BC Parks Management Plan

BACKGROUND DOCUMENT

TETRAHEDRON PROVINCIAL PARK

prepared for:

Ministry of Environment, Lands and Parks
BC Parks
Garibaldi/Sunshine Coast District

by:

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Management Plan Background Document

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Mapping included within the report is for illustrative purpose only. Once an "Exhibit" map has been prepared for park administration, illustrations will provide overlay information for formal mapping

Preface

Tetrahedron Provincial Park is one of several parks created under the 1995 Lower Mainland Nature Legacy. This background document which adheres to BC Parks' management plan policy describes resources values and planning issues pertaining to Tetrahedron Provincial Park. It provides a resource reference for a subsequent park management planning process.

Tetrahedron Provincial Park will be managed by the Garibaldi/Sunshine Coast District to retain its wilderness, water quality, and to prudently manage recreation where possible.

Much of the resource information available for Tetrahedron originates from the extensive public planning process which preceded park establishment. The *Tetrahedron Local Resource Use Plan (LRUP)* process involved many government, forest industry, public and private groups and individuals over its five year duration. A variety of sub-committees conducted research, debated issues and prepared reports which delved intensively into many complicated resource topics, all related to values present within the study area. The planning team then reviewed and assembled the sub-committee reports and made its final recommendation to Cabinet as part of the Protected Areas Strategy program. In addition, the principle goal of the Chapman/Gray Creeks Integrated Water Management Plan (C/G IWMP) is to maintain and improve water characteristics (quality, quantity, and timing of flows) for the two principle domestic water supply drainages along the Sunshine Coast. The primary objective is watershed management that will protect the integrity of the whole forest ecosystem, with special emphasis on protection of hydrological stability, both during and following resource extraction activities. A secondary objective is a balance of human and non-human uses across the watersheds to ensure equitable and sustainable access to resources for all watershed users.

Tetrahedron Provincial Park is dedicated to the ongoing initiative of all those who have been so extensively encircled by debate, interest and passion during the past decade.

Introduction

Tetrahedron Provincial Park was created by provincial statute on July 12, 1995. Comprising 6,000 hectares of mid-elevation plateau and mountain peaks, the Tetrahedron basin has been a four season destination for many years. Establishment of Tetrahedron Provincial Park is a result of many years of intensive land use discussion, culminating with its assessment under the Protected Areas Strategy.

Recreation use of the Tetrahedron is principally by local residents of the Sunshine Coast. Even though a vast majority of the Sunshine Coast land base is rural, over half of its population resides in three principal municipalities: Sechelt (6,123), Gibsons (3,138) and the Sechelt Indian Band (870). Between 1986 and 1991, the Sunshine Coast experienced the largest growth in its history, a population increase of 24%. Further growth is certainly expected in these communities and since all are separated from the rest of British Columbia's mainland by a 45 minute ferry trip across Howe Sound, they depend heavily on locally accessible outdoor recreation resources.

Of primary management concern to BC Parks is the Tetrahedron's importance as two Section 12 watershed reserves under the ***Land Act.*** Gray and Chapman Creeks, both which have headwaters in the park, are the principle supplies of domestic drinking water to coastal communities along the Sunshine Coast. As population increases, along with the demand for water and recreation opportunities, the importance of a sound park management plan which will balance these uses is apparent.

Natural Features of the Park

Physical Geography

Tetrahedron Provincial Park is located on a high elevation plateau ranging between 900 and 1,700 metres. It is situated centrally between the Sechelt and Salmon Inlets, the Tantalus Range of the Coast Mountains, Howe Sound and Georgia Strait (Figure 1). The park contains ten small freshwater lakes and three distinctive mountain peaks. Tetrahedron Peak (1727m), Panther Peak (1681m), and Mt. Steele (1651 m) are landscape features that are clearly visible across Howe Sound from downtown Vancouver and from ferry routes across the Strait of Georgia.

The Tetrahedron is situated within the Southern Pacific Ranges ecosection.[1] At approximately 6,000 hectares in size, Tetrahedron Provincial Park protects lakes, numerous wetlands, open parkland, three mountain peaks and one of the oldest undisturbed forests in Canada. Roughly two-thirds of Tetrahedron Provincial Park is forested land, a majority of this in the Mountain Hemlock or Parkland Mountain Hemlock biogeoclimatic sub-zones. The rest of the forested portion is contained within the Coastal Western Hemlock biogeoclimatic zone. Unforested portions of the park are comprised of alpine tundra, lakes and wetlands.

Within the park, the west and southwest edges have been impacted by logging, as have the adjacent areas outside the boundary. Three of the ten lakes are currently surrounded by recently logged blocks (Tannis, Batchelor and Margie), while another is somewhat impacted (Mayne Lake).

Climatic conditions are typical of mid-elevations in the Pacific northwest - short, cool summers and long, cool, wet winters. The park has a maritime sub-alpine boreal climate with heavy snow cover for several months of the year. Altitudinal gradients, relief and topography cause site-to-site variation in local climate. Nonetheless, low temperatures, a very short growing season, and large quantities of heavy snow (200-400 cm) are characteristic climatic features.

Geological makeup consists primarily of sedimentary and metamorphic rock, locally intruded by granitic batholiths. The plateau has been heavily modified by glacial action, which has smoothed and rounded the overall terrain. The relief pattern has a gentle westward slope, with a mainly rolling topography interrupted by low ridges, which separate the small kettle lakes and shallow stream valleys.

