Executive Council Chambers, Victoria

On the recommendation of the undersigned, the Lieutenant Governor, by and with the advice and consent of the Executive Council, orders that, on the recommendation of the Environment and Land Use Committee, the attached Muskwa-Kechika Management Order is made.

Minister of Employment and Investment

Minister of Forests

Minister of Environment, Lands and Parks

Presiding Member of the Executive Council

Authority under which Order is made:

Act and section: Environment and Land Use Act, R.S.B.C. 1996, c. 117, section 7 (1), (2)

Other (specify): September 30, 1997
Definitions

1 In this order:

“designated official” means
(a) a person employed in the Ministry of Employment and Investment who is designated by name or title to be the designated employment and investment official by the minister of that ministry for the purpose of the management plan,
(b) a person employed in the Ministry of Environment, Lands and Parks who is designated by name or title to be the designated environment official by the minister of that ministry for the purpose of the management plan, or
(c) a person employed in the Ministry of Forests who is designated by name or title to be the designated forest official by the minister of that ministry for the purpose of the management plan;

“local strategic plan” means a plan referred to in section 3.1 of the management plan and set out in Schedule 6;

“management area” means those Crown lands referred to in section 3 as the Muskwa-Kechika Management Area and described in Schedule 1;

“management plan” means the plan referred to in section 4 as the Muskwa-Kechika Management Plan and set out as Schedule 3

“Recommended Fort Nelson Land and Resource Management Plan” means the plan set out in Schedule 4;
"Recommended Fort St. John Land and Resource Management Plan" means the plan set out in Schedule 5;

"resource management zone" means a zone described in Schedule 2.

Application

2 (1) For the purpose of managing the environment and land use, this order applies to every minister, ministry and agent of the Crown who has responsibility for the planning, allocation and management of Crown land and natural resources in the management area.

(2) Subject to this order, all other enactments affecting or respecting Crown land and natural resources in the management area continue to apply.

Muskwa-Kechika Management Area

3 The Muskwa-Kechika Management Area, as described in Schedule 1, is established.

Muskwa-Kechika Management Plan

4 The planning and management of Crown land and natural resources in the management area must be conducted in accordance with the Muskwa-Kechika Management Plan.

Consistency of operational activities

5 (1) The issuance, approval, permitting or authorization of a plan, allocation, tenure, disposition, licence or any other instrument or document affecting or respecting Crown land or a natural resource by a minister, ministry or agent of the Crown must be consistent with the management plan.

(2) A plan, allocation, tenure, disposition, licence or other instrument or document referred to in subsection (1) must incorporate any conditions necessary to make it consistent with the management plan.

Approval of operational activities

6 (1) As a prerequisite to the issuance, approval, permitting or authorization, by a minister, ministry or agent of the Crown, of a plan, allocation, tenure, disposition, licence or any other instrument or document of allocation or management of Crown land or natural resources, the management plan may require the approval of a designated official or the joint approval of designated officials.

(2) An approved local strategic plan is a prerequisite, as required in section 3.3 of the management plan, to the issuance, approval, permitting or authorization, by a minister, ministry or agent of the Crown, of a plan, allocation, tenure, disposition, licence or any other instrument or document of allocation or management of Crown land or natural resources.
Inter-agency management committee

7 The Minister of Environment, Lands and Parks, with the approval of the Minister of Employment and Investment and the Minister of Forests, may appoint an inter-agency management committee, consisting of not less than 3 persons from the ministries or agencies who have responsibility for the planning, allocation and management of Crown land and natural resources, for the purposes of the implementation of the management plan.

Advisory board

8 The Premier of British Columbia may, in accordance with the provisions of the management plan, appoint an advisory board.
SCHEDULE 1

MUSKWA-KECHIKA MANAGEMENT AREA

All those parcels or tracts of Crown land, together with all that foreshore or land covered by water, situated in the Cassiar and Peace River Land Districts and shown on the Official Plan deposited in the Crown Land Registry as Plan 13 Tube 1757.

SCHEDULE 2

RESOURCE MANAGEMENT ZONES OF THE MUSKWA-KECHIKA MANAGEMENT AREA

All those parcels or tracts of Crown land, together with all that foreshore or land covered by water within each of the resource management zones as defined on the Official Boundary Plan deposited in the Crown Land Registry as Plan 12 Tube 1740.

SCHEDULE 3

MUSKWA-KECHIKA MANAGEMENT PLAN
MUSKWA-KECHIKA Management Area

MANAGEMENT PLAN

October 1, 1997
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1.0 Introduction

1.1 The Muskwa-Kechika Management Area

The Muskwa-Kechika Management Area encompasses an area of approximately 4.45 million hectares of Crown land where extensive boreal plains and muskeg of the east meet the Rocky Mountains of the west. It is bounded on the south by the Needham Creek drainage in the Misinchinka Range, on the west by the Rocky Mountains, on the east by the Muskwa and Halfway Plateaus and on the north by the Liard Plain. The area overlaps the Fort Nelson and Fort St. John Land and Resource Management Planning areas.

The area includes parts of the Alberta plateau, the Rocky Mountain Foothills, the Liard Plateau, and the Liard Plain. The topography of the area rises from the vast flat Alberta plateau up the rolling foothill landscapes to the rugged height of the Rocky Mountains. The river systems run straight, meander and braid their way through the deeply cut bedrock of the mountains. This entire region is within the Arctic watershed and is largely drained by the Liard, Muskwa, Toad, Kechika and Sikanni Chief Rivers.

It is one of the few remaining large, intact and almost unroaded wilderness areas south of the 60th parallel. It supports a diverse number of large mammals including moose, elk, mule deer, whitetail deer, caribou, plains bison, mountain sheep, mountain goat, wolves, black bears and grizzly bears in population densities of global importance. Few places in the world match the natural features of the Muskwa-Kechika Management Area in terms of species groupings, remoteness and minimal development. The area is also well endowed with rich energy and mineral resources. In general, oil and gas reserves dominate the eastern portion of the area while a variety of metallic and non-metallic resources can be found in the central and western portions of the area. Valuable timber resources are also present in the southern portion of the area.

There are numerous First Nations groups within the area including the Fort Nelson First Nation, Prophet River First Nation, Kaska Dena First Nation, Lower Post First Nation and the Halfway River Band. A portion of the Muskwa-Kechika Management Area is within the area covered by Treaty 8.

The Fort Nelson-Liard and Peace Regional Districts are within the Muskwa-Kechika Management Area and include the settlements of Toad River and Muncho Lake.
1.2 Development of the Muskwa-Kechika Management Plan

Objectives for the management of the Muskwa-Kechika Management Area were developed as part of the Fort Nelson and Fort St. John Land and Resource Management Plans. Participants in these processes recommended that the objectives for the Muskwa-Kechika Management Area be formally designated establishing a separate jurisdiction: the Muskwa-Kechika Management Area. The Muskwa-Kechika Management Plan identifies objectives for the management of the Muskwa-Kechika Management Area and specifies an integrated and coordinated planning structure to meet these objectives. Sections 2.0 to 6.0 describe the management framework and sections 7.0 to 10.0 specify the objectives for management.

2.0 Muskwa-Kechika Management Plan Implementation

The Muskwa-Kechika Management Plan will be implemented by all relevant government agencies through agency-specific management activities, local strategic plans, resource development permits and Crown land and natural resource dispositions. Development plans and permits will be consistent with the objectives and strategies of resource management zones and any local strategic plans as specified in the Management Plan.

Local strategic plans will include a description of the linkages to the Muskwa-Kechika Management Plan and an explanation of how the local strategic plan meets the objectives and strategies outlined in this plan. Conversely, it is recognized that the resource management zone objectives and strategies in this plan may be amended in the future based on feedback from local strategic plans.

2.1 Roles and Responsibilities

2.1.1 Advisory Board

An Advisory Board, appointed by the Premier, will advise government on natural resource management in the Muskwa-Kechika Management Area to ensure that activities within the area are consistent with the objectives of the Muskwa-Kechika Management Plan.

The Advisory Board will be responsible for:

(a) conducting semi-annual reviews of the issuance of tenures and approval of operational activities to examine the achievement of management plan objectives through local strategic planning and operational activities;
(b) reporting, at least annually, to the public and the Premier on the results of the Board’s semi-annual reviews and any other issues related to the management of the Muskwa-Kechika Management Area;

(c) providing advice to the Inter-Agency Management Committee on corporate priorities for and coordination of local strategic planning in the Muskwa-Kechika Management Area;

(d) facilitating provincial, national and international exposure of the values and management of the Muskwa-Kechika Management Area;

(e) recommending and implementing measures to raise money for a Muskwa-Kechika Fund;

(f) reviewing proposals and funding requests for, but not limited to, research projects; and making recommendations for expenditures from the Muskwa-Kechika Fund;

(g) supporting the initiation of local strategic plans for the Muskwa-Kechika Management Area, to achieve the management plan objectives;

(h) ensuring adequate public consultation in the preparation and approval of local strategic plans, amendments to the Muskwa-Kechika Management Plan, any other significant policy issue for the Muskwa-Kechika Management Area, or as requested by the Inter-Agency Management Committee; and

(i) providing recommendations to the Environment and Land Use Committee on any proposed amendments to the Management Plan.

The Premier will appoint up to 17 members to the Advisory Board, including a Board Chair, such that the Advisory Board represents a broad range of interests. These would include, but not be limited to, First Nations, environmental groups, business, labour and Fort Nelson and Fort St. John Land and Resource Management Plan participants. Kaska Dena representatives would be appointed in accordance with the Letter of Understanding between the Kaska Dena Council and the Province of British Columbia, signed September 24, 1997.

Advisory Board members will be individuals noted for their scientific, financial or community service experience and expertise. Advisory Board appointments will be for a period of 1 to 3 years and will be staggered to provide continuity of Board operations.
The Premier may also appoint up to five members as an Honorary Board who will be individuals of provincial, national or international stature. These members will serve as ambassadors to assist in raising the profile of the Muskwa-Kechika Management Area, but who may not participate fully in the working of the Advisory Board proper. The Advisory Board Chair will be the Chair of the Honorary Board.

2.1.2 Inter-Agency Management Committee

The responsibilities of the Inter-Agency Management Committee are as follows:

(a) to assist in resolving conflicts between agencies and resource users;

(b) to maintain a registry of plan documents and plan amendments, including the Muskwa-Kechika Management Plan and local strategic plans, available to the public and any interested parties;

(c) to review and provide recommendations to the Environment and Land Use Committee on any proposed amendments;

(d) in partnership with the Advisory Board, provide for and coordinate public review and consultation as necessary;

(e) in consultation with the Advisory Board, prepare an annual inter-agency workplan to facilitate the implementation of the Muskwa-Kechika Management Plan; and

(f) to work in partnership with the Advisory Board to prepare an annual monitoring report on plan implementation, amendments and expenditures.

2.1.3 First Nations

A Letter of Understanding, dated September 24, 1997, establishes an agreement between the Kaska Dena Council and the Province of British Columbia regarding the Muskwa-Kechika Management Area. The Muskwa-Kechika Management Plan is without prejudice to aboriginal or treaty rights and treaty negotiations. First Nations will be encouraged to have a direct role in the implementation and monitoring of the plan.
3.0 Direction for Local Strategic Planning

3.1 Local Strategic Plans

Local strategic plans must be consistent with the Muskwa-Kechika Management Plan. Local strategic plans are defined and may be established, varied or canceled as follows:

- **Landscape unit objective**
  (a) A local strategic plan for the purpose of forest and range use is a landscape unit objective or objectives, as defined by the *Forest Practices Code of British Columbia Act* and established, varied or canceled in accordance with the *Forest Practices Code of British Columbia Act* and the Management Plan.

- **Pre-tenure plan**
  (b) A local strategic plan for the purpose of oil and gas exploration and development is a pre-tenure plan, as defined by the *Memorandum of Understanding Respecting Operational Land Use Planning for Oil and Gas Activity in the Northeast of British Columbia, July 31, 1996*, or amendments thereof approved by the Minister of Environment, Lands and Parks, the Minister of Forests and the Minister of Employment and Investment.

- **Recreation management plan**
  (c) A local strategic plan for the purpose of recreation is a recreation management plan, as defined by the *Memorandum of Understanding Respecting Recreation Planning in the Muskwa-Kechika Management Area, December 1997* or amendments thereof approved by the Minister of Environment, Lands and Parks, the Minister of Forests and the Minister of Small Business, Tourism and Culture.

- **Park management plan**
  (d) A local strategic plan for the purpose of the management of a park, ecological reserve or recreation area is a park management plan, as defined by the *Parks Master Plan Policy, April 15, 1986* and the attached zoning amendment, or the *Guidelines Booklet for Management Direction Statements, 1996*, or amendments of either as approved by the Minister of Environment, Lands and Parks.

- **Wildlife management plan**
  (e) A local strategic plan for the purpose of wildlife management is a wildlife management plan, as defined by the *Planning Guide to Wildlife Management Areas, September 1996*, or amendments thereof as approved by the Minister of Environment, Lands and Parks.
3.2 Approval of Local Strategic Plans

Landscape unit objective
(a) The establishment, variance or cancellation of a landscape unit objective requires approval of the designated forest official, the designated environment official and the designated employment and investment official.

Recreation management plan
(b) The approval, variance or cancellation of a recreation management plan requires approval of the Minister of Small Business, Tourism and Culture and the Environment and Land Use Committee and that the plan be established as part of Schedule 6 of the Muskwa-Kechika Management Order.

Pre-tenure plan
(c) The approval, variance or cancellation of a pre-tenure plan requires approval of the Environment and Land Use Committee and that the plan be established as part of Schedule 6 of the Muskwa-Kechika Management Order.

(d) The approval, variance or cancellation of all other local strategic plans requires approval by the Environment and Land Use Committee and that the plan be established as part of Schedule 6 of the Muskwa-Kechika Management Plan.

3.3 Requirements for Local Strategic Plans
Except as specified in section 3.4, local strategic plans are prerequisite to approval of operational activities as follows:

3.3.1 Landscape unit objective
The approval of a forest development plan (as defined by the Forest Practices Code of British Columbia Act) for a specific geographic area must be preceded by the approval of a landscape unit objective or objectives for a landscape unit which includes the area of the forest development plan.

3.3.2 Pre-tenure plan
The issuance, approval, permitting or authorization, by a minister, ministry or agent of the Crown, of an oil and gas development plan, allocation, tenure, disposition, licence or any other instrument or document of oil and gas development allocation or management must be preceded by the approval of a pre-tenure plan which includes the subject area of the instrument or document of allocation or management.

3.3.3 Recreation management plan
The issuance, approval, permitting or authorization, by a minister, ministry or agent of the Crown, of a commercial backcountry recreation allocation, tenure, disposition, licence or any other instrument or document of commercial backcountry recreation allocation or management for any area within the Muskwa-Kechika Management Area, must be preceded by the approval of a recreation management plan which includes the subject area of the instrument or document of allocation or management.
3.4 Exceptions to requirements for local strategic planning

**Geophysical exploration**
(a) A pre-tenure plan is not a prerequisite to the approval of geophysical exploration in accordance with Part 4, section 32, of the Petroleum and Natural Gas Act.

**Wildfire, pest or disease infestation**
(b) A local strategic plan is not a prerequisite to the approval, issuance, permitting, or authorization of an allocation, tenure, disposition, licence or any other instrument or document of allocation or management considered necessary to address wildfire or a pest or disease infestation to forests or wildlife. Operational activities associated with an outbreak of this kind need only be consistent with the objectives of the Management Plan.

3.5 Consistency of plans, approvals, permits and other instruments
Local strategic plans must be consistent with the objectives and strategies of the Management Plan described in sections 7.0 to 10.0. Approvals, permits and plans which are subsequent to and take direction from approved local strategic plans must be consistent with the local strategic plan but need not demonstrate consistency with the objectives of the Management Plan.

4.0 Direction for Operational Activity

4.1 Consistency with local strategic plan
Instruments or documents of allocation or management must be consistent with local strategic plans that direct their operation, as follows:

4.1.1 Forest and range resources
In accordance with the Forest Practices Code of B.C. Act, operational plans for timber or range resource management must be consistent with established landscape unit objectives. The Forest Practices Code of B.C. Act requires forest and range use activities to be consistent with applicable operational plans. Range use plans within provincial parks must be consistent with park management plans.

4.1.2 Oil and gas exploration and development
Any issuance, approval, permit or authorization, by a minister, ministry or agent of the Crown, of an oil and gas exploration or development plan, allocation, tenure, disposition, licence or any other instrument or document of oil and gas development or exploration allocation or management must be consistent with any pre-tenure plan which includes the subject area of the the instrument or document of allocation or management.
4.1.3 Commercial backcountry recreation
Any issuance, approval, permit or authorization, by a minister, ministry or agent of the Crown, of a commercial backcountry recreation allocation, tenure, disposition, licence or any other instrument or document of commercial backcountry recreation allocation or management for any area within the Muskwa-Kechika Management Area, must be consistent with any recreation management plan which includes the subject area of the instrument or document of allocation or management.

4.1.4 Park management
Any issuance, approval, permit or authorization, by a minister, ministry or agent of the Crown, of an allocation, tenure, disposition, licence or any other instrument or document of affecting park management, must be consistent with any park management plan which includes the subject area of the instrument or document of allocation or management.

4.1.5 Wildlife management
Any issuance, approval, permit or authorization, by a minister, ministry or agent of the Crown, of an allocation, tenure, disposition, licence or any other instrument or document affecting wildlife management allocation or management, must be consistent with any wildlife management plan which includes the subject area of the instrument or document of allocation or management.

4.2 Approval of Forest Development Plans
Except as specified in section 6.2, prior to the approval of a forest development plan (as defined in the Forest Practices Code of British Columbia Act), the designated forest official must obtain the agreement of the designated environment official regarding any contents of the forest development plan which relate directly to the construction, modification, and deactivation of roads.

4.3 Approval of Special-Use Permits
The issuance of a special-use permit (as defined by the Forest Practices Code of British Columbia Act), for the purpose of providing road access and other infrastructure outside of mineral claim areas to support mineral exploration or development requires approval of the designated forest official, the designated environment official and the designated employment and investment official.
5.0 Monitoring and Amendment

5.1 Annual Monitoring Report
By November 1, 1998, and annually thereafter, the Advisory Board in partnership with the Inter-Agency Management Committee, will prepare a monitoring report.

The report will assess the degree to which the objectives outlined in the Management Plan are being met through management activities, local strategic planning and development plans and permits.

The report will include all proposed updates and amendments to the Management Plan or any other recommendations made by the Advisory Board.

5.2 Amendment
All proposed amendments to the Muskwa-Kechika Management Plan will be included in the annual monitoring report.

5.2.1 Interim Amendments
Issues to be addressed through plan amendment may be identified by any person, group or agency. Issues which, in the opinion of the Inter-Agency Management Committee in consultation with the Advisory Board, require an amendment to the plan and which materially affect the interest or delivery of objectives of the plan to the extent that they must be addressed sooner than the scheduled major plan review, will be addressed through an interim amendment to the plan. When issues arise that require an interim amendment, the Inter-Agency Management Committee in consultation with the Advisory Board will establish the schedule and Terms of Reference for the amendment process, consistent with existing legislation and regulations.
The Inter-Agency Management Committee and the Advisory Board may make a recommendation to the Environment and Land Use Committee on the proposed amendment, taking into consideration the outcome of public consultation. Final decisions on amendments shall only be made by the Environment and Land Use Committee. Amendments will only be approved if the Environment and Land Use Committee is satisfied that requirements for public notice and consultation of Section 5.3 have been met.

5.2.2 Scheduled Amendments—Plan Review

A major plan review will be undertaken for the entire Management Plan in November 2005, or at any earlier time as directed by the Environment and Land Use Committee. The Inter-Agency Management Committee in consultation with the Advisory Board will establish the Terms of Reference for the review process, consistent with existing legislation and regulations. The public and all other interested parties, agencies and organizations will be involved in the review.

Approval of any proposed amendments resulting from the review will be given by the Environment and Land Use Committee in accordance with the requirements for public notice and consultation of Section 5.3.

5.3 Consultation and Notice Requirements

Sections 5.3.1 and 5.3.2 do not apply to any action taken under or pursuant to the Park Act in respect of the Denetiah, Liard River Corridor, Northern Rocky Mountains, Graham-Laurier and Redfern-Keily Creek Resource Management Zones; the Horneline Creek, Prophet River Hot Springs and Toad River Hot Springs Protected Areas; or the Wokkpash Recreation Area.
5.3.1 Consultation
Before establishing, varying or canceling a resource management zone or objective, or other significant requirement of the Management Plan, the Environment and Land Use Committee must publish in the Gazette and in a newspaper a notice stating

(a) that a resource management zone or objective or requirement of the plan is proposed to be established, varied or canceled,

(b) the location of the resource management zone,

(i) that is proposed to be established, varied or canceled, or

(ii) to which the objective proposed to be established, varied or canceled relates, or

(c) that the following are available at regional and district offices of the Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment:

(i) a copy of the proposed order establishing, varying or canceling the resource management zone, objective or requirement of the plan;

(ii) in the case of a resource management zone, a copy of the proposed objectives for the zone;

(iii) in the case of a requirement of the plan, a copy of the proposed alteration to the plan

(iv) a map showing the location and boundaries of the resource management zone

(A) that is proposed to be established, varied or canceled, or

(B) to which the objective proposed to be established, varied or canceled relates, and

(d) that comments on the proposal may be delivered to the regional or district office of any of the Ministry of Environment, Lands and Parks, Ministry of Forests or Ministry of Employment and Investment within 60 days of the date of the last publication of the notice in the Gazette or newspaper.
5.3.2 Notice
After establishing, varying or canceling a resource management zone or objective, or other significant requirement of the Management Plan, the Environment and Land Use Committee must publish in the Gazette and in a newspaper a notice stating

(a) that a resource management zone or objective or requirement of the plan has been established, varied or canceled,

(b) the location of the resource management zone,
   (i) that has been established, varied or canceled, or
   (ii) to which the objective that has been established, varied or canceled relates, or
   (iii) to which the requirement of the plan that has been established, varied or canceled relates,

(c) that the following are available at regional and district offices of the Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment:
   (i) a copy of the order establishing, varying or canceling the resource management zone, objective or requirement of the plan;
   (ii) in the case of a resource management zone, a copy of the objectives for the zone;
   (iii) in the case of a requirement of the plan, a copy of the alteration to the plan
   (iv) a map showing the location and boundaries of the resource management zone
   (A) that has been established, varied or canceled, and
   (B) to which the objective established, varied or canceled relates.
6.0 Transition provisions

6.1 Grandparenting of existing plans and permits
All existing approvals, issuances, permits and authorizations of plans, allocations, tenures, dispositions, licences and all other instruments and documents of allocation and management that were approved prior to the coming into force of the Management Plan are exempt from the requirements and objectives of the Management Plan.

This does not prevent by mutual agreement the holder of such an instrument or document, or an agency primarily responsible for a local strategic plan, amending the instrument or plan to be consistent with the requirements and objectives of the Management Plan.

6.2 Transition Approval of Forest Development Plans
Where a forest development plan or amendment proposes cutblocks or road construction, and the forest development plan or amendment has been approved or submitted for approval at the time that the Management Plan comes into effect, any forest harvesting or road construction that occurs in the approximate location of that shown in the forest development plan or amendment are exempt from the requirements of the Management Plan, provided the designated forest official is satisfied that these activities are consistent with the spirit and intent of the Management Plan.

6.3 Renewable or Replaceable agreements and permits
All existing approvals, issuances, permits and authorizations of plans, allocations, tenures, dispositions, licences and all other instruments and documents of allocation and management that were approved prior to the coming into force of the Management Plan which may be renewed or replaced, must upon renewal or replacement be consistent with the objectives of the Management Plan and any local strategic plan as specified by the Management Plan despite any wording in the agreement or permit to the contrary.

6.4 Consistency with amendments
Notwithstanding section 6.2, any existing approvals, issuances, permits or authorizations of plans, allocations, tenures, dispositions, licences or any other instrument or document of allocation or management that are approved prior to any amendment of the Management Plan are not required to be consistent with the amendment.
7.0 General Management Direction

7.1 General Management Direction for the Muskwa-Kechika Management Area

The management intent for the Muskwa-Kechika Management Area is to ensure wilderness characteristics, wildlife and its habitat are maintained over time while allowing resource development and use, including recreation, hunting, timber harvesting, mineral exploration and mining, oil and gas exploration and development. The integration of management activities especially related to the planning, development and management of road accesses within the Muskwa-Kechika Management Area is central to achieving this intent. The long-term objective is to return lands to their natural state, as much as possible, as development activities are completed.

7.2 Fort Nelson LRMP General Management Direction

The general management intent described in sections 2.0, 2.1, 2.1.1 to 2.1.18 (pages 11 to 33) of the Recommended Fort Nelson Land and Resource Management Plan, June 1997 (Schedule 4 of the Muskwa-Kechika Management Order) provide direction to the management of the Eight Mile/Sulphur, Aeroplane Lake, Churchill, Fishing, Moodie, Muskwa West, Prophet, Rabbit, Rainbow, Sandpile, Stone Mountain, Terminal, Kechika River Corridor, Muskwa River Corridor, Toad River Corridor, Northern Rocky Mountains, Turnagain/Dall Rivers Corridor, Denetiah, Liard River Corridor and Alaska Highway Corridor Resource Management Zones; Horneline Creek, Toad River Hot Springs and Prophet River Hot Springs Protected Areas; the Tetsa River, Liard River Hot Springs, Muncho Lake and Stone Mountain Provincial Parks; and the Wokkpash Recreation Area.

7.3 Fort St. John LRMP General Management Direction

The general management intent described in sections 2.0, 2.1 to 2.1.17 (pages 11 to 24) of the Recommended Fort St. John Land and Resource Management Plan, April 1997 (Schedule 5 of the Muskwa-Kechika Management Order), provide direction to the management of the Besa - Halfway - Chowade, Graham-North, Graham-Laurier and Redfern-Keily Creek Resource Management Zones; and the Sikanni Chief River Ecological Reserve.
8.0 Special Resource Management Zones

8.1 Category Direction for Fort Nelson LRMP Special Resource Management Zones
The category direction for management described in section 2.2.4 (pages 79 to 82) of the Recommended Fort Nelson Land and Resource Management Plan, June 1997 provides direction to the management of the Eight Mile/Sulphur, Aeroplane Lake, Churchill, Fishing, Moodie, Muskwa West, Prophet, Rabbit, Rainbow, Sandpile, Stone Mountain, Terminal, Kechika River Corridor, Muskwa River Corridor, Toad River Corridor, and Turnagain/Dall Rivers Corridor Resource Management Zones.

8.2 Area-Specific Objectives and Strategies for Fort Nelson LRMP Special Resource Management Zones

8.2.1 Eight Mile/Sulphur
The objectives and strategies of section 2.2.4.1 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 83 to 84) provide direction to the management of the Eight Mile/Sulphur Resource Management Zone.

8.2.2 Aeroplane Lake
The objectives and strategies of section 2.2.4.2 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 85 to 86) provide direction to the management of the Aeroplane Lake Resource Management Zone.

8.2.3 Churchill
The objectives and strategies of section 2.2.4.3 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 87 to 89) provide direction to the management of the Churchill Resource Management Zone.

8.2.4 Fishing
The objectives and strategies of section 2.2.4.4 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 89 to 90) provide direction to the management of the Fishing Resource Management Zone.
8.2.5 Moodie
The objectives and strategies of section 2.2.4.5 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 91 to 92) provide direction to the management of the Moodie Resource Management Zone.

8.2.6 Muskwa West
The objectives and strategies of section 2.2.4.6 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 93 to 95) provide direction to the management of the Muskwa West Resource Management Zone.

8.2.7 Prophet
The objectives and strategies of section 2.2.4.7 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 96 to 98) provide direction to the management of the Prophet Resource Management Zone.

8.2.8 Rabbit
The objectives and strategies of section 2.2.4.8 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 99 to 100) provide direction to the management of the Rabbit Resource Management Zone.

8.2.9 Rainbow
The objectives and strategies of section 2.2.4.9 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 101 to 102) provide direction to the management of the Rainbow Resource Management Zone.

8.2.10 Sandpile
The objectives and strategies of section 2.2.4.10 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 103 to 104) provide direction to the management of the Sandpile Resource Management Zone.

8.2.11 Stone Mountain
The objectives and strategies of section 2.2.4.11 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (pages 107 to 108) provide direction to the management of the Stone Mountain Resource Management Zone.
8.2.12 Terminal
The objectives and strategies of section 2.2.4.12 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 107 to 108) provide direction to the management of the Terminal Resource Management Zone.

8.2.13 Kechika River Corridor
The objectives and strategies of section 2.2.4.13 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 109 to 111) provide direction to the management of the Kechika River Corridor Resource Management Zone.

8.2.14 Muskwa River Corridor
The objectives and strategies of section 2.2.4.13 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 112 to 114) provide direction to the management of the Muskwa River Corridor Resource Management Zone.

8.2.15 Toad River Corridor
The objectives and strategies of section 2.2.4.15 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 115 to 117) provide direction to the management of the Toad River Corridor Resource Management Zone.

8.2.16 Turnagain/Dall Rivers Corridor
The objectives and strategies of section 2.2.4.16 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 118 to 119) provide direction to the management of the Turnagain/Dall Rivers Corridor Resource Management Zone.
8.3 Area-Specific Objectives and Strategies for Fort St. John LRMP Special Resource Management Zones


8.3.1 Besa - Halfway - Chowade

The objectives and strategies of section 3.2 of the Recommended Fort St. John Land and Resource Management Plan, April 1997, (pages 44 to 49) provide direction to the management of Besa - Halfway - Chowade Resource Management Zone.

8.3.2 Graham - North

The objectives and strategies of section 2.2.4.1 of the Recommended Fort St. John Land and Resource Management Plan, April 1997, (pages 93 to 98) provide direction to the management of the Graham - North Resource Management Zone.

9.0 Enhanced Resource Development Zones

9.1 Category Direction for Fort Nelson LRMP Enhanced Resource Management Zones

The category direction for management described in section 2.2.2 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (page 36) provides direction to the management of the Alaska Highway Corridor Resource Management Zone.

9.2 Area-Specific Objectives and Strategies for Fort Nelson LRMP Enhanced Resource Management Zones

9.2.1 Alaska Highway Corridor

The objectives and strategies of section 2.2.2.1 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 37 to 38) provide direction to the management of the Alaska Highway Corridor Resource Management Zone.
10.0 Protection Resource Management Zones

10.1 Management Direction for Provincial Parks, Recreation Areas and Ecological Reserves

Objectives for the management of provincial parks, recreation areas and ecological reserves are described in plans and statements of Schedule 6 of the Muskwa-Kechika Management Order, and as specified below, and are deposited at BC Parks Peace Liard District, Fort St. John, B.C. and BC Parks Headquarters, Victoria, B.C.

10.1.1 Sikanni Chief River Ecological Reserve

Objectives for management of Sikanni Chief River Ecological Reserve are described in the Sikanni Chief River Ecological Reserve Statement of Purpose and Values, March 1993.

10.1.2 Tetsa River Provincial Park

Objectives for management of Tetsa Provincial Park are described in the Annual Park Management Plan for the Tetsa Provincial Park, approved January 10, 1995.

10.1.3 Liard River Hot Springs Provincial Park

Objectives for management of Liard River Hot Springs Provincial Park are described in the Liard River Hot Springs Provincial Park Master Plan, approved October 28, 1990.

10.1.4 Stone Mountain Provincial Park

Objectives for management of Stone Mountain Provincial Park are described in the Stone Mountain Provincial Park Master Plan, approved August 15, 1985.

10.1.5 Muncho Lake Provincial Park

Objectives for management of Muncho Lake Provincial Park are described in the Muncho Lake Provincial Park Master Plan, approved April 21, 1985.

10.1.6 Wokkpash Recreation Area

Objectives for management of Wokkpash Recreation Area are described in the Wokkpash Recreation Area Interim Management Statement, January 1991.
10.2 Category Direction for Fort Nelson LRMP Protection Resource Management Zones
The category direction for management described in section 2.2.5 (pages 120-122) of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (Schedule 4 of the Muskwa-Kechika Management Order) provides direction to the management of the Denetiah, Northern Rocky Mountains and Liard River Corridor Resource Management Zones; and the Horneline Creek, Toad River Hot Springs and Prophet River Hot Springs Protected Areas.

10.3 Area-Specific Objectives and Strategies for the Fort Nelson LRMP Protection Resource Management Zones

10.3.1 Denetiah (including Access Corridor and Dall River Old Growth Site)
The objectives and strategies of section 2.2.5.1 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 123 to 124) provide direction to the management of the Denetiah Resource Management Zone which includes the Dall River Old Growth Site and the Access Corridor.

10.3.2 Liard River Corridor
The objectives and strategies of section 2.2.5.3 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 126 to 127) provide direction to the management of the Liard River Corridor Resource Management Zone.

10.3.3 Northern Rocky Mountains
The objectives and strategies of section 2.2.5.5 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (pages 129 to 131) provide direction to the management of the Northern Rocky Mountains Resource Management Zone.

10.3.4 Horneline Creek Protected Area
Section 2.2.5.8 of the Recommended Fort Nelson Land and Resource Management Plan, June 1997, (page 136) provides direction to the management of the Horneline Creek Protected Area.
10.3.5 Prophet River Hot Springs Protected Area
Section 2.2.5.8 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (page 137) provides direction to the management of the Prophet River Hot Springs Protected Area.

10.3.6 Toad River Hot Springs Protected Area
Section 2.2.5.8 of the *Recommended Fort Nelson Land and Resource Management Plan, June 1997*, (page 137) provides direction to the management of the Toad River Hot Springs Protected Area.

10.4 Area-Specific Objectives and Strategies for the Fort St. John LRMP
Protection Resource Management Zones

10.4.1 Graham-Laurier

10.4.1 Redfern-Keily Creek
The objectives and strategies of section 4.2.2 of the *Recommended Fort St. John Land and Resource Management Plan, April 1997*, (pages 159 to 161) provide direction to the management of the Redfern-Keily Creek Resource Management Zone.
SCHEDULE 4

RECOMMENDED FORT NELSON LAND AND RESOURCE MANAGEMENT PLAN
Recommended Fort Nelson Land and Resource Management Plan
The Fort Nelson Land and Resource Management Plan (LRMP) is a full consensus recommendation on all aspects of land and resource management within a 98,000 square kilometre area built through participation by the public, local industry and government resource agencies. This Plan results in no anticipated job losses, stability for all resource-based industries such as tourism, oil and gas, mining and timber; seven proposed protected areas; a recommendation for a planning framework to provide co-operative and co-ordinated planning management in the Muskwa-Kechika; and an improved outlook for recreational activities and wildlife.

The Fort Nelson Land and Resource Management Plan (LRMP) recommendations have been built over a four year time-frame by a core group of 30 people. This group consisted of a solid cross section of public participants with local, regional and provincial interests, and agency staff, representing a wide range of values including access, agriculture, biodiversity, energy, forestry, guide outfitting, minerals, outdoor recreation and tourism, soil, transportation and utility corridors, trapping, visual quality, water and wildlife. The LRMP table worked with an “open-door” policy, using sector based negotiations.

Local First Nations expressed an interest in the process, but chose not to participate. This was in part due to concerns that participation may compromise treaty negotiations, in addition to staffing and resource constraints. They were apprised of the LRMP progress through personal contacts, formal communications and the LRMP update packages, which were widely distributed. Although First Nations were not formally represented at the LRMP Working Group, archaeological, cultural and heritage values were strongly endorsed by all the LRMP participants.

This LRMP divides a 9.8 million hectare land base into thirty-seven Resource Management Zones (RMZs), which are grouped into four different categories.

1. **Enhanced Resource Development** - Representing approximately 36% (3,564,900 hectares) of the land base. This category gives direction to manage land for oil and gas, mineral and timber resources, with an emphasis on the recreation and tourism resources along the Alaska Highway corridor. This category is made up of the Resource Management Zones where investments in resource development are
encouraged. This category builds on existing legislation and regulations. There are 4 RMZs in this category.

2. General Resource Development - Representing approximately 24% (2,445,000 hectares) of the land base. The intent in this category is to manage for a wide array of integrated resource values. In these RMZs, resource development will be integrated with the requirements of other resource values. Developments are subject to all applicable provincial regulations. There are 10 RMZs in this category.

- 
- Major River Corridors Sub-Category - Identified to highlight the management of the important values within the river corridors such as archaeological, cultural, heritage, recreational, scenic, timber and energy

3. Maskwa-Keshayas Special Management - Representing approximately 29% (2,911,700 hectares) of the land base. This category gives direction to manage in such a way that resource development can proceed while minimizing impacts on other resource values. The Resource Management Zones within this category contain the most restrictive objectives and strategies for development. There are 16 RMZs in this category.

- 
- Major River Corridors Sub-Category - Identified to highlight management of all the important values within the river corridors such as archaeological, cultural, heritage, recreational, riparian, wildlife habitats and unutilized

4. Proposed Protected Area - Representing approximately 11% (1,051,000 hectares) of the land base. This category contains the zones that are proposed for protected area designation for natural, cultural, heritage and/or recreational values as defined by the Protected Area Strategy for BC. Logging, mining, energy and hydroelectric exploration and development are prohibited in those areas designated under the Park Act. There are 7 Goal 1 Resource Management Zones and 13 Goal 2 sites identified in this category. All the Proposed Protected Areas stand alone within the Fort Nelson Plan area as functioning units. Additionally, long-term solutions were developed for the tenured oil and gas interest in the Thinatca and Prophet River Recreation Area Proposed Protected Areas.

- Denetiah (97,200 ha) - This area provides a cross-section of the Rocky Mountain Trench, other special features are Dall and Denetiah lakes, with the intact Denetiah watershed, and the historic Davie Trail. The remote nature of this area enhances its recreation experience. Access corridor will be allowed; the section across the Rocky Mountain Trench to be designated in such a way as to maintain the opportunity for access.

Recommended Fort Nelson Land and Resource Management Plan
- **Kulas Lakes (23,500 ha)** - Located in the south-eastern portion of the plan area, this zone has significant archaeological value with a traditional historic commercial fishery site, a significant native village, native park rangers, an old wagon trail and a spiritual site. The entire area has very high scenic qualities of escarpments/cuesta topography, along with high recreation use. This area provides representation of the Muskwa Ranges Ecossection.

- **Liard River Corridor (81,500 ha)** - Featuring the Grand Canyon of the Liard, ancient caves, a bolted steel and wooden oil derrick, Hudson's Bay Trading Post, archaeological sites and significant grizzly bear habitat. The Liard River Corridor is representative of the Hythe Ridgebank Ecossection and could be considered as a Heritage River candidate. Designation on this area has to take into account the Alaska Highway Pipeline reserve. Any access for utility through this proposed protected area will be subject to the management plan.

- **Mainbeau Lake (27,600 ha)** - Featuring a large lake with white sandy beaches this Proposed Protected Area supports significant recreational opportunity in an area rich with waterfowl and fish values. This area also provides representation of the Etsho Plateau Ecossection. The type of designation on this area has to allow for the opportunity in the future for an access route to the lake for recreational purposes.

- **Northern Rocky Mountains (635,900 ha)** - The largest of the Proposed Protected Areas, this zone rests in the southern portion of the plan area and provides a core for the large intact predator/prey system that coexists together with high density and diversity of large mammal species. The zone has some of the highest, most rugged mountains, and is substantially unroaded and undeveloped. This area has high wildlife and recreation value and is very significant for wilderness and back country recreation experiences. This area provides excellent representation of the Eastern Muskwa Ranges and Muskwa Foothills ecossections. Within it there are special features such as Sleeping Chief Mountain, Mount Sylvia, Mount Mary Henry, significant wetlands along the Tuchodi River and the historic Bedeaux Trail. The Northern Rocky Mountains is the centre piece proposed protected area - combined with adjacent existing and proposed protected areas, a new Protected Area of 771,793 hectares in size will protect significant values in the area.

- **Thinates (19,500 ha)** - This area provides representation of the Petitot Plain Ecossection. It is a good example of muskeg mixed with...
some associated upland forest. There is a significant stand of Jackpine in the RMZ; the area is important for habitat values, especially for waterfowl. The designation on the area has to consider existing oil and gas tenures with the Proposed Protected Area, and provide for the opportunity to directionally drill for pipeline purposes under the north arm.

- **Wokkpash (37,500 ha)** - This zone is a Recreation Area. It has attained international significance with the Wokkpash Gorge (hoodoo canyon - 5 Km in length 30 m in height); Forlorn Gorge (narrow cleft - 150 m deep and 25 m wide); Fusillier Glacier and stepped lakes; with significant recreation values such as hiking, camping, wildlife viewing, fishing, horseback riding and hunting.

- **Goal 2 - 13 small areas (8,500 ha)** - Site specific features such as provincially or regionally significant hot springs, archaeological sites, rare ecosystems and recreation areas. The LRMP WG has allotted 1800 ha for the protection of old growth into this total; the location and stand type has not been determined yet. (A LRMP Working Group Subcommittee has been charged with the completion of this task, and is to report back by the first annual monitoring meeting).

The Plan has developed three levels of management direction.

1. **General Management Direction:**
   - applies to all values and resources on Crown land;
   - applies as a baseline for management; and
   - enhances and supports legislation, policies, existing processes and operational guidelines.

2. **Category Management Direction:**
   - combination of similar Resource Management Zones;
   - refines management regimes for the combination of RMZs;
   - reflects interest-based nature of the plan; and

3. **RMZ Specific Direction:**
   - objectives and strategies for specific values;
   - further defines or clarifies activities or uses;
   - gives fine-tuned direction based on information for each zone; and
   - builds on the general and category management directions.

There are no unresolved issues in this Plan; the Working Group reached consensus on every point negotiated. The Working Group has also

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Recommends Fort Nelson Land and Resource Management Plan
developed positive working relationships, including high trust-levels, extensive individual knowledge on multiple resource values and an ability to negotiate in good faith. This, in addition to the innovative integration of many interests through clear and concise direction supplied in the Plan, will carry the LRMP through a smooth implementation. The Working Group has also designed a system of annual and biennial public meetings which will assess the successes and challenges of implementing the Plan.

Public endorsement and smooth transition and to implementation is expected, as this Plan articulates the common vision for the land base which the resource managers and the local residents are already striving toward. The only new initiative brought into the Plan is the Protected Area Strategy - which serves to integrate important conservation interests.

No job loss is anticipated from implementing the LRMP.

Wildlife and wilderness interests are integrated with economic interests through the recommendation for formal designation for the Muskwa-Kechika Special Management Zone. This recommendation provides certainty to both the environmental and industrial sectors regarding resource management.

It is anticipated that the implementation of the Plan will not have a major impact on resource agencies and staffing, as the majority of the recommendations are expected to fall under current mandates. The exceptions are: the need for additional Agency support to undertake the inventories identified in the Muskwa-Kechika Special Management Category of Resource Management Zones. Additionally, the new Protected Areas will impact on BC Parks (and other affected agencies) resources and staffing.

General access management principals were developed to provide licensed and government authorized resource users access through a number of innovative strategies. Further refinement will be developed in more detailed planning processes. Where public access restrictions are recommended, in order to manage critical values such as wildlife habitats, public consultation and educational processes are endorsed.

All recommendations are consistent with the Forest Practices Code and work to guide, rather than fetter, the designated official’s ability to implement appropriate management practices. All the policy recommendations identified through the course of developing the Plan were separated out of the LRMP. These will be submitted separately to Government for consideration.
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Fort Nelson LRMP Base Case

Fort Nelson LRMP Socioeconomic/Environmental Impact Assessment Report

Resource and Recreation Use Guidelines for Protected Areas

Criteria for Directional Drilling Beneath Proposed Protected Areas

BC Conservation Data Centre: Rare Vertebrate Animal Tracking List Fort Nelson Forest District June 10, 1996
1.0 Introduction

This report contains the recommendations for the Fort Nelson Land and Resource Management Plan (LRMP), a sub-regional land use plan, covering 9.8 million hectares of north eastern British Columbia (Figure 1). This LRMP is the result of several years of work by a table of public stakeholders and government representatives. Their consensus based negotiating process considered all interests and values on provincial Crown land base, presented by the stakeholders, interest groups, local government, the public and information provided by government agencies.

When complete, the Fort Nelson LRMP will form one part of British Columbia’s Land Use Strategy, and will direct the management of all provincial Crown land in the plan area for the next ten years.

As many of the recommendations are innovative, this plan will be subject to monitoring and review as it is implemented. Annual and biennial reviews by the LRMP Working Group will take place, and the major public involvement process to review and revise this plan will start in the year 8, to be completed by year 10.

Part of the LRMP plan may be declared a higher level plan under the *Forest Practices Code of British Columbia Act*. Those portions of the plan approved as a higher level plan under the Code provide strategic direction for forest resource management activities incorporated into operational or local level forest plans such as Five-Year Development plans, Range Use plans and Co-ordinated Access Management Plans among others.

Recommendations in the LRMP are primarily organized by four categories of Resource Management Zones (RMZs). After identifying the resource values, management objectives and strategy statements are developed and incorporated into the plan to manage for these identified values. These statements provide strategic direction for resource uses like forest management, oil and gas exploration and development, mining, recreation and agriculture. These recommendations also account for environment values (e.g. fish, wildlife habitat, biodiversity and water) and highlight management objectives and strategies that provide for these values.

Recommendations for management direction, and the process used to develop them are consistent with provincial government policy for land use planning as well as all other government policies, as described in the *Provincial Land Use Charter* (1992) and the *Principals and Process of LRMP* (1993).
This report contains:

- a description of the plan area including social, economic and environmental aspects
- an overview of the planning process
- recommendations for land use zonation and related resource management objective and strategy statements
- a summary of social, environmental and economic impact assessment
- recommendations for implementation, monitoring and amendment of the plan and

1.1 The Plan Area

The Fort Nelson LRMP encompasses an area of approximately 9.8 million hectares of Crown land and is defined by the boundaries of the Fort Nelson Forest District (8.3 million hectares) and a portion of the Cassiar Forest District (1.5 million hectares), referred to as the Kechika Addition. The Fort Nelson-Liard Regional District is within the planning area and includes the Town of Fort Nelson and the settlements of Prophet River, Toad River, Muncho Lake and Coal River. There are five First Nations within the area: the Fort Nelson First Nation, Prophet River First Nation, Fort Liard First Nation, Lower Post First Nation and Dene Tha First Nation. The entire plan area is within the area covered by Treaty 8. In total about 5,500 (1991) people live within the plan boundaries.

This planning area is bounded on the south by the 58th parallel (which is also the boundary of the Fort Nelson Forest District and the Peace River Regional District), on the west by the Cassiar-Stikine area and the Rocky Mountains, on the east by the Alberta border, and on the north by the Yukon/Northwest Territories border. The topography forms a gradient of increasing relief from east to west. The area encompasses parts of the Alberta plateau, the Rocky Mountain Foothills, the Liard Plateau, and the Liard Plain. This entire region is within the Arctic watershed and is largely drained by the Liard River and its major tributaries; the larger ones including the Fort Nelson, Prophet, Muskwa, Toad, Kechika and the Petitot Rivers.

Ecosystems in BC are broadly classified into geographical zones with similar landforms, vegetation and climate called eosections (Demarchi 1993). The province has been subdivided into 116 eosections, 10 of which occur in the

Biogeoclimatic units are a classification of ecounits based on climate, vegetation and site. The three biogeoclimatic units found in the plan area are: Alpine Tundra (13%), Boreal White and Black Spruce (68%) and Spruce-Willow-Birch (19%).

The planning area has timber, oil and gas and mineral values. The boreal white and black spruce zone is recognized as containing some of the highest productive land in the boreal forest zone.

The planning area is home to a number of big game species, and an abundance of wildlife uncharacteristic of the rest of the province. A number of these species have been characterized as rare, threatened or endangered.

A portion of the planning area overlaps with the Muskwa-Kechika, which covers some five million hectares in the north-eastern region of the province. The Muskwa-Kechika is a remote and relatively undeveloped area of bountiful resources. It is a significant wildlife area that supports a diverse range and sizeable populations of large mammals. Beneath the mountains and valleys, there is a well defined potential for accumulations of natural gas and mineral resources; the northern portion of this area has is timber values. The remote and inaccessible nature of the area is the largest factor that has restricted the exploration of the subsurface resources, yet it is this same wilderness character that is of greatest value to preserving the wildlife habitat systems intact. (Note: for the remainder of this report the term Muskwa-Kechika will refer to that portion of the Muskwa-Kechika which lies within the Fort Nelson LRMP boundary).

The economy of the area is dominated by Forestry (about 40%), public sector incomes (30%-35%), oil/gas (10%-20%), and tourism (10%). Approximately 80% of the area’s 1991 labour force of 2650 workers reside in Fort Nelson. Overall, the town’s labour force held steady at about 2100 during the 1981-91 period, with wood processing and energy exploration/extraction showing quite strong growth, but being offset by declines in construction, and parts of the service sector. Tourism employment (using the accommodation and food service labour force as a proxy) appeared to hold steady.

While quantitative estimates are not available, the evidence (i.e. increased oil/gas activity, higher forest product prices, construction of the Orientated Strand Board (OSB) plant, accommodation room revenue growth, and
population estimates) indicates that employment growth has been stronger in
the 1990s than in the previous decade. The population of the planning area
is estimated to have grown from 1991 - 1996 by a relatively strong annual
average of 2.7%, since the last official Census count of 5184 in 1991.

1.2 THE PLANNING PROCESS

1.2.1 Vision

The vision of this planning process is to produce a Land and Resource
Management Plan that will:

- serve as a land use strategy for provincial Crown land and resources
  within the Plan Area, and may provide guidance in the planning for use
  and development of private lands;

- provide a forum for participation by the general public, interest groups,
  stakeholders, First nations and government agencies.

- be based on consensus;

- result in a framework for planned resource use that embraces the
  principals of sustainable development;

- consider and attempt to mitigate (if necessary) the impacts of land use
  decisions on community stability based on social, economic and
  environmental criteria;

- provide more certainty for investment in the planning area.

1.2.2 Objectives

To achieve this vision, the following were objectives of the planning process:

1) To ensure that land use and resource management decisions are
   based on an assessment of resource, social, economic and
   environmental values. All known resource values were
   considered in the LRMP planning process.

2) To provide resource agencies, the general public, First Nations
   and resource users with opportunities for participation
   throughout the process. A co-operative team
A process in which participants are viewed as equal partners will be used in the planning process. The planning process will respect aboriginal and treaty rights and shall not prejudice ongoing and future treaty negotiations.

3) To assemble and use the most relevant and up-to-date biophysical, social and economic information in the development of the plan. If information proves inadequate to address a resource issue, plan preparation will continue, and the final plan will identify further information needs.

4) To seek consensus among participants when developing recommendations on use of land and resources. Where consensus cannot be reached, the areas of disagreement will be documented and handled through the dispute resolution process.

5) To develop a planning process with enough flexibility to allow for incorporation of new direction in integrated resource management.

6) To provide local governments with a context within which they can respond to resource management issues when they develop or amend Official Community Plans and Implement Bylaws.

7) To provide a mechanism for ensuring that the final plan will be implemented, monitored, amended and updated as required.

1.2.3 Process Overview

In 1992, the Ministry of Forests published an Options Report as part of timber harvest planning for the Fort Nelson Timber Supply Area. Public and agency replies to a questionnaire contained in the Options Report demanded a more comprehensive, open and consensus-based integrated land and resource use planning process, including consideration of Protected Areas. An Interagency Planning Team (IPT) was formed and initiated a new approach to planning in the area.

In February 1993, a public meeting was held in Fort Nelson to introduce a new process for land use planning in British Columbia. This approach would be based on public participation, interagency co-operation, full consideration of all resource values and consensus decision making. Out of this February meeting, a group agreed to embark on the new planning process for the Fort Nelson Forest District. In October 1993, government produced a final Recommended Fort Nelson Land and Resource Management Plan.
document entitled 'A Statement of Principles and Process for Land and Resource Management Planning (LRMP), which summarized guidelines for this new process.

Public participation is the cornerstone of the LRMP planning process. All the major economic sectors, organizations and interest groups were identified at the beginning of the process and invited to participate. During the first few months of the process, through public meetings and workshops, the planning process and sector representation were identified. A group of about 30 core members continued to meet over the next three years; this group formed the LRMP Working Group (WG).

The group generally met once a month for two day sessions. Over the course of the first year, each participant was invited to submit an interest statement or description of their values and priorities. A Terms of Reference was produced by the Working Group and approved by government in September 1994. That document outlined the vision, objectives, principles for public participation, general planning sequence, organizational structure (membership), decision making (consensus) and the approval process.

The next step in the process was to divide the area into units of land called Resource Units. Information, such as physical description, resource inventories, tenures, uses and issues were identified by the Working Group.

In May 1994, the Working Group began developing smaller units, with more detailed descriptions around values and uses. These units were called Resource Management Zones and were the basis for the development of the general management direction and the more specific objectives and strategies.

In June 1994, the Fort Nelson LRMP Working Group proposed to take the lead role in strategic planning for the Kechika, in consultation with Dease Lake (Cassiar Forest District). Through this proposal, the Fort Nelson LRMP plan area was amended to include the Kechika Addition. A sub-committee was developed, which quickly brought the information and zoning for the amended area up to date with the rest of the planning area.

By February 1995, resource descriptions, objectives and management strategies were developed by sub-committees. The committees then presented their findings for consideration by the whole working group. After all RMZs had been completed, the Interagency Planning Team took the information, rolled up similar units (originally 101 RMZs) into 37 RMZs and developed draft management objectives and strategies, and drafted general direction statement for presentation to the Working Group. The group

Recommended Fort Nelson Land and Resource Management Plan
provided revisions and a package was developed which would become the building blocks to this recommended plan.

In October 1995, the Working Group switched its focus from resource management zones to the Protected Areas Strategy. A number of Protected Areas Strategy Areas of Interest (AOIs) were identified by the Regional Protected Areas Team for consideration. The Working Group studied these AOI proposals during the fall and winter of 1995. Once the proposed Protected Areas and Resource Management Zones were agreed to by the Working Group, the focus shifted between March 1996 and June 1996, to the preparation of an outline for implementation and monitoring, including a framework for formal designation for the portion of the Muskwa-Kechika that falls within the Fort Nelson LRMP planning area.

Throughout the process, the Working Group members remained committed to development of this land use plan. Considerable efforts were made to inform the general public and invite their comments and input. There have been open houses in Fort Nelson, Toad River and Lower Post, along with occasional coverage by the local newspaper. All meetings were open to any member of the public who wanted to attend and provide input. Working Group members kept their sectors informed about the process and ensured that their concerns were addressed.

1.3 First Nations

1.3.1 Involvement

The Fort Nelson Working Group encouraged First Nations to participate throughout the LRMP process. Local First Nations did not have formal representation at the Working Group, but were kept apprised of the LRMP progress through personal contacts, formal communications and the LRMP monthly information packages.

Known First Nations archaeological, cultural and heritage values were endorsed by all of the LRMP participants.

Once Table consensus was reached, Table members visited the local First Nations communities to present the Fort Nelson LRMP Plan to First Nations living in the plan area.

The LRMP WG recognizes that Treaty #8, signed in 1910, covers the land base in the LRMP plan area and that the use, ownership of the lands, and the jurisdiction to manage the lands in question, may change as a result of treaty negotiations.
The recommendations put forward within the Plan are without prejudice to aboriginal and treaty rights, and ongoing and/or future treaty negotiations.

1.3.2 Community Profiles

There are five First Nations who traditionally reside in the area covered by the plan; the Fort Nelson Indian Band, the Dene Tsaa Tse K’Nai First Nations of Prophet River, the Kaska-Dena of the Lower Post First Nations, the Fort Liard Indian Band and the Dene Tha’ First Nations of Assumption, Alberta.

1. Fort Nelson Indian Band

Four reserves on 9,558 hectares. The majority community is on the Fort Nelson Indian Reserve #2, 6 km south of Fort Nelson. The other reserves being Fontas River, Snake River, Moose Lake, Sandy Creek and Khantah. There are also four small reserves at Maxhamish Lake. Reserves obtained under Treaty 8, one of two treaties signed in BC. Treaty 8 covers the entire Fort Nelson LRMP planning area. Originally called the Slavey River Indian Band, the name was changed in 1962 to the Fort Nelson Indian Band. The Band split in 1974 when part of the membership broke away to form the Prophet River Band. The Band is characterized by Slavey, Cree and Beaver cultures. Athapaskan linguistic group. Approximately 550+ members (1996).

2. Dene Tsaa Tse K’Nai First Nations, Prophet River Indian Band

One 374 hectare reserve. The Prophet River Indian Band was created when it split from the Fort Nelson Indian Band in 1974. The community is located just off the Alaska Highway, approximately 100km south of Fort Nelson. The Beaver people recognized certain people as “Dreamers” or “Prophets” who could foretell certain events. The Band may be named for the recent Prophet of the Beaver people, Notseta, or it may be named for Decutla, a Prophet of an earlier generation. The Band is covered by Treaty 8 and was originally part of the Slavey band, which changed its name to the Fort Nelson Indian Band in 1962. The Prophet River band was created when it split from the Fort Nelson Band in 1974. The band is part of the Nahanni linguistic group and has Slavey, Beaver and Cree cultures. Approximately 100+ band members (1996).

3. Lower Liard Indian Band #3, also referred to as the Lower Post First Nations

The main community, 65 hectares in size, is located 1 km off of the Alaska Highway approximately 27 km south of Watson Lake, Yukon, or 500 km (6.5 hours) north-west of Fort Nelson with smaller communities located at Fireside and Muncho Lake. The Lower Post First Nations is headquartered in Lower Post, BC, and is a sub-group of the larger Kaska Nation which includes all Kaska in BC and the Yukon. The Lower Post
First Nations has a subsidiary body, the Kaska-Dena Council, who is presently negotiating a land claim with the BC Treaty Commission. Treaty negotiations began July 1995. The traditional land use area of these First Nations covers the western half portion of the Fort Nelson LRMP area. The band is characterized by the Kaska-Dena culture and is part of the Athapaskan linguistic group. Approximately 200+ members.

4. Fort Liard Indian Band
The Band council is referred to as Acho Dene Koe meaning, in the Slavey dialect, "the meeting place of the people beside the big river". No allocated reserve, the Hamlet of Fort Liard is a mixture of Treaty First Nations, Metis and non-native people. Fort Liard is located 1km off of the Liard Highway, 207km (2.5 hours) north of Fort Nelson. The First Nations of this community are signatories to Treaty 11 signed in the NWT in 1921. The traditional land use area of the First Nations of Fort Liard extends into the north-central Fort Nelson LFMP area. The Band is characterized by the Slavey (also referred to as Dene') culture. Linguistic group is Athapaskan. Approximate population of entire community is 500+ with no available number for just First Nations.

5. Hay Lakes # 209, also referred to as the Dene Tha’ First Nations from Assumption, Alberta.
The Hay Lakes Band resides in Assumption, also referred to as Chateh. The reserve is 19,000 hectares in size. Located in Alberta east of High Level on highway 58. A signatory to Treaty 8, Hay Lakes signed in 1899. The Hay Lakes area was historically used as a First Nation community area. The traditional land use area of the Dene Tha’ First Nations, within the Fort Nelson LRMP plan area, extends from the Hay Lakes area, west towards the Alaska Highway. The band is characterized by Cree, Beaver and Slavey cultures. The linguistic dialect is Athapaskan. Approximate population is 1,200.

1.4 Local Government

The Fort Nelson LRMP process recognized local government as an order of government throughout all stages, from process design to plan approval and implementation. All communication with local government in association with the LRMP was in a manner and form that reflected its status as an order of government.

The local government in Fort Nelson was formally offered briefings at key stages of the LRMP process to identify the degree of support and any outstanding areas of concern.
The local government was given the opportunity to comment on the results of the LRMP prior to final approval of the recommendations by the Working Group, even though local government participated as a member of the Working Group.

The local government structure in Fort Nelson is the most unique in British Columbia, as it has integrated the regional and municipal boards. The Fort Nelson-Liard Regional Board consists of a Chair, who is also the Mayor of the Town of Fort Nelson; and 7 Directors, 4 of whom serve as Town Councillors. As elsewhere in BC., general elections are held every three years.

The Fort Nelson LRMP Working Group membership includes two representatives from local government; one from the Fort Nelson-Liard Regional District and one from the Town of Fort Nelson. Both members participated fully in the planning process and support these recommendations.
The intent of this strategic land and resource management use plan for the Fort Nelson Planning Area is to provide direction for management of land, water, ecosystems and resources. The plan was developed with a commitment to balance the economic, environmental and social needs of the people in the planning area, region and province.

Resource management objectives and strategies statements have been developed by the WG to address values, concerns and management issues that were identified through the process.

Management direction for the land and resources is given through three levels of objectives and strategies: General Management Direction; Category Management Direction and RMZ Specific Direction. All three levels have to be reviewed to understand the management intent for a specific unit of land. The three levels of objective and strategy statements are:

**General Management Direction**
- applies to all values and resources on provincial Crown Land;
- applies as a baseline for management; and
- enhances legislation, policies, existing processes and operational guidelines.

**Category Management Direction**
- combination of similar RMZs;
- refines management regimes for the combination of RMZs
- reflects the interest-based nature of the plan; and

**Resource Management Zone Direction**
- objectives and strategies for specific values;
- further defines or clarifies activities or uses;
- gives fine-tuned direction based on information for each zone; and
- builds on the general and category management directions.
2.1 General Management Direction

General management direction is outlined for all values and interests identified by the Working Group: First Nations, heritage and culture; access for resource development; agriculture and grazing; biodiversity; energy; forestry, guide outfitting; jobs and community stability; minerals; outdoor recreation and tourism; protected areas; soil; transportation and utility corridors; trapping; visual quality; water; and wildlife. The general management direction identifies how the land and resources are to be managed so that outside of protected areas the lands are open for integrated resource development, including the development of roads where necessary, subject to the existing regulatory framework and zone specific strategies. If no objective or strategy is listed for a resource within the Category management or RMZ specific direction, then only the General Management Direction applies.

The objectives and strategies outlined under General Management apply to all agencies, resources and activities, and are the fundamental building blocks of the plan. They are enhanced and supported by a large array of complementary legislation, policies, processes and operational guidelines. These include but not limited to:


- other strategic and operational planning processes including but not limited to landscape unit plans, local resource use plans, coordinated access management plans, and protected area management plans.

- existing regulations, standards and guidelines, including but not limited to the Forest Practices Code Operational Planning Regulations and Guidebooks, forest and mining road standards, Mineral Exploration Guidelines, British Columbia Oil and Gas Handbook, range management practices, and Mine Health, Safety and Reclamation Code of BC.
2.1.1. Access Management

Managing access to conserve identified resource values and to provide a variety of recreational experiences is a primary objective for the LRMP; the intent is to ensure that the natural characteristics and wildlife habitat are maintained over time while ensuring opportunities for responsible resource development are maintained, which includes roaded development. Government licenced and authorized resource users will have access to development to all the RMZs, with the exception of mining, oil and gas exploration and development, timber harvesting and hydroelectric development in the Proposed Protected Areas.

Subject to legislation, regulations, RMZ objectives and strategies roaded access related to industrial activity is an acceptable use of the land.

Comprehensive and coordinated access management plans will be developed for specific RMZs as required. These will clearly identify the status of all roads and trails for industrial, commercial and recreational users, as well as the option for new roads, if required. Even though it is recognized that access is managed throughout the land base; the LRMP has identified areas where additional access management is endorsed.

Access controls are an important component of access management planning and will be used only when other existing strategies, regulations and restrictions will not meet the resource management objective. In areas where industrial activities are to occur, existing roads will be used where practical, and the amount of new road constructed will be minimized. All roads will be built and deactivated according to existing and future standards (e.g. Forest Practices Code, Mines Act and Petroleum and Natural Gas Act) to ensure minimal impact on other resource values.

### Access Management Objectives

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<tr>
<th>Objectives</th>
<th>Strategies</th>
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<tr>
<td>• Provide for a level of access that meets the objectives of each RMZ (road and trail construction, maintenance and deactivation and other surface disturbances and construction)</td>
<td>• Where significant access concerns exist conduct an interagency access management planning process</td>
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<td>• Utilize existing corridors and crossings where practical</td>
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<td>• Provide opportunity for stakeholder participation in access management planning</td>
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<td>• Ensure that resource tenure holders are notified when planning for road deactivation</td>
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Recommended Fort Nelson Land and Resource Management Plan
An example of enhanced access management for RMZs such as the Special Management Category of Resource Management Zones is the following strategy adopted to address the conservation of other resource values when planning and developing access.

A more detailed planning process may identify high fish and wildlife values, or other significant features (e.g. licks, hot springs). Where there is a significant risk that these resources may suffer an unacceptable level of negative impact, access may be limited, restricted, or on a site-specific basis, prohibited (e.g. avoid critical habitat components and special features where identified). However, where an access route is prohibited alternative routes will be identified where possible.

The intent of this strategy is to allow development to proceed while mitigating impacts on significant resource values (e.g. critical fish or wildlife habitat) through: the location of roads; the frequency or limitations on use during certain periods; and, if necessary, restrictions through road closures.

2.1.2 Agriculture

The Fort Nelson LRMP plan area contains both documented (as defined by the Agriculture Land Reserve (ALR)) and undocumented Crown land resources. There is approximately 46,000 hectares of ALR, almost all of which is contained in the one Resource Management Zone that surrounds the Town of Fort Nelson. Approximately one third of this zone is covered by ALR.

The agriculture land resource is characterized by a low level of development and is the largest base of virgin agriculture land in British Columbia east of the Rocky Mountains.

Current agricultural enterprises in the area are small in size and function in a non-intensive fashion. The products produced include domestic and game farmed livestock, feed grains, honey and vegetables. Forage crop production forms an integral component of almost all farms and is an important practice for soil conservation in the area.

The workforce associated with the agricultural industry is relatively permanent and supports other seasonal resource based industries such as forestry, guide outfitting and oil and gas. The agricultural industry workforce, which consists of native and non-native professional and trades
people has a history of contributing to the economic and community stability in the Fort Nelson area.

The intent of the management direction is to allow for agricultural enterprises to produce food, feed and fiber while being consistent with multiple use objectives that could sustain or stimulate rural communities.

**Agriculture**

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<th>Objectives</th>
<th>Strategies</th>
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<tr>
<td>• Maintain resources with food production capability for current and future crop and livestock production.</td>
<td>• Crown lands with high agricultural potential, especially those adjacent to existing agricultural developments, to be identified and designated for agricultural use.</td>
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<td>• Forage utilization near agricultural deeded lands will have an emphasis for domestic animals use.</td>
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<td>• Crown ALR lands should be managed for agriculture and uses compatible with long-term agriculture potential, as defined by the Agriculture Land Reserve Act and Regulations</td>
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<td>• Provide opportunities for growth and expansion of Agriculture</td>
<td>• Ensure the integrity of the ALR through the Agricultural Land Reserve Act and Regulations.</td>
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<td>• Support the intent of the ALR and conversion of high quality agricultural land through the Agricultural Land Reserve.</td>
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<td>• Apply the provisions of the Soil Conservation Act and the FARM Practices Protection (Right to Farm Act)</td>
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<td>• Redefine ALR boundaries at a more detailed scale to more accurately capture lands with agricultural capability</td>
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<td>• Encourage farming practices that promote soil conservation</td>
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<td>• Maintain livestock grazing opportunities on existing tenures and where appropriate provide opportunities for new tenures as the RMZ directs.</td>
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<td>• Minimize and mitigate (where necessary) other land, vegetation and water uses or management activities which negatively impact agricultural productivity and sustainability (i.e. noxious weed control, problem wildlife)</td>
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Agriculture (cont'd)

Enhance the opportunity for agricultural enterprises that contribute to wildlife, environmental, and/or multiple use objectives that could sustain or stimulate rural communities.

2.1.3. Air Quality

Air quality within the planning area is relatively good. Exceptions occur near isolated discharges of sulphur compounds (SO) and total reduced sulphur (TRS) compounds from oil and gas processing facilities and downwind of major industrial incinertors (bee-hive burners) associated with the wood processing industry. Smoke from forest fires, slash burning and habitat enhancement is also a routine concern of many residents.

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<th>Objectives</th>
<th>Strategies</th>
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<td>• Maintain acceptable air quality</td>
<td>• All emissions to meet the Provincial air quality standards.</td>
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2.1.4. Biodiversity

Biodiversity is the diversity of plants, animals and other living organisms in all their forms and levels of organization. It includes the diversity of genes, species and ecosystems, and the functional and evolutionary processes that link them. Biodiversity must be managed across the entire plan area, on all landscapes and sites.

Biodiversity is threatened by:
- fragmentation and alienation;
- habitat degradation by industrial and recreational developments and practices or by urban encroachment; and
- direct impact on specific plant and animal species e.g. consumptive use by people.
- increased/improved access and increasing numbers of people.

Maintaining biodiversity depends on:
- the conservation and connectivity of large areas as ecological benchmarks at the regional level,
- providing habitat variety and connectivity at the landscape (watershed) level; and
- management practices at the stand level.

### Biodiversity

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<th>Objectives</th>
<th>Strategies</th>
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<tbody>
<tr>
<td>- Maintain natural biodiversity throughout the plan area.</td>
<td>- Initiate Landscape Unit planning in priority areas.</td>
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<td>- Maintain rare ecosystems, habitat types, plant and animal species.</td>
<td>- Manage natural seral stage distribution by landscape unit using knowledge of natural disturbance patterns.</td>
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<td>- Maintain old-growth attributes on specified sites within landscapes.</td>
<td>- Identify and map suitable sites for maintaining representative, natural functioning areas.</td>
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<td>- Link important habitats to maintain connectivity across the landscape.</td>
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<td>- Identify and map ecosystems, habitat types plant, and plant species designated for long-term monitoring.</td>
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### 2.1.5. Energy (Oil and Gas; Hydroelectric)

Northeastern British Columbia has been the focus of energy exploration and development since the 1950’s and is the only area of the province presently producing oil and gas. These oil and gas fields lie within the Western Sedimentary Basin.

The energy sector is an important element in the economic stability of the Fort Nelson planning area.

This plan confirms that energy exploration and development are acceptable uses of the land outside of protected areas, while considering environmental values within the regulatory framework.

Recent drilling success in the planning area, the expansion of infrastructure and the construction of new pipelines for transportation of the resource provides an encouraging outlook for the energy sector. There is a well developed infrastructure throughout the area and Westcoast energy operates a natural gas processing plant at Mile 285 of the Alaska Highway, which is just south of Fort Nelson.
Objectives | Strategies
--- | ---
• Maintain opportunities and access for oil and gas exploration, development and transportation | • Promote and encourage oil and gas exploration through a timely and efficient permitting process
| • Provide for exploration and development of resources within the regulatory framework
| • Promote and encourage investment in energy exploration and development.

2.1.6. First Nations, Heritage and Culture

The cultural heritage resources reflect past and present uses by aboriginal and non-aboriginal peoples. Three categories of resources are evident: archaeological sites containing physical remains of past human activity; historical sites often consisting of built structures or localities of events significant to living communities; and traditional use sites which often lack the physical evidence of human-made artifacts or structures, but maintain cultural significance to living communities.

The majority of the currently identified archaeological sites within the Fort Nelson area consist of burials, cabin locations and/or surface or thinly buried scatters of stone tools and/or flakes indicating where these tools were manufactured or repaired. More complex sites may include other types of features, such as the remains of trading posts, settlement areas and cooking hearths and post molds where temporary shelters and food drying racks were erected.

Some known historical sites of interest date from 2000 to 5000 BC.

Natural heritage resources included in the Fort Nelson LRMP consist of archaeological sites.

Little historical and ethnographic material is available for this northeastern portion of BC; however, Traditional Use Studies are in different stages of being done in this LRMP area. These are revealing significant archaeological, cultural and heritage sites and traditional use sites.

A Traditional Use Site is any geographically-defined site (on land or water) used traditionally by one or more groups of people for some type of activity. These sites may lack the physical evidence of human-made artifacts or structures, yet maintain cultural significance to a living community of people.
Traditional use sites may include: sacred sites, resource gathering sites such as berry picking and hunting rounds and sites of a legendary or past event of cultural significance.

An archaeological overview assessment for the Fort Nelson planning area was completed in March 1996 (Archaeological Overview of the Fort Nelson Land and Resource Management Plan Area, Heritage North et al. 1996). The study was completed at the 1:250,000 scale and classified the planning area into zones with a low, moderate or high potential to contain archaeological sites. This information will be refined to the 1:50,000 or 1:20,000 scale to assist in operational decision making.

This LRMP Plan is consistent with the British Columbia Archaeological Impact Assessment Guidelines, the Forest Practices Code of BC, the Heritage Conservation Act and the Protocol Agreement on the Management of Cultural Heritage Resources between the Ministry of Small Business, Tourism and Culture and the Ministry of Forests.

The LRMP plan outlines objectives for the entire area, emphasizing recognition and respect of spiritual, cultural and traditional use values; heritage and archaeological sites and values; and Heritage Trails.

The Province has a legal obligation to avoid infringement of Treaty and Aboriginal rights where resource management activities are proposed.

### First Nations, Heritage and Culture

<table>
<thead>
<tr>
<th>Objective</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Avoid infringement of aboriginal and treaty rights</td>
<td>- Complete Traditional Use Study (TUS) for each native band</td>
</tr>
<tr>
<td></td>
<td>- Encourage local band’s participation in archaeological assessment</td>
</tr>
<tr>
<td></td>
<td>- Follow existing policies, guidelines or procedures to protect aboriginal or treaty rights.</td>
</tr>
<tr>
<td></td>
<td>- Identify areas where Treaty or aboriginal rights are being practiced</td>
</tr>
<tr>
<td>- Recognize and maintain traditional uses and values</td>
<td>- Conserve ecological integrity of areas to maintain opportunities for the pursuit of traditional uses</td>
</tr>
<tr>
<td>Identify and manage cultural and heritage resources</td>
<td>Encourage mapping of areas containing cultural heritage</td>
</tr>
<tr>
<td></td>
<td>Encourage Archaeological Impact Assessment (AIA)/Archaeological Impact Study (AIS) to supplement and refine Archaeological Overview Assessment (AOA) map</td>
</tr>
<tr>
<td></td>
<td>Consider undertaking archaeological impact assessments in all areas of High and Medium potential</td>
</tr>
<tr>
<td>Identify, and manage significant Heritage Trails</td>
<td>Locate and map trail locations with historical significance</td>
</tr>
<tr>
<td></td>
<td>Develop a management strategy for significant heritage trails</td>
</tr>
<tr>
<td>Identify and manage heritage and archaeological sites and values (priority sites in the river corridors)</td>
<td>Conserve heritage values through application of a buffer zone, where appropriate. The width of the buffer zone will be site specific and will be decided through lower level planning. All development in the buffer zone will respect and conserve the heritage values of these areas.</td>
</tr>
<tr>
<td></td>
<td>Record known archeological sites with BC Archeological Branch.</td>
</tr>
<tr>
<td></td>
<td>As part of archaeological impact assessments, consider selective impact assessments of Low Potential areas</td>
</tr>
<tr>
<td></td>
<td>Encourage cultural heritage overviews in areas of known significance.</td>
</tr>
<tr>
<td></td>
<td>Conduct activities in a way that is sensitive to known archaeological and heritage values</td>
</tr>
<tr>
<td></td>
<td>Develop management strategies for specific sites at the operational planning process</td>
</tr>
</tbody>
</table>

### 2.1.7 Forestry

The forest sector is vital to the economy in the Fort Nelson planning area. In Fort Nelson there is a skilled work force, advanced technology, economic and political stability, a sophisticated commercial infrastructure and a high quality timber resource.
The general management strategy adopted by the Fort Nelson LRMP is that the forest in the area will be managed for a variety of values by encouraging harvest patterns and block sizes which emulate the natural disturbance patterns found within the planning area. This may require aggregating harvest areas to create forest openings larger than the 60 hectares identified in the Forest Practices Code of BC, along with larger leave strips. Further, the industry will have to move towards:

- enhanced management of forests; and
- increased value added manufacturing.

Management strategies have been designed to ensure a secure and sustainable forest land base and to provide for increased employment opportunities. This will ensure that the economic viability of the Fort Nelson/Liard communities is secured. Further, in key areas, access management and concentrated scheduling of harvesting and silvicultural activities will be a critical component of the integration of forest management with the maintenance of other values. This is especially valid in regard to maintaining a variety of recreational experiences and conserving important wildlife habitat and populations, and cultural and heritage resources.

The LRMP recommends innovative harvesting and silviculture practises in an effort to maintain integrated resource use across the entire plan area. Management strategies recommend silvicultural systems not typically associated with current practice in the timber types in this area (e.g. selective or aggregate harvesting areas). By necessity these processes will be experimental and will need to be evaluated continuously in the years following implementation to assess the success of the practice.

The Forest Practices Code forms the baseline for forest management across the zones and is being implemented to ensure good stewardship of all forest resources consistent with the interests of the stakeholders. Through integration of the rules governing forestry, the Forest Practices Code is intended to provide management flexibility to achieve the goals and objectives identified for forest lands. RMZs are intended to guide more detailed levels of planning. Landscape level planning has been identified as a priority for the implementation phase so that target levels for seral stage distributions can be set.

Forest Renewal BC has been created to provide funding for enhancing employment opportunities for the forest sector and communities. A significant issue in the Fort Nelson area is the amount of land classified as not-sufficiently restocked. With financial support from FRBC an objective of having all backlog areas reforested by the year 2005 has been recommended.
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Maintain and/or enhance the continued sustainable supply of timber</td>
<td>- Promote and encourage forest development through a timely and efficient approval process.</td>
</tr>
<tr>
<td></td>
<td>- Minimize non-recoverable losses through aggressive forest fire suppression and pest management, salvage of damaged or killed timber, and prompt reforestation and stand management regimes.</td>
</tr>
<tr>
<td></td>
<td>- Balance utilization levels in consideration of other resource values.</td>
</tr>
<tr>
<td></td>
<td>- Encourage silvicultural systems that are compatible with other resource values.</td>
</tr>
<tr>
<td></td>
<td>- Appropriate lands will be included within the Forest Land Reserve (FLR).</td>
</tr>
<tr>
<td></td>
<td>- Promote investment in forest resources</td>
</tr>
<tr>
<td></td>
<td>- Improve forest resource inventory information</td>
</tr>
<tr>
<td></td>
<td>- Work toward reforesting all Not Satisfactorily Restocked (NSR) areas with commercial species</td>
</tr>
<tr>
<td></td>
<td>- Rehabilitate previously disturbed forest land</td>
</tr>
<tr>
<td></td>
<td>- Encourage the identification, inventory and harvest of marginally forest types</td>
</tr>
<tr>
<td></td>
<td>- Quantify the Timber Harvesting Land Base (THLB) and develop policies to reduce the loss the THLB to roads, seismic lines, wellsites and other developments.</td>
</tr>
</tbody>
</table>

2.1.8. Guide Outfitting

Some 15 guide outfitting businesses operate within tenured guide outfitting areas that cover all but the extreme northeastern portion of the planning area. The guide outfitting sector is an important component of the local economy and back country tourism industry.

Guided hunts and fishing experiences have been the traditional source of income for the industry. In recent years a number of outfitters have expanded their operations to include non-hunting activities such as guided hikes, trail rides and wildlife viewing.
Historically the guide outfitters have been actively involved in the management of fish and wildlife habitats and populations; the recommendation is that this involvement continue.

Guide Outfitting

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide and maintain guide outfitting opportunities.</td>
<td>• Minimize impacts of commercial and industrial activities on guide outfitter(s) areas.</td>
</tr>
<tr>
<td></td>
<td>• Any coordinated access management planning will include the opportunity for participation by the affected guide outfitter(s).</td>
</tr>
<tr>
<td></td>
<td>• Identify campsites, cabins and critical use areas.</td>
</tr>
<tr>
<td></td>
<td>• Maintain and manage grazing activities associated with guide outfitting.</td>
</tr>
<tr>
<td></td>
<td>• Recognize the rights of existing guide outfitting tenures.</td>
</tr>
<tr>
<td></td>
<td>• Continue the role of guide outfitters in the management of fish and wildlife habitats and populations</td>
</tr>
</tbody>
</table>

2.1.9 Jobs and Community Stability

The residents in and around the Town of Fort Nelson are dependent on the forest and oil and gas industries.

The public and service sectors, tourism and mining round out the list of major employers in Fort Nelson, Toad River, Prophet River and other smaller communities. Due to the high dependence on natural resources, sustainability of the natural resource base is a primary interest of the Fort Nelson LRMP, along with jobs and community stability.

This LRMP recognizes the importance and value of industrial resource development to the district, region and province. Natural resources should be utilized to maintain or increase jobs; resource based industries should be maintained or enhanced; and the importance and value of industrial resource development should be addressed in lower level planning and permitting processes.

More information regarding the employment and community stability can be found in the Fort Nelson LRMP Base Case and Recommended Fort Nelson Land and Resource Management Plan.
Socioeconomic/Environmental Impact Assessment Reports which are summarized in Section 3.0 and bound under separate cover as Appendices.

2.1.10 Minerals

Northeastern British Columbia has significant mineral resource potential supported by a mineral occurrence inventory, existing tenure and exploration and development activity. The area has had limited exploration; significant opportunity remains to identify and develop mineral resources. New and renewed interest in the area has been generated by geological theory; updated geological surveys; recent exploration success in the Gataga lead and zinc trend extending south of the Fort Nelson district; and new development in the Yukon. Mineral exploration and development (mining) are temporary uses of the land with stringent requirements for reclamation of all surface disturbances. Comprehensive review and approval processes exist for mining proposals to ensure all technical, social and environmental aspects are completely assessed. Only small areas of land are used for development, but access to a large land base is required for exploration.

This plan confirms that mining and related road access developments are acceptable uses of the land outside of protected areas; while considering environmental values within the regulatory framework. In combination with the management direction recommended through the objectives and strategies, the existing review and approval process will ensure that mining will be consistent with the level of management prescribed for each Category of Resource Management Zones and the individual Resource Management Zone. Advanced exploration and development activities clearly have an impact on small areas and this plan directs that these will be accommodated, to the degree possible. The first strategy in this section addresses the principal of adaptive management, which accommodates and integrates mineral development on the land base. This principal combined with the direction from the plan will define a regime that can provide for exploration and development activities in all zone categories, except the Protected Areas. The access management section of this plan, along with the general and specific objectives and strategies, provide further direction for access related to mineral exploration and development.

Minerals

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Maintain opportunities and access for mineral exploration and development.</td>
<td>- Accommodate localized impacts of advanced exploration and development activities</td>
</tr>
</tbody>
</table>

Recommended Fort Nelson Land and Resource Management Plan
2.1.11. Outdoor Recreation and Tourism

Within the LRMP planning area there is a high level of tourism/recreational use which is derived from outdoor related activities. Tourism and outdoor recreational use occur across a range of settings from remote wilderness experience with low probability of encountering other users to highway based recreational activities, both on land and water. They range from hiking, hunting, camping, trail riding wildlife viewing, fishing, canoeing, jet boating to cross country skiing and snowmobiling. Undisturbed natural settings, areas modified by development and accessible by the public, scenic areas and the opportunities to access wildlife and fisheries resources are important to experience the whole range of recreation opportunities.

The historic Alaska Highway is the main transportation corridor and dominant travel route through the plan area. Tourists enroute to and from Alaska enjoy the scenic areas along the main travel corridors. Maintaining, and in some cases expanding facilities along the highway will encourage travelers to stop and explore the area and generate additional tourism
revenues. Business travel is also another important tourism component because of Fort Nelson's role as a regional economic center.

To provide opportunities for growth in the back country component the LRMP recommends following the framework provided in the BC Lands Backcountry Recreation Policy.

In addition to the general and category objectives and strategies the LRMP has developed a specific strategy referring to the Ministry of Forests' Recreational Opportunity Spectrum (ROS). The ROS is used to identify the complete spectrum of recreational opportunities. The ROS objectives will be used to guide the management of recreational values, especially in wilderness areas, recognizing that these values may change over time as roads are built and deactivated. The intent of this objective is not to determine or recommend which activities are acceptable, but is designed to give general guidance and offer a comparison, from zone to zone, of the desired state of recreational opportunities over time. This will be achieved through temporal and spatial variations across the zones. (i.e., the ROS component can move across the landscape and the specified classification may fluctuate over time). A more detailed explanation of the ROS classification system is given in the glossary.

