majority of attendance is primarily day use. This includes highway travellers making a short rest stop, and local and regional recreationists choosing this destination for hiking. Day use statistics for the Park has grown dramatically since the 1990s (Figure 5).

The trend of increasing use at Joffre Lakes since it was designated, is also reflected to some extent by highway traffic volume statistics which show increased volume, particularly since the highway was paved in the 1991. The Annual Average Daily Traffic volume for years preceding 1991 remains below 400, while 1991 to 1993 statistics show an increase to the 960 to 1360 range. These indications of demand can approximate the demand at Duffey Lake, given the close proximity of the two parks to each other and recreation opportunities at Duffey Lake park which complement that of Joffre Lakes, and would attract visitors.

Another measure of demand is the use of the six Forest Recreation Sites along the Duffey Lake Road. The Duffy Lake Forest Recreation Site was formerly managed by the Ministry of Forests, and is now the existing campground at the east end of the lake. The statistics show that all recreation sites have received increased use since the paving of the road, however, Duffy Lake site is the only one full every weekend in the summer (McArthur, pers. comm.). The site is limited due to its riparian location and sensitive soils, and is often overcrowded at present.

Fig. 5 Joffre Lakes Recreation Area - Day Use Figures



Parties: 3.0 persons/party

Figure 5

KEY ISSUES

Boundaries

The boundaries that were established through the Protected Areas Strategy were intended to conserve and protect Duffey Lake; however, there are other features outside the park in the adjacent alpine areas that may be beneficial to include. These features include the Mount Rohr alpine, and the alpine areas in both the Haylmore drainage and the Common Johnny Creek drainage.

Development and Conservation - Defining Appropriate Levels of Development

The role of the park and quality of park opportunities determines the desired level of development and use. With newly designated parks, the lack of available information is a limiting factor in determining appropriate levels of development. In particular, information is limited on the biophysical environment, which is essential prior to any development. In addition to the lack of information on the park, the newly paved road corridor has created new travel patterns with marked growth in visitation and unknown future levels of use. There is potentially a wide range of development possibilities from high use front country developments such as campgrounds, to low use wilderness trails. The level of development will be based on recreational needs and opportunities provided by other parks and recreation sites in the public and private sector. This must be weighed against the primary need to protect conservation values.

BC Parks must address possible development options for:

- **Roadside rest-stop facilities**, which could be temporary to allow for collection of information on the biophysical environment, or could complement the long-term development plans;
- **Lake-side day use development** (picnic facilities, short trails, viewing platform, etc.). which could occur concurrently with existing campsite, replace it or occur at a more suitable location.
- **Destination day use and campground facilities** - A range of facilities could include trails to the alpine and/or along the lake, a larger unit campground on the lake with associated day use facilities. This could replace the existing camping site and alleviate the informal camping along the lakeshore. The existing campsite has only five units and is full on summer weekends, and presents problems with access. Flood potential, however, exists at the west end of the lake where more suitable space is available. These developments would extend the length of stay of visitors and offer the fullest range of recreational opportunities possible.

Protecting the Visual Integrity of the Park

As the park is surrounded by active logging and traversed by a highway, there are a number of visual issues to consider. To maintain visually appealing park experiences, it would be important to develop a strategy to deal with the visual impacts on the adjacent land.

Expansion of the Highway

The highway receives increasing use, which may result in expansion of the corridor. Any such development would not likely infringe on the Park along the shoreline, but may impact values associated with the park. As this area is very narrow, contains pockets of the old-growth and provides shoreline recreational opportunities, any highway expansion could displace significant values. BC Parks will need to play a key role in reviewing any proposed highway development plan that will affect the park.

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