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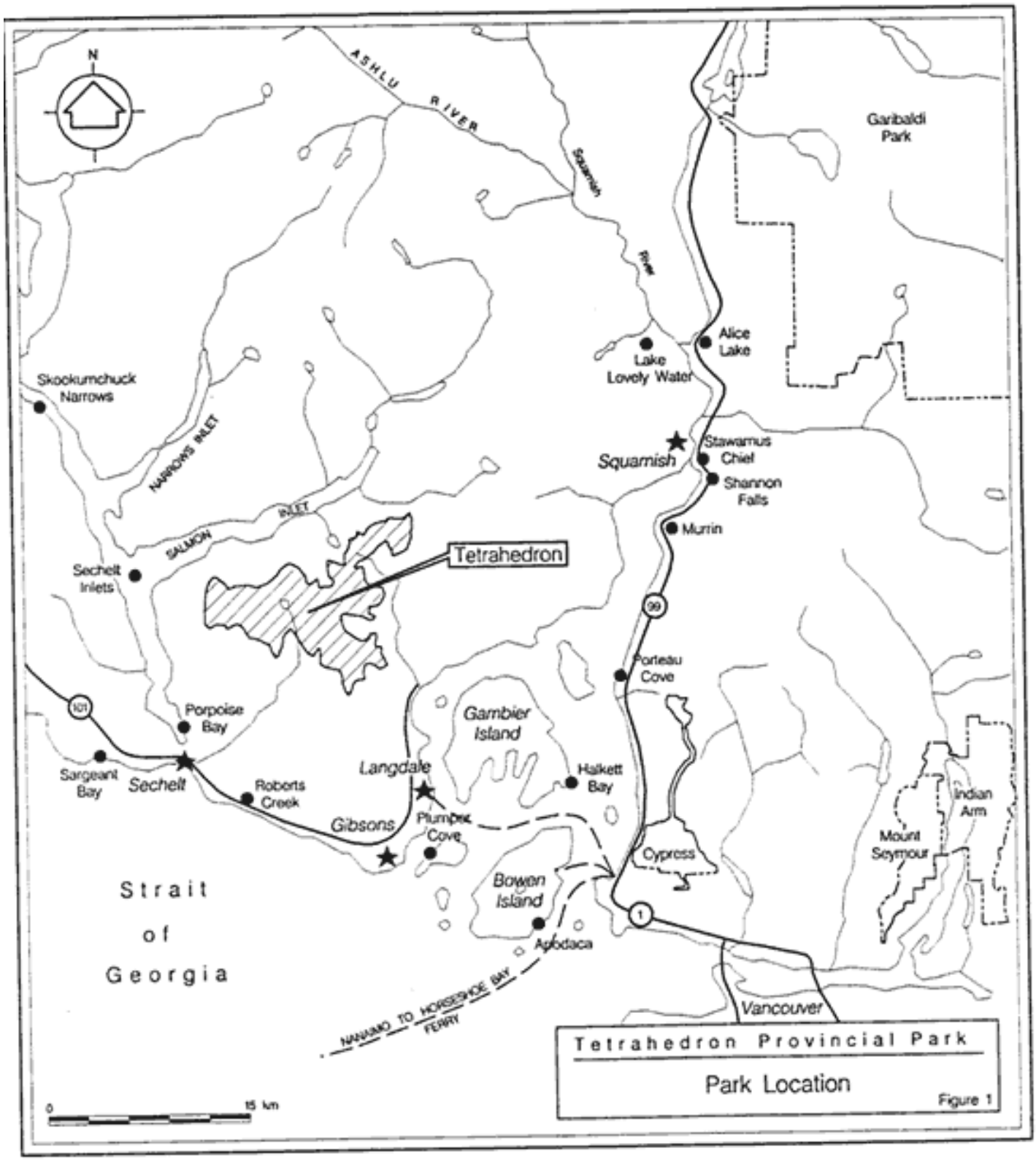
[1] The Southern Pacific Ranges (SPR) is the *ecosection* division of the Lower Mainland ecoregion and Coast and Mountains ecoprovince. The SPR extends from Powell Lake to Harrison Lake and forms the predominant visual backdrop to the Sunshine Coast, Vancouver and the Fraser Valley.

Figure 1 Park Location



Soils and soil processes of the park are representative of the biogeoclimatic zone. There is an accumulation of acid decomposition on the forest floor, slow rates of decomposition, leaching, illuviation and gleization (slumping). Steep, higher elevation slopes tend to be folisolic (rock covered by compacted organic layers), while lower elevation benches and flats tend toward the podzols (acid leached soils subject to a fluctuating water table). Theses podzols are also covered by compacted organic layers that lie saturated for most of the year. The Tetrahedron is marshy and swampy, with small pools and creeks typical of headwater zones, all of which contribute to late season water flows.

Wildlife

A partial inventory of wildlife within the park area was undertaken by the Ministry of Environment, Lands and Parks in June of 1992. Although not a thorough study, wildlife values were sufficiently investigated to give a relative evaluation of abundance for the majority of common species found in the park. The evaluation also established some guidelines and recommendations pertaining to wildlife management within the Tetrahedron and verify the presence of some rare and unusual species.

Two species of ungulate - black-tailed deer and mountain goat, are found within the park. The current low to moderate deer populations probably result from logged forest openings which surround the park area. Mountain goat populations are incidental in the south and west portions of the park; however, low to moderate populations occur in northeast and eastern portions where suitable terrain is presented on Mt. Steele, Tetrahedron Peak and Panther Peak.

Three large species of carnivore have been reported in the park area. Cougar are found in low numbers, relating to the relatively low deer population. Black bear sightings are more common, which indicates a healthy population. Based on a few reported sightings, coyotes also utilize habitat within the park.

Mink, short-tailed weasel, river otter and bobcat historically have been trapped in the Tetrahedron area; however, catch efforts and results were too small to indicate species abundance. Marten presently and fisher historically have ranged within the park as well, these species being dependent on old growth timber stands for vole and other small rodent food sources.

Rock Ptarmigan have been found on all three peaks, the most southern limit of this species breeding in British Columbia. Many other bird species, including peregrine falcon, rosy finches, grouse, raptors, song birds, grouse, eagles and cavity nesting birds such as nuthatches, three-toed woodpeckers, and red-breasted sapsuckers, and both goldeneye duck species frequent Tetrahedron. No spotted owls have been detected, although other important owl species are evident in the park. Marbled murrelet surveys conducted in 1992

concluded that the park contains significant nesting sites for these birds, particularly given that Tetrahedron Provincial Park presents the only old growth forest larger than 1,000 hectares on the lower Sunshine Coast.

Appendix 2 presents a more thorough species list for Tetrahedron Provincial Park.

During the mid-1980s, Tannis and Batchelor Lakes were stocked with cutthroat trout. Chapman Lake contains Dolly Varden char and some rainbow trout, both being stocked by the Fish and Wildlife Branch. In 1992, according to local sources, Tannis Lake was regularly producing cutthroat trout at 2½ lbs. Headwater sections of Gray and Chapman Creeks support resident populations of Dolly Varden char and rainbow trout. These creeks, which flow out of Tetrahedron Provincial Park to salt water, support anadromous species below impassable barriers outside of park boundaries. Fish hatcheries are located at the outlets of both creeks, relying on consistent water quality and quantity to support their continued operation.

Forests and Vegetation

Climatic conditions of the study area are typical of south coast British Columbia sub-alpine forests which feature short, cool summers and long, cool, wet winters, with heavy snow cover for several months. The gradients and extraordinarily complex relief and topography cause great site-to-site variation in soils and local climates. This variation notwithstanding, low temperatures, a very short growing season (long duration of snowpack), and tremendous quantities of heavy snow (200 to over 400 cm deep snowpack) [Brooke et al. 1970, Scagel et al. 1989] are the characteristic climatic features. Rooting of the primary tree species of this sub-zone is shallow, regardless of mineral soil depths, emphasizing the importance of the upper humus layers to growth in this region.

Water

The Tetrahedron plateau is characterized by spongy, water laden meadows and the variety of lakes which dot its landscape. These physical attributes make for a large headwater storage reservoir for Chapman and Gray Creeks, which flow southward from the park into the Strait of Georgia. Abundant rainfall and deep winter snows ensure continual recharge of freshwater supply. Like most west coast surface water sources, Gray and Chapman Creeks carry a relatively high level of suspended organic material. This material comes from significant peat deposits which comprise the alpine wetlands.

The Sunshine Coast Regional District license community water system, which uses the Tetrahedron plateau as its principle source, serves over 7,000 subscribers, an estimated population of 21,000. The system stretches from Langdale to Secret Cove (50 km) with over 200 km of distribution and trunk mains. Thus, the importance of water quality, and the

protection of the headwater area, is paramount.