**Outdoor Recreation and Tourism**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide opportunities for a diverse range of recreational values and uses across the biophysical settings of the planning area.</td>
<td>• Identify broad areas of high recreation use or significance. Through operational, develop specific prescriptions that recognize the unique recreational features of these areas, and integrate recreational uses with other values that are present.</td>
</tr>
<tr>
<td></td>
<td>• Operational plans will identify small, special recreation features such as sites and trails and develop site specific practices which recognize these features.</td>
</tr>
<tr>
<td>• Maintain or enhance ecological integrity in areas subject to impacts from recreational use.</td>
<td>• More detailed plans will address the impact of recreational activity on ecological integrity, for example wildlife disruption, damage to plant communities and water quality.</td>
</tr>
<tr>
<td></td>
<td>• Monitor to ensure public and commercial recreation activities do not exceed acceptable limits of use.</td>
</tr>
<tr>
<td>• Maintain quality of recreation activities.</td>
<td>• Conduct visual quality inventories for recreation and tourism areas</td>
</tr>
</tbody>
</table>
Outdoor Recreation and Tourism (cont’d)

- Provide tourism opportunities.
- Ensure the continued existence of quality experience in areas used for commercial tourism.
- Provide opportunities for existing operators to expand where appropriate, or new operators to come in if an area is able to sustain increased use.

- Identify and provide opportunities for use of Crown land suitable for future development of resort and wilderness tourism operations.
- Manage levels of recreational use to maintain the quality of the experience and the natural environment.
- Identify areas suitable for expansion through inventory.

2.1.12. Protected Areas

The Fort Nelson LRMP table has made recommendations consistent with the direction provided in the Protected Areas Strategy (PAS) and by the Land Use Coordination Office (LUCO). The goals of the Protected Areas Strategy are: to protect specific lands for their special value for wildlife, wilderness, recreation, culture and heritage and as representative examples of natural diversity found in each of the province’s eosections; and to protect smaller natural, recreational and cultural features. The areas meeting the first goal of representation are usually larger than 3000 ha.

Logging, mining, hydroelectric and oil and gas exploration and development will not occur in Protected Areas unless specific recommendations have been made by the Working Group.

In June 1995, the Land Use Coordination Office directed the LRMPs in the Omineca-Peace, to recommend an aggregate 9% (including 1.9% of existing protected areas in the region). The Fort Nelson LRMP was directed to work towards a target of 11.4%; the LRMP has achieved this target.

The intent of the Working Group is that historic activities (e.g. trapping, grazing, guide outfitting, etc.) be allowed to continue.

General Management Direction for Protected Areas is based on A Protected Area Strategy for British Columbia (1993) and is outlined in the Resource and Recreation Use Guidelines for Protected Areas (August 1995), included in Appendix.
2.1.13 Soil

Soil is one of the most important resources in the planning area, as it provides the foundation for all vegetation. The intent of this plan is to ensure that the soil resource is adequately protected.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Minimize soil productivity losses.</td>
<td>• Implement soil disturbance guidelines for all activities</td>
</tr>
<tr>
<td>• Minimize off-site impacts due to soil disturbance.</td>
<td>• Use road construction and maintenance procedures designed to minimize impacts</td>
</tr>
</tbody>
</table>

2.1.14. Transportation and Utility Corridors

Within the Fort Nelson LRMP plan area there are existing transportation and utility corridors and sites. The direction of the plan is to maintain and utilize existing corridors and sites whenever possible for future developments. Any corridor infrastructure or expansion needs will be coordinated with other users through a coordinated access management planning or other appropriate referral process. All maintenance and upgrading of corridors and sites will take place with sensitivity to the other values identified for the area. Planning for transportation and utility corridors will include deactivation, where it is appropriate (e.g. corridor or site no longer required). The deactivation plans will require that all affected agencies and stakeholders be contacted.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Maintain transportation routes and utility corridors</td>
<td>• Provide for highways to be improved.</td>
</tr>
<tr>
<td>• Maintain opportunities for communication sites, repeater sites, airstrips.</td>
<td>• Provide for utility corridors and sites to be constructed to accommodate tie-ins, upgrades to existing and twinning of existing pipelines.</td>
</tr>
<tr>
<td>• Provide opportunities for new transportation, utility corridors and communication sites outside of protected areas.</td>
<td>• Accommodate expansion of existing and development of new transportation, utility corridors and communication sites and airstrips.</td>
</tr>
<tr>
<td>• Provide opportunities for new transportation, utility corridors and communication sites outside of protected areas.</td>
<td>• Provide for new roads to be constructed for industrial, commercial and recreational use</td>
</tr>
</tbody>
</table>

Recommended Fort Nelson Land and Resource Management Plan
Transportation and Utility Corridors (cont’d)

| Reduce wildlife/vehicle interactions (e.g. caribou, moose) | Inventory and research to determine most effective method to use. Examples of projects that have been tried with some success are signing, seeding with non palatable species and use of road side deflectors |

2.1.15. Trapping

The diverse landscapes within the planning area are host to a variety of commercially harvested fur bearers including marten, lynx, beaver, coyote and fox. There are registered traplines or portions of traplines, covering the entire planning area.

Trapping is socially and economically important, especially among First Nations communities where traplines are often held by families.

A concern for many trappers is the need for adequate notification of pending land and resource developments that could potentially have a negative impact on their interests. The Ministry of Environment, Lands and Parks (BC Environment’s Fish and Wildlife Branch) issues and administers trapping tenures. In recent years, BC Environment provided resource developers with trapper information, however due to the Freedom of Information Act, BC Environment can no longer release a trapper’s personal information without the permission of the trapper.

Other resource management agencies, such as the Ministry of Employment and Investment (Energy Resources Division) have initiated a Trapper Notification Program to ensure that trappers are adequately notified pending developments. To participate in the program, trappers must authorize the release of their personal information.

Trapping

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide and maintain opportunities for trapping.</td>
<td>• Commercial/industrial operators to work with trappers to minimize impacts of their activities on fur bearer habitat and trapline operations.</td>
</tr>
<tr>
<td></td>
<td>• Coordinated access management planning will include the opportunity for participation by the trapline holder.</td>
</tr>
<tr>
<td></td>
<td>• Identify campsites, cabins and critical use areas.</td>
</tr>
<tr>
<td></td>
<td>• Recognize existing trapline tenure rights.</td>
</tr>
</tbody>
</table>
2.1.16. Visual Quality

Visual quality is the extent to which the aesthetic or scenic value of a landscape is maintained or altered compared to the pre-existing or natural condition. While resource development drives the economy of the Fort Nelson planning area, the community recognizes the importance of maintaining the aesthetic values of the landscape. Development in the energy, forestry and mineral sectors can occur while managing for visual quality associated with scenic areas, important recreational areas, rivers and streams and important natural features. Some of the important areas identified for visual quality management are the major rivers, Alaska Highway corridor and the more popular back country recreational areas.

Visual quality will be managed through existing legislation and regulation, including the Visual Quality Objective (VQS) management system of the Ministry of Forests.

Visual Quality Objectives are acceptable degrees of change from the natural appearing landscape caused by land-use alterations, such as logging or road-building.

The LRMP Working Group recognizes that events such as forest pest infestations, fires or major windthrow, or subsurface and other resource values may require a re-assessment of visual requirements. Establishment of a ‘master VQO’ means that a range of VQO’s within the viewscape will exist (due to topographical variations), with an emphasis towards one type of VQO designation. Specific recommendations regarding visual sensitivity around lakes and other areas are made in each RMZ.

Visual Quality Objectives could be implemented through the following process: Conduct inventory and recommend VQO’s → approve VQO’s = design and propose activity to comply with VQO = approve activity and review results. It should be noted that Visual Quality Objectives may change over time, due to new inventory information and changing public values.

Visual Quality

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Manage for visual quality</td>
<td>- Identify visually sensitive areas, and recommend master VQO’s.</td>
</tr>
<tr>
<td></td>
<td>- Identify and assess visual values and consider these values in integrated resource management.</td>
</tr>
</tbody>
</table>

Recommended Fort Nelson Land and Resource Management Plan
Visual Quality (cont’d)

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.
- Establish master VQO’s for those lakes which currently do not have a VQO recommended.

- Manage for visual quality associated with lakes, respecting their scenic values and visual sensitivities.

2.1.17 Water

The water resources within the planning area are within the Arctic watershed. The plan area is drained by the Liard River and its major tributaries: the Fort Nelson, Prophet, Muskwa, Toad, Petitot and Kechika rivers. A minor portion of the area near the Alberta border is drained by the Hay River which flows toward the MacKenzie River.

Community water supplies require special consideration to maintain a high quality of drinking water and community health. The Town of Fort Nelson and Fort Nelson Indian Band draw their water supply from the Muskwa River. The community at Prophet River and the Indian Band draw water from Adsett Creek, and the community of Toad River draws its water from the Toad River. Groundwater reserves are scarce and are used sparingly.

Water

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Ensure existence of acceptable levels of water quality and quantity</td>
<td>- Identify priority watersheds and conduct the appropriate level of watershed assessment and implement resulting recommendation in operational plans</td>
</tr>
<tr>
<td>- Maintain watershed hydrological integrity</td>
<td>- Upon review of applicable watersheds, implement procedures to rehabilitate negatively impacted watersheds to improve water quality and/or stream flow regimes to a sustainable level.</td>
</tr>
<tr>
<td></td>
<td>- Minimize man-made changes to stream configurations</td>
</tr>
<tr>
<td></td>
<td>- Manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative impacts to water quality</td>
</tr>
<tr>
<td></td>
<td>- Determine and maintain instream flow requirements for acceptable levels of quality and quantity</td>
</tr>
</tbody>
</table>

Recommended Fort Nelson Land and Resource Management Plan
2.1.18. Wildlife

The area supports an abundance of wildlife in a mixture that differs from the rest of the province. The area includes the transition from the Northern Boreal Mountains to the Taiga Plains and provides for:

- 12 large mammal species (many at the highest population level in the province);
- relatively intact large predator-prey systems;
- wild and diverse fish stocks; and
- species at risk or of regional significance.

Wildlife includes vertebrates that are mammals, birds, reptiles or amphibians, fish, invertebrate crustaceans and mollusks. Key to conserving these wildlife species is the conservation of their habitat.

The management objective for wildlife in the planning area is to achieve the following goals:

- maintain the diversity and abundance of wildlife;
- maintain the integrity and diversity of existing habitats and ecosystems (including functional large predator-prey systems);
- maintain threatened and endangered habitats, and the habitats of rare and endangered species;
- pursue resource management alternatives that favour ecological integrity;
- protect life and property from wildlife; and
- provide for recreational use such as viewing, hunting and appreciation of wildlife.

The management objectives and strategies recommended in the plan are intended for all wildlife species, in some RMZs more specific management is directed at red- and blue-listed and regionally significant species (as defined in the Forest Practices Code). In some cases, one or several species are identified. In these cases the objectives and strategies are still meant for all wildlife, but the designated species require management emphasis.

Wildlife

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Provide for habitat needs of all wildlife.</td>
<td>* Special attention will be paid to those red- and blue-listed species, and regionally significant species.</td>
</tr>
</tbody>
</table>
| * Manage wildlife habitats and populations to meet both consumptive and non-consumptive demands within IRM goals and land capability | * Identify and map important habitat elements.  
* Manage forests for a diversity of age classes and forest stand structure across the landscape. |
<table>
<thead>
<tr>
<th>Wildlife (cont'd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Manage for fur bearer habitats</td>
</tr>
<tr>
<td>- Identify and map important fur bearer habitats and habitat components for</td>
</tr>
<tr>
<td>consideration in more detailed strategic and operational planning process.</td>
</tr>
<tr>
<td>• Maintain waterfowl habitat and minimize impacts on waterfowl</td>
</tr>
<tr>
<td>- Ensure industrial activity is sensitive to waterfowl habitat by minimizing</td>
</tr>
<tr>
<td>disturbance and habitat loss</td>
</tr>
<tr>
<td>- Conserve critical waterfowl habitat by identifying critical waterbodies and</td>
</tr>
<tr>
<td>reviewing for consideration as Wildlife Habitat Areas.</td>
</tr>
<tr>
<td>- Conserve trumpeter swan nesting habitat by providing visual screening, and</td>
</tr>
<tr>
<td>minimizing disturbance by following guidelines.</td>
</tr>
<tr>
<td>• Maintain a diversity of non-game wildlife.</td>
</tr>
<tr>
<td>- Identify and map stick and cliff nest sites to provide information for</td>
</tr>
<tr>
<td>operational planning.</td>
</tr>
<tr>
<td>• Maintain effective spatial and temporal habitat continuity</td>
</tr>
<tr>
<td>- Design connectivity corridors between important habitat areas where</td>
</tr>
<tr>
<td>ecologically appropriate. (e.g. Wildlife Habitat Areas (WHAs), Forest</td>
</tr>
<tr>
<td>Ecosystem Networks (FENs))</td>
</tr>
<tr>
<td>- Identify riparian connectivity corridors based on riparian vegetation</td>
</tr>
<tr>
<td>- Industrial development should avoid riparian connectivity areas or where</td>
</tr>
<tr>
<td>development proceeds, impacts should be minimized on riparian values.</td>
</tr>
<tr>
<td>• Conserve and maintain the genetic diversity of wild fish stocks</td>
</tr>
<tr>
<td>- Establish a catalogue of wild fish stocks.</td>
</tr>
<tr>
<td>- Identify and map existing fish distributions</td>
</tr>
<tr>
<td>• Maintain sports and sustenance fisheries</td>
</tr>
<tr>
<td>• Maintain habitat and water quality for priority fish species (e.g. bull trout</td>
</tr>
<tr>
<td>grayling, red-and blue-listed species)</td>
</tr>
<tr>
<td>- Manage fish harvest where and as required to maintain sustainable population</td>
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<td>levels.</td>
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2.2 Categories of Resource Management Zones (RMZ)

2.2.1 Introduction

The plan area has been divided into 37 Resource Management Zones (RMZ), two of which have subzones identified to give direction for local level planning (Etsho and River Corridors East). Each RMZ contains specific resource values and management objectives and strategies which set out the types of activities and level of intensity permitted in individual zones.

The LRMP identified a framework for four categories of land use which reflects the spectrum of activities and values represented at the planning table. Each category is made up of a combination of similar RMZs. Management objectives and strategies have been developed for each category based on information available about the resources. The management intent for each category is described through these objectives and strategies, rather than operational prescriptions, this is to reflect the interest-based nature of the plan and to encourage creative solutions to resource integration. The management strategies for a category may include direction to do more detailed strategic and operational plans.

The four categories of Resource Management Zones are:

1. **Enhanced Resource Development** - Representing approximately 36% (3,564,900 hectares) of the land base. This category gives direction to manage land for oil and gas, mineral and timber resources, with an emphasis on the recreation and tourism resources along the highway corridor. This category is made up of the Resource Management Zones where investments in resource development are encouraged. This category builds on existing legislation and regulations. There are 4 RMZs in this category.

2. **General Resource Development** - Representing approximately 24% (2,445,000 hectares) of the land base. The intent in this category is to manage for a wide array of integrated resource values. In these RMZs resource development will be integrated with the requirements of other resource values. Developments are subject to all applicable provincial regulations. There are 10 RMZs in this category.

3. **Muskwa-Kechika Special Management** - Representing approximately 29% (2,911,700 hectares) of the land base. This category gives direction to manage in such a way that resource development can proceed while minimizing impacts on other resource values. The Resource Management...
Zones within this category contain the most restrictive objectives and strategies for development. There are 16 RMZs in this category.

4. Proposed Protected Area - Representing approximately 11% (1,051,000 hectares) of the land base. This category contains the zones that are proposed for protected area designation for natural, cultural, heritage and/or recreational values as defined by the Protected Area Strategy for BC. Logging, mining, energy and hydroelectric exploration and development are prohibited. There are 7 Goal 1 Resource Management Zones and 13 Goal 2 sites identified in this category.

The General Resource Development and Special Management Categories have sub-categories to describe the Major River Corridors.

**Major River Corridors** form an important component of the landscape. Water generally flows north-east, from the mountains and foothills through the muskegs dominated plains towards the Arctic Ocean.

The river corridor ecosystems contain some of the highest diversity of plants and animal species; they provide critical habitats including home ranges, travel corridors, winter cover, nesting, foraging and reproductive sites. Wildlife for which these corridors are particularly important include fish, Grizzly bear, ungulates, fisher, marten, golden and bald eagles, neotropical migrants and waterfowl. As a component of landscape level biodiversity, the river corridors connect uplands to rivers, and upper headwaters to valley bottoms. These ecological linkages are essential for meeting stand and landscape level biological diversity objectives in land use management. The ecosystem of the river corridors are generally more sensitive to disturbance than the upland sites, and additional precautions are necessary to maintain the ecological integrity of these systems.

The forest stands found in the river corridors are more productive and have a lower frequency of natural disturbance than the upland sites, which increase their value for wildlife and the forest industry.

Major River Corridors are important due to high potential for archaeological and cultural/heritage sites and trails, and recreation and scenic value. All of the river corridors are used for these reasons. Users of the forest resource depend on the river corridors for transportation throughout the year.

There are five Resource Management Zones categorized as General Resource Development Major River Corridors and four as Special Management Major River Corridors.
CATEGORIES OF RESOURCE MANAGEMENT ZONES

- Enhanced Resource Development RMZs
- General Resource Development RMZs
  - Major River Corridors
- Special Management RMZs
  - Major River Corridors
- Proposed Protected RMZs

FORT NELSON LRMP
CATEGORIES OF RESOURCE MANAGEMENT ZONES

Scale 1:1,640,000 (Approximate)
2.2.2. Enhanced Resource Development Category of Resource Management Zones

Intent:
- To manage land for oil and gas, mineral and timber resources
- To manage the highway corridor to enhance the recreation and tourism resources.

The management intent for these RMZs is to provide for intensive development of resources such as timber, natural gas and minerals. The objectives and strategies for managing other resource values will be applied in such a way that recognises the resource development priority of the zone. The objectives and strategies also cover important cultural, heritage bird habitat and trapping values. Investments in resource development and enhancement will be encouraged in this category.

These zones have had a substantial amount of past activity from oil and gas exploration and development and timber harvesting activities.

The Enhanced Resource Development Category of RMZs is shown in Figure 3, and the RMZs are listed below:

- Alaska Highway Corridor
- Etsho
- Fort Nelson
- Klua

The following objectives strategies apply to all the RMZs in the Enhanced Resource Development Category (the second level of management direction). Where a specific objective or strategy is not listed for a resource value, the first level of management direction (given by the General Management Direction (Section 2.1)) applies. In addition each RMZ may have site specific objectives and strategies listed to accommodate specific resource values and concerns (the third level of management direction).

Objectives
- Manage for a component of Roeded Resource (ROS)

Strategies
- Where significant concerns exist new access will be co-ordinated with access requirements of other resource users through access management planning.
- Identify and map aggregate, sand and gravel inventory and potential.
- Identify and map important habitat elements of red- and blue-listed and regionally significant species for consideration for Wildlife Habitat Areas.
Enhanced Resource Development Category

2.2.2.1 Alaska Highway Corridor Resource Management Zone

Area: 93,700 ha

This RMZ contains the Alaska Highway from Trutch to the Liard River bridge. The rest of the Highway (west of the Liard River) is within the Liard River corridor North RMZ (Section 2.2.3.7).

The Alaska Highway Corridor is based upon the area that is visible from the Alaska Highway. The zone is represented as a corridor for simplicity, however it varies in width depending on topography. The boundaries of the RMZ are based on the Visual Quality Objectives.

This zone crosses four ecossections: Eastern Muskwa Ranges, Fort Nelson Lowlands, Muskwa Foothills and Muskwa Plateau; and is covered by two biogeoclimatic zones: Boreal White and Black Spruce and Spruce-Willow-Birch.

Communities along the highway include Prophet River, Fort Nelson, Toad River, Muncho Lake, Liard River, Fireside and Coal River. The last three communities are within the Liard River Corridor North RMZ.

Portions of the old Alaska Highway are of particular interest as historical sites. The highway was built in 1942 by the U.S. army as a land route to Alaska. The route followed traditional trails and many native and non-native trappers were used as guides. Due to the fact the highway followed traditional trails the potential for traditional use, heritage and cultural sites is high.

Most tourism revenues and employment in the area flow from highway traffic and associated businesses. Visitors travelling the highway take part in activities such as hiking, hunting, fishing, camping, wildlife viewing and general sight-seeing.

Industrial activities, (which include forest management, energy and mineral exploration and development) will be given direction through a variety of strategies designed to manage for visual quality.

This RMZ is important as a source for sand and gravel. The mineral assessment indicates there is significant potential for industrial minerals.

Vehicle accidents involving large wildlife species straying onto the highway is an ongoing safety concern.
CATEGORIES OF RESOURCE MANAGEMENT ZONES

Enhanced Resource Development RMZs

FORT NELSON LRMP
ENHANCED RESOURCE DEVELOPMENT CATEGORY OF RESOURCE MANAGEMENT ZONES
Enhanced Resource Development Category - Alaska Highway Corridor RMZ

There is a small area identified around the settlement of Toad River, referred to as the Toad River Residential Area. In this area the traditional use of All Terrain Vehicles (ATVs) will be reviewed in a local level planning process, which will include input from the community.

Tourism sector opportunities are important in this RMZ. The management in this zone encourages expansion of tourism related facilities (e.g. lodges) along the highway.

The original highway route followed the historic trail of the local First Nations. The highway has historical and current use by Sikani, Slavey, Cree, Beaver and Kaska cultures of the Prophet River, Fort Nelson and Lower Post First Nations. There are known traditional use, archaeological, heritage and cultural sites throughout the corridor. The Prophet River Indian Band community is located within this RMZ.

Objectives:

1. Maintain or enhance visual quality within the Alaska Highway Corridor and settlements area.

2. Provide for quality public and commercial recreational opportunities and values.

3. Reduce wildlife/vehicle interactions (i.e. caribou, moose).

4. An appropriate level of deactivation is required for all access no longer required for resource management. (Intent: minimize effects of roads on wildlife and wildlife habitat.)

5. Manage for a component of Roadded Resource(ROS).

6. Recognize and maintain traditional use, cultural and heritage sites.

Strategies:

- Manage all development activities in a manner that will achieve the VQO's.

- Promote recreational activities that enhance highway based tourism with emphasis on destination activities.

- Identify the areas where the safety concerns are. MOTH and BCE to address at local level utilizing tools available (e.g. signs, seeding, etc.).

- More detailed strategic and operations plans should consider buffers for important wildlife habitat elements.

- Determine and maintain instream flow requirements for fish.
Enhanced Resource Development Category

2.2.2.2 Etsho Resource Management Zone

Area: 3,005,000 ha

This large area is made up of a rolling upland that rises above the Fort Nelson Lowlands to the south and the Petitot Plain to the north. It has extensive lowlands and low rolling plateau’s that overlay flat-lying sedimentary rock. The entire area is covered by one biogeoclimatic zone: Boreal White and Black Spruce. The escarpments are dominated by aspen and white spruce forest stands; and there are extensive areas of muskeg, especially in the east. Historically the area has been disturbed frequently by wildfire.

The zone is resource based and several permanent camps and various seasonal ones exist in this area, associated with energy and forest development. All three of the all weather roads in the plan area are in or cross through this zone: the Alaska Highway, Liard Highway and the Sierra-Desan road. There are also many winter roads in this area including Cabin Lake and Pego roads, Kotcho, Patry, Pine and Liard mainlines. This area has potential and proven energy reserves along with significant natural gas production and infrastructure. The majority of existing oil and gas tenures, activity and existing infrastructure are located in this zone. There is a high potential for the discovery of new reserves. Gravel reserves exist in small pockets.

This area has both present and future operating areas for both the softwood and hardwood timber industries. There is potential for long-term timber management. Both deciduous and coniferous stands are in the Timber Harvesting Land Base as determined through the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Analysis. There will be areas within this RMZ where intensive forest management is practiced at the stand level to maintain or enhance the timber supply.

Healthy populations of large carnivores and ungulates are widespread throughout this area. Black bear are common, as are wolves, coyotes, and other large and small fur bearers. Caribou, moose, and deer prosper here. Small mammals, raptors, owls, cavity nester’s, and waterfowl are commonly found throughout the area. Both bald and golden eagles are often sighted. The small lakes and ponds provide important nesting and staging sites for trumpeter swans an other water fowl. Fish species include bull trout, mountain whitefish, Arctic grayling, lake whitefish, northern pike, pickerel, inconnu, and cisco.
Enhanced Resource Development Category - Etsho RMZ

This area is very important to the trappers for its fur resources.

The recreational opportunities include hunting, fishing, boating, camping, hiking, picnicking, horseback riding and ATV use. The extensive network of roads and trails allows for access throughout the entire RMZ.

There is historic and current use of this RMZ by the Slavey, Beaver and Cree cultures of the Fort Nelson and Fort Liard First Nations. The eastern portion has use by the Dena Tha First Nations. There are numerous gathering, traditional use, heritage and cultural sites throughout the zone, most of these are linked to the trapping, hunting and fishing values. There is medium to high density of clustering of sites by all three First Nations. The known site locations are the: Kotcho Lake Village site and the associated trails are; Simpson heritage and Sierra.

Objectives

1. Enhance timber harvesting and a sustainable long-term timber supply

Strategies

- Establish general forest production targets for landscape units within the Resource Management Zone consistent with high intensity forest management.

- Reforest (within appropriate time frames, as determined through landscape unit planning) all potentially productive brush, non-commercial deciduous and Non Sufficiently Restocked (NSR) areas with ecologically and commercially suitable species while providing for critical wildlife habitat.

- Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks), to increase timber availability and reduce roading requirements.

- Plan patch size, access, disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits identified in the biodiversity guide for this Natural Disturbance Type. Stand level biodiversity to focus on riparian areas and wildlife tree patches.

- Identify and map caribou populations and habitats to provide information for more detailed strategic or operational planning processes.
2. Maintain opportunities and access for oil and gas exploration, development and transportation.

- Promote and encourage oil and gas exploration activities through a timely and efficient permitting process.
- Encourage investment in exploration, development and transportation of energy resources.

3. Identify and provide for the protections of traditional use, archaeological, cultural and heritage sites.

- Identify all known sites within this RMZ and develop appropriate management strategies.

2.2.2.2.1. Maxhamish - Sandy Creek Subzone

The area between Maxhamish Lake Proposed Protected Area, Sandy Creek and the Northwest Territories border has been identified as a subzone of the Etsho RMZ.

Within this subzone there is potential for timber harvesting, and has been identified as a current operating area by the forest industry. The timber within this subzone is included in the Timber Harvesting Land Base in the 1992 Coniferous Timber Supply Analysis.

The subzone has potential for oil and gas.

This area has historical and current use by the Slavey, Beaver and Cree cultures of the Fort Nelson and Fort Liard First Nations. There are currently traditional use, known heritage and cultural sites and values which have been identified. This area is also significant to the First Nations for its hunting, trapping and fishing values. The native settlement of Francois is in this subzone, as are large burial grounds.

This LRMP identified this as an area that requires special management strategies to be developed to accommodate the First Nations values together with the development of the forest and oil and gas resources. The LMRP direction is that this subzone is a priority for subsequent planning to develop management prescriptions. The subsequent planning process will include the government agencies, stakeholders and public who have an interest or concern in the area. A portion of this subzone is within the Rivers Corridors East RMZ. There is no additional direction given in that RMZ.
Enhanced Resource Development Category

2.2.2.3 Fort Nelson Resource Management Zone

Area: 143,100 ha

This RMZ consists of areas that provide for settlement use of Crown lands as outlined in an Official Community Plan, Crown Land Plan or LRMP. Significant uses in these lands are residential, commercial, industrial, agricultural and institutional. The boundaries for the zone are drawn from existing community, settlement and municipal plan boundaries. This zone surrounds existing settlement which is generally private land with some Crown Land included; this zone includes most of the Agriculture Land Reserve and the Fort Nelson Indian Band Reserve.

The Town of Fort Nelson and private lands are not included in the designation of Enhanced Resource Development Zone. This plan applies to the resources on provincial Crown land.

The significant activities include forestry and petroleum development. This zone has existing oil and gas tenures, Westcoast Energy's gas plant and a sulphur recovery plant. Also this RMZ is an important source of sand and gravel resources which are used at a local level.

All of the facilities supporting the forest industry are located in this zone, including a sawmill, plywood plant and oriented strand board plant.

This zone supports the area where it would be possible to provide opportunity for the expansion of agriculture. The main farming enterprise is cropping for hay; there are also beef, horse and bison enterprises. Most of the agricultural activity takes place in the McConachie Creek and Jackfish Creek area.

This area has been used traditionally by First Nations and was home for the early commercial fur trapping industry prior to the construction of the Alaska Highway. Fort Nelson was established as a fur trade post in 1805 by the North West Company. It operated until 1823, when deterioration of the relationship between the natives and the Hudson Bay Company resulted in confrontations throughout the Region and the death of a number of company personnel. Fort Nelson was re-established twice at the confluence of the Muskwa River and Fort Nelson Rivers in 1865 which is a recognized heritage site. The original 1805 fort was approximately 95 kilometres

1 Named for Grant McConachie, bush pilot and one of the founders of Canadian Pacific Airlines.
downstream from the 1865 location. Trapping was the main activity in the area until the late 1930's. Fort Nelson was the administrative centre for the region with transportation links by way of the Fort Nelson and Liard rivers to Fort Simpson in the North West Territories, by trail to Fort St. John and Alberta. The strategic importance of the area during World War Two resulted in the development of Fort Nelson as a staging base for the construction of the Alaska Highway and the community was transformed from a small trading village to a transportation centre. Fort Nelson was incorporated into a village in 1971. In 1988 Fort Nelson was upgraded to Town status and the Fort Nelson Liard Regional District was incorporated on the same date.

The overall management intent in this RMZ is to meet the objectives set out in approved community and land use plans; provide crown land where it is identified in Official Community Plans for community; industrial and agricultural development; and ensure the opportunities for commercial enterprises are available around the town to provide service to the tourist and business traffic.

Historic and current use in this RMZ is by the Slavey, Beaver and Cree cultures of the Fort Nelson and Prophet River First Nations. There are numerous know traditional use, archaeological, heritage and cultural sites, especially along the river corridors, where there is high density clustering of sites. There are hunting, trapping and fishing values for the First Nations.

The Fort Nelson Indian Band reserve #2 is in this RMZ. Other features include the Old Fort Nelson Village Site #1 and #2.

Objectives:

1. Manage the visual quality around the Town of Fort Nelson.

2. Manage for a component of Roaded Resource (ROS)

3. Manage to avoid negative bear/human interactions.

Strategies:

• Where established VQO's will guide incidental timber cutting associated with other resource user activities.

• Provide input to municipal, agricultural or other planning as required.

• Promote recreational activities that enhance highway-based tourism with an emphasis on destination activities.

• To minimize negative bear/human interactions public education will focus on: informing the public on dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.
## Enhanced Resource Development Category - Fort Nelson RMZ

4. **Maintain the structural and functional integrity of the watercourse/waterbody.**
   - Limit man-made changes to stream configurations for 1km upstream of water intake for Fort Nelson town on Muskwa River.

5. **Provide opportunities for the growth of agriculture**
   - Provide for Crown lands with suitable agriculture potential to be designated for agriculture development and use, within the appropriate regulatory framework.
   - Develop target animal unit month (AUM) levels of use for both wild ungulates and domestic livestock.

6. **Enhance timber harvesting and a sustainable long-term timber supply**
   - Establish general forest production targets for landscape units within the RMZ consistent with high intensity forest management regimes.
   - Reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non-commercial deciduous, and Non Satisfactorily Restocked (NSR) areas with ecologically suitable species while providing for critical wildlife habitat.
   - Plan patch size, access, disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits identified in the biodiversity guide for this Natural Disturbance Type. Stand level biodiversity to focus on riparian areas and wildlife tree patches.
   - Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks), to increase timber availability and reduce road requirement.

7. **Maintain opportunities and access for oil and gas exploration, development and transportation.**
   - Promote and encourage oil and gas exploration activities through a timely and efficient permitting process.
   - Encourage investment in exploration, development and transportation of energy resources.
2.2.2.4 Klua Resource Management Zone

Area: 323,100 ha

This RMZ is a part of the lowlands of the Muskwa Plateau and is characterized by black spruce complexes with intermittent muskeg areas. This zone is covered by one biogeoclimatic zone: boreal white and black spruce. The escarpments near the Klua Lakes are some of the noted landscape features and they are dominated by aspen and white spruce stands.

This area has existing oil and gas tenures. Oil and gas exploration, developments and infrastructure and associated activities are present in the area.

This area has both present and future operating areas for both the softwood and hardwood timber industries. There is potential for long-term timber management. Both deciduous and coniferous stands are in the Timber Harvesting Land Base as determined through the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Analysis. There may be areas within this RMZ where intensive forest management is practiced at the stand level to maintain or enhance the timber supply.

There is historical and current use in this RMZ by the Slavey, Beaver, Cree and Sikani cultures of the Fort Nelson and Prophet River First Nations. There are numerous known trails, grazing areas, traditional use, archaeological, heritage and cultural sites throughout. There are hunting, trapping and fishing values throughout the RMZ. The area in the Klua Lake drainage and between the Klua Lake Proposed Protected Area and the Alaska Highway is especially important to the Prophet River First Nations.

There are numerous native pack trails throughout, and the Fort Nelson-Klua heritage trail.

Objectives:

1. Manage visual quality from Alaska Highway Corridor, around Mt. Bigfoot and Mt. Yakatchie.

2. Provide opportunities for non-commercial back-country recreation uses.

Strategies

- Where established VQO's will guide incidental timber cutting associated with other resource user activities.

- Promote recreational activities that enhance highway-based tourism with emphasis on destination activities.

Recommended Fort Nelson Land and Resource Management Plan
3. Enhance timber harvesting and a sustainable long-term timber supply

- Establish general forest production targets for landscape units within the RMZ consistent with high intensity forest management regimes.

- Reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non-commercial deciduous, and Non Satisfactorily Restocked (NSR) areas with ecologically suitable species while providing for critical wildlife habitat.

- Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks), to increase timber availability and reduce road requirements.

- Plan patch size, access disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits of the biodiversity guide for this Natural Disturbance Type. Stank level biodiversity to focus on riparian areas and wildlife tree patches.

4. Maintain opportunities and access for oil and gas exploration, development and transportation.

- Promote and encourage oil and gas exploration activities through a timely and efficient permitting process.

- Encourage investment in exploration, development and transportation of energy resources.

5. Identify and provide for the protection of traditional use, heritage and cultural sites.

- Identify all known traditional use, heritage and cultural sites within the RMZ and develop appropriate management strategies.

- At the end of the industrial development cycle the area must be returned, as closely as possible and practical, to its natural state.

- Identify and map important fish and wildlife habitat to provide information for a more detailed planning process.

6. For areas adjacent to Klua Lake protected area, consider management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

- Establish general forest production targets for landscape units within the RMZ consistent with high intensity forest management regimes.

- Reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non-commercial deciduous, and Non Satisfactorily Restocked (NSR) areas with ecologically suitable species while providing for critical wildlife habitat.

- Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks), to increase timber availability and reduce road requirements.

- Plan patch size, access disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits of the biodiversity guide for this Natural Disturbance Type. Stank level biodiversity to focus on riparian areas and wildlife tree patches.

- Promote and encourage oil and gas exploration activities through a timely and efficient permitting process.

- Encourage investment in exploration, development and transportation of energy resources.

- Identify all known traditional use, heritage and cultural sites within the RMZ and develop appropriate management strategies.

- At the end of the industrial development cycle the area must be returned, as closely as possible and practical, to its natural state.

- Identify and map important fish and wildlife habitat to provide information for a more detailed planning process.
2.2.3. General Resource Development Category of Resource Management Zones

Intent:
- To manage for a wide range of integrated resource values
- Development will be integrated with requirement of other resource values.

The intent for this zone is that the RMZs are to be managed for a wide array of resource values and uses. Guidelines for non-extractive resource values will be integrated with resource development activities. Investments in resource development and enhancement are encouraged and will be integrated with other management objectives. The long-term objective is to return the lands to their natural state, as much as possible, after development activity is completed.

The RMZs that take guidance from General Resource Development Category objectives and strategies are a portion of an intact large predator-prey ecosystem. Most lie next to the area referred to as the Muskwa-Kechika.

The General Resource Development Category Resource Management Zones are shown in Figure 4, and listed below:

- Caribou Range
- Dunedin
- LaBiche
- Smith Uplands
- Tenaka

The General Resource Development Category has a sub-category to describe the major river corridors.

Intent:
- To manage for all the important values within the river corridors such as archaeological, cultural, energy resource, heritage, recreational, riparian, scenic, and timber resource.
- To recognize that these areas are generally more sensitive to disturbance than the upland sites; additional precautions are necessary to maintain ecological integrity of the system.

The General Resource Development Major River Corridors Sub-category Resource Management Zones are:

Recommended Fort Nelson Land and Resource Management Plan
General Resource Development Category

Beaver River Corridor
Liard River North Corridor
Petitot/Hay River Corridors
River Corridors East
Smith/Coal River Corridors

A portion of Smith Uplands, Liard River Corridor North and Coal River Corridor are within the Cassiar Forest District (Prince Rupert Forest Region), even though these areas have been planned for in the Fort Nelson LRMP.

The following objectives and strategies apply to all the RMZs in the General Resource Development Category and the Major River Corridors Sub-category (the second level of management direction). Where a specific objective or strategy is not listed for a resource value the first level of management direction (given by the General Management Direction (Section 2.1)) applies. In addition each RMZ may have site specific objectives and strategies listed to accommodate specific resource values and concerns (the third level of management direction).

Objectives
- Maintain, and where appropriate, enhance the opportunity for environmentally responsible development of energy resources.
- Maintain quality of recreation activities.

Strategies:
- Promote and encourage the oil and gas exploration activities through a timely and efficient permitting process.
- Encourage investment in the exploration, development and transportation of energy resources.
- At the end of the development cycle, the area must be returned, as closely as possible and practical, to its natural state.
- Ensure public and commercial recreational activities do not exceed acceptable limits of use.

Recommended Fort Nelson Land and Resource Management Plan
CATEGORIES OF RESOURCE MANAGEMENT ZONES

General Resource Development RMZs
Major River Corridors

FORT NELSON LRMP
GENERAL RESOURCE DEVELOPMENT CATEGORY OF RESOURCE MANAGEMENT ZONES

Scale 1:1,640,000 (Approximate)
General Resource Development Category

2.2.3.1 Caribou Range Resource Management Zone.

Area: 513,200 ha

This RMZ is located north of the Liard River canyon. The topography of the unit is rolling and broken with numerous water courses intersecting it. One ecossection is represented: Hyland Highland. Boreal White and Black Spruce, Spruce-Willow-Birch and Alpine Tundra biogeoclimatic zones are found in the RMZ.

Lower elevations have mixed species forest with white spruce, black spruce, lodgepole pine, subalpine fir, birch, cottonwood and aspen present. Sub alpine forest is dominated by white spruce, black spruce and lodgepole pine on relatively well drained soils. The main disturbance agents in the area have been extensive forest fire and land slide activity.

Generally this area is unroaded and has healthy populations of grizzly bear, moose and caribou. Fur bearers, raptors, owls, cavity nesters, bats and water fowl are common throughout the area. Most of the streams and creeks contain sport fish, primarily Arctic grayling and bull trout.

There are significant timber resources in the lower elevations along the east, south and western edges of this RMZ. These resources were not included in the Timber Harvesting Land Base for the 1992 Coniferous and 1993 Deciduous Timber Supply Analysis. The expectation is that these areas will contribute in the next analysis of the timber supply review; future operating areas have been identified by the forest industry.

There has been oil and gas exploration and tenures in this area. There is a high potential for natural gas. Some potential for mineral exploration exists especially in the Caribou plateau area. The Grayling River hot springs (identified as a Goal 2 Proposed Protected Area) is located in the middle of the RMZ. This occurrence indicates potential for thermal energy.

Within this RMZ the mineral assessment shows potential for industrial minerals and fluorite prospects.

Trapping and outfitting are the main activities in the area at this time. There is potential for outdoor recreation activities such as hunting, camping, wildlife viewing, snowmobiling and ATV touring southern portions of the zone.
General Resource Development Category - Caribou Range RMZ

Within this RMZ there has been historic and current use by the Slavey (Dene) and Kaska Dena cultures of the Fort Liard and Lower Post First Nations. There are traditional use, heritage and cultural sites; as well as hunting, trapping and fishing values.

Objectives:

1. Manage to maintain forest attributes suitable for high capability low elevation caribou habitat.

2. Manage to maintain forest attributes suitable for high elevation caribou habitat.

3. Manage to maintain forest attributes suitable for high capability grizzly bear habitat.

4. Manage to avoid negative bear/human interactions.

5. Provide opportunities for timber harvesting and a sustainable long-term timber supply.

Strategies:

- Manage and maintain old growth and mature forest to provide low elevation caribou habitat.

- To prevent the creation of predator-corridors, long tangents with extended lines of sight should be avoided when planning linear disturbances.

- Identify the important high elevation caribou winter habitat areas for consideration as Wildlife Habitat Areas.

- Minimize development of new access. Manage new and existing access that would impact on grizzly bear and grizzly bear habitat.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to grizzly and caribou habitat.

- Identify and map important habitat elements of red-and blue-listed and regionally significant species for consideration for Wildlife Habitat Areas.

- To minimize negative bear/human interactions, public education will focus on: informing the public on dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.

- Minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber.

- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.
General Resource Development Category - Caribou Range RMZ

5. For areas adjacent to Liard River Corridor and Grayling Hot Springs protected areas, consider management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

- Provide for the opportunity to aggregate cutblocks to create openings larger than 60 hectares, where environmentally sound and appropriate.
- Encourage appropriate harvesting systems to accommodate identified wildlife species.
- Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks) to increase timber availability and reduce road building requirements.
- An appropriate level of deactivation is required for all access no longer required for resource management. (Intent: minimize effects of roads on wildlife and wildlife habitat.)
- Encourage use of low impact seismic. (Something different than normal cut cut e.g. avoidance cut).
- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.
- For mineral exploration and development, road building into currently unroaded areas will be subject to review and approval through established procedures and all applicable legislation.
- Minimize and manage creation of new access in unroaded areas.
2.2.3.2 Dunedin Resource Management Zone

Area: 617,500 ha

This RMZ is located near the centre of the plan area; it is bounded by the Fort Nelson River, Liard River, Toad River and the Alaska Highway. It is characterized by distinctive plateau uplands intersected by rivers and streams with broad valleys. Two ecossections are represented: Etsho Plateau and Muskwa Plateau. Two biogeoclimatic zones are found in the zone: Boreal White and Black Spruce with a minor amount of Spruce-Willow-Birch. The lowlands have black spruce complexes with intermittent muskeg areas. The escarpments are dominated by aspen and white spruce, the plateau’s have extensive lodgepole pine stands.

There are existing oil and gas tenures and infrastructure in this zone mainly in the south eastern portion. There has been some exploration activity throughout most of the zone and the potential for future gas reserves is medium to high.

Timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. The various forest companies have a number of operating units identified in the area. Merchantable timber includes balsam fir, white and black spruce, lodgepole pine, trembling aspen and balsam poplar.

The zone contains very diverse wildlife populations. These include: large ungulates, such as moose, caribou, mountain goat, elk, whitetail and mule deer, and Stone’s sheep; and predators such as wolves, grizzly and black bears, coyotes and wolverine. Bald and golden eagles are found near the main rivers. The upper portions of the tributaries to the main rivers also have significant spawning and rearing habitat for many important fish species, such as arctic grayling, bull trout, northern pike and mountain whitefish.

Many recreational opportunities are available in the zone including hunting, hiking, boating, angling, camping and limited ATV use in the lower elevations. The major river corridors provide important access into the area for many of these activities. Back country activities include existing guide outfitter and trapper tenures throughout the zone.

Within this RMZ there has been historical and current use by the Slavey, Cree, and Beaver cultures of the Fort Liard and Fort Nelson First Nations.
General Resource Development Category - Dunedin RMZ

Throughout the zone there are traditional use, heritage and cultural sites as well as hunting, fishing and trapping values.

Objectives:

1. Manage for visual quality around Steamboat, Teetering Rock and Indian Head.

2. Manage to maintain forest attributes suitable for high capability grizzly bear habitat.

3. Manage to avoid negative bear/human interactions.

4. Minimize habitat fragmentation.

Strategies:

- Where established, VQO’s will guide incidental timber cutting associated with other resource user activities.

- Identify and map aggregate (mineral) inventory and potential.

- Identify and map important fish & wildlife habitat for information for subsequent planning processes.

- Monitor and maintain sustainable populations of designated species (fish or wildlife).

- An appropriate level of deactivation is required for all access no longer required or resource management. (Intent: minimize effects of roads on wildlife and wildlife habitat).

- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters, bear behaviour and the safest human behaviour while in bear country.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to stone sheep, grizzly, elk, moose and caribou habitat.

- Access planning to take into account connectivity corridors

- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.

- Manage for wildlife habitat using range enhancement in a subsequent more detailed planning process.

- Minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber.

Recommended Fort Nelson Land and Resource Management Plan
Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.

Provide for the opportunity to aggregate cutblocks to create openings larger than 60 hectares, where environmentally sound and appropriate.

Encourage appropriate harvesting systems to accommodate identified wildlife species.

Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks) to increase timber availability and reduce road requirements.

Identify and map existing fish distributions to provide information to operational planning processes.

Encourage use of low impact seismic line development (something different than normal cat cut e.g. avoidance cut).

Minimize number of river crossings. Utilize existing crossings whenever possible.

5. For areas adjacent to the Liard River Corridor protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.
General Resource Development Category

2.2.3.3 La Biche Resource Management Zone

Area: 113,100 ha

This zone is located in the north of the plan area between Caribou Ranges RMZ and the Liard River. The Beaver River bisects the zone. The area is characterized by distinctive plateau uplands intersected by rivers and streams with broad valleys. One ecoregion is represented, the Muskwa Plateau; and Boreal White and Black Spruce is the only biogeoclimatic zone.

This zone contains limited oil and gas tenures centred on the Beaver River gas field. There has been past production from this area and the infrastructure is still in place. The Beaver field has been looked at recently with the intent of reactivating production. The Westcoast transmission line from Pointed Mountain in the Yukon to Fort Nelson runs through this zone.

Timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. The various forest companies have a number of operating units identified in the area. Merchantable timber includes balsam, spruce, lodgepole pine and deciduous species.

The zone contains very diverse wildlife populations. These include: large ungulates, such as moose, caribou, mountain goat, elk, whitetail and mule deer, and Stone's sheep; and predators such as wolves, grizzly and black bears, coyotes and wolverine. Bald and golden eagles are found near the main rivers. The upper portions of the tributaries to the main rivers also have significant spawning and rearing habitat for many important fish species, such as arctic grayling, bull trout, northern pike and mountain whitefish.

Many recreational opportunities are available in the zone including hunting, hiking, boating, angling, camping and limited ATV use in the lower elevations. The major river corridors provide important access into the area for many of these activities. Back country activities include existing guide outfitter and trapper tenures throughout the zone.

This RMZ has historic and current use by the Slavey, Cree, Beaver and Kaska Dena cultures of the Fort Liard, Fort Nelson and Lower Post First Nations. Traditional use, heritage and cultural values and sites exist in the zone. These sites are numerous and the values are significant; therefore they warrant a higher level of consideration in strategic planning. First Nations use includes hunting, fishing and trapping activities.
General Resource Development Category - LaBiche RMZ

Objectives

1. Identify and protect traditional use, heritage and cultural sites.

2. Provide opportunities for timber harvesting and a sustainable long-term timber supply.

3. Minimize habitat fragmentation.

Strategies:

- Identify all known traditional use, heritage and cultural sites within the RMZ and develop appropriate management strategies.

- Minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber.

- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.

- Provide for the opportunity to aggregate cutblocks to create openings larger than 60 hectares, where environmentally sound and appropriate.

- Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks) to increase timber availability and reduce roading requirements.

- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters: bear behaviour: and the safest human behaviour while in bear country.

- Encourage appropriate timber harvesting systems to accommodate conservation of habitat for identified wildlife species.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to moose habitat.

- Minimize number of river crossings (e.g. winter crossings only). Utilize existing crossings whenever possible.

- Access planning to take into account connectivity corridors.

- An appropriate level of deactivation is required for all access no longer required for resource management. (Intent: minimize effects of roads on wildlife and wildlife habitat.)
General Resource Development Category - LaBiche RMZ

- Identify and map important fish & wildlife habitat and distributions.
- Identify and map aggregate (mineral) inventory and potential.

4. Identify and manage for the protection of traditional use, cultural and heritage sites. Identify all known traditional use, cultural and heritage sites within the RMZ, and develop appropriate management strategies.
General Resource Development Category

2.2.3.4 Smith River Uplands Resource Management Zone

Area: 277,200 ha

This RMZ is located in the north western portion of the planning area between the Liard River and the Yukon Territory boundary. It is bounded by the Caribou plateau on the east and the Alaska Highway on the west. Two ecossections are represented: Liard Plain and a minor portion of Hyland Highland. Boreal White and Black Spruce, Spruce-Willow-Birch and Alpine Tundra are the biogeoeclimatic zones. This zone has greater snow falls and colder temperatures than the zones to the south and east. The summers are generally warm and dry.

White spruce and aspen forest dominate on moderately well drained soils. There are also minor components of tamarack, cottonwood and birch. The primary disturbance type is forest fire with some wind and insect impacts. The timber in this zone was not included in the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Analysis. There is potential for future forest management activities, as currently forest development planning is occurring in the area.

There is medium to high natural gas potential.

The mineral assessment for this zone indicates significant potential for industrial minerals, fluorite and barite prospects; there has been a past producer of barite with remaining reserves.

Many small lakes with populations of sport fish dominate the landscapes of this zone. Lake trout, Arctic grayling, pike and bull trout are present in good numbers in most of the lakes and streams. The lakes are also important as nesting sites for swans. Raptors and many other species of smaller birds exist in the zone. There is also a variety of fur bearers present.

The area is relatively unroaded and supports limited recreation activities primarily associated with fishing in the lakes. As the timber resource is developed, access to more lakes could become available. Other activities which occur in site specific areas of the zone are hunting, camping, snowmobiling and ATV use.

Trapping is the primary activity that occurs on the land. There is also some commercial back country recreational activities associated with hunting and camping.
General Resource Development Category - Smith River Uplands RMZ

Within this RMZ there has been historic and current use by the Kaska Dena culture of the Lower Post First Nations. There are known cabin sites, traditional use, heritage and cultural sites with trapping, hunting and fishing values.

Objectives:

1. Manage to maintain visual quality around the various lakes.
2. Manage to maintain forest attributes for trumpeter swan nesting habitat.
3. Provide opportunities for timber harvesting and a sustainable long-term timber supply.
4. Minimize habitat fragmentation.

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource activities.
- Encourage appropriate harvesting systems to accommodate identified wildlife species.
- Minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber.
- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.
- Provide for the opportunity to aggregate cutblocks to create openings larger than 60 hectares, where environmentally sound and appropriate.
- Plan patch size, access, disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits identified in the biodiversity guide for this Natural Disturbance Type. Stand level biodiversity to focus on riparian areas and wildlife tree patches.
- Where appropriate, vary cutblock requirements (in accordance with Forest Practices code, the Green-up and Biodiversity guidebooks) to increase timber availability and reduce roading requirements.
- Identify and map caribou populations and habitats to provide information for more detailed planning processes.
- Access planning to take into account connectivity corridors.
5. Manage to avoid negative bear/human interactions.

6. For areas adjacent to Smith River Ecological Reserve protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.

- Encourage use of low impact seismic line development (something different than normal cat cut e.g. avoidance cut)

- Minimize number of river crossings. Utilize existing crossings whenever possible.
Tenaka Resource Management Zone

Area: 391,400 ha

This RMZ is located in the southern portion of the planning area between the Muskwa and Prophet rivers. It is characterized by plateau uplands that are intersected by rivers and streams with broad valleys. Two ecossections are represented: Muskwa Plateau and Fort Nelson Lowlands. The biogeoclimatic zones covering this zone are Boreal White and Black Spruce, with small amounts of Spruce-Willow-Birch and a very minor amount of Alpine Tundra.

The lowland areas have black spruce complexes with intermittent muskeg areas while the plateau’s have extensive lodgepole pine forest types. Some of the merchantable timber species in this area include balsam, spruce, lodgepole pine, aspen and cottonwood. Timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. The various forest companies have a number of operating units identified in the area.

A small portion of this zone, south and east of Milo Lake, has been identified as having agricultural capability and is currently included within the Agricultural Land Reserve.

The zone has numerous existing oil and gas tenures with active exploration, development and infrastructure in place. The potential for additional gas reserves is medium to high.

The zone contains very diverse wildlife populations including large ungulates (moose, caribou, mountain goat, elk, whitetail and mule deer, and Stone’s sheep) and predators (wolves, grizzly and black bears, coyotes and wolverine). Bald and golden eagles are found near the main rivers. The upper portions of the tributaries to the main rivers also have significant spawning and rearing habitat for many important fish species (Arctic grayling, bull trout, northern pike and mountain whitefish).

The area offers many recreational opportunities like hunting, hiking, boating, camping, and angling. Back country activities include existing guide outfitting and trapping tenures.

Within this RMZ there has been historic and current use by the Slavey, Cree, Beaver and Sekani cultures of the Fort Nelson and Prophet River First Nations. In this zone there are many known traditional use, heritage and
cultural sites, with trapping, hunting and fishing values. The known sites include pack and travel trails and traditional grazing areas.

Objectives

1. Provide opportunities for timber harvesting and a sustainable long-term timber supply.

Strategies:

- Minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber.

- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.

- Where appropriate, vary cutblock adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity guidebooks) to increase timber availability and reduce roeding requirements.

- Provide for the opportunity to aggregate cutblocks to create openings larger than 60 hectares, where environmentally sound and appropriate.

- Where significant concerns exist new access will be co-ordinated with access requirements of other resource users through access management planning. (The more detailed access management planning process will include public and stakeholder input on the issue of all weather access across the Muskwa and Prophet rivers.)

- Identify aggregate (mineral) inventory and potential

- Encourage use of low impact seismic line development (something different than normal cut, e.g. avoidance cut.)
General Resource Development Category  
Major River Corridors Sub-Category

2.2.3.6  Beaver River Corridor Resource Management Zone

Area:  15,400 ha

The Beaver River, with its headwaters in the Yukon territory, is a large tributary of the Liard River. The land is in a transition zone and is dominated by low rolling hills, the Beaver River Valley is quite deep with a relatively narrow floor and rolling-broken side slopes. Fire and natural landslides dominate the disturbance regimes with alluvial influences adjacent to the river. This zone represents one ecosection: Liard Plain; and one biogeoclimatic zone: Boreal White and Black Spruce.

Timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. The various forest companies have a number of operating units identified in the area. Merchantable timber includes balsam fir, white and black spruce, lodgepole pine, trembling aspen and balsam poplar. The potential for forest management activities in the zone is high.

Exploration for the oil and gas resources took place in this area during the 1950's. This zone contains limited oil and gas tenures centred on the Beaver River gas field. There has been past production from this area and the infrastructure is still in place. The Beaver field has been looked at recently with the intent of reactivating production. There has been exploration and development of the oil and gas resource in the adjacent RMZ (LaBiche), and the potential in this zone is medium to high. Aggregate exists in site specific locations within the zone and will be important for future infrastructure development.

The zone has some grizzly bear and healthy populations of moose. A small herd of wood buffalo live in the area adjacent to the Liard River. Many small birds live and nest in the zone. Fur bearers are important and exist in healthy populations. There are also populations of sport fish present in the river.

Trapping is carried out on existing traplines.

There is limited recreational potential along the Beaver River, these activities are mainly associated with boating and camping.

Within this RMZ there has been historic and current use by the Slavey, Cree and Beaver cultures of the Fort Liard First Nations. There is a high potential to find heritage and cultural sites, since the zone is a river corridor, the

Recommended Fort Nelson Land and Resource Management Plan
trapping, fishing and hunting values exist. Known traditional use sites include cabins and associated trails.

<table>
<thead>
<tr>
<th>Objectives:</th>
<th>Strategies:</th>
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<tbody>
<tr>
<td>1. Manage to maintain forest attributes suitable for high capability grizzly bear habitat.</td>
<td>Identify and map important fish &amp; wildlife habitat for information for more detailed planning processes.</td>
</tr>
<tr>
<td>2. Manage to avoid negative bear/human interactions.</td>
<td>Maintain integrity of island habitat.</td>
</tr>
<tr>
<td>3. Manage for a component of Semi-Primitive Motorized. (ROS)</td>
<td>To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.</td>
</tr>
<tr>
<td>4. Provide for timber harvesting and forest management opportunities.</td>
<td>Where significant access concerns exist new access will be co-ordinated with access requirements of other resource users through an access management planning process.</td>
</tr>
</tbody>
</table>

- Identify aggregate (mineral) inventory and potential.
- Quantify the Timber Harvesting Land Base and develop policies to reduce the loss to the Timber Harvesting Land Base to roads, landing, seismic lines, wellsites and other developments.
- Reforest (within appropriate time frames, as determined through landscape unit planning) all potentially productive brush, non-commercial deciduous, and Not Sufficiently Restocked (NSR) areas with ecologically and commercially suitable species while providing for critical wildlife habitat.
- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.
- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.
4. Identify and provide for the protection of traditional use, heritage and cultural sites.

- Identify all known traditional use, cultural and heritage sites within the RMZ and develop appropriate management strategies.
2.2.3.7 Liard River North Corridor Resource Management Zone

**Area:** 93,500 ha

This zone is located along the Liard River upstream of the Liard River Hot Springs Provincial Park to the boundary of the plan area. The corridor includes the Alaska Highway. The boundaries of the RMZ are based upon the view shed associated with the highway. Three ecossections are represented: Eastern Muskwa Ranges, Hyland Highland and Liard Plain. The biogeoclimatic zone is the Boreal White and Black Spruce with a minute amount of Spruce-Willow-Birch. Forest species include balsam poplar, white spruce, black spruce, lodgepole pine, minor components of tamarack and true fir, and aspen on relatively well drained soils. Extensive forest fire disturbance has occurred in the area and is the primary disturbance type, however alluvial disturbance occurs primarily along the lower benches and islands of the Liard River.

The river and tributaries contain approximately 20 species of fish that rely on the tributaries for spawning and rearing habitat. The zone also has habitat for grizzly bear, moose, elk, whitetail deer and smaller fur bearers. A variety of waterfowl are known to nest in the area; there are also passerines and shore birds. Bald eagles and other raptors are common. Bats are common around the hot springs.

The benches along the Liard River, as well as the upland, are very productive for growing timber. Timber in this zone did not contribute the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis or the 1994 Timber Supply Review in the Cassiar Timber Supply Area. The potential for forest management activities in the zone is high.

Some mining interests exist along the Liard River. This area borders on other zones that have medium to high potential for oil and gas. There is high geothermal energy potential associated with the hot springs. Because this RMZ is a major transportation corridor visual quality objectives are important, and industrial activities will be managed in a way that will minimize impacts on the VQO’s.

Recreation activities are important in the zone. Tourism facilities are common along the highway, and the activities include wildlife viewing, hunting, fishing, boating and camping. The area known as Skook's landing is

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General Resource Development Category
Major Rivers Corridors Sub-category - Liard River North RMZ

significant due to its use as a boat launch and provides access onto the Liard and Kechika rivers.

Traditionally used by First Nations the Liard River Hot Springs were noted by Robert Campbell, a HBC trader, when he travelled through the area in 1835. In the 1920’s, John Smith homesteaded in the vicinity of the hot spring for about 10 years. In 1942, the US Army built a board walk and other structures to facilitate the use of the pools by personnel engaged in the building of the Alaska Highway.

There are historic trading posts dating back to the 1830’s in the zone, the most significant being Fort Halkett, which has been identified as a Goal 2 Proposed Protected Area. The Liard river was one of the overland routes used during the gold rush to the Klondike in 1898.

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nations. This zone has high potential for archaeological, cultural and heritage resources. There are also known sites which include cabins and trails as well as hunting, fishing and trapping values. The Lower Liard Indian Reserve #3 is in this RMZ.

Objectives:

1. Manage for visual quality around Smith River Falls, Portage Brule Rapids, Whirlpool Canyon, Strawberry Rapids and Skook’s Landing.
2. Reduce wildlife/vehicle interactions (i.e. caribou)
3. Promote recreational placer gold panning as a tourism element.
4. Manage to avoid negative bear/human interactions.

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.
- Identify the areas where the safety concerns are; MOTH and BCE to resolve at local level.
- Establish a recreational placer and panning reserve for use and enjoyment of the public and tourists.
- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.
5. For areas adjacent to Liard Hotsprings Provincial Park and Liard River Corridor protected areas, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to wildlife habitat, visual, archaeological, heritage and cultural values.

- Identify and map important habitat elements of red-and blue-listed and regionally significant species for consideration for Wildlife Habitat Areas.

- Minimize and manage creation of new access in unroaded areas.

- Minimize the impact of vegetation control near ecosystems, habitat types and plant species designated for long-term monitoring.

- Identify and recommend a course of action for damaged or degraded habitat.

- Encourage new operations to utilize existing private holdings where appropriate.

- Promote recreational activities that enhance highway-based tourism with emphasis on destination activities.

6. Manage for a component of Roadded Resource (Alaska Highway)

- Identify and map aggregate (mineral) inventory and potential.

- Quantify the Timber Harvesting Land Base and develop policies to reduce the loss to the Timber Harvesting Land Base to roads, landings, seismic lines, wellsites and other developments.

- Reforest (within appropriate time frames, as determined through landscape unit planning) all potentially productive brush, non-commercial deciduous, and Not Sufficiently Restocked (NSR) areas with ecologically and commercially suitable species while providing for critical wildlife habitat.

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.

7. Provide for timber harvesting and forest management opportunities.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to wildlife habitat, visual, archaeological, heritage and cultural values.

- Identify and map important habitat elements of red-and blue-listed and regionally significant species for consideration for Wildlife Habitat Areas.

- Minimize and manage creation of new access in unroaded areas.

- Minimize the impact of vegetation control near ecosystems, habitat types and plant species designated for long-term monitoring.

- Identify and recommend a course of action for damaged or degraded habitat.

- Encourage new operations to utilize existing private holdings where appropriate.

- Promote recreational activities that enhance highway-based tourism with emphasis on destination activities.

- Identify and map aggregate (mineral) inventory and potential.

- Quantify the Timber Harvesting Land Base and develop policies to reduce the loss to the Timber Harvesting Land Base to roads, landings, seismic lines, wellsites and other developments.

- Reforest (within appropriate time frames, as determined through landscape unit planning) all potentially productive brush, non-commercial deciduous, and Not Sufficiently Restocked (NSR) areas with ecologically and commercially suitable species while providing for critical wildlife habitat.

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.
8. Identify and provide for the protection of traditional use, heritage and cultural sites.

- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.

- Identify all known traditional use, cultural and heritage sites within the RMZ and develop appropriate management strategies.
2.2.3.8 Petitot/Hay Rivers Corridor Resource Management Zone

Area: 80,100 ha
Petitot Corridor  46,000 ha
Hay Corridor    34,100 ha

These two river valleys lie within the Taiga Plain. This is very flat low-lying terrain with extensive wetlands, slow moving streams and numerous lakes and potholes. Soils are dominantly crysols with areas of discontinuous permafrost. Muskeg predominates with extensive areas of wet land and black spruce bogs. Jack pine associations can be found in some of the more well drained areas. The Petitot River represents the Petitot Plain ecossection and the Hay River represents the Fort Nelson Lowlands ecossection. Both river corridors are covered by one biogeoclimatic zone, the Boreal White and Black Spruce.

Both river corridors and the RMZ they lie in (Etsho) are extensively covered by existing oil and gas tenures and infrastructure. Activity in the area has seen steady growth, with proposals to upgrade existing infrastructure such as all weather roaded access. The area is currently producing both oil and natural gas with medium potential for the discovery of new reserves. Due to the extremely wet nature of the area, access has been limited to winter operations.

Timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous Fort Nelson Timber Supply Area Analysis. Merchantable timber includes balsam, spruce, lodgepole pine and deciduous species. There is potential for forest management activities in the zone.

Densities of moose, caribou and deer are lower in this zone than the areas to the south. The area is traversed by very important migratory routes for all birds except passerines. Other wildlife found include wolf, black bear, coyote, wolverine and many of the smaller fur bearers such as martin, fisher, fox, beaver, mink and otter. The fisheries values in the two rivers are quite high. The main sport fish species found are northern pike, walleye, inconnu, grayling and whitefish.

Recreational opportunities within the zone are seasonal and limited by poor access. Boating, hunting, fishing and camping are the major activities. There are few established campsites in the zone.
General Resource Development Category

Major River Corridors Sub-category - Petitot/Hay Rivers Corridor RMZ

Within this RMZ there has been historic and current use by the Slavey, Cree, and Beaver cultures of the Fort Nelson, Fort Liard and Dene Tha First Nations. This zone has high potential for archaeological, cultural and heritage resources. There are known traditional use, heritage and cultural sites, and trapping, hunting and fishing values.

Objectives:

1. For areas adjacent to Thinatea and Hay River protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

2. Maintain integrity of island habitat.

3. Identify and provide for the protection of traditional use, heritage and cultural sites.

Strategies:

- Low development level campgrounds and small group sites are compatible with the setting.

- Identify and map existing fish distributions.

- Minimize and manage creation of new access in unroaded areas.

- Where significant access concerns exist new access will be co-ordinated with access requirements of other resource users through subsequent planning.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to riparian values.

- Minimize number of river crossings. Utilize existing crossings whenever practical.

- Identify all known traditional use, cultural and heritage sites within the RMZ and develop appropriate management strategies.

- Identify and map aggregate inventory and potential.

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2.2.3.9 River Corridors East Resource Management zone

Area: 293,200 ha
- Fort Nelson River North/Liard 165,900 ha
- Prophet River 75,400 ha
- Fort Nelson River South 37,200 ha
- Liard River - Scatter Cr. North 14,700 ha

This RMZ includes a number of the major river valleys within the plan area, these are the Prophet, the majority of the Fort Nelson, and a portion of the Liard rivers. Numerous ecossections are represented: Etsho Plateau (Liard and Fort Nelson rivers), Fort Nelson Lowlands (Fort Nelson, Muskwa and Prophet rivers) and Muskwa Plateau (Liard and Prophet rivers). The majority of the river corridors are covered by one biogeoclimatic zone: Boreal White and Black Spruce.

Oil and gas exploration and development activities occur within these corridors including existing, active tenured parcels of land. The river valleys fall within and intersect, areas of proven and medium to high potential for oil and gas reserves. There is also high potential for sand, gravel and industrial minerals.

The riparian areas in the valley bottoms are one of the most highly productive sites for growing timber. The forests in these areas are generally dense with areas of large older, mature stands. All the merchantable species can be found along the various river valleys. Timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. The various forest companies have a number of operating units identified in the area. The potential for forest management activities in the zone is high; there has been past activity in this RMZ.

The riparian areas and river valleys are also very important for many wildlife species, especially moose, other large ungulates, fish and many bird species. The forest stands in the valleys are generally dense and moist with understories dominated by shrubs and forbs. This makes them excellent habitats for migratory songbirds, many of which are red- and blue-listed species. Coarse woody debris from large fallen trees and snags and seasonal flooding provide areas for fur bearers and bats, stabilize streambanks and provide protective cover for fish. The riparian habitat provides high capability winter habitat for moose, elk, deer and caribou, and also provides corridors for migration and daily travel.
Within the river valley's of this zone, much of the valley bottoms are lands that have agricultural potential, and some are designated under the Agricultural Land Reserve.

Access management and control is an important objective for this zone. An emphasis has been placed on minimizing road construction and activities that would negatively impact these riparian values.

Water quality is also very important as many of these rivers are water sources for communities, such as Fort Nelson.

Due to their larger size and ease of access, these rivers are used as major recreation corridors in the plan area. All types of boating activities, as well as hiking, fishing, camping, picnicking and hunting are common along the length of many of the rivers. Many of the areas that this RMZ covers has high scenic/visual qualities. Proper management of activities in this vast area will ensure that the values that make the large rivers so appealing will not be lost.

This zone has historic and current use by the Slavey, Cree, Beaver, Sikani and Kaska Dena cultures of the Fort Nelson, Prophet River and Fort Liard First Nations. This zone has high potential for archaeological, cultural and heritage resources. There are numerous known cabin locations, archaeological, cultural and heritage sites recorded, as well as traditional use areas such as grazing areas and trails. These sites are clustered mainly along the Nelson, Liard and Prophet rivers. Some of the known sites include: the village of Francois at the confluence of Sandy Creek and Liard River; Nelson Forks at the confluence of Capot-Blanc Creek and Fort Nelson River; LaJolie Butte at the confluence of Ella Creek and Liard River; Hudson Bay Company Trading Post #2 located 90 Kilometres upstream on the Nelson River; Kiwigana (Deer) River Indian Reserve located at the confluence of the Kiwigana and Nelson rivers; Snake River Indian Reserve located at the confluence of the Snake and Nelson rivers; and Fontas River Indian Reserve located at the confluence of the Fontas and Nelson rivers.

Objectives:

1. Manage for visual quality from the rivers.

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.
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| 3. | Maintain the structural and functional integrity of the watercourse/waterbody. | Ensure industrial exploration activities are undertaken with sensitivity to riparian values  
- Minimize and manage creation of new access in unrode areas.  
(Access management planning process will include public and stakeholder input on the issue of all weather access across the Muskwa and Prophet rivers.)  
- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible. |
| 4. | Maintain the structural and functional integrity of riparian areas. | Maintain integrity of island habitat.  
- Establish appropriate buffers for important habitat elements.  
- Minimize roads parallel to rivers and reduce roads in Riparian Management Areas where possible.  
- Minimize the impact of vegetation control near ecosystems, habitat types and plant species designated for long-term monitoring.  
- Encourage use of low impact seismic line development (something other than cat cut e.g. hand cut)  
- Quantify the Timber Harvesting Land Base and develop policies to reduce the loss to the Timber Harvesting Land Base to roads, landings, seismic lines, wellsites and other developments.  
- Reforest (within appropriate time frames, as determined through landscape unit planning) all potentially productive brush, non-commercial deciduous, and Not Sufficiently Restocked (NSR) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. |
| 5. | Provide for timber harvesting and forest management opportunities. |   |
General Resource Development Category
Major River Corridors Sub-category - River Corridors East RMZ

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.

- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.

6. Identify and provide for the protection of traditional use, heritage and cultural sites.

7. Identify and manage significant Heritage trails.

2.2.3.9.1. Liard - Scatter River Subzone

A subzone has been identified on the Liard River, from Scatter River downstream to the 'big bend'.

The intent of identifying this subzone is to give direction to a more detailed strategic planning process required as a follow-up to this plan. The follow-up planning process has to address issues of conservation of river valley, old growth, braided stream channels and integrity of the islands, together with development of the forest resource. The follow-up planning process will identify if the legislation, regulation and guidelines in the Forest Practices Code of BC is adequate or if additional management strategies need to be developed. The follow-up planning process will include all stakeholders and members of the public who have an interest or concern in the area.

This subzone has historic and current use by the Kaska Dena, Slavey, Cree and Beaver cultures of the Lower Post, Fort Liard and Fort Nelson First Nations. There is high potential for archaeological, cultural and heritage resources in this subzone.
The Smith and Coal rivers are two separate corridors in the Smith Uplands RMZ. Both these rivers are moderately sized tributaries of the Liard River and have their headwaters in the Yukon Territory. Both rivers flow south within relatively narrow valleys that cut through rolling country with low hills. Both the river corridors are representative of one ecossection: Liard Plain, and both are within the Boreal White and Black Spruce biogeoclimatic zone. Both valleys have experienced extensive disturbance by fire in the 1980's.

Both the Smith and Coal rivers contain healthy populations of sport fish, primarily bull trout and Arctic grayling. Spawning and rearing habitats are important in these zones. Moose are present in both valleys and there have been occasional reports of grizzly bear.

There is medium to high natural gas potential.

There are coal deposits which could be developed in the future, along the Coal River. The mineral assessment shows a potential for industrial minerals in this RMZ.

There are some timber values in the zones in the lower reaches of the rivers. Both valleys have extensive areas of early seral forest with lodgepole pine, white spruce aspen and black spruce regeneration. The soils in these valleys are relatively well drained and the potential for production of forest crops is high. There are some mature to old growth stands within these valleys, however, immature forest is the dominate feature. The primary contribution of these valleys to potential timber supply is through this immature forest. The timber in the Smith River Corridor was not included in the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. The area is being considered in the short and long term for forest operations. The Coal River Corridor is within the Cassiar Forest District, the timber resource not identified in the Timber Harvesting Land Base in the 1994 Timber Supply Review for the Cassiar Timber Supply Area.
General Resource Development Category  
**Major River Corridors Sub-category - Smith/Coal Rivers Corridor RMZ**

The Smith River Corridor contains one of the few back country roads that is suitable for motor vehicle access. The road leads up to the old military site and airstrip, and also provides access to West and Crooked lakes for recreational purposes. Camping, fishing, boating and hunting are the primary activities in the zone. Special features to note are: the warm pool near Crooked Lake; and the Smith River Falls (located in the Liard River North Corridor RMZ and identified as a Goal 2 Proposed Protected Area).

Within the Coal River Corridor there is no roaded access, but recreational opportunities similar to those in the Smith River Corridor exist. The Coal River Corridor is important for kayaking opportunities due to the class of river. Special features include the canyons and the Coal River Falls.

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nations. High potential for archaeological, cultural and heritage resources exist in this zone. Traditional use, cultural and heritage sites, such as cabins and associated trails, exist in the zone along with significant hunting, trapping and fishing values.

**Objectives:**

1. Manage for visual quality from the rivers.
2. Manage for a component of Semi-Primitive Motorized (ROS)
3. Maintain the water-based recreation routes in the Coal River Corridor
4. For areas adjacent to Portage Brule Rapids, Smith River/Fort Halkett, and Smith River Ecological Reserve protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.
5. Manage to avoid negative bear/human interactions.

**Strategies:**

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.
- Access planning to take into account connectivity corridors.
- Identify and map caribou populations and habitats to provide information for more detailed planning processes.
- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour, and the safest human behaviour while in bear country.

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**Recommended Fort Nelson Land and Resource Management Plan**
General Resource Development Category
Major River Corridors Sub-category - Smith/Coal Rivers Corridor
RMZ

6. Provide for timber harvesting and forest management opportunities.

- Quantify the Timber Harvesting Land Base and develop policies to reduce the loss to the Timber Harvesting Land Base to roads, landings, seismic lines, wellsites and other developments.

- Reforest (within appropriate time frames, as determined through landscape unit planning) all potentially productive brush, non-commercial deciduous, and Not Sufficiently Restocked (NSR) areas with ecologically and commercially suitable species while providing for critical wildlife habitat.

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.

- Promptly and aggressively reforest and manage cutovers and wildfires, within the Timber Harvesting Land Base, to maintain sustainable timber harvest levels.

7. Identify and provide for the protection of traditional use, heritage and cultural sites.

- Identify all known traditional use, cultural and heritage sites within the RMZ and develop appropriate management strategies.
2.2.4. Muskwa-Kechika Special Management Category of Resource Management Zones

**Intent:**
- Resource development can proceed while minimizing impacts on other resource values.
- Ensure that the wilderness characteristics and wildlife habitat are maintained over time while allowing resource development, including roaded resource development.

A portion of this large pristine area falls within the planning area. The Muskwa-Kechika is situated where extensive boreal plains and muskeg of the east meet the mountains to the west. It is one of the few remaining large areas, with few roads, south of the 60th parallel.

The significance of the Muskwa-Kechika is that it supports a diverse number of large mammals in population densities of global importance. Few other places in the world match the features of the Muskwa-Kechika in terms of species groupings, remoteness, minimal development and low human population.

Over the course of the geologic history of the Muskwa-Kechika the variety of rock sequences and the complex faulting and mountain building periods all contributed to the formation of rich energy and mineral resources throughout the area. While there is some geographic overlap of the distribution of energy and mineral resources, in general oil and gas resources dominate the eastern portion of the area while a variety of metallic and non-metallic resources can be found in the central and western portions of the area.

Due to the fact that the Muskwa-Kechika area is of international significance for wildlife and wilderness resources; and that it has significant mineral, natural gas values with development potential, as well portions of the area contain immature and mature timber; the LRMP WG is recommending that some type of formal designation be placed over this area. The intention is to give certainty to both the environmental and industrial interests regarding management within the RMZs that make up the Muskwa-Kechika; certainty for industry regarding the opportunity for development to attract investors to British Columbia who are willing to undertake the high risks and expense of subsurface exploration and development. Also certainty to the environmental and conservation interests regarding the management of all developments.

The management intent in the resource management zones is to ensure wilderness characteristics and wildlife habitat are maintained over time while allowing resource development, including roaded resource development.
Resource development activities, such as logging, mineral exploration and mining, oil and gas exploration and development are acceptable activities in the Muskwa-Kechika Special Management Category of Resource Management Zones. Such activities are subject to provincial guidelines and standards and will be carried out in a manner which respects sensitive natural values. The long-term objective is to return the lands to their natural state, as much as possible, after development activity is completed.

The Muskwa-Kechika Special Management Category Resource Management Zones are shown in Figure 5, and listed below:

8 Mile/Sulpher
Aeroplane
Churchill
Fishing
Moodie
Muskwa West
Prophet
Rabbit
Rainbow
Sandpile
Stone Mountain
Terminal

The Muskwa-Kechika Special Resource Development Category has a sub-category to describe the major river corridors.

Intent:
- To manage for all the important resource values within the river corridors such as archaeological, cultural, energy, heritage, recreational, riparian, scenic, timber and wildlife habitat.
- To recognize that these areas are generally more sensitive to disturbance than the upland sites; additional precautions are necessary to maintain ecological integrity of the system.

The Muskwa-Kechika Special Management Major River Corridors Sub-category Resource Management Zones are:

Kechika River Corridor
Muskwa River Corridor
Toad River Corridor
Turnagain/Dall Rivers Corridor

Recommended Fort Nelson Land and Resource Management Plan
Muskwa-Kechika Special Management Category

A portion of Fishing, and all of Aeroplane, Moodie, Rabbit, Rainbow, Sandpile, Kechika River Corridor, and Turnagain/Dall Rivers Corridor are within the Cassiar Forest District (Prince Rupert Forest Region), even though they have been planned for in the Fort Nelson LRMP.

The following objectives and strategies apply to all the RMZs in the Muskwa-Kechika Special Management Category and the Major River Corridors Sub-category, (the second level of management direction). Where a specific objective or strategy is not listed for a resource value the first level of management direction (given by the General Management Direction (Section 2.1)) applies. In addition each RMZ may have site specific objectives and strategies listed to accommodate specific resource values and concerns (the third level of management direction).

Objectives:
1. Ensure Commercial Backcountry Recreation activities are consistent with the objectives and strategies of the RMZ, and maintain a balance with public recreation and other use.

2. Licensed and authorized resource users will have access to all the RMZs. Access will be managed to provide a variety of recreational experiences and to conserve other resource values over time. Resource users will be licensed or authorized by the appropriate line agency (e.g. Ministry of Environment, Land and Parks, Ministry of Employment and Investment or Ministry of Forests).

3. Provide opportunities to develop access while ensuring that this activity will be undertaken in a way that is sensitive to the non-extractive resources.

Strategies:
1. An inventory of existing and potential CBR opportunities is required to guide the allocation. CBR activities must be consistent with:
   - acceptable limits of use;
   - environmental sustainability;
   - greatest benefit to local community, region and province;
   - equitable forage allocation between commercial and non-commercial use; and
   - equitable allocation of suitable campsites.

2. Motorized access (including recreational motorized activities) will be managed consistent with the intent of the Muskwa-Kechika Access Management Area Regulation (BC Reg. 218/94) as determined through a subsequent planning process.

3. A more detailed planning process may identify high fish and wildlife values, or other significant features (e.g. licks, hot springs). Where there is a significant risk that these resources may suffer an unacceptable level of negative impact, access may be limited, restricted, or on a site-specific basis, prohibited (e.g. avoid critical habitat components and special features where identified). However, where an access route is prohibited alternative
Muskwa-Kechika Special Management Category

routes will be identified.

- Minimize and manage creation of new access in unroaded areas.

- New access to mine sites will be managed with access control points.

- For new access developments, maintain the pre-existing levels of public motorized access.

- At the end of the development cycle, the area must be returned, as closely as possible and practical, to its natural state. (Intent: to minimize effects on wildlife and wildlife habitat).

- Operational plans in this area will include information on the deactivation of all access routes proposed.

- For mineral exploration and development, road building into currently unroaded areas will be subject to review and approval through established procedures and all applicable legislation.

4. The opportunities for the appropriate range of recreation experiences, values and uses will be maintained and in some cases enhanced.

- Low development level campgrounds and small group sites are compatible with the setting.

- Ensure public and commercial recreation activities do not exceed acceptable limits of use.

- Identify and map important fish and wildlife habitat for information for more detailed planning processes.

- ATV travel will be on designated routes only. (The routes to be designated for ATV use will be determined through a more detailed planning process which will invite public input.)
CATEGORIES OF RESOURCE MANAGEMENT ZONES

- Special Management RMZs
- Major River Corridors

FORT NELSON LRMP

SPECIAL MANAGEMENT CATEGORY OF RESOURCE MANAGEMENT ZONES

Scale 1:1,640,000 (Approximate)
Muskwa-Kechika Special Management Category

2.2.4.1 8 Mile/Sulphur Resource Management Zone

Area: 249,500 ha

This RMZ is located in the middle of the planning area bounded on the south and east by the Alaska Highway, the north the Liard River Corridor Proposed Protected Area, and the west the Toad River Corridor. Most of this zone is mountainous, the northern extension of the Stone Range. The most north westerly portion includes the Sentinel Range. Two ecossections are represented: Eastern Muskwa Ranges and Muskwa Foothills. Three biogeoclimatic zones cover the RMZ: Alpine Tundra predominates with Spruce-Willow-Birch and a minute amount of Boreal White and Black Spruce.

In this zone the rain shadow east of the Rocky Mountains provides low snow depths and frequent chinooks that influence the vegetation and result in abundant wildlife, and frequent fires.

This RMZ has large active floodplains and has been subjected to frequent disturbance from forest and range fires which has resulted in an exceptionally diverse vegetative mosaic. The results of this are a high density and diversity of mammals and exceptional viewscapes. The RMZ is a part of a larger intact predator prey system and is home to caribou, Stone’s sheep, moose, elk, grizzly and black bear, mountain goat, and wolves.

This RMZ is virtually unroaded. There are a few lakes in the zone and the back country recreation opportunities include activities such as wildlife viewing, hunting, horseback riding, hiking, boating, camping and angling. Guide outfitters and other commercial back country operators provide services.

The mineral assessment for this zone shows significant industrial mineral potential. There are three developed prospects of barite with established reserves. Although this zone is largely unexplored for oil and gas, the eastern portion falls within the high potential areas of the western Canada Sedimentary Basin. Future prospects for oil and gas discovery are considered to be medium to high. There is potential for development of the timber resource along the west side of the Toad River.

This zone has historic and current use by the Kaska Dena, Slavey, Cree and Beaver cultures of the Lower Post and Fort Nelson First Nations. Traditional use, heritage and cultural sites; and fishing, hunting and trapping values are present in the zone.
Muskwa-Kechika Special Management Category - 8 Mile/Sulphur RMZ

Objectives:

1. Maintain visual quality from Nonda Tower.

2. Manage to maintain forest attributes suitable for habitat for elk, Stone’s sheep, grizzly and moose.

3. Manage to maintain forest attributes suitable for high capability grizzly bear habitat.

4. Manage to avoid negative bear/human interactions.

5. For areas adjacent to Muncho Lake Provincial Park and Liard River Corridor protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

6. Manage for components of Semi-Primitive Non-Motorized and Primitive. (ROS)

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource activities.

- Ensure industrial exploration activities are undertaken with sensitivity to elk, Stone’s sheep, grizzly bear and moose habitat.

- Manage wildlife habitat enhancement through subsequent planning processes.

- Access planning will take into account connectivity corridors.

- Minimize and manage creation of new access in unroded areas.

- Encourage use of low impact seismic. (Something different than normal cat cut e.g. hand cut).

- To minimize negative bear/human interactions, public education will focus on informing the public on dealing with bear/human encounters, bear behaviour and the safest human behaviour while in bear country.