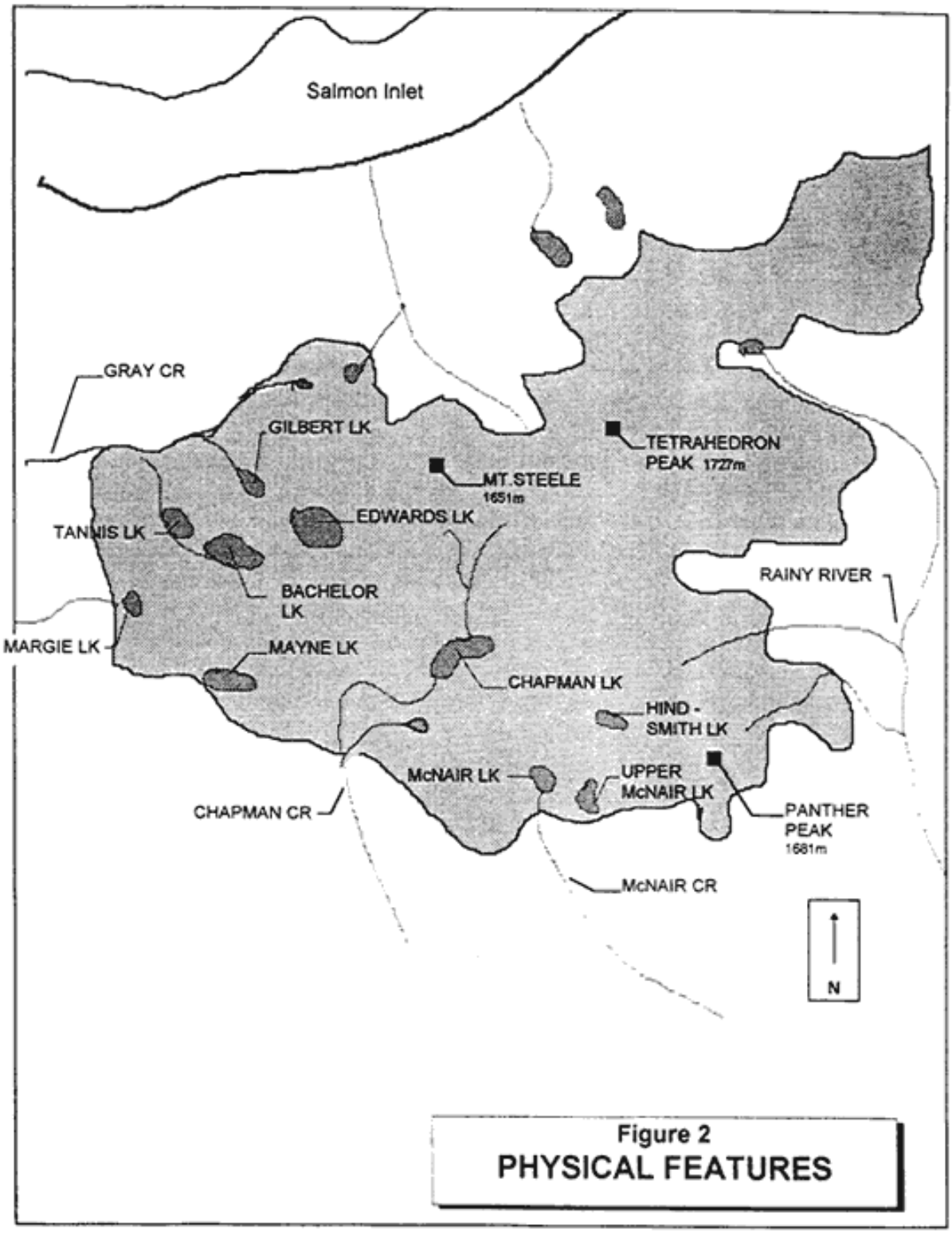
Water quality is routinely monitored by the Sunshine Coast Regional District at the intakes below the Park boundaries. Recreation developments (i.e. cabins) have been purposely situated away from sensitive lakeshores and creeks to avoid contamination of the water source.

Table 1 compares size and elevation of the ten freshwater lakes which lie within Tetrahedron Provincial Park.

Table 1

Lake	Size	Elevation
Chapman Lake	31.2 ha	925m
Edwards Lake	28.5ha	1065m
Tannis Lake	12ha	1027m
Batchelor Lake	11.7ha	1060m
Mayne Lake	11.3ha	1084m
Upper McNair Lake	8.4ha	1218m
Hind-Smith Lake	8.1ha	1040m
Gilbert Lake	6.6ha	1032m
McNair Lake	6.5ha	1022m
Margie Lake	6.2ha	1014m

Figure 2
Natural Features of the Park



Cultural Features of the Park

Historic aboriginal use of the Tetrahedron area was probably limited because of the plateau's altitude and relative inaccessibility from settlement areas. Although there are recorded use sites throughout both the Sechelt Indian Band's and Squamish First Nation's traditional territories (which include the Tetrahedron), there are no known archaeological sites recorded in the park.

Present day members of the Sechelt Indian Band use the park vicinity for occasional subsistence hunting (primarily deer); however, according to written reports on the Tetrahedron, they do not conduct trapping in the park.

Modem European history along the Sunshine Coast includes typical coastal tales of its settler's use of the rich natural resources: fish, timber and minerals. Probably of most interest in the park is its historical recognition as an outdoor recreation site and the long-standing debate over its protection. This history is chronicled in Appendix 1.

Recreation Features of the Park

The Ministry of Forests has completed a thorough *Recreation Resource Inventory* of the Tetrahedron plateau. The report and accompanying maps were produced in April 1991, with a supplemental report completed in the fall of 1992, thus covering both the skiing and hiking seasons. This comprehensive work precludes conducting BC Parks' version of an outdoor recreation features analysis.

The recreation focus of the park is the wilderness setting supported by the rustic four cabins and trails. As well, the forested landscape which includes substantial stands of old growth is an equally important recreation feature. Several polygons exhibiting high feature significance and sensitivity ratings are identified in the Forest Service inventory, many containing features related to old growth forests, lakes, meadows and mountain peak vistas.

On the western side of the park, the existing visual condition of the logged terrain surrounding Tannis, Batchelor and Margie Lakes can be rated very low. Adjacent forests to the north and south, and beyond the park boundary to the east, have also been harvested and maintain a similar visual condition rating. Striking into the heart of the plateau, now the park, road construction was completed through the forests above Gilbert Lake, dead-ending at a point above Edwards Lake. Although never used for logging, the road's de-activated condition still impairs the visual quality of this section of the park.

Recreational values of the park's high-elevation landscape of forests, mountains, lakes and parkland has been well recognized in studies completed for the land use planning process. Old growth Mountain hemlock forests offer a good opportunity to experience original Sunshine Coast temperate rainforest. These values are particularly important to the number of local residents who utilize the cabin and trail system for hiking, camping, skiing and fishing. The park is unique in that it protects the only sub-alpine "semi-wilderness" area on the Sunshine Coast where accessibility and size can offer a high quality outdoor recreation experience. The trail system is rudimentary and the present lack of signages may pose some hazards to park users.

In 1993, as part *of Protected Areas Strategy of BC* analysis, a recreation use and appreciation assessment was completed for the Southern Pacific Ranges ecosection. Results of this PAS Goal 1 (conservation) analysis concluded that protection of the Tetrahedron would conserve significant proportions of the *upland lake* and *alpine/subalpine* recreation settings, which maintain high recreational value in the Southern Pacific Ranges ecosection. The analysis rated the Tetrahedron as having *high* value for the conservation of outdoor recreation features.

Table 2 outlines the specific outdoor recreation features inventoried in Tetrahedron Provincial Park.

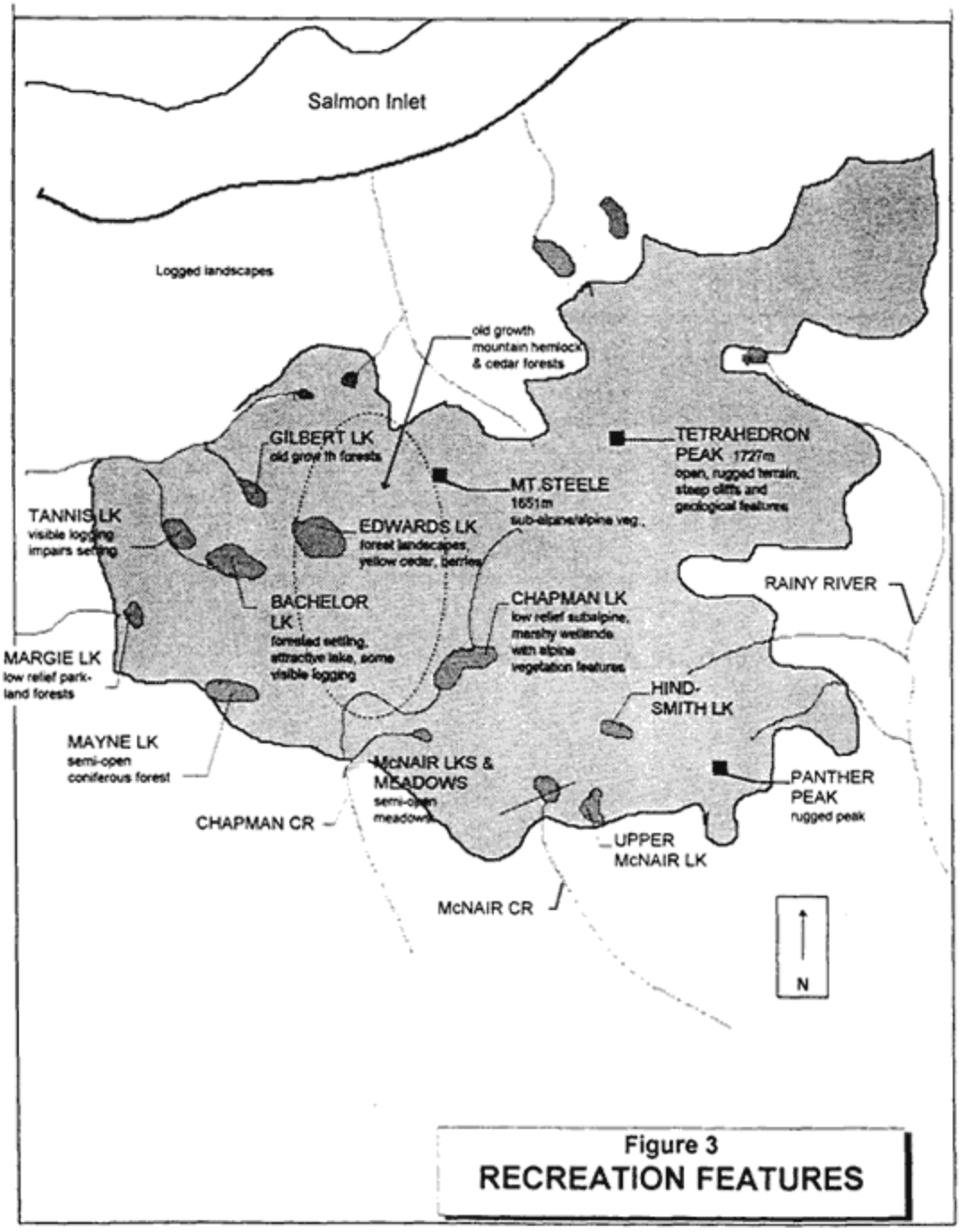
Table 2

Specific Outdoor Recreation Features

Feature	General Characteristics
Margie Lake	-generally wet terrain -lake is bordered to the south east by an attractive marsh/meadow complex -interesting hiking and viewing
Mayne Lake	-short hike from the end of a logging spur road -semi-open coniferous forest bordering the lake -sections of the trail area traverse areas of soft, moisture inundated soils -angling opportunities for resident cutthroat trout
Tannis Lake	-short hike from the end of a logging spur road -semi-open coniferous forest, landscape has been extensively modified (logged) -day use hiking, swimming, canoeing, some angling
Batchelor Lake	-attractive sub-alpine lake surrounded by mature forest -re-vegetating logging blocks above the south shore -day-use hiking, swimming, canoeing, some angling
Chapman Lake	-weir outlet limits hiking opportunities in this areas -sections of the trail are wet and slippery -blueberries are plentiful, extensive bear browsing area
McNair Meadows	-open meadows with knee-high grasses -good hiking terrain with some marsh areas
Chapman Creek	-high water quality, cool temperatures -rock and gravel and substrate material
McNair Lake	-semi-open meadows bordering the lake are generally wet and poorly drained -dense, lush, low-lying ground cover around the lake perimeter
Upper McNair Lake	-small peninsula on the west side of the lake has potential as an attractive picnic site -attractive cascading falls originate from the outlet of upper McNair Creek
Gilbert Lake	-shoreline is generally wet and poorly drained -forested landscape surrounding the lake is an attractive backdrop -no known sport fish population, however has good potential to support habitat
Edwards Lake	-small concrete weir maintains water levels -high water quality supports swimming -good opportunities for camping and angling -forest landscapes border the lake
Lower Mt. Steele	-forest parkland suitable for dispersed use recreation
Mount Steele	-sub-alpine and alpine vegetation. -numerous small shallow tarns with high water quality -attractive opportunities for extended hiking and viewing with an excellent 360 degree view of the Tetrahedron Plateau, the Coast Range, Salmon Inlet, Sechelt Inlet and the Strait of Georgia
Tetrahedron Peak/ Panther Peak	-steep, rugged terrain with exposed bedrock and mineralization -open terrain suitable for extended hiking and limited climbing -resident mountain goat population

Old Growth MH and CW Forests	-old growth mountain hemlock and cedar forests ranging in age from 300-1000 years -habitat for wildlife and rare/endangered species -special interest for nature study and benchmark scientific research on old growth habitat

Figure 3
Cultural and Recreation Features of the Park



Land Tenure, Occupancy Rights and Jurisdiction

Land Tenure

There are no existing tenures, such as mineral reserves, Crown land leases, private inholdings or similar, within Tetrahedron Provincial Park. Forest chart areas (i.e. timber tenures) became invalid upon designation of the park under the *Park Act*.

Appendix G of BC Environment's *Guidelines for Management of Watersheds Used for Community Water Supplies,* classifies Chapman Creek as a Category II Watershed which, according to government policy, "may be protected by the establishment of map reserves or Crown land designations over an entire watershed or over critical or sensitive areas." [2]

Occupancy Rights

One registered trapline exists along Gray Creek. However, Conservation Officers in Sechelt report that the line is inactive, with most of the trapper's activity occurring outside of the park.

Portions of Tetrahedron Provincial Park lie within the registered territory of a hunting guide/outfitter from Powell River.

According to the Ministry of Energy, Mines and Petroleum Resources, there are no active mineral claims in the park. Most recently, the Thorn 2 claim (#309207), which was staked over a small part of the Tetrahedron, was forfeited to the Crown in 1993. Prior to the LRUP process initiation in 1992, one other claim had also been forfeited.

Watershed management guidelines state that "(land) applications are not accepted in watersheds which have been reserved..., with the exception of those for temporary occupation, provided that such uses are compatible with the primary purpose of watersheds". In adherence with the guidelines, the Tetrahedron Ski Club, in cooperation with the Ministry of Forests (Sunshine Coast District), was authorized to build and maintain backcountry trails and four recreation cabins within the Gray, Chapman and McNair Creeks watersheds in 1987. The McNair, Mt. Steele, Edwards and Batchelor cabins have been operated under a volunteer cooperative agreement since their construction.