- Promote recreational activities that enhance highway-based tourism with emphasis on destination activities

- Recurring aircraft use and access will be sensitive to RMZ values and resource user activities.
2.2.4.2 Aeroplane Lake Resource Management Zone

Area: 206,300 ha

This RMZ lies on the north west edge of the plan area. The entire RMZ is in the Cassiar Forest District. It is bounded by the Liard River on the north, the Kechika River on the east and the Sandpile RMZ on the south. It is a broad rolling lowland with a cold sub-Arctic climate. The zone is representative of the Liard Plain Ecoregion and is covered by three biogeoclimatic zones. Boreal White and Black Spruce covers over half the zone, most of the remainder is covered by Spruce-Willow-Birch and a very small amount in the higher elevations is Alpine Tundra.

Lodgepole pine is the dominant tree species in this zone with trembling aspen, black and white spruce, and willow occupying the rest of the landscape. The timber in this zone contributed to the Timber Harvesting Land Base identified in the 1994 Timber Supply Review for the Cassiar Timber Supply Area, however development potential of this resource is low.

This RMZ is located outside the Western Sedimentary Basin. There is no oil and gas tenures in the zone, and the potential is considered low.

The mineral assessment for the RMZ indicates significant metallic and industrial mineral potential. There is one prospect.

The zone is a significant wintering area for caribou which migrate from the Kechika Mountains and other surrounding areas. This RMZ is part of a larger intact predator prey system and is home to moose, caribou, grizzly bear, wolves, and Stone’s sheep, as well as significant numbers of fur bearers. The numerous lakes in the zone are valuable for the various fish species which include lake trout, northern pike and Arctic grayling.

Hunting and fishing are the primary recreational activities. There are numerous lakes, the larger ones are Aeroplane, Twin Island and Birches, and many unnamed smaller ones which have the potential to be utilized for future recreational opportunities. The management intent for this area is directed toward restricting the use of access routes by recreationalists. This is to minimize the impacts on wildlife, especially the caribou populations, and wilderness values.

Special features in the zone include the historic Davie Trail which has significant heritage value.
Muskwa-Kechika Special Management Category - Aeroplane Lake RMZ

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nations. Traditional use, heritage and cultural sites, as well as hunting, fishing and trapping values exist throughout. A portion of the Davie Trail, which is an important part of a traditional travel corridor, is in this RMZ.

Objectives:

1. Manage for visual quality around the lakes. Strategies:
   - Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

2. Manage to maintain forest attributes suitable for habitat for caribou and Stone’s sheep. Strategies:
   - Identify and map caribou populations and habitats for information into more detailed planning processes.
   - Ensure industrial exploration and timber management activities are undertaken with sensitivity to caribou and Stone’s sheep habitat.
   - Encourage appropriate harvesting systems to accommodate identified wildlife species.

3. Minimize habitat fragmentation. Strategies:
   - Access planning to take into account connectivity corridors.
   - Encourage the use of low impact seismic (something other than normal cut cut e.g. hand cut).

4. Manage for a component of Semi-Primitive Non-motorized (R.O.S.). Strategies:
   - Recurring aircraft use and access will be sensitive to RMZ values and resource user activities.

5. Maintain timber harvesting and forest management opportunities. Strategies:
   - Establish general forest production targets for landscape units with the RMZ consistent with low intensity forest management regimes.

6. Identify and manage significant Heritage trails. Strategies:
   - Locate and map trail locations.
   - Develop a management strategy for significant heritage trails.

Recommended Fort Nelson Land and Resource Management Plan
Churchill Resource Management Zone

Area: 384,900 ha

This RMZ is located in the middle western part of the planning area. It is bounded on the north by the Alaska Highway and Muncho Lake Provincial Park, on the east by Stone Mountain provincial Park and Wokkpash Recreation Area, and on the south by the height of land which is the planning area boundary. This zone is very mountainous and is representative of one ecoregion: Eastern Muskwa Ranges. Three biogeoclimatic zones cover this RMZ, two thirds of the area being covered by Alpine Tundra, a very small amount by Boreal White and Black Spruce and the rest by Spruce-Willow-Birch. The RMZ includes the Racing River and upper Toad River valleys and is dominated by the Battle of Britain Range with major peaks like Mount Churchill and Mount Dieppe to 2859 metres in elevation.

The lower elevations in the zone are forested, have large active floodplains and frequent fire disturbances. These types of disturbances provide for very diverse mosaic of vegetation, which results in exceptional viewscapes and an abundant diversity of large mammals. The zone is part of a larger intact predator prey system and is home to caribou, Stone's sheep, moose, elk, grizzly and black bear, mountain goat, and wolves. The fish species present in the rivers and streams include bull trout, whitefish and Arctic grayling.

Virtually unroaded, this zone provides a number of back country recreation opportunities including wildlife viewing, hunting, horseback riding, hiking, boating, camping and angling. Guide outfitters and other commercial back country operators provide services.

This zone has high potential for mine development. Some mining activity has occurred in the past (Davies-Keays and Churchill Copper mine sites). The mineral assessment for this RMZ indicates industrial mineral potential and significant metallic potential with numerous copper showings. There are three developed prospects and one past producer with significant reserves remaining. Although this zone is largely unexplored for oil and gas, the eastern portion falls within high potential areas of the Western Canada Sedimentary Basin. Future prospects for oil and gas discovery are considered to be medium to high. There is also limited potential for timber resources.

This zone has historic and current use by the Kaska Dena, Slavey, Cree and Beaver cultures of the Lower Post and Fort Nelson First Nations. Traditional use, archaeological, heritage and cultural sites exist throughout as well as
Muskwa-Kechika Special Management Category - Churchill RMZ

Fishing, hunting and trapping values. Portions of this zone has significant use by the McDonald family.

**Objectives:**

1. Maintain visual quality from the Toed and Racing rivers
2. Manage to maintain forest attributes suitable for habitat for Stone’s sheep, caribou and goats.
3. Minimize habitat fragmentation.
4. For areas adjacent to Stone Mountain and Muncho Lake provincial parks, Northern Rocky Mountains and Wokpesh protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.
6. Identify and provide for the protection of traditional use, cultural and heritage sites.

**Strategies:**

- Where established VQO's will guide incidental timber cutting associated with other resource user activities.
- Identify and map caribou populations and habitats for information for more detailed planning processes.
- Identify and map important fish & wildlife habitat for information for more detailed planning processes.
- Ensure industrial exploration activities are undertaken with sensitivity to Stone’s sheep, caribou and goat habitat.
- Encourage use of low impact seismic line development (something different than normal cat cut e.g. hand cut).
- Identify and recommend a course of action for damaged or degraded habitat.
- Access planning to take into account connectivity corridors.
- Minimize and manage creation of new access in unroded areas.
- Maintain existing waterbased recreation opportunities.
- Promote recreational activities that enhance highway-based tourism with emphasis on destination activities.
- Recurring aircraft use and access to be sensitive to RMZ values and resource user activities.
- Identify all known traditional use, cultural and heritage sites within the RMZ and develop appropriate management strategies.
2.2.4.4 Fishing Resource Management Zone

Area: 212,700 ha

This RMZ lies in the north west portion of the plan area. It is bounded by the Liard River on the north, the Kechika River on the west and the Rabbit and Terminal RMZs on the south. This zone is split between the Fort Nelson and Cassiar Forest Districts. The terrain is upland with rolling hills and relatively low relief. There are several large lakes with moderately large rivers and creeks associated with them. It is representative of one ecossection: the Liard Plain. The Boreal White and Black Spruce biogeoclimatic zone covers the RMZ.

The forest is dominated by lodgepole pine, white and black spruce, trembling aspen and balsam poplar on relatively well drained soils. The timber producing lands in this zone did not contribute to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis or the 1994 Timber Supply Review in the Cassiar Timber Supply Area. The potential for timber resource development exists.

The potential for mineral resources is moderate and there are existing mineral tenures in the zone. The mineral assessment for this RMZ indicates significant metallic and industrial mineral potential. There are two prospects. The eastern portion of this zone lies within the sedimentary basin. The potential for oil and gas is considered low.

The lakes contain healthy populations of sport fish especially lake trout, bull trout and Arctic grayling. Moose, caribou, grizzly bear and small fur bearers also occur in the zone. Waterfowl and small song birds live throughout the area, raptors and cavity nesters are present as well.

Recreational activities include fishing, hunting and camping. There is potential for snowmobiling and ATV touring in this unit as industrial activity opens up access. The management intent for this area is directed toward restricting the use of access routes by recreationalists. This is to minimize the impacts on wildlife, especially the caribou populations, and wilderness values.

Trapping and operators offering back country recreational activities are the primary commercial operations in this zone.
Muskwa-Kechika Special Management Category – Fishing RMZ

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nation. Traditional use such as cabins and associated trails, archaeological, cultural and heritage sites exist throughout, as well as trapping, hunting and fishing values.

Objectives:

1. Manage visual quality around the lakes.

2. Manage to maintain forest attributes suitable for habitat for grizzly bear, caribou and moose habitat.

3. Manage to avoid negative bear/human interactions.


5. Maintain timber harvesting and forest management opportunities.

6. Manage for a component of Semi-Primitive Non-Motorized (ROS)

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

- Identify and map caribou populations and suitable habitat for information for more detailed planning processes.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to grizzly bear, caribou and moose habitat.

- Encourage appropriate harvesting systems to accommodate identified wildlife species.

- Encourage the use of low impact seismic line development (something other than normal cat cut e.g. hand cut).

- To minimize negative bear/human interactions, public education will focus on informing the public on dealing with bear/human encounters, bear behaviour and the safest human behaviour while in bear country.

- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.

- Establish general forest production targets for landscape units within the RMZ consistent with low intensity forest management regimes.

Recommended Fort Nelson Land and Resource Management Plan
Muskwa-Kechika Special Management Category

2.2.4.5 Moodie Resource Management Zone

Area: 142,400 ha

This zone is located in the western portion of the planning area and is bounded by the Kechika and Turnagain rivers. There are glacial fluvial deposits throughout this zone. Outwash plains are common with small lakes scattered throughout. The area shows the generalized geology of folded sedimentary rocks. The major peak is Mount Winston at 2358 metres. The area has dominantly brunisolic soils. This whole RMZ falls within the Cassiar Forest District. The zone is representative of the Kechika Mountains eosection and includes three biogeoclimatic zones: Boreal White and Black Spruce, Spruce-Willow-Birch and Alpine Tundra.

Logging has not occurred within this zone except for the construction of facilities used by trappers, miners and guide outfitters. Lower elevations of this zone are characterized by open forests of primarily white spruce and subalpine fir. Upper elevations are dominated by deciduous shrubs including birch and willows. In some high, wide valleys, cold air collects, resulting in a mosaic of shrubs, grassland, and wetlands on valley floors below a band of forest on the valley sides.

The mineral assessment for this RMZ indicates significant metallic and industrial mineral potential.

The area is part of a large intact predator/prey system with moose, mountain goat, Stone’s sheep, grizzly bear and wolves being common throughout the zone. The area is notable for winter range for caribou and is significant for Stone Sheep and fur bearers. A small herd of Rocky Mountain elk utilizes parts of this zone. Fish species include grayling, northern pike, bull trout, rainbow trout, whitefish, and lake trout.

The remote nature of the area enhances its recreational activity, big game hunting is the primary recreational activity. Fishing would be considered to be the next major activity with scenery viewing and hiking a future opportunity.

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nation. Traditional use such as cabins and associated trails, archaeological, cultural and heritage sites exist throughout, as well as trapping, hunting and fishing values.
Objectives:

1. Manage visual quality from rivers and Moodie Lakes.

2. Manage to maintain forest attributes suitable for habitat for Stone's sheep, elk and goats.

3. Minimize habitat fragmentation

4. For areas adjacent to the Denetiah protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

5. Manage for a component of Semi-Primitive Non-Motorized and Primitive. (ROS)

Strategies:

- Where established VQO's will guided incidental timber cutting associated with other resource user activities.

- Ensure industrial exploration activities are undertaken with sensitivity to stone sheep, grizzly and elk habitat.

- Manage for wildlife habitat enhancement through subsequent planning processes.

- Identify and recommend a course of action for damaged or degraded habitat.

- Manage access to avoid disturbance within ungulate winter habitat and minimize disturbance near winter habitat.

- Access planning to take into account connectivity corridors.

- Minimize and manage creation of new access in unroaded areas.
Muskwa-Kechika Special Management Category

2.2.4.6 Muskwa West Resource Management Zone

Area: 146,800 ha

This zone is located in the western portion of the plan area between the Muskwa River Corridor and the Northern Rocky Mountains Proposed Protected Area. It is characterized by subdued mountains, isolated by wide valleys, and is the foothills of the Rocky Mountains. The zone lies in the rain shadow of the Rocky Mountains to the west and is commonly influenced by cold arctic air in the winter. Cool wet summers and dry warm winters with low snow accumulations are typical. The east/west valley’s typical to this zone are low moisture areas, drier than the mountains in-between them. One ecoregion is represented: Muskwa Plateau. Dominantly brunisolic soils there are two main biogeoclimatic zones: Boreal White and Black Spruce and Spruce-Willow-Birch.

This zone is generally unroaded and undeveloped with large forest openings and natural sub-alpine complexes. Merchantable timber in this zone includes balsam, spruce, lodgepole pine aspen and cottonwood species. Portions of the zone contributed to the Timber Harvesting Land Base as identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis. Potential to develop the timber resource exists.

Some oil and gas tenures are found on the eastern edge of this zone and exploration has been done throughout much of the area. Future prospects for oil and gas discovery are medium to high and the area falls within a high to very high potential portion of the sedimentary basin.

The mineral assessment for this RMZ indicates a potential for industrial minerals.

The zone contains very diverse wildlife populations. These include: large ungulates, such as moose, caribou, mountain goat, elk, whitetail and mule deer, and Stone’s sheep; and predators such as wolves, grizzly and black bears, coyotes and wolverine. This zone has high productivity for forage species. Bald and golden eagles are found near the main rivers. The upper portions of the tributaries to the rivers have significant spawning and rearing habitat for arctic grayling, bull trout, northern pike and mountain whitefish. A large proportion of the spawning habitat occurs within this zone due to the impassable steep gradients and waterfalls upstream.

This zone offers many recreational opportunities for hunting, hiking angling and camping. A viewscape in this area may include steep rolling hills with
Muskwa-Kechika Special Management Category - Muskwa West RMZ

grassy uplands and high tundra areas. The major river corridors provide access into the area for many recreational activities.

This zone has historic and current use by the Slavey, Cree, Beaver and Sekani cultures of the Fort Nelson and Prophet River First Nations. There is potential for traditional use, archaeological, cultural and heritage sites, and there are existing trapping, fishing and hunting values.

### Objectives:

1. **Manage visual quality from the rivers.**

2. **Manage to maintain forest attributes suitable for habitat for Stone's sheep, elk, caribou, moose and goats.**

3. **Minimize habitat fragmentation.**

### Strategies:

- Where established VQO's will guide incidental timber cutting associated with other resource user activities.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to elk, moose, Stone's sheep and caribou habitat.

- Monitor and maintain sustainable populations of designated species (fish or wildlife).

- Encourage use of low impact seismic line development (something different than normal cat cut e.g. hand cut).

- Encourage appropriate harvesting systems to accommodate designated wildlife species.

- Encourage efficient and rational subsurface resource development to minimize surface disturbances and maximize subsurface resource utilization.

- More detailed strategic and operational plans should consider buffers for important habitat elements.

- Manage access to avoid disturbance within ungulate winter habitat and minimize disturbance near winter habitat.

- Minimize roads parallel to rivers and reduce roads in Riparian Management Areas where possible.

- Access planning to take into account connectivity corridors.

- Minimize and manage creation of new access in unroaded areas.
4. For areas adjacent to the Northern Rocky Mountains protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

5. Maintain timber harvesting and forest management opportunities.


- Recurring aircraft use and access will be sensitive to RMZ values and resource user activities.

- New access will be co-ordinated with access requirements of other resource users through lower level planning.

- Establish general forest production targets for landscape units within the RMZ consistent with low intensity forest management regimes.

- Plan patch size, access and disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits identified in the biodiversity guide for this Natural Disturbance Type. Stand level biodiversity to focus on riparian areas and wildlife tree patches.

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.
Muskwa-Kechika Special Management Category

2.2.4.7 Prophet Resource Management Zone

Area: 157,500 ha

This zone is located in the most southerly unit in the planning area. It is bounded on the west, south and east by the height of land which is also the boundary of the plan area, and on the north by the Northern Rocky Mountains Proposed Protected Area. The zone includes the Prophet River valley and watershed. Two ecossections are represented: Eastern Muskwa Ranges and Muskwa Foothills. A small portion of the area in the river valleys is covered by Boreal White and Black Spruce, the rest is covered by Spruce-Willow-Birch in the mid elevations and Alpine Tundra in the peaks. The zone is mostly in the rain shadow east of the Rocky Mountains providing the low snow depths and frequent chinooks that influence the vegetation and result in abundant wildlife and frequent fire disturbance.

The mineral assessment for this RMZ indicates potential for metallic and significant potential for industrial minerals. There are numerous showings and three prospects. Future prospects for oil and gas discovery are considered high and the area falls within a high to very high potential portion of the sedimentary basin. Subsurface resource development, in this area, will be done in an efficient and rational manner to minimize surface disturbances and to maximize subsurface resource utilization. There has been some seismic work done along with some limited exploratory drilling. The gas potential for this zone is high. There is potential for forest resource development in the eastern low elevation portion of the Prophet River valley.

The lower elevations are forested with a diverse vegetative mosaic. This provides for an abundant diversity of large mammals as well as exceptional viewscapes. This RMZ is a part of a larger intact predator prey system and is home to large numbers of Stone's sheep, moose, caribou, elk, grizzly and black bear, mountain goat, and wolves. The more abundant fish species that occur in the rivers and streams include bull trout, whitefish and Arctic grayling.

This RMZ is unroaded and provides opportunities for many back country recreation activities such as hunting, camping, hiking, wildlife viewing, horseback riding, boating and angling. Commercial back country recreation operators provide visitor services in this zone.

Some special feature in this zone include the Eastern Rockies High Trail, a traditional route for horse travel, and the Bedeaux Trail cross through the recommended Fort Nelson Land and Resource Management Plan.
General Management

Direction

Category Management

Direction

Muskwa-Kechika Special Management Category - Prophet RMZ

middle of the zone. The Prophet River hot springs, a Goal 2 Proposed Protected Area is also within this zone.

This zone has historic and current use by the Sekani, Slavey, Cree and Beaver cultures of the Prophet River and halfway First Nations. There are know traditional use, archaeological, cultural and heritage sites throughout.

Objectives:

1. Manage visual quality from the rivers and Bedeaux and High trails.

2. Manage to maintain forest attributes suitable for habitat for Stone’s sheep, elk, caribou, moose and goats.

3. For areas adjacent to the Northern Rocky Mountains protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

4. Manage for components of Semi-Primitive Non-Motorized and Primitive. (ROS)

Strategies:

- Where established VQ0’s will guide incidental timber cutting associated with other resource user activities.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to Stone’s sheep, elk, caribou, moose and goat habitat.

- Monitor and maintain sustainable populations of designated species (fish or wildlife).

- Manage for wildlife habitat enhancement through subsequent planning processes.

- More detailed strategic and operational plans should consider buffers for important habitat elements.

- Manage access to avoid disturbance within ungulate winter habitat and minimize disturbance near winter habitat.

- Encourage use of low impact seismic line development (something different than normal cat cut, e.g. hand cut)

- Encourage efficient and rational subsurface resource development to minimize surface disturbances and maximize subsurface resource utilization.

- Maintain existing waterbased recreation opportunities.

- Recurring aircraft use and access will be sensitive to RMZ values and resource user activities.

Recommended Fort Nelson Land and Resource Management Plan
5. Minimize habitat fragmentation.

- New access will be co-ordinated with access requirements of other resource users through lower level planning.

- Minimize roads parallel to rivers and reduce roads in Riparian Management Areas where possible.

- The determination of linear development, including roaded development, will be through current review and approval processes and legislation. A more detailed planning process may identify high fish and wildlife values, or other significant features (e.g. licks, hot springs). Where there is a significant risk that these resources may suffer an unacceptable level of negative impact, access may be limited, restricted, or on a site-specific basis, prohibited (e.g. avoid critical habitat components and special features where identified). However, where an access route is prohibited alternative routes will be identified.

6. Maintain timber harvesting and forest management opportunities.

- Establish general forest production targets for landscape units within the RMZ consistent with low intensity forest management regime.

7. Identify and manage significant Heritage trails.

- Locate and map trails with historical significance.

- Develop a management strategy for significant heritage trails.
Muskwa-Kechika Special Management Category

2.2.4.8 Rabbit RMZ

Area: 419,800 ha

This zone is located in the western portion of the plan area and is completely within the Cassiar Forest District. The area is part of the Northern Rocky Mountains with glacial fluvial deposits throughout. Outwash plains are common interspersed with small lakes. The area shows the generalized geology of folded sedimentary rocks. The major peaks are Terminus Mountain at 1910 metres and Gataga Mountain at 2281 metres. The Terminus area has unique weather that is warmer and has less snow than normal for the surrounding area. The area has dominantly brunisolic soils. This zone represents one ecoregion: Kechika Mountains. Three biogeoclimatic zones cover the RMZ: Boreal White and Black Spruce, Spruce-Willow-Birch and Alpine Tundra. The area has had large natural fires and some man caused fires set for the purpose of wildlife habitat enhancement.

There is potential for forest resource development in the lower elevation portions of the river valleys. The majority of the area is completely unroaded and undeveloped.

The mineral assessment for this RMZ indicates significant metallic and industrial mineral potential.

The area has large intact predator prey relationships with moose, caribou, mountain goat, Stone's sheep, grizzly bear and wolves being common throughout the valleys. The area is notable winter range for caribou and is significant for Stone Sheep and fur bearers. There is also some use by expanding elk herds. All major bird groups are represented in the area, the Rocky Mountain Trench being significant for migrating waterfowl. The fish, in the area represent species from the Columbia, Mississippi, Arctic and Pacific river drainage's. Fish species include lake trout, northern pike, bull trout, rainbow trout, whitefish, grayling, and burbot.

The remote nature of the area enhances its recreational potential, with big game hunting the primary recreational activity, fishing secondary and viewing and hiking.

This zone has historic and current use by the Kaska Dena culture from the Lower Post First Nations. There is potential for archaeological, traditional use, cultural and heritage sites as well as hunting, fishing and trapping values.
Muskwa-Kechika Special Management Category - Rabbit RMZ

There are old cabins and trails associated with trapping activity in the area.

Objectives:
1. Manage visual quality in the Kechika Valley
2. Manage to maintain forest attributes suitable for habitat for Stone’s sheep, caribou and grizzly bear.
3. Minimize habitat fragmentation.
4. For areas adjacent to the Denetiah protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.
5. Manage for components of Semi-Primitive Non-Motorized and Primitive. (ROS)

Strategies:
- Where established VQO’s will guide incidental timber cutting associated with other resource activities.
- Identify and map caribou populations and habitats for information for more detailed planning processes.
- Ensure industrial exploration activities are undertaken with sensitivity to Stone’s sheep, caribou and grizzly habitat.
- Manage for wildlife habitat enhancement through subsequent planning processes.
- Manage access to avoid disturbance within ungulate winter habitat and minimize disturbance near winter habitat.
- Access planning to take into account connectivity corridors
- Minimize and manage creation of new access in unroded areas.
- Maintain existing waterbased recreation opportunities.
Muskwa-Kechika Special Management Category

2.2.4.9  Rainbow Resource Management Zone

Area: 162,000 ha

This RMZ is located in the most western portion of the plan area. This area contains the highest mountains within the Cassiar Ranges, Sharktooth Mountain at 2347 metres. The western boundary of the RMZ is the most westerly point of the plan area and follows from the height of land at the south end of the western Rainbow Lake and then along the west shoreline of Rainbow Lake to Kutcho Creek. Kutcho Creek is the boundary to the point where it intersects with the Turnagain corridor. The north boundary is the Turnagain River corridor and the east boundary is the Denetiah Proposed Protected Area to its intersection with Moody RMZ which is common. This zone represents one ecossection: Cassiar Ranges. The Alpine Tundra biogeoclimatic zone covers most of the zone, with a small portion of Spruce-Willow-Birch. This area has not had the extensive fire disturbance that other zones have had, and provides good representation of the two biogeoclimatic zones.

The majority of this zone is unroade.

The mineral assessment for this RMZ indicates significant metallic and industrial mineral potential.

The zone has a wildlife population which includes moose, goat, Stone’s sheep, caribou, grizzly bear and wolves. Rainbow Lakes have an established population of rainbow trout. The fish in this zone originate from the Liard River drainage and the other species include lake trout, northern pike, bull trout, whitefish, and grayling.

The remote nature of this area enhances its opportunity for back country recreation activities, with big game hunting being the primary activity and fishing the secondary. There is potential for other activities such as hiking, camping and wildlife viewing.

This zone has historic and current use by the Kaska Dena culture of the Lower Post first Nations and the Tahltan First Nations people. There is potential for archaeological, traditional use, cultural and heritage sites. There are trapping, fishing and hunting values.
Objectives:

1. Manage visual quality from and around the various lakes.

2. Manage to maintain forest attributes suitable for habitat for Stone’s sheep, goat, moose and grizzly bear.

3. Minimize habitat fragmentation.

4. For areas adjacent to the Denetiah protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

5. Manage for components of Semi-Primitive Non-Motorized and Primitive (ROS)

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

- Identify and map important fish & wildlife habitat for information for more detailed planning processes.

- Identify and recommend a course of action for damaged or degraded habitat.

- Ensure industrial exploration activities are undertaken with sensitivity to Stone’s sheep, goat and grizzly habitat.

- Access planning to take into account connectivity corridors.

- Minimize and manage creation of new access in unroaded areas.

- Maintain existing waterbased recreation opportunities.
Muskwa-Kechika Special Management Category

2.2.4.10  Sandpile Resource Management Zone

Area:  224,700 ha

This area is made up of high mountains in the rain shadow of the Cassiar Ranges to the west. It is bordered by the Turnagain River corridor on the south and east, and the planning area boundary on the west.

This area is a portion of the Kechika Mountains ecossection, it is covered by two biogeoclimatic zones: Spruce-willow-Birch and Alpine Tundra.

The area is part of the Northern Rocky Mountains with glacial fluvial deposits throughout. Outwash plains are common interspersed with small lakes. The Four Brothers Mountain Range shows the generalized geology of folded sedimentary rocks. The area has dominantly brunisolic soils.

There is potential for forest resource development in the lower elevation portions of the river valleys. The majority of the area is completely unroaded and undeveloped.

The mineral assessment for this RMZ indicates significant metallic and industrial mineral potential. There are two prospects.

The area has had large natural fires with some man caused fires for the purpose of wildlife habitat enhancement.

The area has large intact predator prey relationships with moose, caribou, mountain goat, Stone’s sheep, grizzly bear and wolves being common throughout the valleys. The area is notable for winter range for caribou and is significant for Stone Sheep and fur bearers. There is also some use by the expanding elk herds. The fish are representative of species found in the Columbia, Mississippi, Arctic and Pacific drainage’s. Fish species include lake trout, northern pike, bull trout, rainbow trout, whitefish and grayling.

The remote nature of the area enhances its recreational potential with big game hunting the primary recreational activity, fishing secondary and viewing and hiking.

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nations and the Tahltan First Nations people. There is potential for archaeological, traditional use, cultural and heritage sites. There are trapping, fishing and hunting values.
Muskwa-Kechika Special Management Category - Sandpile RMZ

Objectives:
1. Manage visual quality in around the various lakes, Four Brother Range and Horse Ranch Range.
2. Minimize habitat fragmentation.
3. Manage to avoid negative bear/human interactions.
4. Manage for a component of Semi-Primitive Motorized (ROS). The intent is not to impact on the use of boats on the lakes.
5. Maintain timber harvesting and forest management opportunities.

Strategies:
- Where established VQO's will guide incidental timber cutting associated with other resource user activities.
- Monitor and maintain sustainable populations of designated species (fish or wildlife).
- Ensure industrial exploration activities are undertaken with sensitivity to Stone's sheep, goat, elk and caribou habitat.
- Access planning to take into account connectivity corridors.
- Minimize and manage creation of new access in unroded areas.
- Manage for wildlife habitat enhancement through subsequent planning processes.
- To minimize negative bear/human interactions, public education will focus on informing the public on dealing with bear/human encounters, bear behaviour and the safest human behaviour while in bear country.
- Establish general forest production targets for landscape units within the RMZ, consistent with low intensity forest management regimes.
2.2.4.11 Stone Mountain Resource Management Zone

Area: 161,000 ha

This zone is located in the middle of the planning area and is bounded by the Alaska Highway on the south and east, the Toad River Corridor. The terrain in this zone is predominantly mountains of the Stone Range. Three ecossections are represented: Eastern Muskwa Ranges, Muskwa Foothills and the Muskwa Plateau. Three biogeoclimatic zones cover this RMZ, Boreal White and Black Spruce and Spruce-Willow-Birch in the valleys and side slopes and Alpine Tundra at the high elevations. This zone is in the rain shadow east of the Rocky Mountains, that provides for low snow depths and frequent chinooks that influence vegetation and result in abundant wildlife and frequent fire disturbance.

Mostly forested this zone has active floodplains on even the smaller streams. This together with the frequent fire history provides a diversity of vegetation. There is also a high density and diversity of large mammals present, such as caribou, Stone's sheep, moose, elk, grizzly and black bear and wolves. This zone is part of a larger intact predator prey system.

The mineral assessment for this RMZ indicates potential for industrial minerals. There has been very little exploration and presently no tenures for oil and gas. This zone lies within the western edge of the sedimentary basin and future prospects for oil and gas discovery are medium to high. There is potential for forest development along the eastern edge.

Virtually unroaded, but with a few lakes this zone has opportunities for recreational activities such as wildlife viewing, hunting, horseback riding, hiking and camping. Commercial back country operators provide some visitor services.

This zone has historic and current use by the Kaska Dena, Slavey, Cree and Beaver cultures of the Lower Post and Fort Nelson First Nations people. There is potential for archaeological, traditional use, cultural and heritage sites. There are trapping, fishing and hunting values.

Objectives:

1. Manage visual quality from the Alaska Highway

Strategies:

Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

Recommended Fort Nelson Land and Resource Management Plan
<table>
<thead>
<tr>
<th>Number</th>
<th>Activity Description</th>
<th>Implementation Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Manage to maintain forest attributes suitable for high elevation caribou habitat.</td>
<td>Identify the important high elevation caribou winter habitat areas for consideration as Wildlife Habitat Areas.</td>
</tr>
<tr>
<td>3</td>
<td>Manage to avoid negative bear/human interactions.</td>
<td>To minimize negative bear/human interactions, public education will focus on informing the public on dealing with bear/human encounters, bear behaviour and the safest human behaviour while in bear country.</td>
</tr>
<tr>
<td>4</td>
<td>Manage to maintain forest attributes suitable for habitat for Stone's sheep, caribou, goat and moose.</td>
<td>Ensure industrial exploration and timber management activities are undertaken with sensitivity to grizzly, Stone's sheep, caribou, goat and moose habitat.</td>
</tr>
<tr>
<td>5</td>
<td>Manage to maintain forest attributes suitable for high capability grizzly bear habitat.</td>
<td>Encourage appropriate harvesting systems to accommodate identified wildlife species. Encourage use of low impact seismic. (Something different than normal cat cut e.g. hand cut). Manage for wildlife habitat enhancement through subsequent planning processes. Identify and recommend a course of action for damaged or degraded habitat. Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.</td>
</tr>
<tr>
<td>6</td>
<td>Minimize habitat fragmentation.</td>
<td>Access planning to take into account connectivity corridors.</td>
</tr>
<tr>
<td>7</td>
<td>For areas adjacent to the Stone Mountain Park, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.</td>
<td>Promote recreational activities that enhance highway-based tourism with emphasis on destination activities.</td>
</tr>
<tr>
<td>8</td>
<td>Manage for a component of Semi-Primitive Non-Motorized and Primitive. (ROS)</td>
<td>Recurring aircraft use and access will be sensitive to RMZ values and resource user activities. Establish general forest production targets for landscape units within the RMZ consistent with low intensity forest management regimes. Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.</td>
</tr>
<tr>
<td>9</td>
<td>Maintain timber harvesting and forest management opportunities.</td>
<td></td>
</tr>
</tbody>
</table>
Muskwa-Kechika Special Management Category

2.2.4.12 Terminal Resource Management Zone

Area: 180,000 ha

The area is part of the Northern Rocky Mountains with glacial fluvial deposits throughout. Outwash plains are common with interspersed small lakes. The area shows the generalized geology of folded sedimentary rocks. The area has dominantly brunisolic soils. This zone represents two ecosections: Eastern Muskwa Ranges and Kechika Mountains and is covered by three biogeoclimatic zones: Boreal White and Black Spruce in very small amount in the lowest elevations, Spruce-Willow-Birch and Alpine Tundra in the highest elevations.

Merchantable species include balsam fir, white and black spruce, and lodgepole pine. There is potential for forest resource development in the lower elevation portions of the river valleys on the northern edge of the zone. The majority of the area is completely unroaded and undeveloped. The area has had large natural fires with some man caused fires for the purpose of wildlife habitat enhancement.

The mineral assessment for this RMZ indicates significant metallic and industrial mineral potential.

The area has large intact predator prey relationships with moose, caribou, mountain goat, Stone’s sheep, grizzly bear and wolves being common throughout the valleys. The area is notable for winter range for caribou and is significant for Stone Sheep and fur bearers. There is also some use by the expanding elk herds. The fish in the area are representative of the Columbia, Mississippi, Arctic and Pacific drainage’s. Fish species include lake trout, northern pike, bull trout, whitefish, and grayling.

The remote nature of this area enhances its opportunity for back country recreation activities, with big game hunting being the primary activity and fishing the secondary. There is potential for other activities such as hiking, camping and wildlife viewing.

This zone has historic and current use by the Kaska Dena, Slavey, Cree and Beaver cultures of the Lower Post and Fort Nelson First Nations people. There is potential for archaeological, traditional use, cultural and heritage sites. There are trapping, fishing and hunting values.
Objectives:

1. Manage visual quality around the various lakes.

2. Manage to maintain forest attributes suitable for habitat for caribou, Stone’s sheep and grizzly bear.

3. Minimize habitat fragmentation.

4. For areas adjacent to Muncho Lake Provincial Park, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

5. Manage for components of Semi-Primitive Non-Motorized and Primitive (ROS).

6. Maintain timber harvesting and forest management opportunities.

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

- Identify and map caribou populations and habitats for information for more detailed planning process.

- Identify and map important fish & wildlife habitat for information for more detailed planning process.

- Ensure industrial exploration activities are undertaken with sensitivity to stone sheep, caribou and grizzly habitat.

- Encourage use of low impact seismic line development (something different than normal cat cut e.g., hand cut).

- Access planning to take into account connectivity corridors.

- Minimize and manage creation of new access in unroaded areas.

- Maintain existing waterbased recreation opportunities.

- Establish general forest production targets for landscape units within the RMZ consistent with low intensity forest management regimes.
Muskwa-Kechika Special Management Corridors  
Major River Corridors Sub-Category

2.2.4.13 Kechika River Corridor Resource Management Zone

Area: 130,400 ha

This zone is located in the north western part of the plan area. The corridor includes the wide river valley and immediate escarpments of the Kechika River. In this section the river runs mainly south to north. This portion of the river is the northern end of the Rocky Mountain Trench, and the river valley is the separation between the Kechika and Muskwa ranges. This zone is covered by through three ecosections: Liard Plain, Kechika Mountains and Cassiar Ranges. The majority of the area is covered by one biogeoclimatic zone: Boreal White and Black Spruce with some of the escarpments covered by Spruce-Willow-Birch. This zone is influenced by rain shadows and has lower snow depths and frequent chinooks that create a unique climatic variant for it’s latitude.

This RMZ is a significant transportation and access corridor for adjacent RMZs which show high metallic and industrial mineral potential. The timber in this zone did not contribute to the Timber Harvesting Land Base identified in the 1994 Timber Supply Review in the Cassiar Timber Supply Area. The potential for timber resource development exists.

Mostly forested this zone has large active floodplains, and some fire disturbance; this results in a diverse vegetation mosaic. The RMZ is a part of a larger intact predator prey system and is home to Stone’s sheep, moose, elk, grizzly and black bear, mountain goat and wolves. The floodplains and riparian areas are listed as high capability for ungulates and grizzly and black bear; they are also important staging and migration areas for a variety of mammals and birds including eagles and sandhill cranes. The dominant fish species found in the river include bull trout, whitefish and Arctic grayling. Lake trout are found in some of the lakes within the RMZ.

Currently unroaded, this zone provided opportunities for back country recreation activities such as river boating, hunting, horseback riding, camping and angling. The river corridor is used heavily as an access route to the other RMZs and has high scenic values. Commercial back country operators provide visitor services.

This zone has high historic and current use by the Kaska Dena culture of the Lower Post First Nations. There is high potential for traditional use, archaeological, cultural and heritage sites. Important as a traditional travel corridor there are a number of historic trails including the Davie Trail.
## Muskwa-Kechika Special Management Corridors
### Major River Corridors Sub-Category - Kechika River Corridor
### RMZ

#### Objectives:

1. Manage visual quality from the Kechika River.

2. Manage to maintain forest attributes for habitat for Stone’s sheep, goats, elk and grizzly bear.

3. Manage to avoid negative bear/human interactions.

4. Minimize habitat fragmentation.

#### Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

- Ensure industrial exploration and timber management activities are undertaken with sensitivity to wildlife habitat, visual, riparian and recreational values.

- Identify and map important fish & wildlife habitat.

- Maintain integrity of island habitat.

- Encourage appropriate harvesting systems to accommodate identified wildlife species.

- Manage for wildlife habitat enhancement through operational plans.

- Recurring aircraft and river boat use and access will be sensitive to RMZ values and resource user activities.

- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.

- Minimize number of river crossings Utilize existing crossings whenever possible and practical.

- Encourage the use of low impact seismic line development (something different than normal cat cut e.g. hand cut).

- Access planning to take into account connectivity corridors.

- Minimize and manage creation of new access in unroded areas.

- Minimize the impact of vegetation control near ecosystems, habitat types and plant species designated for long-term monitoring.

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Recommended Fort Nelson Land and Resource Management Plan
Muskwa-Kechika Special Management Category
Major River Corridors Sub-Category - Kechika River Corridor RMZ

5. For areas adjacent to Denetiah protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

6. Manage for components of Semi-Primitive Non-Motorized and Primitive. (ROS) The intent is not to impact on river boat traffic.

7. Maintain timber harvesting and forest management opportunities.

8. Identify and provide for the protection of traditional use, archaeological, cultural and heritage sites.

9. Identify and manage significant heritage trails.

- Identify and recommend a course of action for damaged and degraded habitat.
- Re-vegetate disturbed areas. Use local native plant species, where appropriate and possible.
- Low development level campgrounds and small group sites are compatible with the setting.
- Promote recreational activities which are water-based, and the use of rivers as access and recreational corridors.
- Maintain the levels of public motorized access that existed prior to any new access developments.
- Ensure industrial exploration activities are undertaken with sensitivity to riparian values.
- Establish general forest production targets for landscape units within the RMZ consistent with low forest management regimes.
- Identify all known sites within the RMZ and develop appropriate management strategies.
- Locate and map trails with historical significance.
- Develop a management strategy for significant heritage trails.
2.2.4.14 Muskwa River Corridor Resource Management Zone

Area: 43,200 ha

This zone is located along the east side of the Muskwa West RMZ in the southern portion of the plan area. The corridor includes the river valley and immediate escarpments of the Muskwa river. This section of the river runs from south to north so the RMZ is a long linear corridor. The zone represents one ecossection: Muskwa Plateau; and the entire RMZ is covered by one biogeoclimatic zone: Boreal White and Black Spruce.

Within this RMZ there is high potential for gravel and other mineral resources as well as energy resources. There are already a number of existing seismic lines and well sites. There is potential to develop the forest resource and some of the timber within this zone contributed to the Timber Harvesting Land Base identified in the 1992 Coniferous and 1993 Deciduous Fort Nelson Timber Supply Area Analysis.

Mostly forested, this zone has large active floodplains and frequent disturbance from fire which results in a diverse vegetative mosaic. The RMZ is part of a larger intact predator prey system and is home to caribou, moose, elk, grizzly and black bear, and wolves. Both the floodplains and riparian areas are high capability for grizzly bear habitat and important staging and migration areas for a variety of mammals and birds such as eagles and sandhill cranes. The most abundant fish species include bull trout, whitefish and Arctic grayling.

Currently unroadeed this zone provides opportunities for back country recreation activities such as hunting, horseback riding, camping and boating. There is ATV use on the east side of the Muskwa River. The river is used as a major access route to the adjacent RMZ and has high scenic values.

This zone has historic and current use by the Sekani, Slavey, Cree and Beaver cultures of the Prophet River and Fort Nelson First Nations. There is high potential for archaeological, traditional use, cultural and heritage sites. There are pack trails throughout and trapping, hunting and fishing values.

Objectives: Strategies:

1. Manage visual quality from the Muskwa River.
   - Where established VQO’s will guide incidental timber cutting associated with resource user activities.
2. Maintain the structural and functional integrity of the watercourse/waterbody.
   - Ensure industrial exploration and timber management activities are undertaken with sensitivity to wildlife habitat, visual and recreational values.
   - Minimize roads parallel to rivers and reduce roads in Riparian Management Areas where possible.
   - New access to mine sites will be managed with Special Use Permit (SUP) elements that control access (i.e. elements of Eskay and Muddy Lake roads SUPs).
   - Minimize and manage creation of new access in unroaded areas.
   - Identify and map aggregate (mineral) inventory and potential.
   - Identify and map important fish & wildlife habitat.
   - Identify and map important habitat elements of red-and blue-listed and regionally significant species for consideration for Wildlife Habitat Areas.
   - Identify and map migration routes.
   - Minimize the impact of vegetation control near ecosystems, habitat types and plant species designated for long-term monitoring.
   - Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.
   - Low development level campgrounds and small group sites are compatible with the setting.

3. For areas adjacent to the Northern Rocky Mountains protected area, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

4. Manage for components of Semi-Primitive Motorized and Semi-Primitive Non-Motorized. (ROS)
   - Maintain the levels of public motorized access that existed prior to any new access developments.
Muskwa-Kechika Special Management Category
Major River Corridors Sub-Category - Muskwa River Corridor
RMZ

- Recurring aircraft and river boat use and access will be sensitive to RMZ values and resource user activities.

- Ensure industrial exploration activities are undertaken with sensitivity to riparian values.

6. Maintain timber harvesting and forest management opportunities.

- Establish general forest production targets for landscape units within the RMZ consistent with low forest management regimes.

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.

7. Identify and provide for the protection of traditional use, archaeological, cultural and heritage sites.

- Identify all known sites within the RMZ and develop appropriate management strategies.

- Locate and map trails with historical significance.

8. Identify and manage significant heritage trails.

- Develop a management strategy for significant heritage trails.
Muskwa-Kechika Special Management Category
Major River Corridors Sub-Category

2.2.4.15 Toad River Corridor Resource Management Zone

Area: 39,300 ha

This RMZ includes the Toad River valley and immediate escarpments. In this section the river runs basically from south to north, and separates Stone Mountain from 8 Mile/Sulpher RMZ. At the north end of this corridor is the Liard River Corridor Proposed Protected Area. The river flows through two ecossections: Muskwa Foothills and Muskwa Plateau. Two biogeoclimatic zones cover the river corridor, most of the area is covered by Boreal White and Black Spruce with a minor portion covered by Spruce-Willow-Birch.

There is high potential for gravel; the mineral assessment for the RMZ indicates potential for industrial minerals. This zone borders on other zones that have medium to high potential for oil and gas prospects in the near future. There is also high potential for geothermal resources. There is potential for development of the forest resource on the lower portion of the Toad River.

This zone has large active floodplains and is disturbed by fire which results in a diverse vegetative mosaic. The RMZ is part of a larger intact predator prey system and is home to Stone’s sheep, elk, grizzly and black bear, caribou, moose, deer and wolves. The floodplains and riparian areas have high capability for grizzly bear and are also important staging and migration sites for a variety of mammals, and birds such as eagles and sandhill cranes. The most abundant fish species include bull trout, whitefish and Arctic grayling.

Currently unroaded, this zone provides opportunities for back country recreation activities such as hunting, horseback riding, camping and boating. The river could be used as an access corridor to the adjacent RMZs and has high scenic values.

This zone has historical and current use by the Kaska Dena culture of the Lower Post and Fort Nelson First Nations. There are known archaeological, traditional use, cultural and heritage sites, and a high potential for others. As well there are hunting, trapping and fishing values.

Objectives:

1. Manage visual quality from the Toad River.

Strategies:

- Where established VQO’s will guide incidental timber cutting associated with other resource user activities.

Recommended Fort Nelson Land and Resource Management Plan 11
### Muskwa-Kechika Special Management Category

**Major River Corridors Sub-Category - Toad River Corridor RMZ**

<table>
<thead>
<tr>
<th>2.</th>
<th>Manage to maintain forest attributes suitable for habitat for grizzly, Stone's sheep and elk.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Manage to maintain forest attributes suitable for high capability grizzly bear habitat.</td>
</tr>
<tr>
<td>4.</td>
<td>Manage to avoid negative bear/human interactions.</td>
</tr>
<tr>
<td>5.</td>
<td>Minimize habitat fragmentation.</td>
</tr>
</tbody>
</table>

- Identify and map important fish & wildlife habitat.
- Identify and map existing fish distributions.
- Ensure industrial exploration and timber management activities are undertaken with sensitivity to grizzly, Stone's sheep and elk habitat; visual and recreational values.
- Encourage appropriate harvesting systems to accommodate identified wildlife species.
- Manage for wildlife habitat enhancement through operational plans.
- Encourage use of low impact seismic line development (something different than normal cat cut, e.g. hand cut).
- Minimize the impact of vegetation control near ecosystems, habitat types and plant species designated for long-term monitoring.
- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.
- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.
- Minimize number of river crossings. Utilize existing crossings whenever possible and practical.
- Access planning to take into account connectivity corridors.
- Plan patch size, access and disturbance to emulate natural disturbance patterns. Utilizing aggregate cutblocks and clustered harvest patterns, focus on patch sizes at the upper limits identified in the biodiversity guide for this Natural Disturbance Type. Stand level biodiversity to focus on riparian areas and wildlife tree patches.
6. For areas adjacent to the Toad River Hot Springs and Liard River Corridor protected areas, encourage management of resource development that supports the intended objectives and acceptable uses of the protected area, including conservation and recreation.

7. Manage for a component of Semi-Primitive Non-Motorized and Primitive (ROS)

- Promote recreational activities which are water-based; and the use of rivers as access and recreation corridors.

- Recurring river boat use and access will be sensitive to RMZ values and resource user activities.

- Maintain the levels of public motorized access that existed prior to any new access developments.

- Ensure that industrial exploration activities are undertaken with sensitivity to riparian values.

8. Maintain timber harvesting and forest management opportunities.

- Establish general forest production targets for landscape units within the RMZ consistent with low forest management regimes.

- Minimize losses from damaging agents through prompt fire and pest management, including the salvage of damaged or killed timber.

9. Identify and provide for the protection of traditional use, archaeological, cultural and heritage sites.

- Identify all known sites within the RMZ and develop appropriate management strategies.
**Muskwa-Kechika Special Management Category**  
**Major River Corridors Sub-C:itcgory**

### 2.2.4.16 Turnagain/Dall Rivers Corridor Resource Management Zone

**Area:** 54,200 ha

This RMZ is located between the Sandpile, Rainbow, and Moodie RMZs. The corridor contains the Turnagain and Dall River valleys to the point where it intersects the Kechika corridor on the east and the Denetiah Proposed Protected Area. Meanders on the lower portions of the river explains its name "Turnagain". The lower Turnagain is navigable by river boats up to a series of falls, west of the confluence of the Cassiar River. This RMZ crosses both the Cassiar Mountains and Kechika Mountains and forms a natural corridor between the Kechika River Valley and the upper Turnagain and Dall Lake area. This RMZ is with the Boreal Black and White Spruce biogeoclimatic zone with the exception of the western portion which changes to the Spruce Willow Birch biogeoclimatic zone. This RMZ is influenced by rain shadows resulting in lower snow depths and warm Chinook winds that create unique climatic variant for its latitude.

Significant changes have been made to this RMZ as a result of natural and man made fires. There are large open areas along the rivers with the main forested area being those areas that have escaped any burning to date.

This RMZ is a significant transportation and access corridor for adjacent RMZs which have high metallic and industrial mineral potential.

The RMZ is part of a larger intact predator prey system and is home to Stone Sheep, Moose, Elk, Grizzly Bear, mountain Goats, Black Bear, caribou and wolves. the flood plain and Riparian areas have high capability for ungulates and Grizzly Bears. Bull trout, Whitefish Arctic Grayling, Burbot, and Rainbow trout are the most abundant fish species.

This RMZ is currently unroaded and primitive. This has provided a number of backcountry opportunities both public and include; hunting, trapping fishing, boating, and camping. The use of the Turnagain River as a recreation area continues to grow as it has become known to the public.

This zone has historic and current use by the Kaska Dena culture of the Lower Post First Nation and Tahltan First Nations. There is high potential for archaeological, traditional use, cultural and heritage sites. The zone also has hunting, trapping and fishing values.

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Recommended Fort Nelson Land and Resource Management Plan
Muskwa-Kechika Special Management Category
Major River Corridors Sub-Category - Turnagain/Dall Rivers Corridor RMZ

Objectives:
1. Manage visual quality from Turnagain and Dall Rivers.
2. Manage to maintain forest attributes suitable for habitat for Stone's sheep, mountain goat and elk.
3. Maintain opportunities to develop access while ensuring that this activity will be undertaken with sensitivity to the resource(s) emphasized for the RMZ.
4. Manage for a component of Semi-Primitive Motorized (lower section) and Semi-Primitive Non-Motorized (above the Cassiar River). (ROS)
4. Minimize habitat fragmentation.

Strategies:
- Where established VQO's will guide the incidental timber cutting associated with other resource user activities.
- Ensure industrial exploration activities are undertaken with sensitivity to wildlife habitat, visual and recreational values.
- Access planning to take into account connectivity corridors.
- Maintain the levels of public motorized access that existed prior to any new access developments.
- Recurring aircraft and river boat use and access will be sensitive to RMZ values and resource user activities.
- Minimize and manage creation of new access in unroaded areas.
- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.
- Low development level campgrounds and small group sites are compatible with the setting.
- Ensure that industrial exploration activities are undertaken with sensitivity to riparian values.
2.2.5. Proposed Protection Category of Resource Management Zones

Intent:
- To designate large-scale areas for the protection of viable representative examples of natural diversity, and protect special natural, recreational and cultural heritage values and features in accordance with the government’s Protected Areas Strategy.
- To provide recognition and special consideration to existing tenures, licences, authorizations and public use where uses are compatible with the objectives for which the area was established.

Planning processes are the primary means of delivering the government’s Protected Areas Strategy (PAS). The policy, released in July 1993, sets out in considerable detail protected area conservation, recreation and culture heritage objectives, candidate area selection criteria and technical methods for analyzing protected area gaps. The policy sets a target for a protected area system of 12% of the province by the year 2000. To offer guidance for achieving the provincial goal, in June 1995, the Land Use Co-ordination Office set a target of 9% protected areas for the Omineca-Peace Region. In addition, to help guide the planning tables in the region, each LRMP was assigned planning targets. The target for the Fort Nelson Planning Area is 11.4%.

The protected area strategy is the result of significant commitment from government and public groups in its development. The Parks and Wilderness for the ‘90s initiative, the Old Growth Strategy initiative, preparation of resource inventories, and technical gap analysis with PAS implementation have all contributed to an impressive information base. The detailed and systematic PAS documentation, the concentrated government commitment to its development and delivery, and the negotiation and information results from the LRMP WG provide a solid basis upon which to make protected area designation recommendations for the Fort Nelson plan area.

Currently 1.8% of the plan area has either full or partial protected area designation. The most well known of these are the two large parks in the area: Muncho Lake and Stone Mountain. The rest of the percentage is made up of smaller campgrounds along the Alaska Highway, recreation areas and ecological reserves.

PAS government planners and environmental interest groups have compiled relatively extensive information on the range of potential opportunities for adding to the existing protected area system in the plan area. Many agree that biological conservation is best achieved by protected area additions which comprise relatively undisturbed and unfragmented natural areas.
Proposed Protected Area Category

Obviously, this selection criterion limits the areas where suitable candidates could be located, given past patterns of development and to a lesser extent human settlement. Conservation and recreation objectives in this area can also be addressed through the protection of the same large wilderness areas.

The LRMP WG was able to reach consensus on proposed protected areas within the 11.4% target. The chosen areas are compatible with the Regional Protected Areas Team (RPAT) recommendations, and shows the balanced participation of sectors representing the full spectrum of values.

The proposed protected areas make important advances in the representation of a number of ecosystems. Representation in some ecosystems, however, remains low, particularly in the boreal white and black spruce ecosystems of the mid to eastern portions of the planning area. The pattern of resource development throughout the area precludes good options for protected area representation. To a small degree, the representation of these poorly represented ecosystems can be addressed through the implementation of the PAS Goal 2 recommendations to protect special features. Many protected area proposals contain areas of known and potential archaeological, traditional use, cultural and heritage significance. Some areas include known historical trade routes, trails and sustenance areas.

The New Proposed Protection Category of Resource Management Zones is shown in Figure 6, and listed below:

<table>
<thead>
<tr>
<th>Goal 1</th>
<th>Goal 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denetiah</td>
<td>Grayling Hot Springs</td>
</tr>
<tr>
<td>Klua Lakes</td>
<td>Goguka Creek</td>
</tr>
<tr>
<td>Liard River Corridor</td>
<td>Hay River</td>
</tr>
<tr>
<td>Maahamish</td>
<td>Horneline Creek</td>
</tr>
<tr>
<td>Northern Rocky Mountains</td>
<td>Jackpine Remnant</td>
</tr>
<tr>
<td>Thinitea</td>
<td>Kotcho Lake Village Site</td>
</tr>
<tr>
<td>Wokkpash</td>
<td>Old Growth</td>
</tr>
<tr>
<td></td>
<td>Prophet River Hot Springs</td>
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<tr>
<td></td>
<td>Portage Brule Rapids</td>
</tr>
<tr>
<td></td>
<td>Smith River/Fort Halkett</td>
</tr>
<tr>
<td></td>
<td>Toad River Hot Springs</td>
</tr>
</tbody>
</table>

Logging, mining, hydroelectric and oil and gas exploration (unless otherwise noted) and development will not be allowed to occur in Protection RMZs. Allowable uses will be subject to the Protected Area Management Plan.
Proposed Protected Areas Category

(PAMP) which will be developed at some future date. The planning and management of new Protection RMZs will be carried out in a co-operative manner by all agencies and affected stakeholders. Local level planning processes will develop the management plans for individual Proposed Protection RMZs, consistent with the acceptable uses outlined in the following pages, and will encourage the involvement of all parties, including the public, with a key interest or stake in the plan.

The following additions and changes are recommended to the Acceptable Uses Matrix which will apply to all the RMZs in the Proposed Protected Areas category. In addition, each RMZ also has site specific objectives and strategies listed to accommodate specific resource values and concerns.

<table>
<thead>
<tr>
<th>Activity/Use/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trapping</td>
<td>• Trapping activity will be allowed. Trapline tenures will be renewable and transferable.</td>
</tr>
<tr>
<td>Pack animal use</td>
<td>• Exotics, such as llamas and ostriches, are not to be used as pack animals. The reasons for this recommendation is an attempt to avoid any diseases being introduced, as this would compromise the integrity of the areas. Over time horses and mules have proven to be compatible with the environment. With time and research it may be proven that exotics are also compatible with the natural environment; if this turns out to be the case then this recommendation can be revisited and amended.</td>
</tr>
<tr>
<td>Off-road activities - motorized</td>
<td>• Some types of off-road motorized recreational vehicles and boats may be restricted either by type of vehicle, time of year or areas designated for use. The specifics will be developed through the Protected Area Management Planning process, which is a public process.</td>
</tr>
</tbody>
</table>

Objective: Strategies:
- Revegetate disturbed areas. Use local, native plant species, where appropriate and possible.
- Identify and recommend a course of action for damaged or degraded habitat.
CATEGORIES OF RESOURCE MANAGEMENT ZONES

FORT NELSON LRMP

PROPOSED PROTECTION CATEGORY OF RESOURCE MANAGEMENT ZONES

Scale 1:1,640,000 (Approximate)
2.2.5.1 Denetiah Protected Area

Area: 97,200 ha

The Denetiah proposed protected area is located on the west side of the plan area. It includes the entire Denetiah Lake watershed, a cross-section of the Rocky Mountain Trench and Kechika River (Heritage River Candidate). It is entirely within the Cassiar Forest District.

The area represents the Kechika Mountains and Cassiar Ranges ecoregions. It is a component of a large intact predator-prey system. Provincially significant wildlife values including moose, caribou, Stone's sheep mountain goat, wolves and grizzly bears, significant mineral licks and dry microclimate at Terminus Mountain. Big game hunting is the primary recreational activity, fishing is secondary. Some canoeing, rafting, and jet-boat activities, along with wildlife viewing and hiking occur.

The special features of this area are the Dall and Denetiah Lakes, with the intact Denetiah watershed and the historic Davie Trail from Fort Ware to Lower Post.

This area has historic and current use by the Kaska Dena culture of the Lower Post First Nations and Tahltan First Nations. Even though there is limited documentation there is high potential for archaeological, cultural and heritage resources. There are hunting, fishing and trapping values. The area includes a historic fur trading route and related historic trapper cabin sites. The Davie Trail runs through a portion of this area.

The location of the Denetiah Proposed Protected Area, if designated under the Park Act, would block road access to a large relatively under-explored area lying immediately to the south. There is a diversity of opinion amongst the members of the Working Group regarding the acceptability of future road access through the proposed protected area. However, in order to preserve the opportunity for a future access corridor through this area, the Working Group recommends that a portion of the Denetiah Proposed Protected Area (Kechika River corridor) be designated under the Environment and Land Use Act. The determination of future individual access proposals, including road development, will be made through existing processes, as appropriate, in effect at the time the proposals come forward, which will include full public and stakeholder involvement. In the case of a major mine development, this will include the Environment Assessment Process.
**Proposed Protected Areas Category - Denetiah**

**LRMP Working Group Recommendation for Acceptable Uses:**

<table>
<thead>
<tr>
<th>Activity/Use/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water: motorized activities</td>
<td>Traditional motorized boat use allowed on rivers and lakes.</td>
</tr>
<tr>
<td>Grazing</td>
<td>Allowed subject to management plan. New tenures can be issued as necessary to support commercial back country recreation opportunities.</td>
</tr>
<tr>
<td>Roads within Protected Areas</td>
<td>Allowed subject to management plan. The intent is to preserve the opportunity for future access across this area.</td>
</tr>
</tbody>
</table>

**Objectives**

1. Ensure Commercial Backcountry Recreation activities are consistent with the objectives and strategies of the RMZ, and maintain a balance between public recreation and other use.

2. Manage to avoid negative bear/human interactions.

**Strategies**

- An inventory of existing and potential CBR opportunities is required to guide the allocation. CBR activities must be consistent with:
  - acceptable limits of use;
  - environmental sustainability;
  - greatest benefit to local community, region and province;
  - equitable forage allocation between commercial and non-commercial use; and
  - equitable allocation of suitable campsites.

- To minimize negative bear/human interactions, public education will focus on informing the public on: dealing with bear/human encounters; bear behaviour; and the safest human behaviour while in bear country.

- Recurring aircraft use and access will be sensitive to RMZ values and resource user activities.

- Should road access proposals be approved, proponents will be required to include plans to:
  - implement the access controls required to maintain, over time, impacted wildlife values;
  - reclaim roads and development sites when the tenure holder has completed activities and the road and/or site is no longer needed;
  - meet the intent of all Resource Management Zone objectives and strategies within the framework of the access corridor.
2.2.5.2 Klua Lakes Protected Area

Area: 28,600 ha

The Klua Lakes proposed protected area is located in the southern part of the plan area, a few kilometres east of the Alaska Highway in the Prophet River area.

The Klua Lakes area represents the Muskwa Plateau Ecossection and includes examples of escarpments and cuesta topography. This area provides wildlife habitat for Trumpeter swans, peregrine falcons, mountain goats, grizzly bear, ungulates, fur bearers, as well as significant diversified fish species in the lake (whitefish, walleye, northern pike, white sucker and burbot). The area has recreation sport fishing values of the native walleye population; other important fish species include red-listed spaces such as cisco and spottail shiners.

This area has historic and current use by the Sekani, Slavey, Cree and Beaver cultures of the Prophet River and Fort Nelson First Nations. There is high potential for archaeological, cultural and heritage resources. This zone has hunting, trapping and fishing values.

The area has significant cultural value including a traditional historic commercial fishery site, a significant native village which was abandoned after World War Two, native pack trails, an old wagon trail and a spiritual site. The chief of the Klua Lakes families was named Mekenacha (Bigfoot). He was the chief of Prophet River who signed adhesion to Treaty 8 in 1911. Mount Bigfoot located south-west of the Klua Lakes is named for him.1

The word “Klua” means “fish” in the Slavey language.

LRMP Working Group Recommendation for Acceptable Uses:

<table>
<thead>
<tr>
<th>Activity/Use/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grazing</td>
<td>Allowed subject to management plan. New tenures can be issued as necessary to support commercial back country recreation opportunities.</td>
</tr>
</tbody>
</table>

1 The Mount Bigfoot on maps is different than the Mount Bigfoot recognized by the First Nations.
Proposed Protected Areas Category

2.2.5.3 Liard River Corridor Protected Area

Area: 81,900 ha

The Liard River Corridor proposed protected area is located adjacent to the Liard Hot Springs Provincial Park. It encompasses the river valley and uplands to the height of land on both the north and south of the river as far east as Scatter River.

The area includes the following special features: the Grand Canyon, archaeological sites, fossils, old growth spruce in the alluvial areas, an oil derrick constructed for exploration in 1953, significant grizzly habitat, a population of wood bison, and Hudson's Bay Trading Post. This area is also important for wildlife as a staging area for shorebirds and sandhill cranes; and as a component of a larger predator-prey system. The recreational values along the river are high and include opportunities for activities such as hunting, wildlife viewing and spelunking. River recreation opportunities include fishing for arctic grayling, bull trout, mountain whitefish, northern pike and lake trout. Other important fish species include inconnu, cisco and chum salmon.

The Liard River Corridor represents the Highland Hyland Ecossection.

This area falls within the territory of the Kaska Dena, Slavey, Cree and Beaver cultures of the Lower Post, Fort Nelson and Fort Liard First Nations. There is high potential for archaeological, cultural and heritage resources. The Liard River corridor has significant cultural and heritage values related to traditional native activities and fur trading dating back to the early 1800’s.

The portion of the Liard Proposed Protected Area affected by the Alaska Highway Pipeline reserve should be declared under the Environment and Land Use Act.

LRMP Working Group Recommendations for Acceptable Uses:

<table>
<thead>
<tr>
<th>Activity/Use/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipeline/transmission line and other rights-of-way.</td>
<td>There is a reserve in place for the Alaska Highway Pipeline which runs across the proposed protected area. The pipeline will be allowed if there is no practical or feasible alternative.</td>
</tr>
<tr>
<td>Proposed Protected Areas Category - Liard River Corridor</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Roads within protected areas</td>
<td></td>
</tr>
<tr>
<td>Existing road allowed to remain. Corridor will</td>
<td></td>
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<tr>
<td>be identified and maintenance will be subject</td>
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<tr>
<td>to the management plan.</td>
<td></td>
</tr>
<tr>
<td>Grazing</td>
<td></td>
</tr>
<tr>
<td>Allowed subject to management plan. New</td>
<td></td>
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<tr>
<td>tenures can be issued as necessary to support</td>
<td></td>
</tr>
<tr>
<td>commercial back country recreation opportunities.</td>
<td></td>
</tr>
</tbody>
</table>
Proposed Protected Areas Category

2.2.5.4 Maxhamish Lake Protected Area

Area: 27,600 ha

The Maxhamish Lake proposed protected area is located in the north of the plan area close to the British Columbia/Northwest Territory border. It is east of the Liard River. The lake has sandy beaches and the potential to be a popular recreation area. The proposed protected area includes the existing Maxhamish Lake Park (668 hectares).

The Maxhamish area is an ecological and geographical representation of the Etsho Plateau. The area has a high wildlife value due to waterfowl, pike, walleye, a unique fish species found here, and the red-listed cisco and spottail shiner. The maintenance and enhancement of fish and wildlife habitat and populations must be given a high priority. The Protected Area Management Plan will outline how visual quality will be maintained in high scenic quality areas.

This area has significant historic and current use by the Slavey, Beaver, cultures of the Fort Nelson and Fort Liard First Nations. There is high potential for archaeological, cultural and heritage resources. There are known hunting, fishing and trapping values. The lake is significant to the First Nations for food fishery values. There are known historic native village, Indian Reserve Lands, cabins, trails and traditional use areas.

Maxhamish Lake is referred to as Sandy Lake by the local First Nations.

LRMP Working Group Recommendation for Acceptable Uses

<table>
<thead>
<tr>
<th>Activity/Uses/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads within protected area</td>
<td>Proposed road route, for access to lake, for recreation purposes, must be identified in Protected Area Management Plan. This is consistent with the recreational purposes of the proposed protected area. (The decision regarding any road proposal will be made at a subsequent planning process which will involve public and First Nations.)</td>
</tr>
</tbody>
</table>
The Northern Rocky Mountains proposed protected area is located in the west of the plan area in the core of the Rocky Mountains. It is the largest proposed protected area, and is adjacent to Stone Mountain Provincial Park and Wokkpash Recreation Area.

The entire area is excellent ecosystem representation of Eastern Muskwa Ranges and Muskwa Foothills. The special features include the spectacular geological formations, escarpments and chevron folds of Sleeping Chief Mountain, Mount Sylvia (2942 metres) and Mount Mary Henry (2614 metres), significant wetlands and areas of old growth forests along the Tuchodi River and the historical High Trail travelled by a 1934 expedition attempting to establish an east-west route through the Rockies. The area is in a natural state. Other features include transition from foothills to the Rocky Mountains.

Other features of the area are that it is a part of a larger intact predator-prey system with a high density and diversity of large mammal species. Ungulates include moose, caribou, whitetail deer, mule deer, mountain goat, elk, and Stone’s sheep. There are also wolves, grizzly bear, black bear, wolverine, coyote, many smaller mammals and rare sightings of mountain lion. Various bird species use portions of the area as important staging and migration routes. This area provides key winter ranges for wildlife populations. Prescribed fires have been historically used for wildlife habitat enhancement.

The area has historic and current use by the Kaska Dena, Sekani, Slavey and Beaver cultures of the Lower Post, Prophet River and Fort Nelson First Nations. There is potential for archaeological, cultural and heritage resources. There are hunting, trapping and fishing values.

Cominco has applied to have mineral claims registered within the boundary of the proposed protected area in the Crehan Creek area. The Working Group has made the following recommendations based on this development:

- The claims in question and a buffer area half the width of that requested by Cominco (around the northernmost claim) to be designated under the Muskwa-Kechika Order-In-Council such that both claims are allowed for a period of ten years.
- New exploration tenures for oil and natural gas exploration to be allowed for period of five years.
Proposed Protected Areas Category - Northern Rocky Mountains

- Natural gas production tenures to be allowed until cessation of production of natural gas.
- After ten years, if no mine exists, mining tenures to be automatically and voluntarily surrendered with no compensation. The ten year time frame is to begin after approval of LRMP.
- After ten years, if no mine exists, the two mining tenures and all of the watershed flowing into the Muskwa (watershed of Crehan Creek) to automatically roll into Protected Area under the Parks Act, except for areas under natural gas production tenures (should there be any) which will remain under the Order-In-Council designation until cessation of production.
- Mining tenures to be renewable after period of ten years only if a mine exists.
- All activities to be conducted with a sensitivity compatible with eventual Class A Park designation.
- If a mine is developed, once production ceases, and a reasonable time for reclamation is given, then the area should roll into the Park Act.2

LRMP Working Group Recommendation for Acceptable Uses

<table>
<thead>
<tr>
<th>Activity/Uses/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grazing</td>
<td>Allowed subject to management plan. New tenures can be issued as necessary to support commercial back country recreation opportunities.</td>
</tr>
<tr>
<td>Water control structures</td>
<td>Small scale water diversion structure allowed (not to be used for small scale hydro-electric development). Intent is to allow commercial operators to provide water supply to base camps.</td>
</tr>
<tr>
<td>Roads within protected areas.</td>
<td>Roads not allowed.</td>
</tr>
<tr>
<td>Water: motorized activities</td>
<td>No motorized boats above Tuchodi Lakes</td>
</tr>
</tbody>
</table>

Objectives:
1. Ensure Commercial Back Country Recreation (CBR) are consistent with the objective and strategies of the RMZ, and maintain a balance between public recreation and other use.

Strategies:
- An inventory of existing and potential CBR opportunities is required to guide the allocation. CBR activities must be consistent with:
  - acceptable limits of use;
  - environmental sustainability;
  - greatest benefit to local community, region and province;
  - equitable forage allocation between regions.

2 The recommendations regarding the Cominco mineral claims have been made without the participation of either representatives from Cominco and the mining industry.

Recommended Fort Nelson Land and Resource Management Plan
Proposed Protected Areas Category - Northern Rocky Mountains

commercial and non-commercial use; and
• equitable allocation of suitable campsites.

• Manage for wildlife habitat enhancement through subsequent planning processes.

2. Manage to avoid negative bear/human interactions.

• To minimize negative bear/human interactions, public education will focus on informing the public on dealing with bear/human encounters, bear behaviour and the safest human behaviour while in bear country.

• Recurring aircraft and river boat use and access will be sensitive to RMZ values and resource user activities.
Proposed Protected Areas Category

2.2.5.6 Thinatea Protected Area

Area: 19,500 ha

The Thinatea proposed protected area is located in the north east corner of the plan area near the confluence of Thinatea Creek and the Petitot River. It completely encompasses Thinatea Lake and sections of the creek both north and south of the lake.

The area is the best representation of the Petitot Plain Ecosection; it is a good example of muskeg, mixed with some associated upland forest including significant jackpine stands. The area has a high capability rating for Trumpeter swans, and is also important for moose and other waterfowl. The area is significant for food and medicinal values for First Nations.

The area has historic and current use by the Slavey, Cree and Beaver cultures of the Dene Tha and Fort Nelson First Nations. There is potential for archaeological, cultural and heritage resources. There are known fishing, hunting and trapping values.

The word Thinatea means “where the giants laid down.” in the Slavey language.

The Working Group is recommending that the following points be considered when designating the Thinatea area:

- Directional drilling for a linear corridor under the north arm of the area may be permitted. The intent is to avoid a pipeline across the surface.
- Directional drilling for the extraction of energy resources be permitted under the north arm.
- Existing oil and gas tenures will be grandparented.
- The south portion of area be designated under the Environment and Land Use Act, or similar designation that would allow for new tenures for directional drilling (note that the northern portion of the Thinatea has been previously recommended for a designation that allows directional drilling under slightly different conditions than that brought forward here).
- Designation to allow no surface disturbances, including seismic.
- After period of ten years, Protected Area to automatically roll into Parks Act except for areas under tenure, which will roll into Parks Act designation when tenures expire.
- During the ten year period, the area is to be managed as a Protected Area similar to a Class A Park, with the exception of allowing directional drilling from beyond the perimeter.
• After ten year period, no new exploration tenures will be allowed, but natural gas production tenures to be renewable until cessation of production.

For directional drilling to occur all criteria identified by the subcommittee must be met. The subcommittee's information and criteria on directional drilling under Proposed Protected Areas is included as an Appendix.

LRMP Working Group Recommendation for Acceptable Uses

<table>
<thead>
<tr>
<th>Activity/Use/Facility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads within protected areas</td>
<td>No new roads will be allowed except in grandparented tenures.</td>
</tr>
</tbody>
</table>
Proposed Protected Area Category

2.2.2.7 Wokkpash Protected Area

Area: 37,500 ha

The Wokkpash proposed protected area is currently an existing Recreation Area, (since 1987). It is located south west of Stone Mountain Provincial Park and the Alaska Highway. This area spans the Wokkpash Creek watershed.

The Wokkpash area has attained international significance due to its unique geographical features, including the: Wokkpash gorge which has hoodoos up to 30 metres in height along its 5 kilometre length; Forlorn Gorge which is a narrow cleft 150 meters deep and 25 meters wide; Fusillier Glacier; and Stepped Lakes. There are significant recreation opportunities for activities such as hiking, camping, wildlife viewing, fishing, horseback riding and hunting.

This area is in the traditional area of the Kaska Dena, Sekani, Cree, Beaver and Slavey cultures of the Lower post, Fort Nelson and Prophet River First Nations. There is potential for archaeological, cultural and heritage resources, and there are known hunting, fishing and trapping values.
Proposed Protected Areas Category

2.2.5.8 Goal 2 Protected Areas

Andy Bailey Recreation Area - 170 ha
Grayling Hot Springs - 1,410 ha
Goguka Creek - 380 ha
Hay River - 2,310 ha
Horneline Creek - 300 ha
Jackpine Remnant - 160 ha
Kotcho Lake Village Site - 60 ha
Old Growth - 1,800 ha
Portage Brule Rapids - 1,000 ha
Prophet River Hot Springs - 180 ha
Prophet River Recreation Area - 120 ha
Smith River/ Fort Halkett - 240 ha
Toad River Hot Springs - 400 ha

Goals:

Andy Bailey Recreation Area
Ecosection representation of Fort Nelson Lowlands.
An existing recreation area developed into a 12 unit
campsite, boat launch and picnic area.

Goguka Creek
Ecosection representation of the Fort Nelson Lowlands
The ecological reserve proposal to protect an example of
Chamaedaphe bog and pitcher plant.
Designation should allow for directional drilling to extract
energy resources.
For directional drilling to occur all criteria identified by the
subcommittee must be met. The subcommittees
information and criteria on directional drilling under
Proposed Protected Areas is included as an Appendix.

Grayling Hot Springs
Ecosection representation of the Hyland Highland.
This is a significant hotspring complex in Canada due to its
ecological values

Hay River
Ecosection representation of the Fort Nelson Lowlands
Historical use by Wood Bison and First Nations people.
Proposed Protected Areas Category - Goal 2 Areas

An outstanding example of river meadows with associated wildlife values.
Designation should allow for directional drilling to extract energy resources.
For directional drilling to occur all criteria identified by the subcommittee must be met. The subcommittees information and criteria on directional drilling under Proposed Protected Areas is included as an Appendix.

Horneline Creek
Ecosection representation of Kechika Mountains.
There is a significant mineral lick for the goat population.

Jackpine Remnant
Ecosection representation of the Fort Nelson Lowlands
Western extension of Jack pine
Designation should allow for directional drilling to extract energy resources.
For directional drilling to occur all criteria identified by the subcommittee must be met. The subcommittees information and criteria on directional drilling under Proposed Protected Areas is included as an Appendix.

Kotcho Lake Village Site
Ecosection representation of the Etsho Plateau
An area of First Nations values.

Old Growth
Alluvial influenced, riparian white spruce old growth forest.
The Fort Nelson working group has agreed to the protection of 1800 Ha of alluvial influenced, riparian white spruce old growth forest. The working group has not finalized the site for this Goal 2 Protected Area. The current Protected Areas figures includes the 1800 Ha. in anticipation of a site being identified for protection.
Therefore, the working group recommends that:
• a subcommittee address the need to identify a maximum of 1800 Ha. that satisfies the LRMP objectives for the Goal 2 protection of alluvial old growth forest within the Liard - Scatter River Subzone;
Proposed Protected Areas Category - Goal 2 Areas

• the subcommittee would provide its recommendations at the first annual review of the Fort Nelson LRMP implementation, and;
• the subcommittee would comprise interests represented by the Fort Nelson LRMP Working Group.

Portage Brule Rapids
Ecosystem representation of the Liard Plain
The ecological reserve proposal to protect the Hotsprings and unusual vegetation, an example of a forest on alluvial terraces in the BWBS Zone.

Prophet River Hot Springs
There is a locally significant hot spring

Prophet River Recreation Area
Ecosystem representation of the Fort Nelson Lowlands
There is a 36 unit campsite on the banks of the Prophet River. This campsite/area is managed by BC Parks

Smith River/ Fort Halkett
Ecosystem representation of the Liard Plain
The old site of Fort Halkett is located at the mouth of the Smith River which has a large two step waterfall, 35 metres in height.

Toad River Hot Springs
Ecosystem representation of the Muskwa Foothills.
There is regionally significant hot springs, for wildlife viewing, hiking and First Nations values.
3.0 Social, Environmental and Economic Impact Assessment.

3.1 Introduction, Overview and the Significance of the "Base Case"

The vision statement and its stated objectives in the LRMP document include the desire to recognise and balance social, economic, and environmental values in the recommended land use plan. In June 1996, the Ministry presented to the Working Group (WG) a "Base Case" analysis of the planning area's social, economic, and environmental characteristics and trends in the absence of a land use plan.1 Subsequently, the WG reached a draft consensus land use plan (the Plan), essentially the same as the plan detailed in the preceding chapter.

The socioeconomic and environmental implications of the Plan were independently assessed and presented to the WG in September 1996; the report was produced by the Policy Development Branch of the Ministry of Employment and Investment (MEI) and its consultants - socioeconomic expertise was provided by Robinson Consulting & Associates and J. Paul & Associates and the environmental analysis was by Eliot Terry (R.P. Bio.) of Keystone Wildlife Research. The work also relied on resource analysis from the government's Inter-Agency Planning Team (IPT) for the Ft. Nelson LRMP and Geographic Information Systems (GIS) area statistics provided by the Ministry of Forests (MoF). The following is essentially a summary of that assessment, but also is updated to address some concerns raised at the September presentation and is slightly adjusted for some changes to RMZ labels agreed to by WG since that time.2

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2 After the September assessment, the LRMP confirmed that classification of the Aeroplane, Fishing, and Muskwa-West RMZs should be "Special Management" (High Biodiversity) - these zones were previously assessed as "General Resource Development" (Intermediate Biodiversity.) However, the management objective and strategies did not change. An assessment of this change concluded that there is a negligible impact on timber supply, no impacts on mineral exploration and development and that there would be reduced risks to Caribou and general levels of biodiversity.
The consequences of the Plan potentially span a broad spectrum, from effects on the community, employment, incomes, and government revenue, to implications for wildlife populations and other environmental values. In British Columbia, a "Multiple Accounts" framework is used for conveying the different impacts of LRMP's on different resource values3. This framework organises both descriptive and numerical information so that all of the significant effects are presented in a value neutral manner, and the assessment attempts to reach relatively clear conclusions about the key "big-picture" trade-offs associated with the land use plan.

It is evident that in the absence of the LRMP process, current government policies such as the Timber Supply Review (TSR), Forest Practices Code (FPC) and Protected Areas Strategy (PAS) would be implemented in the "Base Case" land use scenario. With respect to PAS, the provincial Regional Protected Areas Team (RPAT) recommended Protected Areas of which closely met government's Protected Areas target of 11.4% (+ or - 0.25%) for the planning area.4 Note that while the RPAT areas did not restrict the LRMP from designating alternative areas for protection, due to current provincial policy (i.e. the Protected Areas Strategy, or "PAS"), these represent the best estimate of which lands would become Protected Areas in the absence of the LRMP.

Therefore the impact of the Plan is the change relative to what would have occurred in the Base Case. The IPT provided its best estimate of the Base Case crown land management regime that would likely prevail in the absence of the LRMP, by classifying the RMZs according to same four management labels utilized by the LRMP: Protected, Muskwa-Kechika Special Management, General Development, and Enhanced Resource Development. These labels correspond to the four categories of management intent discussed in Section 2.2. (For the Base Case, this exercise is necessarily speculative, but not to do so would exaggerate the impacts of the Plan. For example, the FPC and government interest in the Muskwa-Kechika is evidence that incremental constraints on resource extraction are


4 In theory, there should be no difference between the amount of protected areas in the Base Case and the Land Use Plan, since the government stipulated that a protected area target of 11.4% should be met - this percentage was applied to an area of 9,249,249 ha., comprised of the Ft. Nelson TSA and a portion of the Cassiar TSA. However, the RPAT recommended PAS areas in the Base Case totalled only about 991,000 ha., or about 60,000 ha. short of the target amount of 1,054,000 ha. Note also that the actual LRMP planning area was expanded further into the Cassiar TSA after the target was provided, and totalled about 9,879,000 ha.
occurring over time, which may not be reflected in the “Status Quo” management regime.

A general indication of the implications of the Base Case and Land Use Plan is provided by the area roll-up (total gross land base of area assessed is 9,879,415 hectares) of the GIS analysis, broken down by RMZ designation:

<table>
<thead>
<tr>
<th></th>
<th>Protected Areas</th>
<th>Muskwa-Kechika Special Resource Mgt. Category</th>
<th>General Development Category</th>
<th>Enhanced Resource Development Category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Case</strong></td>
<td>10%</td>
<td>27%</td>
<td>18%</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Land Use Plan</strong></td>
<td>11%</td>
<td>28%</td>
<td>25%</td>
<td>36%</td>
</tr>
</tbody>
</table>

The various implications of the Base Case and the Plan will occur over a long period of time and few significant socioeconomic and environmental implications from the Base Case and the Land Use Plan are expected to occur in the next few decades. Rather, they will occur gradually over the long term and therefore are difficult to quantify. However, it should be stated at the outset that no existing jobs are expected to be lost as a result of either Base Case initiatives or the Plan, only that long term economic growth in the petroleum industry may be somewhat less than otherwise would occur. At the same time, risks to wildlife populations and backcountry recreation/tourism activities are reduced due to the Forest Practices Code, new Protected Areas, and the Land Use Plan.

The summary of the social and economic impacts begins with a description of the sector, followed by a discussion of the expected implications of the Base Case and the Plan management regimes. Where it was feasible to do so, quantitative (i.e., numeric) impacts were estimated. Otherwise the impact is indicated in qualitative (i.e., descriptive) terms.

### 3.2 Socioeconomic Assessment

#### 3.2.1 Petroleum Sector

The planning area’s petroleum reserves are provincially significant. To date, development has centered on the Fort Nelson catchment area (roughly the eastern part of the planning area on the Alberta plateau and to a lesser extent, the Liard catchment area). Production from several fields in the Fort Nelson area began nearly 25 years ago, and are depleting rapidly. Highly promising, but lightly explored land lies to the west, in the Northern Foothills and Muskwa-Kechika areas. It is anticipated that an increasing share of future reserves and production will come from this latter area, with production commencing as early as the year 2005. This area’s share of total production
is speculated to increase over time as currently producing fields are
exhausted.

According to the Minerals, Oil, and Gas Section of MEI, as of 1994 an
estimated 1500 persons in the planning area were employed in the sector,
likely in mainly seasonal occupations. Since most of these individuals do not
reside in the area, using 1991 Census data and internal MEI information as
benchmarks, it is estimated that 250-450 area residents are employed in the
energy sector on a relatively permanent basis, accounting for 10%-20% of
the local economy. The Census also indicates that there is almost 100 local
gas processing jobs, and given the high amount of oil/gas activity in the mid-
1990s, there may now exist up to about 350 local full-time and seasonal jobs
in natural gas exploration/extraction. It is these 350 jobs that are the most
sensitive to changes in Crown land use, since gas production is likely to
continue to grow from proven reserves over at least the next 20 years in spite
of land use changes, according to MEI petroleum analysts.

The Base Case and Plan are not expected to impact proven oil and gas
reserves, of which the latter is most important and estimated at 2.5 Trillion
cubic feet (Tcf). Rather, the impact is most likely on the exploration for and
development of future potential gas reserve additions. Potential reserves that
lie below proposed protected areas are assumed to be precluded, since
present laws prohibit gas exploration/development in parks. On other lands
subject to relatively more stringent controls (i.e., Muskwa-Kechika Special
Management Category of Resource Management Zones) fewer reserves are
developed because of increased costs. The Petroleum Geology Branch of
MEI estimates at total of about 10.9 Tcf of potential natural gas reserves to
exist in the planning area. Under the Base Case regime, the potential declines
18% (3% due to FPC and 15% due to PAS) to an estimated 9.0 Tcf, and by
a further 6% to 8.4 Tcf due to the management strategies in the Plan. These
cumulative impacts arise mainly because about 22% of the Higher
Potential gas lands (with an estimated >40,000 m3/ha., covering 28% of the
planning area) would be precluded by protected areas and 21% would be

5 MEI estimates that 30% of industry exploration expenditures in the Peace region are
made by B.C. firms, and prorating the 1500 in current employment by 30% results in the
450 estimate. However, the 1991 Census data indicates there were about 250 petroleum
sector jobs in the planning area at that time.

6 This number may be an over-estimate, in that the 1991 Census data indicates that in the
planning area’s workforce there were about 120 individuals associated with the
“extractive” energy sector, a total of 80 in non-forestry manufacturing (most of which is
likely gas processing), and 45 in utilities (which would include gas distribution.)

7 To provide the appropriate context, there was 0.18 Tcf of marketable gas produced in the
planning area in 1994.

Recommended Fort Nelson Land and Resource Management Plan
An economic model of the provincial and North American energy industry was modified to estimate the timing and magnitude of the reserve reductions on natural gas production. Over the 20-year forecast period, the planning area's production is still forecast to grow from the present volume under the both Base Case and the Plan, only somewhat more slowly than would be the case under the "Status Quo" land management regime. Thus no losses of existing jobs are expected, just slower growth than otherwise would occur. Using the model's projections, it is estimated that under the Status Quo situation, employment in the Ft. Nelson planning area should rise to about 770 by the year 2016, or an average of 550 over the 20 year period. Prorating the 24% in potential gas reserve reductions to this Base Case 20-year average employment level, it still appears that resident employment will exceed the current 350 estimate well into the future.

The 20-year total net present value of those B.C. government revenues which are estimated to be sensitive to Crown land use planning (i.e. the sum of annual production royalties and land bonus bid revenues, discounted at a rate of 6%) is estimated to be $1246 million in the Status Quo, $930 million in the Base Case, and $892 million with the Land Use Plan. Therefore the approximate "opportunity cost" of FPC, protected areas, and the Plan on these revenues is a net present value of $354 million or about a $28 million annual annuity ($25 million for Base Case and $3 million for the Land Use Plan) for 20 years; this represents about $20.40 annually in foregone direct natural gas tax revenues per B.C. household (based on 1.373 million households in 1994). The Table below summarizes the key impact estimates.


<table>
<thead>
<tr>
<th></th>
<th>Status Quo Regime</th>
<th>Base Case</th>
<th>Land Use Plan</th>
<th>Cumulative Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Estimated Potential Gas Volume (Trillion cubic feet)</td>
<td>10.9</td>
<td>9.3 (-15%)</td>
<td>9.0 (-3%)</td>
<td>8.4 (-6%)</td>
</tr>
<tr>
<td>Average Total Direct Resident Exploration/Extraction Jobs over 20 years (1991-96 Jobs = ~ 350)</td>
<td>550</td>
<td>468 (-15%)</td>
<td>451 (-3%)</td>
<td>418 (-6%)</td>
</tr>
<tr>
<td>Average Annual B.C. Government Revenue Cost in $ millions</td>
<td>0</td>
<td>$25 mill.</td>
<td>$3 mill</td>
<td>$28 mill</td>
</tr>
</tbody>
</table>

Recommended Fort Nelson Land and Resource Management Plan
| Annual Revenue Cost per Household | 0 | $18.21 | $2.18 | $20.40 |


Note that a small portion of these impacts could be mitigated due to the Plan recommendation that “directional drilling” (i.e. drilling underneath an area from a position outside the area) be allowed under three small “Goal 2” protected areas (Hay River, Goguka Creek, and Jackpine Remnant) and under a small portion of the Thinahtea “Goal 1” protected area.

3.2.2 Hydro Electricity Sector

The Liard River Corridor is a proposed protected area (82,000 ha.) in both the Base Case and the Plan. This would preclude B.C. Hydro’s now dormant Liard River project in both situations, since the Protected Areas Strategy does not allow hydro-electric development and the Plan recommends that water control structures (such as dams) not be allowed in this protected area. BC Lands staff state that the flood reserve is no longer in place BC Hydro staff indicate that the corporation would not be interested in developing such energy potential for well in excess of 20 years, if at all. Therefore, there is no incremental impact of the Plan on this resource and BC Hydro personnel ascertain no other implications on the corporations hydro-electricity interests from the Plan.

3.2.3 Mining Sector

Presently in the planning area, there are no major metal mines operating or applications in the Environmental Assessment Process. This sector’s current activity involves exploration projects, and small scale mining of sand and gravel. Significant opportunity remains to identify and develop mineral resources. Current employment is estimated at some 25-30 Fort Nelson residents directly or indirectly employed in this sector (about 1% of local employment). Anecdotal evidence suggests that non-resident employment (i.e. exploration crews flying into the planning area from locales such as Vancouver) generally exceeds the employment of local residents.

Prior to the implementation of the Protected Area Strategy, about 140,000 ha. in the area had park designation, i.e. Muncho Lake, Stone Mountain, a portion of Kwadacha, and some smaller areas. This would increase to about 990,000 hectares in the Base Case and 1,058,000 hectares in the Plan. Mining in the Wokkapash Recreation Area, is allowed under the Status Quo, however is excluded in both the Base Case and the Plan.
In the Land Use Plan, less than 1% of high potential metallic mineral lands are included in the protected areas, but over 99% is located in 5 Resource Management Zones in the Muskwa-Kechika Special Management Category (Rainbow, Sandpile, Moodie, Terminal, and Rabbit); also, 95% of Medium Metallic Potential lands are located in Muskwa-Kechika Special Management Category of Resource Management Zones. About 14% of the 12,000 ha. in mineral tenures are in protected areas and all 7 developed prospects (i.e., the most promising known mineral occurrences with estimated grades/tonnages) are located in the Churchill and 8 Mile/Sulphur Resource Management Zones.

The impact of the Plan on mining, in terms of RMZ designations, is virtually identical to the Base Case, with the exception that the Plan offers documented management objectives and strategies which could pose some incremental constraints and costs on the sector. Notwithstanding, among the Plan’s objectives is the confirmation that mining and related road access development outside the protected areas is acceptable. These activities will be subject to the same provincial review processes as are the proposed mineral development activities that might be proposed in the medium and high intensity management areas. The key difference is that for major mine development, the environmental assessment processes will take into consideration the management objectives and strategies applicable to the RMZ as per the Land Use Plan. Similarly for exploration and development, existing review and permitting processes will take into consideration the management objectives and strategies applicable to the RMZ as per the Land Use Plan. This may require the tenure holder to conduct exploration activities in a more costly manner to avoid or minimize the impact on the other values.

Specifically, the Muskwa-Kechika Special Management Category of RMZs cover much of the planning area’s most prospective mineral lands. While there is some risk that the cumulative effect of these strategies may be to render some exploration and development uneconomic, it is also possible that these high potential areas may be better able to accommodate cost increases and remain attractive to explorationists. Also, exploration could be diverted to less encumbered RMZs (or to other portions of the same RMZ), especially since the area is relatively unexplored.

In summary, while there may be some foregone opportunities and possibly some reduced exploration activity by non-area residents, no existing local jobs are expected to be lost in this sector as a result of either Base Case or Land Use Plan initiatives.
3.2.4 Forestry Sector

The forest industry is one of the economic mainstays of the planning area economy. As of the early 1990s, the sector’s resident employment was about 550-600 jobs (woodlands and mills), plus an additional 280 positions as the new Oriented Strandboard (OSB) plant reaches full production. With the new OSB mill, it is estimated that about 40% of the Ft. Nelson planning area economy will be “driven” by the forest sector.

As of January 1, 1995 the Allowable Annual Cut (AAC) was set at 600,000 m³/yr. for coniferous harvest and 900,000 m³/yr. for deciduous. However, the Timber Harvesting Land Base (THLB) on which the current AAC is based is considered to be conservative, and currently be re-evaluated by the Ministry of Forests.

No completed timber supply forecast of annual harvest flows for either the Base Case or the Plan was available at the time this assessment was prepared. However, based on the likelihood that the THLB supporting the most recent AAC determination is likely to increase, MoF’s assessment is that while the FPC, new protected areas, and the Plan will create some new constraints on the THLB, it expects these can be fully offset for both the Base Case and the Plan. Moreover, even these new constraints are minimal, primarily because, in the Plan: (1) less than 4% of the both mature coniferous and deciduous volumes are precluded by protected areas, and (2) about 7% of mature coniferous volumes and under 3% of mature deciduous volumes are located in Muskwa-Kechika Special Management Category Resource Management Zones. (This is mainly due to the fact that the majority of the new protected and Muskwa-Kechika Special Management Category of Resource Management Zones are located in the western portion of the planning area, in mountainous/less accessible areas that contribute relatively little to the THLB.) Therefore no risks to existing jobs are anticipated from these land use initiatives, and long term stability is expected in this sector.

3.2.5. Agriculture Sector

The most recent information available indicates that there are 12 ranchers within the planning area, about 400 head of cattle, 21 Ministry of Forests

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8 The Ministry of Forests defines the THLB as “The portion of the total land area of a management unit considered to contribute to, and be available for, long term timber supply.”

9 The Timber Supply Review (TSR Discussion Paper, August 1993, p. 7) alluded to such a possibility, as it states that use of more pine/spruce mixed stands was possible and that there are additional opportunities for increased future utilization of lower volume per hectare spruce stands and coniferous-leading mixed wood stands.
range tenures, and about 50 B.C. Lands agricultural leases. There are currently about 25-50 people working full-time (with additional part-timers) in this sector, accounting for about 1% of the local economy.

The only mapped agricultural information available is the Agriculture Land Reserve (ALR), which indicates an estimated 49,309 hectares of ALR (although the amount of arable and potentially arable land exceeds this amount) within the planning area, all situated close to Fort Nelson. In the Base Case, 89% of the ALR land area falls within the Enhanced Resource Development Category of Resource Management Zones and less than 1% is located within the RPAT proposed protected areas. There may, however, be some cost implications arising from the FPC, especially in riparian areas of the Ft. Nelson River and Prophet River corridors.

As for the Land Use Plan, the amount of ALR which falls within protected areas is the same as the Base Case, with 74% in the Enhanced Resource Development Category of Resource Management Zones and 25% in the General Development Category of Resource Management Zones, but there are no discernible implications for agriculture resulting from this reallocation. The areas where additional costs may arise due to the Plan’s management strategies are those agricultural lands which fall within the aforementioned Ft. Nelson RMZ (Enhanced Resource Development Category), the Rivers Corridors East RMZ (General Development Category), and possibly the Toad River Corridor RMZ (Muskwa-Kechika Special Management Category) and the Tenaka RMZ (General Development Category). Impacts on grazing tenures appear to be negligible, and the Plan states that grazing on existing tenures is to be maintained.

Finally, if market demand for the area’s agricultural products stimulate future agricultural expansion, there is enough potentially arable land (but possibly less accessible and more costly) not being currently utilized for agriculture such that the overall (and especially longer term) implications of both the Base Case and Plan are minor. Moreover, some of the strategies in the Plan should enhance the viability of the sector, e.g. identifying lands with high agricultural potential.

3.2.6. Tourism, Guide-Outfitting, and Wilderness Recreation

Both the Peace Region and the Fort Nelson planning area are experiencing growth in commercial tourism and general public outdoor recreation. The planning area also offers nature-based tourism and outdoor recreation experiences with significant longer term potential. It is this “backcountry” component that is quite dependent on relatively pristine environmental resources to attract visitors, and therefore is the portion of the sector that is most sensitive to changes in Crown land use. The industry can therefore be
divided into two main categories: “front-country” (i.e., highway / community) tourism and “back-country” (i.e., nature-based) tourism, which collectively drive from 5% to 15% of the local economy. The front-country component accounts for the majority of the area’s 250-300 tourism jobs, and much of this activity is currently dependent on accommodation, food, etc. expenditures made by workers in the resource industries. The back-country portion consists mainly of the guide-outfitters, who are responsible for an estimated 47 “person years” of employment, but due to the seasonal nature of the work, there are actually about 180 individuals who work at least part of the year in this sector.  

In both the Base Case and the Plan, front-country tourism will continue to grow, largely based on expanding summer traffic along the Alaska Highway and expected growth in the resource industries for the next several decades. This type of tourism could also benefit from the improvements in visual quality offered by the plan, in that 36% of the 326,712 ha. that has been identified as having high visual sensitivity will be located in protected areas, with 32% in Muskwa-Kechika Special Management Category. Also, in key corridors such as the Alaska Highway, River Corridors East (i.e. Ft. Nelson River North & South, Prophet River, and Liard River/Scatter Creek North), Toad River, Kechika River, Muskwa River, and Turnagain/Dall Rivers, there are specific objectives and strategies in place to avoid impacts that would affect visual quality.

The new protected areas provide for wilderness settings in key parts of the region, and the Muskwa-Kechika Special Management Category provide measures to more appropriately manage those areas where sensitive wilderness values occur. In terms of zone designations, both the Base Case and the Plan have similar impacts, which is a definite improvement relative to the Status Quo regime for both backcountry tourism and recreation. For example, in the Plan, 24% and 75% of the estimated 1,881,158 ha. in “Primitive Non-Motorized Areas” (i.e. areas more than 8 km from a 4-wheel drive road and greater than 5000 ha. in size) are located in protected areas and Muskwa-Kechika Special Management Category respectively. Similarly, 22% and 69% of the 2,876,121 ha. in “Undeveloped Watersheds over 5000 ha.” are in protected areas and Muskwa-Kechika Special Management Category. Notwithstanding the foregoing, roads, seismic lines, etc. are still allowed outside of protected areas, and therefore over the long term, the majority of these now pristine areas are likely to experience declines in wilderness values as access increases over time.

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10 Source: J. Paul and Associates. Based upon personal interviews which concluded that there is estimated average of 12 employees for each of the planning area’s 15 guide-outfitting territories. This implies that, on average, each of the 47 “person-years” of employment consists of work for about 3.5 individuals.
The Plan should offer greater certainty to the area’s guiding industry for at least the foreseeable future since 8 of the area’s 15 guide-outfitting territories at least partially overlap protected areas, within which this activity is an allowable use subject to permit. In addition, several other territories guide outfitting territories overlay in the Muskwa-Kechika Special Management Category of Resource Management Zones. While the outlook is therefore reasonably optimistic, future growth in back-country tourism could be constrained in the long term due to expanding timber harvesting and petroleum/mineral activities into currently unaccessed areas.

3.2.7 Trapping

There are about 90 registered trap lines in the planning area. It appears that trapping is primarily a seasonal pursuit, but nonetheless is an important part of the lifestyles of those engaged in the activity. Activity in this sector is obviously sensitive to forbearer populations. The Base Case management regime indicates a relatively high risk to marten and fisher, as significant habitat is located in the General Development Category and Enhanced Resource Development Category, and thus longer term decreases in populations would be likely. This decline in populations would obviously negatively affect trapping activity.

The Plan moderately improves the outlook for marten and fisher by introducing some supportive management objective and strategies (e.g., “Ensure that impacts of commercial/industrial activities on trappers are minimized”) but the environmental assessment concludes longer term population declines may still occur, thus creating the potential for negatively impacting future trapping incomes.

3.2.8. Community and First Nations Implications

The population of the Planning Area at the time of the last 1991 Census was 5142 persons. The 1994 population was estimated by B.C. Stats to be 5471, indicating quite strong growth, likely due to more activity in the forestry and petroleum sectors. Fort Nelson is the largest community, with a population of 4104 as of 1994. Most of the remaining population is found along the Alaska Highway corridor. Anecdotal evidence also indicates that there is a relatively large non-resident labour component. That is, significant amounts of seasonal work in forestry, mineral exploration, gas exploration, and guide outfitting is taken by provincial residents residing outside the planning area, including residents of Alberta.

Community implications mainly arise from the changes in industrial sectors, which can impact jobs/incomes, population levels, the local tax base, community services, local incomes, etc. As is apparent from the sectoral...
analyses above, neither the Base Case nor the Plan are expected to negatively impact current employment. The large untapped resource base of the planning area will continue to support cyclical economic growth, although at a somewhat slower pace over the longer term than if there were no FPC, new protected areas, or a Land Use Plan.

Local First Nations are the Ft. Nelson, Prophet River, Ft. Liard, Lower Post Bands, and Alberta’s Dene Tha. First Nation total population (on and off reserve) is estimated to be 400-500 individuals. The implications of the Base Case and Plan on First Nations is more difficult to assess, mainly because they were not highly involved in the Ft. Nelson LRMP process. The Plan itself specifies several strategies to protect heritage/archaeological sites and values, accommodate aboriginal/treaty rights, recognise spiritual/cultural values, and conserve key environmental values that are important for traditional uses. Therefore, the Plan should provide an improvement in the management of aboriginal values vs. the Base Case.

### 3.3 Environmental Assessment

#### 3.3.1 Overview - Biodiversity Implications

The environmental implications of implementing the proposed Land Use Plan are generally positive. The incremental benefits compared to the Base Case are largely due to the reduction (9% less of the Gross Land Base) in the amount of land allocated to Enhanced Resource Development Category of Resource Management Zones, which was reallocated primarily in the various river corridor RMZs which are classified in the General Development Category. The reduced intensity of development proposed in these areas should provide more natural levels of biodiversity and moderately improves the outlook for species and habitats that occur within these zones.

Overall, the proposed Land Use Plan improves the outlook for many species and their habitats. This is mainly due to the allocation of the Muskwa-Kechika Special Management Category (28% of Gross Land Base) and 11% in new protected areas in the western portion of the planning area, where significant wildlife and wilderness values occur. Allocating this large amount of land to low levels of resource development reduces the risks to wildlife populations and ecosystem processes (e.g., predator-prey relationships). Furthermore, by allocating so much of the western portion of the plan area (i.e., contiguous) as protected areas and Muskwa-Kechika Special Management Category with supportive management strategies, the Plan reduces the risks of regional fragmentation. This should provide for more
natural levels of connectivity which also minimizes the risks to wildlife populations and biodiversity in general.

3.3.2. Proposed Protected Areas and Ecosystem Representation

The proposed Land Use Plan provides for 11% of the Gross Land Base as protected areas, of which the Northern Rockies protected area would contribute over 50% (620 759 ha). This new park, together with the management strategies outlined by the Plan, ensures the significant conservation values that occur in this area will be maintained. This new park would provide excellent representation of the Eastern Muskwa Ranges and Muskwa Foothills ecosections and, primarily due to its large size, provides favourable outlooks for many of the plant and animal species dependent on large, relatively intact ecosystems. In addition, the protected area and the Muskwa-Kechika Special Management Category in surrounding areas provide for relatively low risks to provincially significant populations of Stone’s sheep, elk and mountain goat.

The Land Use Plan and the Base Case provide ecosystem representation for 6 of 7 biogeoclimatic subzones. However, the Land Use Plan provides increased representation in 2 subzones that have high biodiversity values. Most notably, the Denetiah proposed protected area results in a doubling (increase of 9000 ha) of the amount of the dry-cool Boreal White and Black Spruce (BWBSdk1) biogeoclimatic subzone. This subzone supports many provincially significant wildlife species including caribou, moose, wolf, and grizzly bears. Although the moist-cool Spruce-Willow-Birch (SWBmk) biogeoclimatic subzone is well represented at 19% in the Base Case, the Land Use Plan allocates an additional 62 000 ha in new parks which results in a total of 22% of the SWBmk within protected areas.

In contrast, most of the eastern portion of the plan area will continue to be managed in Enhanced Resource Development Category of Resource Management Zones (36% of land base) which means a significant proportion of the moist warm variants (BWBSmw1 and mw2) are under represented in protected areas and implies that biodiversity may be maintained significantly below more natural levels.

Although most of the other proposed protected areas are expected to have positive impacts on wildlife populations and wilderness values, the reduction in size (14,000 ha) of the Grayling-Liard proposed Protected Area increases the risks to riparian cottonwood habitats compared to the Base Case. Lower-level planning processes, however, may partly mitigate the potential adverse effects of managing this river ecosystem as a part of the General Development Category.
3.3.2.1. Red and Blue-Listed Species

Several aspects of the Land Use Plan improve the outlook for species considered endangered (Red-listed) or vulnerable (Blue-listed). Most importantly, the significant reduction (almost 50%) in the amount of mature deciduous forest to be managed as Enhanced Resource Development Category Resource Management Zones reduces the risks to many riparian species, including red and blue-listed warblers dependent on habitats that occur within the River Corridor RMZs. In addition, the Plan outlines specific management direction to identify and map critical wildlife habitats of concern. Although this is an incremental improvement over the Base Case, moderate risks remain to species dependent on upland riparian communities.

3.3.2.2. Fisheries

The reallocation of the River Corridor RMZs from the Enhanced to General Resource Development category reduces the risks to key watershed and fisheries habitat values. While the Forest Practices Code will significantly improve protection for fisheries habitat by requiring the use of Riparian Management Zones, reduced resource development and management strategies outlined by the Plan to mitigate potential adverse effects further reduce the risks to water and fishery resources.

3.3.2.3. Ungulate Winter Ranges

Except for a portion of caribou habitat that has been designated as part of the General Development Category (Caribou RMZ), winter ranges for caribou, Stone’s sheep, elk and mountain goat would likely have been specially managed and/or in protected areas under the Base Case. This allocation minimizes the risks to ungulate winter ranges through reduced access (forestry, oil and gas) and forest harvesting. Similar land use allocations under the Plan also pose relatively low risks to ungulate winter ranges including the larger predator-prey ecosystems that occur within these areas. In addition, RMZ objectives and access management strategies outlined by the Land Use Plan, further reduce the risks to these large mammal populations.

3.3.3 Muskwa-Kechika Access Management Area

Although some access management in the Muskwa-Kechika would continue to be implemented in the absence of a land use plan, the management strategies outlined in the Plan further reduce the risks to large mammal populations (e.g., grizzly bears, ungulates). These strategies reduce the risks by providing a greater degree of certainty that wildlife populations vulnerable to increased access will be given adequate consideration during lower level
planning processes. So, although many of these areas would have received similar management attention under the Base Case scenario, the Land Use Plan provides clearer direction and a protocol which together provide a greater degree of certainty and commitment that effective access management will be implemented. The possible legislated status of this area under a formal designation should also provide more certainty that the management objectives and strategies for those RMZs located in the Muskwa-Kechika will be implemented as intended in the Plan.
4.0 IMPLEMENTATION

Portions of the Fort Nelson LRMP may become a government approved higher level plan. It is a working document that will be implemented by all relevant government agencies through agency-specific management activities, more detailed strategic and operational plans, resource development permits and land disposition. In the absence of more detailed and operational plans, all resource-specific development plans or permits will take guidance from the resource management zone objectives and strategies described in this plan.

All subsequent strategic and operational plans will include a section that describes the linkages to the Fort Nelson LRMP. This will include an explanation of how the plan meets the objectives and implements the strategies outlined in the LRMP. Conversely, it is recognised that the resource management zone objectives and strategies in this plan may be amended in the future based on feedback from the subsequent level of planning.

4.1 Resource Management Zones and the Forest Practices Code

Resource Management Zones can come into force in two different ways. One approach is that Cabinet would approve the LRMP and give it the effect of ‘policy to be implemented by all relevant government agencies.’ The second approach is that Cabinet could declare all or parts of the intents, zones, objectives and strategies under Part 1 of the Forest Practices Code Act of British Columbia. This would give the provisions the force of law in their implementation.

4.2 Formal Designation - Muskwa-Kechika

The intent is to ensure that wilderness characteristics and wildlife habitat are maintained over time while allowing resource development, including roaded resource development.

The Fort Nelson Working Group recommends that a portion of the planning area, specifically the following resource management zones: 8 Mile/ Sulphur, Aeroplane, Churchill, Fishing, Moodie, Muskwa West, Prophet, Rabbit, Rainbow, Sandpile, Stone Mountain, Terminal, Kechika River Corridor,
Turnagain/ Dall Rivers Corridor, that portion of the Alaska Highway Corridor that falls within the Muskwa-Kechika boundary, that portion of the Toad River Corridor above Scaffold Creek, and the west portion of the Muskwa River Corridor (boundary to follow river) be formally designated in a manner that meets the following fourteen points. The spirit and intent of the fourteen points is to foster a co-operative management approach for the Muskwa-Kechika.

1. Covers the Muskwa-Kechika area.

2. Captures the intent of the objectives and strategies for the respective resource management zones.

3. Authority for operational planning and approvals remain within the jurisdiction of line agencies.

4. The intent is to ensure that wilderness characteristics and wildlife habitat are maintained over time while allowing resource development, including roaded resource development.

5. Joint approval is required for off-site mineral pre-development plans (e.g. airstrips, access roads), pre-tenure plans for oil and gas, landscape unit plans for forestry or equivalent for all other tenured activities.

6. Ensure adequate government resources (inventory data, government staffing) are provided to allow for timely development plans.

7. No additional delays in operational decision making by line agencies - plans and permits to be approved in a timely and efficient process consistent with normal permitting time frames experienced in the Fort Nelson LRMP area.

8. The Muskwa-Kechika designation will not result in operational delays especially those leading to job loss.

9. The Muskwa-Kechika designation does not infer future protected area status.

10. The Environment Assessment Process applies to reviewable projects.

11. Dispute resolution mechanisms will be in accordance with the administrative protocols in place, under development and/or being developed. Examples include:

   - 2005;
- Forest Practices Code; or
- similar post-tenure mechanism for mining.

12. There will be a role for an advisory body, based on the LRMP Working Group; to provide interpretation of the intent of the plan with respect to management issues within the Muskwa-Kechika.

13. The proposed protected areas will be formally designated as appropriate, and incorporated within the Muskwa-Kechika designation to ensure management consistency.

14. Government agencies to manage the protected areas in a co-operative manner; this includes a continued role for the Ministry of Forests to contribute to the management within the protected areas.

### 4.3 Protected Area Designation Process

Concurrent with the approval of the Fort Nelson LRMP by cabinet, legal description for the recommended protected areas will be prepared by the IPT. A complete land and tenure status report and clear documentation about the intent of special consideration of each protected area will be forwarded to the Land-Use Co-ordination Office.

### 4.4 Roles and Responsibilities

#### 4.4.1 Interagency Management Committee

The responsibilities of the Interagency Management Committee are as follows:
- co-ordinate and ensure implementation;
- review and provide recommendations on proposed amendments;

#### 4.4.2 Agencies

All relevant agencies are responsible for the following items:
- prepare an annual, or biennial monitoring report on plan implementation;
- prepare implementation matrix and action plan to ensure strategies and objectives are carried out;
- review existing more detailed strategic and operational plans, and resource management plans to ensure consistency with the LRMP; and,
distribute a copy of the plan to all licensed resource users, resource agency staff, stakeholders and interested public

4.4.3 First Nations

Government is committed to work with First Nations on a government-to-government basis. The LRMP will be without prejudice to aboriginal and treaty rights, and ongoing and future treaty negotiations. First Nations will be encouraged to play a direct role in the implementation and monitoring of the Plan.

4.4.4 Public

It is recognised that the public, in partnership with the different government agencies and First Nations, is an important contributor to the effective implementation and monitoring of the plan.

4.5 Direction for Local Level Planning

Local level plans may be a wide range of local or more detailed planning processes including, but not limited to landscape unit objectives, local resource plans, co-ordinated access management plans and protected area management plans. Where this is no other planning process for a defined area, plans are to be developed by the appropriate agencies and will provide an opportunity for public review. Any concerns with specific resource management practices should be raised directly with the resource agency mandated to manage those specific values.

4.6 Criteria that Apply to All Local Level Plans

All parties with a key interest or stake in the plan must be invited and encouraged to:

- Participate
- Strive for consensus through an interest-based decision making process
- Ensure all local level plans are consistent with the LRMP
- Address resource user conflicts.
4.7 Public Education

It is recognized that public education is an important part of the LRMP planning process. All Working Group members should work to educate the public with regards to the content of LRMP recommendations, including the Proposed Protected Area designations, recognition of resource values, resource management objectives and strategies and the justification for proposed management strategies. Working Group members should also understand and be able to communicate the potential economic impacts of those strategies.

In particular, the Working Group recognizes that there is a need to educate motorized outdoor recreation users about the potential impacts of that motorized recreational vehicles (e.g., ATV’s, four wheel drives, snowmobiles and off-road motor bikes) can have on the landscape and to ecosystems.

5.0 Transition Strategy

It is recognized by the Working Group that there is a need to provide the necessary flexibility for relevant agencies to adapt to changing circumstances and apply scarce resource in an efficient manner while also assuring the public that LRMP implementation is occurring. It is already apparent that the management intent is being incorporated into daily resource management activities.

Licensed resource tenure holders have generally been involved in a substantive way during the development of the Fort Nelson LRMP. They require some time and opportunity to design and institute management practices that will ultimately be consistent with the general intent of this plan. To ensure continuity of operational plan activity the LRMP will include phase-in provisions. These provisions, which will be developed at a later date, will include input from the stakeholders on how to phase-in the recommendations.
6.0 Monitoring and Amendment

6.1 Plan Term and Review Schedule

The term of the LRMP will be ten (10) years with a formal review in year five (5). The scheduled amendment and review process to renew the LRMP will begin in year eight (8).

6.2 Monitoring Committee and Reporting

6.2.1. LRMP Monitoring Committee and Reporting

The Fort Nelson LRMP recommends that the LRMP Working Group be used as the plan’s monitoring committee and assist the Inter-agency Management Committee (IAMC) with reviewing the annual or biennial monitoring report.

The monitoring report will indicate how the objectives and strategies outlined in the Land and Resource Management Plan are being met through agency-specific resource management activities, subsequent planning processes and resource development plans or permits.

The resource agencies will prepare a LRMP monitoring report for the Working Group to review, annually for the first two years, and biennially thereafter. The report will include:

- actions taken to conform with plan direction
- compliance with plan requirements
- instances where the intent of the plan had to be clarified
- an update on the more detailed strategic plan schedule.

The monitoring report will review and collate indicator information and assess how well the plan is meeting stated management objectives. Each appropriate government agency will be responsible for collecting and collating indicator information, revising the indicators as necessary, and raising issues that need to be addressed.

Following the release of the Monitoring Report, the LRMP Working Group will hold a meeting to review the report and solicit public comment. The meeting will be an opportunity for the public to raise issues that may require update or amendment of the plan.
6.2.2 Muskwa Kechika Advisory Committee

The Muskwa-Kechika Advisory Committee is intended to provide a long term mechanism that will allow both non-government and government agencies to co-operatively provide interpretation and intent of the plan with respect to management issues on the Muskwa-Kechika, within both the Protected Areas and surrounding Special management Zones. This group will consist of agency representatives, interested LRMP working group members and other representatives as needed in the future.

6.3 Plan Amendment

Local or operational planning processed may, through more detailed mapping, research or public involvement, recommend changes to the land and Resource Management Plan. The outcome of the LRMP Monitoring Committee or the Muskwa-Kechika Advisory Committee meetings may also recommend amendments to the plan. These recommendations would be circulated to all the LRMP Working Group members. The amendments to the plan would be communicated by the LRMP Chairperson (or IAMC designate) to the Omineca-Peace Interagency Management Committee for their consideration.

6.3.1 Plan Updates (Minor Amendments)

Plan updates are any minor changes to the plan and may include:
- revision of wording;
- revised priorities for local level plans
- small changes to boundaries of Resource Management Zones (Max 500 ha) suggested by local level plans
- refinements to objectives and strategies suggested by local level plans; and,

The Monitoring Report will contain proposed plan updates. The IAMC will be responsible for review and approval plan updates. All changes to the plan will be documented and circulated to the public interest groups and tenure holders.

6.3.2 Unscheduled (Major) Amendments

The LRMP Working Group, public or agencies may identify issues that require an unscheduled amendment. These will be identified in the Monitoring Report or at the Monitoring Committee's meeting. When issues arise that require a major amendment, the IAMC will establish the schedule and Terms of Reference for the amendment process, consistent with existing legislation and regulations.
The LRMP Working Group and public will be involved in the plan amendment process.

An unscheduled amendment is a major or significant change to the plan including:
- large changes to Resource Management Zone boundaries (500 ha or more);
- major revisions to targets set out in the plan

### 6.3.3 Scheduled Amendments

A scheduled amendment will review the entire plan and include a detailed examination of significant revisions. The process to amend the plan will begin eight years following plan approval. The IAMC will establish the Terms of Reference for the amendment process, consistent with existing legislation and regulations. The public will be involved in the amendment process.
7.0 Interpretation and Appeal

From time to time, the LRMP Working group, public or agencies may become concerned about how the plan is being interpreted or about specific practices that are occurring. In all instances, the concerns will be dealt with in the same spirit that the plan was developed.

7.1 Interpretation of Land Use Objective and Strategies

Where a concern is raised over land use objectives and strategies, the concern will be addressed directly to the affected agency(s). The responsible manager(s) will respond to the concern in writing. If the matter is not satisfactorily resolved, the concern will be forwarded to the Omineca-Peace Interagency Management Committee, or other designated committee, for resolution.

7.2 Appeal of Resource Management Practices

Where the public or agencies raise concerns with specific resource management practices that are occurring in the LRMP, they will raise the issue directly with the affected agencies. Where there is an existing review or appeal process, the concern will be dealt with through it. For example, concerns over forest road construction will be dealt with under the Forest Practices Code.

7.3 Reconvening the LRMP Working Group

At the annual meeting and review, or if the LRMP Working Group is reconvened, the Working Group will have an opportunity to provide interpretation and input on specific issues relating to the Fort Nelson LRMP. A group of Working Group members may make a request to the Interagency Management Committee that the Fort Nelson LRMP Working Group be reconvened to address specific issues related to interpretation of the plan.
8.0 Issues

The Fort Nelson LRMP Working Group identified several issues that directly or indirectly affect land-use within the Fort Nelson Planning Area, and were related to existing government policy. The following section outlines the recommended policy changes.

It is important to note that these changes to policy recommendations are included for information purposes. The approval of the Recommended Fort Nelson Land and Resource Management Plan should not be delayed pending resolution of these policy issues. The policy issues will be formalized and forwarded under separate cover to the Omineca-Peace Interagency Management Committee. Not all of these issues are consensus recommendations; some are of interest to only one or two sector representatives.

8.1 Recommended Policy Directions

8.1.1 Commercial Backcountry Recreation

The management of public and commercial recreation within the Proposed Protected Areas and Muskwa-Kechika Special Management Category of Resource Management Zones was discussed at length by the table. The Fort Nelson LRMP Working Group provides the following recommendations that will affect the management of commercial backcountry recreation (CBR) activities. The intent of this recommended guidance is to maintain a balance between non-commercial public use and other use.

- An inventory should be completed of existing and potential CBR opportunities to guide the allocation of future CBR tenures.
- Commercial backcountry recreation activities must be consistent with:
  - acceptable limits of use
  - environmental sustainability
  - greatest benefit to local community, region and province
  - equitable forage allocation between commercial and non-commercial use
  - equitable allocation of suitable campsites.
8.1.2 Management of Protected Areas

The Northern Rocky Mountains and Denetiah Proposed Protected Areas cover a large portion of the proposed protected areas within the Fort Nelson planning area. There are significant wildlife and recreation values found within these two areas and the table has concerns regarding the future management of these areas. The table suggests that these large protected areas be managed in a way that recognizes their unique historical use patterns and recommends that the ‘status-quo’ remains relative to recreational use.

The following specific concerns should be incorporated into the more detailed planning for these two protected areas:

- Traditional backcountry use has provided for the use of firearms outside of lawful hunting seasons for personal protection.

- Horse and pack stock use has been a traditional method of traversing these areas. Given that they will continue to be used, non-commercial ‘horse-use’ permits should not be required until such time as they are required to protect other values within these areas.

- Horses should not be limited to existing trails unless required to protect other important values. (e.g. sensitive habitats)

- There should be no duplication of requirements for commercial operations in and adjacent to these protected areas. Permits required for commercial operators should not increase because of changes in land status associated with these protected areas.

- For these new Protected Areas, statements on management direction will be drafted as soon as possible, which reflect the intent of the LRMP recommendations. The statements will be prepared by the appropriate agency designated to manage the Protected Area, in cooperation with other agencies that have a management interest in the area. The Management Direction Statements will provide commitment to co-operative management of the protected areas between agencies; and will provide the management direction until comprehensive Protected Area Management Plans are prepared through an open and inclusive public process.

- The proposed protected areas should be managed for the reasons for which they were recommend for protection, more specifically, their respective wilderness and wildlife values, not just for human use. This should not preclude restrictions on the amount or type of recreational use if the level of use is compromising these wilderness or wildlife values.
Sufficient staff and resources need to be committed to ensure the proper management of the proposed protected areas contained within this plan.

8.1.3. Drilling Under Proposed Protected Areas

The Fort Nelson LRMP Working Group recommends that the sale of subsurface rights and drilling for petroleum resources be allowed under specific proposed Protected Areas if doing so would not compromise the values for which the areas where protected. This does not include surface access to or through these Protected Areas. This policy would allow for some economic recovery of these sub-surface resources and would possibly mitigate compensation issues. It is the Working Group’s understanding that this would require a modification of existing government policy.

A subcommittee of the Environmental Conservation and Oil and Gas Sectors met in December 1996 to determine if the sectors could reach consensus on areas that might be appropriate for directional drilling under proposed Protected Areas in the Fort Nelson, Fort St. John and Dawson Creek planning areas. The subcommittee reviewed the proposed Goal 1 and 2 areas, and developed draft criteria for determining if directional drilling should be supported underneath proposed Protected Areas. The information was intended as a recommendation from the subcommittee to the Working Group. A list of their recommendations and criteria used to develop them are found in the Appendix.

The proposed protected areas which are affected by this issue are:
- Goal 1: Thinatea Proposed Protected Area
- Goal 2: Hay River Proposed Protected Area
- Goguka Creek Proposed Protected Area
- Jackpine Remnant Proposed Protected Area

8.1.4. Trapping in Proposed Protected Areas

The Fort Nelson LRMP planning area has historically been subject to trapping. Trapping remains socially important, especially amongst First Nations communities, where traplines are often held by families.

Therefore, the Working Group recommends that trapping be an “allowed use” in the Proposed Protected Areas, maintaining existing full rights. In addition the long term goal of maintaining trapping opportunities in the...
Proposed Protected Areas should be implemented through the Protected Area management planning process.

8.1.5. Access and the Use of Gates

A considerable amount of the direction contained within this plan relates directly or indirectly to the management of access to crown lands. For a variety of reasons, this plan directs that access be controlled in certain circumstances to protect other resource values such as wildlife or wilderness. There are a variety of measures that can be taken to achieve this objective depending on the exact nature of the access control required.

The table has concerns that the use of gates for purposes other than public safety may lead to further complications if not used or monitored correctly. Problems in the past have been noted where certain individuals have gate privileges while others do not. To this end, the Working Group recommends the following with regards to the use of gates as an access control mechanism:

- Land Managers should use alternate access control measures where they are feasible.
- When gates are chosen as the tool to control access, it must be advertised with sufficient time for public concerns to be addressed.

8.1.6. Expansion of Lodges within Provincial Parks

The Fort Nelson LRMP Working Group recommends that BC Parks allow for tourism operators to expand their holding and operations within the existing Provincial Parks, if such an expansion is feasible.

8.1.7. Development of Operational Plans for Habitat Enhancement by BC Environment

The conversion of vegetation to forage through the use of fire was discussed by the Fort Nelson LRMP Working Group. As a result of these discussions the Working Group provides the following direction:

- Manage for wildlife habitat enhancement through a subsequent planning process.

The intent of this strategy is to give direction for the development of operational plans which cover range burning activities. It is the Working Group's understanding that this is a policy issue for BC Environment.
8.2 Inventory and Research Priorities.

The following priorities are recommended:

- Undertake research on the social, economic and environmental impacts of implementing LRMP objectives and strategies.
- Undertake research on the impacts of implementing biodiversity strategies.
- Implement an adaptive management research program into biodiversity to ensure overall objectives for biodiversity are achieved in the long term.
- Initiate a research program to improve our understanding of the behaviour and biology of caribou populations and the effect of resource development on caribou habitat.
- Undertake research to update forest inventory information and provide for the ability to maintain current database information at all times.
- Conduct research into range and integrated resource management issues such as ago-forestry, integrating multiple uses on crown range land.
- Undertake research into different types of vegetation management and alternatives to herbicides.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABORIGINAL RIGHTS</strong></td>
<td>a practice, tradition or custom which has been a central and significant part of the society’s distinctive culture prior to contact with European society (R.v. Van der Pear, Supreme Court of Canada, August 1996). Examples of recognized aboriginal rights include (but are not limited to) fishing, berry picking, hunting and trapping for food, and the use of land and resources for shelter, medicinal, spiritual and ceremonial purposes.</td>
</tr>
<tr>
<td><strong>ACCEPTABLE LIMIT OF USE</strong></td>
<td>term to indicate a benchmark or threshold or disturbance on the land. Once the threshold has been reached, or passed, the use is no longer acceptable and strategies to restore the site could be considered.</td>
</tr>
<tr>
<td><strong>ACCESS</strong></td>
<td>a way or means of approach, (includes paths, trails, routes, corridors, roads, rails, etc.), to a specified interest.</td>
</tr>
<tr>
<td><strong>ACCESS MANAGEMENT</strong></td>
<td>the process of planning, developing, regulating and deactivating a way or means of approach to a specified interest.</td>
</tr>
<tr>
<td><strong>AGE CLASS</strong></td>
<td>any interval into which the age ranges of trees, forests, stands or forest types is divided for classification and use; forest inventories commonly group trees into 20 year age class groups.</td>
</tr>
<tr>
<td><strong>AGGREGATE</strong></td>
<td>formed by the gathering of smaller units into one large unit (e.g. cut blocks)</td>
</tr>
<tr>
<td><strong>AGRICULTURE</strong></td>
<td>the practice of growing and harvesting plants or animals, on land (including substrates) or in water, for the production of food, fibre, fuel, medicine, ornamentals and industrial products or uses associated with or ancillary to the production of food, fibre, fuel, medicine, ornamentals and industrial items.</td>
</tr>
<tr>
<td><strong>AGRICULTURE LAND</strong></td>
<td>land that is used for farming, including ranching, and land that has biophysical attributes that make it suitable for agricultural use. The latter includes lands identified by the Canada Land Inventory agricultural classes 1 to 5, as well as unique lands that have the capability to sustain agriculture in the regional context.</td>
</tr>
<tr>
<td><strong>AGRICULTURE LAND RESERVE (ALR)</strong></td>
<td>land designated and reserved for agricultural purposes under the <em>Agriculture Land Commission Act</em> (the reserve covers about 5% of the provincial land base and includes most of BC’s high quality agricultural land). It includes both private and public lands, and covers land being farmed and land with agricultural potential. Non-agricultural uses on the ALR are regulated.</td>
</tr>
<tr>
<td><strong>ALLUVIAL</strong></td>
<td>sand, clay, or gravel and other soil materials gradually deposited along river beds and floodplains, by running water.</td>
</tr>
</tbody>
</table>
ARCHEOLOGICAL SITES

- locations that contain physical evidence of past human activity for which application of scientific methods of inquiry (i.e. survey, excavation, etc.) are the primary source of information. These resources do not hold direct associations with living communities. Examples of archeological sites include shell middens, lithic scatters, cache pits and pit house remains.

(from: Douglas Glaum communication, April 1996)

BEST MANAGEMENT PRACTICES

- accepted methods for controlling non-point sources pollution, may in more conservation practices.

BIODIVERSITY

- biological diversity, is the diversity of plants, animals and other organisms in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems, as well as the evolutionary and functional processes that link them.

The underlying assumption of applying the biodiversity management is that all native species and ecological processes are more likely to be maintained if managed forests are made to resemble those forests created by the action of natural disturbance agents such as fire, wind, insects and disease. The composition, size, age and distribution of forest types and structural attributes of forest stands have been determined by these natural processes.

Applying biodiversity emphasis options to landscape units across a region is a key biodiversity management strategy.

When landscape level biodiversity management options have been established, the requirement for maintaining biodiversity in individual stands can be determined from Biodiversity Field Guide.

(from: Biodiversity Guidebook, September 1995)

BIODIVERSITY - STAND LEVEL

- Stand level - stand management to maintain biodiversity, stand level recommendations for biodiversity are designed to maintain or restore structural attributes such as wildlife trees (including standing dead coarse woody debris), tree species diversity and under storey vegetation.

(from: Biodiversity Guidebook, September 1995)

BIOGEOCLIMATIC ZONES

- are geographic areas having similar patterns of energy flow, vegetation as a result of broadly homogeneous climate.

(from: Biodiversity Guidebook, September 1995)

- a classification of forest or range lands incorporating primarily climate vegetation data.
**BLUE LISTED SPECIES**
- taxa that are considered to be vulnerable and "at risk", but not yet endangered or threatened. Populations of these species may not be in decline, but their habitat or other requirements are such that they are sensitive to further disturbance. The blue list also includes species that are generally suspected of being vulnerable, but for which information is too limited to allow designation in another category.

**BUFFER ZONE**
- a zone of vegetation around a sensitive area intended to filter impacts of adjacent activities, such as road building, on the resource being protected - some activities may be permitted within buffer zones. Often used in conjunction with leave strips - an undisturbed strip of vegetation around a sensitive resource area.  
*(from: Environmental Guidelines for Seismic and Drilling Operations in Northeast British Columbia (Interim), MELP, November 1994.)*

**CARIBOU MANAGEMENT ZONE**
- areas where operable timber supply has been reduced to meet the habitat requirements of caribou.

**CERTAIN**
- fixed; settled
- proved to be true
- dependable, reliable
- indisputable, undeniable

**CERTAINTY**
- something that is certain; the state of being certain

**COLIFORMS**
- bacteria present in the intestinal tracts of humans and other warm blooded animals and excreted in large numbers in faecal wastes. Water is not a natural medium for coliform organisms and their presence is indicative of faecal pollution. Total coliform counts are used as an indicator of the treatment adequacy in drinking water supply systems. Total coliforms include a wide variety of bacteria, many of which are not pathogenic and not associated with human waste. The faecal coliforms counts are specific for faecal pollution.  
*(from: Draft Community Watershed Guidebook, March 1996)*

**CONFLUENCE**
- place where streams meet

**CONNECTIVITY**
- a qualitative term used to describe the degree to which late successional ecosystems are linked to one another to form an interconnected network. The degree and characteristics of these linkages are determined by topography and Natural Disturbance Type (NDT).  
- Specific types of connectivity are:
  - upland to upland
  - upland to stream
  - upland to wetland
  - cross-elevational

*(from: Biodiversity Guidebook, September 1995)*
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSERVATION DATA CENTER</td>
<td>a division of B.C. Environment that tracks species and plant communities considered threatened or endangered at the provincial, national or global level.</td>
</tr>
<tr>
<td>CONSERVE</td>
<td>to keep in a safe or sound state; to avoid wasteful or destructive use of</td>
</tr>
<tr>
<td>CRITICAL HABITAT</td>
<td>part or all of a specific place occupied by a wildlife species or a population of species and recognized as being essential for the maintenance of the population or the ecosystem processes. The habitats may be well defined, geographically concentrated, critical niches or species-specific critical ecological components, widely distributed across the landscape.</td>
</tr>
<tr>
<td>CRITICAL USE AREAS</td>
<td>area important to the operations</td>
</tr>
<tr>
<td>CUESTA</td>
<td>a ridge with a steep face on one side, and a gentle slope on the other</td>
</tr>
<tr>
<td>DEVELOPED PROSPECT</td>
<td>mineral occurrence with resources/reserves defined by advanced exploration</td>
</tr>
<tr>
<td>DISCOURAGE</td>
<td>to hinder by disfavouring; deter;</td>
</tr>
<tr>
<td>ECOSECTION</td>
<td>large, defined geographic units based primarily on landform and climate that are used to divide the province into large physiographic units.</td>
</tr>
<tr>
<td>ECOSECTION REPRESENTATION</td>
<td>the degree to which an area represents the biophysical features of the ecosystem and especially its ability to capture the full range of biogeoecological units</td>
</tr>
<tr>
<td>ECOSYSTEM</td>
<td>a community of animals, plants and bacteria and its interrelated physical and chemical environment</td>
</tr>
<tr>
<td>ENCOURAGE</td>
<td>to spur on: stimulate;</td>
</tr>
<tr>
<td>ENDANGERED</td>
<td>a species facing imminent extirpation or extinction, COSEWIC.</td>
</tr>
<tr>
<td>ENHANCE</td>
<td>to add or contribute to as: improve, increase</td>
</tr>
<tr>
<td>ENSURE</td>
<td>to make sure, certain, or safe: guarantee</td>
</tr>
<tr>
<td>FACILITATE</td>
<td>to make easier</td>
</tr>
<tr>
<td>FLYWAY</td>
<td>specific air route taken by birds during migration.</td>
</tr>
</tbody>
</table>
FOREST ECOSYSTEM NETWORK (FENs) • planned landscape zones that serve to maintain or restore natural connectivity within a landscape unit. FENs are contiguous networks of representative old-growth and mature forest and are composed of a variety of protected and classified areas (e.g., protected areas, old-growth management areas, riparian management areas and reserve zones, wildlife habitat areas and other sensitive areas such as unstable terrain, high visual quality or any other inoperable areas).  
(from: Biodiversity Guidebook, September 1995)

FOREST PRACTICE • timber harvesting, road construction, road maintenance, road deactivation, silviculture treatments, botanical forest product collecting, grazing, hay cutting, forest use, control, suppression and any other activity that is • carried out on land that is • Crown Land • range land, or • private land that is subject to tree farm license or a woodlot license, and • carried out by • any person (A) under an agreement under the Forest Act or Range Act, (B) for a commercial purpose under this Act or the regulations, or (C) to rehabilitate forest resources after an activity referred to in clause (A) or (B), or • the government.  
(from: Forest Practices Code, April 1995)

FOREST PRACTICES CODE OF BRITISH COLUMBIA • part of an overall strategy introduced by the provincial government for land use planning and resource management in B.C.. The Code is based on the goal of sustainable use which includes: • managing forests to meet present needs without compromising the needs of future generations, • providing stewardship of forests based on an ethic of respect for the land, • balancing productive, spiritual, ecological and recreational values of forests to meet the economic and cultural needs of peoples and communities, including First Nations, • conserving biological diversity, soil, water, fish, wildlife, scenic diversity and other forest resources; and, • restoring damaged ecosystems  
**FRAGMENTATION**
- a process whereby large contiguous forest patches are transformed into one or more smaller patches surrounded by disturbed areas. Fragmentation occurs naturally by fire, disease, wind and insect attack. It also occurs in managed forests, influenced by the rate of cut, cutblock size, cutblock distribution and silvicultural systems used to re-forest. Fragmentation due to forest harvesting should be viewed and managed to mimic fragmentation resulting from natural disturbances.

Fragmentation can lead to declines in biodiversity in three ways:
- the loss of habitat through the conversion of natural forest stands to managed forest stands
- the increase in micro-climatic and biotic edge effects through the reduction in size of forest patches
- the imposition of barriers to gene flow and dispersal through the increased isolation of remaining forest patches

*(from: Biodiversity Guidebook, September 1995)*

<table>
<thead>
<tr>
<th>GROUNDWATER</th>
<th>Subsurface water found in the zone of saturation; found in the aquifer</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUNDWATER RECHARGE</td>
<td>The inflow to an aquifer</td>
</tr>
<tr>
<td>HABITAT</td>
<td>An area in which a plant or animal naturally lives; part of a broader unit, the ecosystem</td>
</tr>
<tr>
<td>HEADWATERS</td>
<td>The source and upper reaches of a stream, also the upper reaches of a reservoir</td>
</tr>
<tr>
<td>HIGHER LEVEL PLAN (HLP)</td>
<td>A plan formulated pursuant to section 4 (c) of the Ministry of Forests Act</td>
</tr>
<tr>
<td></td>
<td>A management plan</td>
</tr>
<tr>
<td></td>
<td>An objective for a resource management zone</td>
</tr>
<tr>
<td></td>
<td>An objective for a landscape unit or sensitive area</td>
</tr>
<tr>
<td></td>
<td>An objective for a recreation site, recreation trail or interpretative forest site, a</td>
</tr>
<tr>
<td></td>
<td>A plan or agreement declared to be a higher level plan by</td>
</tr>
<tr>
<td></td>
<td>The Ministers, or</td>
</tr>
<tr>
<td></td>
<td>The Lieutenant Governor in Council under this or any other Act.</td>
</tr>
<tr>
<td>HYDROLOGY</td>
<td>The science of waters of the earth, waters properties, circulation, principles and distribution</td>
</tr>
<tr>
<td>IDENTIFIED WILDLIFE</td>
<td>Those species at risk that the Deputy Minister of Environment, Lands and Parks, or a person authorized by that deputy minister and the chief forester agree will be managed through a higher level plan, wildlife habitat area or general wildlife measure.</td>
</tr>
</tbody>
</table>
| **IMPROVE** | • to enhance in value or quality: make better  
• to use to good purpose  
• to advance or make progress in what is desirable  
• to make useful additions or amendments |
| **INDUSTRIAL MINERAL** | • non-fuel, non-metallic minerals and rocks that often require bulk processing, transportation and marketing to meet commercial and industrial uses. Examples include but are not limited to: limestone for industrial or commercial needs, barite, gypsum, clay, glass sand and dimension stone. |
| **INSTREAM FLOW REQUIREMENT** | • the minimum amount of water required in a stream to maintain the existing aquatic resources and associated wildlife and riparian habitat |
| **INTEGRITY** | • an unimpaired condition; soundness  
• the quality or state of being complete or undivided; completeness |
| **LANDSCAPE** | • a watershed or series of similar and interacting watersheds, usually between 5 000 and 100 000 ha in size |
| **LANDSCAPE UNIT** | • a planning area, delineated according to topographic or geographic features such as a watershed or series of watersheds and, as designated by a district forest manager  
(from: Biodiversity Guidebook, September 1995) |
| **LARGE WOODY DEBRIS** | • Woody debris functioning as fish habitat, during at least part of the year, with a diameter of 10 cm or greater and a length of 2 meters or greater. |
| **LAND AND RESOURCE MANAGEMENT PLANNING** | • The sub-regional integrated resource planning process for British Columbia. LRMP considers all resource values and requires public participation, interagency co-ordination and consensus-building in land and resource management decisions. |
| **LINEAR DEVELOPMENT** | • straight line industrial development that is typically of powerlines, highways, gas lines and seismic activities. |
| **LOWER LEVEL PLANS** | • see Operational Plans |
| **MAINTAIN** | • to keep in an existing state (as of repair, efficiency, or validity): preserve from failure or decline |
| **MANAGE** | • to handle or direct with a degree of skill or address  
• to treat with care  
• to exercise executive, administrative, and supervisory direction of |
| **MANAGEMENT STRATEGY** | • a method for achieving an end or objective |
| **MATURE GROWTH** | • or mature seral stage, is a forest composed primarily of co-dominant trees, with canopies that vary vertically, horizontally, or both. Generally refers to trees 80 to 120 years old or greater, depending upon species and site conditions. The age structure of mature seral-stage forests varies significantly by forest type and one biogeoclimatic zone to another.  
(from: Biodiversity Guidebook, September 1995) |
| **MAXIMIZE** | • to increase to a maximum  
• to make the most of  
| **METALLIC MINERAL** | • ore minerals that contain metal. Metallic ores are almost always transported a mine in a concentrated form for further processing.  
| **MINERAL ASSESSMENT** | • a description of the known and potential or estimated mineral values of the base. Discovered deposits comprise the known value component; and predict estimated resources based on occurrences, past production, exploration expenditures and expert knowledge, comprise the potential value component.  
Mineral assessment classifies tracts of land from 1 (lowest) to 10 (highest). Metallic and industrial mineral (non-metallic, non-fuel minerals) values are assessed separately. The assessments in this document were completed by the provincial Geological Survey Branch and based on a refined version of the assessment process used by the United States Geological Survey.  
| **MINING** | • Mining means both mineral exploration and development  
• Development means final stages of advanced exploration, construction of production facilities and production of minerals  
| **MINIMIZE** | • to reduce to a minimum  
| **NATURAL DISTURBANCE TYPES (NDTs)** | • characterize areas with different natural disturbance regimes. Natural stand-initiating disturbances are those processes that largely terminate the existing stand and initiate secondary succession in order to produce a new stand. For purpose of setting biodiversity objectives, five natural disturbance types are recognized as occurring in BC. These are:  
• NDT 1 - ecosystems with rare stand-initiating events  
• NDT 2 - ecosystems with infrequent stand-initiating events  
• NDT 3 - ecosystems with frequent stand-initiating events  
• NDT 4 - ecosystems with frequent stand-maintaining fires  
• NDT 5 - Alpine Tundra and Sub-alpine Parkland ecosystems  
(from: Biodiversity Guidebook, September 1995)  
| **NATURAL STREAM FLOW** | • the flow of a stream as it would be if unaltered by upstream diversion, storage import, export or changes in upstream consumption use caused by development  
| **NOT SATISFACTORILY RESTOCKED (NSR)** | • productive forest lands that has been denuded and has bailed, partially or completely, to regenerate either naturally or artificially.
OLD GROWTH MANAGEMENT AREA (OGMA)

- Mapped-out special management areas that contain or are managed to replace specific structural old-growth attributes. They are intended to capture old-growth or mature seral stages within landscape units to meet retention objectives and can be harvested (using timber harvesting and silvicultural practices consistent with management objectives for the OGMA) when equivalent old-seral stage areas are available.

(from: Biodiversity Guidebook, September 1995)

OLD-GROWTH

- Or old seral stage is a climax forest that contains live and dead trees of various sizes, species, composition and age class structure. The age and structure of old-growth forests varies significantly by forest type and from one biogeoclimatic zone to another.

(from: Biodiversity Guidebook, September 1995)

OPERATIONAL PLAN

- Detail the logistics for development. Methods, schedules and responsibilities for accessing, harvesting, renewing and protecting the resource are set out to enable site-specific operations to proceed. These include forest development plan, logging plan, access management plan, range use plan, silviculture prescription, stand management prescription and 5-year silvicultural plan.


PAST PRODUCER

- Past producing mine, often with potential for expanding existing reserves and mining.

PATCH

- A stand of similar-aged forest that differs in age from adjacent patches by more than 20 years. The term is used in landscape level planning to either refer to the size of an opening created by a natural disturbance that led to even-aged forests or an opening created by cutblocks.

(from: Biodiversity Guidebook, September 1995)

POLLUTION

- Any alteration in character of quality of the environment which renders it unfit or less suited for certain uses.

POTABLE

- Water fit for human consumption without further treatment.

PRE-EXISTING LEVELS

- In reference to motorized access.
- The number of routes available for use by recreational motorists before any new developments.

PREDATOR-PREY SYSTEM

- A combination of a population of large predator, a complex of prey populations, and the environment in which this relationship exists. In the Fort Nelson Forest District, there are two large predator-prey systems: bears and wild ungulates; and wolves and wild ungulates. Any network of areas designed to maintain large predator-prey populations must include the centres of their occurrence and the vital linkages or movement corridors between them.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESCRIPTION</td>
<td>a set of detailed directions for managing habitat for identified wildlife</td>
</tr>
<tr>
<td>PRESERVE</td>
<td>to keep safe from injury, harm, or destruction: protect</td>
</tr>
<tr>
<td>PRIORITY FISH SPECIES</td>
<td>freshwater game fish species such as rainbow trout, bull trout, walleye and bu</td>
</tr>
<tr>
<td>PRODUCER</td>
<td>a current mining operation</td>
</tr>
<tr>
<td>PROMOTE</td>
<td>to contribute to the growth or prosperity of: further</td>
</tr>
<tr>
<td>PROSPECT</td>
<td>mineral occurrence with some indication of dimension and value.</td>
</tr>
<tr>
<td>PROTECTED AREA</td>
<td>areas such as provincial parks, federal parks, wilderness areas, ecological re</td>
</tr>
<tr>
<td>PROTECT</td>
<td>to make a proviso or stipulation</td>
</tr>
<tr>
<td>PROVIDE</td>
<td>to make preparation to meet a need: to supply something for sustenance or su</td>
</tr>
<tr>
<td>RARE ECOSYSTEM</td>
<td>an ecosystem (either site series - sites capable of producing the same late</td>
</tr>
<tr>
<td>RECLAMATION</td>
<td>to put into a desired condition</td>
</tr>
<tr>
<td>RED-LISTED SPECIES</td>
<td>the taxa on the red list are either extirpated, endangered or threatened, or</td>
</tr>
<tr>
<td>REGIONALLY IMPORTANT SPECIES</td>
<td>species that are not red- or blue-listed, that require management practices th</td>
</tr>
<tr>
<td>RECOGNIZE</td>
<td>to acknowledge formally, as to admit as being of a particular status; to ac</td>
</tr>
<tr>
<td>REHABILITATION</td>
<td>re-establish to condition of good health</td>
</tr>
</tbody>
</table>
| RESERVE          | • to hold in reserve: keep back  
|                 | • to set aside  
|                 | • an area of forest land, that by law or policy, is not available for timber harvesting or production.  
| (from: Biodiversity Guidebook, September 1995) |
| RESOURCE MANAGEMENT ZONE | • a land use designation category under the Forest Practices Code that establishes strategic objectives and special requirements to guide subsequent subregional/local and operational planning. |
| RESTORATION     | • ecological restoration is the process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems |
| RIPARIAN HABITAT| • a distinct wildlife habitat zone located in riparian areas (land adjacent to the banks of rivers, streams, lakes and wetlands). Riparian areas are dominated by continuous high moisture content and influenced by adjacent upland vegetation. They incorporate ecosystems that are biologically diverse, frequently containing the highest number of plant and animal species found in a forest. Riparian areas provide critical habitats, home ranges and travel corridors for wildlife and serve to maintain ecological linkages throughout the forest landscape by connecting hillsides to streams and upper-elevation stream headwater areas to valley bottoms.  
| (from: Riparian Management Area Guidebook, March 1995) |
| RIPARIAN MANAGEMENT AREA | • an area determined in accordance with the Forest Practices Code Riparian Management Areas, that  
|                 | • is adjacent to a stream or wetland, or lake with a riparian class of L2, L3 or L4, and  
|                 | • consists of a riparian management zone and, depending on the riparian class of the stream, wetland or lake, a riparian reserve zone.  
| (from: Riparian Management Area Guidebook, March 1995) |
| RIPARIAN MANAGEMENT AREAS GUIDEBOOK | • a guidebook to the establishment of riparian management areas and reserve zones under the Forest Practices Code of B.C.  
| (from: Riparian Management Area Guidebook, March 1995) |
| RIPARIAN MANAGEMENT ZONE | • an area adjacent to a stream, wetland or lake where constraints to forest practices apply for the purpose of maintaining the integrity of the stream, wetland or lake and associated wildlife habitat.  
| (from: Draft 2 - Riparian Management Area Guidebook, March 1995) |
| RIPARIAN RESERVE ZONES | • an area adjacent to a stream, wetland, or lake, within the Resource Management Zone, where no forest practices may occur.  
<p>| (from: Riparian Management Area Guidebook, March 1995) |</p>
<table>
<thead>
<tr>
<th>ROS (RECREATION OPPORTUNITY SPECTRUM) DELINEATION CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>- ROS classes are determined by considering the three basic criteria of remoteness, size, and evidence of humans.</td>
</tr>
<tr>
<td>- Remoteness: Remoteness from the sights and sounds of human activities is used as one of the criteria for the opportunity to experience greater or lesser amounts of rural social interaction and primitive to rural influences as one moves across the spectrum. To identify remoteness, delineate all roads, railroads and trails on the base map or overlay. Distinguish between two levels of roads: primitive road and better-than-primitive roads. Trails with motorized use are included in the primitive road category.</td>
</tr>
<tr>
<td>- Road Classification: For roads which are difficult to classify into the primitive road or better-than-primitive road categories, apply these definitions:</td>
</tr>
<tr>
<td>- better-than-primitive roads are constructed and maintained for the use of highway-type vehicles having more than two wheels</td>
</tr>
<tr>
<td>- primitive roads are not constructed or maintained for vehicles primarily intended for highway use</td>
</tr>
<tr>
<td>- Road Patterns: In most cases all roads and trails are mapped. In areas with dense road patterns it may not be necessary to identify each road for ROS delineation. Based on main roads alone, the entire area may be road-influence and become the same ROS class. In these cases only the roads along the perimeter of the densely roaded area are needed to define the Recreation Opportunity Spectrum class boundaries.</td>
</tr>
<tr>
<td>- Traffic Volume: Although volume of traffic may vary widely on the better-than-primitive roads, depending upon the specific road involved, volume need not be recorded on the base map or overlay. The physical presence and sight of a road even with no traffic on it still affects the visitor experience, and is accounted for through the Recreation Opportunity Spectrum criteria. If traffic volume results in sounds from a road at distances greater than the line of sight, then sound may become the determinant criterion in delineating the appropriate ROS class.</td>
</tr>
<tr>
<td>- Water Travel: Where motorized water travel routes provide the only access, consider them in a manner similar to primitive roads. These specialized types of access may also provide a basis to determine the need for subclasses within the ROS continuum.</td>
</tr>
<tr>
<td>CLASS</td>
</tr>
<tr>
<td>---------------</td>
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</tbody>
</table>
| Primitive     | > 8 km from a 4-wheel drive road | - Very high probability of experiencing solitude, closeness to nature, self-reliance and challenge  
- Unmodified natural environment  
- Very low interaction with other people  
- Little on-the-ground evidence of other people  
- Restrictions and controls generally not evident  
- Non-motorized access and travel on trails, cross-count waterways  
- Generally no facilities except where required for safety  
- General lack of site modification |
|               | > 5000 hectares |                                                                                                                                                    |
| Semi-Primitive Non-Motorized | > 1 km from a 4-wheel drive road | - High probability of experiencing solitude, closeness to nature, self-reliance and challenge  
- Natural or natural-appearing environment  
- Low interaction with other people  
- Some on-the-ground evidence of other people, some on-site controls  
- Non-motorized access and travel on trails, cross-count waterways  
- Facilities may be present for signing and for sanitary and safety needs using natural, rustic materials wherever possible  
- Minimal to no site modification |
|               | > 1000 hectares |                                                                                                                                                    |
| Semi-Primitive Motorized | > 1 km from a 2-wheel drive road | - Moderate opportunity for solitude, closeness to nature, degree of self-reliance and challenge in using motorized equipment  
- Natural or natural-appearing environment  
- Low interaction with other people  
- Some on-the-ground evidence of other people, some on-site controls  
- Motorized access on trails, primitive roads & cross-count waterways may occur  
- Limited facilities for signing, sanitary and safety needs using natural, rustic materials wherever possible  
- Minimal site modification |
|               | > 1000 hectares |                                                                                                                                                    |
| Roaded Resource Land | Often within 1 km of a 2-wheel drive road with a gravel or dirt surface | - Opportunities for both privacy and social interaction; feelings of independence and freedom  
- Natural environment may be substantially modified  
- On-the-ground evidence of other people, some on-site controls  
- Access and travel is by motorized vehicle  
- Facilities generally present; natural, rustic materials preferred  
- Minimal to no site modification |

**SCENIC AREA**
- any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the district manager.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>SENSITIVE SPECIES</td>
<td>those plant or animal species susceptible or vulnerable to activity impacts.</td>
</tr>
<tr>
<td>SERAL STAGES</td>
<td>the stages of ecological succession of a plant community, e.g., from young stage. The characteristic sequence of biotic communities that successively replace each other by which some components of the physical environment altered over time.</td>
</tr>
<tr>
<td>SHOWING</td>
<td>mineral occurrence insufficiently defined to allow for a resource estimation.</td>
</tr>
<tr>
<td>SILVICULTURAL SYSTEMS</td>
<td>a planned cycle of activities by which a forest stand, or group of trees, is regenerated and tended over time.</td>
</tr>
<tr>
<td>SPECIAL MANAGEMENT AREA</td>
<td>a land use designation under the plan used to identify areas where enhanced management are required to address sensitive values such as fish and wildlife, visual quality, recreation and cultural heritage features, etc. The management maintains these values while allowing compatible human use and development.</td>
</tr>
<tr>
<td>SPECIES AT RISK</td>
<td>(a) any species that in the opinion of the deputy minister of MELP or a person authorized by that deputy minister is threatened, endangered, sensitive or vulnerable. It also includes threatened and endangered plants or plant communities identified by the Ministry of MELP or a person authorized by that deputy minister, as requiring particular attention.</td>
</tr>
<tr>
<td>STAND</td>
<td>a community of trees with common characteristics; one stand can be distinguished from another by age, species, site type and other characteristics.</td>
</tr>
<tr>
<td>STAND ATTRIBUTES</td>
<td>components of a forest stand that are to be retained to maintain biodiversity. Components include but are not limited to: dead wood, standing dead trees, debris, large living trees, tree species diversity, structural diversity and biodiversity.</td>
</tr>
<tr>
<td>STAND LEVEL</td>
<td>the level of forest management at which a relatively homogeneous land area is managed under a single prescription, or set of treatments, to meet well-defined objectives.</td>
</tr>
<tr>
<td>STIMULATE</td>
<td>to excite to activity or growth or to greater activity.</td>
</tr>
<tr>
<td>STRUCTURAL ATTRIBUTES</td>
<td>components of a forest stand (including living and dead standing trees, architecture and fallen trees) which together determine stand structure.</td>
</tr>
<tr>
<td>THREATENED OR ENDANGERED SPECIES</td>
<td>indigenous species that are either threatened or endangered, and identified by the Ministry of Environment, Lands and Parks.</td>
</tr>
<tr>
<td>TOPOGRAPHY</td>
<td>the general configuration of the land surface, including relief and position of man-made features.</td>
</tr>
</tbody>
</table>

| **Trangional Use Sites** | any geographically defined site that has been traditionally used by one or more groups of people for some type of activity. These sites will often lack the physical evidence of human-made artifacts or structures, but will maintain cultural significance to a living community of people. Traditional use sites are usually documented with the assistance of oral, historical and archival sources. Examples of such sites include: sacred sites, ritual bathing pools, resource gathering sites and sites of a legendary or past event of cultural significance. *(from: Douglas Glaum communication, April 1996)* |
| **Tributary** | a stream that contributes its water to another stream or body of water |
| **Turbidity** | describes the cloudy or hazy characteristics of water which is usually due to the presence of suspended particles of silt and clay. *(from: Draft Community Watershed Guidebook, March 1996)* |
| **Ungulate** | a hoofed mammal |
| **Viable Population** | a population that can withstand the normal cycles of environmental factors without going to extinction. |
| **Visual Quality Objective** | a resource management objective established by the district manager or contained in a higher level plan that reflect the desired level of visual quality based on the physical characteristics and social concerns for the area. |
| **Vulnerable Species** | species that are not threatened or endangered but are sensitive and particularly at risk and identified as 'blue-listed' by the Ministry of Environment, Lands and Parks. *(from: Draft Wildlife Habitat Areas Field Guide, October 1994)* |
| **Water Level Streamflow** | measure of the water flowing in the stream at any point in time. *(from: Draft Community Watershed Guidebook, March 1996)* |
| **Water Quality Parameters** | includes turbidity, bacteria counts (total and faecal coliforms), and water level streamflow. These would be used to characterize existing water quality conditions and establish a reference database for future comparison. *(from: Draft Community Watershed Guidebook, March 1996)* |
| **Watershed** | an area drained by a particular stream or river. A large watershed may contain several smaller watersheds. |
WATERSHED ASSESSMENT • an evaluation of the cumulative impact that proposed activities and development have on stream flows, suspended sediment, landslide and stream channel stability in the watershed. The assessment has three levels:
- Level I: reconnaissance level analysis; identifies watersheds at risk and identifies the effects and identifies specific hazards that need to be addressed, such as suspended sediment and landslides.
- Level II: an overview channel stability assessment, only conducted or implemented where there is a high impact based on Level I analysis.
- Level III: detailed field investigation by a watershed specialist on high priority streams and is used to develop management prescriptions to mitigate impacts.

WETLAND • swamp, marsh or other similar area that supports natural vegetation that is not found in the adjacent upland areas. More specifically, an area where a water table is generally above the surface or where soils are water saturated for sufficient length of time, resulting in excess water and resulting low oxygen levels are principle determinants of soil development.

WILDERNESS • an area generally greater than 1000 hectares that predominantly retains its natural character and on which human impact is transitory, minor and in the long term substantially unnoticeable.

WILDLIFE • (a) a vertebrate that is a mammal, bird, reptile or amphibian prescribed as such by the Wildlife Act, S.B.C. 1982, c.57 (b) a fish, or including (i) any vertebrate of the class Petromyzoniformes (lampreys) or class Osteichthyes (bony fishes), or (ii) an invertebrate of the class Crustacea (crustaceans) or class Mollusca (mollusks) found in the non-tidal waters of the Province, and (c) an invertebrate or plant listed by the Minister of Environment, Lands and Parks as an endangered, a threatened, or a vulnerable species, and includes the eggs and juvenile stages of these vertebrates and plants.

WILDLIFE HABITAT AREA • a mapable unit of land necessary to meet the requirements of identified wildlife species.

WILDLIFE MANAGEMENT AREA • areas of critical wildlife habitat or rare ecosystems that are administered by the Wildlife Branch, BC Environment. WMAs are not equivalent to wildlife habitat areas.

WILDLIFE TREE • a standing live or dead tree with special characteristics that provide wildlife benefits for conservation or enhancement of wildlife. Characteristics include large height for the site, current use by wildlife, declining or dead condition, valuable location and relative scarcity.

(from: Biodiversity Guidebook, September 1995)
### WILDLIFE TREE PATCH
- synonymous with a *group reserve* and is an area specifically identified for the rete and recruitment of suitable wildlife trees. It can contain a single wildlife tree or more.

*(from: Biodiversity Guidebook, September 1995)*

### YELLOW-LISTED SPECIES
- species identified by the Ministry of Environment, Lands and Parks that require a management emphasis on a regional basis.

*(from: Conservation Data Centre)*
<table>
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<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>ADM</td>
<td>Assistant Deputy Minister</td>
</tr>
<tr>
<td>AOI</td>
<td>Area of Interest</td>
</tr>
<tr>
<td>ALR</td>
<td>Agricultural Land Reserve</td>
</tr>
<tr>
<td>AST</td>
<td>Approval Support Team</td>
</tr>
<tr>
<td>BC</td>
<td>British Columbia</td>
</tr>
<tr>
<td>CAMP</td>
<td>Coordinated Access Management Plan</td>
</tr>
<tr>
<td>CBR</td>
<td>Commercial Back Country Recreation</td>
</tr>
<tr>
<td>COSEWIC</td>
<td>Directional Drilling</td>
</tr>
<tr>
<td>DD</td>
<td>Department of Fisheries and Oceans</td>
</tr>
<tr>
<td>DFO</td>
<td>Deputy Minister</td>
</tr>
<tr>
<td>DM</td>
<td>District Manager</td>
</tr>
<tr>
<td>DO</td>
<td>Designated Official</td>
</tr>
<tr>
<td>ELUC</td>
<td>Environment and Land Use Committee</td>
</tr>
<tr>
<td>FN</td>
<td>First Nations</td>
</tr>
<tr>
<td>FPC</td>
<td>Forest Practices Code</td>
</tr>
<tr>
<td>GMD</td>
<td>General Management Direction</td>
</tr>
<tr>
<td>HLP</td>
<td>Higher Level Plan</td>
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<tr>
<td>IAMC</td>
<td>Interagency Management Committee</td>
</tr>
<tr>
<td>IPT</td>
<td>Interagency Planning Team</td>
</tr>
<tr>
<td>IRM</td>
<td>Integrated Resource Management</td>
</tr>
<tr>
<td>LRMP</td>
<td>Land and Resource Management Plan</td>
</tr>
<tr>
<td>LUCCO</td>
<td>Land Use Coordination Office</td>
</tr>
<tr>
<td>LUS</td>
<td>Land Use Strategy</td>
</tr>
<tr>
<td>MAFF</td>
<td>Ministry of Agriculture, Fisheries and Food</td>
</tr>
<tr>
<td>MEI</td>
<td>Ministry of Employment and Investment</td>
</tr>
<tr>
<td>MELP</td>
<td>Ministry of Environment, Lands and Parks</td>
</tr>
<tr>
<td>M-K</td>
<td>Muskwa-Kechika</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Forests</td>
</tr>
<tr>
<td>MOTH</td>
<td>Ministry of Transportation and Highways</td>
</tr>
<tr>
<td>OIC</td>
<td>Order-In-Council</td>
</tr>
<tr>
<td>PAS</td>
<td>Protected Area Strategy</td>
</tr>
<tr>
<td>RMP</td>
<td>Resource Management Plan</td>
</tr>
<tr>
<td>RMZ</td>
<td>Resource Management Zone</td>
</tr>
<tr>
<td>RPAT</td>
<td>Regional Protected Areas Team</td>
</tr>
<tr>
<td>SEA</td>
<td>Socioeconomic Assessment</td>
</tr>
<tr>
<td>TOR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>TSA</td>
<td>Timber Supply Area</td>
</tr>
<tr>
<td>TUS</td>
<td>Traditional Use Study</td>
</tr>
</tbody>
</table>
INFORMATION

☐ FILE ☒ DOCUMENT ☐ PAGE

☒ O.I.C. 1367/97 - Attachment

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☐ DOES NOT EXIST.

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SCHEDULE 5

RECOMMENDED FORT ST. JOHN LAND AND RESOURCE MANAGEMENT PLAN
Recommended Fort St. John Land and Resource Management Plan
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EXECUTIVE SUMMARY

Overview

The Fort St. John Land and Resource Management Plan (LRMP) incorporates the principles of integrated resource management into a long-term plan for Crown land and resource development within the planning area, the Fort St. John Forest District.

Many residents of this area value the economic opportunities provided by natural resource development and the outdoor and wilderness recreation experiences that are readily available in this area. These two important values have been combined to form a vision statement for the plan:

Our vision is to maintain resource development opportunities to sustain the economic base of planning area communities while maintaining high outdoor recreation, wilderness, wildlife and biodiversity values for future generations.

The Fort St. John LRMP provides a stable strategic planning framework for resource development industries and ensures continued access to these natural resources outside of Protected Areas. At the same time, the plan incorporates the protection of environmental and recreation resource values through the development and implementation of objectives and strategies to manage and maintain these values over the planning area. After ratification and adoption by government, implementation of the plan should provide greater economic stability for residents and communities within the planning area and increased environmental awareness, management and protection.

Planning Area Description

The Fort St. John Forest District is one of the largest in British Columbia covering approximately 4.6 million hectares. Crown lands within the legal boundary of the Forest District are essentially, the planning area. The southern district boundary is the Peace River. The north boundary is shared between the Fort St. John and Fort Nelson Forest Districts.

Bisected by the Alaska Highway, the planning area can be roughly described as two major areas: east of the Alaska Highway and west of the Alaska Highway. The topography east of the highway is flatter or gently rolling terrain, part of the extensive Alberta Plateau extending all the way to the BC/Alberta provincial boundary. West of the highway, the terrain becomes increasingly more rugged as part of the Rocky Mountain Foothills. Further west lies the Rocky Mountains, the western boundary of the planning area.

The Fort St. John planning area is unique in several ways. Oil and gas exploration and development has occurred throughout most of the planning area over the past few decades. The southern and southeastern portion of the planning area is predominantly used for agriculture and has a high concentration of privately-held lands. Forest harvesting and management, although a major part of the current local economy, is relatively recent with many areas yet to be developed for timber harvesting. The mineral resources of the area are relatively unexplored and significant potential exists in the western portion of the planning area near the Rocky Mountains. Energy development is the largest economic sector in this planning area, with agriculture and forestry ranked second and third, respectively, in terms of local employment.

Nationally and internationally important wildlife resources are an important feature, especially in the “wilderness” areas in the western portion of the planning area. The planning area incorporates the southern portion of the access management area known as the Muskwa-Kechika, part of the Northern Rockies. Management of this area for its high wildlife, biodiversity and wilderness values is a key objective for several sectors and several provincial, national and international groups.
Process

The Land and Resource Management Planning process is an integral part of the Province's Land Use Strategy. This process differs from previous or other land use planning processes in that:

- The general public and a wide selection of interest groups were invited and encouraged to participate in the planning process.
- The plan’s recommendations are an outcome of the deliberations of the Fort St. John planning table – private citizens, stakeholders (industrial sectors, environmental groups, etc.) and government agency representatives who live, work or who have an interest in how Crown lands and resources are managed in the planning area. Table representatives provided presentations of their land and resource management interests.
- Despite governments sincere attempts to involve local First Nations, they chose not to participate in the planning exercise. First Nations were kept informed through regular mailings of meeting agendas and minutes. Copies of the draft plans were forwarded to First Nations for comment. Although the process had minimal direct involvement of First Nations and their communities, their cultural, archaeological and heritage values were endorsed by the Table and incorporated into the planning exercise where identified.
- The Fort St. John LRMP process incorporated a form of consensus-based decision-making. Resource sector representatives were not directed to steadfastly support all positions and recommendations. The overall planning objective was to identify land and resource management issues and then develop solutions and recommendations that sector representatives “could live with”. General agreement was reached on all issues.

The Fort St. John LRMP is an organized set of recommendations which will be applied to the management of Crown lands and resources in the planning area. These recommendations included: resource management zone boundaries, proposed Protected Areas, resource management objectives and strategies and a list of selected indicators to monitor the outcome of the different strategies. Policy change recommendations were included for those issues that the Table wished to send a strong message to government.

Recommendations in the plan are directed to the BC Provincial Government Cabinet. The Fort St. John LRMP has developed recommendations for a number of resources including; energy, forestry, recreation, agriculture, range, minerals, fish, wildlife, transportation, heritage, culture and water resources. In addition, this plan has developed a comprehensive set of access management objectives and strategies to address access concerns on Crown lands. Once approved by government, the entire plan or portions of the plan provides strategic direction to land and resource planning, management and development for a period of ten years.

An important aspect of government approval is how an LRMP fits within the strategic planning framework of the Forest Practices Code of British Columbia Act (FPC). All or part of an LRMP can be declared a higher level plan under the FPC. Those portions of an LRMP declared as higher level plans under the FPC provide strategic direction for forest management activities and more detailed plans (for example Forest Development Plans, Range Use Plans, Access Management Plans, etc.).
Key Features of the Plan

- The planning area is divided into 27 resource management zones (RMZ's) based on resource values, existing economic activity, environmentally important areas and Agricultural Land Reserve (ALR) boundaries.
- Using provincially-adopted land-use categories, the planning area can be subdivided by percent area, into five broad categories: Agriculture/Settlement - 12%, Enhanced Resource Development - 20%, General Resource Development - 46%, Special Management -14%, Major River Corridors - 4% and Protected Areas - 4%.
- Industrial activity is permitted in all RMZ's with the exception of proposed Protected Areas. Although resource development and access may be limited or restricted in some RMZ's, the plan provides appropriate strategic direction for more detailed planning to allow responsible resource development in the vast majority of the planning area.
- Resource developers and users will be required to manage for environmental and conservation values using a range of management strategies. In general, management intensity decreases from east to west across the planning area (from general resource development to special management).
- Access management is critical to maintaining wildlife, recreation, wilderness and biodiversity values, especially in environmentally sensitive areas like major river valleys and the western region of the planning area. This plan includes specific access management objectives and strategies to achieve the objectives for each RMZ.
- Opportunities for the expansion of lands for agriculture (including grazing) are a priority for areas identified as having significant agricultural potential. Appropriate strategies have been developed to achieve this objective.
- Existing and traditional uses of the land within proposed Protected Areas that are not in conflict with the provincial Protected Area Strategy are being recommended in the plan to continue. Recommended uses include trapping, hunting, fishing, guide outfitting and limited livestock grazing in support of these activities.
- Directional drilling for petroleum and natural gas, under proposed Protected Areas, should be allowed if it does not compromise other values.