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[2] An exact boundary of the Section 12 (map) Reserve on Chapman Creek is not known because the original MoCL maps accompanying the reserve documentation have not been located.

Jurisdiction

Tetrahedron Provincial Park is designated as Class A Park under the *Park Act* of British Columbia and, as such, is managed by BC Parks (Brackendale). Former management authority was transferred to BC Parks from the Ministry of Forests (Powell River) and BC Lands (Burnaby).

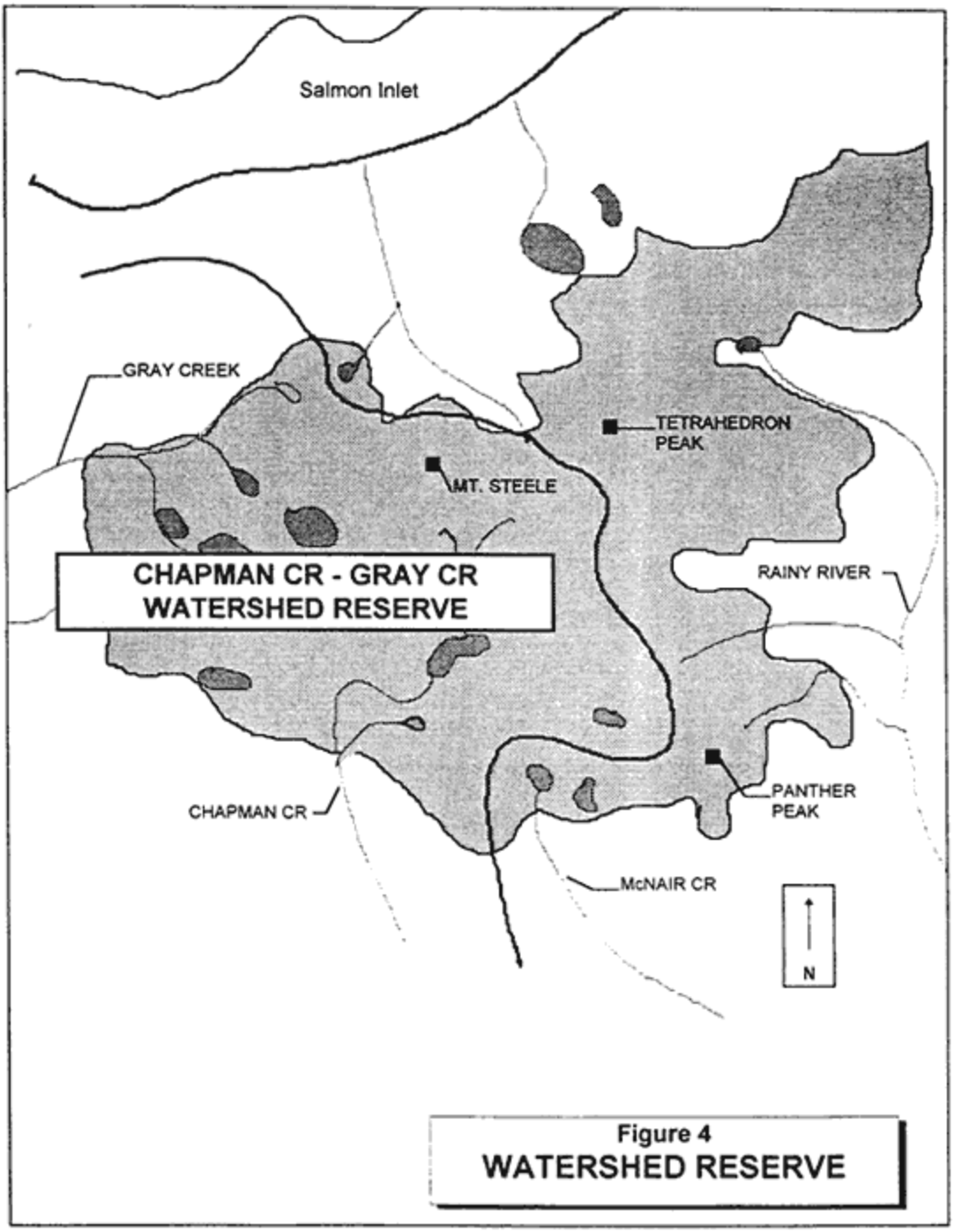
The park overlays traditional aboriginal territory of both the Sechelt Indian Band and Squamish First Nation.

Wildlife species which inhabit Tetrahedron Provincial Park are jointly regulated under agreement with BC Environment (Fish and Wildlife Branch), as part of Wildlife Management Unit 2-5.

Probably of most significance to land management within Tetrahedron Provincial Park are the two Watershed Reserves within the Chapman and Gray Creek headwaters. These Section 12 Reserves have traditionally been the responsibility of the Ministry of Environment, Lands and Parks, (Water Management Branch).

Since Tetrahedron is now designated under the *Park Act*, jurisdiction has been transferred to BC Parks. Notwithstanding, the importance of protecting these freshwater supply areas from impairment must remain a foremost objective.

Figure 4 Watershed Reserve



Visitor Facilities, Use and Opportunities

Tetrahedron Provincial Park has well recognized recreation facilities - an extensive 35 kilometre hiking/skiing trail network which links four log cabins. Trails and cabins were developed by the Tetrahedron Ski Club and the BC Forest Service, along with local volunteers, the Federal Government, local forest companies and local businesses. This system currently offers the only hut-to-hut backcountry hiking and skiing experiences in the Coast Mountains.

Access

Two main access roads are used to get to Tetrahedron Provincial Park:

- Gray Creek Forest Service Road is the main route to access the park. It is maintained during the forest operations season and semi-deactivated in winter. For the past few winter seasons, Gray Creek Road has been ploughed on occasion.

- McNair Creek Forest Service Road provides remote summer access to the east side of the park. The road is not maintained, is quite prone to avalanche, and sustains a large bear population.