Implementation and Monitoring

Once approved by government, the plan will be generally implemented as follows:

- The plan will guide land and resource development on Crown lands for a period of ten years.
- Resource managers will incorporate appropriate strategic direction from the plan into more detailed plans. These plans include a wide range of existing and improved regulatory processes, including inter-agency planning, referral, and joint management provisions (defined in the Glossary of this report).
- Draft indicators to monitor the implementation of the plan’s resource management strategies have been developed. Resource management agencies will monitor the indicators to ensure that resource management objectives are met or exceeded.
- Public concerns regarding specific operational practices within the planning area will be directed to the appropriate resource management agency.
- Government agencies will use information in the plan to guide budget deliberation exercises, especially where resource inventory gaps have been identified.
- An appropriate time frame, method and format will be developed to ensure that Table members and the public are informed of the plan’s progress. Special circumstances and/or scheduled update meetings may require that Table members be reconvened to try and resolve any new issues or plan interpretation issues.
- Concerns or conflicts related to overlapping mandates of government agencies or different interpretations of the plan by industry or one or more agencies will first be forwarded to the line manager for clarification. The line managers may consult with the LRMP Table for clarification on major issues. Conflicts not resolved will be elevated to the Omineca-Peace Inter-Agency Management Committee for resolution.
Summary Recommendations

I Plan Adoption

The Fort St. John LRMP recommends that the BC Government:

1. Approve the Fort St. John LRMP document as general policy and guidance to strategic Crown land and resource management planning for the planning area.


3. Approve and adopt the areas recommended for Goal 1 and 2 Protected Area status (approximately 4.25% of the land base) as required under the Protected Areas Strategy.

II Policy Recommendations

The Fort St. John LRMP recommends that the BC Government:

a. Recognize that the Besa-Halfway-Chowade, Graham-Laurier, Redfern-Keily and Graham North resource management zones (with their related management objectives and strategies as developed and recommended by the Fort St. John LRMP Table), be included in any formal designation established for the area known as Muskwa-Kechika.

b. Confirm that the introduction and implementation of the Commercial Backcountry Recreation Policy shall fully consider non-commercial recreation in the adjudication of commercial backcountry proposals so that historic and traditional non-commercial recreational use is maintained.

c. Address the issue of permitting access (using appropriate technology) to petroleum and natural gas resources located under proposed Protected Areas. This should not preclude the balance of the Fort St. John LRMP from going forward to the Provincial Government for approval. (see Appendix B)

d. Endorse the establishment of funding for the Fort St. John LRMP planning area to meet the grazing objectives of the proposed plan.

e. Consider protecting the islands within the Peace River Valley (that are currently within the BC Hydro and Power Authority's flood reserve) using appropriate legislation until BC Hydro reviews the Site C project.

f. Consider advising BC Hydro to re-evaluate their hydro-electric development proposals on the Peace River prior to the onset of a future LRMP process within an eight year time frame.

g. Consider directing resource managers to adopt a comprehensive public consultation process where access control gates, that are required for reasons other than safety, are a realistic and preferred option used to regulate access on Crown lands.

Lastly, although not a formal recommendation, the Table wishes to lend its support to any provincial initiative to review the Ministry of Environment, Lands and Parks, Crown Lands Agricultural Lease Policy, to ensure that it is meeting the needs of both the agriculture sector and government.
I.0 INTRODUCTION

Since 1993, a group of people from the Fort St. John area have been working on a Land and Resource Management Plan for their area. The plan is a recommendation to the BC Government that will guide all land use activities on Crown lands within the Fort St. John planning area over the next ten years.

This document, *The Fort St. John Land and Resource Management Plan* contains:

- a map of the planning area
- a socio-economic and physical description of the area and an overview of the planning process (Section 1.0)
- a summary of important values, resources and general management direction (Section 2.0)
- Resource Management Zone (RMZ) descriptions, values, objectives and strategies (Section 3.0)
- Proposed Protected Areas including values, objectives and management strategies (Section 4.0)
- socio-economic and environmental assessment of the plan (Section 5.0)
- implementation and recommendations (Section 6.0)
- monitoring and amendment provisions (Section 7.0)
- interpretation and appeal of the plan (Section 8.0)
- a glossary and list of Table members (Appendices)

Additional background information, including the "Preliminary Socio-economic/Environmental Assessment of Base Case and Land Use Scenarios" and the "Planning Process Terms of Reference" can be viewed at the Ministry of Forests office in Fort St. John or other government agencies.
I.1 The Planning Area

The Fort St. John LRMP area covers over 46,000 square kilometres of land. It is only slightly smaller than the Province of Nova Scotia, and about 1.5 times the size of Vancouver Island. This is one of the largest LRMP areas in the province.

The planning area boundaries follow the Fort St. John Forest District boundaries in northeastern British Columbia. The area is bounded on the east by Alberta, on the south by the Peace River, to the west by the height of land of the Rocky Mountains and to the north by the Fort Nelson planning area at about the 58th parallel.

I.1.1 Socio-economic Description

The Cree, Beaver, Sekani and Slavey First Nations are the original inhabitants of the Fort St. John planning area. In 1899 (northern bands) and 1900 (Beaver), Treaty 8 was signed by the Crown and representatives of the First Nations bands that traditionally use the LRMP area: the Halfway River Band, the Prophet River Band, the Blueberry River Band and the Doig River Band. Nothing in this document can, nor was intended, to change the nature of Treaty 8 rights.

European settlement began over two hundred years ago with the establishment of the Northwest Company fur trading post. Rocky Mountain Fort was located at the junction of the Peace and Moberly Rivers. The population grew slowly until the Alaska Highway was completed in 1942. The Highway opened the area to development and a wave of immigration. Another influx of people arrived with the discovery of oil and gas in 1957. Transportation and sales of North Peace natural resources have improved since the Pacific Great Railway arrived in 1958. The W.A.C. Bennett hydroelectric dam was constructed in 1967, flooding the upper Peace River and creating the Williston Lake Reservoir. Each of these developments has contributed to the population growth and economic development of the region.

Over the past two decades the population of the planning area has risen and fallen, with the level of activity and economics of the energy sector. The current population is estimated at 23,940 people and is expected to grow by about 1% per year. Settlement is concentrated in Fort St. John (14,818 population) and Taylor (933 population). The economies of the communities of Fort St. John, Taylor and Wonowon are dependent on providing services to the three major resource based industries: oil and gas exploration and development, agriculture and ranching, and timber harvesting, processing and related forest management activity. Taylor’s industrial base includes a gas processing plant, a pulpmill and a sawmill. The remaining population lives in a number of small settlements scattered throughout the region. About 800 people live in the First Nations settlements at the Halfway River, Blueberry River, Doig River and Prophet River Indian reserves.

Energy is the largest economic sector in the planning area. It provides 23% of the basic employment and 22% of the personal income. The public sector follows, with about 20% of both employment and income. Agriculture (13%), tourism (10%), forestry (9%) and mining (2%) comprise the remainder of the natural resource sectors.

I.1.2 Physical Description

Glaciation, tectonic forces (movement of the earth’s plates) and climate have created the soils, vegetation, forest ecosystems and subsurface formations that exist today. The vast flat plateau that dominates the eastern regions of the planning area was formed by retreating glaciers. Soils are generally fine textured with deeply incised streams. The northeastern area tends towards saturated soils and muskeg while southeastern soils are drier. Moving westward, the topography rises to the rolling and hilly landscapes of the foothills and ends in the Rocky Mountains. River systems originating in the mountains cut deeply through bedrock and can be straight, meandering or braided.
Rivers are the dominant hydrological feature in the planning area. The major river systems include the Halfway, Graham, Beaton, Sikanni-Chief, Fontas and Peace River systems. Where lakes exist, they tend to be small and shallow with low to moderate productivity. Significant lakes include Charlie Lake and Redfern Lake. Over 40 fish species, including mountain whitefish, bull trout, Arctic grayling, rainbow trout, lake whitefish and walleye are found, mostly in the large rivers and streams.

The area has a fairly typical northern continental climate. Cold winters, short growing seasons and low precipitation limit the vegetation, agricultural crops and forest ecosystems that can thrive here. Mean daily temperatures range from -19.4°C to +21.5°C. Most of the moisture carried by the prevailing westerly winds falls on the west side of the Rocky Mountains, outside of the planning area. Average annual precipitation is 295.9 mm of rainfall and about 198.2 mm in equivalent snow cover. Some areas can suffer a water deficit, especially during summer. The short growing season is somewhat offset by the long sunny northern days during spring and summer.

Substantial populations of large mammals such as deer, elk, sheep, goat and moose inhabit the LRMP area. Both black and grizzly bear are found across the planning area. Other significant wildlife include furbearers such as marten and a variety of birds, including waterfowl and warblers.

White spruce, lodgepole pine and trembling aspen are the main commercial tree species, accounting for most of the timber harvested in the planning area.

I.1.3 Ecosystem Classifications

The natural ecosystems of British Columbia have been divided into ecosections, based on climate, landforms and vegetation. Ecosection classification is significant because management strategies are often based on ecosystems to respect and mimic natural processes. Nine of the 116 ecosections are found in the planning area. These are: the Clear Hills, the Halfway Plateau, the Peace Lowlands, the Peace Foothills, the Fort Nelson Lowlands, the Muskwa Foothills, the Muskwa Plateau, the Eastern Muskwa Ranges and the Missinchinka Ranges.

Biogeoclimatic units are a classification of ecounits based on climate, vegetation and site. The four biogeoclimatic zones found in the LRMP area are:

- Alpine Tundra (AT) - Alpine Tundra is found above the tree line. It is characterized by short growing seasons and long, cold winters with deep snow. White and Engelmann spruce and subalpine fir are the dominant tree species. Trees generally exhibit a stunted or 'krummholz' growth form. Vegetation consists of shrubs, heathers, herbs, mosses and lichens. Alpine Tundra supports Stone's sheep, caribou, grizzly bear, wolf, wolverine and small mammals such as marmots and ground squirrels.

- Engelmann Spruce-Subalpine Fir (ESSF) - These coniferous forests include Engelmann spruce, subalpine fir and lodgepole pine with shrub-dominated understoreys. The growing season is short and cool, with long cold winters and deep snow depths. Mountain goat and caribou have adapted well to winter in this zone. Coniferous forests provide habitat for furbearing animals and a variety of seed-eating birds. Avalanche tracks provide spring and summer habitats for grizzly bear and ungulates. These large mammals spend summer in the parkland meadows.

- Boreal White and Black Spruce (BWBS) - Extensive BWBS forests in the area contain lodgepole pine, white and black spruce and trembling aspen along with many bogs and fens. Common understory plants are highbush cranberry, rose, forbs and moss. Fires are common. Two subzones are found within the BWBS: moist warm (mw), and wet cool (wk). The BWBS zone with its low to moderate snow accumulation provide important ungulate wintering habitat. Deciduous forests established after fires are also useful to ungulates and many species of birds and small mammals.
Spruce-Willow-Birch (SWB) - The SWB zone is found at lower elevations. These areas are generally forested with white spruce and subalpine fir, and lesser amounts of lodgepole pine, black spruce and trembling aspen. Wildfires are less common and extensive than in the BWBS. Wetlands can be white spruce and tall willow swamps, sedge fens and marshes. Deep snows in the winter make this zone less productive for wintering ungulates.

I.2 The LRMP Planning Process

Public participation is the cornerstone of the LRMP planning process. All the major economic sectors, organizations and interest groups were identified at the beginning of the process and invited to participate. The Fort St. John LRMP Table included representatives from the energy, forestry, agriculture, ranching, trapping, tourism, non-commercial anglers and hunters, small business sectors, local governments, labour, guide outfitters, environmental, and culture and heritage interests.

Representatives of the government ministries involved in land and resource management participated in the LRMP process as supporters. They included the Ministry of Forests (MOF), Ministry of Environment, Lands and Parks (MELP), Ministry of Agriculture, Fisheries and Food (MAFF), and the Ministry of Employment and Investment (MEI). The role of the government representatives was to provide information, answer questions, chair meetings and support the process.

The LRMP process uses consensus-based decision making, as opposed to majority rule. This means that the entire Table must come to common agreement on issues before a decision is reached. Consensus decision making requires full cooperation and commitment (not to mention tremendous patience and good will) on the part of everyone involved. While this principle was at times difficult for the participants, it has resulted in a plan that is supported by the entire Table.

I.2.1 Defining the Process

The Fort St. John LRMP process dates back to June 1993 when a public workshop was held in Fort St. John describing the process, identifying the sectors and inviting all interested parties to join. A Working Group of about 30 core members continued to meet over the next three years to draft the Plan. This group formed the LRMP Table.

The Terms of Reference was produced by the Table and adopted in October 1994. That document outlined the vision, objectives, principles for public participation, general planning sequence, organizational structure (membership), decision making (consensus) and the approval processes. The Terms of Reference document states:

"The vision of this planning process is to produce a Land and Resource Management Plan that will:

- guide the use and development of Crown land at a strategic level, based on the principles of sustainability, meeting the needs of the present without compromising the ability of future generations to meet their own needs;
- present Crown land and resource use options which will identify and consider all resource values, along with social, economic and environmental needs;
- provide information that may assist in the planning and future development of private land, and;
- provide a forum for shared decision making on broad land and resource use issues, based on consensus."

I.2.2 Establishing the Resource Management Zones

The first step was to subdivide the planning area into Resource Units (RU's). Land resource values were identified for each of the resource units. RU's were then combined into somewhat larger Resource Management Zones (RMZ's). Ultimately the Table identified 27 RMZ's; three of these zones are Protected Area Strategy Goal 1 recommendations.
For each of the RMZ's, land and resource management objectives and strategies were developed to address each of the resource values identified. After general agreement was reached on the objectives and strategies, common statements were identified and used to define General Management Directions. These statements define broad land and resource management objectives and strategies that apply to the entire planning area.

A number of Areas of Interest (AOI's) were identified for consideration as Protected Areas under the Protected Area Strategy. The Table studied these Protected Areas proposals during the spring of 1996. All of the proposed Protected Areas were ultimately recommended for protection, although many boundaries were changed to satisfy concerns about representation, to protect specific ecological or geographical features or to exclude areas of commercial and economic interest.

The Graham-Laurier and Milligan Hills proposed Protected Areas were the subject of considerable debate. Several alternative boundaries were proposed by various sectors. The final boundaries were agreed upon by the Table after reviewing the socio-economic effects of various proposals. Lastly, preliminary RMZ's with resource management objectives and strategies were communicated to adjacent LRMP Tables to harmonize RMZ boundaries, objectives and strategies.

I.2.3 Public Participation

Throughout the process, the Table made considerable efforts to inform the public and invite their comments and input. LRMP meetings received local media coverage. Many meetings were broadcast on the local cable channel and articles appeared in the local paper. In the fall of 1995, every household in the Fort St. John planning area received a flyer outlining the progress of the LRMP and inviting the public to become involved. The public was invited to attend the meetings and individuals could make presentations to the Table. Table members kept their sectors informed about the process and ensured that the concerns of their interest group were addressed. Each interested sector had the opportunity to make formal presentations to the Table and to express their interests and concerns regarding Crown land. A series of open houses were held to present the draft plan, including: Upper Pine School, Hudson's Hope Hall, Buick Creek School, Fort St. John and the Upper Halfway Community Hall.

I.3 First Nations

The province of British Columbia is committed to avoiding the infringement of Treaty and Aboriginal rights in areas where resource management activities are proposed. In this regard, government agencies consult with First Nations to determine the nature and extent of Treaty and Aboriginal rights and to also determine if infringement of those rights could occur by government decisions. The First Nations in the LRMP that have signed Treaty 8 have Treaty Rights.

Despite governments sincere attempts to involve them, the First Nations peoples chose not to participate in the Fort St. John LRMP. Although the First Nations peoples were not formally represented at the LRMP Table, their archaeological, cultural and heritage values were recognized by all of the LRMP participants. The Table attempted to incorporate any First Nation interests that were known by Table members at the time. The recommendations put forward by the Plan are without prejudice to Treaty and Aboriginal rights.
• Fort St. John Land and Resource Management Plan •
2.0 GENERAL MANAGEMENT DIRECTION

2.1 Introduction

The overall objective of the Fort St. John Land and Resource Management Plan (LRMP) is to ensure sustainable management of land, resources, water and ecosystems within the Fort St. John Forest District (i.e. the planning area). This provides greater certainty for the planning of resource developments by maintaining opportunities for responsible land resource development. Throughout the planning process, the LRMP working group maintained its commitment to balancing the social, economic and environmental needs of the people, industries and communities with environmental conservation and protection within the planning area.

The Fort St. John LRMP adopts the principles of:

- Sustainable use of renewable natural resources, and;

- The management of any one resource shall take into consideration other resource values, rights, tenures, and development opportunities and shall recognize the biological and physical limitations of the land and resources. In addition, land and resource management objectives and strategies will incorporate the need to maintain or enhance the local quality of life, social and economic stability and vitality of the local communities.

The General Management Direction for each of the resource sectors is intended to provide strategic direction to land resource management across Crown lands within the planning area. The direction addresses the values, needs and interests of resource users and are based on the following guiding principles:

- Industrial and commercial activities (commercial backcountry recreation, forest resource development and general resource exploration and development, etc.) are acceptable uses of Crown lands.

- Industrial development planning shall give full consideration to other land and resource values. The conservation of these values shall be incorporated into more detailed plans and operational activities.

- All land and resource developments shall comply with the existing regulatory framework (i.e. appropriate legislation, regulation and government policies).

- Land and resource development is subject to the Fort St. John LRMP General Management Direction and, appropriate, Resource Management Zone (RMZ) specific resource management objectives and strategies developed and recommended by the LRMP Table.

- In areas recommended for Protected Area status, acceptable uses shall be in compliance with the Protected Area Strategy and government policy. Further, existing land and resource uses within proposed Protected Areas that are not in contravention with government policies shall be identified and recommended for preservation by the LRMP Table.

- The Fort St. John LRMP plan relies on the spirit and intent of the Forest Practices Code of BC Act to plan and conserve many values not specifically mentioned in the land use plan. Although practices may change over time, the intent of the FPC at the time of plan approval, is considered by the Table as integral to the proposed Fort St. John Land and Resource Management Plan.
2.2 Agriculture

Agriculture dates back to the late 1800's when the first settlers began arriving in the area. These early farmers depended on income from a variety of sources including forestry, fur trapping and agriculture. Since the productive agricultural lands are in the Taylor and Baldonnel area, the village of Taylor was the dominant agricultural settlement until the 1940's. Today, more than 800 farmers occupy 4,700 square kilometres, or 9% of the area. The North Peace area of BC is similar to the prairie agricultural regions to the east. Cereal crops, beef and specialty field crops form the bulk of the agricultural operations.

The Peace River region accounts for over one third of the Province's Agricultural Land Reserve (ALR). About one fifth of those lands are in the Fort St. John LRMP area. Most ALR Crown lands tend to be of lower agricultural capability, lands already in production, but are well suited to forage production.

Agriculture is an important component of the economic and social fabric of the Plan area. The industry provides about 8,000 direct jobs of direct employment. It also sustains a local pool of skilled, adaptable workers for other industries such as guide outfitters, forest harvesting, wood processing, oil and gas exploration and development, and infrastructure maintenance for road and railways.

Agriculture is subject to wide swings in profitability due to global commodity supply and demand. The dramatic improvement in agricultural commodity prices during the mid 1990's will create pressure to bring more land into agricultural production.

The LRMP Working Group recognizes the need for agricultural expansion on ALR lands, and recommends that integrated land use be accommodated wherever possible and feasible.

The Fort St. John LRMP adopts the general management direction that within the Agricultural Land Reserve, agriculture will have a high priority. Compatible land and resource uses will be permitted at multiple land and resource uses encouraged, where appropriate and achievable. Crown lands with appropriate agriculture potential will be made available to potential users under the BC Crown Land Agricultural Policy. The integrity of the Agricultural Land Reserve will be protected under existing legislation and regulations.

The Fort St. John LRMP adopts the general management direction of conserving soil productivity. Agricultural soil productivity will be maintained through implementation of practices contained in the Agriculture Land Reserve Guidelines and policies.

2.3 Range

The Peace River area is one of North America's highest capability areas for cow/calf production. The ranching sector has grown considerably over the past few years. Like agriculture, ranching contributes to the stability of northeastern communities. It provides job opportunities and helps maintain a skilled and adaptable labour pool for other industries.

The LRMP Working Group recognizes that the Coordinated Resource Management Planning (CRMP) process is an important process for the early identification of operational issues and concerns in order to accommodate grazing and other interests into more detailed plans. The strategic direction from this LRMP is that these types of processes will be used to resolve potential conflicts between grazing and other resource values and interests.
The Fort St. John LRMP adopts the general management direction that the ranching sector will have increased access to grazing opportunities through utilization of prescribed burning and range clearing in forested areas of low value for timber production. The Fort St. John LRMP endorses the establishment of funding (such as a grazing enhancement fund) for the Fort St. John planning area to meet the grazing objectives of the proposed land use plan.

The Fort St. John LRMP adopts the general management direction of controlling the spread of noxious weeds. This will be achieved through implementing noxious weed control plans and enforcing compliance with the Weed Act.

2.4 Forest Management

Approximately 24% of the Plan area is suitable for timber harvesting, with the majority of the harvest coming from Crown regulated forest lands. Private holdings, primarily agriculture and mostly located in the vicinity of the Peace River are also sources of timber. The current allowable annual cut of 2,015,000 m³/yr is divided more or less equally between coniferous (1,100,000 m³/yr) and deciduous (915,000 m³/yr) species.

Legislation to protect the commercial forest land base of British Columbia was proclaimed in July 1994. The Forest Land Reserve Act creates a Forest Land Reserve (FLR) similar to the Agriculture Land Reserve (ALR). Crown forest lands and suitable privately managed forest lands may be included in the reserve. Protected Areas, ALR and private lands not being managed as forest lands will not be included in the reserve. It is anticipated that following the Fort St. John Land and Resource Management Planning process, the Forest Land Reserve will be used to designate suitable forest lands.

Canadian Forest Products Ltd. (Canfor) and Fibreco Export Inc. (a division of Slocan Forest Products) are the two major forest licensees operating within the area. Canfor – Fort St. John Division produces about 165 million board feet of lumber and 85,000 metric tonnes of pulp chips each year. Another Canfor mill in Taylor produces about 65 million board feet of studs and speciality products and 52,400 tonnes of pulp chips.

Fibreco, the second major wood user, produces pulp at its Taylor mill. The company purchases chips from Canfor and other primary wood industries. Fibreco plans to upgrade the mill within the next two to three years to use hardwood as well as softwood chips. This will add flexibility in changing market conditions. The upgrade will double the mill capacity from 180,000 metric tonnes to 360,000 metric tonnes per year. When the expansion occurs, Fibreco will require its own woodlands operation to harvest mostly aspen timber. The Fibreco facility is one of three in BC using a chemithermomechanical process (which does not use chlorine in the bleaching process) and one of two that can utilize both hardwood and softwood chips.

The Fort St. John LRMP adopts the general management direction of managing forests in the Fort St. John Forest District for a variety of forest values by encouraging forest harvesting patterns and block sizes which emulate the natural disturbance patterns found within the planning area. Flexible harvesting activities, including utilizing variable rotation ages in mature stands, will be utilized to accommodate other resource values and optimize sustained yield. Where ecologically and silviculturally appropriate, the evaluation of a range of silvicultural systems at the landscape level will be encouraged. In addition, forest harvesting activities and timing will be undertaken with sensitivity to ungulate wintering habitat.
2.5 Energy

Northeastern British Columbia is the only area of the province that currently produces oil and gas. The Fort St. John area, has been a centre of energy exploration and development since the 1950's.

The northeast oil and gas fields lie within the Western Canada Sedimentary Basin. The recent discovery of large gas deposits in the south foothills area has stimulated more interest in the natural gas potential within the Fort St. John LRMP area. The outlook for the energy sector is encouraging, with slow and steady growth expected. Exploration remains very active and substantial reserves have been identified.

Energy is the dominant economic sector in the planning area and it will likely maintain that position for the foreseeable future. The energy sector provides 23% of the jobs in the plan area.

The City of Fort St. John has a well developed infrastructure and is the main supplier of goods and services to the energy sector. Westcoast Energy operates a natural gas processing plant in the neighbouring village of Taylor.

The LRMP working group wishes to optimize opportunities for safe, efficient and environmentally-sound exploration and development of oil and gas resources for the economic benefit of the planning area and the province. To meet this challenge, the LRMP Working Group has adopted a general management direction that will apply to all RMZ's.

2.6 Recreation and Tourism

The Fort St. John planning area supports a wide range of public and commercial outdoor recreation and tourism opportunities. This sector depends on the land, water, fish and wildlife resources to provide outdoor recreation experiences for residents and non-resident visitors. Tourism provides 13% of the employment and 4% of the income within the planning area.

The historic Alaska Highway is the dominant travel route. Tourists enroute to or from Alaska enjoy the scenic areas along the main travel corridors. Improving these sites will encourage travellers to stop and explore the area and generate additional tourism revenues. Business travel is also another important tourism component because of Fort St. John’s role as a regional economic centre.

Tourism in the region is growing in both revenues and employment. The industry will have a bright future, providing that the scenic quality of major travel corridors and natural settings is maintained.
Much of the tourism and recreational use focuses on outdoor activities. Popular activities such as hunting and snowmobiling rely on natural settings and the presence of wildlife and fish.

The Commercial Backcountry Recreation Policy administrated by the Ministry of Environment, Lands and Parks allows for commercial businesses to obtain a form of tenure in the backcountry. Backcountry enterprises such as guide outfitting are taking advantage of the new policy by applying for tenures to increase the viability of outdoor/nature based wilderness tourism opportunities which in turn will serve to increase the longevity of their businesses.

The Fort St. John LRMP adopts the general management direction of managing a wide spectrum of public and commercial recreation and tourism values, opportunities and activities. This will be achieved by managing, recognizing and identifying existing recreational use and by identifying future opportunities. In order to protect the outdoor experience, access will be carefully planned and recreational activities will be managed to minimize the effects on scenic and recreational values. The Ministry of Forests and the Ministry of Environment, Lands and Parks (BC Parks) will manage public recreational facilities, areas and trails (including trails noted within the plan), including important scenic areas. Commercial backcountry recreation opportunities and tenures will be established consistent with: RMZ objectives and strategies, existing inter-agency referral processes, in consultation with user groups, as identified within the Commercial Backcountry Recreation Policy. Wildlife populations will be managed to provide opportunities for non-commercial hunting. This will be achieved through strategies in lower level plans that complement the wildlife management policies and practices to sustain wildlife.

2.7 Access

The Fort St. John LRMP aims to find a balance in order to maintain wilderness characteristics and fish and wildlife habitats over time, while permitting resource development, including resource road development.

Road access for industrial activity is an acceptable use of the land, and will be subject to regulations, objectives and strategies.

An example of enhanced access management (for RMZ’s such as Besa-Halfway-Chowade, Graham North, Graham South and Lower Sikanni-Fontas Valley) is the following strategy adopted to address the conservation of other resource values when planning and developing access.

More detailed planning will be used to identify significant fish, wildlife and other resource values. Where there is significant risk that these resources may be impacted, access may be limited, restricted or in special circumstances, prohibited.

The intent of these strategies is to encourage the identification of other resource values and to incorporate the conservation of these values into site specific access management planning and development. This strategy may result in management prescriptions such as limiting the use of roads and routing new access away from critical habitat areas.

Where new access proposals conflict with the conservation of other resource values and where these conflicts are determined by resource managers to be significant (high risk), access may in special circumstances may be limited, restricted, or in some circumstances, prohibited. Under these circumstances, proponents (and, as appropriate, resource management agencies) are guided by this LRMP to identify alternatives of lower risk to the resource values identified (for example, a critical habitat component) using the best information available. This information will be used by land and resource managers within established regulatory review processes.
In addition, the Fort St. John LRMP has directed that new access routes should be appropriately managed so that unnecessary access routes are deactivated. For the term of this general management direction, access routes means new roads, linear utility corridors (old and new) and seismic lines. The Fort St. John Working Group endorses requesting resource managers to establish a consultative process to address the ‘non-routine’ deactivation of routes that may be required for industrial or non-industrial purposes. The plan follows the spirit and intent of the Muskwa-Kechika Access Management Area (AMA) that was designated under the Wildlife Act (BC Reg. 218/94). The AMA restricts public off-road vehicular access to designated roads in order to protect wildlife and habitat. Industrial access is allowed subject to a permit being issued by MELP.

The intent is not to develop and implement additional consultation processes for all road deactivation such as road deactivation that is already required under statute or regulation. The intent is to ensure that major access routes proposed for deactivation are not later required for some other access purpose. Road deactivation planning will allow for notification of tenure holders and stakeholders.

The Fort St. John LRMP adopts the general management direction of maintaining or enhancing access to Crown land by the residents of this province, subject to specific Resource Management Zone objectives and strategies.

2.8 Fish and Wildlife

2.8.1 Fish

Fish populations can be divided into two categories: residents of the Peace River watershed and residents of the Liard River watershed.

The area supports twelve species of sport fish. The most abundant are mountain whitefish, Arctic grayling, rainbow trout, lake whitefish and walleye. There are also substantial populations of bull trout, northern pike, goldeye, yellow perch and burbot. Common non-sport species include the long nose sucker, largescale sucker, white sucker and the northern squawfish. Forage fish living in the streams and lakes of the area include: the spoonhead and slimy sculpins, spottail shiner and redside shiner.

Fish populations tend to have slow growth rates and late maturations. Exploitation rates have historically been low, resulting in populations of large, old fish. During the past decade, however, several species such as Arctic grayling and bull trout appear to be diminishing in presence and population size in many watersheds.

Bull trout and pearl dace are blue-listed (threatened) species. Pearl dace are found in the Beatton River drainage, specifically in Charlie Lake. Bull trout, one of the most prized sport fish, makes extensive migrations through the main stems of the Halfway, Peace and Beatton Rivers. Populations of bull trout in the Halfway River watershed may be suffering from over exploitation and habitat degradation, linked to resource development activities.

Williston and Dinosaur Lakes are reservoirs created by the W.A.C. Bennett and Peace Canyon dams. They have been stocked with kokanee salmon. Twenty-eight other lakes in the Peace and Liard River watersheds have also been stocked since 1975. Most of these lakes were stocked with rainbow or brook trout and some were stocked with cutthroat trout. Kokanee salmon, brook trout and cutthroat trout are all introduced species (not native) to the planning area.

The Fort St. John LRMP adopts the general management direction of maintaining the opportunity for the sustainable harvest of fish and wildlife resources by maintaining sufficient habitat of appropriate capability to sustain populations. In addition, sustain resident opportunities to harvest fish and wildlife.
2.8.2 Wildlife

The Fort St. John planning area boasts a great diversity and abundance of habitat types and wildlife species. Many of these have provincial or international importance.

Part of the western portion of the plan area encompasses the largely undeveloped Muskwa-Kechika area. The Muskwa-Kechika area is considered by many to be globally significant for wildlife due to substantial populations of large mammals, including four species of large carnivores and eight species of ungulates. This area represents one of the best opportunities in BC to protect an intact, functional large mammal ecosystem.

Ungulate populations have special significance due to their natural abundance and history of use. This area supports thriving populations of mule and white-tailed deer, caribou, elk, moose, Stone’s sheep, mountain goats and the only bison population in the province. Transplant programs have allowed elk and bison to successfully occupy new areas. Trends suggest that elk, bison and deer populations are increasing.

Carnivore species in the planning area include black bear, grizzly bear, coyotes, wolves, wolverine and cougars.

Furbearers such as squirrel, mink, weasel, martens, lynx, beaver and fisher are common. Many are commercially harvested.

Upland game birds include the Sharp-tailed, Ruffed and Blue grouse and several species of ptarmigan. Significant wetlands provide habitat for the Canada and Snow goose, Trumpeter Swan and numerous duck species such as the Mallard, Blue-winged teal and Bufflehead ducks. These wetlands are important due to their size, stability and natural biodiversity. Avian predator species include the Gyrfalcon, Bald Eagle, Boreal Owl and Broad-winged Hawk. Songbirds found in the planning area include the American Robin, European Starling, Yellow-headed Blackbird and several species of waxwings.

This area is home to five provincially red-listed (endangered) bird species: the Bay-breasted Warbler, the Connecticut Warbler, the Sharp-tailed Sparrow and the Upland Sandpiper. Only one mammal species has been designated as red-listed, the Northern Long-eared Myotis.

Several species within the planning area are provincially blue-listed (threatened). Nine of these are birds: the American Bittern, the Black-throated Green Warbler, the Canada Warbler, the Palm Warbler, the Philadelphia Vireo, the Short-eared Owl, the Surf Scoter, and the Trumpeter Swan. Seven blue-listed species are mammals including the black backed shrew, northern bog lemming, fisher, grizzly bear, wolverine, Stone’s sheep and Plains bison.

Yellow-listed species that have a regional importance include: white-tail deer, elk, Northern flicker, Golden Eagle and the Great Horned Owl.

Wildlife species in the planning area require a variety of habitats to sustain their populations. Important wildlife habitats in the planning area include interior mature and old-growth forests, riparian areas along lakes, rivers and streams, subalpine areas, major wetlands and south facing river valleys. The value of each of these habitats varies for each and within each zone. Each RMZ description highlights important habitat characteristics representative of that zone and then identifies objectives and strategies to sustain those habitats.
The Fort St. John LRMP adopts the general management direction of ensuring that the habitat needs for red & blue-listed (rare & threatened), and yellow-listed (regionally significant) species are provided for. The habitat needs of these species will be addressed as a priority at the landscape and stand level. Rare habitats (aquatic and terrestrial) and plant communities will be identified and mapped and considered for establishment.

2.9 Biodiversity

Biodiversity is the diversity of plants, animals and other living organisms in all their forms and levels of organization. It includes the diversity of genes, species, and ecosystems and the functional and evolutionary processes that link them. Biodiversity can be described at the genetic, species and ecosystem levels.

Genetic diversity refers to the different forms (alleles) of genes present in a particular population of living things. Many forms of a gene are present in a genetically diverse population. Genetically diverse populations are able to adapt swiftly when local conditions change. A population which is not genetically diverse (e.g. an inbred or isolated population) has only a few forms of each gene. This makes it vulnerable to genetic diseases and less able to adapt to environmental changes.

Species diversity refers to the number of different species in a particular area. When species become extinct, species diversity diminishes. Each species has its own particular set of environmental conditions under which it can live and breed, and chooses its habitat accordingly. Species diversity depends on the number of different habitats present. British Columbia has the highest diversity of wildlife species in Canada, due to its habitat diversity.

Ecosystem diversity refers to the number of different habitats available within a particular ecosystem. Ecosystem diversity is directly reflected in species diversity. Human activities tend to split, isolate and eliminate certain types of habitat while maximizing others. Conserving ecosystem diversity means maintaining sufficient areas of all naturally occurring habitats to allow all the species that are associated with those habitats to survive.

Biodiversity is threatened by:

- loss of habitat due to fragmentation and alienation.
- habitat degradation.
- direct impacts on specific plant and animal species such as consumptive use by people.

Maintaining biodiversity depends on:

- the protection and connectivity of large areas as ecological benchmarks at the regional level.
- providing habitat variety and connectivity at the landscape (watershed) level.
- management practices at the stand (site) level.
The Fort St. John LRMP Table chose to establish strategic direction for biodiversity management to guide more detailed planning processes (landscape unit planning, forest development plans, etc.) in two ways:

- By establishing a general biodiversity emphasis for each of the Resource Management Zones (RMZ's). Biodiversity emphasis options, based on government guidelines, are consistent with the recommended intensities of forest management activities within the RMZ and other non-conflicting land and resource uses. The biodiversity emphasis listed for each RMZ will be used with other landscape level biodiversity guidelines to guide the selection of biodiversity emphasis options at the landscape unit level.
- Establishing priorities for landscape level planning. Four RMZ's were selected as high priorities: Trutch Creek, Graham South, Graham North and Lower Sikanni - Fontas Valley.

It is the Table's intent to provide some strategic direction to the designation of biodiversity options at the landscape level and to prioritize landscape level planning within the planning area.

**The Fort St. John LRMP adopts the general management direction of conserving biodiversity, rare ecosystems, plant communities and habitat types. This will be achieved by identifying and mapping rare ecosystems, plant communities and habitat types and considering them for incorporation into more detailed plans with designations such as sensitive areas or wildlife habitat areas and managing them with ecologically appropriate silvicultural systems. The goal will be further achieved by maintaining larger patches of unfragmented mature and older seral stage forests, where appropriate, and ensuring connectivity between important habitat types by using naturally occurring corridors (e.g. riparian areas).**

### 2.10 Culture and Heritage

The Fort St. John planning area is the location of the oldest prehistoric site in BC (Charlie Lake Cave), the oldest historic site (original Fort St. John) and, along with Dawson Creek and Fort Nelson, the oldest paleontological sites in BC.

In the Fort St. John planning area, natural heritage resources consist of palaeontological sites, containing the fossil remains of past life forms.

Archaeological sites in the area range from surface or thinly buried scatterings of stone tools and/or flakes indicating where these tools were manufactured or repaired to sites that may include features, such as the remains of cooking hearths and post molds where temporary shelters and food drying racks were erected.

Historical sites of interest date from the early fur trade and homestead period.

The cultural heritage resources reflect past and present uses by aboriginal and non aboriginal peoples. Three categories of resources are evident: archaeological sites containing physical remains of past human activity; historical sites consisting of built structures or localities of events significant to living communities; and traditional use sites which lack the physical evidence of human-made artifacts or structures, but maintain cultural significance to living communities.
The Fort St. John LRMP adopts the general management direction of protecting culture and heritage resources. This will be achieved through the application of the Forest Practices Code, Heritage Conservation Act, Agreement of the Management of Cultural Heritage Resources and the Archaeological Impact Assessment Guidelines to identify and maintain culture and heritage resources.

2.11 Minerals

Northeastern BC has significant mineral resource potential, but the area is currently under explored.

Mineral exploration, development¹ and mining² are temporary uses of the land. Mining proposals are subject to comprehensive review and approval processes. Only small areas of land are used for development but access to large areas is essential for exploration.

This plan confirms that mining and related road developments are acceptable uses of the land, outside of Protected Areas. These activities will be subject to the regulatory framework over the entire area. The existing review and approval processes will ensure that mining will avoid, minimize or mitigate impacts on identified resource values. These impacts will be consistent with the level of management prescribed for each resource management zone within this plan.

Advanced exploration and development activities clearly have impacts on small areas. This plan directs that the impacts of those activities will be accommodated wherever possible.

Further direction for access related to mineral exploration and development is provided in the general access management section of this plan and other general and specific objectives and strategies.

The Fort St. John LRMP adopts the general management direction of maintaining opportunities and access for mineral exploration, development and transportation. Mineral exploration and development activities will be integrated with other resource user activities. Revisions to standards of practice and permitting processes will be implemented in order to address evolving management issues, to provide consistency with the Forest Practices Code (FPC) where required, and to ensure timely and efficient permitting. Localized impacts of advanced exploration and development activities within existing legislative framework will be accommodated wherever possible. Wherever possible, requirements of the Forest Act and the FPC permits and licences will minimize impacts on the land base. Visual quality for mineral exploration and development projects will be managed through the Mines Act. For proposed mine developments captured by the provincial Environmental Assessment Process, the assessment process will consider RMZ objectives. For small mines and quarry development, zone objectives will be addressed by the multi-agency regional mine development review process.

¹ Development means final stages of advanced exploration, construction of production facilities and production of minerals.
² Mining means both mineral exploration and development.
2.12 Water

Water resources are found in two main physiographic regions; the Western Cordillera and the Interior Plain. There are three distinct limnological (fresh water) regions, the Peace River Basin, Fort Nelson-Hay River Basin and the Rocky Mountains. The major drainage areas are the Peace River and Liard River watersheds. Major tributaries include the Sikanni Chief River, the Beatton River, the Halfway River, the Chowade River, the Graham River, the Ettithun River and the Fontas River. Major lakes include Charlie Lake (the current water supply for the City of Fort St. John) the mountain lakes – Redfern, Fairy and Trimble, and the Alberta plateau lakes – Chinchaga, Ekwan, Tommy, Ettithun and Strom lakes.

Natural springs resulting from perched water tables are common throughout the southern portion of the planning area. Several of these springs are used by rural residents as community water supplies. Groundwater reserves within the region are scarce and their use is limited for domestic water supplies.

Communities, oil and gas industries and a pulpmill are the largest water users. Water for rural domestic uses, irrigation, stock watering, conservation of waterfowl and dust control is generally diverted from small streams or overland runoff that has been collected in dugouts.

Community water supplies require special consideration to maintain a high quality of drinking water and community health. Water supplies for Hudson’s Hope, Taylor and several downstream Alberta communities, are pumped from the Peace River. First Nations communities along the Halfway, Doig and Blueberry Rivers also draw water from these systems. Charlie Lake currently supplies water to the City of Fort St. John. However, growing demand for water has led the City of Fort St. John to begin construction of waterworks to draw groundwater from a site adjacent to the Peace River.

The Fort St. John LRMP Table has established RMZ-specific objectives and strategies for maintaining stream flows, water quality and water quantity. Resource Management Zones with high existing or potential levels of resource development and significant fisheries values have strategies that indicate priorities for watershed assessments (see Fish, 2.8). The following RMZ’s are priorities for watershed assessment: Besa-Halfway-Chowade, Bluegrave-Horseshoe, Crying Girl, Graham South, Graham North, Grassy-Minaker, Kobes Creek, River Corridors, Lower Sikanni-Fontas Valley and Trutch Creek.

The Fort St. John LRMP recognizes the importance of the headwaters of major rivers in the Rocky Mountains as the initial source of clean water for current and future generations. It is recommended that operational activities not significantly alter the water quality, quantity or downstream flow regime.

The Fort St. John LRMP adopts the general management direction of maintaining water supplies for licensed domestic water users and community waterworks licensees, and striving to maintain the natural stream flow regime (timing of flow, water quality and quantity) for watercourses, recognizing that natural hydrologic processes are beyond the control of resource managers. As well, land and resource developments within community water supply areas will be managed to maintain water quality and quantity. These goals will be achieved by: 1) establishing and maintaining instream flow requirements and hydrologic regimes; 2) determining the equivalent clear-cut area (ECA’s) thresholds for specific watersheds on a priority basis; 3) identifying high priority watersheds and using the appropriate levels of watershed assessment to determine potential effects, prescriptions and rehabilitation measures; 4) identifying and establishing water quality monitoring sites (parameters to be monitored could include any or all the following: turbidity, stream flow, water temperature, conductivity, faecal and total coliform counts) and; 5) identifying smaller watersheds in settled areas with significant licensed water use and a high intensity of present or future forest resource development as having potential for community watershed designation under the Forest Practices Code of British Columbia Act.
2.13 Air Quality

Air quality within the planning area is relatively good. Exceptions occur near isolated discharges of sulphur compounds. Sulphur dioxide (SO₂) and total reduced sulphur (TRS) compounds from oil and gas processing facilities and downwind of major industrial incinerators (beehive burners) associated with the wood processing industry. Smoke from forest fires, slash burning and habitat enhancement is also a routine concern of many residents.

The Fort St. John LRMP adopts the general management direction of maintaining air quality. This will be achieved by complying with Provincial legislation.

2.14 Trapping

The diverse landscapes within the planning area host a variety of commercially harvested furbearers including marten, lynx, beaver, coyote and fox. There are 71 registered traplines, or portions of traplines, covering the entire planning area. Although most furbearers are relatively abundant, low fur prices limit the current harvest.

Although not important from a regional employment perspective, trapping remains socially important, especially among First Nations communities where traplines are often held by families.

A concern for many trappers is the need for adequate notification of pending land and resource developments that could potentially have a negative impact on their interests. The Ministry of Environment, Lands and Parks (Fish and Wildlife Branch) issues and administers trapping tenures. In recent years, BC Environment provided resource developers with trapper information, however due to the Freedom of Information Act, BC Environment can no longer release trappers personal information.

Other resource management agencies, such as the Ministry of Employment and Investment (Energy Resources Division - formerly Energy, Mines and Petroleum Resources) have initiated a Trapper Notification Program to ensure that trappers are adequately notified of pending development. To participate in the program, trappers must authorize the release of their personal contact information.

The Fort St. John LRMP adopts the general management direction of maintaining trapping opportunities. This will be achieved by honouring existing tenures and managing furbearer habitats and populations. Critical furbearer habitat for priority species (marten, Fisher and lynx) will be identified and incorporated into more detailed plans. In order to reduce conflicts, trappers will be notified in a timely manner under the Trapper Notification Program of industrial land and resource development activity taking place within their tenure area. It will be a priority to maintain traditional modes of transport used by registered trapline holders to harvest fur on their traplines. Trapline tenure holders will retain the right to transfer traplines.
2.15 Guide Outfitting

There are seven active guide outfitters in the planning area primarily in the western portion of the Forest District. Guided hunts and fishing experiences for non-residents are the primary source of income for the industry. In recent years some guides have expanded their operations and successfully marketed non-hunting activities such as guided hikes, trail rides and wildlife viewing. New hunting or non-hunting activities should be considered through the Commercial Backcountry Recreation (CBR) application process.

The Commercial Backcountry Recreation Policy (CBR Policy) administered by the Ministry of Environment, Lands and Parks, allows commercial businesses to obtain a form of tenure in the backcountry. Backcountry enterprises, including guide outfitting are applying for tenures to increase the viability and scope of their outdoor, nature-based wilderness tourism businesses.

The Fort St. John LRMP adopts the general management direction of maintaining guide outfitting opportunities. This will be achieved by recognizing and honouring the existing tenures, managing fish and wildlife habitat and populations, and providing opportunities for the expansion of non-hunting wilderness tourism activities through the CBR Policy.

2.16 Visual Quality

Visual quality levels or objectives are the extent to which the visual or scenic value of a landscape is altered compared to the pre-existing or natural condition. While resource development drives the economy of the Fort St. John planning area, the community recognizes the importance of maintaining the aesthetic values of the forest landscape. Development in the energy and forestry sectors can occur while managing the visual quality associated with important recreational areas, rivers and streams and important natural features. Some important areas identified for visual quality management are the Peace River, Alaska Highway Corridor and major backcountry access routes into the Besa-Halfway-Chowade, Graham North and Graham South RMZ's.

The Fort St. John LRMP adopts the general management direction of managing visual quality in scenic areas identified as having a high capability for tourism or recreational use. Visual quality will be managed through existing legislation and regulation including the Visual Quality Objective management system of the Ministry of Forests. Where established, Visual Quality Objectives (VQO's) will apply to timber harvesting and should guide incidental timber harvesting associated with other resource user activities. Identified scenic areas will have their site specific Visual Quality Objectives met in accordance with the Forest Practices Code. It should also be noted that Visual Quality Objectives may change over time, due to new inventory information and changing public values.
2.17 Communications, Transportation and Utilities

The planning area is traversed by a number of communication, transportation and utility corridors. Infrastructure is important in the development of resources within the planning area. Corridors, which provide a means for recreation and motorized access, can also create fragmentation of habitats. In recent years, there has been more cooperation between resource management agencies and industry in planning, developing and rehabilitating these corridors.

The Fort St. John LRMP adopts the general management direction of maintaining existing communication, transportation and utility corridors and sites. Where feasible, future development will be directed to established corridors and sites. Where new development of corridors and sites are required, these will be coordinated with other users. Corridor maintenance and upgrading activities must also take place with sensitivity to high capability wildlife habitat, visual and recreational values and visual quality objectives.
3.0 RESOURCE MANAGEMENT ZONES

3.1 Introduction

One of the major aspects of the LRMP is the subdivision of the planning area into Resource Management Zones (RMZ’s). The boundaries for each zone were determined by the Working Group based on a number of considerations including topography, existing land use and access, Agricultural Land Reserve (ALR) boundaries, environmental concerns and resource values. Each of the zones has a unique set of resource values, objectives to maintain or enhance those values and a number of strategies to be implemented to achieve the objectives. Along with the General Management Directions adopted by the LRMP Table, the Resource Management Zones provide geographically focused, strategic direction for all land and resource development in the planning area.

A central theme of this LRMP was to develop integrated strategies to maximize compatibility between objectives within RMZ’s. All known values were considered in the development of the objectives and strategies for each zone.

The Fort St. John LRMP subdivides the planning area into 27 Resource Management Zones (RMZ’s). Each RMZ is further classified into provincial land use categories which reflect the general management regime for each RMZ. The RMZ’s and categories are listed below:

<table>
<thead>
<tr>
<th>RMZ Name</th>
<th>Provincial Land Use Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture/Settlement Area</td>
<td>Agriculture/Settlement</td>
</tr>
<tr>
<td>Aikman-Deadhorse</td>
<td>Enhanced Resource Development</td>
</tr>
<tr>
<td>Grazing Reserves</td>
<td>Enhanced Resource Development</td>
</tr>
<tr>
<td>Jedney</td>
<td>Enhanced Resource Development</td>
</tr>
<tr>
<td>Kobes Creek</td>
<td>Enhanced Resource Development</td>
</tr>
<tr>
<td>Upper Cameron</td>
<td>Enhanced Resource Development</td>
</tr>
<tr>
<td>Bluegrave-Horseshoe</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Chinchaga</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Conroy</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Crying Girl</td>
<td>General Resource Management/Special Resource Management¹</td>
</tr>
<tr>
<td>Farrell Creek</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Grassy Minaker</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Osborn</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Trutch Creek</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Two Bit Creek</td>
<td>General Resource Management</td>
</tr>
<tr>
<td>Alaska Highway Corridor</td>
<td>Special Management - Tourism/Visual Quality</td>
</tr>
<tr>
<td>Besa-Halfway-Chowade</td>
<td>Special Management - Fish and Wildlife Habitat, Wilderness Values and Backcountry Recreation</td>
</tr>
<tr>
<td>Graham North</td>
<td>Special Management - Fish and Wildlife Habitat, Wilderness Values and Backcountry Recreation</td>
</tr>
<tr>
<td>Cecil Lake and Boundary Lake</td>
<td>Special Management - Fish and Wildlife Habitat</td>
</tr>
</tbody>
</table>

¹ It was a decision of the Table that the western half of Crying Girl be classified as Special Resource Management and the eastern half as General Resource Management.
In summary, the planning area can be subdivided into broad Provincial Land Use Categories as follows (percentages approximate only):

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture/Settlement</td>
<td>12%</td>
</tr>
<tr>
<td>Enhanced Resource Development</td>
<td>20%</td>
</tr>
<tr>
<td>General Resource Development</td>
<td>46%</td>
</tr>
<tr>
<td>Special Management</td>
<td>14%</td>
</tr>
<tr>
<td>Protected Areas</td>
<td>4%</td>
</tr>
<tr>
<td>Major River Corridors</td>
<td>4%</td>
</tr>
</tbody>
</table>

**Broad Provincial Land Use Category Descriptions**

The **Agriculture/Settlement** Provincial Land Use category includes land:

- currently used or proposed for settlement under an Official Community Plan
- primarily planned and managed by local government under the Municipal Act
- currently used for, or with future development potential, for agriculture and range
- used for agriculturally compatible activities such as mineral exploration, oil and gas exploration and development; transportation, utility and communication corridors; recreational developments and forest management
- the majority of the land is in the Agricultural Land Reserve

The **Enhanced Resource Development** Provincial Land Use category includes lands:

- with existing or with future potential suitability, for intensive resource development with due consideration to the management of other resource values
- where a high priority has been designated for a special or combined resource management emphasis (such as high intensity forest management regime or range management emphasis)
- where investments in resource development and enhancement are encouraged in full compliance with the existing regulatory regime
The General Resource Development Provincial Land Use category includes lands:

- to be managed for a wide range of resource values
- where strategies (including guidelines and subsequent management prescriptions) for achieving non-extractive resource objectives may modify resource development
- where conflicts between land uses are managed in an effort to integrate resource development with environmental and conservation values
- where investment in resource development and enhancement may be encouraged in areas with few land use conflicts

The Special Resource Management Provincial Land Use category is subdivided into specific land use categories based on the major resource values to be given a high priority in land and resource planning and development. It is recognized that these lands contain extractive resource value, the exploration and development of which may be of significant social and economic benefit to the province. Resource development is permitted but must consider and address all significant values identified. The intent is to assess risk to the identified values and to adequately manage any conflict. Resource values have been subdivided as follows:

- **Tourism and Visual Quality:** lands within this Provincial Land Use category are to be managed to established visual quality objectives, in support of significant tourism and scenic values, identified along a major transportation route.
- **Fish and Wildlife Habitat:** lands within this Provincial Land Use category have significant fish and/or wildlife values and habitats of regional and/or provincial significance.
- **Wilderness and Backcountry Recreation:** lands within this Provincial Land Use category have significant wilderness values which support a variety of commercial and non-commercial recreational opportunities.
- **Major River Corridors:** lands within this Provincial Land Use category are identified major river valleys that have significant fish and wildlife habitat, recreation, tourism and scenic/visual quality values.
- **Community Water Supply:** lands within this Provincial Land Use category have been identified as important watersheds where the management of land and resource development should not negatively affect water quality in major licensed waters sources.

The Protected Area Provincial Land Use category includes all Goal 1 lands proposed for protection under the Protected Area Strategy. Lands within this category:

- are Protected Area Strategy (PAS) Goal 1 and 2 areas proposed for protection for their natural, culture and heritage, and/or recreational values
- incorporate a range of existing values and land uses, as defined by the LRMP Table, that are recommended for inclusion in any subsequent Protected Area (such as existing land and resource use activities: non-commercial hunting and fishing, guide outfitting, trapping, grazing in support of guide outfitting, camping and hiking)
- do not permit logging, mining, hydroelectric development, oil and gas exploration and development
3.2 Resource Management Zones

Agriculture Settlement Area Resource Management Zone

This Agriculture Settlement Area covers most of the southeast portion of the planning area and contains most of the settlements in the northern Peace River district. It is bordered on the south by the Peace River, on the southeast by Alberta and to the northeast by the Osborn Resource Management Zone (RMZ). The western boundary follows the Jedney RMZ boundary to the Alaska Highway then heads west to the confluence of the Cameron and Halfway Rivers. The southwestern boundary follows the Halfway River to the confluence of the Halfway and Peace Rivers.

Three ecossections are represented: the Halfway Plateau ecossection, the Clear Hills ecossection, and the Peace Lowlands ecossection. The total land area is 606,309 hectares. Approximately two thirds of the land is privately owned.

Most of the RMZ falls within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. These forests are dominated by trembling aspen with some white spruce and lodgepole pine. There is good potential for deciduous timber harvesting, mainly on private land. Extensive conifer harvesting has already occurred throughout the area and many reforested sites now support thriving forest plantations.

Agriculture is the dominant land use. More than two-thirds of the land lies within the Agriculture Land Reserve. This is British Columbia's largest grain producing area. Wheat, barley and canola are the most important crops and there has been steady growth in beef and forage crop production. Recently some area ranchers have diversified into non-traditional activities such as bison and reindeer ranching. Agriculture accounts for about 13% of employment in the area.

The City of Fort St. John, nine smaller communities and the Blueberry River and Doig River First Nations communities are located in the RMZ. Rural springs are important water sources for rural residents.

Active oil and gas tenures exist throughout the RMZ and pipelines, dehydration and processing facilities have been constructed. Future prospects for new oil and gas discovery are medium to high.

There is potential for industrial minerals, including sand and gravel. There is an occurrence of barite (mineral) in a well borehole.

The south-facing slopes of most streams and rivers provide critical ungulate winter range. The area is an important central flyway for migrating waterfowl and contains important waterfowl staging areas.

Visually sensitive areas include: the Alaska Highway corridor and Highway 29 to Hudson's Hope.
Agriculture / Settlement Area

Values:
- agriculture
- First Nations
- trapping
- oil and gas
- settlement needs / local government
- water
- timber
- mineral (e.g., sand, gravel)
- fish
- wildlife
- recreation
- culture and health
- range

Goal 2 Proposed Protected Area - Beaton - Doig Canyon

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation
- ensure future infrastructure requirements are considered when exploring for oil and gas

Strategies
- allow exploration and development of resources within appropriate framework
- minimize impact of industry on local residents by continuing to work with industry to lower emissions and decrease visual impacts

TIMBER
- maintain timber harvesting and forest management opportunities
- minimize losses to the timber harvesting land base

Strategies
- quantify the timber harvesting land base and develop policies to mitigate permanent loss of the timber harvesting land base to roads, landing lines, well sites and other developments
- establish general forest production targets for landscape units within Resource Management Zones (RMZ) consistent with moderate intensity management regimes.
- encourage the utilization of pulp quality stands, and the pulp component stands slated for sawlog harvest.
- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase availability and reduce roading requirements
- minimize losses from damaging agents through aggressive and prudent pest management, including the salvage of damaged or killed trees
- encourage reforestation and sustainable forest management of unproductive agricultural land
- promptly and aggressively reforest and manage cutovers and areas burned by wildfire, within the timber harvesting land base, to maintain sustainable timber harvest levels

RECREATION
- provide a full range of recreation opportunities

Strategies
- incorporate existing recreational activities and assess potential
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RECREATION (cont’d)</strong></td>
<td>• maintain public access to Aitken Creek Falls, Prespatou Lake and other local recreation features</td>
</tr>
<tr>
<td><strong>AGRICULTURE</strong></td>
<td>• allow Crown lands with suitable agricultural potential to be designated for agricultural development and use, within the appropriate regulatory framework</td>
</tr>
<tr>
<td>• maintain or increase land supply for agriculture including access to Crown Land</td>
<td>• encourage management plans to reduce wildlife/agriculture conflicts</td>
</tr>
<tr>
<td>• minimize or mitigate wildlife impact on agricultural enterprises</td>
<td>• applications for new agriculture and range tenures will be reviewed on a site specific basis</td>
</tr>
<tr>
<td>• provide opportunities for the growth of agriculture</td>
<td>• support the purpose and the intent of the Agricultural Land Reserve (ALR) and the conversion of suitable land to agricultural use through existing processes</td>
</tr>
<tr>
<td>• provide opportunities for the growth and expansion of the agriculture and food production industries</td>
<td></td>
</tr>
<tr>
<td><strong>RANGE</strong></td>
<td>• encourage an increase in range production giving preference to integrated use</td>
</tr>
<tr>
<td>• maintain or enhance opportunities for livestock grazing</td>
<td>• in forested areas of low value for timber production, encourage conversion to range through clearing and prescribed burning</td>
</tr>
<tr>
<td>• control the spread of noxious weeds</td>
<td>• implement noxious weed control plans and enforce the Weed Act</td>
</tr>
<tr>
<td><strong>ACCESS</strong></td>
<td>• maintain existing access including provisions for upgrading</td>
</tr>
<tr>
<td>• maintain existing access, coordinate industrial access development including linear development to minimize negative effects on other resource values</td>
<td>• encourage consistent road construction standards between industries</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td>• identify habitat (by ecossection and landscape unit, on a priority basis) for red and blue listed species (as identified by the Conservation Data Centre)</td>
</tr>
<tr>
<td>• protect or enhance habitats for red and blue listed species</td>
<td>• maintain the integrity of riparian forests along all streams and rivers in the Resource Management Zone</td>
</tr>
<tr>
<td>• maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td>• identify critical furbearer habitat and incorporate, on a priority basis, into more detailed plans</td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td><strong>Strategies</strong></td>
</tr>
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</tr>
<tr>
<td><strong>WILDLIFE (CONT’D)</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose)</td>
<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• maintain site specific habitats</td>
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<tr>
<td></td>
<td>• develop and implement strategies at the landscape level to maintain site specific habitats</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td><strong>the general biodiversity emphasis is low</strong></td>
</tr>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td></td>
</tr>
<tr>
<td><strong>MINERALS</strong></td>
<td><strong>provide input to more detailed planning as required</strong></td>
</tr>
<tr>
<td>• maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access</td>
<td></td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td><strong>identify and map critical fish habitat information (e.g. pools, migration patterns, spawning and rearing areas)</strong></td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• plan and develop access to minimize disturbances within riparian reserve zones and management areas</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td></td>
</tr>
<tr>
<td>• sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>• establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td></td>
<td>• incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</td>
</tr>
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</table>
### Agriculture / Settlement Area

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
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</thead>
</table>
| WATER (CONT'D) | - identify and designate water bodies with significant licensed withdrawals of potable water as Forest Practices Code designated Community Watersheds (where appropriate)  
- ensure that land development activities within designated community watersheds comply with community watershed protection guidelines  
- maintain groundwater quality and quantity | - manage resource development within sensitive groundwater recharge areas to minimize negative effects on groundwater quality and quantity |
| LOCAL GOVERNMENT | - recognize Official Community Plans established by local municipal governments | - ensure that all land and resource management planning activities within the planning area (including where appropriate, more detailed plans), allow for consultation with, and incorporate the input of local municipal governments (rural and urban) |
Aikman - Deadhorse Resource Management Zone

This RMZ is located in the south central portion of the planning area. It is bounded on the west by the Halfway River, the north by the Upper Cameron RMZ, on the south by the Agriculture Settlement Area and Kobes Creek RMZ and east by the Alaska Highway. About 99% of the area lies in the Halfway Plateau ecossection, with a small portion in the Peace Lowlands ecossection to the south. The total area is 181,289 hectares.

This region is entirely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Timber values are high, particularly for hardwood species.

Many active oil and gas wells and a transportation infrastructure, including gas and oil pipelines, are found in the RMZ. Additional oil and gas discoveries are likely in the future.

There is potential for industrial minerals, including sand, gravel and coal. There is an occurrence of limonite (iron) along the Cameron River.

This area contains excellent moose habitat and important winter habitat for elk, deer, and furbearers (e.g. fisher, marten and lynx). Several important fish species are present in the Halfway River and its major tributaries.

Sensitive groundwater recharge areas are present and several springs are used as licensed water supplies.

Most Crown lands with agricultural potential have been developed. Range use is quite prevalent in the area.

Common outdoor recreational pursuits include: hunting, wildlife-viewing, camping, fishing and hiking.

Much of this RMZ lies within areas traditionally used by the Halfway River First Nation.
Aikman - Deadhorse

Values:
- furbearer habitat
- oil and gas infrastructure
- wildlife
- ranching/grazing
- recreation
- timber - hardwood/softwood
- agriculture
- minerals
- fish
- water

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation

Strategies
- allow exploration and development of resources within appropriate regulatory framework
- maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources
- ensure that oil and gas exploration and development activities are undertaken with sensitivity to wildlife habitat and wildlife

TIMBER
- enhance timber harvesting and a sustainable long-term timber supply
- minimize losses to the timber harvesting land base

Strategies
- quantify the timber harvesting land base and develop policies to reduce the permanent loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with high intensity forest management regimes
- reforest (within appropriate time frames, as determined through more detailed planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.
- establish and maintain a permanent road infrastructure to facilitate long term integrated resource management
- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest
- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce roading requirements
<table>
<thead>
<tr>
<th>Aikman - Deadhorse</th>
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<tbody>
<tr>
<td><strong>Objectives</strong></td>
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</table>

**TIMBER (CONT'D)**
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- encourage afforestation and sustainable forest management of reverted and low capability agricultural land
- promptly and aggressively reforest and manage cutovers and areas burned by wildfire, within the timber harvesting land base, to maintain sustainable timber harvest levels

**RECREATION**
- provide quality public and commercial recreational opportunities and values
- identify and provide opportunities for the use of suitable Crown land for commercial recreation development and use
- low impact development, campgrounds and small group sites are compatible with the setting
- provide for motorized recreation access corridors to similar destinations as currently allowed

**AGRICULTURE**
- provide opportunities for the growth and expansion of the agriculture and food production industries
- allow Crown lands with suitable agricultural potential to be designated for agricultural development and use, within the appropriate regulatory framework
- minimize or mitigate wildlife impact on agricultural enterprises
- encourage management plans to reduce wildlife/agriculture conflicts

**RANGE**
- maintain or enhance opportunities for livestock grazing
- develop range use plans according to the Forest Practices Code
- in forested areas of low value for timber production, encourage conversion to range through clearing and prescribed burning
- minimize tree/grass/cattle conflicts through integrated management practices
- maintain livestock grazing opportunities on existing tenures
- allow for the transfer and renewal of existing tenures
- encourage range management that promotes soil conservation
- applications for new agriculture and range tenures will be reviewed on a site
<table>
<thead>
<tr>
<th>ACCESS</th>
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</thead>
<tbody>
<tr>
<td>• coordinate access and linear development to minimize negative effects on other resource values</td>
</tr>
<tr>
<td>• encourage shared access</td>
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<tr>
<td>• maintain existing access including provisions for upgrading</td>
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<tr>
<td>• encourage consistent road construction standards between industries</td>
</tr>
<tr>
<td>• where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)</td>
</tr>
</tbody>
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<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose)</td>
</tr>
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<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
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<tr>
<td>• consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td>• plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td>• maintain site specific habitats</td>
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<tr>
<td>• identify habitat areas at the landscape level to sustain site specific habitats</td>
</tr>
<tr>
<td>• address wildlife/agriculture conflicts in operational plans</td>
</tr>
<tr>
<td>• establish riparian reserves and management areas around critical wetland areas</td>
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<tr>
<td>• maintain stable wetland water levels.</td>
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<table>
<thead>
<tr>
<th>BIODIVERSITY</th>
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<tbody>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
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<tr>
<td>• the general biodiversity emphasis is low</td>
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<tr>
<td>• restore and rehabilitate negatively impacted ecosystems</td>
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<tr>
<td>• identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation</td>
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<thead>
<tr>
<th>MINERALS</th>
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<tbody>
<tr>
<td>• maintain opportunities for mineral exploration and development and allow for access</td>
</tr>
<tr>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
</tr>
<tr>
<td>• provide input to more detailed planning as required</td>
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</tbody>
</table>
## Fort St. John Land and Resource Management Plan

### Aikman - Deadhorse

#### Objectives

<table>
<thead>
<tr>
<th>FISH</th>
<th>WATER</th>
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</thead>
<tbody>
<tr>
<td>- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>- sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
</tr>
</tbody>
</table>

#### Strategies

<table>
<thead>
<tr>
<th>FISH</th>
<th>WATER</th>
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<tbody>
<tr>
<td>- incorporate the maintenance of fish and fish habitat into more detailed plans</td>
<td>- incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into more detailed plans</td>
</tr>
<tr>
<td></td>
<td>- minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</td>
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<tr>
<td></td>
<td>- maintain groundwater quality and quantity</td>
</tr>
<tr>
<td></td>
<td>- identify sensitive groundwater recharge areas</td>
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<tr>
<td></td>
<td>- manage resource development within sensitive groundwater recharge areas to minimize negative effects on groundwater quality and quantity</td>
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</tbody>
</table>
Alaska Highway Corridor Resource Management Zone

This zone includes the area that is visible from the Alaska Highway, from the community of Charlie Lake in the south to the Fort Nelson Forest District Boundary in the north. The zone is represented as a corridor for simplicity, however, it varies in width depending on the topography.

It includes three ecosections: the Muskwa Plateau, the Halfway Plateau and the Peace Lowlands. The total land area is approximately 28,461 hectares.

This zone is entirely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone.

Communities along the Alaska Highway corridor include Charlie Lake, Wonowon and Pink Mountain.

The old Alaska Highway is of particular interest as a culture and heritage site. It was built in 1942 by the U.S. army as a land route to Alaska. Most tourism revenues and employment in the area flow from highway traffic and associated businesses. Visitors travelling the highway take part in hiking, fishing, camping, wildlife viewing and general sightseeing.

All oil and gas exploration and development and timber harvesting activities are managed to maintain the visual qualities of the area.

There is good potential for industrial minerals, particularly sand and gravel. There are occurrences of sand and gravel along the corridor.

Accidents involving cattle and large wildlife species straying onto the highway are an ongoing safety concern.
Alaska Highway Corridor

Goals: visual quality, economic/tourism, travel corridor, oil and gas, transportation, timber, minerals, fish

Goal 2 Proposed Protected Area - Pink Mountain

Objectives

**ENERGY**
- maintain opportunities and access for oil and gas exploration, development and transportation
- allow exploration and development of resources within appropriate regulatory framework
- ensure development activities and associated access are undertaken with sensitivity to visual and recreational values (e.g. exploration and development planning will recognize existing topography and ground conditions to reduce impact on visual and recreation values as much as practical)

**TIMBER**
- maintain timber harvesting and forest management opportunities
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes
- ensure all forest management activities are undertaken with sensitivity to their effects in visually sensitive areas
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- encourage afforestation and sustainable forest management of reverted and low capability agricultural land
- promptly and aggressively reforest and manage cutovers and areas burned by wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels

**RECREATION**
- provide quality public and commercial recreational opportunities and values
- manage visually sensitive areas associated with trail systems, campsites and special features, in recreation sites
- identify areas of high recreation use or significance and develop appropriate management strategies
- maintain public access to major stream and river crossings
### Alaska Highway Corridor

<table>
<thead>
<tr>
<th>Range</th>
<th></th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- maintain or enhance opportunities for livestock grazing</td>
<td>- minimize tree/grass/cattle conflicts through integrated management practices</td>
<td>- encourage range use plans that will deal with the safety concerns associated with domestic stock within the highway corridor</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Access</th>
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<tbody>
<tr>
<td>- coordinate access and linear development to minimize negative effects on other resource values</td>
<td>- promote shared access</td>
<td>- encourage deactivation and rehabilitation of unused roads, particularly within visible areas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wildlife</th>
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</thead>
<tbody>
<tr>
<td>- maintain site specific habitats</td>
<td>- develop and implement strategies at the landscape level to maintain site specific habitats</td>
<td>- develop and implement a management plan to prevent or minimize large species wildlife-motorized vehicle conflicts and associated safety concerns</td>
</tr>
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<table>
<thead>
<tr>
<th>Biodiversity</th>
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<tbody>
<tr>
<td>- maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>- the general biodiversity emphasis is low</td>
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<table>
<thead>
<tr>
<th>Culture and Heritage</th>
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</thead>
<tbody>
<tr>
<td>- maintain historical significance of the Alaska Highway</td>
<td>- identify all known culture and heritage sites within the zone and develop appropriate management strategies</td>
<td>- recommend an inventory of known resources (culture and heritage) and designation of significant localities within the zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- recognize and manage representative sections of the old Alaska Highway as a significant heritage or historical feature</td>
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<table>
<thead>
<tr>
<th>Minerals</th>
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<tbody>
<tr>
<td>- maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
<td>- ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
<td>- provide input to more detailed planning as required</td>
</tr>
<tr>
<td><strong>Alaska Highway Corridor</strong></td>
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</tr>
<tr>
<td><strong>Objectives</strong></td>
<td><strong>Strategies</strong></td>
<td></td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td></td>
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<tr>
<td>• maintain fish habitat at highway stream crossings</td>
<td>• incorporate the protection of fish and fish habitat within landscape level plans</td>
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<tr>
<td><strong>LOCAL GOVERNMENT</strong></td>
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<tr>
<td>• ensure that all land and resource management planning activities within the planning area, (including, where appropriate, more detailed plans), allow for consultation with, and incorporate the input of, local municipal governments (rural and urban)</td>
<td>• recognize Official Community Plans established by local municipal governments</td>
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<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td></td>
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<tr>
<td>• manage visually sensitive areas within the Alaska Highway area</td>
<td>• review existing openings and structures to rehabilitate to a less obtrusive impact e.g. modify openings, use of low visibility colours on structures or install tree breaks</td>
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<td></td>
<td>• encourage rehabilitative measures on visually sensitive areas</td>
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</table>
The Besa-Halfway-Chowade RMZ is the fourth largest of the zones and covers much of the western part of the planning area. It is defined on the east by the boundaries of the Grassy Minaker, Two Bit and Bluegrave Horseshoe RMZs, on the north by the Fort Nelson Forest District boundary and the Redfern-Keily proposed Protected Area, and on the south by the proposed Graham-Laurier Protected Area.

Five ecosections are represented: Muskwa Foothills, the Eastern Muskwa Ranges, the Peace Foothills, the Missinchinka Ranges and the Muskwa Plateau. The total land area is 435,425 hectares.

Alpine Tundra (AT), Spruce-Willow-Birch (SWB), Boreal White and Black Spruce (BWBS) and Engelmann Spruce-Subalpine Fir (ESSF) biogeoclimatic zones are all found in the zone. Wildfires are less frequent than in areas further east. Timber values are low in the western areas, increasing to moderate in other parts of the zone. Higher volumes are found in the larger valleys and foothills south of the Halfway River.

There are no proven oil and gas reserves within the RMZ and the area is relatively unexplored. However, there are numerous tenured properties and gas potential appears to be high. Exploration is expected to increase in the future.

The highest metallic and industrial mineral values lie in the western limits of the district. This zone has geological tracts with metallic potential classified 1, 2, 3, 4, and 9/10; with industrial mineral potential classified 1, 2, 3, 4, 5, 8 and 9/10; and, there are eleven documented mineral occurrences including the Robb Lake deposit where exploration has indicated a resource of up to 20 million tonnes at 5% combined lead and zinc. The Robb Lake deposit is tenured. There is also potential for coal in this zone.

The zone is an important area for wildlife. Extensive burning for wildlife and horse grazing has occurred, particularly in the Halfway and Sikanni drainages. The area is important for wildlife with wolf, grizzly bear and moose population densities among the highest found in North America. This region incorporates critical winter habitat and calving areas for eight species of ungulates and four species of large predators. Furbearers are present, along with black bears, wolves, elk and Stone’s sheep. A stable population of plains bison live near the Halfway and Sikanni Chief Rivers.

Several rivers and tributary streams contain critical habitat for bull trout, Arctic grayling and other priority species, and are very important for spawning and rearing Peace River bull trout populations.

Access management is an important issue in this area. Several major trails follow the Chowade and Halfway Rivers and Cypress Creek, as well as an old mining road to Robb Lake that is used by horseback riders and snowmobilers. All weather petroleum and forestry industry roads in the east, as well as seismic lines, provide access to the area.
The Besa-Halfway-Chowade RMZ is an important component of the overall area (shared with the Fort Nelson and Mackenzie Land and Resource Management Planning Areas) known as the Muskwa-Kechika. The Muskwa-Kechika area has high wilderness and outdoor recreation values and is widely used by residents of the planning area and others for a number of outdoor recreation experiences including hunting, fishing, camping, river boating, canoeing, ATVing and commercial backcountry recreation activities like guide outfitting.

The Mary Henry Trail and the Bedeaux historic trails pass through this zone. There are significant archaeological sites in the RMZ.

Management of visually sensitive areas is important along the main access roads and recreational trails, especially the Chowade and Halfway Rivers, Cypress Creek and the Robb Lake trail.

This RMZ lies within areas traditionally used by the Prophet River, Carrier-Sekani and Halfway River First Nations.
values:

wildlife habitat (intact predator-prey systems)  recreation  timber  natural gas potential
mineral potential  guide outfitting  trapping  wilderness  range
water quality  fish  visual quality

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
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</thead>
<tbody>
<tr>
<td><strong>energy</strong></td>
<td>• allow exploration and development of resources within appropriate regulatory framework</td>
</tr>
<tr>
<td>• maintain opportunities and access for oil and gas exploration, development and transportation</td>
<td>• maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources</td>
</tr>
<tr>
<td></td>
<td>• encourage efficient and rational subsurface resource development to minimize surface disturbances and maximize subsurface resource utilization</td>
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<tr>
<td></td>
<td>• all new-cut seismic exploration in areas with potentially unstable slopes and/or high environmental values shall be heli-portable unless it can be conclusively demonstrated that conventional seismic exploration will not cause significant environmental impacts.</td>
</tr>
<tr>
<td><strong>timber</strong></td>
<td>• establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with low intensity forest management regimes</td>
</tr>
<tr>
<td>• maintain timber harvesting and forest management opportunities</td>
<td>• encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest unless it can be conclusively demonstrated that the utilization of these stands or components will negatively impact long term viability and sustainability of individual wildlife species</td>
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<tr>
<td></td>
<td>• minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber</td>
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<td>• promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
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<tr>
<td><strong>recreation</strong></td>
<td>• identify areas of high recreation use or significance and develop appropriate management strategies</td>
</tr>
<tr>
<td>• provide quality public and commercial recreational opportunities and values</td>
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</table>
### RECREATION (CONT’D)

- maintain guide and outfitting opportunities
- maintain and enhance ecological integrity in areas subject to resource impacts from recreational use
- provide a full range of wilderness recreation opportunities (as identified in the Ministry of Forests Recreation Opportunity Spectrum (ROS)) classified as primitive, semi-primitive non-motorized and semi-primitive motorized
- maintain opportunities for commercial/non-commercial livestock grazing associated with recreation
- manage backcountry recreation and tourism opportunities in a natural or natural appearing condition

### STRATEGIES

- develop strategies in more detailed plans (e.g., landscape unit plans) to implement the wildlife management policies and management practices of the life managers, to sustain wildlife and guide outfitting opportunities
- identify and protect guide outfitting campsites and cabins
- manage existing tenures and the associated grazing activities of guide outfitting to limit impacts and reduce risk to other resource values (keeping out of sensitive habitats, etc.)
- provide a more detailed plan to address the effects of recreational activity on ecological integrity (e.g., wildlife disruption, damage to plant communities and waterbodies)
- provide more detailed planning to develop access management strategies, maintain a proportion (%) of the RMZ area classified as ROS “primitive” land at 1996 levels over the long-term. This recognizes that there may be fluctuations in the proportion of ROS “primitive” land over time.
- develop a grazing plan to address issues of forage allocation among users, residents and wildlife
- identify and manage appropriate grazing management activities (e.g., monitoring
- more detailed planning processes will determine the areas that are easiest for backcountry and tourism expansion, while maintaining the objectives of the Resource Management Zone. Provide opportunities for developing backcountry facilities. Tourism facilities and development will be consistent with intended recreation experiences (ROS)
- provide for motorized recreation access corridors to similar destinations currently allowed

### ACCESS

- coordinate access and linear development to minimize negative effects on other resource values
- where appropriate, require winter access unless a need for all-season access can be conclusively demonstrated through more detailed planning
- minimize new access development
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Access (cont’d)</strong></td>
<td></td>
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<tr>
<td>• promote the development of multiple-use corridors for resource extraction activities</td>
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<tr>
<td>• where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)</td>
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<tr>
<td>• in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)</td>
<td></td>
</tr>
<tr>
<td>• upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, recontouring, bridge removal and where possible, native species</td>
<td></td>
</tr>
<tr>
<td>• a more detailed planning process will identify significant fish and wildlife and other resource values. Where there is a significant risk that these resources may be impacted, access may be limited, restricted or, in special circumstances, prohibited</td>
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<tr>
<td>• consider alternatives to road construction, including helicopter-based technologies</td>
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<tr>
<td>• for new developments, manage new road access to ensure that pre-existing levels of public motorized access are maintained</td>
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</tbody>
</table>

**Wildlife**

- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)
  - identify and map high capability ungulate wintering areas at the landscape level
  - incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans
  - consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat

- maintain medium and high quality grizzly bear habitat
  - identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis
  - incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)
### Objectives

**WILDLIFE (CONT’D)**

- plan and develop access to avoid medium and high quality habitats and human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)

- incorporate medium and high quality grizzly bear habitats and connectivity corridors into landscape level plans

- consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)

- develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with potential to negatively affect medium and high capability grizzly bear habitat

- minimize impacts on grizzly bear habitat by ensuring that critical habitat areas are linked by connectivity corridors or forest ecosystem networks (FEN’s) (where biologically and ecologically appropriate)

- maintain caribou habitat

- identify and map medium and high capability caribou habitat

- incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors, into landscape level plans

- consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)

- develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource developments that may negatively affect critical medium and high capability caribou habitat

- maintain connectivity (migration/travel) corridors between important seasonal habitats

- manage wildlife populations to provide opportunities for non-commercial hunting

- develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers to sustain wildlife
### Biodiversity
- maintain functioning and healthy ecosystems in the Resource Management Zone
- minimize wildlife habitat fragmentation

### Strategy
- the general biodiversity emphasis is high
- identify and maintain existing predator-prey systems through the identification and establishment of connectivity corridors at the landscape level

### Minerals
- maintain opportunities for mineral exploration and development and allow for access.

### Strategy
- ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values
- provide input to more detailed planning as required
- road building into currently unroaded areas will be permitted when it can be demonstrated that road access is required and justified for further development, subject to review and approval through established procedures and applicable legislation
- aircraft access and use will be sensitive to Resource Management Zone values and resource user activities

### Fish
- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)

### Strategy
- identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)
- incorporate the maintenance of fish and fish habitat into landscape level plans
- plan and develop access to minimize disturbances within riparian reserve zones and management areas
- identify priority watersheds for Level I and II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities
- incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)
- maintain high quality fisheries in natural settings
- minimize permanent motorized access to remote lakes, streams and rivers with high quality fisheries
## Fort St. John Land and Resource Management Plan

### Besa - Halfway - Chowade

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WATER</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain the headwaters of major rivers and streams as a source of water for current and future generations</td>
<td>• operational activities will not significantly alter the water quality, quantity or downstream flow regime.</td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td>• maintain groundwater quality and quantity</td>
<td>• identify sensitive groundwater recharge areas</td>
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<tr>
<td></td>
<td>• manage resource development within sensitive groundwater recharge areas to minimize negative effects on groundwater quality and quantity</td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td></td>
</tr>
<tr>
<td>• manage visually sensitive areas along existing access corridors/trails and adjacent to proposed Protected Areas</td>
<td>• manage visually sensitive areas adjacent to designated Proposed Protected Areas, maintaining the values identified in the Protected Areas Strategy</td>
</tr>
</tbody>
</table>
Bluegrave - Horseshoe Resource Management Zone

This Resource Management Zone is located in the south-central region of the planning area, west of the Halfway River Valley and north of the Graham River. It lies within the Halfway Plateau and the Peace Foothills ecossections. The total land area is 101,283 hectares.

Most of the zone is within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone, with some Engelmann Spruce-Subalpine Fir (ESSF) and small amounts of Alpine Tundra (AT) at high elevations. There has been extensive harvesting and reforestation in the RMZ.

Sensitive groundwater recharge areas are present and there are concerns about the effects of timber harvesting and livestock grazing on water quality.

Natural gas pipelines service the northern and southeastern portions of the RMZ and the area is covered with active tenures. Most of this zone has high natural gas potential.

This zone has potential for industrial minerals, including sand, gravel, and coal.

There is high capability winter habitat for caribou, elk, deer, moose and high and medium quality grizzly bear and furbearer habitat. The Upper Horseshoe Creek Watershed has significant wilderness values. There is critical fish habitat for bull trout, Arctic grayling and red and blue listed species within the Halfway and Graham River systems.

There is an all-weather road from Bluegrave Creek to the Graham River at Crying Girl Prairie, however, access is a concern due to the large amount of high capability wildlife habitats.

This zone has areas of high recreational use for such activities as hunting, fishing, ATVing, camping, snowmobiling and hiking. A guide outfitting base camp is located on Horseshoe Creek.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
Bluegrave - Horseshoe

Values:
- gas potential/tenures
- range
- fish
- trapping
- wildlife habitat
- mineral potential
- guide outfitting
- water quality
- timber values
- agriculture

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation
- allow exploration and development of resources within appropriate regulatory framework
- maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources
- encourage efficient and rational subsurface resource development to minimize surface distribution and maximize subsurface resource utilization

TIMBER
- enhance timber harvesting and a sustainable long-term timber supply
- quantify the timber harvesting land base and develop policies to reduce the permanent loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with high intensity forest management regimes.
- reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.
- establish and maintain a permanent road infrastructure to facilitate long term integrated resource management
- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- promptly and aggressively reforest and manage cutovers and wildfires, within the
### Bluegrave - Horseshoe

#### Objectives

**RECREATION**
- provide quality public and commercial recreational opportunities and values
- maintain guide and outfitting opportunities
- provide a full range of recreation opportunities
- maintain and enhance ecological integrity in areas subject to resource impacts from recreational use

#### Strategies

- identify areas of high recreation use or significance and develop appropriate management strategies
- new access will be planned to minimize negative effects on existing scenic commercial and non-commercial recreational values
- develop strategies in lower plans (e.g., landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities
- identify and protect guide outfitting campsites and cabins
- manage existing tenures and the associated grazing activities of guides and outfitters to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)
- incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)
- more detailed plans will address the effects of recreational activity on ecological integrity (e.g., wildlife disruption, damage to plant communities and water quality)
- seasonal access (e.g., snowmobile) may be limited to address wildlife habitat needs. A Recreation Use Plan is recommended to address this issue

**AGRICULTURE**
- minimize or mitigate wildlife impact on agriculture enterprises
- provide opportunities for the growth of agriculture

**RANGE**
- maintain livestock grazing opportunities on existing tenures
- maintain or enhance opportunities for livestock grazing

**encourage management plans to reduce wildlife/agriculture conflicts**
**allow Crown lands with suitable agriculture potential to be designated for agricultural development and use, within the appropriate regulatory framework**
**develop range use plans according to the Forest Practices Code**
**encourage an increase in range production giving preference to integrated use**
### Bluegraves - Horseshoe

#### Objectives

**Range (cont'd)**
- in forested areas of low value for timber production, encourage conversion to range through clearing and prescribed burning
- minimize tree/grass/cattle conflicts through integrated management practices

**Access**
- coordinate access and linear development to minimize negative effects on other resource values
- coordinate access at the Coordinated Resource Management Plan (CRMP) level
- where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)
- upon cessation of tenure holder's activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, recontouring, bridge removal and where possible, native species.

**Wildlife**
- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)
- identify and map high capability ungulate wintering areas at the landscape level
- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans
- consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat
- plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats
- maintain medium and high quality grizzly bear habitat
- identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis
- incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)
- plan and develop access to avoid, where possible, medium and high quality habitats and human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)
- incorporate medium and high quality grizzly bear habitats and connectivity corridors into landscape level plans
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<thead>
<tr>
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<tbody>
<tr>
<td><strong>WILDLIFE (cont’d)</strong></td>
<td>• encourage the use of silvicultural systems that minimize negative impacts on medium and high quality grizzly bear habitat</td>
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<tr>
<td>• maintain caribou habitat</td>
<td>• identify and map medium and high capability caribou habitat</td>
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<td>• incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors into landscape level plans</td>
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<td></td>
<td>• consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)</td>
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<td>• encourage the use of silvicultural systems that minimize negative impacts on medium and high capability caribou habitat</td>
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<td>• limit line of sight on linear access, such as seismic line cutting, in medium and high capability caribou habitat areas to minimize predation</td>
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<td></td>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource developments that may negatively affect critical medium and high capability caribou habitat</td>
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<tr>
<td>• maintain site specific habitats</td>
<td>• maintain connectivity (migration/travel) corridors between important seasonal habitats</td>
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<td>• develop and implement strategies at the landscape level to maintain site specific habitats</td>
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<thead>
<tr>
<th>BIODIVERSITY</th>
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<tbody>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>• the general biodiversity emphasis is low</td>
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<tr>
<td>• minimize wildlife habitat fragmentation and maintain existing large mammalian predator - prey system</td>
<td>• identify and establish connectivity corridors at the landscape level</td>
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<tr>
<td>• restore and rehabilitate negatively affected ecosystems</td>
<td>• identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation</td>
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<tr>
<td>MINERALS</td>
<td>STRATEGIES</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td>• maintain opportunities for mineral exploration and development and allow for access.</td>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
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<tr>
<td>• provide input to more detailed planning as required</td>
<td>• identify and map critical fish habitat (e.g., pools, migration patterns, spawning and rearing areas)</td>
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<td>• incorporate the protection of fish and fish habitat within landscape level plans</td>
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<td>• identify priority watersheds for Level I and II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
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<td></td>
<td>• incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
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<td></td>
<td>• determine equivalent clear-cut area (ECA) threshold levels for streams with bull trout and incorporate into landscape level plans</td>
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<tr>
<th>FISH</th>
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<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g., bull trout, grayling and red and blue listed species)</td>
<td>• determine equivalent clear cut area threshold levels for priority watersheds and incorporate into landscape level plans</td>
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<td>• minimize the negative effects of grazing on water quality by applying the Agriculture Code of Practice for Waste Management and the associated Best Management Practices</td>
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<td></td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
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<td></td>
<td>• identify sensitive groundwater recharge areas</td>
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<td>• manage resource development within sensitive groundwater recharge areas to minimize negative effects on groundwater quality and quantity</td>
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<tr>
<th>WATER</th>
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<tbody>
<tr>
<td>• sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>• determine equivalent clear cut area threshold levels for priority watersheds and incorporate into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• minimize the negative effects of grazing on water quality by applying the Agriculture Code of Practice for Waste Management and the associated Best Management Practices</td>
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Upper Cameron Resource Management Zone

The Upper Cameron RMZ is located between the Alaska Highway and the Halfway River. The boundaries follow the Alaska Highway in the north and Halfway River in the west.

Nearly all of the land is within the Halfway Plateau ecossection with just one percent of the most northern areas within the Muskwa Plateau ecossection. The total land area is 119,948 hectares.

The entire area is within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Forest fires are frequent and help the forests maintain a variety of different age classes. Both softwood and hardwood timber resources are present and the area is managed with a high intensity forest management regime.

There is high gas potential and a great deal of natural gas and oil exploration and development are occurring. A number of gas wells currently operate on numerous tenured land parcels within the RMZ. A petroleum infrastructure including gas pipelines, dehydration and processing facilities is in place.

There is potential for industrial minerals, including sand, gravel and coal. There is an occurrence of limonite (iron) at the northern boundary near the Alaska Highway Corridor.

Wildlife resources include large areas of Class 1 and 2 capability moose, deer and elk habitat. All major furbeare found within the zone.

Agricultural opportunities also exist, though most Crown lands with agricultural potential have been developed. 1 use is common on scattered private farm holdings throughout the area.

The zone has good access with many summer and winter roads that spur off the Alaska Highway. Hunting, wildlife-viewing, camping, fishing and hiking are common recreational pursuits.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
Upper Cameron

Values:
- wildlife
- timber
- grazing
- oil and gas
- furbearers
- recreation
- fish
- industrial minerals (sand and gravel)
- agriculture
- water

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation
- allow exploration and development of resources within appropriate framework
- maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources
- promote low impact seismic exploration
- encourage efficient and rational subsurface resource development to minimize surface disturbances and maximize subsurface resource utilization

TIMBER
- enhance timber harvesting and a sustainable long-term timber supply
- quantify the timber harvesting land base and develop policies to reduce permanent loss of the timber harvesting land base to roads, landings, lines, well sites and other developments
- establish general forest production targets for landscape units within a Resource Management Zone (RMZ) consistent with high intensity management regimes.
- reforest (within appropriate time frames, as determined through landscaping) all potentially productive brush, non-commercial deciduous, (not sufficiently stocked) areas with ecologically and commercially superior species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas
- encourage the utilization of pulp quality stands, and the pulp component stands slated for sawlog harvest
- where appropriate, vary cut-block adjacency requirements (in accord with Forest Practices Code and acceptable silvicultural practices) to increase availability and reduce roading requirements
- promptly and aggressively reforest and manage cutovers and wildfires on the timber harvesting land base, to maintain sustainable timber harvest
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| **RECREATION** | • identify areas of high recreation use or significance and develop appropriate management strategies  
• develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities |
| **AGRICULTURE** | • allow Crown lands with suitable agricultural potential to be designated for agricultural development and use within the appropriate regulatory framework |
| • maintain or increase land supply for agriculture including access to Crown land | |
| **RANGE** | • minimize tree/grass/cattle conflicts through integrated management practices |
| • maintain or enhance opportunities for livestock grazing | |
| **ACCESS** | • encourage consistent road construction standards between industries  
• deactivate all new non-permanent access that is no longer required for resource management  
• where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat) |
| • coordinate access and linear development to minimize negative effects on other resource values | |
| **WILDLIFE** | • identify critical furbearer habitat and incorporate into lower level plans  
• identify and map high capability ungulate wintering areas at the landscape level  
• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans  
• consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat  
• plan and develop new access routes that avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats | |
| • maintain furbearer habitat for priority species (e.g. fisher, marten, lynx) | |
| • maintain high capability ungulate wintering habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat) | |
| **BIODIVERSITY** | • the general biodiversity emphasis is low |
| • maintain functioning and healthy ecosystems in the Resource Management Zone | |
### MINERALS
- maintain opportunities for mineral exploration and development and allow for access.
- ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values
- provide input to more detailed planning as required
- inventory and map current and potential aggregate deposits

### FISH
- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)
- identify and map critical fish habitat information (e.g. pools, migration patterns, spawning and rearing areas)

### WATER
- sustain natural stream flow regime (water quality, quantity and timing of flow)
- establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands
- incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans
- promote water stewardship to manage for other resources
- manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality
This Resource Management Zone (RMZ) includes two separate wetland entities - the Cecil Lake wetlands and the Boundary Lake wetlands. They can be viewed as "islands" within the southeastern portion of the Agriculture Settlement Area.

The Cecil Lake wetlands are located approximately 20 km east of Fort St. John. The Boundary Lake wetlands are found along the Alberta border, northeast of Goodlow, BC. Both areas are within the Clearhills ecossection and together cover 1,505 hectares.

These wetlands are within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone.

Critical habitats for waterfowl and other wildlife are important wildlife resources in this RMZ. The intent is to protect these critical habitats from disturbances.

Farms, oil and gas wells and energy exploration activities surround the wetlands.

There is potential for industrial minerals, including sand and gravel.

This RMZ lies within areas traditionally used by the Doig River First Nation.
Cecil Lake and Boundary Lake Wetlands

**Values:**
- wildlife habitat
- oil & gas infrastructure
- recreation
- agriculture
- water

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
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<tbody>
<tr>
<td><strong>ENERGY</strong></td>
<td><strong>allow exploration and development of resources within appropriate regulatory framework</strong></td>
</tr>
<tr>
<td>- maintain opportunities and access for oil &amp; gas exploration, development and transportation</td>
<td></td>
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<td></td>
<td><strong>ensure that oil and gas exploration and development activities are undertaken with sensitivity to wildlife and wildlife habitat</strong></td>
</tr>
<tr>
<td><strong>RECREATION</strong></td>
<td><strong>incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (add motorized recreational pursuits, etc.)</strong></td>
</tr>
<tr>
<td>- provide a full range of recreation opportunities</td>
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<td></td>
<td><strong>maintain public access to Cecil and Boundary Lakes</strong></td>
</tr>
<tr>
<td><strong>AGRICULTURE</strong></td>
<td><strong>encourage management plans to reduce wildlife/agriculture conflicts</strong></td>
</tr>
<tr>
<td>- minimize or mitigate wildlife impact on agricultural enterprises</td>
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<tr>
<td>- control the spread of noxious weeds</td>
<td><strong>implement noxious weed control plans and enforce the Weed Act</strong></td>
</tr>
<tr>
<td><strong>ACCESS</strong></td>
<td><strong>restrict the development of permanent motorized access adjacent to wildlife habitat</strong></td>
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<tr>
<td>- coordinate access and linear development to minimize negative effects on other resources</td>
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<tr>
<td><strong>WILDLIFE</strong></td>
<td><strong>identify habitat (by ecosection and landscape unit, on a priority basis) and blue listed species (as identified by the Conservation Data Centre)</strong></td>
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<tr>
<td>- protect or enhance habitats for red and blue listed species</td>
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<tr>
<td>- manage critical wetland habitats for waterfowl and other wildlife species</td>
<td><strong>address wildlife/agriculture conflicts in operational plans</strong></td>
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<td><strong>establish riparian reserves and management areas around critical wetland areas</strong></td>
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<tr>
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<td><strong>maintain stable wetland water levels.</strong></td>
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</table>
## Cecil Lake and Boundary Lake Wetlands

### Objectives

**Biodiversity**
- maintain functioning and healthy ecosystems in the Resource Management Zone

**Water**
- sustain natural stream flow regime (water quality, quantity and timing of flow)
- promote water stewardship to manage for other resources

### Strategies

- the general biodiversity emphasis is high
- incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans
- manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize the negative effects on water quality
Charlie Lake Water Supply Area Resource Management Zone

This Resource Management Zone (RMZ) encompasses the watershed area surrounding Charlie Lake. It is located in the centre of the Agriculture Settlement Area and follows the eastern boundary of the Alaska Highway Corridor. It is entirely within the Halfway Plateau ecosection with a small portion to the south in the Peace Lowlands ecosection. The total land area of 25,968 hectares includes about 19,000 hectares of private property.

This zone is entirely within the Boreal White and Black Spruce (BWBS) ecosection.

Protection of the water quality and quantity within the watershed is the major land use planning issue. Charlie Lake supplies water to the City of Fort St. John and surrounding area. The water supply area is within the Charlie Lake Community Commission. The Peace River Regional District must be involved in any land use planning for the area as most of the land within the water supply area is privately owned.

Human activities are potential sources of contamination to the watershed. Agriculture and range use is found side by side with oil and gas, aggregate and mineral extraction activities within the watershed area. There is also considerable residential development along the shores of the lake. Timber harvesting has occurred since the 1940s and is expected to be limited in the future.

This zone has potential for industrial minerals, including sand and gravel.

The main water management issues are:
- control of nutrient loadings from agriculture and human residential development around the lake.
- preventing disturbance to riparian areas surrounding Stoddart Creek, the major input into Charlie Lake.
- restricting access through the watershed to minimize water crossings and related impacts.

Walleye, pike and perch are the major fish species in Charlie Lake. The watershed provides habitat for waterfowl, fishers and ungulates.

Public and commercial recreational opportunities within this zone include boating, fishing, swimming, sailing and water sports. Two provincial parks are located on the shores of Charlie Lake. The Charlie Lake Cave, an archaeological site, is located on private property.

This RMZ lies within areas traditionally used by the Blueberry River First Nation.
Charlie Lake Water Supply Area

<table>
<thead>
<tr>
<th>Values:</th>
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<tbody>
<tr>
<td>agriculture</td>
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<tr>
<td>forestry</td>
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<td>local government</td>
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<td>recreation</td>
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<td>wildlife</td>
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<td>fish</td>
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<td>water quality</td>
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<td>culture and heritage</td>
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<tr>
<td>oil and gas</td>
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<tr>
<td>minerals</td>
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<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENERGY</strong></td>
<td></td>
</tr>
<tr>
<td>* maintain opportunities and access for oil and gas exploration, development and transportation</td>
<td></td>
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<tr>
<td>* allow exploration and development of resources within appropriate regulatory framework</td>
<td></td>
</tr>
<tr>
<td><strong>TIMBER</strong></td>
<td></td>
</tr>
<tr>
<td>* maintain timber harvesting and forest management opportunities</td>
<td></td>
</tr>
<tr>
<td>* quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments</td>
<td></td>
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<tr>
<td>* establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with low intensity forest management regimes</td>
<td></td>
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<tr>
<td>* reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently stocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas</td>
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<tr>
<td><strong>RECREATION</strong></td>
<td></td>
</tr>
<tr>
<td>* provide quality public and commercial recreational opportunities and values</td>
<td></td>
</tr>
<tr>
<td>* identify areas of high recreation use or significance and develop appropriate management strategies</td>
<td></td>
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<tr>
<td>* provide a full range of recreation opportunities</td>
<td></td>
</tr>
<tr>
<td>* incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc)</td>
<td></td>
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<tr>
<td><strong>AGRICULTURE</strong></td>
<td></td>
</tr>
<tr>
<td>* minimize or mitigate wildlife impact on agricultural enterprises</td>
<td></td>
</tr>
<tr>
<td>* encourage management plans to reduce wildlife/agriculture conflicts</td>
<td></td>
</tr>
<tr>
<td>* provide opportunities for the growth and expansion of the agriculture and food production industries</td>
<td></td>
</tr>
<tr>
<td>* support the purpose and the intent of the Agricultural Land Reserve (ALR) and the conversion of high quality agricultural land through existing processes</td>
<td></td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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</tr>
<tr>
<td><strong>Range</strong></td>
<td><strong>Range</strong></td>
</tr>
<tr>
<td>maintain or enhance opportunities for livestock grazing</td>
<td>develop range use plans according to the Forest Practices Code</td>
</tr>
<tr>
<td><strong>Access</strong></td>
<td><strong>Encourage</strong></td>
</tr>
<tr>
<td>coordinate access and linear development to minimize negative effects on other resource values</td>
<td>encourage shared access</td>
</tr>
<tr>
<td><strong>Wildlife</strong></td>
<td><strong>Identify</strong></td>
</tr>
<tr>
<td>protect or enhance habitats for red and blue listed species</td>
<td>identify habitat (by ecosection and landscape unit on a priority basis) for red and blue listed species (as identified by the Conservation Data Centre)</td>
</tr>
<tr>
<td>maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td>identify critical furbearer habitat and incorporate into more detailed plans</td>
</tr>
<tr>
<td>maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
<td>identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td>incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
<td>consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td>manage critical wetland habitats for waterfowl and other wildlife species</td>
<td>establish riparian reserves and management areas around critical wetland areas</td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td><strong>General</strong></td>
</tr>
<tr>
<td>maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>the general biodiversity emphasis is low</td>
</tr>
<tr>
<td><strong>Culture and Heritage</strong></td>
<td><strong>Identify</strong></td>
</tr>
<tr>
<td>protect heritage sites and trails</td>
<td>identify all known culture and heritage sites within the zone and develop appropriate management strategies</td>
</tr>
<tr>
<td>identify and provide for the protection of historical sites and trails</td>
<td>recommend an inventory of known resources (heritage sites and trails) and designation of significant localities within the zone</td>
</tr>
</tbody>
</table>
Charlie Lake Water Supply Area

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
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</thead>
<tbody>
<tr>
<td><strong>MINERALS</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
<td>• provide input to more detailed planning as required</td>
</tr>
<tr>
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<tr>
<td><strong>FISH</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. walleye, perch and pike)</td>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td></td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• plan and develop access to minimize disturbances within riparian reserve zones and management areas</td>
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<tr>
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<tr>
<td><strong>WATER</strong></td>
<td></td>
</tr>
<tr>
<td>• sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>• establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td></td>
<td>• incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans</td>
</tr>
<tr>
<td>• protect water quality and quantity</td>
<td>• minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td>• implement an appropriate level of watershed assessment to determine potential negative impacts to water quality</td>
</tr>
<tr>
<td></td>
<td>• ensure that all land development activities within the watershed comply with watershed protection guidelines</td>
</tr>
<tr>
<td></td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
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<tr>
<td><strong>LOCAL GOVERNMENT</strong></td>
<td></td>
</tr>
<tr>
<td>• ensure that all land and resource management planning activities within the planning area (including, where appropriate, more detailed plans), allow for consultation with, and incorporate the input of, local municipal governments (rural and urban)</td>
<td>• recognize Official Community Plans established by local municipal governments</td>
</tr>
</tbody>
</table>
Chinchaga Resource Management Zone

The Chinchaga RMZ covers much of the northeastern regions of the planning area. Its boundary follows Alberta east and the Fort Nelson Forest District to the north. It surrounds the Sikanni Chief - Fontas Valley in the north and proposed Milligan Hills and Chinchaga Lakes Protected Areas in the south. The RMZ falls within the Fort Nelson Lowlands and the Clearhills ecosections. The total land area is 908,108 hectares.

This zone is entirely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Forest fires are frequent and keep the forest in a variety of age classes. Mature conifer volumes are relatively low, but there are large areas of immature boreal mixedwood forests which will support future harvests. This zone has important deciduous timber values.

There are many existing oil and gas tenures and a substantial natural gas infrastructure is in place. The potential for new energy discoveries is quite high.

There is potential for industrial minerals, including sand and gravel. There are occurrences of clay and sulphur in well boreholes.

Overall, the area has relatively low biodiversity. However, large river riparian ecosystems within the zone do have moderate to high biological diversity. Moose, caribou, black bear and furbearers are found here along with a large variety of bird species ranging from owls to waterfowl and songbirds. This is an important central flyway for migrating waterfowl. Trumpeter Swan nesting habitat is found along major rivers.

A semi-permanent work camp is located along the Fontas Road at Paddy. A First Nations community which is associated with the Fort Nelson First Nation, is located at Kahntah on the Fontas River. The entire RMZ lies within areas traditionally used by the Doig River First Nation.

The Fontas Road provides all weather access into this zone. Some summer access extends off the main Fontas. There is extensive winter access due to oil field activity.

Outdoor recreation focuses on hunting, snowmobiling and fishing. A small portion of a guide outfitting area exists west of Black Creek.
### Chinchaga

**Values:**

- minerals, gravel and sand
- culture and heritage
- wildlife
- oil and gas
- trapping
- timber
- fish
- First Nations
- agriculture

**Goal 1 Proposed Protected Area - Milligan Hills**

**Goal 2 Proposed Protected Areas - Chinchaga and Ekwan Lakes**

### Objectives

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<tr>
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<td>• maintain opportunities and access for oil and gas exploration, development and transportation</td>
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<td>• reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non-commercial deciduous, and NSF (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.</td>
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<td>• establish and maintain a permanent road infrastructure to facilitate long term integrated resource management</td>
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<td>• encourage the utilization of pulp quality stands and the pulp components of stands slated for sawlog harvest</td>
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<td>• minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber</td>
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<td>• promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
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<tr>
<td>• encourage management plans to reduce wildlife/agriculture conflicts</td>
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</table>
### ACCESS

- Coordinate access and linear development to minimize negative effects on other resource values

### STRATEGIES

- Encourage shared access
- Encourage consistent road construction standards between industries
- Deactivate all new non-permanent access that is no longer required for resource management
- Where reasonable alternatives exist, avoid building roads through riparian areas, south facing aspects, and meadows (intent: avoid high value wildlife habitat)

### WILDLIFE

- Protect or enhance habitats for red and blue listed species
- Maintain furbearer habitat for priority species (e.g., fisher, marten, lynx)
- Maintain high capability ungulate winter habitat (e.g., elk, deer, moose)
- Maintain medium and high quality grizzly bear habitat
- Maintain caribou habitat

### STRATEGIES

- Identify and map high capability ungulate wintering areas at the landscape level on a priority basis, to protect critical wintering habitat
- Plan and develop new access routes to avoid direct disturbance with close proximity to, high capability ungulate wintering habitats
- Identify and map medium and high quality grizzly bear habitat at the landscape level on a priority basis
- Incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)
- Identify and map medium and high capability caribou habitat
- Incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors, into landscape level plans
<table>
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<tr>
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</table>
| **WILDLIFE (cont'd)** | - consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA's)  
- encourage the use of silvicultural systems that minimize negative impacts on medium and high capability caribou habitat  
- limit line of sight on linear access, such as seismic line cutting, in medium and high capability caribou habitat areas to minimize predation  
- maintain connectivity (migration/travel) corridors between important seasonal habitats |
| **BIODIVERSITY** | - the general biodiversity emphasis is intermediate  
- maintain functioning and healthy ecosystems in the Resource Management Zone |
| **CULTURE AND HERITAGE** | - avoid activities that will impact known archaeological sites  
- identify and provide for the protection of historical sites and trails  
- recommend an inventory of known resources (heritage sites and trails) and designation of significant localities within the zone |
| **MINERALS** | - provide input to more detailed planning as required  
- maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access. |
| **FISH** | - identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)  
- incorporate the protection of fish and fish habitat into landscape level plans  
- plan and develop access to minimize disturbances within riparian reserve zones and management areas |
Conroy Resource Management Zone

The Conroy RMZ is bounded on the west by the Sikanni Chief River, to the east by the Chinchaga RMZ, to the north by the Fort Nelson Forest District boundary, and to the south by the Jedney RMZ.

The Muskwa Plateau, Clearhills and Fort Nelson Lowlands ecossections are represented. The total land area is 391,293 hectares.

This zone is entirely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Frequent forest fires keep the forest in a variety of age classes. Significant timber values are scattered throughout the area with the most productive found in river valleys with high site productivity. Timber harvesting has occurred along the Sikanni Chief River, Conroy Creek and Gutah Creek and more is proposed for the next five year period. The area is managed with a high intensity forest management regime.

There are numerous oil and gas tenures and a substantial infrastructure has been constructed.

There is potential for industrial minerals, including sand and gravel.

Large river riparian ecosystems contain moderate to high natural diversity. The main river valleys provide critical moose wintering habitat. High habitat capability for furbearers is supporting healthy populations of black bears and wolves. A large variety of birds ranging from raptors to waterfowl are found within the zone.

Winter seismic lines are the primary access routes, with limited all-weather access. The Sikanni Chief River provides some riverboat access and a BC Rail line passes through the zone.

While there are no permanent communities, there are several seasonal oil and gas and logging camps.

A former Hudson’s Bay post was located on the Sikanni Chief River, north of the Tommy Lakes. The Fort Nelson cuts through this zone. The visual quality in areas adjacent to proposed Protected Areas, such as the Sikanni Canyon, is a future land management concern.

This RMZ lies within areas traditionally used by the Blueberry River and Prophet River First Nations.
Values:
- fish
- timber
- oil and gas
- minerals (gravel)
- First Nations values
- trapping
- recreation
- water
- wildlife
- visual quality

Objectives

Energy
- Maintain opportunities and access for oil and gas exploration, development and transportation

Timber
- Enhance timber harvesting and a sustainable long-term timber supply
- Quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- Establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with high intensity forest management regimes
- Establish and maintain a permanent road infrastructure to facilitate long term integrated resource management
- Encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest
- Minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- Promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels

Recreation
- Provide quality public and commercial recreational opportunities and values
- Manage visually sensitive areas associated with trail systems, campsites and special features, in recreation sites
- Develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers and to sustain wildlife
- Incorporate existing recreational activities and assess the potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)
<table>
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<tr>
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<td><strong>ACCESS</strong></td>
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<td>• coordinate access and linear development to minimize negative effects on other resource values</td>
<td>• encourage shared access</td>
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<tr>
<td></td>
<td>• deactivate all new non-permanent access that is no longer required for resource management</td>
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<td></td>
<td>• promote the development of multiple-use corridors for resource extraction activities</td>
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<tr>
<td></td>
<td>• encourage winter access (where appropriate) for resource development activities</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
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<tr>
<td>• protect or enhance habitats for red and blue listed species</td>
<td>• identify habitat (by ecossection and landscape, unit on a priority basis) for red and blue listed species (as identified by the Conservation Data Centre)</td>
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<td>• maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
</tr>
<tr>
<td></td>
<td>• identify critical furbearer habitat and incorporate into lower level plans</td>
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<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
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<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
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<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
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<td>• consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>• plan and develop new access routes that avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td></td>
<td>• maintain site specific habitats</td>
</tr>
<tr>
<td></td>
<td>• develop and implement strategies at the landscape level to maintain site specific habitats</td>
</tr>
<tr>
<td></td>
<td>• maintain, where appropriate, visually screening buffers along major roads and transportation corridors</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>• the general biodiversity emphasis is low</td>
</tr>
<tr>
<td>Objectives</td>
<td>Conroy</td>
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</tr>
<tr>
<td><strong>CULTURE AND HERITAGE</strong></td>
<td>recognize and manage the Fort Nelson trail as a significant heritage</td>
</tr>
<tr>
<td>- protect heritage sites and trails</td>
<td>historical feature</td>
</tr>
<tr>
<td>- identify and provide for the protection of historical sites and trails</td>
<td>recommend an inventory of known resources (heritage sites and trajectories of significant localities within the zone)</td>
</tr>
<tr>
<td><strong>MINERALS</strong></td>
<td>provide input to more detailed planning as required</td>
</tr>
<tr>
<td>- maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
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</tr>
<tr>
<td><strong>FISH</strong></td>
<td>identify and map critical fish habitat (e.g. pools, migration patterns, rearing areas)</td>
</tr>
<tr>
<td>- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>incorporate the protection of fish and fish habitat into landscape level</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>plan and develop access to minimize disturbances within riparian zones and management areas</td>
</tr>
<tr>
<td>- sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>establish instream flow requirements, lake volumes and stage, wetland and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td>- promote water stewardship to manage for other resources</td>
<td>manage resource development adjacent to sensitive water bodies (wetlands, rivers and streams) to minimize negative effects on water quality</td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td>manage visually sensitive areas adjacent to designated Protected Areas, maintaining the values identified in the Protected Areas Strategy</td>
</tr>
<tr>
<td>- manage visually sensitive areas within Tommy Lakes area</td>
<td></td>
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</tbody>
</table>
Crying Girl Resource Management Zone

The Crying Girl RMZ is located south of the Besa-Halfway-Chowade RMZ, north of the Graham South RMZ, east of Graham North RMZ, and west of the Bluegrave-Horseshoe RMZ. It includes the area north of the Graham River between the eastern boundary of the Graham-Laurier proposed Protected Area and the Hackney Hills.

The Crying Girl RMZ includes most of the Hackney Hills and falls within the Peace Foothills eosection. Its area is approximately 48,321 hectares.

Most of the land is within the Engelmann Spruce-Subalpine Fir (ESSF) biogeoclimatic zone, with some Boreal White and Black Spruce (BWBS) biogeoclimatic areas and a small portion of Alpine Tundra (AT). The zone includes operable coniferous timber although limited logging has occurred to date.

Oil and gas exploration has occurred and there are a number of tenured parcels.

This zone has potential for industrial minerals (classification of 3, 5, 6/10), including sand, gravel and coal.

This zone contains habitat for furbearers including fisher, marten and lynx, for ungulates such as elk, caribou, moose and deer and for grizzly bear. Caribou migrate through the zone, from the Hackney Hills at the head of Horseshoe Creek south through to Butler Ridge. These habitat linkages are vital to the species. Management of the adjacent areas consider maintenance of these forest ecosystem networks (FENs).

This zone has high existing and potential recreation values. Guide outfitting is well established with a permanent guide located near Crying Girl Prairie. Two important recreation features are Christina Falls, a proposed Protected Area 2 site, and the Graham River Valley.

One major all-weather road, the Crying Girl Forest Service road, traverses the southern portion of the RMZ.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
| Crying Girl |
| Values: |
| gas potential/tenures | backcountry/wilderness values | wildlife habitat | guide outfitting |
| timber values | fish | trapping | caribou | mineral potential |
| culture and heritage | water |

<table>
<thead>
<tr>
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<tr>
<td><strong>ENERGY</strong></td>
<td>• allow exploration and development of resources within appropriate regulatory framework</td>
</tr>
<tr>
<td>• maintain opportunities and access for oil and gas exploration, development and transportation</td>
<td>• maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources</td>
</tr>
<tr>
<td><strong>TIMBER</strong></td>
<td>• establish general forest production targets for landscape units within Resource Management Zone (RMZ) consistent with moderate intensity management regimes.</td>
</tr>
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<td>• maintain timber harvesting and forest management opportunities</td>
<td>• establish and maintain a permanent road infrastructure to facilitate integrated resource management</td>
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<td></td>
<td>• encourage the utilization of pulp quality stands, and the pulp component stands slated for sawlog harvest</td>
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<td></td>
<td>• minimize losses from damaging agents through aggressive and proactive pest management, including the salvage of damaged or killed timber</td>
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<tr>
<td></td>
<td>• promptly and aggressively reforest and manage cutovers and wildfires on the timber harvesting land base, to maintain sustainable timber harvesting opportunities</td>
</tr>
<tr>
<td><strong>RECREATION</strong></td>
<td>• manage visually sensitive areas associated with trail systems, camps and special features, in recreation sites</td>
</tr>
<tr>
<td>• provide quality public and commercial recreational opportunities and values</td>
<td>• identify and provide opportunities for the use of suitable Crown land for commercial recreation development and use</td>
</tr>
<tr>
<td>• maintain guide and outfitting opportunities</td>
<td>• identify areas of high recreation use or significance and develop appropriate management strategies</td>
</tr>
</tbody>
</table>
### Objectives

**RECREATION (cont'd)**

- new access will be planned to minimize effects on existing scenic commercial and non-commercial recreational values
- develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities
- identify and protect guide outfitting campsites and cabins
- manage existing tenures and the associated grazing activities of guides and outfitters to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)
- seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. A Recreation Use Plan is recommended to address this issue
- provide a full range of wilderness recreation opportunities (as identified in the Ministry of Forests Recreation Opportunity Spectrum (ROS) classed as semi-primitive non-motorized (SPNM))
- develop strategies in more detailed plans to maintain a component of the land-base classified as ROS 'SPNM' land (intent: maintain opportunities for a wilderness recreation experience) remains, recognizing that this component may change in location over time as roads are built and deactivated.
- maintain opportunities for commercial and non-commercial livestock grazing that is associated with recreation
- provide for motorized recreation access corridors to similar destinations as currently allowed
- develop a grazing plan to address issues of forage allocation among tenured users, residents and wildlife

### Strategies

- coordinate access and linear development to minimize negative effects on other resource values
- encourage consistent road construction standards between industries
- where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)
- in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access (cont'd)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td></td>
</tr>
<tr>
<td>- maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td>- identify critical furbearer habitat and incorporate into more detailed plans</td>
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<tr>
<td>- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)</td>
<td>- where appropriate, incorporate landscape level forest ecosystem networks (FENs) to prevent priority species habitat fragmentation and maintain areas of interior forest habitat (e.g. &gt; 600 metres wide)</td>
</tr>
<tr>
<td>- maintain medium and high quality grizzly bear habitat</td>
<td>- identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
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<td></td>
<td>- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
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<td>- consider establishing wildlife habitat areas (WHA's) at the landscape level on a priority basis, to protect critical wintering habitat</td>
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<td>- identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
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<td>- incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
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<td>- plan and develop access to avoid medium and high quality habitats and human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)</td>
</tr>
<tr>
<td></td>
<td>- incorporate medium and high quality grizzly bear habitats and corridors into landscape level plans</td>
</tr>
</tbody>
</table>
### WILDLIFE (cont'd)

- Consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA's).
- Develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively affect medium and high capability grizzly bear habitat.
- Maintain caribou habitat
- Identify and map medium and high capability caribou habitat
- Incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors, into landscape level plans.
- Consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA's).
- Develop inter-agency development plans (Ministry of Environment, Lands and Parks and Ministry of Forests and Ministry of Employment and Investment) for all resource developments that may negatively affect critical medium and high capability caribou habitat.
- Maintain connectivity (migration/travel) corridors between important seasonal habitats.

### BIODIVERSITY

- Maintain functioning and healthy ecosystems in the Resource Management Zone.
- The general biodiversity emphasis is intermediate.
- Minimize wildlife habitat fragmentation and maintain existing large mammalian predator-prey system.
- Identify and establish connectivity corridors at landscape level.

### CULTURE AND HERITAGE

- Identify and provide for the protection of historical sites and trails.
- Identify and protect Crying Girl gravesites on Crown Land.

### MINERALS

- Maintain opportunities for mineral exploration and development and allow for access.
- Ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values.
- Provide input to more detailed planning as required.
<table>
<thead>
<tr>
<th>Objectives</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>MINERALS (cont’d)</strong></td>
<td>• road building into currently unroaded areas will be permitted when it can be demonstrated that road access is required and justified for further development and subject to review and approval through established procedures and applicable legislation</td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td>- identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>- incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>- plan and develop access to minimize disturbances within riparian reserve zones and management areas</td>
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<td></td>
<td>- identify priority watersheds for Level I and II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
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<td>- incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
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<td>- determine equivalent clear-cut area (ECA) threshold levels for streams with bull trout and incorporate into landscape level plans.</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td></td>
</tr>
</tbody>
</table>
Farrell Creek Resource Management Zone

This RMZ is located along the southern boundary of the planning area, just west of the Agriculture Settlement Area RMZ. West and southern boundaries follow the Fort St. John Forest District border. The eastern edge borders the Peace River, the Agriculture Settlement Area RMZ. To the north is the Kobes RMZ and the northern arm of Farrell Creek.

This zone is divided almost equally between the Halfway Plateau ecossection in the north, and the Peace Lowlands ecossection in the south. The total land area is 54,646 hectares.

This zone is completely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone.

Natural gas, oil and mineral development opportunities exist here. There is moderate to high potential for future gas discovery within the area.

This zone has potential for industrial minerals, including sand, gravel and a good potential for coal. There is a coal prospect consisting of several seams of bituminous coal.

Notable wildlife species found in the RMZ, including mule and whitetail deer, moose and elk. As well, the Peace River supports populations of priority fish species such as bull trout, Arctic grayling and red and blue listed species.

A large portion of the zone is within the Agricultural Land Reserve. Crown land with agricultural potential can be developed through the Crown’s Agriculture-Lease program. Range use is quite prevalent.

Consultation and input regarding planning activities is required from the District of Hudson’s Hope since the municipality is adjacent to the RMZ.

Potential exists for commercial and public recreation development in the future; for the present, hunting is one of the recreational uses.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
Farrell Creek

Values:
- agriculture
- oil and gas
- guide outfitting
- wildlife
- minerals (e.g. sand, gravel)
- timber - hardwood/softwood
- range
- water

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation

Timber
- enhance timber harvesting and a sustainable long-term timber supply
- quantify the timber harvesting land base and develop policies to reduce the permanent loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes
- establish and maintain a permanent road infrastructure to facilitate long term integrated resource management
- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest
- minimize losses from damaging agents through aggressive and prompt fire and pest management including the salvage of damaged or killed timber
- encourage afforestation and sustainable forest management of reverted and low capability agricultural land
- promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels

RECREATION
- provide quality public and commercial recreational opportunities and values
- identify areas of high recreation use or significance and develop appropriate management strategies
<table>
<thead>
<tr>
<th>Objectives</th>
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</thead>
<tbody>
<tr>
<td><strong>RECREATION (CONT’D)</strong></td>
<td></td>
</tr>
<tr>
<td>provide a full range of recreation opportunities</td>
<td>develop a grazing plan to address issues of forage allocation among tenured users, residents and wildlife</td>
</tr>
<tr>
<td><strong>AGRICULTURE</strong></td>
<td></td>
</tr>
<tr>
<td>maintain or increase land supply for agriculture including access to Crown Land</td>
<td>ensure the integrity of the Agricultural Land Reserve through the Agricultural Land Commission Act and Regulations and the Crown Agricultural Lease Policy</td>
</tr>
<tr>
<td>minimize or mitigate wildlife impact on agricultural enterprises</td>
<td>encourage management plans to reduce wildlife/agriculture conflicts</td>
</tr>
<tr>
<td>provide opportunities for the growth and expansion of the agriculture and food production industries</td>
<td>support the purpose and the intent of the Agricultural Land Reserve (ALR) and the conversion of high quality agricultural land through existing processes</td>
</tr>
<tr>
<td><strong>RANGE</strong></td>
<td></td>
</tr>
<tr>
<td>maintain or enhance opportunities for livestock grazing</td>
<td>encourage an increase in range production, giving preference to integrated use</td>
</tr>
<tr>
<td></td>
<td>minimize tree/grass/cattle conflicts through integrated management practices</td>
</tr>
<tr>
<td>control the spread of noxious weeds</td>
<td>implement noxious weed control plans and enforce the Weed Act</td>
</tr>
<tr>
<td><strong>ACCESS</strong></td>
<td></td>
</tr>
<tr>
<td>coordinate access and linear development to minimize negative effects on other resource values</td>
<td>where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td></td>
</tr>
<tr>
<td>maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td></td>
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</tr>
<tr>
<td><strong>WILDLIFE (CONT'D)</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td>• manage critical wetland habitats for waterfowl and other wildlife species</td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td>• establish riparian reserves and management areas around critical wetland areas</td>
<td>• consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>• the general biodiversity emphasis is low</td>
</tr>
<tr>
<td><strong>MINERALS</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain opportunities for mineral exploration and development and allow for access</td>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
</tr>
<tr>
<td>• provide input to more detailed planning as required</td>
<td></td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td></td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td>• minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</td>
</tr>
<tr>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
<td></td>
</tr>
<tr>
<td><strong>LOCAL GOVERNMENT</strong></td>
<td></td>
</tr>
<tr>
<td>• ensure that all land and resource management planning activities within the planning area (including where appropriate, more detailed plans), allow for consultation with, and incorporate the input of, local municipal governments (rural and urban)</td>
<td>• recognize Official Community Plans established by local municipal governments</td>
</tr>
</tbody>
</table>
Graham South Resource Management Zone

The Graham South RMZ is located along the southern boundary of the planning area. It includes the area south of the Graham River between the eastern boundary of the Graham-Laurier proposed Protected Area and the western boundary of the Kobes RMZ. The Crying Girl RMZ lies to the north.

This zone is within the Peace Foothills ecoregion. The total land area is approximately 35,085 hectares; most of it vacant Crown land.

The Boreal White and Black Spruce (BWBS), and Engelmann Spruce-Subalpine Fir (ESSF) biogeoclimatic zones are represented. The BWBS zone is confined to the area beside the Graham River. This zone contains extensive tracts of operable coniferous timber. Deciduous values are generally low, other than scattered patches along river valleys.

Natural gas resource potential is high and there are a number of tenured parcels in the eastern and western portions of the zone.

This zone has tracts with metallic potential classified 1 and 3/10 (placer gold occurs just south of the district boundary); and industrial mineral potential classified 3, 4, 5 and 6/10. There is also potential for coal in this area.

Wildlife occurs in great diversity and abundance. There are critical wintering and calving areas for caribou and moose along with important summer caribou range. Important Class 1 and Class 2 grizzly bear habitat are located within ESSF areas. Black bears, wolves, elk, deer, and sheep are present.

Recreation activities include canoeing, recreational hunting, fishing, snowmobiling, ATVing, rafting, camping and back riding. Successful long-term operations are headquartered on the north side of the Graham River at Crying Prairie.

Several undeveloped trails currently provide the only access in this area. A traditional First Nations trail is located along the Graham River Valley.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
<table>
<thead>
<tr>
<th>timber values</th>
<th>mineral potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>gas potential/tenures</td>
<td>fish</td>
</tr>
</tbody>
</table>

### Values:
- guide outfitting
- high wildlife values
- grizzly bear
- water
- visual quality

### Objectives

**Energy**
- maintain opportunities and access for oil and gas exploration, development and transportation

### Strategies
- allow exploration and development of resources within appropriate regulatory framework
- maintain and enhance opportunities for environmentally responsible development of surface and subsurface resources
- ensure development activities and associated access are undertaken with sensitivity to visual and recreational values (e.g. exploration development planning will recognize existing topography and ground conditions to reduce impact on visual and recreation values as much as practical)
- promote low impact seismic exploration
- encourage efficient and rational subsurface resource development to minimize surface disturbances and maximize subsurface resource utilization
- ensure oil and gas exploration and development activities are undertaken with sensitivity to wildlife and wildlife habitat
- all new-cut seismic exploration in areas with potentially unstable slopes and/or high environmental values, shall be heli-portable unless it can be conclusively demonstrated that conventional seismic exploration will not cause significant environmental impacts
- promote site specific assessments to minimize number of wells in riparian areas

**Timber**
- enhance timber harvesting and a sustainable long-term timber supply
- maintain timber harvesting and forest management opportunities

### Strategies
- quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes
<table>
<thead>
<tr>
<th>Objectives</th>
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<tr>
<td><strong>TIMBER (cont'd)</strong></td>
<td>• encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest</td>
</tr>
<tr>
<td></td>
<td>• where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce roading requirements</td>
</tr>
<tr>
<td></td>
<td>• minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber</td>
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<td>• promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
</tr>
<tr>
<td></td>
<td>• develop a long term plan to manage access and forest management activities, incorporating a form of sequential development to accommodate and address the concerns of other tenure holders and resource users.</td>
</tr>
<tr>
<td><strong>RECREATION</strong></td>
<td>• manage visually sensitive areas associated with trail systems, campsites and special features, in recreation sites</td>
</tr>
<tr>
<td></td>
<td>• identify and provide opportunities for the use of suitable Crown land for commercial recreation development and use</td>
</tr>
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<td>• identify areas of high recreation use or significance and develop appropriate management strategies</td>
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<td>• new access will be planned to minimize effects on existing scenic commercial and non-commercial recreational values</td>
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<td>• develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities</td>
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<td></td>
<td>• identify and protect guide outfitting campsites and cabins</td>
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<tr>
<td></td>
<td>• provide quality public and commercial recreational opportunities and values</td>
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<tr>
<td></td>
<td>• maintain guide and outfitting opportunities</td>
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</table>
**Objectives**

**RECREATION (CONT'D)**

- provide a full range of wilderness recreation opportunities (as identified in the Ministry of Forests Recreation Opportunity Spectrum (ROS)) classed as semi-primitive non-motorized (SPNM)

**Access**

- coordinate access and linear development to minimize negative effects on other resource values

- manage access to protect significant wildlife and recreation values

**Strategies**

- manage existing tenures and manage the associated grazing activities of guide outfitters to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)

- seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. A Recreation Use Plan is recommended to address this issue

- develop strategies in more detailed plans to maintain a component of the land-base classified as ROS ‘SPNM’ land (intent: maintain opportunities for a wilderness recreation experience) remains, recognizing that this component may change in location over time as roads are built and deactivated

- provide for motorized recreation access corridors to similar destinations as currently allowed

- encourage shared access

- encourage consistent road construction standards between industries

- deactivate all new non-permanent access that is no longer required for resource management

- where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)

- in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)

- upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, re-contouring, bridge removal and where possible, native species

- a more detailed planning process will identify significant fish and wildlife and other resource values. Where there is a significant risk that these resources may be impacted, access may be limited, restricted or, in special circumstances, prohibited.
## Objectives

<table>
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<td>- maintain furbearer habitat for priority species (e.g. marten, lynx)</td>
<td>- identify critical furbearer habitat and incorporate into more detailed plans</td>
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<td>- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
<td>- where appropriate, incorporate landscape level forest ecosystem networks (FENs) to prevent priority species habitat fragmentation and maintain areas of interior forest habitat (e.g. &gt; 600 metres wide)</td>
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<tr>
<td>- maintain medium and high quality grizzly bear habitat</td>
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<td>- identify and map high capability ungulate wintering areas at the landscape level</td>
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<td>- incorporate the maintenance of high capability ungulate wintering habitats (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
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<td></td>
<td>- consider establishing wildlife habitat areas (WHA's) at the landscape level on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>- plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
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<td>- identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
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<td>- incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
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<td>- plan and develop access to avoid where possible medium and high quality habitats and minimize human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)</td>
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<td>- incorporate medium and high quality grizzly bear habitats and connectivity corridors into landscape level plans</td>
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<td>- consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA's)</td>
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<tr>
<td></td>
<td>- develop inter-agency development plans (Ministry of Environment, Land and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively affect medium and high capability grizzly bear habitat</td>
</tr>
<tr>
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<td>Strategies</td>
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</tr>
</tbody>
</table>
| **WILDLIFE (cont'd)** | • encourage the use of silvicultural systems that minimize negative impacts on medium and high quality grizzly bear habitat  
• minimize impacts on grizzly bear habitat by ensuring that critical habitat areas are linked by connectivity corridors or forest ecosystem networks (FENs) (where biologically and ecologically appropriate) |
| **BIODIVERSITY** | • the **general** biodiversity emphasis is high  
• this Resource Management Zone is a high priority for the initiation of landscape level planning. Landscape level plans will identify and map a number of ecosystem attributes (e.g., rare ecosystems, habitats and plant communities, ecosection representation, biogeoclimatic zones and variants, wildlife habitat classes, critical habitats, environmentally sensitive and wildlife habitat areas for identified wildlife) and incorporate strategies to sustain these attributes.  
• minimize wildlife habitat fragmentation  
• restore and rehabilitate negatively affected ecosystems |
| **MINERALS** | • identify and maintain existing predator-prey systems through the identification and establishment of connectivity corridors at the landscape level  
• identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation  
• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values  
• provide input to more detailed planning as required |
| **FISH** | • identify and map critical fish habitat (e.g., pools, migration patterns, spawning and rearing areas)  
• incorporate the maintenance of fish and fish habitat into landscape level plans  
• plan and develop access to minimize disturbances within riparian reserve zones and management areas  
• maintain fish habitat and water quality for priority fish species (e.g., bull trout, grayling and red and blue listed species) |
<table>
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<td><strong>FISH (cont’d)</strong></td>
<td>• identify priority watersheds for Level I and/or II watershed assessment to determine potential negative impacts to fish habitat, riparian and water quality from land development activities</td>
</tr>
<tr>
<td></td>
<td>• incorporate habitat protection criteria for bull trout into landscape and level plans (as these criteria are developed)</td>
</tr>
<tr>
<td></td>
<td>• determine equivalent clear-cut area (ECA) threshold levels for stream bull trout and incorporate into landscape level plans</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>• establish instream flow requirements, lake volumes and stage, wetland and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td>• sustain natural stream flow regime (water quantity, quality and timing of flow)</td>
<td>• manage resource development adjacent to sensitive water bodies wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td>• manage visually sensitive areas adjacent to designated Protected Areas maintaining the values identified in the Protected Areas Strategy</td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td>• manage visually sensitive areas identified as scenic areas (including travel and recreation corridors as identified by the Ministry of Forests visual landscape inventory)</td>
</tr>
</tbody>
</table>
Graham North Resource Management Zone

The Graham North RMZ is in two non-adjacent parts. The major part of this RMZ incorporates the middle portion of the Graham River watershed above the confluence of Needham Creek to below the confluence of Poutang Creek, including Justice Creek watershed. The smaller segment is on the south side of the Graham River approximately between the mouth of the Needham Creek and Crying Girl Prairie. Both parts are adjacent to the Graham-Laurier proposed Protected Area. The Crying Girl RMZ lies either to the north or east. The Besa-Halfway-Chowade RMZ lies to the north of the larger part.

This zone lies mainly in the Peace Foothills ecossection. The total land area is approximately 30,183 hectares, nearly all undisturbed Crown Land. The major biogeoclimatic zone at lower elevations is the Engelmann Spruce-Subalpine Fir (ESSF) zone and at higher elevations is Alpine Tundra (AT).

This zone contains extensive volumes of coniferous timber in mature and older seral stage forests. Although not scheduled for harvest over the next five years, this portion of the Graham River watershed will be logged during the next few decades.

Natural gas potential is high although there are few tenured parcels in the zone. The zone has geological tracts with metallic potential classified 2 and 3/10; and industrial mineral potential classified 4 and 8/10 with phosphate as a primary industrial mineral commodity.

Moose and mountain caribou and a number of furbearers inhabit the forested portions of the Graham River valley. Medium capability grizzly bear habitat supports a small population of grizzly bears. As in other RMZ's, the Graham and many tributary streams support a number of fish species including grayling, mountain whitefish, rainbow trout, and bull trout.

This RMZ is primarily in a "natural" state and has high "wilderness" values. A long-term, successful guide out operation and tenure overlaps this RMZ. Other recreation opportunities include recreational hunting, fishing, hiking, camping, canoeing, trail riding with horses, or ATV's and, in the winter season, snowmobiles.

Access into this area is limited to several primitive trails, some with a history of use by First Nations and early settlers. Present, road access does not exist although several seismic lines have been cut in the area.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
**Graham North**

<table>
<thead>
<tr>
<th>timber values</th>
<th>mineral potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>gas potential/tenures</td>
<td>fish</td>
</tr>
<tr>
<td>wilderness</td>
<td></td>
</tr>
</tbody>
</table>

**Values:**
- guide outfitting
- high wildlife values
- grizzly bear
- water
- visually sensitive areas

**Objectives**

**ENERGY**
- maintain opportunities and access for oil and gas exploration, development and transportation

**Strategies**
- allow exploration and development of resources within appropriate framework
- maintain and enhance opportunities for environmentally responsible development of surface and subsurface resources
- ensure development activities and associated access are undertaken with sensitivity to visual and recreational values (e.g. exploration developments will recognize existing topography and ground conditions to mitigate impact on visual and recreation values as much as practical)
- promote low impact seismic exploration
- encourage efficient and rational subsurface resource development
- maximize surface disturbances and maximize subsurface resource utilization
- ensure oil and gas exploration and development activities are undertaken with sensitivity to wildlife and wildlife habitat
- all new-cut seismic exploration in areas with potentially unstable soil or high environmental values shall be heli-portable unless it can be conclusively demonstrated that conventional seismic exploration will not result in significant environmental impacts
- promote site specific assessments to minimize number of wells in areas

**TIMBER**
- enhance timber harvesting and a sustainable long-term timber supply
- maintain timber harvesting and forest management opportunities

- quantify the timber harvesting land base and develop policies to mitigate loss of the timber harvesting land base to roads, landings, seismic well sites and other developments

- establish general forest production targets for landscape units with Source Management Zone (RMZ) consistent with moderate intensity management regimes
### Fort St. John Land and Resource Management Plan

#### Graham North

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timber (cont'd)</strong></td>
<td>- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest</td>
</tr>
<tr>
<td></td>
<td>- no forest industry timber harvesting or related development will occur south of the Graham River, in this RMZ, until after 2006</td>
</tr>
<tr>
<td></td>
<td>- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce roading requirements</td>
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<tr>
<td></td>
<td>- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber</td>
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<tr>
<td></td>
<td>- promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
</tr>
<tr>
<td></td>
<td>- develop a long term plan to manage access and forest management activities, incorporating a form of sequential development to accommodate and address the concerns of other tenure holders and resource users, in consultation with stakeholders.</td>
</tr>
<tr>
<td><strong>Recreation</strong></td>
<td>- manage visually sensitive areas associated with trail systems, campsites and special features, in recreation sites</td>
</tr>
<tr>
<td></td>
<td>- identify and provide opportunities for the use of suitable Crown land for commercial recreation development and use</td>
</tr>
<tr>
<td></td>
<td>- identify areas of high recreation use or significance and develop appropriate management strategies</td>
</tr>
<tr>
<td></td>
<td>- new access will be planned to minimize effects on existing scenic commercial and non-commercial recreational values</td>
</tr>
<tr>
<td></td>
<td>- develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities</td>
</tr>
<tr>
<td></td>
<td>- identify and protect guide outfitting campsites and cabins</td>
</tr>
<tr>
<td></td>
<td>- manage existing tenures and manage the associated grazing activities of guide outfitter to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)</td>
</tr>
<tr>
<td></td>
<td>- ensure that timber harvesting in the Graham River Watershed recognizes the watershed's other important resource values such as wilderness, guide outfitting, trapping, wildlife, fish, recreation, etc.</td>
</tr>
</tbody>
</table>
### Objectives

**RECREATION (cont’d)**

- provide a full range of wilderness recreation opportunities (as identified in the Ministry of Forests Recreation Opportunity Spectrum (ROS)) classed as semi-primitive non-motorized (SPNM)

**Access**

- coordinate access and linear development to minimize negative effects on other resource values
  - encourage shared access
  - encourage consistent road construction standards between industries
  - deactivate all new non-permanent access that is no longer required for resource management
  - where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)
  - in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)
  - upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, re-contouring, bridge removal and where possible, native species
  - a more detailed planning process will identify significant fish and wildlife and other resource values. Where there is a significant risk that these resources may be impacted, access may be limited, restricted or, in special circumstances, prohibited.

- manage access to protect significant wildlife and recreation values

**Wildlife**

- maintain furbearer habitat for priority species (e.g. marten, lynx)
  - identify critical furbearer habitat and incorporate into lower level plans

### Strategies

- seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. A Recreation Use Plan is recommended to address this issue
- develop strategies in more detailed plans to maintain a component of the land-base classified as ROS ‘SPNM’ land (intent: maintain opportunities for a wilderness recreation experience) remains, recognizing that this component may change in location over time.
- provide for motorized recreation access corridors to similar destinations as currently allowed
### Objectives

**WILDLIFE (CONT’D)**

- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)

### Strategies

- where appropriate, incorporate landscape level forest ecosystem networks (FENs) to prevent priority species habitat fragmentation and maintain areas of interior forest habitat (e.g. > 600 metres wide)

- identify and map high capability ungulate wintering areas at the landscape level

- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans

- consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat

- plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats

- identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis

- incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)

- plan and develop access to avoid medium and high quality habitats and/or human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)

- maintain medium and high quality grizzly bear habitat

- incorporate medium and high quality grizzly bear habitats and connectivity corridors into landscape level plans

- consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)

- develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively affect medium and high capability grizzly bear habitat

- encourage the use of silvicultural systems that minimize negative impacts on medium and high quality grizzly bear habitat
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>WILDLIFE (CONT'D)</td>
<td>• minimize impacts on grizzly bear habitat by ensuring that critical habitat areas are linked by connectivity corridors or forest ecosystem networks (FENs) (where biologically and ecologically appropriate)</td>
</tr>
<tr>
<td>BIODIVERSITY</td>
<td>• minimize wildlife habitat fragmentation</td>
</tr>
<tr>
<td></td>
<td>• the general biodiversity emphasis is high</td>
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<tr>
<td></td>
<td>• this Resource Management Zone is a high priority for the initiation of landscape level planning. Landscape level plans will identify and map a number of ecosystem attributes (e.g. rare ecosystems, habitats and plant communities, ecoregion representation, biogeoclimatic zones and variants, wildlife habitat classes, critical habitats, environmentally sensitive and wildlife habitat areas for identified wildlife) and incorporate strategies to sustain these attributes.</td>
</tr>
<tr>
<td></td>
<td>• restore and rehabilitate negatively affected ecosystems</td>
</tr>
<tr>
<td></td>
<td>• identify and maintain existing predator-prey systems through the identification and establishment of connectivity corridors at the landscape level</td>
</tr>
<tr>
<td></td>
<td>• identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation</td>
</tr>
<tr>
<td>MINERALS</td>
<td>• maintain opportunities for mineral exploration and development and allow for access.</td>
</tr>
<tr>
<td></td>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
</tr>
<tr>
<td></td>
<td>• provide input to more detailed planning as required</td>
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<tr>
<td>FISH</td>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
</tr>
<tr>
<td></td>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
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<tr>
<td></td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• plan and develop access to minimize disturbances within riparian reserve zones and management areas</td>
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<td></td>
<td>• identify priority watersheds for Level I and/or II watershed assessments to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
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<td></td>
<td>• incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
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### Fort St. John Land and Resource Management Plan

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
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</thead>
<tbody>
<tr>
<td><strong>FISH (cont’d)</strong></td>
<td>- determine equivalent clear-cut area (ECA) threshold levels for streams with bull trout and incorporate into landscape level plans</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>- establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td>- sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>- manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td>- promote water stewardship to manage for other resources</td>
<td></td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td>- manage visually sensitive areas adjacent to designated Protected Areas maintaining the values identified in the Protected Areas Strategy</td>
</tr>
<tr>
<td>- manage visually sensitive areas identified as scenic areas (including travel and recreation corridors as identified by the Ministry of Forests visual landscape inventory)</td>
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</tbody>
</table>
Grassy - Minaker Resource Management Zone

The Grassy - Minaker Resource Management Zone is located in the northern part of the planning area. The easterly boundary follows the Alaska Highway up to the boundary of the Fort Nelson Forest District. The Besa-Halfway-Chetwynd RMZ is to the southwest while the Sikanni Chief River forms the southern boundary.

The Muskwa Plateau and Muskwa Foothills ecossections are represented. The total area is 73,454 hectares; most of it is Crown land.

This zone is almost completely within the Boreal White and Black Spruce (BWBS) and Spruce-Willow-Birch (SWB) biogeoclimatic zones, with a small portion of Alpine Tundra (AT). There are significant merchantable coniferous timber stands within this zone. Though little forest harvesting has occurred to date, there are plans for future forest harvesting activities in the area.

Substantial oil and gas reserves have been developed and exploration continues. An infrastructure of pipelines, dehydration and processing facilities and semipermanent oil field camps have been constructed.

The zone has industrial mineral potential classified as only 3/10, however, a bentonite clay occurrence is located near the eastern boundary at Buckinghorse. There is also coal potential. Sand and gravel occur along the Sikanni Chief River.

Significant mammals include moose, caribou, mule deer, white-tail deer, elk, mountain goat, bison, wolf, grizzly and bear. All major sport fish species occur within the major rivers and streams.

Important connectivity corridors within the zone are vital to such species as caribou, grizzly bears and migratory birds. Management of adjacent areas must be an important consideration in maintaining these habitat linkages.

Despite the diversity of wildlife, the wilderness values are low to moderate, due to extensive roading. Much of the zone contains all-weather roads and extensive seismic lines and there is an airstrip at Chicken Creek.

Primary recreation activities include snowmobiling, ATVing, hiking, horseback riding, camping, hunting and wildlife viewing. The entire zone is covered by guide outfitting tenures. Snowmobile trails and an ATV trail leading to the Creek watershed and Redfern Lake also pass through this zone.

This RMZ lies within areas traditionally used by the Prophet River and Halfway River First Nations.
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENERGY</strong></td>
<td>- allow exploration and development of resources within appropriate regulatory framework</td>
</tr>
<tr>
<td>- maintain opportunities and access for oil and gas exploration, development and transportation</td>
<td>- maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources</td>
</tr>
<tr>
<td><strong>TIMBER</strong></td>
<td>- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes</td>
</tr>
<tr>
<td>- maintain timber harvesting and forest management opportunities</td>
<td>- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest</td>
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<tr>
<td></td>
<td>- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber</td>
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<tr>
<td></td>
<td>- promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
</tr>
<tr>
<td><strong>RECREATION</strong></td>
<td>- manage visually sensitive areas associated with trail systems, campsites and special features, in recreation sites</td>
</tr>
<tr>
<td>- provide quality public and commercial recreational opportunities and values</td>
<td>- identify areas of high recreation use or significance and develop appropriate management strategies</td>
</tr>
<tr>
<td>- maintain guide and outfitting opportunities</td>
<td>- development of new access will be planned to minimize negative effects on existing scenic commercial and non-commercial recreational values</td>
</tr>
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<td></td>
<td>- develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>RECREATION (cont’d)</strong></td>
<td>• identify and protect guide outfitting campsites and cabins</td>
</tr>
<tr>
<td>• provide a full range of</td>
<td>• maintain opportunities for commercial and non-commercial livestock</td>
</tr>
<tr>
<td>recreation opportunities</td>
<td>grazing that is associated with recreation</td>
</tr>
<tr>
<td>• maintain and enhance</td>
<td>• manage existing tenures and the associated grazing activities of</td>
</tr>
<tr>
<td>ecological integrity in</td>
<td>guides and outfitters to limit impacts and reduce risk to other</td>
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<tr>
<td>areas subject to resource</td>
<td>resource values (keep grazing out of sensitive habitats, etc.)</td>
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<tr>
<td>impacts from recreational use</td>
<td>• seasonal access (e.g. snowmobile) may be limited to address</td>
</tr>
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<td></td>
<td>wildlife habitat needs. A Recreation Use Plan is recommended to</td>
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<td></td>
<td>address this issue</td>
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<tr>
<td>• maintain opportunities for</td>
<td>• incorporate existing recreational activities and assess potential for</td>
</tr>
<tr>
<td>commercial and non-</td>
<td>the development of new recreational opportunities in more detailed</td>
</tr>
<tr>
<td>commercial livestock grazing</td>
<td>plans (additional motorized recreational pursuits, etc.)</td>
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<tr>
<td>that is associated with</td>
<td>• more detailed plans will address the effects of recreational activity</td>
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<tr>
<td>recreation</td>
<td>on ecological integrity (e.g. wildlife disruption, damage to plant</td>
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<td></td>
<td>communities and water quality)</td>
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<tr>
<td>• coordinate access and linear</td>
<td>• provide for motorized recreation access corridors to similar</td>
</tr>
<tr>
<td>development to minimize</td>
<td>destinations as presently allowed (maintain motorized access to</td>
</tr>
<tr>
<td>negative effects on other</td>
<td>Nevis Creek)</td>
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<tr>
<td>resource values</td>
<td>• develop a grazing plan to address issues of forage allocation among</td>
</tr>
<tr>
<td></td>
<td>tenured users, residents and wildlife</td>
</tr>
<tr>
<td><strong>ACCESS</strong></td>
<td>• identify and manage appropriate grazing management activities (e.g.</td>
</tr>
<tr>
<td>• encourage shared access</td>
<td>burns)</td>
</tr>
<tr>
<td>• promote the development of</td>
<td>• where reasonable alternatives exist avoid building roads through</td>
</tr>
<tr>
<td>multiple-use corridors for</td>
<td>riparian areas, south-facing aspects, and meadows (intent: avoid high</td>
</tr>
<tr>
<td>resource extraction activities</td>
<td>value habitat)</td>
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<tr>
<td></td>
<td>• upon cessation of tenure holder’s activities, return linear development</td>
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<td></td>
<td>(e.g. roads, pipeline and utility corridors - not seismic lines) to a</td>
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<td></td>
<td>vegetative state which over time approximates natural conditions using</td>
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<td></td>
<td>reclamation, rehabilitation, recontouring, bridge removal and where</td>
</tr>
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<td></td>
<td>possible, native species.</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td></td>
</tr>
<tr>
<td>maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)</td>
<td>identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td>maintain medium and high quality grizzly bear habitat</td>
<td>identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
</tr>
<tr>
<td></td>
<td>incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td></td>
<td>plan and develop access to avoid medium and high quality habitats and human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)</td>
</tr>
<tr>
<td>maintain caribou habitat</td>
<td>identify and map medium and high capability caribou habitat</td>
</tr>
<tr>
<td></td>
<td>incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors, into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA's)</td>
</tr>
<tr>
<td></td>
<td>develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource developments that may negatively affect critical medium and high capability caribou habitat</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td></td>
</tr>
<tr>
<td>maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>the general biodiversity emphasis is intermediate</td>
</tr>
<tr>
<td>Objectives</td>
<td></td>
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</tr>
<tr>
<td><strong>Biodiversity (cont'd)</strong></td>
<td></td>
</tr>
<tr>
<td>• minimize wildlife habitat fragmentation and maintain existing large mammalian predator-prey system</td>
<td></td>
</tr>
<tr>
<td><strong>Minerals</strong></td>
<td></td>
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<tr>
<td>• maintain opportunities for mineral exploration and development and allow for access.</td>
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<tr>
<td><strong>Fish</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td></td>
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<tr>
<td><strong>Water</strong></td>
<td></td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td></td>
</tr>
<tr>
<td>• maintain groundwater quality and quantity</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• identify and establish connectivity corridors at the landscape level.</td>
</tr>
<tr>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
</tr>
<tr>
<td>• provide input to more detailed planning as required</td>
</tr>
<tr>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td>• plan and develop access to minimize disturbances within riparian reserve zones and management areas</td>
</tr>
<tr>
<td>• identify priority watersheds for level I and/or level II watershed assessment to determine potential negative impacts to fish habitat</td>
</tr>
<tr>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td>• identify sensitive groundwater recharge areas</td>
</tr>
<tr>
<td>• manage resource development within sensitive groundwater recharge areas to minimize negative effects on groundwater quality and quantity</td>
</tr>
</tbody>
</table>
Grazing Reserves Resource Management Zone

This Resource Management Zone (RMZ) incorporates the five Grazing Reserves that are located on Crown land, within the Agriculture Settlement Area.

The RMZ encompasses three ecossections: the Clearhills, Peace Lowlands and Halfway Plateau. The Cecil Lake and Milligan Grazing Reserves, as well as part of the Beatton-Doig Community Pasture, are found in the Clearhills ecossection. Most of the Beatton-Doig Community Pasture and the Boundary Grazing Reserve are in the Peace Lowlands, while the Umbach Community Pasture falls entirely within the Halfway Plateau. Altogether, the five Grazing Reserves total 61,399 ha.

This zone is entirely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. This zone is managed using moderately intensive forest management. Aspen forest cover within several of the Grazing Reserves is targeted for future harvest.

Agriculture and range are the main resource activities in the RMZ. Demand for grazing land has been steadily increasing with the growing cattle population. The availability of large areas of land for grazing and forage has been instrumental in the growth of the industry in the North Peace District. Grazing tenures on Crown land meet the grazing needs of approximately one half of the District’s total cattle population base. The gross annual production value from animals supported by Crown grazing land is approximately $8.9 million.

Natural gas and oil exploration, and extraction activities are active within all five of the Grazing Reserves.

There is potential for industrial minerals, including sand and gravel.

High capability winter habitat exists for deer and moose. There are also important wetland habitats for waterfowl within the reserves and for priority fish species, such as Arctic grayling and red and blue-listed forage fish species, adjacent to the Grazing Reserves. There is some concern about the effects from grazing and resource development on the water quality of nearby, sensitive water bodies.

Hunting is the main recreation activity.

The grazing reserves lie within areas traditionally used by the Blueberry River and Doig River First Nations.
Grazing Reserves

Values:

<table>
<thead>
<tr>
<th>range</th>
<th>water</th>
<th>recreation</th>
<th>wildlife</th>
<th>oil and gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>fish</td>
<td>timber - hardwood/softwood</td>
<td>trapping</td>
<td>agriculture</td>
<td></td>
</tr>
</tbody>
</table>

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation
- allow exploration and development of resources within appropriate regulatory framework

TIMBER
- maintain timber harvesting and forest management opportunities
- quantify the timber harvesting land base and develop policies to reduce permanent loss of the timber harvesting land base to roads, landings, lines, well sites and other developments
- establish general forest production targets for landscape units within the Fort St. John Resource Management Zone (RMZ) consistent with moderate intensity management regimes.
- establish and maintain a permanent road infrastructure to facilitate an integrated resource management

RECREATION
- integrate recreational activities with grazing and resource extraction
- develop strategies in more detailed plans (e.g. landscape unit plans) to implement the wildlife management policies and management practices of land managers, to sustain wildlife and guide outfitting opportunities
- coordinate recreation through more detailed planning (e.g. Coordination Management Plans)

AGRICULTURE
- minimize or mitigate wildlife impact on agricultural enterprises
- develop a forage inventory for developing animal unit months (AUMs)
- encourage management plans to reduce wildlife/agriculture conflicts

RANGE
- maintain or enhance opportunities for livestock grazing
- encourage an increase in range production, giving preference to public use
- control the spread of noxious weeds
- implement noxious weed control plans and enforce the Weed Act
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS</td>
<td>- coordinate access and linear development to minimize negative effects on other resource values</td>
</tr>
<tr>
<td></td>
<td>- coordinate access at the Coordinated Resource Management Plan (CRMP) level</td>
</tr>
<tr>
<td>WILDLIFE</td>
<td>- identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>- consider establishing wildlife habitat areas (WHA's) at the landscape level on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>- manage critical wetland habitats for waterfowl and other wildlife species</td>
</tr>
<tr>
<td></td>
<td>- establish riparian reserves and management areas around identified critical wetland areas</td>
</tr>
<tr>
<td>BIODIVERSITY</td>
<td>- the general biodiversity emphasis is low</td>
</tr>
<tr>
<td>MINERALS</td>
<td>- maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
</tr>
<tr>
<td></td>
<td>- provide input to more detailed planning as required</td>
</tr>
<tr>
<td>FISH</td>
<td>- identify and map critical fish habitat information (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td></td>
<td>- incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>- plan and develop access to minimize disturbances within riparian reserve and riparian management areas</td>
</tr>
<tr>
<td>WATER</td>
<td>- sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
</tr>
<tr>
<td></td>
<td>- establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority stream rivers, lakes and wetlands</td>
</tr>
<tr>
<td></td>
<td>- incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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</tr>
<tr>
<td><strong>WATER (cont’d)</strong></td>
<td><strong>minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</strong></td>
</tr>
<tr>
<td>- promote water stewardship to manage for other resources</td>
<td>- manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
</tbody>
</table>
The Jedney RMZ lies in the heart of the planning area, just east of the Alaska Highway. From the Highway, the RMZ follows the Sikanni Chief River and the Conroy RMZ to the northeast. Jedney shares its eastern boundary with the Chinchaga and Osborn RMZs. The Agriculture Settlement Area lies to the south.

Three ecossections are represented: the Clearhills ecossection in the northeast, the Muskwa Plateau throughout the rest of the north and the Halfway Plateau in the south. The total land area is 540,399 hectares.

The RMZ falls predominantly within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Timber values are high for both coniferous and deciduous species. There has been extensive harvesting in the southern regions since the mid 1950's, and new forest plantations are well established on older cutblocks.

Numerous active gas tenures and a substantial gas infrastructure have been developed. Potential gas reserves are moderate to high.

There is potential for industrial minerals including sand, gravel, and coal along the western limits of the zone.

The northern portion contains extensive areas of high capability habitat for large mammals such as moose, caribou, grizzly bear and black bear. A variety of furbearers and birds are also present. The banks along the Beatton River contain important nesting sites that attract Trumpeter Swans each spring. Streams and rivers support most major sport fish including bull trout and Arctic grayling.

Several agricultural operations are scattered along the major river valleys and there is significant range activity in the southern portion.

All-weather roads and winter trails provide good access to most of the RMZ. The exception is the area to the east of Laprise Creek, which contains only seismic trails.

Heritage sites include the Nig Creek Hudson’s Bay Post and meat drying camps, the Old Alaska Highway, and historic air strips.

This RMZ lies in areas traditionally used by the Blueberry River First Nation.
## Fort St. John Land and Resource Management Plan

### Values:

<table>
<thead>
<tr>
<th>timber</th>
<th>oil and gas</th>
<th>First Nations values</th>
</tr>
</thead>
<tbody>
<tr>
<td>fish</td>
<td>minerals</td>
<td>trapping</td>
</tr>
<tr>
<td>agriculture</td>
<td></td>
<td>water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wildlife</td>
</tr>
<tr>
<td></td>
<td></td>
<td>recreation</td>
</tr>
</tbody>
</table>

### Objectives

**ENERGY**
- maintain opportunities and access for oil and gas exploration, development and transportation

**TIMBER**
- enhance timber harvesting and a sustainable long-term timber supply

**Strategies**
- allow exploration and development of resources within appropriate framework
- quantify the timber harvesting land base and develop policies to reforest (within appropriate time frames, as determined through planning) all potentially productive brush, non commercial deciduous NSR (not sufficiently restocked) areas with ecologically and economically suitable species while providing for critical wildlife habitat. Timbre recommended are 10 years for high priority areas and 20 years for priority areas.
- establish and maintain a permanent road infrastructure to facilitate integrated resource management
- encourage the utilization of pulp quality stands, and the pulp component stands slated for sawlog harvest
- where appropriate, vary cut-block adjacency requirements (in accord with Forest Practices Code and accepted silvicultural practices) to increase availability and reduce road requirements
- minimize losses from damaging agents through aggressive and predictable pest management, including the salvage of damaged or killed trees
- encourage afforestation and sustainable forest management of revivable low capability agricultural land
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TIMBER (CONT'D)</strong></td>
<td>• promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
</tr>
</tbody>
</table>

**RECREATION**

- provide a full range of recreation opportunities

**AGRICULTURE**

- provide opportunities for the growth of agriculture

- ensure the integrity of the Agricultural Land Reserve through the Agricultural Land Commission Act and Regulations and the Crown Agricultural Lease Policy

- allow Crown lands with suitable agriculture potential to be designated for agricultural development within the appropriate regulatory framework

**RANGE**

- maintain or enhance opportunities for livestock grazing

- develop range use plans according to Forest Practices Code

- minimize tree/ground/cattle conflicts through integrated management practices

**ACCESS**

- coordinate access and linear development to minimize negative effects on other resource values

- encourage shared access

- encourage deactivation and rehabilitation of unused roads, particularly within visible areas

- encourage consistent road construction standards between industries

- deactivate all new non-permanent access that is no longer required for resource management

- promote the development of multiple-use corridors for resource extraction activities

- where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)

**WILDLIFE**

- maintain fur-bearing habitat for priority species (e.g. fisher, marten, lynx)

- identify critical fur-bearing habitat and incorporate into lower level plans

- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)

- identify and map high capability ungulate wintering areas at the landscape level
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WILDLIFE (CONT'D)</strong></td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• consider establishing wildlife habitat areas (WHAs) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>• plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td>• the general biodiversity emphasis is low</td>
</tr>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td></td>
</tr>
<tr>
<td><strong>CULTURE AND HERITAGE</strong></td>
<td>• recommend an inventory of known resources (historical sites and trails) and designation of significant localities within the zone</td>
</tr>
<tr>
<td>• identify and provide for the protection of historical sites and trails</td>
<td></td>
</tr>
<tr>
<td><strong>MINERALS</strong></td>
<td>• provide input to more detailed planning as required</td>
</tr>
<tr>
<td>• maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
<td></td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td>• identify and map critical fish habitat information (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td></td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td>• sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>• establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
</tbody>
</table>
Kobes Creek Resource Management Zone

The Kobes Creek RMZ lies in the south-central part of the planning area. The southern and eastern boundaries follow Farrell Creek and the Fort St. John Forest District border. The northern boundary follows the Graham and Halvway Rivers and on the west it is bounded by the Graham South RMZ.

Most of the zone is in the Halfway Plateau ecossection, with a small portion in the Peace Lowlands and Peace Foothills ecossections. The total area is 101,709 hectares.

This zone is almost completely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Forest fires are frequent throughout the RMZ, leading to a variety of forest age classes. A very small part of the zone is within the Engelmann Spruce-Subalpine Fir (ESSF) and Alpine Tundra (AT) biogeoclimatic zones. Coniferous and deciduous timber values are high and extensive timber harvesting has occurred since the 1970's.

Abundant gas reserves have been located. There are numerous tenured parcels and a substantial petroleum infrastructure has been constructed. There is medium to high potential for future gas discovery.

There is good potential for coal in the zone and there are sand and gravel sources along the Halfway and Graham Rivers.

Habitats for priority furbearer species such as fisher, marten and lynx are found in the RMZ along with high capacity winter habitat for elk, deer, moose, caribou and Stone's sheep. The area has some of the best moose habitat in BC, with medium quality grizzly bear and caribou habitat. Bull trout, Arctic grayling, and other red and blue listed species among the priority sport fish species in the Kobes Creek area.

A large portion of this zone is within the Agricultural Land Reserve, but only a limited agricultural industry is primarily on private land. A number of large ranches are found along the Halfway and Graham rivers.

The Graham and Halfway Rivers provide a wide variety of recreational opportunities including fishing, jet-boat camping, canoeing and rafting. The most popular recreational pursuit is hunting.

The Halfway River First Nations community is located on the east side of the Halfway River Valley and the semipermanent logging camp west of Kobes Creek. The RMZ lies within areas traditionally used by the Halfway First Nation.
Kobes Creek

Values:
- timber-hardwood/softwood
- wildlife
- recreation
- water quality
- agriculture
- oil and gas
- trapping
- aggregate/industrial minerals
- visually sensitive area - Butler Ridge
- range/grazing
- fish

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation
- allow exploration and development of resources within appropriate regulatory framework
- maintain and enhance opportunities for environmentally responsible development of surface and subsurface resources

TIMBER
- enhance timber harvesting and a sustainable long-term timber supply
- quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- minimize losses to the timber harvesting land base
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with high intensity forest management regimes.
- reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.
- establish and maintain a permanent road infrastructure to facilitate long term integrated resource management
- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest
- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce road maintenance
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| **TIMBER (CONT’D)** |  - encourage afforestation and sustainable forest management of reverted and low capability agricultural land  
|  - promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels  |
| **RECREATION** |  - identify areas of high recreation use or significance and develop appropriate management strategies  
|  - develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities  
|  - incorporate existing recreational activities and access potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)  |
| **AGRICULTURE** |  - allow Crown lands with suitable agricultural potential to be designated for agricultural development and use within the appropriate regulatory framework  
|  - ensure the integrity of the Agricultural Land Reserve through the Agricultural Land Commission Act and Regulations and the Crown Agricultural Lease Policy  
|  - support the purpose and the intent of the Agricultural Land Reserve (ALR) and the conversion of high quality agricultural land through existing processes  |
| **ACCESS** |  - deactivate all new non-permanent access that is no longer required for resource management  
|  - where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)  |

- **Kobes Creek**
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCESS (CONT’D)</strong></td>
<td><strong>WILDLIFE</strong></td>
</tr>
<tr>
<td></td>
<td>• in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)</td>
</tr>
<tr>
<td></td>
<td>• upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, recontouring, bridge removal and where possible, native species.</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td>• identify critical furbearer habitat and incorporate into lower level plans</td>
</tr>
<tr>
<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)</td>
<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td>• maintain medium and high quality grizzly bear habitat</td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>• identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
</tr>
<tr>
<td></td>
<td>• incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td></td>
<td>• consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)</td>
</tr>
<tr>
<td></td>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively affect medium and high capability grizzly bear habitat</td>
</tr>
<tr>
<td></td>
<td>• minimize impacts on grizzly bear habitat by ensuring that critical habitat areas are linked by connectivity corridors or forest ecosystem networks (FEN’s) (where biologically and ecologically appropriate)</td>
</tr>
<tr>
<td></td>
<td>• maintain caribou habitat</td>
</tr>
<tr>
<td></td>
<td>• identify and map medium and high capability caribou habitat</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>WILDLIFE (CONT’D)</strong></td>
<td>• incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)</td>
</tr>
<tr>
<td></td>
<td>• encourage the use of silvicultural systems that minimize negative impacts on medium and high capability caribou habitat</td>
</tr>
<tr>
<td></td>
<td>• limit line of sight on linear access, such as seismic line cutting, in medium and high capability caribou habitat areas to minimize predator corridor opportunities</td>
</tr>
<tr>
<td></td>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource developments that may negatively affect critical medium and high capability caribou habitat</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BIODIVERSITY</th>
<th>• the general biodiversity emphasis is low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
</tr>
<tr>
<td></td>
<td>• minimize wildlife habitat fragmentation and maintain existing large mammalian predator - prey system</td>
</tr>
<tr>
<td></td>
<td>• restore and rehabilitate negatively affected ecosystems</td>
</tr>
<tr>
<td></td>
<td>• identify and establish connectivity corridors at the landscape level near or adjacent to Butler Ridge</td>
</tr>
<tr>
<td></td>
<td>• identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MINERALS</th>
<th>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• provide input to more detailed planning as required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FISH</th>
<th>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• plan and develop access to minimize disturbances within riparian reserve</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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</tr>
<tr>
<td><strong>Kobes Creek</strong></td>
<td></td>
</tr>
<tr>
<td><strong>FISH (CONT’D)</strong></td>
<td>• identify priority watersheds for Level I and II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
</tr>
<tr>
<td></td>
<td>• incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td></td>
<td>• determine equivalent clear-cut area (ECA) threshold levels for streams with bull trout and incorporate into landscape level plans</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>• minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</td>
</tr>
<tr>
<td>• sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
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</tr>
</tbody>
</table>
Osborn Resource Management Zone

The Osborn RMZ is located on the eastern boundary of the planning area, just north of the Agriculture Settlement Area. The western boundary follows the Beatton River and Milligan Grazing Reserve, and to the north is the Chinchaga RMZ.

This zone is entirely within the Clearhills ecossection and has a total land area of 231,642 hectares. The RMZ falls within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Frequent forest fires have led to a variety of forest age classes. Mature coniferous timber values are low to moderate. Significant amounts of first pass logging have been completed and most remaining timber is second or third pass.

Substantial oil and natural gas reserves have been located and the potential for future discoveries is moderately high. A large part of the zone has been tenured and a substantial infrastructure has been developed.

There is potential for industrial minerals, including sand and gravel.

Moderate moose and black bear populations can be found throughout the zone and caribou is found in the eastern areas. There is high capability habitat for lynx and other furbearers. This is an important central flyway area for migratory waterfowl. A variety of bird species including songbirds (some red or blue listed species), owls and waterfowl are found in the RMZ.

Agricultural activity is confined mainly to the border of the Agriculture Settlement Area RMZ.

All-weather access roads are scattered throughout the southern half of the zone. Remaining access is primarily through winter trails.

Recreational activities are mainly limited to hunting and winter snowmobiling.