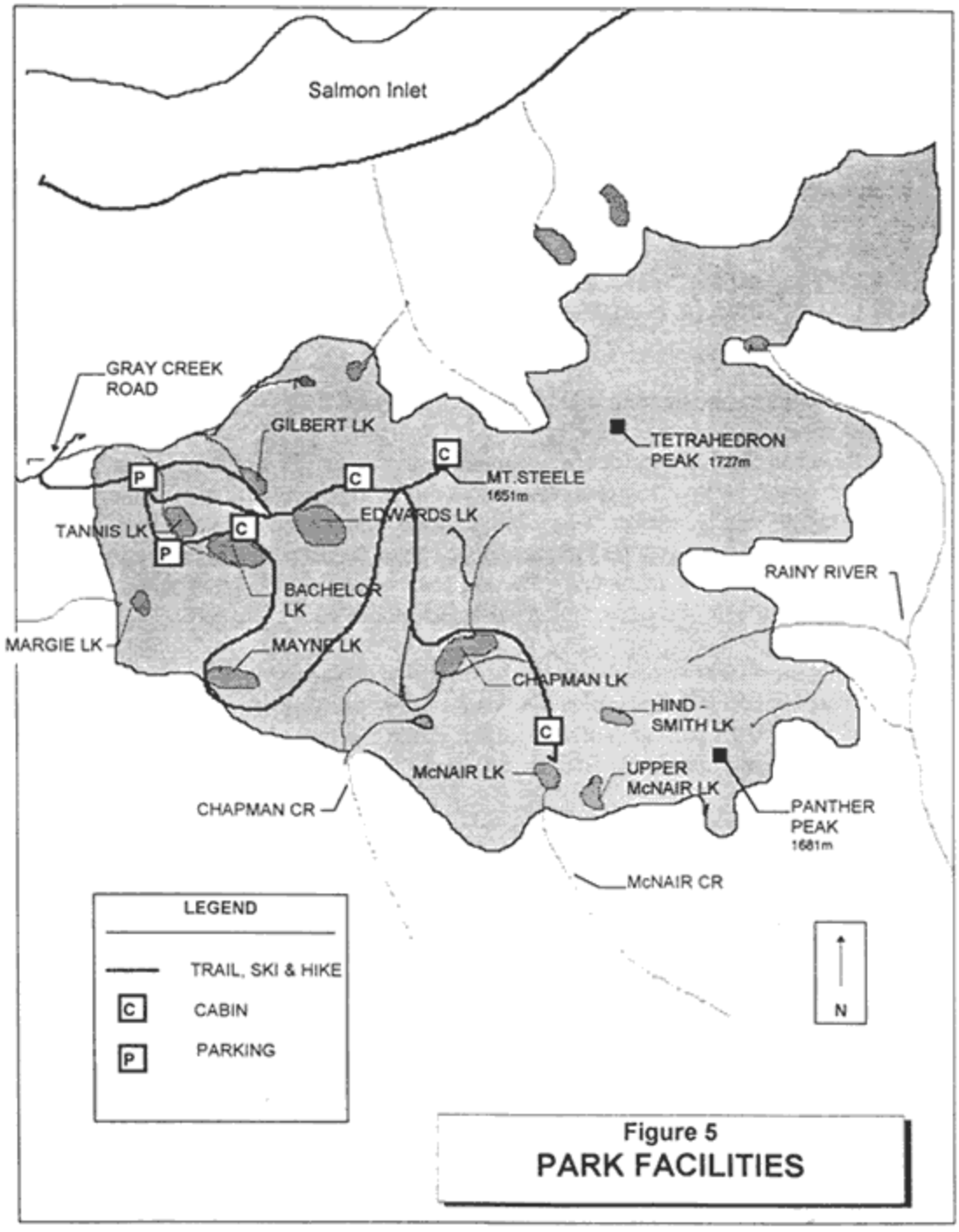
Facilities

The four backcountry log cabins constructed in 1987 are in excellent condition. These cabins provide secure shelter for 15 persons and are complete with basic facilities such as wood stoves, firewood, primitive outhouses and emergency supplies. Currently the cabins are available on a first-come, first-served basis free of charge. Care and maintenance is undertaken by members of the ski club and numerous volunteers, using some funding from the provincial government.

Approximately 35 kilometres of dual use ski and hiking trails link the four cabins and access the ten lakes and four mountain peaks which attract use to the Tetrahedron. Hiking and skiing trails are separated for much of their length; during the winter, skiers are able to travel across the frozen lakes. Summer trail conditions vary according to weather. The sub-alpine nature of the vegetation and natural water-retention characteristic of the soil, have created many sections of trail which require long periods of clear, warm weather to dry. Otherwise, during most of the snow-free season, trails are deeply entrenched and wet.

Directional signs and trail markers are in place throughout the trail network. Although some require improvement and standardization, they nevertheless provide trail users with information about route options and distances.

Figure 5 - Park Facilities



Three parking areas can be used during the summer; these being no more than former logging landings or gravel borrow pits left over from timber harvesting activity. In winter, the Gray Creek access road and an area for parking has been occasionally cleared just outside the park's western boundary. From here, skiers travel the road right-of-way until reaching the various trail heads.

Use

Use estimates from cabin book signings and visitor experience indicate that the Batchelor Lake cabin receives most winter and summer *day-use* visits. The cabin and lake are easily accessed by a short trail from roads and parking lots. The Edwards Lake cabin hosts the highest number of *overnight* visits, followed by Mount Steele and McNair Lake cabins. As experienced in most backcountry parks, more remote areas receive least public use.

During the fall season, hunting takes place in and around the park.

The Tetrahedron Ski Club maintains a membership of over 125 which represents the core winter user of the park. Club records suggest that a large proportion of winter trips are taken during the early spring, when longer days and dependable weather are more attractive. Logged areas around Tannis and Batchelor Lakes are used for telemark skiing and instruction by many members. Several tour to any of the other three cabins, or climb to Mount Steele for some alpine skiing on slopes above the cabin.

Table 3 illustrates use figures derived only from Forest Service recreation estimates; no accurate measures have been employed to date. Moreover, use estimates quoted by those most familiar with the park area often conflict, indicating a need to undertake dependable measurement of park use for future management planning.

Opportunities

The BC Forest Service *Recreation Resource Inventory* and LRUP *Recreation Sub-Committee Report* catalogue and classify many outdoor recreation features and opportunities within the Tetrahedron plateau. These opportunities are related to the recreation settings[3] which are evident in the park. Table 3 presents the common outdoor recreation opportunities evident in Tetrahedron Provincial Park.

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[3] Recreation Settings are polygons of contiguous, terrain-based units which support (or potentially support) recreation use and appreciation. They are classified from general landscape terrain units. Recreation Setting identification and mapping was developed by DLC in Protected Areas Strategy analyses for outdoor recreation.