This RMZ lies within areas traditionally used by the Doig River First Nation.
Values:

- timber
- wildlife
- fish
- oil and gas
- First Nations values
- grazing
- minerals
- trapping
- recreation
- water
- oil and gas
- First Nations values
- minerals
- recreation
- agriculture
- oil and gas
- First Nations values
- minerals
- recreation
- agriculture

Objectives

ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation

TIMBER
- enhance timber harvesting and a sustainable long-term timber supply

Strategies

- allow exploration and development of resources within appropriate regulatory framework
- quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes
- reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas
- establish and maintain a permanent road infrastructure to facilitate long term integrated resource management
- encourage the utilization of pulp quality stands and the pulp components of stands for sawlog harvest
- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce roading requirements
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- encourage afforestation and sustainable forest management of reverted and low capability agricultural land
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timber (cont’d)</strong></td>
<td></td>
</tr>
<tr>
<td>promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
<td></td>
</tr>
<tr>
<td><strong>Recreation</strong></td>
<td></td>
</tr>
<tr>
<td>incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)</td>
<td></td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
</tr>
<tr>
<td>maintain or increase land supply for agriculture including access to Crown Land</td>
<td></td>
</tr>
<tr>
<td>allow Crown lands with suitable agricultural potential to be designated for agricultural development and use within the appropriate regulatory framework</td>
<td></td>
</tr>
<tr>
<td>minimize or mitigate wildlife impact on agricultural enterprises</td>
<td></td>
</tr>
<tr>
<td>ensure the integrity of the Agricultural Land Reserve through the Agricultural Land Commission Act and Regulations and the Crown Agricultural Lease Policy</td>
<td></td>
</tr>
<tr>
<td>provide opportunities for the growth and expansion of the agriculture and food production industries</td>
<td></td>
</tr>
<tr>
<td>encourage management plans to reduce wildlife/agriculture conflicts</td>
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</tr>
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<td><strong>Range</strong></td>
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<td>maintain or enhance opportunities for livestock grazing</td>
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<td>support the purpose and the intent of the Agricultural Land Reserve (ALR) and the conversion of high quality agricultural land through existing processes</td>
<td></td>
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<tr>
<td><strong>Access</strong></td>
<td></td>
</tr>
<tr>
<td>develop range use plans according to Forest Practices Code</td>
<td></td>
</tr>
<tr>
<td>coordinate access and linear development to minimize negative effects on other resource values</td>
<td></td>
</tr>
<tr>
<td>encourage shared access</td>
<td></td>
</tr>
<tr>
<td>encourage consistent road construction standards between industries</td>
<td></td>
</tr>
<tr>
<td>deactivate all new non-permanent access that is no longer required for resource management</td>
<td></td>
</tr>
<tr>
<td>where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)</td>
<td></td>
</tr>
<tr>
<td><strong>Wildlife</strong></td>
<td></td>
</tr>
<tr>
<td>identify habitat (by ecossection and landscape unit, on a priority basis) for red and blue listed species (as identified by the Conservation Data Centre)</td>
<td></td>
</tr>
<tr>
<td>protect or enhance habitats for red and blue listed species</td>
<td></td>
</tr>
</tbody>
</table>
## Fort St. John Land and Resource Management Plan

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WILDLIFE (cont'd)</strong></td>
<td></td>
</tr>
<tr>
<td>- maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td>- incorporate appropriate habitat protection criteria, for red and blue listed species, into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td>- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
<td>- maintain the integrity of riparian forests along all streams and rivers in the Resource Management Zone</td>
</tr>
<tr>
<td>- maintain site specific habitats</td>
<td>- identify critical furbearer habitat and incorporate into more detailed plans</td>
</tr>
<tr>
<td>- manage critical wetland habitats for waterfowl and other wildlife species</td>
<td>- identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>- consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>- plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td></td>
<td>- maintain, where appropriate, visually screening buffers along major roads and transportation corridors</td>
</tr>
<tr>
<td></td>
<td>- address wildlife/agriculture conflicts in operational plans</td>
</tr>
<tr>
<td></td>
<td>- establish riparian reserves and management areas around critical wetland areas</td>
</tr>
</tbody>
</table>

**BIODIVERSITY**

- maintain functioning and healthy ecosystems in the Resource Management Zone

- the general biodiversity emphasis is intermediate

**CULTURE AND HERITAGE**

- protect heritage sites and trails

- identify and provide for the protection of historical sites and trails

- avoid activities that will impact known archaeological sites

- recommend an inventory of known resources (historical sites and trails) and designation of significant localities within the zone
<table>
<thead>
<tr>
<th><strong>MINERALS</strong></th>
<th><strong>STRATEGIES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
</tr>
<tr>
<td></td>
<td>• provide input to more detailed planning as required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>FISH</strong></th>
<th><strong>STRATEGIES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td></td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>WATER</strong></th>
<th><strong>STRATEGIES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>sustain natural stream flow regime (water quality, quantity and timing of flow)</td>
<td>• establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
</tr>
<tr>
<td></td>
<td>• minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Best Management Practices</td>
</tr>
<tr>
<td>promote water stewardship to manage for other resources</td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
</tbody>
</table>
Peace River Corridor Resource Management Zone

This Peace River Corridor RMZ forms the southern edge of the planning area. It follows the Peace River Valley along the southern boundary of the Fort St. John Forest District from Farrell Creek, east to the Alberta boundary.

This zone is entirely within the Peace Lowlands ecossection and has the mildest climate and the least amount of snowfall in the planning area. The Peace River Valley has the only prairie grassland habitat within the area and boasts several unique plant species. The total land area is 31,634 hectares.

Most of the area is within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone and includes some mixedwood aspen, spruce and pine forests. Forest activity is limited to logging on private lands.

Water quality is a major concern in this area. Hudson’s Hope, Taylor and several communities in Alberta take their water directly from the Peace River. Plans are now underway for the City of Fort St. John to use the Peace River as the City’s water source. The City’s water system will be connected to several wells that are adjacent to the river. The provincial Waste Management Act allows for waste water discharges into the Peace River from the Fibreco pulp mill in Fort St. John, the City of Fort St. John, the community of Charlie Lake, and Westcoast Energy.

Though they are outside of the planning area, the W.A.C. Bennett and Peace Canyon hydroelectric dams have dramatic effects on the hydrology of the Peace River by reducing spring flooding and ice formation along the valley; two dams use more water than any other industrial user in the region, to produce 31% of BC’s hydroelectric power. A third dam, called Site C, has been proposed for the Peace River. The proposed location is just downstream of the Mackenzie River and Peace River confluence, about 7 km southeast of Fort St. John. Plans for the new mega-project are currently in abeyance.

Proven gas reserves are being exploited, and there is a high potential for future gas discoveries throughout the corridor. There are concerns about the environmental impact of oil and gas development on human water supplies, sensitive wildlife and fish habitats. The industry’s environmental practices have improved in recent years. High standards of habitat protection are required for all new oil and gas developments, and a number of older sites have been impacted. Habitat protection strategies must be incorporated into all future development plans for the Peace River valley.

There is potential for industrial minerals, including sedimentary rocks and sediments such as shale, clay, and sand and gravel. There is shale and clay occurrence near Rolla Ferry north landing and sand and gravel occurrences, including an operating pit at Taylor.

This RMZ contains a substantial number of archaeological sites as well as historic sites.
The Peace River corridor contains some of the best agricultural land in the planning area, much of it privately owned. Market gardens, cereal crops, forage crops and pastures for livestock are all found near Taylor.

Twelve species of sport fish are present in the mainstem Peace River, downstream of the Peace Canyon dam between Hudson's Hope and Fort St. John. The most abundant are mountain whitefish, Arctic grayling, rainbow trout, lake whitefish and walleye. Bull trout, kokanee and northern pike are present in lower numbers.

Marshes along the river provide excellent habitat for nesting and migratory waterfowl. Some of the songbirds that regularly migrate through the area, are considered rare in the rest of BC. Mule and white-tailed deer are quite common and there are extensive areas of critical ungulate wintering habitat along the south-facing breaks of the Peace River and its major tributaries.

Visual quality is a major management objective along the Peace River. The river is heavily used by local residents who for boating, swimming, rafting, and fishing. The islands in the Peace River, and a site near Golata Creek are being proposed as Protected Areas.
## Peace River Corridor

### Values:
- water
- agriculture
- recreation
- wildlife
- visually sensitive areas
- minerals
- trapping
- oil and gas
- Protected Areas
- fish
- timber
- range
- culture and heritage

### Objectives

#### ENERGY
- maintain opportunities and access for oil and gas exploration, development and transportation

#### TIMBER
- manage for forest health

#### RECREATION
- provide quality public and commercial recreational opportunities and values
- provide tourism opportunities

#### AGRICULTURE
- recognize the high agricultural values within the Peace River corridor.

#### RANGE
- maintain livestock grazing opportunities on existing tenures

#### ACCESS
- coordinate access and linear development to minimize negative effects on other resource values

#### WILDLIFE
- protect or enhance habitats for red and blue listed species

### Strategies

- allow exploration and development of resources within appropriate regulatory framework
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- identify areas of high recreation use or significance and develop appropriate management strategies
- maintain public access to Peace River
- ensure integrity of the Agricultural Land Reserve through the Agricultural Land Commission Act and Regulations and the Crown Agricultural Lease Policy. Ensure that proposals for new agricultural tenures are investigated with respect to impacts on: future public access routes to the river, recreation and conservation values
- allow for the transfer and renewal of existing tenures
- encourage range management that promotes soil conservation
- applications for new agriculture and range tenures will be reviewed on a site specific basis, during more detailed planning
- encourage deactivation and rehabilitation of unused roads, particularly within visible areas
- identify habitat (by ecosite and landscape, unit on a priority basis) for red and blue listed species (as identified by the Conservation Data Centre)
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WILDLIFE (CONT'D)</strong></td>
<td><strong>Peace River Corridor</strong></td>
</tr>
<tr>
<td>- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
<td>- incorporate appropriate habitat protection criteria, for red and blue listed species, into landscape and stand level plans (as these criteria are developed)</td>
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<td>- identify and map high capability ungulate wintering areas at the landscape level</td>
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<td>- plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
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<tr>
<td><strong>BIODIVERSITY</strong></td>
<td><strong>the general biodiversity emphasis is intermediate</strong></td>
</tr>
<tr>
<td>- maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td><strong>CULTURE AND HERITAGE</strong></td>
</tr>
<tr>
<td></td>
<td>- identify all known culture and heritage sites within zone and develop appropriate management strategies</td>
</tr>
<tr>
<td></td>
<td>- inventory traditional trails, culture, heritage and archaeological sites within the zone</td>
</tr>
<tr>
<td><strong>MINERALS</strong></td>
<td><strong>FISH</strong></td>
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<tr>
<td>- maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
<td><strong>Fish</strong></td>
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<tr>
<td></td>
<td>- ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
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<td>- provide input to more detailed planning as required</td>
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<td></td>
<td>- encourage rehabilitative measures on visually sensitive areas</td>
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<td>- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
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</tr>
<tr>
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<td><strong>Strategies</strong></td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td></td>
</tr>
<tr>
<td>- maintain water quality in the Peace River</td>
<td>- establish instream flow requirements, lake volumes and stage, water levels and determine water quality baseline information for high flows, rivers, lakes and wetlands</td>
</tr>
<tr>
<td>- promote water stewardship to manage for other resources</td>
<td>- incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans</td>
</tr>
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<td>- minimize the negative effects of grazing on water quality by applying the Agricultural Code of Practice for Waste Management and the associated Management Practices</td>
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<td>- manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize the negative effects on water quality</td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td></td>
</tr>
<tr>
<td>- manage visually sensitive areas within the Peace River Valley</td>
<td>- a visual landscape inventory will be carried out by Ministry of Forests to determine the visual sensitivity of the scenic areas. Visual Quality Objectives will be established in accordance with the Ministry of Forests visual landscape management system. Forest practices proposed in those scenic areas will be assessed and carried out in the field consistent with achieving the Visual Quality Objectives.</td>
</tr>
<tr>
<td></td>
<td>- manage visually sensitive areas from both river and highway viewpoints</td>
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</table>
Major River Corridors Resource Management Zone

This RMZ includes major river valleys within the planning area. They are the Sikanni Chief, the Buckinghorse, the Halfway, the Bluegrave, Horseshoe Creek, the Chowade, the Lower Graham, the Cypress, the Graham, the Beatton, the Doig, the Cameron and the Osborn Rivers.

The Beatton, Halfway, Chowade, Doig, Cameron, Buckinghorse and Osborn River Valleys and the Bluegrave, Horseshoe and Cypress Creek Valleys, are within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. The Sikanni Chief River flows through the Spruce Willow Balsam (SWB), Alpine Tundra (AT) and Boreal White and Black Spruce (BWBS) biogeoclimatic zones.

Oil and gas and mineral exploration and development activities occur within these valleys. There is also potential for industrial minerals, including sand and gravel.

Riparian habitat is usually highly productive for timber, making it attractive for forest harvesting operations.

These river valleys and riparian habitats are vitally important for many species, especially fish, moose, ungulates and many birds. The forests are generally dense and moist with understorys dominated by shrubs and forbs. This makes them excellent habitats for many riparian species such as migratory songbirds. Seasonal flooding or high water tables routinely influence and enhance this habitat. Coarse woody debris from large fallen trees and snags provides areas for fur-bearers and bats, stabilizes streambeds and provides protective cover for fish. Wildlife species may also use riparian corridors for migration and daily travel. Riparian habitats provide high capability winter habitat for elk, deer, moose, caribou, mountain sheep and mountain goat. The Beatton, southern Halfway and Blueberry Rivers have significant low elevation habitat for mule deer and bison. The best grizzly bear habitat in the planning area is found in the Graham and northwest portion of Halfway River and medium capability habitat is found in the upper reaches of the Sikanni Chief, Buckinghorse, Halfway, Bluegrave, Horseshoe, Chowade, Cypress and Graham River Valleys.

All these rivers are important spawning sites for Arctic grayling, mountain whitefish and bull trout. The Beatton River drainage and Charlie Lake are important for pearl dace, a blue listed species. The Sikanni Chief, Buckinghorse, Halfway, Bluegrave, Horseshoe, Chowade, Cypress and Graham river systems are especially important to bull trout.

The many ranches within the river valleys use the land primarily for livestock grazing. Grazing can cause erosion, streambank degradation and losses to water quality in the sensitive riparian habitat areas.

Access control is an important management objective. An emphasis has been placed on deactivating and rehabilitating unused roads and on avoiding road construction in critical wildlife habitats. Within the Sikanni Chief, Buckinghorse, Halfway, Bluegrave, Horseshoe, Chowade, Cypress, and Graham Valleys there has been a trend to return road and pipeline developments to a natural vegetative state after permanent deactivation.

Traditional trails, heritage and archaeological sites occur within the valleys.

Visual quality is very important to maintaining the recreational values for river boating, canoeing, hunting, fishing and swimming.

Water quality is important as many of these rivers are the licensed water sources for many communities, First Nations bands and rural residents. The only major permitted discharges are to the Beatton River by the City of Fort St. John.

The Halfway River First Nation, Blueberry River First Nation, and the Doig River First Nation make their homes along the banks of the rivers that share their names.
Major River Corridors

<table>
<thead>
<tr>
<th>timber</th>
<th>agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>recreation</td>
<td>water</td>
</tr>
<tr>
<td>culture and heritage</td>
<td>trapping</td>
</tr>
</tbody>
</table>

**Values:**
- fish
- minerals (aggregate)
- guide outfitting
- First Nations
- range
- oil and gas
- visual quality
- wildlife habitat

**Objectives**

**Energy**
- maintain opportunities and access for oil and gas exploration, development and transportation

**Strategies**
- allow exploration and development of resources within appropriate regulatory framework
- maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources
- promote low impact seismic exploration
- ensure that oil and gas exploration and development activities are undertaken with sensitivity to wildlife and wildlife habitat
- promote site specific assessments to minimize number of wells in riparian areas

**Timber**
- maintain timber harvesting and forest management opportunities

**Energy**
- quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, wellsites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes
- reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.
- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce roading requirements

**Timber**
- manage for forest health
- minimize losses from damaging agents through aggressive and prompt fire
<table>
<thead>
<tr>
<th>Major River Corridors</th>
<th>Objectives</th>
<th>Strategies</th>
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<tbody>
<tr>
<td><strong>TIMBER (CONT’D)</strong></td>
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<tr>
<td></td>
<td>promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
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<thead>
<tr>
<th>RECREATION</th>
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<tbody>
<tr>
<td>provide quality public and commercial recreational opportunities and values</td>
<td>identify areas of high recreation use or significance and develop appropriate management strategies</td>
<td></td>
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<tr>
<td>provide a full range of recreation opportunities</td>
<td>incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)</td>
<td></td>
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<tr>
<td></td>
<td>maintain public access to rivers</td>
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<thead>
<tr>
<th>AGRICULTURE</th>
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<tr>
<td>provide opportunities for the growth and expansion of the agriculture and food production industries</td>
<td>support the purpose and the intent of the Agricultural Land Reserve (ALR) and the conversion of suitable land to agricultural use through existing processes</td>
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<th>RANGE</th>
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<tbody>
<tr>
<td>maintain or enhance opportunities for livestock grazing</td>
<td>develop range use plans according to Forest Practices Code</td>
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<td></td>
<td>minimize tree/grass/cattle conflicts through integrated management practices</td>
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<thead>
<tr>
<th>ACCESS</th>
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<tbody>
<tr>
<td>coordinate access and linear development to minimize negative effects on other resource values</td>
<td>encourage shared access</td>
<td></td>
</tr>
<tr>
<td>manage access to protect significant riparian habitats, fish, wildlife and visual quality</td>
<td>encourage deactivation and rehabilitation of unused roads, particularly within visible areas</td>
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<tr>
<td></td>
<td>coordinate access at the Coordinated Resource Management Plan (CRMP) level</td>
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<td></td>
<td>maintain existing access including provisions for upgrading</td>
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<tr>
<td></td>
<td>deactivate all temporary linear developments</td>
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<tr>
<td></td>
<td>minimize new access development</td>
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<tr>
<td></td>
<td>deactivate all new non-permanent access that is no longer required for resource management (intent: minimize effects of roads on wildlife and wildlife habitat)</td>
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</table>
### Major River Corridors

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<th>Objectives</th>
<th>Strategies</th>
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<tbody>
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<td><strong>ACCESS (CONT'D)</strong></td>
<td>• promote the development of multiple-use corridors for resource extraction activities</td>
</tr>
<tr>
<td></td>
<td>• where reasonable alternatives exist, avoid building roads through riparian areas, south-facing aspects and meadows (intent: avoid high value habitats)</td>
</tr>
<tr>
<td></td>
<td><strong>Sikanni, Buckinghorse, Halfway, Bluegrave, Horseshoe, Chowade, Cypress, Lower Graham Valleys also include:</strong></td>
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<td></td>
<td>• upon cessation of tenure holder’s activities, return linear industrial developments (roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using techniques such as reclamation, rehabilitation, recontouring, bridge removal, and where possible the use of native species</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>• plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td></td>
<td>• maintain, where appropriate, visually screening buffers along major roads and transportation corridors</td>
</tr>
<tr>
<td></td>
<td>• identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
</tr>
<tr>
<td></td>
<td>• incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td><strong>maintain site specific habitats</strong></td>
<td><strong>maintain medium and high quality grizzly bear habitat</strong></td>
</tr>
<tr>
<td><strong>Sikanni, Buckinghorse, Halfway, Bluegrave, Horseshoe, Chowade, Cypress and Graham also include:</strong></td>
<td><strong>maintain site specific habitats</strong></td>
</tr>
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- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat).
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<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WILDLIFE (cont’d)</strong></td>
<td>• plan and develop access to avoid, where possible, medium and high quality habitats and human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)</td>
</tr>
<tr>
<td></td>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively affect medium and high capability grizzly bear habitat</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td>• the general biodiversity emphasis is intermediate</td>
</tr>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td></td>
</tr>
<tr>
<td><strong>CULTURE AND HERITAGE</strong></td>
<td>• inventory traditional trails, culture, heritage and archaeological sites within the zone</td>
</tr>
<tr>
<td>• identify and provide for the protection of historical sites and trails</td>
<td>• recommend an inventory of known resources (traditional trails, and historical sites) and designation of significant localities within the zone</td>
</tr>
<tr>
<td><strong>MINERALS</strong></td>
<td>• ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values</td>
</tr>
<tr>
<td>• maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access</td>
<td>• provide input to more detailed planning as required</td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• plan and develop access to minimize disturbances with riparian reserve zones and management areas</td>
</tr>
<tr>
<td></td>
<td>• identify priority watersheds for Level I and Level II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
</tr>
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</table>
### Major River Corridors

<table>
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<tbody>
<tr>
<td><strong>FISH (CONT’D)</strong></td>
<td>Sikanni, Buckinghorse, Halfway, Bluegrass, Chowade, Cypress, Lower</td>
</tr>
<tr>
<td></td>
<td>incorporate habitat protection criteria for bull trout into landscape and level plans (as these criteria are developed)</td>
</tr>
</tbody>
</table>

**WATER**
- sustain natural stream flow regime (water quality, quantity and timing of flow)
- establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high value streams, rivers, lakes and wetlands
- incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans
- minimize the negative effects of grazing on water quality by applying Agricultural Codes of Practice for Waste Management and the associated Best Management Practices
- promote water stewardship to manage for other resources
- manage resource development adjacent to sensitive water bodies, wetlands, rivers and streams to minimize negative effects on water quality

**LOCAL GOVERNMENT**
- ensure that all land and resource management planning activities within the planning area (including, where appropriate, more detailed plans), allow for consultation with, and incorporate the input of, local municipal governments (rural and urban)
- recognize Official Community Plans established by local municipalities

**VISUAL QUALITY**
- manage visually sensitive areas as scenic areas (including travel and recreation corridors as identified by the Ministry of Forests visual landscape inventory)
- manage visually sensitive areas from both river and highway viewpoints
Lower Sikanni - Fontas Valley Resource Management Zone

The Lower Sikanni - Fontas Valley Resource Management Zone consists of two river corridors: the Sikanni Chief River Valley from the proposed Sikanni Canyon Protected Area to the proposed Sikanni Old Growth Protected Area in the north-central area; and the Fontas River Valley from the Fort St. John Forest District boundary to the Ekwan Lake proposed Protected Area in the northeast.

The northern part of this zone falls within the Fort Nelson Lowland ecossection while the southern part is within the Muskwa Plateau ecossection. The cumulative land area is 42,384 hectares.

The RMZ is entirely within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Infrequent forest fires have created forests of older age classes. Forest stands in the valleys tend to be older than those on the plateau since fires are less common in the valley bottoms. Timber values are high in merchantable timber species such as aspen, spruce and pine.

Natural gas exploration and development are active and the area has moderately high levels of potential gas reserves.

There is potential for industrial minerals, including sand and gravel.

The unique large river riparian ecosystems have moderate to high biological diversity. They are very productive for large mammals and furbearing species. Moderate populations of moose, black bear and wolves are found within the valleys.

The BC Rail line that intersects the zone is used for the transportation of timber and other freight. While there is no summer road access, logging and oil roads provide some winter access. Seasonal airstrips exist at both Kahntah and Niteal Creek.

This zone has three Goal 2 Proposed Protected Areas within its boundaries. They include the Ekwan Lake proposed Protected Area in the northeast, the Sikanni Old Growth proposed Protected Area in the northwest and the Sikanni Canyon proposed Protected Area in the south. Visual quality within these areas is very important.

Part of the zone is used by a guide outfitter but current recreation use is low because of poor access.

A small, permanent First Nations community, part of the Fort Nelson First Nation, is located at the junction of the Fontas and Kahntah Rivers.
### Lower Sikanni - Fontas Valley

**Values:**
- Wildlife
- Oil and gas
- Recreation
- Fish
- First Nations
- Timber
- Minerals (aggregate)
- Water

**Goal 2 Proposed Protected Areas - Sikanni Old Growth, Sikanni Canyon, Ekwan Lake**

### Objectives

**Energy**
- Maintain opportunities and access for oil and gas exploration, development and transportation

**Strategies**
- Allow exploration and development of resources within appropriate regulatory framework
- Maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources
- Promote low impact seismic exploration
- Ensure oil and gas exploration activities are undertaken with sensitivity to wildlife and wildlife habitats
- Promote site specific assessments to minimize number of wells in areas

**Timber**
- Maintain timber harvesting and forest management opportunities

**Strategies**
- Quantify the timber harvesting land base and develop policies to reduce loss of the timber harvesting land base to roads, landings, seismic well sites and other developments
- Establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with low intensity forest management regimes
- Establish and maintain a permanent road infrastructure to facilitate forest integrated resource management
- Minimize losses from damaging agents through aggressive and integrated fire and pest management, including the salvage of damaged or lost timber
- Promptly and aggressively reforest and manage cutovers and wildfires affecting the timber harvesting land base, to maintain sustainable timber harvest
## Lower Sikanni - Fontas Valley

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RECREATION</strong></td>
<td></td>
</tr>
<tr>
<td>• provide quality public and commercial recreational opportunities and values</td>
<td>• identify areas of high recreation use or significance and develop appropriate management strategies</td>
</tr>
<tr>
<td>• provide a full range of recreation opportunities</td>
<td>• incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)</td>
</tr>
<tr>
<td>• coordinate access and linear development to minimize negative effects on other resource values</td>
<td>• maintain public access to rivers</td>
</tr>
<tr>
<td>• manage access to protect significant wildlife and riparian areas</td>
<td>• encourage deactivation and rehabilitation of unused roads, particularly within visible areas</td>
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<td>• where appropriate, require winter access unless a need for all season access can be conclusively demonstrated through more detailed planning</td>
</tr>
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<td></td>
<td>• deactivate all new non-permanent access that is no longer required for resource management (intent: minimize effects of roads on wildlife and wildlife habitat)</td>
</tr>
<tr>
<td></td>
<td>• where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)</td>
</tr>
<tr>
<td></td>
<td>• upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, recontouring, bridge removal and where possible, native species.</td>
</tr>
<tr>
<td></td>
<td>• a more detailed planning process will identify significant fish and wildlife and other resource values. Where there is a significant risk that these resources may be impacted, access may be limited, restricted or, in special circumstances, prohibited.</td>
</tr>
<tr>
<td><strong>WILDLIFE</strong></td>
<td></td>
</tr>
<tr>
<td>• maintain furbearer habitat for priority species (e.g. marten, lynx)</td>
<td>• identify critical furbearer habitat and incorporate into more detailed plans</td>
</tr>
<tr>
<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep, and mountain goat)</td>
<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td>Objectives</td>
<td>Strategies</td>
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<tr>
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</tbody>
</table>
| **WILDLIFE (cont'd)** | • consider establishing wildlife habitat areas (WHA's) at the landscape level, on a priority basis, to protect critical wintering habitat  
• plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats  
• maintain site specific habitats | • develop and implement strategies at the landscape level to maintain site specific habitats |
| **BIODIVERSITY** | • the general biodiversity emphasis is high  
• this Resource Management Zone is a high priority for the initiation of landscape level planning. Landscape level plans will identify and map a number of ecosystem attributes (e.g. rare ecosystems, habitats and plant communities, ecosphere representation, biogeoclimatic zones and variants, wildlife habitat classes, critical habitats, environmentally sensitive and wildlife habitat areas for identified wildlife) and incorporate strategies to sustain these attributes |
| **CULTURE AND HERITAGE** | • inventory traditional trails, culture, heritage and archaeological sites within the zone  
• recommend an inventory of known resources (historical and palaeontological sites) and designation of significant localities within the zone |
| **MINERALS** | • ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values  
• provide input to more detailed planning as required |
| **FISH** | • identify and map critical fish habitat i (e.g. pools, migration patterns, spawning and rearing areas)  
• incorporate the protection of fish and fish habitat into landscape plans  
• plan and develop access to minimize disturbances within riparian reserve zones and management areas |
<table>
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<tr>
<td><strong>FISH (CONT'D)</strong></td>
<td>• identify priority watersheds for Level I and Level II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
</tr>
<tr>
<td>• maintain high quality fisheries in natural settings</td>
<td>• incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td></td>
<td>• minimize permanent access to remote lakes, streams and rivers with high quality fisheries</td>
</tr>
</tbody>
</table>
Trutch Creek Resource Management Zone

The Trutch Creek Resource Management Zone is located along the northern edge of the planning area, between the Alaska Highway Corridor on the west and the Sikanni Chief River on the south and east. This zone also includes the area known as the Sikanni Buckinghorse triangle.

Most of the land is within the Muskwa Plateau ecoregion but a small area to the north falls into the Fort Nelson Lowlands ecoregion. The total land area is 337,497 hectares.

The RMZ is classified within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Forest fires are frequent and have kept the forest stands distributed in a variety of age classes. Moderate timber values are confined to river and creek valleys and well drained areas. Timber harvesting activities in the zone have been minimal.

Most of the land is owned by the Crown; there is some scattered private land and a settlement along the Alaska Highway. There is no agricultural activity.

Substantial gas reserves are being exploited and an infrastructure has developed. The potential for future gas discoveries is high.

There is potential for industrial minerals, including sand, gravel, and coal along the western limits of the zone. Important gravel reserves also exist.

Some very productive areas for large mammalian species, such as mountain goat, grizzly bear, Stone’s sheep, mos caribou habitat are found throughout the zone. The streams and rivers support most major sport fish including bull and Arctic grayling.

Access is limited, however there is a major all-weather road at Mason Creek as well as extensive seismic lines.

Recreational pursuits include snowmobiling, ATVing, fishing, and recreational hunting. During the fall months, caribou is common throughout the zone. The entire zone has been licensed to a guide outfitter.

Archaeological sites within the zone include First Nations grave sites. This RMZ lies within areas traditionally used by Prophet River First Nations.
<table>
<thead>
<tr>
<th>Timber</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>timber</td>
<td>fish</td>
</tr>
<tr>
<td>water</td>
<td>recreation</td>
</tr>
<tr>
<td>minerals (aggregate, industrial)</td>
<td>visual quality</td>
</tr>
<tr>
<td>trapping</td>
<td>wildlife</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objectives</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ENERGY</td>
<td>• maintain opportunities and access for oil and gas exploration, development and transportation</td>
</tr>
<tr>
<td></td>
<td>• allow exploration and development of resources within appropriate regulatory framework</td>
</tr>
<tr>
<td></td>
<td>• ensure that oil and gas exploration and development activities are undertaken with sensitivity to wildlife and wildlife habitat</td>
</tr>
<tr>
<td>TIMBER</td>
<td>• maintain timber harvesting and forest management opportunities</td>
</tr>
<tr>
<td></td>
<td>• quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments</td>
</tr>
<tr>
<td></td>
<td>• establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes</td>
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<tr>
<td></td>
<td>• encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest</td>
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<tr>
<td></td>
<td>• where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code and accepted silvicultural practices) to increase timber availability and reduce roading requirements</td>
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<tr>
<td></td>
<td>• minimize losses to the timber harvesting land base</td>
</tr>
<tr>
<td></td>
<td>• promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels</td>
</tr>
<tr>
<td>RECREATION</td>
<td>• develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities</td>
</tr>
<tr>
<td></td>
<td>• manage existing tenures and manage the associated grazing activities of guide outfitters to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)</td>
</tr>
</tbody>
</table>
### Recreation (cont'd)
- provide a full range of recreation opportunities
- maintain and enhance ecological integrity in areas subject to resource impacts from recreational use
- maintain opportunities for commercial and non-commercial livestock grazing associated with recreation

### Strategies
- incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)
- more detailed plans will address the effects of recreational activity on ecological integrity (e.g. wildlife disruption, damage to plant communities and water quality)
- develop a grazing plan to address issues of forage allocation among tenured users, residents and wildlife
- identify and manage appropriate grazing management activities (e.g. burns)

### Range
- maintain or enhance opportunities for livestock grazing

### Access
- coordinate access and linear development to minimize negative effects on other resource values

### Strategies
- encourage consistent road construction standards between industries
- deactivate all new non-permanent access that is no longer required for resource management
- where reasonable alternatives exist, avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)
- upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipelines and utility corridors - not seismic lines) to a vegetative state which, over time, approximates natural conditions using reclamation, rehabilitation, recontouring, bridge removal, and where possible, native species

### Wildlife
- maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)
- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)

### Strategies
- identify critical furbearer habitat and incorporate into more detailed plans
- identify and map high capability ungulate wintering areas at the landscape level
- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans
<table>
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<th>Objectives</th>
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<tbody>
<tr>
<td><strong>WILDLIFE (cont’d)</strong></td>
<td>• consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td>• maintain medium and high quality grizzly bear habitat</td>
<td>• plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td>• identify and map medium and high quality grizzly bear habitat, at the landscape level on a priority basis</td>
<td>• incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td>• consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)</td>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively affect medium and high capability grizzly bear habitat</td>
</tr>
<tr>
<td>• maintain site specific habitats</td>
<td>• develop and implement strategies at the landscape level to maintain site specific habitats</td>
</tr>
</tbody>
</table>

**Biodiversity**

- maintain functioning and healthy ecosystems in the Resource Management Zone
- the **general** biodiversity is intermediate
- this Resource Management Zone is a high priority for the initiation of landscape level planning. Landscape level plans will identify and map a number of ecosystem attributes (e.g. rare ecosystems, habitats and plant communities, ecosite representation, biogeoclimatic zones and variants, wildlife habitat classes, critical habitats, environmentally sensitive and wildlife habitat areas for identified wildlife) and incorporate strategies to sustain these attributes

- minimize wildlife habitat fragmentation
- identify and maintain existing predator-prey systems through the identification and establishment of connectivity corridors at the landscape level
<table>
<thead>
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<tr>
<td><strong>CULTURE AND HERITAGE</strong></td>
<td></td>
</tr>
<tr>
<td>• protect heritage sites and trails</td>
<td>• avoid activities that will impact known archaeological sites</td>
</tr>
<tr>
<td>• identify and provide for the protection of historical sites and trails</td>
<td>• recommend an inventory of known resources (historical sites and trails) and designation of significant localities within the zone</td>
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<td><strong>MINERALS</strong></td>
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<td>• maintain opportunities for mineral exploration and development (particularly aggregates and industrial minerals) and allow for access.</td>
<td>• provide input to more detailed planning as required</td>
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<td><strong>FISH</strong></td>
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<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
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<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
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<td>• plan and develop access to minimize disturbances within riparian reserve zones and management areas</td>
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<td>• identify priority watersheds for Level I and II watershed assessment to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
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<td>• incorporate habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
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<td><strong>WATER</strong></td>
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</tr>
<tr>
<td>• promote water stewardship to manage for other resources</td>
<td>• manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality</td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td></td>
</tr>
<tr>
<td>• manage visually sensitive areas identified as scenic areas (including travel and recreation corridors as identified by the Ministry of Forests visual landscape inventory)</td>
<td>• manage visually sensitive areas adjacent to designated Proposed Protected Areas, maintaining the values identified in the Protected Areas Strategy</td>
</tr>
</tbody>
</table>
Two Bit Creek Resource Management Zone

The Two Bit Creek Resource Management Zone is located in the west-central portion of the planning area. It is bounded on the east by the Alaska Highway and the west by the Besa-Halfway-Chowade RMZ. The north boundary is the Sikanni Chief River while the southern boundaries are the Upper Cameron RMZ and the Bluegrave-Horseshoe RMZ.

The Muskwa Plateau, Muskwa Foothills and Halfway Plateau ecossections are represented. The total land area is 85,394 hectares.

The Spruce-Willow-Birch (SWB) and Alpine Tundra (AT) biogeoclimatic zones make up the northern areas. The south is mainly within the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. Coniferous timber values are high and deciduous values are moderate.

The community of Pink Mountain and several large ranches such as the Boring Ranch and the Brady Ranch are located here.

Proven gas reserves are high and there are excellent prospects for future development. A substantial infrastructure of pipelines and processing facilities has been built.

The zone has industrial mineral potential classified as 3, 5 and 6/10. There is good coal potential and one coal prospect at Pink Mountain has numerous seams up to 3.7 metres thick.

There is high capability habitat for moose, caribou and grizzly bear. The area supports a diversity of large mammal species in high densities, including moose, caribou, white-tail deer, mule deer and elk along with wolves, black bear, wolverine, coyote, cougar and furbearers. Most major sport species of fish occur in the Sikanni Chief River system.

Much of this zone is roaded. There is special concern regarding road construction in high value habitat areas, such as the Sikanni Chief River and in sub-alpine and alpine areas. The Alaska Highway and Upper Halfway Road are important travel corridors through the zone, and both are visually sensitive.

Camping, hunting and fishing are the primary recreation activities within this zone.

This RMZ lies within areas traditionally used by the Halfway River First Nation.
## Two Bit Creek

**Values:**
- gas potential
- wildlife habitat
- fish
- guide outfitting
- timber values
- water quality
- backcountry recreation
- wilderness values
- trapping
- mineral potential
- range
- First Nations
- agriculture

### Objectives

**ENERGY**
- maintain opportunities and access for oil and gas exploration, development and transportation

**TIMBER**
- maintain timber harvesting and forest management opportunities

### Strategies

- allow exploration and development of resources within appropriate regulatory framework
- maintain and enhance opportunities for environmentally responsible development of surface and sub-surface resources
- encourage efficient and rational subsurface resource development to minimize surface disturbances and maximize subsurface resource utilization
- quantify the timber harvesting land base and develop policies to reduce the loss of the timber harvesting land base to roads, landings, seismic lines, well sites and other developments
- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with moderate intensity forest management regimes.
- reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.
- encourage the utilization of pulp quality stands, and the pulp components of stands slated for sawlog harvest
- minimize losses from damaging agents through aggressive and prompt fire and pest management, including the salvage of damaged or killed timber
- promptly and aggressively reforest and manage cutovers and wildfires, within the timber harvesting land base, to maintain sustainable timber harvest levels
### Two Bit Creek

#### RECREATION
- **Objectives**
  - provide quality public and commercial recreational opportunities and values
  - provide a full range of recreation opportunities
  - maintain and enhance ecological integrity in areas subject to resource impacts from recreational use

- **Strategies**
  - manage visually sensitive areas associated with trail systems, campsites and special features, in recreation sites
  - identify areas of high recreation use or significance and develop appropriate management strategies
  - new access will be planned to minimize negative effects on existing scenic commercial and non-commercial recreational values
  - develop strategies in more detailed plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities
  - seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. A Recreation Use Plan is recommended to address this issue
  - incorporate existing recreational activities and assess potential for the development of new recreational opportunities in more detailed plans (additional motorized recreational pursuits, etc.)
  - more detailed plans will address the effects of recreational activity on ecological integrity (e.g. wildlife disruption, damage to plant communities and water quality)

#### AGRICULTURE
- **Objectives**
  - maintain or increase land supply for agriculture including access to Crown Land
  - minimize or mitigate wildlife impact on agricultural enterprises

- **Strategies**
  - allow Crown lands with suitable agricultural potential to be designated for agricultural development and use within the appropriate regulatory framework
  - encourage management plans to reduce wildlife/agriculture conflicts

#### RANGE
- **Objectives**
  - maintain or enhance opportunities for livestock grazing
  - maintain livestock grazing opportunities on existing tenures

- **Strategies**
  - develop range use plans according to the Forest Practices Code
  - encourage an increase in range production, giving preference to integrated use
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCESS</strong></td>
<td><strong>STRATEGIES</strong></td>
</tr>
<tr>
<td>• coordinate access and linear development to minimize negative effects on other resource values</td>
<td>• promote the development of multiple-use corridors for resource extraction activities</td>
</tr>
<tr>
<td>• manage access to protect alpine areas</td>
<td>• where reasonable alternatives exist avoid building roads through riparian areas, south-facing aspects, and meadows (intent: avoid high value habitat)</td>
</tr>
<tr>
<td></td>
<td>• maintain existing access management regulations with provisions for future restrictions on Little Pink and Little Butler mountains</td>
</tr>
<tr>
<td></td>
<td>• upon cessation of tenure holder’s activities, return linear development (e.g. roads, pipeline and utility corridors - not seismic lines) to a vegetative state which over time approximates natural conditions using reclamation, rehabilitation, recontouring, bridge removal and where possible, native species.</td>
</tr>
</tbody>
</table>

**WILDLIFE**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• maintain high capability ungulate winter habitat (e.g. elk, deer, moose, caribou, mountain sheep and mountain goat)</td>
<td>• identify and map high capability ungulate wintering areas at the landscape level</td>
</tr>
<tr>
<td></td>
<td>• incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into landscape level plans</td>
</tr>
<tr>
<td></td>
<td>• consider establishing wildlife habitat areas (WHA’s) at the landscape level, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td></td>
<td>• plan and develop new access routes to avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitats</td>
</tr>
<tr>
<td></td>
<td>• identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
</tr>
<tr>
<td></td>
<td>• incorporate habitat protection criteria for grizzly bears, into landscape and stand level plans (as these criteria are developed)</td>
</tr>
<tr>
<td>• maintain medium and high quality grizzly bear habitat</td>
<td>• plan and develop access to avoid, where possible, medium and high quality habitats and human/bear interactions (possibly including, but not limited to: winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)</td>
</tr>
</tbody>
</table>
## WildLife (cont’d)

- maintain caribou habitat
  - identify and map medium and high capability caribou habitat
  - incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors, into landscape level plans
  - consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA’s)

## Biodiversity

- maintain functioning and healthy ecosystems in the Resource Management Zone
  - the general biodiversity emphasis is intermediate
- minimize wildlife habitat fragmentation
  - identify and maintain existing predator-prey systems through the identification and establishment of connectivity corridors at the landscape level

## Minerals

- maintain opportunities for mineral exploration and development and allow for access
  - ensure mineral exploration activities are undertaken with sensitivity to visual and recreation values
  - provide input to more detailed planning as required

## Fish

- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)
  - identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)
  - incorporate the protection of fish and fish habitat into landscape level plans
  - plan and develop access to minimize disturbances within riparian reserve zones and management areas

## Water

- promote water stewardship to manage for other resources
  - manage resource development adjacent to sensitive water bodies, lakes, wetlands, rivers and streams to minimize negative effects on water quality
4.0 PROTECTED AREAS

4.1 Background

In 1993, the Province formalized the Protected Areas Strategy for British Columbia. The strategy was designed to expand the system of Protected Areas from 6% to 12% of the province's land base by the year 2000.

There are two distinct types of Protected Areas.

- Goal 1 Protected Areas are established for representativeness. They may protect viable, representative examples of the natural diversity of the province such as major terrestrial, marine and freshwater ecosystems, characteristic habitats, hydrology and landforms, and/or characteristic backcountry recreation culture and heritage values of each ecossection.

- Goal 2 Protected Areas represent special features. They are set aside to protect the special natural, cultural and heritage and recreational sites, including rare and endangered species and critical habitats, outstanding unique botanical, zoological, geological and palaeontological features, outstanding or fragile cultural heritage features, and outstanding outdoor recreational features such as trails.

In June 1995, the Land Use Coordination Office (LUCO) directed the seven established LRMP's and the Macet Planning Table in the Prince George Forest Region to recommend an aggregate of 9% of the region for Protection Status. The Fort St. John LRMP Table was later directed to provide 4% of its planning area toward the regional goal of 9%. Prior to completion of the Fort St. John LRMP, only 0.09% of the planning area land base was in Protected Areas.

Potential Protected Areas were identified through the Regional Protected Area Team (RPAT), a group of representatives from local government agencies. RPAT identified a set of Areas of Interest (AOI's) which met the Goal 1 and Goal 2 requirements. The LRMP Table then used this information to finalize proposed Protected Area boundaries and priorities for areas for protection.

Future planning processes are expected to provide further operational detail to the stated LRMP objectives and strategies for each proposed Protected Area.

The Fort St. John LRMP recognizes that trapping, hunting, fishing and guide outfitting are acceptable uses within proposed Protected Areas. Where tenured activity is permitted, it is assumed to include the provision for transfer in accordance with existing policies.

The Fort St. John LRMP Table is proposing 11 areas for Protection Status, which total 4.3 percent of the land base 202,258 hectares. The Table believes these areas are worthy of protection and that they meet the objectives of the Protected Area Strategy.

4.2 Proposed Protected Areas Within the Fort St. John LRMP

Eleven Goal 1 and Goal 2 areas have been proposed for protection. They vary in size from 102 hectares to 100 hectares. They represent a diverse sample of the local landscape and are meant to capture a sample of the ecological, recreational and cultural values found within the planning area. The Chinchaga, Redfern-Keily and Ekwan Lake areas were recommended for protection by First Nations.
4.2.1 PEACE RIVER - BOUDREAU PROPOSED PROTECTED AREA

The Peace River - Boudreau proposed Protected Area is located southwest of the City of Fort St. John. It incorporates a major portion of the southerly bank of the Peace River Valley, Boudreau Lake, the lower Moberly River Valley and the islands at the confluences of Maurice Creek and the Moberly Rivers with the Peace River.

This proposed Goal 1 Protected Area is shared between the Fort St. John and Dawson Creek LRMPs. The islands located within the Peace River are within the Fort St. John Forest District while the balance of the lands within the proposal are within the Dawson Creek Forest District.

The key features of the area include:

- representation of the Peace Lowland Ecossection
- representation of the moist warm variant of the Boreal White and Black Spruce (BWBSmw1) biogeoclimatic zone
- an important historic site - the location of the first European settlement in mainland British Columbia known as Rocky Mountain Fort
- several archaeological sites of significance
- a portion of a historical travel corridor, the Peace River
- a significant portion of mixed species forest typical of this biogeoclimatic zone and the Peace River Valley
- alluvial cottonwood - spruce ecosystems
- critical swan nesting sites near pothole lakes
- a large proportion of the area is high capability ungulate winter range
- the proposed area has regionally important recreation values (boating, canoeing, hunting, fishing, bird watching, etc.)

The proposal captures significant petroleum resources and potential resource development. It also captures a portion of the area currently under the BC Hydro and Power Authority’s flood reserve for the Site ‘C’ hydro-electric development. Several oil and gas tenures, gravel reserves, transmission and utility corridors exist within the boundary of the proposed Protected Area.

The Fort St. John LRMP Table is recommending that the BC Government protect the Peace River islands from development using appropriate legislation (islands currently within the proposed Goal 1 Protected Area and BC Hydro and Power Authority’s flood reserve) until BC Hydro confirms their plans for further hydro-electric developments on the Peace River. In addition, the Fort St. John Table recommends that the BC Government consider advising BC Hydro to re-evaluate their hydro-electric development proposals on the Peace River prior to the onset of a future LRMP process within an eight year time frame.

Further, the Fort St. John Table recommends that the Fort St. John LRMP portion of the Peace-Boudreau Goal 1 proposal be considered as part of a Protected Area recommendation from the Dawson Creek LRMP. The Fort St. John proportion is a small part of the overall proposal and greatly influenced by the much larger area within the Dawson Creek planning area. It is more efficient to consider the entire proposal as one proposed Goal 1 Protected Area. If adopted by the BC Government, management direction and implementation would also be an outcome of the Dawson Creek LRMP process.
The Milligan Hills proposed Protected Area is located near the British Columbia - Alberta boundary and includes the headwaters of the Chinchaga drainage in the eastern section of the Milligan Hills. The total area is 7,931 hectares.

The key features of this area include: representation of wet cool Boreal White and Black Spruce (BWBSwk2) in the planning area; woodland caribou habitat for endangered Alberta populations; representation of the Clear Hills Ecosystem.
### Milligan Hills

**Values:**
- recreation
- wildlife
- fish
- access
- biodiversity

## Objectives

### Recreation
- provide a full range of recreation opportunities
- maintain and enhance ecological integrity in areas subject to resource impacts from recreational use

### Wildlife
- maintain fur bearer habitat for priority species (e.g. fisher, marten, lynx)
- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)

### Biodiversity
- maintain functioning and healthy ecosystems in the Resource Management Zone
- restore and rehabilitate negatively affected ecosystems

### Strategies
- incorporate existing recreational activities and assess potential for the development of new recreational opportunities in a Protected Area Management Plan (additional motorized recreational pursuits, etc.)
- address the effects of recreational activity on ecological integrity in a Protected Area Management Plan (e.g. wildlife disruption, damage to plant communities and water quality)
- identify critical fur bearer habitat and incorporate into a Protected Area Management Plan
- identify and map high capability ungulate wintering areas in a Protected Area Management Plan
- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) into a Protected Area Management Plan
- incorporate habitat protection criteria for grizzly bears in a Protected Area Management Plan (as these criteria are developed)
- identify and map medium and high quality grizzly bear habitat, in a Protected Area Management Plan on a priority basis
- identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation
- the general biodiversity emphasis is high
Milligan Hills

Objectives

FISH
- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)

Strategies
- identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)
- incorporate the protection of fish and fish habitat in a Protected Area Management Plan

PROPOSED PROTECTED AREA
- to protect, over the long-term for ecological representation and natural, culture, heritage, and recreation values

- designate the area under appropriate legislation, consistent with "Protected Areas" definition (PAS Document, 1993) so that logging, mining, oil and gas development and exploration, and hydro dams are not allowed uses
- ensure that the Protected Area Management Plan respects the natural, cultural, heritage and recreation values identified by the LRMP Table. The values include: public recreation, hunting and fishing, culture - identified First Nations values; wilderness, wildlife, trapping, ecological representation and fisheries
The Graham-Laurier proposed Protected Area is an RMZ approximately 100,000 ha in size and encompassing the undeveloped upper reaches of the Graham River watershed. This area lies to the north of the Peace Arm of Wil Lake. Its western boundary is the Continental Divide.

The Protected Area will incorporate Christina Falls and that portion of the Graham River watershed above the confluence of Poutang and Needham Creeks. The eastern portion also includes that portion of the Emerslund Creek watershed within the planning area.

The Graham-Laurier RMZ is bordered to the north by the Besa-Halfway-Chowade and Graham North RMZ’s (both are part of the area generally known as the Muskwa-Kechika Access Management Area) and in the east by the Graham South RMZ. This RMZ captures the vast majority of lands within the Graham watershed that are classified as “primitive” under the MOF Recreational Opportunity Spectrum (ROS).

The distinguishing Protected Area strategy (PAS), conservation, recreation and cultural values of this proposed Protected Area include:

- high natural biodiversity (mix of forest cover types and age classes, moist riparian corridors, natural connectivity corridors between valley lowlands and alpine areas)
- significant medium and high capability habitat for caribou, grizzly bear, moose and furbearers
- high fisheries values in the Graham River, tributary streams and Lady Laurier Lake
- PAS biogeoclimatic zone representation of the Engelmann Spruce-Subalpine Fir moist and very cold variant (ESSFmv4) and Boreal White and Black Spruce wet and cool variant (BWBSwk2)
- Christina Falls special feature, including access to this significant tourist destination
- high existing and potential commercial (guide outfitting, trapping and commercial backcountry recreation) recreation values
- high existing and potential non-commercial recreational opportunities (fishing, canoeing, hiking, hunting, snowmobiling, ATVing and horseback riding)
- First Nations traditional use values (Halfway River First Nation, Carrier-Sekani First Nation)
- captures several undeveloped watersheds (Poutang Creek, Guilbault Creek, Lapierre Creek, Horn Creek, Needham Creek, all tributary to the upper reaches of the Graham River)

This RMZ captures significant identified timber resources, mining and petroleum resources and potential for re-development. Several oil and gas exploration and grazing tenures exist within the proposed boundary of this RMZ active mining claims are present although considerable resource potential was identified along the Continental Div
### Recreation

- maintain guide and outfitting opportunities
- provide a full range of recreation opportunities
- provide a full range of wilderness recreation opportunities
- maintain opportunities for commercial and non-commercial livestock grazing associated with recreation
- manage backcountry recreation and tourism opportunities in a natural or natural-appearing condition

### Strategies

- develop strategies in a Protected Area Management Plan to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities
- identify and protect guide outfitting campsites and cabins
- manage existing tenures and the associated grazing activities of guide outfitters to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)
- seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. Recreation use should be addressed within the Protected Area Management Plan
- manage the area consistent with the intent of ROS recognizing existing historical recreation activities.
- develop strategies to maintain a range of wilderness recreation opportunities across the Resource Management Zone in a Protected Area Management Plan
- address issues of forage allocation among tenured users, residents and wildlife, within the Protected Area Management Plan
- identify and manage appropriate grazing management activities (e.g. burns)
- the Protected Area Management Plan process will determine the areas that are suitable for backcountry and tourism expansion, while maintaining the objectives of the Resource Management Zone. Provide opportunities for development of backcountry facilities. Plan access in conjunction with tourism and recreation groups in the area. Tourism facilities and development will be matched with intended recreation experiences.
<table>
<thead>
<tr>
<th><strong>Objects</strong></th>
<th><strong>Strategies</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCESS</strong></td>
<td>in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)</td>
</tr>
<tr>
<td>- manage access to protect Protected Areas Strategy values, guide outfitting, recreation values and fish and wildlife and their habitats</td>
<td>- identify critical furbearer habitat and incorporate in a Protected Area Management Plan</td>
</tr>
<tr>
<td>- maintain furbearer habitat for priority species (e.g. fisher, marten, lynx)</td>
<td>- identify and map high capability ungulate wintering areas in a Protected Area Management Plan</td>
</tr>
<tr>
<td>- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)</td>
<td>- consider establishing wildlife habitat areas (WHA's) in a Protected Area Management Plan, on a priority basis, to protect critical wintering habitat</td>
</tr>
<tr>
<td>- maintain medium and high quality grizzly bear habitat</td>
<td>- identify and map medium and high quality grizzly bear habitat, in a Protected Area Management Plan, on a priority basis</td>
</tr>
<tr>
<td>- consider identifying and designating critical grizzly bear habitat areas, on a priority basis, as wildlife habitat areas (WHA's) in a Protected Area Management Plan</td>
<td></td>
</tr>
<tr>
<td>- maintain caribou habitat</td>
<td>- identify and map medium and high capability caribou habitat</td>
</tr>
<tr>
<td>- consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA's) in a Protected Area Management Plan</td>
<td></td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td>the general biodiversity emphasis is high</td>
</tr>
<tr>
<td>- maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td>- identify and prioritize negatively affected ecosystems for potential restoration and rehabilitation</td>
</tr>
<tr>
<td>- restore and rehabilitate negatively impacted ecosystems</td>
<td>- identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
</tr>
<tr>
<td><strong>FISH</strong></td>
<td>- incorporate the protection of fish and fish habitat in a Protected Area Management Plan</td>
</tr>
<tr>
<td>- maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>- incorporate habitat protection criteria for bull trout in a Protected Area Management Plan (as these criteria are developed)</td>
</tr>
<tr>
<td>- maintain high quality fisheries in natural settings</td>
<td>- minimize permanent access to remote lakes, streams and rivers with high quality fisheries</td>
</tr>
</tbody>
</table>
**Objectives**

**Water**
- maintain the headwaters of major rivers and streams in a pristine, undisturbed condition

**Strategies**
- consider identifying and designating the highest order headwater tributaries of specific streams and rivers (in the Resource Management Zone) with a designation such as a sensitive area

**Proposed Protected Area**
- to protect, over the long-term for ecological representation and natural, cultural, heritage, and recreation values

- designate the area under appropriate legislation, consistent with “Protected Areas” definition (PAS Document, 1993) so that logging, mining, oil and gas development and exploration, and hydro dams are not allowed uses

- ensure that the Protected Area Management Plan respects the natural, cultural, heritage and recreation values identified by the LRMP Table. The values include: public, commercial and backcountry recreation, hunting and fishing, culture - identified First Nations values; wilderness, wildlife, guide outfitting, trapping, ecological representation, fisheries, heritage - historic trails and existing trail networks etc.
Redfern - Keily Proposed Protected Area

The Redfern-Keily proposed Protected Area is located approximately 40 km west of the Alaska Highway. This area includes the glacial waters of the Redfern, Fairy and Trimble Lakes, alpine basins and the icefields of the Besa River and Keily Creek watersheds (above the confluence of Keily Creek with the Besa River) of the Rocky Mountains and Foothills. Most of the area is within the Muskwa Foothills ecoregion. The most northwestern portion is within the Eastern Muskwa Range ecoregion. The total land area is 80,779 hectares.

Key features include: significant populations of Stone’s sheep, mountain goat, caribou, moose and elk. Extensive watersheds provide good moose habitat and areas of Class 1 capability habitat for caribou, Stone’s sheep and Rocky Mountain elk. The area contains important old-growth furbearer habitat and contains terrain and mixed spruce and pine forests representative of the high mountain valleys of the eastern flank of the Rocky Mountains. This is a typical glaciated landscape.

Generally the zone is non-roaded with some ATV access along corridors in the zone.

The RMZ contains significant First Nations values. Trails leading to Redfern Lake allow for a full range of outdoor recreation and backcountry recreation opportunities. A successful guide outfitting operation offers a variety of guided outdoor experiences. Visual quality associated with the trails leading to Redfern Lake is a concern in this zone.
<table>
<thead>
<tr>
<th>Values:</th>
<th>recreation</th>
<th>wildlife</th>
<th>fish</th>
<th>access</th>
<th>biodiversity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>water</td>
<td>visual quality</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RECREATION</strong></td>
<td>• develop strategies in a Protected Area Management Plan to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide outfitting opportunities</td>
</tr>
<tr>
<td></td>
<td>• identify and protect guide outfitting campsites and cabins</td>
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<tr>
<td></td>
<td>• manage existing tenures and the associated grazing activities of guide outfitters to limit impacts and reduce risk to other resource values</td>
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<tr>
<td></td>
<td>• seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. Recreation use should be addressed within the Protected Area Management Plan.</td>
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<tr>
<td></td>
<td>• incorporate existing recreational activities and assess potential for the development of new recreational opportunities in a Protected Area Management Plan</td>
</tr>
<tr>
<td>• maintain guide and outfitting opportunities</td>
<td>• develop strategies to maintain a range of wilderness recreation opportunities across the Resource Management Zone in a Protected Area Management Plan</td>
</tr>
<tr>
<td>• provide a full range of recreation opportunities</td>
<td>• manage Keily Creek watershed to maintain a 'primitive' wilderness experience</td>
</tr>
<tr>
<td>• provide a full range of wilderness recreation opportunities</td>
<td>• provide for motorized recreation access corridors/trails to similar destinations as currently allowed</td>
</tr>
<tr>
<td>• maintain opportunities for commercial and non-commercial livestock grazing associated with recreation</td>
<td>• address issues of forage allocation among tenured users, residents and wildlife within a Protected Area Management Plan</td>
</tr>
<tr>
<td></td>
<td>• identify and manage appropriate grazing management activities (e.g. burns)</td>
</tr>
</tbody>
</table>
**Recreation (cont'd)**

- provide backcountry recreation and tourism opportunities in a way that maintains a natural or natural-appearing condition

- the Protected Area Management Plan process will determine the areas that are suitable for backcountry and tourism expansion, while maintaining the objectives of the Resource Management Zone. Provide opportunities for development of backcountry facilities. Plan access in conjunction with tourism and recreation groups in the area. Tourism facilities and development will be matched with intended recreation experiences

**Access**

- manage access to protect Protected Areas Strategy values, recreation values and fish and wildlife and their habitats

- maintain existing access, including provisions for upgrading

- in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)

**Wildlife**

- maintain high capability ungulate winter habitat (e.g. elk, deer, moose, mountain sheep and mountain goat)

- identify and map high capability ungulate wintering areas in a Protected Area Management Plan

- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, sustainability of forage and browse) in a Protected Area Management Plan

- consider establishing wildlife habitat areas (WHA's) in a Protected Area Management Plan, on a priority basis, to protect critical wintering habitat

- maintain medium and high quality grizzly bear habitat

- identify and map medium and high quality grizzly bear habitat, in a Protected Area Management Plan, on a priority basis

- incorporate habitat protection criteria for grizzly bears, in a Protected Area Management Plan (as these criteria are developed)

- incorporate medium and high quality grizzly bear habitats and connectivity corridors, in a Protected Area Management Plan

- maintain caribou habitat

- identify and map medium and high capability caribou habitat

- incorporate the maintenance of medium and high capability caribou habitat and connectivity corridors, in a Protected Area Management Plan
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WILDLIFE (cont’d)</strong></td>
<td>• consider identifying and designating critical caribou habitat areas, on a priority basis, as wildlife habitat areas (WHA’s), in a Protected Area Management Plan</td>
</tr>
<tr>
<td><strong>BIODIVERSITY</strong></td>
<td>• the general biodiversity emphasis is high</td>
</tr>
<tr>
<td>• maintain functioning and healthy ecosystems in the Resource Management Zone</td>
<td></td>
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<tr>
<td><strong>FISH</strong></td>
<td>• identify and map critical fish habitat (e.g. pools, migration patterns, spawning and rearing areas)</td>
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<tr>
<td>• maintain fish habitat and water quality for priority fish species (e.g. bull trout, grayling and red and blue listed species)</td>
<td>• incorporate the protection of fish and fish habitat in a Protected Area Management Plan</td>
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<tr>
<td>• maintain high quality fisheries in natural settings</td>
<td>• minimize permanent access to remote lakes, streams and rivers with high quality fisheries</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>• consider identifying and designating the highest order headwater tributaries of specific streams and rivers (in the Resource Management Zone) with a designation such as a sensitive area</td>
</tr>
<tr>
<td>• maintain the headwaters of major rivers and streams in a pristine, undisturbed condition</td>
<td></td>
</tr>
<tr>
<td><strong>PROPOSED PROTECTED AREA</strong></td>
<td>• designate the area under appropriate legislation, consistent with “Protected Areas” definition (PAS Document, 1993) so that logging, mining, oil and gas development and exploration, and hydro dams are not allowed uses</td>
</tr>
<tr>
<td>• to protect, over the long-term for ecological representation and natural, culture, heritage, and recreation values</td>
<td>• ensure that the Protected Area Management Plan respects the natural, culture, heritage and recreation values identified by the LRMP Table. The values include: public, commercial and backcountry recreation, hunting and fishing, culture - identified First Nations values; wilderness, wildlife, guide outfitting, trapping, ecological representation, fisheries, heritage - historic trails and existing trail networks etc.</td>
</tr>
<tr>
<td><strong>VISUAL QUALITY</strong></td>
<td>• manage existing recreation sites by maintaining Visual Quality Objectives for trail systems, campsites and special features. Establish acceptable limits of use (may include timing) e.g., migration pattern, reproductive cycles</td>
</tr>
<tr>
<td>• manage visually sensitive areas identified as scenic areas (including travel and recreation corridors as identified by the Ministry of Forests visual landscape inventory)</td>
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</tr>
</tbody>
</table>
4.2.2 Goal 2 Proposed Protected Areas

The Sikanni Chief Canyon is 4,266 hectares in size and captures portions of the Sikanni Chief Canyon and Buckinghorse River Canyons. A key feature within this proposed Protected Area is the population of mountain goats that reside year round on the steep precipices above the Sikanni Chief and Buckinghorse Rivers. This is one of the few places in BC where mountain goats are found along larger rivers. Alluvial stands of white spruce along the Sikanni Chief River are another key feature.

The Sikanni Chief Falls is a recreational feature of local importance. A forest service recreation site within the proposed Protected Area is popular with visitors attracted by the spectacular falls. As a bonus, this Protected Area will capture known palaeontological sites upstream from the falls. This Protected Area encompasses 729 hectares.

Pink Mountain is the smallest of the proposed Protected Areas at 100 hectares. This Protected Area will capture a significant palaeontological site.

On the northern boundary of the planning area, the proposed Sikanni-Old Growth Proposed Protected Area is 1,410 hectares. This proposal captures alluvial old-growth white spruce along the Sikanni Chief River. These large diameter spruce provide high quality wildlife habitat.

In the extreme north eastern portion of the planning area is the Ekwan Lake proposed Protected Area of 1,892 hectares. This area was identified as having important First Nation values. In addition there are stands of spruce that provide wildlife habitat, including waterfowl habitat. Fish values in Ekwan Lake are high.

Several sites along the Peace River corridor have been proposed for protection. These sites are located from the mouth of the Beatton River to the British Columbia/Alberta boundary. These sites collectively total 557 hectares. They offer locally important recreational opportunities as well as protecting rare grassland ecosystems and mule deer winter range.

The Beatton-Doig Canyon proposed site is found at the junction of the Beatton and Doig Rivers. This site is 867 hectares in size and protects an excellent example of local steep cutbanks.

In the eastern portion of the planning area, a proposed Protected Area is found around Chinchaga Lakes. This area was identified as having high First Nation values. This area is 1,389 hectares in size.
5.0 Socioeconomic & Environmental Assessment Summary

5.1 Introduction & Overview

This document summarizes the key conclusions reached by an independent assessment of the Land Use Plan. The socioeconomic work was undertaken by the Policy Branch of the Ministry of Employment and Investment (MEI), with assistance from Robinson Consulting & Associates and J. Paul & Associates; the environmental analysis was by Eliot Terry (R.P. Bio.) of Keystone Wildlife Research. The assessment also relied on input from the government’s Inter-Agency Planning Team and Geographic Information Systems (GIS) area statistics provided by the Ministry of Forests (MoF) for the LRMP.

The starting point for the assessment is to define the “Base Case,” i.e. the current/future socioeconomic and environmental trends associated with the “default land use regime” that would prevail in the absence of a Land Use Plan. Key initiatives that are assumed to occur in the Base Case are the current forest management regime as per MoF’s Timber Supply Review (TSR) for the Fort St. John TSA (September 1995), the Forest Practices Code (FPC), various “special management” initiatives of government (e.g. provincial interest in the Muskwa-Kechika area), and the provincial Regional Protected Areas Team (RPAT) recommended Protected Areas of 4.27%, which closely meets government’s Protected Areas target of 4% (+ or - 0.25%) for the planning area. (The planning area is defined as the Fort St. John Forest District.) Note that while the RPAT areas did not restrict the LRMP from designating alternative areas for protection, due to current provincial policy (i.e. the Protected Areas Strategy, or “PAS”), these represent the best estimate of which lands would become Protected Areas in the absence of the LRMP.

A general indication of the implications of the Base Case and Land Use Plan is provided by the area roll-up of the GIS analysis:

<table>
<thead>
<tr>
<th>Protected Areas</th>
<th>Special RMZ</th>
<th>General RMZ</th>
<th>Enhanced Resource Development Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>4.3%</td>
<td>10%</td>
<td>34%*</td>
</tr>
<tr>
<td>Land Use Plan</td>
<td>4.3%</td>
<td>18%*</td>
<td>46%</td>
</tr>
</tbody>
</table>

* Includes 4% from “Major River Corridors” RMZ (note that the total planning area is 4,677,115 hectares)
** Includes 12% from “Agriculture/Settlement” RMZ

Few significant socioeconomic and environmental implications from the Base Case and the Land Use Plan are expected to occur in the next few decades. Rather, they will occur gradually over the long term and therefore are difficult to quantify. However, it should be stated at the outset that no existing jobs are expected to be lost as a result of either Base Case initiatives or the Plan, only that long term economic growth in the petroleum and forest industries may be somewhat less than otherwise would occur. At the same time, risks to wildlife populations and backcountry recreation/tourism activities are reduced due to the Forest Practices Code, new Protected Areas, and the Land Use Plan.
5.2 Key Socioeconomic Implications

Petroleum Sector

The Petroleum Geology Branch of MEI estimates a “Status Quo” inventory of about 16.2 million cubic metres (m³) of proven oil, 4.4 Trillion cubic feet (Tcf) of proven gas, and 20.1 Tcf of potential gas reserves in the planning area. Most of the proven reserves and current industry activity lies in the Fort St. John catchment area, east of the Alaska Highway. Status Quo proven plus potential reserves could likely sustain current production rates for another 50-100 years, without accounting for improved technology, exploitation of coal-bed methane, etc. There are no significant implications of the Base Case land management regime for proven reserves, but the FPC (due to cost increases) and Protected Areas (since oil/gas activities are not allowed in parks) are expected to preclude gas potential by 0.5 Tcf and 1.0 Tcf respectively - this implies a Base Case availability of 18.6 Tcf vs. the 20.1 Tcf in the Status Quo.

By 1991, the oil/gas sector accounted for about 22% of the planning area economy, or about 2000-2500 jobs, of which about 700 are in natural gas exploration/extraction and held by area residents. It is this portion of “upstream employment” that is the most sensitive to changes in Crown land use, since gas production is likely to continue to grow over at least the next 20 years, according to the Oil & Gas Section of MEI. Assuming these exploration/extraction jobs are proportionately linked to production volumes, this growth would likely result in 20-year average employment of about 900 in the absence of the FPC and PAS and over 800 with these initiatives taken into account in the Base Case.

In the Land Use Plan, again the only significant implications are to future potential rather than to proven reserves or existing infrastructure/tenures. Most of the lost potential occurs in the promising northern foothills area west of the Alaska Highway, primarily in and around the Graham Protected Area and Besa Halfway Chowade RMZ. These impacts arise mainly because about 10% of the Highest Potential gas lands (with an estimated >100,000 m³/ha, covering 40% of the area) would be precluded by Protected Areas and 30% would be located in Special Resource Management Zones (SRMZs).

The Oil & Gas Section of MEI estimates that the Plan’s management strategies in these and other Resource Management Zones (RMZs) will further reduce the availability of potential gas reserves from 18.6 to 16.5 Tcf (11%), since access is restricted and costs are increased. However, given the forecasted growth in the U.S. and Canada’s future energy markets, as noted above, the area’s gas production is expected to increase over the next 20 years. The implication of the Base Case and Land Use Plan, then, is that given reduced and more costly options, the industry will have to move to higher cost reserves (sometimes outside of BC) sooner than it otherwise would, the implications of which should begin to occur within 5-10 years. Production will continue grow over this time, but at a slower pace than under a Status Quo regime.

It was also noted that in the Base Case an average of over 800 resident jobs in gas exploration/extraction is expected the next 20 years. Pro-rating the 11% in potential gas reserve reductions to this Base Case 20-year average employment level, it still appears that resident employment will exceed the latest estimate of 700 well into the future.

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1 The only exception is that about 50% of the 8300 ha. of “Proven Oil Reserves > 500 m³/ha.” is located in SMRs, primarily in the Charlie Lake Water Supply Area RMZ. However, an objective in this RMZ is to “maintain opportunities for oil/gas exploration, development, and transportation.”

2 The forecast of North America’s natural gas supply and demand prepared by the Canadian Energy Research Institute (CERI) was used to also forecast production from the planning area.
The 20-year total net present value of those BC government revenues which are estimated to be sensitive to Crown land use planning (i.e. the sum of annual production royalties and land bonus bid revenues, discounted at a rate of 6%) is estimated to be $1.51 billion in the Status Quo, $1.40 billion in the Base Case, and $1.23 billion with the Land Use Plan. Therefore the approximate “opportunity cost” of FPC, PAS, and the Land Use Plan on these revenues is a net present value of $280 million or $23 million annually ($9 million for Base Case and $14 million for the Land Use Plan) for 20 years; this represents about $17 annually in foregone direct natural gas tax revenues per BC household (based on 1.373 million households in 1994). To further place these estimates in context, in 1993 and 1994 total oil and gas revenues from the planning area were some $205 million and $286 million respectively. The Table below summarizes all the related production, employment, and revenue impacts.

Note that a small portion of these impacts could be mitigated due to the Plan recommendation that “directional drilling” (i.e. drilling underneath an area from a position outside the area) be allowed under five small “Goal 2” Protected Areas: Sikanni Canyon, Sikanni Falls, Beatton Doig Canyon, Ekwan Lake, and Chinchaga Lakes, with the latter two being subject to First Nations review.

### Estimated 20-year Average Impact of Base Case & Land Use Plan on Gas Potential, Direct Resident Employment, and BC Government Revenues for the Fort St. John Planning Area

<table>
<thead>
<tr>
<th></th>
<th>Status Quo Regime</th>
<th>Base Case PAS</th>
<th>FPC</th>
<th>Land Use Plan</th>
<th>Cumulative Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Estimated Potential Gas Volume (Trillion cubic feet)</td>
<td>20.1</td>
<td>19.1 (-5%)</td>
<td>18.6 (-3%)</td>
<td>16.5 (-10%)</td>
<td>16.5 (-18%)</td>
</tr>
<tr>
<td>Average Total Direct Resident Exploration/Extraction Jobs over 20 years (1991 Jobs = -700*)</td>
<td>909 (-5%)</td>
<td>863 (-3%)</td>
<td>836 (-3%)</td>
<td>746 (-10%)</td>
<td>746 (-18%)</td>
</tr>
<tr>
<td>Average Annual BC Government Revenue Cost in $ millions (1994 Revenues = $286 million)</td>
<td>0 $9 mill.</td>
<td>$14 mill.</td>
<td>$23 mill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Revenue Cost per Household</td>
<td>0 $6.55</td>
<td>$10.20</td>
<td>$16.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Estimated as 30% of 2300 total upstream jobs in the area, using MEI data that 30% of industry exploration expenditures are by BC firms. Also consistent with Ministry of Finance job estimates.

Sources: MEI, CERI, & Fort St. John LRMP Base Case Report (ARA Consulting, March 1996)

3 Note that these estimated revenue “reductions” do not imply that revenues will decline vs. today’s levels. Rather, since production is still expected to increase over the next 20 years even with the Plan, they are only an estimated...
Hydro-Electricity

There is minimal employment related to the generation of hydro-electricity, and the “Site C” dam/reservoir proposal does not appear to be on BC Hydro’s current planning horizon, notwithstanding that the flood reserve continues to exist. In the Base Case, RPAT’s recommended Protected Areas would likely preclude the development. In the Plan, however, the LRMP has recommended that the Environment and Land Use Act be used to designate the Protected Areas within the flood reserve so as to not preclude the project - the decision to proceed is therefore left with BC Hydro. However, the Plan recommends that Hydro review its intentions regarding this project within 10 years.

Forest Sector

This industry drives about 8% of the local economy, accounting for in the order of 600-700 direct jobs in harvesting, hauling, and processing as of 1991. As of December 31 1996, the Allowable Annual Cut was set at 1.1 million m³/yr (up 0.2 million m³/yr from the previous level) for coniferous supplies and remained at 0.9 million m³/yr for deciduous. According to analysis undertaken by MoF staff for the 1995 Timber Supply Review (TSR), the sustainable coniferous Long Term Harvest Level (LTHL) is about 1.8 million m³/yr, without accounting for the FPC, PAS, or the LRMP. However, for deciduous, the sustainable LTHL is likely to decline to 0.6 million m³/yr gradually over the 50 years.

In both the Base Case and the Land Use Plan, very small amounts of both the coniferous and deciduous Timber Harvesting Land Base (THLB) are overlain by new Protected Areas and SRMZs - in the Plan, only 0.3% of deciduous and 2% of coniferous THLB is precluded by new parks, and 4% of deciduous and 12% of coniferous THLB is affected by SRMZs. As a result, according to MoF’s timber analysis for the LRMP, the combination of the FPC and Protected Areas would reduce the coniferous LTHL to 1.5 million m³/yr and the Plan’s management strategies cause a further decline to 1.3 million m³/yr. Both these amounts are above the current AAC, so while some potential opportunities are foregone, there are no impacts on existing jobs. For the deciduous harvest, there is virtually no difference between the 1995 TSR harvest flow and the projected harvests which account for the effects of the FPC, PAS, and the Plan - in all cases, the current harvest of 0.9 million m³/yr can be held for about 10 years, but by the fifth decade, the LTHL of just over 0.6 million m³/yr would be reached. It is noteworthy that very little of the deciduous supply is now being harvested, implying that the decline to LTHL should occur without noticeable adverse socioeconomic implications.

Mining

There are no existing mines and few exploration jobs in the planning area, with about 2% of the local economy (100-150 local jobs) dependent on mining/mineral processing as of 1991. There is also additional seasonal activity undertaken by exploration geologists from outside of the region. The Geological Survey Branch of MEI estimates that about 2% of the planning area consists of High Potential metallic mineral lands and there are 39 identified mineral occurrences, of which the most promising is the Robb Lake lead-zinc deposit (potential for 150 jobs over 20 years, but timing/probability of development is uncertain) located just north of the proposed Graham Protected Area.

In the Plan, 65% of the identified High Potential (Classes 8-10) metallic mineral areas and 37% of the occurrences are located in Protected Areas, which is not significantly different from the Base Case. Approximately one-third of both High potential lands and occurrences are located in SRMZs, including the Robb Lake deposit in the Besa-Halfway-Chowade SRMZ. New Protected Areas and management strategies in the SRMZs (and certain other RMZs) will reduce access and increase costs for mineral exploration, but mineral exploration and mining remain allowable uses outside of Protected Areas. Also, much of the area is not well-explored, implying that significant activity may continue to occur or simply be diverted to less encumbered RMZs. While no existing resident mining jobs appear to be threatened, some potential opportunities may be foregone, however their nature, probability, and timing is not possible to assess.
Agriculture

The key activities are grain production and cattle ranching, and the sector accounted for about 7% of planning area incomes and 13% of the jobs. Grain production will not be affected since it occurs almost exclusively on private land. Cattle ranching has the potential to be impacted by Crown land use planning initiatives such as the FPC, PAS, and/or the LRMP, given that significant amounts of grazing occurs on public land. In the Base Case, it is possible that some agriculture costs could increase due to the FPC.

The only mapped indicator available for the assessment is the 736,000 ha of land within the Agricultural Land Reserve, of which only 0.06% is located in Protected Areas and 6% is in SRMZs. Moreover, Ministry of Agriculture, Fisheries and Food (MAFF) staff estimate that only about 225,000 ha is currently being cultivated. While most of the rest is of lower capability or less accessible, any need for expansion caused by improving world markets would also likely render this 500,000+ ha of “agriculturally underutilized” more economically viable (not to mention arable lands outside of the ALR), implying that the implications of the Plan for the sector are not significant. In addition, grazing on Crown range is an allowable use outside of Protected Areas, and even if some tenures are located in Protected Areas, provincial policy has been to “grandfather” these activities.

However, MAFF staff are of the view that some additional cost increases will occur due to certain LRMP management strategies, primarily in the Cecil Lake Wetlands, Peace Corridor, Agriculture Settlement, Charlie Lake Water Supply Area, Major River Corridors, Aikman-Deadhorse, Cameron, Farrell Creek, and Kobes Creek RMZs. No existing jobs are expected to be impacted, however.

Tourism, Guide-Outfitting, and Trapping

Tourism accounted for about 4% of planning area income and 10% of the jobs as of 1991, with much of the “front-country” activity being generated by business travellers in the energy and forestry sectors. Of the approximately 900 tourism jobs in the planning area, it is estimated that about 40-50 depend on relatively pristine “back-country wilderness values” for their livelihoods, most of whom are guide outfitters operating in one of the eight tenures which lie wholly or partly within the planning area. Even with the FPC and 4.27% of the area protected, it is likely that key wilderness values would continue to erode in the Base Case, placing these businesses a greater risk over the long term without official management strategies in place to accommodate their interests.

Of the 500,000 to 600,000 ha in the planning area with little or no current access (as identified by the MoF Recreation Opportunities Spectrum and Undeveloped Watershed inventories), approximately one-quarter to one-third will be permanently protected from development with virtually all of the remainder in SRMZs. The Plan also offers specific strategies to control access into wilderness areas, protect fisheries/wildlife habitat, promote higher levels of visual quality in key travel corridors, and manage for backcountry recreation opportunities over and above the Base Case regime. While these designations and strategies will assist the backcountry tourism sector for at least the next few decades, given that 96% of the planning area will continue to the open to roads, seismic activity, etc., it is likely that wilderness values will continue to erode and place some of these businesses at risk in the long run, but at a slower rate than in the Base Case.

There are over 70 traplines in the area, and trapping is primarily a seasonal pursuit. Both the FPC and the Plan’s management strategies to protect high quality furbearer habitat (primarily for lynx, marten, and fisher) will result in improved trends for this sector.
Communities and First Nations

There is no evidence to suggest that there will be job losses in any community within the planning area as a result of either Base Case initiatives or the Land Use Plan. While there may be some short term fluctuations in oil and gas exploration and related spin-off activities as investors become accustomed to the Forest Practices Code, new Protected Areas, and the Plan, it is likely that such changes are more related to volatile world prices/markets, rather than incremental changes in Crown land management regimes. In fact, the increase in certainty that should arise due to having a Plan with management objectives/strategies documented on a zone-by-zone basis could even have a positive effect on petroleum sector investor confidence.

If, however, there is some short-term economic volatility, the majority of the implications would occur in Fort St. John, as the 1991 Census/Ministry of Finance analysis indicates that 26% of its economy is driven by this sector, vs. less than 20% in Taylor and the remainder of the planning area, the latter relying more on forestry and agriculture.

In the longer term, as noted previously, any direct effects are likely to be manifested as somewhat lower economic and population growth than would otherwise occur, rather than declines in current economic activities. In addition, the new Protected Areas, Special Resource Management Zones, and Visual Quality provisions should enhance the viability of tourism (primarily backcountry tourism, near the area’s smaller communities) in the foreseeable future.

Since there was not direct participation by First Nations in the LRMP process, and their interests are not mapped, it is difficult to assess the implications of the Base Case and Land Use Plan on the area’s aboriginal peoples. However, the beneficial environmental effects of PAS, the FPC, and the Plan’s management strategies should protect the natural and spiritual values that are important to First Nations to a greater extent than would otherwise be the case.

5.3 Key Environmental Implications

Biodiversity & Ecosystem Representation

The environmental implications of implementing the Land Use Plan are generally positive. This is largely due to the reduced intensity of development in the eastern portions of the plan area vs. the Base Case and the allocation of significant amounts of land west of the Alaska Highway as SRMZs and Protected Areas.

East of the Highway, the Charlie Lake Water Supply Area, Peace River Corridor and Lower Sikanni-Fontas Valley zones are allocated to SRMZ status whereas the Trutch zone will be managed as a General Resource Management Zone. A lower intensity of development in these areas should provide for more natural levels of biodiversity and moderately improves the outlook for species and habitats that occur within these zones. Overall, the allocation of land use zones, however, suggests the risks to biodiversity increases from west to east reflecting the greater intensity of resource development east of the Highway.

Some key management zones situated west of the Highway also receive lower intensity development designations under the Plan vs. the Base Case, i.e. Crying Girl, Graham South, Farrell Creek, and Bluegrave-Horseshoe. Those zones situated west of the Highway that will be managed as SRMZs (i.e., low intensity development) reflect the significant wildlife and wilderness values that occur in these watersheds. Managing the largest zone (i.e., Besa-Halfway-Chowade: 415 477 ha) west of the Highway to meet a High Biodiversity Emphasis, as well as the proposed Protected Areas in the Redfern-Keily and Graham-Laurier, reduces the impact to fish and wildlife populations and poses relatively low to moderate risks for these values.
Thirteen proposed Protected Areas (about 4.3% of planning area) would achieve representation in 7 of 9 ecossections and 8 of 9 subzone variants under the proposed Plan. Both the Base Case and proposed Plan lack representation of the Halfway Plateau ecossection. Although the RPAT Protected Areas in the Base Case would achieve similar ecossection representation, the proposed Plan reduces ecosystem representation of the Graham very moist cold Engelmann Spruce Subalpine Fir biogeoclimatic subzone/variant (ESSFmv4) by about 8300 ha (such that 24% is protected vs. 29% in the Base Case) due to the reduction in size of the Graham-Laurier proposed Protected Area. Shifting this portion of Graham from Protected Area to Special Management increases the risks to vulnerable species such as caribou and grizzly bears, however, access management strategies may partly mitigate the potential adverse effects.

Overall, the general management direction outlined in the Plan to incorporate ecosystem attributes into landscape plans, maintain connectivity, and minimize fragmentation indicate a reduced risk to biodiversity. These objective strategies will have the greatest benefit west of the Highway where many significant wildlife values occur.

Riparian Habitats

The Base Case trends for riparian communities is generally positive due to the implementation of the FPC Riparian Management Areas. Although Riparian Reserve Zones will protect habitats and ecological processes adjacent to water bodies, the full benefit of maintaining forest cover in riparian areas will only be achieved if management practices recommended in the Riparian Management Zones are carried out. The Land Use Plan recognizes the conservation values of riparian communities by allocating major riparian systems occurring in the River Corridors as Special Resource Management. In addition, by designating the Peace River Corridor and Lower Sikanni-Valley zones as SRMZs, the risks to riparian communities in these areas become relatively low. Although these changes are generally positive, proposed development in the Graham North and Graham South zones pose moderate risks to riparian connectivity. A more detailed planning process, however, may lessen the potential impact to these riparian communities by designing management practices that will partly mitigate the potential negative effects of timber harvesting and road development.

Red and Blue Listed Species

Although many smaller mammal and bird species listed as endangered or vulnerable will benefit from the FPC Riparian Management Areas, Wildlife Tree Patches), other species such as caribou, grizzly bear and Northern hawk need relatively large specially managed and/or Protected Areas from higher level plans to address their habitat requirements. In general, the Land Use Plan provides increased certainty that species listed as endangered (red-) or vulnerable (blue-listed) will receive adequate consideration during lower level planning processes compared to the Base Case. This is largely due to the clear direction provided by the management objectives and strategies in the Plan, which provide direction for identification/mapping of critical wildlife habitats and designate Wildlife Habitat (where required) to meet the needs of sensitive species during the development of landscape-level plans and stand prescriptions.

Grizzly Bear

The Land Use Plan allocates over 70% (vs. about 60% in the Base Case) of grizzly bear habitat as SRMZs (i.e., low intensity development) and about 21% to Protected Areas (vs. 22% in the Base Case), with no grizzly habitat within Enhanced Resource Development Management (high intensity) Zones. While there are some increased risks to bears from increased access (i.e., more bear-human conflict, poaching) into the Graham North and Graham South zones (given that somewhat less habitat is in Protected Areas vs. the Base Case), the RMZ strategies may partly mitigate adverse effects.
Woodland Caribou

The four caribou management zones (Milligan Hills, Hackney Hills, Kobes Creek and Graham) identified in the 1995 TSR together with the RPAT Protected Areas suggest minimal impacts to caribou populations in the Base Case. While the Base Case would likely maintain most key caribou habitat over the long term, declines are more likely in those caribou zones surrounded by General and Enhanced Resource Development Zones (i.e., Bluegrave-Horseshoe and Kobes Creek RMZs). Overall, the proposed Plan improves the outlook for woodland caribou over most of the planning area by providing specific management direction to maintain connectivity between seasonal ranges. However, moderate risks still remain in the approximately 20% of caribou habitat managed in General Resource Management Zones.