Table 3

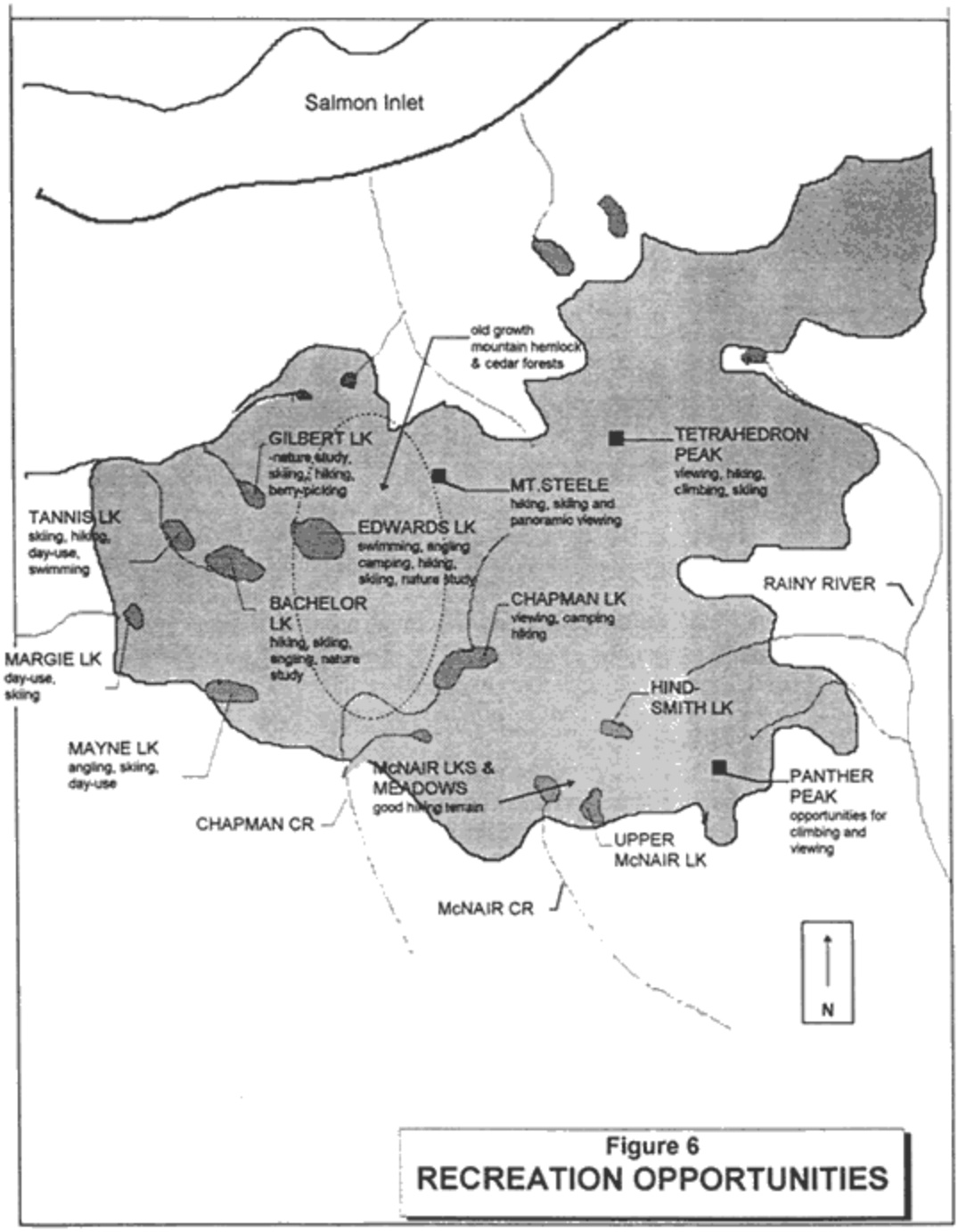
Opportunities and Estimated Use

Recreation Setting	Location	Activities	Estimated Use[4]
Steep sloped mountains and ridges	Majority on the east side of Chapman drainage in and around Panther Peak, Tetrahedron Peak and the ridge to the northeast.	? mountain climbing ? orienteering ? nature study ? viewing ? wildlife viewing ? snow shoeing ? backcountry skiing	light use, 80-120 users per year
Alpine/Sub-Alpine	Areas mentioned above as well as the north side of the upper Gray Creek drainage and the high country on both sides of the upper-mid Chapman Creek.	? climbing ? orienteering ? nature study ? viewing ? picnicking ? camping ? hunting ? hiking ? snow shoeing ? backcountry skiing gathering	light use, 150-200 users per year
Tundra and Shrubland	In and around the various headwater lakes. Good portion of users access this feature area via the trail system.	? picnicking ? camping ? hunting ? hiking ? nature study ? wildlife viewing ? gathering and collecting ? snow shoeing ? backcountry skiing	500-800 users per year
Upland Lakes and Creeks	Tannis, Batchelor and Mayne Lakes. Gray and Chapman Creeks and tributaries	? angling ? boating ? canoeing ? swimming and bathing	no estimate of use very limited use in the lower reaches

[4] **Use Estimates are taken from Ministry of Forests Recreation Resource Inventory completed in 1991-92; however, the accuracy of these figures has not been verified.**

Forested Slopes	Immature forest encompasses the entire and lower reaches of both Chapman and Gray Creek drainages. Old growth surrounds the upper Chapman and a portion of the upper Gray Creek drainages.	? picnicking ? camping ? hunting ? hiking ? nature study ? wildlife viewing gathering and collecting ? trail bike riding (confined to roads) ? snow shoeing ? backcountry skiing ? mountain biking ? four wheel driving (confined to roads)	immature area - 4,000-5,000 user days mid old growth area- 2,500-3,500 user days
	Resource lands in upper Gray Creek, logged areas	? hunting ? hiking ? nature study ? viewing ? horseback riding ? trail bike riding ? four wheel driving ? snowmobiling ? backcountry skiing ? mountain biking	moderate use- 8,000 user days per year
	35 km of established trail, 4 cabins.	? picnicking ? camping ? hunting ? hiking ? nature study ? viewing ? wildlife viewing ? gathering and collecting ? snow shoeing ? backcountry skiing	hiking - 1,800 user days ski touring - 1,400 user days
	Clear-cut areas around Tannis and Batchelor Lakes.	? hunting ? gathering and collecting ? wildlife viewing ? skiing	moderate use for berry picking in the summer, hunting in the fall and skiing in the winter

Figure 6
Recreation Opportunities



Park Management Issues

The Tetrahedron area has come to BC Parks "ready-made", with traditional forms of use, developed facilities and an established pattern of use. The park was established to protect its wilderness ecology, water quality and limited recreational opportunities. Designation of the park was a direct result of public involvement and long-standing requests to the provincial government. For several years, volunteers and work programs have cleared trail, erected cabins and promoted four-season recreational use of the area. As well, the Sunshine Coast Regional District relies on the park area for a majority of its domestic water supply. As such, many eyes are focused on BC Parks and management options which it presents for the future.

During the lengthy *Local Resource Use Plan* process, which culminated with a final committee report and set of recommendations, many individuals and sub-committees debated management issues which BC Parks now inherits. Few park planning processes will match the degree of detail to which the initial process worked. This section outlines the significant issues which have been identified within the Tetrahedron, relating both to general management of the area's resources and to the area's specific management as a provincial park.

Water Quality

Conservation of water resources formed the foundation of all land use debate in the Tetrahedron.

> *BC Parks must adopt a similar objective for managing natural and recreational resources within the park.*

The quality of public water supplies can be affected by recreation activities.

> *Park infrastructure may have to be upgraded to community watershed standards, (human waste disposal management, gray-water disposal, trail wet-spots, bridges).*
>
> *It is recommended that further studies be undertaken to evaluate the impact of recreation activities on water quality within the watersheds.*

Given an increasing requirement for domestic water supply, more extensive research and analysis will be required by the SCRD to assess the need for future water structures.

> *Present considerations include, but do not seem to be limited to:*
>
> - *raising the level of Chapman Lake dam*

- *to further minimize the impact on this sensitive region, no road access will be constructed to maintain or build new water structures in the Protected Areas Strategy*
- *draw down dam on Hind-Smith Lake (formerly "no-name" lake)*

Wildlife Management

Wildlife diversity, as described in the *Thomas Plath* report, seems to indicate that current use levels have not adversely affected the park's biodiversity. Nonetheless, determining a capability of the area to support various types of outdoor recreation is important. Protection of particular species (owls, bats, amphibians, murrelets, mountain goats) may require specialized inventory.

> *BC Parks may need to identify and inventory critical wildlife habitat, sensitive terrain, and examine the suitability of certain types of use within the area.*

Wildlife corridors are intended to allow for movement of large mammals and nesting bird species from one large area of habitat to another. Much work was done by planning committees to identify such corridors in the vicinity of the Tetrahedron.

> *Working with the Ministry of Forests, BC Parks should encourage the implementation of wildlife corridor proposals originating from the LRUP recommendations.*

Use of the various lakes within the park for angling is popular. Unfortunately, there is no information available to evaluate the numbers caught, or the impact that recreation is having on natural and artificial supply.

> *Lake inventory is necessary to determine results of earlier fish stocking programs, to study population dynamics, and to identify other potential enhancement opportunities which occur in a natural ecosystem context within the park.*

Recreation Use Levels

Given the rapid population growth on the Sunshine Coast, which was reported in 1992 as being one of the five fastest growing areas in Canada, the demand for use in Tetrahedron Provincial Park will undoubtedly increase. Promotion of the park, only if from park designation, coupled with increasing population, will create more pressure on existing park resources, as well as jeopardize water quality standards to which BC Parks is committed.

Because of the potential for increased problems related to human activity, preliminary estimates (based on the LRUP committee recommendations) gauge the visitor use for the park at approximately 4,500-5,000 visitors per year.

Because of the very real potential for increased problems related to human activities, it is strongly recommended that the park's carrying capacity be defined; in particular, Limits of Acceptable Change[5], would be a substantial tool to monitor and protect park resources from impairment over time.

Trail Conditions

It has been observed that the use of trails through sensitive areas of the park, with resulting soil compaction and erosion, has had an effect on both ground vegetation and likely water quality. This situation is becoming more serious each year, and will continue into the future as the park receives more frequent summer visits. Creek crossings have been washed out, wet meadowlands are being criss-crossed and the unnecessary widening of trails in wet areas is evident.

Proper monitoring and correction of trail design problems, surfacing and routing may have to be implemented throughout the park.

Types of use may need to be evaluated relative to trail conditions and terrain.

Development of Recreation Facilities and Services

Currently there are three places to park vehicles in the Tetrahedron. Given the relatively short distance to Tannis, Margie and Batchelor Lakes, which receive the heaviest day-use, limiting vehicle access to and into the park may become necessary to maintain its backcountry wilderness atmosphere. As well, ease of access for ATVs has been identified as a management issue.

Four cabins have been constructed in the park by the Tetrahedron Ski Club. As the park becomes more popular, problems associated with crowding and vandalism may increase in the cabins, particularly those a short distance from road access. Beyond overnight cabin shelter, no well-situated tenting grounds are available which could provide summer season shelter for overnight hikers and other users in the park.

Monitoring use patterns at the four cabins may indicate the relative importance of each site to summer and winter recreational use.

The issue of the impact of tenting areas on the ecology of the park is to be addressed.

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[5] *Limits of Acceptable Change, as developed by the US Forest Service, involves the establishment of specific resource protection objectives, the identification of indicators to be used as a gauge for change, and the process of periodically monitoring the backcountry environment to ensure that any change remains within pre-determined limits.*

No toilet facilities, other than at cabin sites, are located in the park.

> *To safeguard water quality, toilets may need to be installed at parking areas and popular day-use sites throughout the park.*

Park establishment often encourages the private sector to request permission to provide certain recreation services. Guided skiing, nature camps, tours, accommodation and equipment rentals are services supplied in some provincial parks by commercial operators. At Tetrahedron, the unique hut-to-hut system and natural backcountry setting will likely attract visitor services proposals.

> *As part of park management planning, an intensive evaluation of visitor services requirements in relation to the small and fragile wilderness ecology of the park may help to guide future decision-making relative to commercial opportunities.*

Appendix 1
Chronology of Land Use Planning for the Tetrahedron

Land use issues related to the Tetrahedron have their roots in a proposal presented to the Sunshine Coast Regional Board in the early 1960s.

1960
- the SCRD and Provincial Parks Branch receive the first of a number of proposals to have the area set aside as parkland
- requests were denied due to status of the watershed as a domestic water source

1968
- a local group proposes a more extensive park boundary
- proposal is shelved pending resolution of water supply and management issues

1969
- Sunshine Coast Regional District conducts water quality and quantity studies for supplying increasing populations in the Sechelt area with domestic water
  - culminates in a *Chapman Creek Water Reserve,* established in 1970

1972
- first concerns raised regarding logging and its impact on water quality in the Chapman Creek watershed

1973
- non-motorized recreation first recommended as an appropriate use within the watershed, following removal of upper Chapman Creek from timber sale licenses

1974
- *Integrated Resource Management Study of the Chapman Drainage* concludes that road building and logging were the primary causes of water quality deterioration within the Chapman Creek drainage

1975
- Chapman Creek designated a Section 12 Watershed Reserve under the *Land Act*

1979
- another park proposal submitted to Parks and Outdoor Recreation Division

1982
- BCFS builds a hiking trail system around Batchelor, Tannis, Gilbert, Mayne and Edwards Lakes

1987
- Tetrahedron Ski Club builds a ski and hiking trail system and four cabins to facilitate overnight use
- Section 12 Watershed Reserve established on upper Gray Creek watershed

1989
- growing public controversy over logging within the watershed and impacts on recreational use

1990
- Tetrahedron Local Resource Use Plan initiated to address all concerns

1991 ? deferral of all logging activity within the study area
? designation of the area as a Study Area under Parks and Wilderness for the 90's

1994 ? evaluation of the area under the Protected Areas Strategy, with a special planning process represented by the ongoing Local Resource Use Plan

1995 ? LRUP full study area boundary was designated as 6,000 hectare, Class A - Tetrahedron Provincial Park

Appendix 2
Wildlife Species List

Ungulates	? black-tailed deer	? mountain goat	
Carnivores	? cougar	? black bear	? coyote
Furbearers	? mink ? short-tailed weasel ? river otter	? bobcat ? fisher	? marten ? wolverine
Small Mammals	? sorex spp ? montane shrew ? common shrew ? microtus spp ? red-backed vole	? deer mouse ? snowshoe hare ? yellow pine chipmunk ? bat species incl. Keen's myotis	? Douglas squirrel ? northern flying squirrel ? hoary marmot ? pika
Birds	• 6 species of woodpecker including the rare 3-toed ? Barred and northern Pygmy Owl	? duck species: Barrow's goldeneye, buffleheads, mallard ? peregrine falcon ? rosy finch ? Rock Ptarmigan	? spotted sandpiper ? mew gull
Amphibians and Reptiles	? long-toed salamander	? Western toad ? Pacific tree frog	? spotted frog ? garter snake
Endangered Species	*? report of a Spotted Owl near Mayne Lake	? recorded Marbled Murrelet	

An extensive, comprehensive list of species is also included in the final report of the LRUP Committee.

* not documented

Appendix 3
Recreation Management Options presented by 1994 LRUP Committees

Objective	Action
Reduce use of the entire watershed area	? gate roads at an appropriate distance to maintain a carrying capacity ? restrict activities ? establish a permit system (reservation) ? limit the length of stay ? encourage use of other areas ? charge a user fee
Reduce use of problem areas.	? no further access development that would impact problem areas ? eliminate existing access to problem areas (lake basins, creek drainages and other destination areas) ? re-route existing trails away from identified problem areas (see Feb. 1994 submissions by the LRUP Recreation Sub-Committee for possible re-routings) ? discourage or prohibit use of problem areas ? limit the number of visitors in problem areas ? make access more difficult
Modify the location of use within problem areas.	? discourage/prohibit camping in certain locations within problem areas ? concentrate use on sites through facility design ? discourage off site use and/or trail travel
Modify the timing of use.	? discourage use during the wet period of late spring/early summer/late fall by access management, fees or other ? prohibit use when impact potential is high ? encourage use of other areas by improving access, facilities, etc.
Modify type of use and visitor behaviour.	? prohibit motor use on all lakes ? prohibit motorcycles, ATVs and horses on all trails ? install Parks' presence to ensure visitors are aware of the rules and regulations ? establish cabin etiquette
Increase the resistance, maintain and/or rehabilitate the resource.	? re-evaluate the trail and cabin system and develop a short and long term plan for trail rehabilitation, upgrading and relocation ? inventory all areas in need of site rehabilitation and upgrading ? install Parks' presence to ensure visitors are aware of the rules and regulations

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