Ungulate Winter Range

The planning area supports provincially significant populations of white-tailed deer, mule deer, caribou (both mountain and northern ecotypes), elk, Plains bison and Stone’s sheep. Management strategies outlined by the Plan to identify critical Wildlife Habitat Areas provides for greater certainty that ungulate winter ranges will be adequately considered during landscape-level planning and the development of stand-level prescriptions.

Fisheries and Water Resources

The planning area supports 12 species of sport fish including whitefish, Arctic grayling, rainbow trout, lake whitefish and walleye. Other species of management concern include bull trout (blue-listed) which is believed to be declining in many watersheds. The Base Case implication for fisheries values, however, is generally positive due to the implementation of the FPC Riparian Management Zones and Watershed Assessments. Specific management objectives related to fishery and water resources documented in the Land Use Plan, add further certainty that these environmental values will receive adequate protection.

Access Management

Many of the undeveloped watersheds situated in the western portion of the planning area, will be developed in the future. Increased access into undeveloped watersheds significantly increases the risks to fish and wildlife populations and can reduce wilderness values. However, as part of the Muskwa-Kechika area, management strategies (e.g. co-ordinated access management plans) outlined for the Besa-Halfway-Chowade and Graham North zones will partly mitigate the potential adverse effects of increased road development on fish and wildlife populations in these areas.
6.0 IMPLEMENTATION

6.1 Declaration of the Fort St. John Land and Resource Management Plan as a Higher Level Plan

All or part of the Fort St. John LRMP that relate to operational forestry, may be declared a higher level plan under the Forest Practices Code of British Columbia Act (FPC). By law, operational plans must conform to those parts of an LRMP designated as higher level plans under the FPC. Operational plans provide a description of lands and resources. They also describe the location of, timing and type of management practices and prescriptions that will be used to manage, use and conserve described lands and resources. Examples of forest management operational plans include Forest Development Plans, Range Use Plans and Access Management Plans.

In addition to the management of forest resources and those requirements stipulated under the FPC, the Fort St. John LRMP will guide other land and resource developments on Crown lands for a period of ten years. Developments affected by the plan, include water use and storage, land developments, recreation, guide outfitting, trapping, agriculture, fish, wildlife and surface and sub-surface mineral resources. Many existing and new planning mechanisms (such as existing statutes and regulations, approval and referral processes and new policies like the 2005 Initiative) used by resource management agencies will be guided by the strategic direction included within the plan.

The plan also provides a set of acceptable uses for proposed Protected Areas. Management direction suggested by the Table as appropriate for areas designated under the Protected Areas Strategy will provide a framework for managing new Protected Areas.

6.1.1 Formal Designation - Muskwa-Kechika

The Fort St. John Planning Table recommends that a portion of the planning area, specifically the Besa-Halfway-Chowade, Graham-North, Graham-Laurier and Redfern-Keily resource management zones, be formally designated such that the following criteria are met.

1. Formal designation captures the intent of the objectives and strategies for the respective resource management zones.
2. Joint approval is required for off-site mineral pre-development plans (e.g. airstrips, access roads), pre-tenure plans for oil and gas, landscape unit plans for forestry or equivalent for all other tenured activities.
3. Dispute resolution mechanisms for pre- and post-tenures will be in accordance with administrative protocols in place, under development and/or to be developed. Examples include: pre-tenure 2005, Forest Practices Code and similar post-tenure mechanisms for mining.
4. Designation should not result in longer permitting time frames
5. Ensure adequate government resources (inventory data, government staffing) are provided to allow for timely development of plans.
6. Formal designation is to facilitate management that will manage this area as a larger unit and not to make this area a ‘Park’ in waiting for a declaration.
7. Authority for operational planning and approvals remain within the jurisdiction of line agencies.
8. The intent is to ensure that wilderness characteristics and wildlife habitat are maintained (over time) while allowing resource development, including roaded resource development and timber harvesting.
9. Pre-development plans will be required for all new road construction.
10. The Environment Assessment Process should apply to all reviewable projects.
11. The Graham-Laurier and Redfern-Keily proposed Protected Areas will be formally designated (e.g. Park Act, Environment and Land Use Act) but will be incorporated within the broader formal designation to ensure management consistency.
12. The Graham-Laurier and Redfern-Keily proposed Protected Areas will be managed corporately by the government agencies including BC Parks, BC Environment, Ministry of Forests, and BC Lands.
13. An Advisory Body (based on the membership of sectors at the Fort St. John LRMP Table) will be created to solely advise on interpretation and intent of the Fort St. John LRMP with respect to management issues within those RMZ's (Besa-Halfway-Chowade, Graham North, Graham-Laurier and Redfern-Keily) that form part of the area known as the Muskwa-Kechika.

6.1.2 Protected Area Designation Process

Concurrent with the approval of the Fort St. John LRMP by Cabinet, legal descriptions for proposed Protected Areas will be prepared jointly by BC Parks and BC Lands and subsequently signed off by the chair of the Omineca-Peace Inter-agency Management Committee. A complete land and tenure status report and clear documentation about the intent of special considerations of each Protected Area will be forwarded to the Land-Use Coordination Office.

6.2 Recommended Policy Directions

The Fort St. John working group identified several issues that indirectly or directly affect land-use within the Fort St. John Planning Area that were related to existing government policy. The following policy changes are recommended as part of this land use recommendation to government.

6.2.1 Commercial Backcountry Recreation

The management of public and commercial recreation within the western portion of the planning area was discussed at length by the Table. The Fort St. John LRMP Table recommends the development and use of more detailed recreational use plans, to direct and manage commercial backcountry recreation (CBR) activities. The intent of this direction is to maintain a balance between non-commercial public use and other use.
- An inventory should be completed of existing and potential CBR opportunities to guide the allocation of future CBR tenures.
- Commercial backcountry recreation activities must be consistent with:
  - acceptable limits of use
  - environmental sustainability
  - greatest benefit to the local community, region and province
  - equitable forage allocation between commercial and non-commercial use
  - equitable allocation of suitable campsites
6.2.2 Management of Proposed Protected Areas

The Redfern-Keily and Graham-Laurier proposed Protected Areas cover a large portion of the Protected Areas within the Fort St. John planning area. There are significant wildlife and recreational values found within these two areas and the Table has concerns regarding the future management of these areas. The Table recommends that these large Protected Areas be managed differently than most other 'parks', given historical usage, and recommends the following considerations be incorporated in detailed recreation management plans for these two areas:

- That, for personal protection, the carrying and use of firearms be permitted outside of lawful hunting season.
- That permits not be required for non-commercial use of horses, until such time as they are required to protect other values within the areas.
- That horse use not be restricted to existing trails, unless required to protect other important values or to manage erosion or other issues.
- That there be no duplication or unnecessary increase in permits for commercial operations in and adjacent to these Protected Areas, resulting from a change in land status associated with the Protected Area.
- That the Ministry of Environment, Lands and Parks and the Ministry of Forests undertake joint management of these Protected Areas; that a joint management strategy be established prior to designation of the Protected Areas and that the Park Act not supersede the management plan developed locally for these Protected Areas.
- That the majority of the proposed Protected Areas be managed as much for their inherent wilderness and wildlife values as for human use, and that human use be restricted as required to protect and manage these inherent values.
- That there be a commitment of sufficient resources to ensure proper management of the Protected Areas proposed in this Plan.

6.2.3 Recommendations for Directional Drilling under Proposed Protected Areas

The Fort St. John LRMP Table recommends that the sale of subsurface rights and drilling for petroleum resources be allowed under specific proposed Protected Areas if doing so would not compromise the values for which the areas were protected. This does not include surface access through these Protected Areas. This policy would allow for some economic recovery of these sub-surface resources and would possibly mitigate possible compensation issues. It is the Tables understanding that this would require a modification of existing government policy.

A subcommittee of the Environmental Conservation and Oil and Gas Sectors met in December 1996 to determine if the sectors could reach consensus on areas that might be appropriate for directional drilling under proposed Protected Areas in the Fort St. John, Dawson Creek and Fort Nelson planning areas. The group reviewed the proposed Goal 1 and 2 proposals and developed draft criteria for determining if directional drilling should be supported underneath proposed Protected Areas. The information was intended as a recommendation from the subcommittee to the Table. A list of their recommendations and criteria used to develop them are found in Appendix B.

6.2.4 Crown Land Agriculture Policy

The Table endorses any initiative taken at the provincial level to review the Crown Land Agriculture Policy to ensure that it is meeting the needs of both the agriculture sector and government.
6.2.5 Revision of Agricultural Land Reserve (ALR) Boundaries

The current Agricultural Land Reserve boundaries were created in 1974 at a scale of 1:50,000. The Table supports the intent of the Agriculture Land Reserve but has concerns that these reserve boundaries may not truly reflect the agricultural potential of land within the planning area. It is anticipated that the "working forests" will be incorporated into a Forest Land Reserve that will have these boundaries. Therefore, it is the Table’s recommendation that the current ALR boundaries be refined at a more detailed scale to more accurately capture the lands agricultural capability.

6.2.6 Forest Land Reserve

The Forest Land Reserve (FLR) is an essential element of BC’s Provincial land use strategy. The FLR is designed to retain forest land for timber production and related public values, and to discourage its conversion to urban uses. The Table recommends that Crown land outside of the revised ALR boundaries be included in the FLR.

6.2.7 Grazing Enhancement Fund

The Fort St. John LRMP endorses the establishment of funding for the Fort St. John planning area to meet the grazing objectives of the proposed land use plan.

The Fort St. John LRMP has developed strategies that are designed to minimize conflicts between livestock grazing and other resource users, but recognize that some mitigative strategies are required to deal with impacts of the Forest Practices Code (biodiversity and riparian management concerns) and wildlife guidelines established in the Plan area.

6.2.8 Site “C”

Since 1979, BC Hydro has held a flood reserve on a portion of the Fort St. John Planning area adjacent to the Peace River at an area known as the Site “C” flood reserve, an area previously identified as a potential dam site and reservoir. Above this dam site are several islands in the Peace that the Fort St. John Table would like to recommend for protection status. Current government policy regarding acceptable uses in Protected Areas clearly states that flooding would not be an acceptable use. Thus, full protection status would preclude future hydroelectric development opportunities. To this end the Table recommends the following:

- Any portion of these islands that are outside of the flood reserve be designated as Protected Areas.
- Areas within the flood reserve be designated under the Environment and Land Use Act such that resource development activities or tenures are precluded until such time as a decision is made on the Site “C” proposal.
- If the Site “C” flood reserve is cancelled, the areas designated under the Environment and Land Use Act, be upgraded to full protection status.

The current Site “C” flood reserve causes significant uncertainty in land-use planning within the Fort St. John area planning area. The Table therefore recommends that BC Hydro review its plans for Site “C” prior to any subsequent land use planning exercise, no later than 10 years from the approval date of this Plan.
6.2.9 Access and the Use of Gates

A considerable amount of the direction contained within this Plan relates directly or indirectly to the management of access to Crown lands. For a variety of reasons, this Plan directs that access be controlled in certain circumstances to protect other resource values such as wildlife or wilderness. There are a variety of measures that can be taken to achieve this objective depending on the exact nature of the access control required.

The Table has concerns that the use of gates for purposes other than public safety may lead to further complications if not used or monitored correctly. Problems in the past have been noted where certain individuals have gate privileges while others do not. To this end the Table recommends the following with regards to the use of gates as an access control mechanism:

- Land managers should use alternate access control measures where they are feasible
- When gates are chosen as the tool to control access, it must be advertised with sufficient time for public concerns to be addressed.

6.2.10 Transition

To ensure continuity of operational planning activity, the Fort St. John LRMP will include phase-in provisions. These provisions will be developed at a later date.

6.2.11 ROS 'Primitive Management'

Detailed planning will be required to develop access management strategies than maintain, over time, the current (1996) proportion/percentage of ROS "Primitive" land within the Besa-Halfway-Chowade Resource Management Zone.

6.2.12 Charlie Lake Licensed Water Supply Area

The Charlie Lake watershed has been identified as a significant source of water for the use of residents of the planning area. There is a broad general concern that this watershed has been negatively affected by settlement and resource development. Although this has not been proven satisfactorily to date, some water users believe that water quality and quantity have been negatively affected.

The Charlie Lake watershed does not meet the intent of official community watershed designation under the Forest Practices Code. These guidelines were developed to protect water quality and quantity in smaller, heavily licensed watersheds (<500 km²) from less than adequate forest and/or range practices. The prescriptions as listed and described in the Community Watershed Guidelines would not significantly protect water quality and quantity as currently written. Designation of this watershed as a 'community watershed', although possible under a higher level plan such as an LRMP, would cause residents and industry unnecessary bureaucracy with little substantive protection for this important water source.
6.3 Roles and Responsibilities

6.3.1 Interagency Management Committee

The responsibilities of the Omineca-Peace Interagency Management Committee (IAMC) are to:

- co-ordinate and ensure plan implementation by the various resource agencies;
- review and provide recommendations on proposed amendments;
- reconvene the Table for plan interpretation or the implementation report;

6.3.2 Government Agencies

All applicable resource management agencies are responsible for:

- preparing an annual monitoring report on plan implementation;
- preparing an implementation matrix and action plan to ensure that strategies and objectives are implemented;
- reviewing more detailed plans and resource management plans to ensure consistency with the LRMP; and,
- distributing a copy of the approved plan to major licensed resource users, resource agency staff, stakeholders and interested public.

6.3.3 First Nations

Government is committed to work with First Nations on a government-to-government basis. The LRMP will be without prejudice to aboriginal rights and treaty negotiations. First Nations will be encouraged to play a direct role in the implementation and monitoring of the Plan.

6.3.4 Public

It is recognised that the public is an important contributor to the effective implementation and monitoring of the plan in partnership with the different government agencies and First Nations.

6.4 Direction for More Detailed Planning

More detailed plans include a wide range of planning processes including, but not limited to landscape unit plans, pre-tenure plans, resource plans, co-ordinated access management plans and Protected Area Management Plans. Where there is no detailed planning process for a defined area, plans will be developed by the appropriate agencies and will provide an opportunity for public review. Any concerns with specific resource management practices should be raised directly with the resource agency mandated to manage those specific values.

6.5 Criteria that Apply to More Detailed Plans

All parties with a key interest or stake in the plan must be invited and encouraged to:

- participate,
- strive for consensus through an interest-based decision making process, and
- ensure all subsequent plans are consistent with the LRMP.
7.0 Monitoring and Amendment

7.1 Plan Term & Review Schedule

The term of the LRMP will be 10 years with a formal review in 2002 (year 5). The scheduled amendment and review process to renew the LRMP will begin 2005 (year 8).

7.2 Monitoring Committee & Annual Reporting

The Fort St. John LRMP Table recommends that the LRMP Working Group be used as the plan's monitoring committee and assist the interagency management committee (IAMC) with reviewing an annual monitoring report.

The monitoring report will indicate how the objectives and strategies outlined in the Land and Resource Management Plan are being met through agency-specific resource management activities, more detailed planning processes and resource development plans or permits.

By 1998 and annually thereafter the resource agencies will prepare an LRMP monitoring report for the LRMP Working Group to review. It will include:

- actions taken to conform with plan direction
- compliance with plan requirements
- instances where the intent of plan had to be clarified
- an update on the schedule for more detailed planning

The monitoring report will review and collate indicator information and assess how well the plan is meeting stated management objectives. Each appropriate government agency will be responsible for collecting and collating indicator information, revising the indicators as necessary, and raising issues that need to be addressed.

Following release of the Monitoring Report, the LRMP Working Group will hold an annual meeting to review the report and solicit public comment. The meeting will be an opportunity for the public to raise issues that may require update or amendment of the plan.

7.3 Draft Monitoring Indicators

Monitoring indicators were developed by the Table for the majority of the strategies in the General Management Direction and within each RMZ. The indicators are considered to be a draft and may be refined by the resource management agencies responsible for implementing the plan. They have not been updated with the current management objectives and strategies.

7.4 Plan Amendment

Local or operational planning processes may, through more detailed mapping, research or public involvement, recommend changes to the Land and Resource Management Plan. The outcome of LRMP Monitoring Committee meetings may also be recommended amendments to the plan. These would be communicated by the LRMP Chairperson (or IAMC designate) to the Omineca-Peace Inter-agency Management Committee for their consideration.
7.4.1 Plan Updates (Minor Amendments)

Plan updates are any minor changes to the plan and may include:
- revision of wording;
- revised priorities for more detailed plans
- small changes to boundaries of Resource Management Zones (maximum 500 ha) suggested by more detailed plans
- refinements to objectives and strategies suggested by more detailed plans; and,

The annual Monitoring Report will contain proposed plan updates. The IAMC will be responsible for review and approval of suggested plan updates. All changes to the plan will be documented and circulated to public interest groups and major tenure holders.

7.4.2 Unscheduled (Major) Amendments

An unscheduled amendment is a major or significant change to the plan including:
- large changes to Resource Management Zone boundaries (500 ha or more);
- major revisions to objectives and/or strategies set out in the plan

The LRMP Table, public or agencies may identify issues that require an unscheduled amendment. These will be identified in the Annual Report or at an annual meeting. When issues arise that require a major amendment, the IAMC will establish the schedule and Terms of Reference for the amendment process, consistent with existing legislation, regulations, and policies.

The public will be involved in the plan amendment process.

Further direction will be provided by the Land Use Co-ordination Office (LUCO) on what constitutes a major amendment to the plan.

7.4.3 Scheduled Amendments

A scheduled amendment will involve the review of the entire plan and include a detailed examination of significant revisions. The process to amend the plan will begin eight years following plan approval. The IAMC will establish the Terms of Reference for the amendment and review process, consistent with existing legislation, regulations and policies.

The public will be involved in the amendment process.

7.4.4 Audit Process

An audit process should be developed so that the success of implementing the LRMP can be measured. One method that can be used is for the LRMP Chair and the IPT to contract with an independent auditor. Through interviews, field work or other methods, the auditor determine the success of implementation. The audits, which should require about one to two weeks work, could be carried out every two years, beginning in 1999, and ending with the 8 year review of the plan. Results of audits can be presented at the annual meeting.
8.0 Interpretation and Appeal

From time to time, the LRMP Working group, public or agencies may become concerned about how the plan is being interpreted or about specific practices that are occurring. In all instances, the concerns will be dealt with in the same spirit that the plan was developed.

8.1 Interpretation of Land Use Objectives and Strategies

Where a concern is raised over land use objectives and strategies, the concern will be addressed directly to the affected agency(s). The responsible manager(s) will respond to the concern in writing. If the matter is not satisfactorily resolved, the concern will be forwarded to the Omenica-Peace Inter-agency Management Committee for resolution.

8.2 Appeal of Resource Management Practices

Where the public or agencies raise concerns with specific resource management practices that are occurring in the LRMP planning area, they will raise the issue directly with the affected agencies. Where there is an existing review or appeal process, the concern will be dealt with through it. For example, concerns over forest road construction will be dealt with under the Forest Practices Code.

8.3 Reconvening the LRMP Table

At the annual meeting and review, or if the LRMP Table is reconvened, the Table will have an opportunity to provide interpretation and input on specific issues relating to the Fort St. John LRMP. A group of Table members may make a request to the Inter-Agency Management Committee that the Fort St. John LRMP Table be reconvened to address specific issues related to interpretation of the plan.
## APPENDICES

### Appendix A  Fort St. John LRMP Table Members

<table>
<thead>
<tr>
<th>Sector</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Conservation</td>
<td>Wayne Sawchuk</td>
</tr>
<tr>
<td>Guide-Outfitting</td>
<td>Ray Jackson</td>
</tr>
<tr>
<td>Hardwood Forest Industry</td>
<td>John Dymond</td>
</tr>
<tr>
<td>Hardwood Forest Industry</td>
<td>Lyle Mortenson</td>
</tr>
<tr>
<td>Heritage</td>
<td>Pat Westergaard</td>
</tr>
<tr>
<td>Labour</td>
<td>Allana MacAulay</td>
</tr>
<tr>
<td>Labour</td>
<td>Ron Wagner</td>
</tr>
<tr>
<td>Local Urban Government</td>
<td>Rob Fraser</td>
</tr>
<tr>
<td>Local Rural Government</td>
<td>Karen Goodings</td>
</tr>
<tr>
<td>Local Rural Government</td>
<td>Jean Leahy</td>
</tr>
<tr>
<td>Ministry of Agriculture, Fisheries and Food</td>
<td>Allan Blair</td>
</tr>
<tr>
<td>Ministry of Employment and Investment (Minerals)</td>
<td>Jamie Pardy</td>
</tr>
<tr>
<td>Ministry of Employment and Investment (Energy)</td>
<td>Tom Ouellette</td>
</tr>
<tr>
<td>Ministry of Environment, Lands and Parks (Environment)</td>
<td>Mike Lambert</td>
</tr>
<tr>
<td>Ministry of Environment, Lands and Parks (Lands)</td>
<td>Alex Ostapiuk</td>
</tr>
<tr>
<td>Ministry of Environment, Lands and Parks (Parks)</td>
<td>Don Roberts</td>
</tr>
<tr>
<td>Ministry of Forests</td>
<td>Andy Johnson</td>
</tr>
<tr>
<td>Non-Commercial Hunters and Anglers</td>
<td>Barry Holland</td>
</tr>
<tr>
<td>Petroleum and Natural Gas</td>
<td>Van Greig</td>
</tr>
<tr>
<td>Petroleum and Natural Gas</td>
<td>Rob Jefferies</td>
</tr>
<tr>
<td>Ranching</td>
<td>Larry Beale</td>
</tr>
<tr>
<td>Recreation</td>
<td>Ray Van Skiver</td>
</tr>
<tr>
<td>Small Business</td>
<td>Judy Thomas</td>
</tr>
<tr>
<td>Softwood Forest Industry</td>
<td>Dave Menzies</td>
</tr>
<tr>
<td>Tourism</td>
<td>Ella Fraser</td>
</tr>
<tr>
<td>Trapping</td>
<td>Arnold Churchill</td>
</tr>
<tr>
<td>Utilities, Transmission Lines and Transportation</td>
<td>Eric Mohun</td>
</tr>
</tbody>
</table>

1 Table members as of July 2, 1996, when consensus was achieved.
Appendix B Recommendations of Environmental Conservation and Oil and Gas Sector Subcommittee on Directional Drilling under proposed Protected Areas

Criteria NOT supporting Directional Drilling beneath Protected Areas

1. designation objective relates to subsurface issues (e.g. hot springs)
2. size/shape of area too large to get seismic data (not technically feasible)
3. ecological values compromised by adjacent directional drilling activity
4. spiritual and/or cultural values
5. adjacent topography
6. drilling tech feasibility unsuitable
7. highest pristine areas
8. visual impact
9. too small, intent agreed is that the boundary of either a large or small area should not preclude that area outside of the park from being developed - allow tenure sales of that portion of a DSU (drilling supply unit) that falls outside a designated Class A Park, allow production from DSUs even where a portion of that DSU is taken up by a Protected Area.
10. not geologically prospective near term (indicated by geological trends and activity)

Criteria supporting Directional Drilling beneath Protected Areas

a. designation of PA for recreational cultural purposes (non-ecological values)
b. existing tenure in or adjacent to the Protected Area
c. size/shape technically suitable for directional drilling
d. existing access/infrastructure in or adjacent to Protected Area
e. high term geological potential indicated by geological trends and activity
f. where high pooling operations exist
g. corridor/linear sites
h. topography adjacent seems amenable
i. technical directional feasability

Implementation Recommendations

i. Protected Areas where directional drilling is appropriate should be designated such that directional drilling be allowed otherwise they should be administered as a Class A Park.
ii. List of Protected Areas and their suitability for directional drilling should be reviewed every 10 years. ELU Act sites would move into a Class A park designation where the directional drilling criteria no longer applies, where warranted - long term intent would be to get all ELU Act sites into Class A designation.
iii. Long-term goal - to have all ELU Act sites moved to Class A park designation (Note: This may not be the intent at each of the three LRMP Tables)
iv. No surface disturbance (including seismic)
v. ELU Act sites areas allow for subsurface oil and gas tenures - would allow for new subsurface tenures.
vi. Allow tenure sales on the portion of the DSU which falls outside a designated Class A Park.
vii. Allow production from DSUs even where a portion of the royalties and bonus points to Park management from the revenues from Protected Areas where directional drilling occurs.
viii. where tenure already exists in a Protected Area it will be grandfathered under existing normal rules regarding access, voluntarily surrendered, expropriated by government or resolved under other yet to be determined mechanisms.
Fort St. John LRMP Recommendations

Rationale (Criteria numbered 1 through 10 for NOT supporting directional drilling or criteria numbered a through i in support of directional drilling) are included after each proposed Protected Area.

<table>
<thead>
<tr>
<th>Appropriate</th>
<th>Not Appropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sikanni Canyon (b, d, e)</td>
<td>Pink Mountain (9)</td>
</tr>
<tr>
<td>Sikanni Falls (d, e)</td>
<td>Sikanni Old Growth (5)</td>
</tr>
<tr>
<td>Ekwan Lakes (c, d and e subject to First Nations review)</td>
<td>Peace River Corridor Sites (9 including Golata Creek)</td>
</tr>
<tr>
<td>Beatton-Doig Canyon (b, e)</td>
<td>Milligan Hills (2, 3, 5)</td>
</tr>
</tbody>
</table>

Appropriate
Chinchaga Lakes (b, d and e subject to First Nations Cultural review)

Not Appropriate
Graham-Laurier (2)
Redfern-Keily Creek (2, 3, 5)
Appendix C Glossary Of Terms

ACCESS MANAGEMENT
the overall mandate for the administration of the planning, construction, maintenance, use and deactivation of present and proposed Forest Service Roads, operation roads and non-status roads on Crown Lands within or outside Provincial Forests (including Tree Farm licences (TFL)), in conjunction with Timber Supply Analysis (TSA) and TFL plans, resource development plans and in addition to emergency pest and fire contingency plans.

AGE CLASS
any interval into which the age ranges of trees, forests, stands or forest types is divided for classification and use; forest inventories commonly group trees into 20 year age class groups.

AGRICULTURAL CODE OF PRACTICE FOR WASTE MANAGEMENT
purpose of this Code is to describe practices for using, storing and managing agricultural waste that will result in agricultural waste being handled in an environmentally sound manner.

AGRICULTURAL LAND RESERVE - ALR
established under the Land Commission Act in April, 1973. Principal objective is the preservation of Agricultural Land for farm use and encouragement for establishment and maintenance of family farms.

ALIENATE
to convey or transfer land from crown status to fee simple.

ALLUVIUM
sand, clay and other earth materials gradually deposited along river beds and floodplains.

AQUIFER
a water bearing stratum of permeable rock, sand or gravel.

ARCHOLOGICAL SITES
locations that contain physical evidence of past human activity for which the application of scientific methods of inquiry (i.e. survey, excavation, data analysis) are the primary source of information. These resources do not necessarily hold direct associations with living communities. Examples of archaeological sites include shell middens, lithic scatters, cache pits and pit house remains.
(from: Douglas Glaum communication, April 1996)

ASSEMBLAGES
collection or aggregate, a number of persons or things assembled.

AVIAN
of, or pertaining to birds.

BEST MANAGEMENT PRACTICES
accepted methods for controlling non-point sources pollution, may include one or more conservation practices.
Biodiversity

Or biological diversity, is the diversity of plants, animals and other living organisms in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems, as well as the evolutionary and functional processes that link them.

The underlying assumption of applying the biodiversity management approach is that all native species and ecological processes are more likely to be maintained if managed forests are made to resemble those forests created by the activities of natural disturbance agents such as fire, wind, insects and disease. The composition, size, age and distribution of forest types and structural characteristics of forest stands have been determined by these natural processes.

Applying biodiversity emphasis options to landscape units across a planning area is a key biodiversity management strategy. LRMP tables can indirectly assign biodiversity options to landscape units consistent with broad scale land use zonation using lower biodiversity emphasis.

When landscape level biodiversity management options have been established, the requirement for maintaining biodiversity in individual strands can be determined from Biodiversity Field Guide.

(from: Biodiversity Guidebook, September 1995)

Biodiversity - Lower Level

Lower biodiversity emphasis, first in a range of three landscape level options to maintain biodiversity. Where the primary management objectives are primarily socio-economic demands such as timber supply, the lower biodiversity emphasis option may be appropriate. Habitat is provided for a wide range of species, however, the pattern of biodiversity will be significantly altered. Accordingly, there is a relatively high risk that some native species will be unable to survive in a specific area.

(from: Biodiversity Guidebook, September 1995)

Biodiversity - Intermediate Level

Intermediate biodiversity emphasis, second option, essentially a trade-off between biodiversity conservation and timber production. The risk to eliminating certain species from an area is reduced.

(from: Biodiversity Guidebook, September 1995)

Biodiversity - Higher Level

Higher biodiversity emphasis, an option recommended for those areas where biodiversity conservation is a high management priority. It gives a higher priority to biodiversity conservation and has the greatest impact on timber supply.

(from: Biodiversity Guidebook, September 1995)

Biodiversity - Stand Level

Stand level - stand management to maintain biodiversity, stand level recommendations for biodiversity are designed to maintain or restore important structural attributes such as wildlife trees (including standing dead or dying trees), coarse woody debris, tree species diversity and understorey vegetation diversity.

(from: Biodiversity Guidebook, September 1995)

Biogeoclimatic Zones

Are geographic areas having similar patterns of energy flow, vegetation and soils as a result of broadly homogeneous climate.

(from: Biodiversity Guidebook, September 1995)
BLUE LISTED SPECIES
 taxa that are considered to be vulnerable and “at risk”, but not yet endangered or threatened. Populations of these species may not be in decline, but their habitat or other requirements are such that they are sensitive to further disturbance. The blue list also includes species that are generally suspected of being vulnerable, but for which information is too limited to allow designation in another category.

BROAD ECOSYSTEM UNITS
 a permanent area of the landscape, meaningful to animal use, that supports a distinct kind of dominant vegetative cover, or distinct non-vegetated cover. These units are defined as including potential (climax) vegetation and any associated successional stages (for forests and grasslands).

BUFFER ZONE
 a zone of vegetation around a sensitive area intended to filter impacts of adjacent activities, such as road building, on the resource being protected - some activities may be permitted within buffer zones. Often used in conjunction with leave strips - an undisturbed strip of vegetation around a sensitive resource area.
(from: Environmental Guidelines for Seismic and Drilling Operations in Northeast British Columbia (Interim), MELP, November 1994.)

CAPABILITY MAPPING
 a habitat interpretation for a species which describes the greatest potential of a habitat to support that species. Habitat potential may not be reflected by the present habitat condition or successional stage.

CARIBOU MANAGEMENT ZONE
 areas where operable timber supply has been reduced to meet the requirements of caribou habitats.

CAPABILITY RATINGS (HABITAT) FOR UNGULATES (CLASSES I THROUGH 6)
 Capability ratings are established on the ability of the land to meet the total needs of the ungulate species over the long term. In terms of food and cover needs, the ratings are based on the optimum vegetational stage (successional stage) that can be maintained assuming good management practices that do not degrade the environment or the land base.
• Class 1 Lands in this class have no significant limitations to the production of ungulates.
• Class 2 Lands in this class have very slight limitations to the production of ungulates.
• Class 3 Lands in this class have slight limitations to the production of ungulates.
• Class 4 Lands in this class have moderate limitations to the production of ungulates.
• Class 5 Lands in this class have severe limitations to the production of ungulates.
• Class 6 Lands in this class have limitations so severe that there is no ungulate production.
(Inter-agency Planning Team definition - primarily from the map legend from Northeast Coal Habitat Inventory Studies, Resource Inventory branch, Victoria, 1977-79)

CLEARCUTTING SILVICULTURAL SYSTEM
 the process of removing all trees in a stand in one cutting operation. The previous stand is replaced with an even aged crop of new trees through planting and or natural regeneration.

COARSE WOODY DEBRIS
 sound and rotting logs and stumps that provide habitat for plants, animals and insects and, are a source of nutrients for soil development.
(from: Biodiversity Guidebook, September 1995)
COLIFORMS
bacteria present in the intestinal tracts of humans and other warm blooded animals and excreted in large numbers in faecal wastes. Water is not a natural medium for coliform organisms and their presence is indicative of faecal pollution. Total coliform counts are used as an indicator of the treatment adequacy in drinking water supply systems. Total coliforms include a wide variety of bacteria, many of which are not pathogenic and not associated with human waste. The faecal coliforms counts are specific for faecal pollution.
(from: Draft Community Watershed Guidebook, March 1996)

COMMERCIAL ACCESS
roading or the use of roads in support of commercial non-industrial activities (tourism, guide outfitting, angling, etc.).

COMMUNITY WATERSHED (AS DESIGNATED BY THE FOREST PRACTICES CODE)
a watershed with a drainage area of not more than 500 km² that
• is licensed under the Water Act for community water use, or
• is licensed under the Water Act for domestic water use and the holder of the license, the district manager, the designated environmental official and Minister of Health, all agree that the area should be regarded as a community watershed.

COMMUNITY WATERSHED PROTECTION GUIDELINES
recognize water quality, quantity and timing of flow as the principles in the community watersheds, and provide for their protection and enhancement by guiding and regulating resource management activities.

CONFLUENCE
place where streams meet.

CONIFEROUS
cone bearing evergreen trees or shrubs, usually with needle-shaped or scale-like leaves. The wood of coniferous trees is known as softwood (e.g. pine, fir and spruce).

CONNECTIVITY
a qualitative term used to describe the degree to which late successional ecosystems are linked to one another to form an interconnected network. The degree and characteristics of these linkages are determined by topography and Natural Disturbance Type (NDT).
Specific types of connectivity are:
• upland to upland
• upland to stream
• upland to wetland
• cross-elevational
(from: Biodiversity Guidebook, September 1995)

CONSERVATION DATA CENTRE
a division of BC Environment that tracks species and plant communities that are considered threatened or endangered at the provincial, national or global level.

CRITICAL HABITAT
part or all of a specific place occupied by a wildlife species or a population of such species and recognized as being essential for the maintenance of the population or ecosystem processes. The habitats may be well defined, geographically concentrated, critical niches or species-specific critical ecological components widely distributed across the landscape.
CUTOVER
land cleared of trees

DECIDUOUS
trees or shrubs, commonly broad leafed, that shed their leaves annually. The wood of deciduous trees is known as hardwood (e.g. aspen).

DFO
Department of Federal Fisheries and Oceans.

DIAMETER AT BREAST HEIGHT (DBH)
the diameter of a tree, measured at 1.3 m above the ground. A measurement taken at approximately breast height and used as the standard for describing the diameter of a tree.

DISCOURAGE
to hinder by disfavouring: deter;
to attempt to dissuade.

ECOSECTION
large, defined geographic units based primarily on landform and climate that are used to divide the province into large physiographic units.

ECOSECTION REPRESENTATION
the degree to which the area represents the biophysical features of the ecoregion, especially its ability to capture the full range of biogeoclimatic units.

ECOSYSTEM
a community of animals, plants and bacteria and its interrelated physical and chemical environment.

ENCOURAGE
to spur on: stimulate;
to give help or patronage to: foster

ENDANGERED
a species facing imminent extirpation or extinction, COSEWIC.

ENHANCE
to add or contribute to: improve; increase.

ENSURE
to make sure, certain, or safe: guarantee
making certain or inevitable of an outcome, but INSURE sometimes stresses the taking of necessary measures beforehand.
EQUIVALENT CLEAR CUT AREA (ECA) THRESHOLD LEVELS

term used to describe a second growth back in relation to its hydrological equivalence to a recent clear cut. As second growth develops, the hydrological impact on the site is reduced. The rate of reduction is expressed in proportion to the height of the second growth. On average, a stand must be at least 9 metres in height before a stand can be considered hydrologically recovered.

FACILITATE

to make easier.

FLYWAY

specific air route taken by birds during migration.

FOREST ECOSYSTEM NETWORK (FENs)

planned landscape zones that serve to maintain or restore natural connectivity within a landscape unit. FENs are contiguous networks of representative old-growth and mature forest and are composed of a variety of protected and classified areas (e.g., Protected Areas, old-growth management areas, riparian management areas and reserve zones, wildlife habitat areas and other sensitive areas such as unstable terrain, high visual quality or any other inoperable areas).

(from: Biodiversity Guidebook, September 1995)

FOREST MANAGEMENT REGIME (LOW, MODERATE OR HIGH INTENSITY)

A forest management regime (low, moderate or high intensity) is a general forest resource management statement incorporated into the majority of the resource management zones within the planning area. It is intended to describe the intensity of forest resource management activity (timber harvesting, road construction, silviculture, etc.) in a specific RMZ.

• **High intensity** areas are extensively logged and roaded with numerous tree plantations at various stages. Forest resource development is a major resource value within the zone. Timber licensees have made substantial investments (such as road construction) within the RMZ. A high level of industrial forestry activity is anticipated over the long term.

• **Moderate intensity** areas are currently logged or forecast for timber harvesting and subsequent forest management activities at a substantially lower level of intensity than in high intensity areas. Industrial forest activity is one of several resource values. Forest licensees have made some substantial investments into forest resource infrastructure within the zone. Forest resource development may not be the most prominent industrial activity in the RMZ.

• **Low intensity** areas have, to date, experienced minimal industrial forest management activity. Previous timber harvesting may not have occurred or have been completed and cutblocks may be in various stages of forest regeneration. In general, low intensity areas have higher biodiversity, conservation, recreation and wildlife values. Future timber harvesting and related forest management activity is anticipated but at a level less than in RMZ's with a moderate forest management regime. (Source; JPT)

FOREST PRACTICE

timber harvesting, road construction, road maintenance, road use, road deactivation, silviculture treatments, botanical forest product collecting, grazing, hay cutting, fire use, control, suppression and any other activity that is

• carried out on land that is

  i) Crown Forest Land

  ii) range land, or

  iii) private land that is subject to tree farm license or a woodlot license, and

• carried out by

  i) any person (A) under an agreement under the Forest Act or Range Act, (B) for a commercial purpose under this Act or the regulations, or (C) to rehabilitate forest resources after an activity referred to in clause (A) or (B), or

  ii) the government. (from: Forest Practices Code, April 1995)
FOREST PRACTICES CODE OF BRITISH COLUMBIA

part of an overall strategy introduced by the provincial government for land use planning and resource management in BC. The Code is based on the goal of sustainable use which includes:

• managing forests to meet present needs without compromising the needs of future generations,
• providing stewardship of forests based on an ethic of respect for the land,
• balancing productive, spiritual, ecological and recreational values of forests to meet the economic and cultural needs of peoples and communities, including First Nations,
• conserving biological diversity, soil, water, fish, wildlife, scenic diversity and other forest resources; and,
• restoring damaged ecosystems.


FRAGMENTATION

a process whereby large contiguous forest patches are transformed into one or more smaller patches surrounded by disturbed areas. Fragmentation occurs naturally by fire, disease, wind and insect attack. It also occurs in managed forests, influenced by the rate of cut, cutblock size, cutblock distribution and silvicultural systems used to reforest. Fragmentation due to forest harvesting should be viewed and managed to mimic fragmentation resulting from natural disturbances.

Fragmentation can lead to declines in biodiversity in three ways:

• the loss of habitat through the conversion of natural forest stands to managed forest stands,
• the increase in micro-climatic and biotic edge effects through the reduction in size of forest patches,
• the imposition of barriers to gene flow and dispersal through the increasing isolation of remaining forest patches.

(from: Biodiversity Guidebook, September 1995)

GREEN-UP

a cutblock that supports a stand of trees that

• has attained the green-up height specified in the higher level plan for the area,
• in the absence of a higher level plan for the area, has attained a height that is 3 metres or greater.

(from: Green-Up Guidebook, December 1995)

GROUNDWATER

subsurface water found in the zone of saturation.

GROUNDWATER RECHARGE

the inflow to an aquifer.

HABITAT

an area in which a plant or animal naturally lives; part of a broader unit, the ecosystem.

HEADWATERS

the source and upper reaches of a stream, also the upper reaches of a reservoir.

HIGHER LEVEL PLAN (HLP)

In the broader context, higher level plans refer to plans, agreements or objectives as defined in the Forest Practices Code. They provide the strategic context for operational plans that determine the mix of forest resources to be managed in a given area. There are two main categories:
Appendix D Draft Monitoring Indicators by Interest

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Indicator</th>
<th>Methods &amp; Assumptions</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timber</strong></td>
<td>- quantify the timber harvesting land base and develop policies to reduce the permanent loss of net forest land to roads, landings, seismic lines, wellsites and other developments</td>
<td>- net timber harvesting land base 1996 vs 2001</td>
<td>- Road Access and Density Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- amount of roads, landings, seismic lines, wellsites removed from timber harvesting land base</td>
<td>- GIS Data</td>
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<tr>
<td></td>
<td></td>
<td>- quantify trends in timber harvesting land base</td>
<td>- MOF Forest Inventory</td>
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<td></td>
<td>- establish general forest production targets for landscape units within the Resource Management Zone (RMZ) consistent with (choose one):</td>
<td>- silviculture activities and/or expenditures</td>
<td>- Forest Cover Maps</td>
</tr>
<tr>
<td></td>
<td>(i) low intensity, or</td>
<td>- Landscape Units and biodiversity options</td>
<td>- GIS Data</td>
</tr>
<tr>
<td></td>
<td>(ii) moderate, or</td>
<td></td>
<td>- MOF ISIS</td>
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<tr>
<td></td>
<td>(iii) high intensity forest management regimes.</td>
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<td>- Licensee MLSIS</td>
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<td></td>
<td>- reforest (within appropriate time frames, as determined through landscape planning) all potentially productive brush, non commercial deciduous, and NSR (not sufficiently restocked) areas with ecologically and commercially suitable species while providing for critical wildlife habitat. Time frames recommended are 10 years for high priority areas and 20 years for moderate priority areas.</td>
<td>- ha of NSR reforested/restocked</td>
<td>- Forest Cover Maps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- amount of backlog NSR in 1996 vs 2001</td>
<td>- MOF ISIS</td>
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<td></td>
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<td>- NSR land base being converted back to forest land base</td>
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<td></td>
<td>- establish and maintain a permanent road infrastructure to facilitate long term integrated resource management</td>
<td>- length and number of permanent road infrastructures for multiple resource users 1996 vs 2001</td>
<td>- GIS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- quantify trends in permanent road systems</td>
<td>- Forest Cover Inventory</td>
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<td></td>
<td>- where appropriate, vary cut-block adjacency requirements (in accordance with Forest Practices Code, the Green-up and Biodiversity Guidebooks) to increase timber availability and reduce roading requirements</td>
<td>- # of occasions adjacency requirement have been reduced</td>
<td>- MOF Timber Staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- timber developed in relation to km of roads</td>
<td>- 5 Year Plans</td>
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<td></td>
<td></td>
<td>- quantify extent and nature of various adjacency requirements for cut-blocks area in relation to roading requirements</td>
<td></td>
</tr>
<tr>
<td># OF DOCUMENTS TO BE CORRECTED</td>
<td>REASON FOR THE CORRECTION</td>
<td>OPERATOR</td>
<td></td>
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PROVINCE OF B.C.  DO NOT PHOTOCOPY/USE BLACK PEN
HIGHER LEVEL PLANS, CON'T

1. Plans that are directly enabled through Part 2 of the Forest Practices Code of British Columbia Act, including objectives for resource management zones, landscape units, sensitive areas and interpretive forest sites and recreation sites and trails.

2. Plans that are developed under non-Forest Practices Code legislation and policy. These include plans that are authorized by Cabinet, plans pursuant to Section 4(c) of the Ministry of Forests Act that have been authorized by a District Manager with direction from the chief forester and management plans, which may be designated as higher level plans by the chief forester for tree farm licenses, and by the regional manager for other agreements under the Forest Act.

The following is a hierarchy of higher level plans:
- plans approved by Cabinet or three Ministers (such as CORB land-use plans)
- resource management zone objectives (such as those developed for an LRMP)
- landscape unit objectives
- sensitive area objectives
- 4(c) plan under the Ministry of Forests Act.
- interpretive forest site, recreation site or trail objectives
- management plan

Note: By legislation, landscape unit and sensitive area objectives must be consistent with resource management zone objectives.

HYDROLOGY

the science of the waters of the earth, water properties, circulation, principles and distribution.

IDENTIFIED WILDLIFE

those species at risk that the Deputy Minister of Environment, Lands and Parks or a person authorized by that deputy minister and the chief forester agree will be managed through a higher level plan, wildlife habitat area or general wildlife measure.

IMPROVE

to enhance in value or quality: make better,
to use to good purpose,
to advance or make progress in what is desirable,
to make useful additions or amendments.

INDIGENOUS

existing, growing or produced naturally in a region.

INDUSTRIAL ACCESS

roading and other infrastructure requirements related to the oil and gas, timber, mineral and trapping industries.

STREAM FLOW REQUIREMENT

the minimum amount of water required in a stream to maintain the existing aquatic resources and associated wildlife and riparian habitat.

INTEGRITY

an unimpaired condition; soundness,
the quality or state of being complete or undivided; completeness.
**CE CLASS**
a designation, made by the district manager, for lakes with a riparian class of L1 that indicates the width of a lakeshore management zone and practices that are appropriate within that zone.

**CESHORE GUIDELINES**
designates which management practices are acceptable within reserve and management zones. 
*(from: Lake Classification and Lakeshore Management Guidebook: Prince George Forest Region, November 1995)*

**CESHORE MANAGEMENT AREA**
an area established adjacent to a lake with a riparian class of L1, consisting of a riparian reserve zone determined in accordance with the Forest Practices Code of BC, a lakeshore management area, and a lakeshore management zone.

**CESHORE MANAGEMENT ZONE**
portion of the lakeshore management area established by the district manager around a lake with a riparian class of L1, consisting of a riparian reserve zone or if there is no riparian reserve zone, that are located adjacent to the lake.

**NDSCAPE**
a watershed or series of similar and interacting watersheds, usually between 10,000 and 100,000 ha in size.

**NDSCAPE UNIT**
a planning area, generally up to 100,000 ha, delineated according to topographic or geographic features such as a watershed or series of watersheds and, as designated by a district forest manager. 
*(from: Biodiversity Guidebook, September 1995)*

**AGE WOODY DEBRIS**
Woody debris functioning as fish habitat, during at least part of the year, with a diameter of 10 cm or greater and a length of 2 metres or greater.

**ND AND RESOURCE MANAGEMENT PLANNING**
The sub-regional integrated resource planning process for British Columbia. LRMP considers all resource values and requires public participation, interagency coordination and consensus building in land and resource management decisions.

**HYDROLOGY**
the branch of hydrology pertaining to the study of freshwater, especially ponds and lakes.

**EAL DEVELOPMENT**
straight line industrial development that is typical of powerlines, highways, gas lines and seismic activities.

**AL RESOURCE USE PLAN (LRUP)**
district or landscape level plans providing objectives and guidelines for use and protection of valued resources. Examples include integrated watershed management plans, coordinated access management plans and wilderness/recreation plans.

**INTAIN**
to keep in an existing state (as of repair, efficiency, or validity); preserve from failure or decline. The intent of the Table is that "maintain" is not used in a strict, narrow sense, to such an extent that no use or change in use is tolerated. It is recognized that natural processes do not preserve the natural environment in an unaltered state. Rather, changes occur over time and space, while they appear to be the same.
MANAGE

to handle or direct with a degree of skill or address,
to treat with care; to exercise executive, administrative, and supervisory direction.

MATURE GROWTH

or *mature seral-stage*, is a forest composed primarily of co-dominant trees, with canopies that vary vertically, horizontally, or both. Generally refers to trees 80 to 120 years old or greater, depending upon species and site conditions. The age and structure of mature seral-stage forests varies significantly by forest type and from one biogeoclimatic zone to another.

(from: *Biodiversity Guidebook, September 1995*)

MAXIMIZE

to increase to a maximum;
to make the most of.

MEI

Ministry of Employment and Investment.

MELP

Ministry of Environment, Lands and Parks.

MOF

Ministry of Forests.

MINIMIZE

to reduce to a minimum.

NATURAL DISTURBANCE TYPES (NDTs)

characterize areas with different natural disturbance regimes. Natural stand-initiating disturbances are those processes that largely terminate the existing forest stand and initiate secondary succession in order to produce a new stand. For the purpose of setting biodiversity objectives, five natural disturbance types are recognized as occurring in BC. These are:

*NDT 1* - ecosystems with rare stand-initiating events,
*NDT 2* - ecosystems with infrequent stand-initiating events,
*NDT 3* - ecosystems with frequent stand-initiating events,
*NDT 4* - ecosystems with frequent stand-maintaining fires,
*NDT 5* - Alpine Tundra and Sub-alpine Parkland eco systems.

(from: *Biodiversity Guidebook, September 1995*)

NATURAL STREAM FLOW

the flow of a stream as it would be if unaltered by upstream diversion, storage, import, export or changes in upstream consumption use caused by development.

NON-POINT SOURCE POLLUTION

pollution discharged over a wide land area, not from one specific location.
PRODUCTIVE forest land that has been denuded and has failed, partially or completely, to regenerate either naturally or artificially.

OLD GROWTH MANAGEMENT AREA (OGMA)
mapped-out special management areas that contain or are managed to replace specific structural old-growth attributes. They are intended to capture old-growth or mature seral stages within landscape units to meet retention objectives and can be harvested (using timber harvesting and silvicultural practices consistent with management objectives for the OGMA) when equivalent old-seral stage areas are available.
(from: Biodiversity Guidebook, September 1995)

OLD-GROWTH or old-seral stage is a climax forest that contains live and dead trees of various sizes, species, composition and age class structure. The age and structure of old growth forests varies significantly by forest type and from one biogeoclimatic zone to another.
(from: Biodiversity Guidebook, September 1995)

OPERATIONAL PLAN
details the logistics for development. Methods, schedules and responsibilities for accessing, harvesting, renewing and protecting the resource are set out to enable site specific operations to proceed. These include Forest Development Plan, Logging Plan, Access Management Plan, Range Use Plan, Silviculture Prescription, Stand Management Prescription and Five Year Silvicultural Plan.

PARTIAL RETENTION
Partial retention is a practice designed to meet MOF Visual Quality Objectives (VQO). The partial retention VQO requires that alterations remain visually subordinate to the characteristic landscape. Repetition of the line form, colour and texture is important to ensure a blending with the dominant elements. In the managed forest, partial retention may apply to areas where landscapes are of aesthetic importance and where management activities generally can match the landscape character and do not cause obvious intrusion (e.g. where landscapes can absorb change).
(Source: MOF VQO policy)

TCH
a stand of similar-aged forest that differs in age from adjacent patches by more than 20 years. The term is used in landscape level planning to either refer to the size of an opening created by a natural disturbance that led to even-aged forests or an opening created by cutblocks.
(from: Biodiversity Guidebook, September 1995)

UNITED COMMUNITY
an abstract unit based on sample plots of climax vegetation that possesses similar vegetation structure and native species composition and occurs repeatedly in similar habitats.

ALTERATION
any alteration in character of quality of the environment which renders it unfit or less suited for certain uses.
POTABLE
water fit for human consumption without further treatment.

PRESCRIPTION
a set of detailed directions for managing habitat for identified wildlife.

PRESERVE
to keep safe from injury, harm, or destruction: protect,
to keep up and reserve for personal or special use.

PRIORITY FISH SPECIES
freshwater game fish species such as kokanee salmon, rainbow trout, bull trout, walleye and burbot.
(from: Fish-Stream Identification Guidebook, July 1995)

PROMOTE
to contribute to the growth or prosperity of: further.

PROTECTED AREA
areas such as provincial parks, federal parks, wilderness areas, ecological reserves, and recreation areas that have protected designations according to federal and provincial statutes. Protected Areas are land and freshwater to marine areas set aside to protect the province's diverse natural and cultural heritage.

PROTECT
to cover or shield from exposure, injury, or destruction: guard.

PROVIDE
to make a proviso or stipulation,
to make preparation to meet a need; to supply something for sustenance or support.

QUANTIFY
to make explicit the logical quantity of; to determine, express, or measure the quantity of.

RARE ECOSYSTEM
an ecosystem (either site series - sites capable of producing the same late seral or climax plant communities within a biogeoclimatic zone or variant, or surrogate - to elect as substitute) that makes up less than 2% of a landscape unit and is not common in adjacent landscape units.
(from: Biodiversity Guidebook, September 1995)

RED-LISTED SPECIES
the taxa on the red list are either extirpated, endangered or threatened, or are being considered for such status. Any indigenous taxon (species or subspecies) threatened with imminent extinction or extirpation throughout all or a significant portion of its range in BC is endangered. Threatened taxa are those indigenous species or subspecies that are likely to become endangered in BC if factors are not reversed.
REGIONALLY IMPORTANT SPECIES

Species that are not red or blue-listed, that require management practices that differ from standard integrated resource management guidelines in order to fulfill critical habitat needs; or locally or regionally threatened or declining species or those that may reasonably be expected to decline without protection of critical habitats.

ECOiGNIZE

to acknowledge formally; as to admit as being of a particular status; to acknowledge the de facto existence or the independence of,
to acknowledge or take notice of in some definite way as: to acknowledge with a show of appreciation; to acknowledge acquaintance with.

EiiABiiLiiTiiATION

re-establish to, condition of good health.

EiiSiiERVE

to hold in reserve: keep back,
to set aside an area of forest land, that by law or policy, is not available for timber harvesting or production.
(from: Biodiversity Guidebook, September 1995)

ESiOURiiCE MANAGEMENT OBJECTIVES

These statements apply to specific resource management zones and are derived by the LRMP working group to sustain or enhance identified resource values. They provide direction to future land use resource management activities within a resource management zone (RMZ).
(Source: IPT)

ESiOURiiCE MANAGEMENT STRATEGIES

These are generally strategic-level resource management prescriptions that apply to specific resource management zones. These strategies or actions are derived by the LRMP working group to achieve resource management objectives.
(Source: IPT)

ESiOURiiCE MANAGEMENT ZONE (RMZ)

A land use designation category under the Forest Practices Code that establishes strategic objectives and special requirements to guide subsequent subregional/local and operational planning.
(Source: IPT)

ESTORiiATION

Ecological restoration is the process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems.

ARIAN LAKE CLASSES

determined by lake size and the biogeoclimatic zone within which it occurs. Depending on these characteristics, the lake is given a designation of either L1, L2, L3 or L4.
(from: Riparian Management Area Guidebook, December 1995)
RIPARIAN HABITAT

A distinct wildlife habitat zone located in riparian areas (land adjacent to the banks of rivers, streams, lakes and wetlands). Riparian areas are dominated by continuous high moisture content and influenced by adjacent upland vegetation. They incorporate ecosystems that are biologically diverse, frequently containing the highest number of plant and animal species found in a forest. Riparian areas provide critical habitats, home ranges and travel corridors for wildlife and serve to maintain ecological linkages throughout the forest landscape by connecting hillsides to streams and upper-elevation stream headwater areas to valley bottoms.

(from: Draft 2 - Riparian Management Area Guidebook, March 1995)

RIPARIAN MANAGEMENT AREA

An area determined in accordance with the Forest Practices Code Riparian Management Areas, that
• is adjacent to a stream or wetland, or lake with a riparian class of L2, L3 or L4, and
• consists of a riparian management zone and, depending on the riparian class of the stream, wetland or lake, a riparian reserve zone.

(from: Draft 2 - Riparian Management Area Guidebook, March 1995)

RIPARIAN MANAGEMENT ZONE

An area adjacent to a stream, wetland or lake where constraints to forest practices apply for the purpose of maintaining the integrity of the stream, wetland or lake and associated wildlife habitat.

(from: Draft 2 - Riparian Management Area Guidebook, March 1995)

RIPARIAN RESERVE ZONES

An area adjacent to a stream, wetland, or lake, within the Resource Management Zone, where no forest practices may occur.

(from: Draft 2 - Riparian Management Area Guidebook, March 1995)
ROSC (RECREATION OPPORTUNITY SPECTRUM) DELINEATION CRITERIA

ROS classes are determined by considering the three basic criteria of remoteness, size and evidence of humans.
• Remoteness: Remoteness from the sights and sounds of human activities is used as one of the criteria for the opportunity to experience greater or lesser amounts of social interaction and primitive to rural influences as one moves across the spectrum. To identify remoteness, delineate all roads, railroads and trails on the base map or overlay. Distinguish between two levels of roads: primitive roads and better-than-primitive roads. Trails with motorized use are included in the primitive road category.
• Road Classification: For roads which are difficult to classify into the primitive road or better-than-primitive road categories, apply these definitions:
  • better-than-primitive roads are constructed and maintained for the use of highway-type vehicles having more than two wheels
  • primitive roads are not constructed or maintained for vehicles primarily intended for highway use
• Road Patterns: In most cases all roads and trails are mapped. In areas with dense road patterns it may not be necessary to identify each road for ROS class delineation. Based on main roads alone, the entire area may be road-influenced and become the same ROS class. In these cases only the roads along the periphery of the densely roaded area are needed to define the Recreation Opportunity Spectrum class boundaries.
• Traffic Volume: Although volume of traffic may vary widely on the better-than-primitive roads, depending upon the specific road involved, volume need not be recorded on the base map or overlay. The physical presence and sight of a road, even with no traffic on it still affects the visitor experience, and is accounted for through the Recreation Opportunity Spectrum criteria. If traffic volume results in sounds from a road at distances greater than the line of sight, then sound may become the determinant criterion in delineating the appropriate ROS class.
• Water Travel: Where motorized water travel routes provide the only access, consider them in a manner similar to primitive roads. These specialized types of access may also provide a basis to determine the need for subclasses within the ROS continuum.
## ROS (Recreation Opportunity Spectrum) Classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Remoteness</th>
<th>Evidence of Human Activity</th>
</tr>
</thead>
</table>
| Primitive              | ≥ 8 km from a 4-wheel drive road  
 ≥ 5000 hectares | - Very high probability of experiencing solitude, closeness to nature, self-reliance and challenge  
 - Unmodified natural environment  
 - Very low interaction with other people  
 - Little on-the-ground evidence of other people  
 - Restrictions and controls generally not evident  
 - Non-motorized access and travel on trails, cross-country & waterways  
 - Generally no facilities except where required for safety & sanitation  
 - Generally no site modification |
| Semi-Primitive Non-Motorized | ≥ 1 km from a 4-wheel drive road  
 ≥ 1000 hectares | - High probability of experiencing solitude, closeness to nature, self-reliance and challenge  
 - Natural or natural-appearing environment  
 - Low interaction with other people  
 - Some on-the-ground evidence of other people, some on-site controls  
 - Non-motorized access and travel on trails, cross-country & waterways  
 - Facilities may be present for signing and for sanitary and safety needs using natural, rustic materials wherever possible  
 - Minimal to no site modification |
| Semi-Primitive Motorized | ≥ 1 km from a 2-wheel drive road  
 ≥ 1000 hectares | - Moderate opportunity for solitude, closeness to nature; high degree of self-reliance and challenge in using motorized equipment  
 - Natural or natural-appearing environment  
 - Low interaction with other people  
 - Some on-the-ground evidence of other people, some on-site controls  
 - Motorized access on trails, primitive roads & cross-country may occur  
 - Limited facilities for signing, sanitary and safety needs using natural, rustic materials wherever possible  
 - Minimal site modification |
| Roaded Resource Land   | Often within 1 km of a 2-wheel drive road with gravel or dirt surface  
 with a gravel or dirt surface | - Opportunities for both privacy and social interaction; feelings of independence and freedom  
 - Natural environment may be substantially modified  
 - On-the-ground evidence of other people, some on-site controls  
 - Access and travel is by motorized vehicle  
 - Facilities generally present; natural, rustic materials preferred |

April, 1997
SCENIC AREA
any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the district manager.

SELECTION SILVICULTURE SYSTEM
this process has the following characteristics:
• harvesting timber at specified repeated intervals,
• harvesting single scattered individuals or small groups of individual trees,
• encouraging relatively frequent establishment of regeneration in canopy gaps,
• encouraging and maintaining an uneven canopy and an uneven-aged stand structure of at least three well-represented age classes,
• including intermediate cuttings in immature age classes, concurrent with the harvest of mature timber or otherwise, during the cutting cycle, to meet specified stand management goals.

SENSITIVE AREAS
Sensitive areas are sites on Crown land that, due to special circumstances, require special management or measures, different from adjacent lands, to conserve forest resources.
Sensitive areas are generally less than 1000 ha in size and are established under the Forest Practices Code under the authority of a District Manager in consultation with the designated environment official.
(Inter-agency Planning Team definition - primarily from the 'Higher Level Plans: Policy and Procedures', Forest Practices Code of British Columbia, Queens Printer, Victoria, June 1996.)

SENSITIVE SPECIES
those plant or animal species susceptible or vulnerable to activity impacts or habitat alterations.

SEQUENTIAL DEVELOPMENT
a method by which industrial forestry development proceeds across the landscape so as to minimize the negative effects of development and related access on other non-industrial resources such as wildlife habitat or recreational values. Development and rehabilitation is completed in one area before new areas are developed.

SERNAL STAGES
the stages of ecological succession of a plant community, e.g. from young stage to old stage. The characteristic sequence of biotic communities that successively occupy and replace each other by which some components of the physical environment becomes altered over time.

SILVICULTURAL SYSTEMS
a planned cycle of activities by which a forest stand, or group of trees, is harvested, regenerated and tended over time. Silvicultural systems use such practices as clearcutting and selection.

SPECIAL MANAGEMENT AREA
a land use designation under the Plan used to identify areas where enhanced levels of management are required to address sensitive values such as fish and wildlife habitat, visual quality, recreation and cultural heritage features, etc. The management intent is to maintain these values while allowing compatible human use and development.
SPECIES AT RISK
(a) any wildlife species that in the opinion of the deputy minister of MELP or a person authorized by that deputy minister is threatened, endangered, sensitive or vulnerable, (b) any threatened and endangered plants or plant communities identified by the deputy minister of MELP or a person authorized by that deputy minister, as requiring protection, and (c) regionally important wildlife as determined by the deputy minister of MELP or a person authorized by that deputy minister.

STAND
a community of trees with common characteristics; one stand can be distinguished from another by age, species, site type and other characteristics.

STAND ATTRIBUTES components of a forest stand that are to be retained to maintain biodiversity. These components include: dead wood, standing dead trees, coarse woody debris, large living trees, tree species diversity, structural diversity and forest soils.
(from: Biodiversity Guidebook, September 1995)

STAND LEVEL
the level of forest management at which a relatively homogeneous land unit can be managed under a single prescription, or set of treatments, to meet well-defined objectives.

STIMULATE
to excite to activity or growth or to greater activity.

STRUCTURAL ATTRIBUTES components of a forest stand (including living and dead standing trees, canopy architecture and fallen trees) which together determine stand structure.
(from: Biodiversity Guidebook, September 1995)

SUITABILITY MAPPING
a habitat interpretation that describes the current potential of a habitat to support a species. Habitat potential is reflected by the present habitat condition or successional stage.

THREATENED OR ENDANGERED SPECIES
indigenous species that are either threatened or endangered, and identified as 'red-listed' by the Ministry of Environment, Lands and Parks.
(from: Biodiversity Guidebook, September 1995)

TOPOGRAPHY
the general configuration of the land surface, including relief and position of natural and man-made features.

TRADITIONAL USE SITES
any geographically defined site that has been traditionally used by one or more groups of people for some type of activity. These sites will often lack the physical evidence of human-made artifacts or structures, but will maintain cultural significance to a living community of people. Traditional use sites are usually documented with the assistance of oral, historical and archival sources. Examples of such sites include: sacred sites, ritual bathing pools, resource gathering sites and sites of a legendary of past event of cultural significance.
(from: Douglas Glaum communication, April 1996)
RIBUTARY
  a stream that contributes its water to another stream or body of water

URBIDITY
  describes the cloudy or hazy characteristics of water which is usually due to the presence of suspended particles of silt and clay.
  *(from: Draft Community Watershed Guidebook, March 1996)*

UNGULATE
  a hoofed mammal.

ABLE POPULATION
  a population that can withstand the normal cycle of environmental factors without going to extinction.
  *(from: Biodiversity Guidebook, September, 1995)*

ISUAL QUALITY OBJECTIVE
  a resource management objective established by the district manager or contained in a higher level plan that reflect the desired level of visual quality based on the physical characteristics and social concerns for the area.

ULNERABLE SPECIES
  species that are not threatened or endangered but are sensitive and particularly at risk, and identified as 'blue-listed' by the Ministry of Environment, Lands and Parks.
  *(from: Draft Wildlife Habitat Areas Field Guide, October 1994)*

ATER LEVEL STREAM FLOW
  measure of the water flowing in the stream at any point in time.
  *(from: Draft Community Watershed Guidebook, March 1996)*

ATER QUALITY PARAMETERS
  includes turbidity, bacteria counts (total and faecal coliforms), and water level streamflow. These would be used to characterize existing water quality conditions and to establish a reference database for future comparison.
  *(from: Draft Community Watershed Guidebook, March 1996)*

ATERASHER
  an area drained by a particular stream or river. A large watershed may contain several smaller watersheds.

ATERASHER ASSESSMENT
  an evaluation of the cumulative impact that proposed activities and developments would have on stream flows, suspended sediment, landslide and stream channel stability within the watershed. The assessment has three levels:
  - Level I: reconnaissance level analysis; identifies watersheds at risk and cumulative effects and identifies specific hazards that need to be addressed, such as peak flows, suspended sediment and landslides.
  - Level II: an overview channel stability assessment, only conducted on streams that have a high impact based on Level I analysis.
  - Level III: detailed field investigation by a watershed specialist on highly impacted streams and is used to develop management prescriptions to mitigate hydrological impacts.
**VETLAND**

swamp, marsh or other similar area that supports natural vegetation that is distinct from the adjacent upland areas. More specifically, an area where a water table is at, near, or above the surface or where soils are water saturated for sufficient length of time that excess water and resulting low oxygen levels are principle determinants of vegetation and soil development.

**WILDERNESS**

This word has a different meaning for different people and is therefore difficult to define. One definition is:

- an area of land generally greater than 1000 ha that predominantly retains its natural character and on which human impact is transitory, minor and in the long-run substantially unnoticeable.


**WILDLIFE**

(a) a vertebrate that is a mammal, bird, reptile or amphibian prescribed as wildlife under the Wildlife Act, S.B.C. 1982, c.57
(b) a fish, or including (i) any vertebrate of the order Petromyzoniformes (lampreys) or class Osteichthyes (bony fishes), or (ii) any invertebrate of the class Crustacea (crustaceans) or class Mollusca (mollusks), from or in the non-tidal waters of the Province, and (c) an invertebrate or plant listed by the Minister of Environment, Lands and Parks as an endangered, a threatened or a vulnerable species, and includes the eggs and juvenile stages of these vertebrates, invertebrates and plants.

**WILDLIFE CAPABILITY**

adaptability is the potential of a habitat unit to produce an animal species under specified technological controls, irrespective of the numbers of that species that are currently being produced on that unit (Demarchi et al. 1990).

**WILDLIFE HABITAT AREA**

a unit of land necessary to meet the habitat requirements of one or more species of identified wildlife

(from: Biodiversity Guidebook, September 1995)

**WILDLIFE MANAGEMENT AREA**

areas of critical wildlife habitat or rare ecosystems that are administered by the Wildlife Branch, BC Environment. WMAs are not equivalent to wildlife habitat areas (WHAs).

**WILDLIFE TREE**

a standing live or dead tree with special characteristics that provide wildlife habitat for the conservation or enhancement of wildlife. Characteristics include large diameter and height for the site, current use by wildlife, declining or dead condition, value as a species, valuable location and relative scarcity.

(from: Biodiversity Guidebook, September 1995)

**WILDLIFE TREE PATCH**

synonymous with a group reserve and is an area specifically identified for the retention and recruitment of suitable wildlife trees. It can contain a single wildlife tree or many.

(from: Biodiversity Guidebook, September 1995)

**10DL0T**

a license issued to an individual to manage a specific area of Crown Timber, plus any private woodlands the individual owns. Requires the holder to file a management plan and to harvest at a pre-determined date.

**LOW-LISTED SPECIES**

species identified by the Ministry of Environment, Lands and Parks that require a management emphasis on a regional basis.

(from: Conservation Data Centre)
Appendix D Draft Monitoring Indicators by Interest

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<thead>
<tr>
<th>Strategy</th>
<th>Indicator</th>
<th>Methods &amp; Assumptions</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>• # of tenures 1996 vs 2001</td>
<td>• ongoing monitoring</td>
<td>• MEI</td>
</tr>
<tr>
<td></td>
<td>• # of proven reserves 1996 vs 2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• money from tenure sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• km of shot seismic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• # of WA's issued</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• # of wells drilled</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>minimize impact of industry on local residents by continuing to work with industry to lower emissions and decrease visual impacts</td>
<td>• Air Quality complaints received 1996 vs 2001</td>
<td>• BCE</td>
</tr>
<tr>
<td></td>
<td>• # of consultation group meetings per year</td>
<td>• quantify and establish trends in public's perception of air quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ensure oil and gas exploration and development activities are undertaken with sensitivity to wildlife and wildlife habitat</td>
<td>• # of pre-tenure plans completed</td>
<td>• MEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• preplanning is better for wildlife and their habitat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>all new-cut seismic exploration in environmentally sensitive areas shall be heli-portable unless it can be conclusively demonstrated that conventional seismic exploration will not cause significant environmental impacts</td>
<td>• amount of conventional seismic in high biodiversity RMZ's 1996 vs 2001</td>
<td>• MEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• quantify use of heli-portable seismic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>promote site specific assessments to minimize number of wells in riparian areas</td>
<td>• number of wells in riparian management areas 1996 vs 2001</td>
<td>• BCE referral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• decreasing or increasing number of wells in riparian areas</td>
<td></td>
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</tbody>
</table>
### Appendix D Draft Monitoring Indicators by Interest

<table>
<thead>
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</thead>
<tbody>
<tr>
<td><strong>Timber</strong></td>
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</tr>
<tr>
<td>- quantify the timber harvesting land base and develop policies to reduce the permanent loss of net forest land to roads, landings, seismic lines, wellsites and other developments</td>
<td>net timber harvesting land base 1996 vs 2001</td>
<td>quantify trends in timber harvesting land base</td>
<td>Road Access and Density Information, GIS Data, MOF Forest Inventory</td>
</tr>
<tr>
<td></td>
<td>• amount of roads, landings, seismic lines, wellsites removed from timber harvesting land base</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- silviculture activities and/or expenditures</td>
<td>increased silviculture activities are associated with higher timber management</td>
<td>Forest Cover Maps, GIS Data, MOF ISIS, Licensee MLSIS</td>
</tr>
<tr>
<td></td>
<td>Landscape Units and biodiversity options</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- ha of NSR reforested/restocked</td>
<td>- NSR land base being converted back to forest land base</td>
<td>Forest Cover Maps, MOF ISIS</td>
</tr>
<tr>
<td></td>
<td>• amount of backlog NSR in 1996 vs 2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- length and number of permanent road infrastructures for multiple resource users 1996 vs 2001</td>
<td>quantify trends in permanent road systems</td>
<td>GIS, Forest Cover Inventory</td>
</tr>
<tr>
<td></td>
<td>- # of occasions adjacency requirement have been reduced</td>
<td>quantify extent and nature of various adjacency requirements for cut-blocks area in relation to roading requirements</td>
<td>MOF Timber Staff, 5 Year Plans</td>
</tr>
<tr>
<td></td>
<td>- timber developed in relation to km of roads</td>
<td></td>
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</tbody>
</table>

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April, 1997
### Appendix D Draft Monitoring Indicators by Interest

<table>
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</thead>
<tbody>
<tr>
<td><strong>Timber (Cont'd)</strong></td>
<td>unsalvaged losses to pest and fire in 1996 vs 2001</td>
<td>quantify losses or trends to damaging agents</td>
<td>MOF staff, Forest Insect and Disease surveys</td>
</tr>
<tr>
<td></td>
<td>ha of abandoned agricultural land reforested 1996 vs 2001</td>
<td>quantify any additions to timber harvesting land base</td>
<td>BC Lands, MOF staff, ISIS</td>
</tr>
<tr>
<td></td>
<td>% of wildfires within the timber harvesting land base reforested</td>
<td>amount of land reforested -licensee -MOF</td>
<td>MOF, ISIS</td>
</tr>
<tr>
<td></td>
<td>ha (% of land base reforested after wildfires)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of visual quality corridor in non-Greenned-Up stage</td>
<td>quantify impacts to VQO's along the Alaska Hwy</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td>completion and multi-agency approval of Graham Total Resource Plan address multiple values. Plan to include operational access management strategies</td>
<td>areas sensitive to resource development approval subject to a total resource plan</td>
<td>MOF, BCE, MEI</td>
</tr>
<tr>
<td><strong>Recreation</strong></td>
<td>ha in visual sensitive areas where VQO is Retention or Partial Retention 1996 vs 2001</td>
<td>public perception of visual quality is estimated by the % of the population that would perceive an area to be visually preferred or liked.</td>
<td>MOF recreation staff, Perception Rating System (developed by Kamloops LRMP, 1994) based on studies relating public preference to levels of visual impact</td>
</tr>
<tr>
<td></td>
<td>public perception of visual quality along trail systems, campsites and special features</td>
<td>public includes residents and visitors</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>GIS data</td>
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<td></td>
<td></td>
<td></td>
<td>public perception can be gained from open houses, question-</td>
</tr>
</tbody>
</table>
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</tr>
</thead>
<tbody>
<tr>
<td>Recreation, Cont’d</td>
<td>• identify and provide opportunities for the use of suitable Crown land for commercial recreation development and use</td>
<td>• ha of Crown land developed for resort and wilderness tourism</td>
<td>• BC Lands</td>
</tr>
<tr>
<td></td>
<td>• # of commercial back-country recreation proposals approved</td>
<td>• quantify extent and nature of developed opportunities</td>
<td></td>
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<td></td>
<td>• level of compliance with the CBR Policy</td>
<td>• Tourism Capability mapping</td>
<td></td>
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<td>• ROS - MOF</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Recreation Features Inventory - MOF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• identify areas of high recreation use or significance, for development at lower level planning stages</td>
<td>• % of plan area mapped 1996 vs 2001</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• this indicator needs to utilize MOF Recreation Opportunity Spectrum mapping/inventory and recreation features inventory</td>
<td></td>
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<td></td>
<td></td>
<td>• relies heavily on professional judgement and communication with various recreation groups</td>
<td></td>
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<td></td>
<td></td>
<td>• BCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• develop strategies in lower level plans (e.g. landscape unit plans) to complement the wildlife management policies and management practices of wildlife managers, to sustain wildlife and guide-outfitting opportunities</td>
<td>• wildlife harvest data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• identify and protect guide-outfitting campsites and cabins</td>
<td>• hunter days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• seasonal access (e.g. snowmobile) may be limited to address wildlife habitat needs. A Recreation Use Plan is recommended to address this issue</td>
<td>• # of landscape level plans completed 1996 vs 2001</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• manage wildlife through strategies developed in Lower Level plans</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• manage existing tenures and manage the associated grazing activities of guide-outfitter to limit impacts and reduce risk to other resource values (keep grazing out of sensitive habitats, etc.)</td>
<td>• range use (horse use) plans completed that address sensitive habitats 1996 vs 2001</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• quantify conflicts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• monitoring of range tenures associated with guide-outfitting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BCE</td>
<td>• MOF Range Staff</td>
</tr>
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</tr>
</tbody>
</table>
### Recreation, Cont'd

- develop strategies in lower level plans to maintain a component of the land base classified as ROS 'primitive' land (intent: maintain opportunities for a wilderness recreation experience) remains, recognizing that this component may change in location over time as roads are built and deactivated

- incorporate existing recreational activities and access potential for the development of new recreational opportunities in lower level plans (additional motorized recreational pursuits, etc.)
- maintain public access to XXX

- provide for motorized recreation access to similar destinations as currently allowed

- develop a grazing plan to address issues of forage allocation among tenured users, residents and wildlife

- identify and manage appropriate grazing management activities (e.g. burns)

- coordinate existing recreation through lower level planning (e.g. Coordinated Resource Management Plans)

<table>
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<tbody>
<tr>
<td></td>
<td>% of planning area in primitive and semi-primitive non-motorized (SPNM) and semi-primitive motorized (SPM)</td>
<td>relative diversity of recreation opportunities is estimated by predicting the % change of the area in the following ROS classes: primitive, SPNM and SPM</td>
<td>Recreation Opportunity Spectrum (ROS) Classification System, professional judgement</td>
</tr>
<tr>
<td></td>
<td>user satisfaction, number of recreation users, number of new sites</td>
<td>recreational opportunities to be incorporated into landscape plans</td>
<td>Tourism Data, MOF</td>
</tr>
<tr>
<td></td>
<td># of landscape level plans and/or Parks Master plans or Recreation Use plans completed 1996 vs 2001 that incorporate recreation concerns</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>km of motorized recreation access corridors 1996 vs 2001</td>
<td>quantify motorized recreational use</td>
<td>MOF, BCE</td>
</tr>
<tr>
<td></td>
<td># of forage allocation plans completed 1996 vs 2001</td>
<td>quantify grazing plans to address forage allocation issues</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td># (ha) of wildlife and range burns 1996 vs 2001</td>
<td>quantify wildlife and range burns - establish trends</td>
<td>MOF, BCE</td>
</tr>
<tr>
<td></td>
<td># of active CRMPs 1996 vs 2001</td>
<td>CRMPs are used to address local resource conflicts</td>
<td>MOF, BCE, MEI</td>
</tr>
<tr>
<td>Strategy</td>
<td>Indicator</td>
<td>Methods &amp; Assumptions</td>
<td>Data Sources</td>
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<td>--------------</td>
</tr>
<tr>
<td><strong>Recreation, Cont'd</strong></td>
<td>• integrate recreational activities with grazing and resource extraction GRAZING RESERVES</td>
<td>• # of reported conflicts between visitors, ranchers and industry (Problem wildlife committee)</td>
<td>• quantify conflicts</td>
</tr>
<tr>
<td>Agriculture &amp; Range</td>
<td>• develop range use plans according to the Forest Practices Code</td>
<td>• # of Range Use Plans completed 1996 vs 2001</td>
<td>• range use plans tool to address conflicts</td>
</tr>
<tr>
<td></td>
<td>• encourage an increase in range production, giving preference to integrated use</td>
<td>• AUM's 1996 vs 2001</td>
<td>• quantify range use</td>
</tr>
<tr>
<td></td>
<td>• minimize tree/grass/cattle conflicts through integrated management practices</td>
<td>• # of active CRMPs 1996 vs 2001</td>
<td>• CRMPs are used to address local resource conflicts</td>
</tr>
<tr>
<td></td>
<td>• encourage range use plans that will deal with the safety concerns associated with domestic stock within the highway corridor</td>
<td>• # of reported accidents and near-accidents involving vehicle/livestock conflicts 1996 vs 2001</td>
<td>• quantify wildlife and vehicle accidents</td>
</tr>
<tr>
<td></td>
<td>• allow Crown lands with suitable agricultural potential to be designated for agricultural development and use within the appropriate regulatory framework</td>
<td>• # of Ag leases approved</td>
<td>• quantify trends in agricultural land use of Crown land</td>
</tr>
<tr>
<td></td>
<td>• ensure the integrity of the Agricultural Land Reserve through the Agricultural Land Commission Act and Regulations</td>
<td>• ha in ALR</td>
<td>• quantify trends in ALR change applications</td>
</tr>
<tr>
<td></td>
<td>• support the purpose and the intent of the Agriculture Land Reserve (ALR) and the conversion of high quality agricultural land through existing processes</td>
<td>• amount of land in ALR 1996 vs 2001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• encourage management plans to reduce wildlife/agriculture conflicts</td>
<td>• number of reported conflicts/year 1996 vs 2001 (to Problem Wildlife Committee)</td>
<td>• quantify conflicts</td>
</tr>
</tbody>
</table>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture &amp; Range, Cont</strong>&lt;br&gt;• in forested areas of low value for timber production, encourage conversion to range through clearing and prescribed burning</td>
<td>ha of low value forested areas converted to range land 1996 vs 2001</td>
<td>quantify gains to grazing land base</td>
<td>MOF Burn Plans</td>
</tr>
<tr>
<td></td>
<td>• allow for the transfer and renewal of existing tenures</td>
<td># of tenures 1996 vs 2001</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td></td>
<td># of tenures transferred</td>
<td>BC Lands</td>
</tr>
<tr>
<td></td>
<td>• applications for new agriculture and range tenures will be reviewed on a site specific basis</td>
<td># of applications for new agriculture and range tenures 1996 vs 2001</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td></td>
<td># of lower level plans completed (Range use plans, etc.)</td>
<td>BC Lands</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MAFF</td>
</tr>
<tr>
<td><strong>Access</strong>&lt;br&gt;• encourage shared access&lt;br&gt;• encourage deactivation and rehabilitation of unused roads, particularly within visible areas&lt;br&gt;• require winter access unless need for all-season access can be conclusively demonstrated through lower level planning&lt;br&gt;• coordinate access at the Coordinated Resource Management Plan (CRMP) level&lt;br&gt;• maintain existing access including provisions for upgrading&lt;br&gt;• deactivate all temporary linear development&lt;br&gt;• minimize new access development&lt;br&gt;• encourage consistent road construction standards between industries&lt;br&gt;• deactivate all new non-permanent access that is no longer required for resource management</td>
<td>km of unused roads not deactivated 1996 vs 2001</td>
<td>quantify trends in use and deactivation of roads</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td></td>
<td># and area of temporary roads deactivated/year (area, ha)</td>
<td>BCE</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>MEI</td>
</tr>
<tr>
<td></td>
<td>• restrict the development of permanent motorized access adjacent to critical wildlife habitat</td>
<td># of pre-tenure plans/landscape plans completed 1996 vs 2001</td>
<td>prevent occurrence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MOF</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>BCE</td>
</tr>
</tbody>
</table>
### Access, Cont'd

- in consultation with users, restrict the use of existing motorized access except along designated roads and trails to non-motorized and approved industrial uses to sustain other resource values (e.g. fish and wildlife populations and habitats, rare ecosystems)

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td># of km’s of access corridors with access restrictions 1996 vs 2001</td>
<td>quantify and describe access restriction</td>
<td>BCE</td>
</tr>
<tr>
<td></td>
<td>ha (%) of linear developments rehabilitated upon completion of activities 1996 vs 2001</td>
<td>quantitate nature and extent of utility,</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pipeline and road corridor deactivation</td>
<td></td>
</tr>
<tr>
<td></td>
<td># of landscape level/pre-tenure plans completed 1996 vs 2001</td>
<td># a lower level plan should address any</td>
<td>MOF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>conflicts</td>
<td>MEI</td>
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<td></td>
<td></td>
<td></td>
<td>BCE</td>
</tr>
<tr>
<td></td>
<td>a lower level planning process will identify significant fish and wildlife and other</td>
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<td></td>
<td>resource values. Where there is a significant risk that these resources may be</td>
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<td></td>
<td>impacted, access may be limited, restricted or, in special circumstances, prohibited.</td>
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</tbody>
</table>

### Wildlife

- identify habitat (by eco-section and landscape unit, on a priority basis) for red and blue listed species (as identified by the Conservation Data Centre)

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td># and distribution of species of red and blue listed in planning area 1996 vs 2001</td>
<td>quantify and describe species present</td>
<td>BCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conservation Data Centre</td>
<td></td>
</tr>
<tr>
<td></td>
<td># of red and/or blue listed species known habitat locations within the RMZ 1996 vs 2001</td>
<td>applied to areas where blue and red listed</td>
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<tr>
<td></td>
<td></td>
<td>species are known to occur within the</td>
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<tr>
<td></td>
<td></td>
<td>identified habitat or location</td>
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<td></td>
<td></td>
<td>red and blue listed species are defined by</td>
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<tr>
<td></td>
<td></td>
<td>the Conservation Data Centre</td>
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<td></td>
<td></td>
<td>assumes that RMZ guidelines will be</td>
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<td></td>
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<td>needed, over and above the Forest</td>
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<tr>
<td></td>
<td></td>
<td>Practices Code, in certain situations</td>
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</table>
### Wildlife, Cont

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Indicator</th>
<th>Methods &amp; Assumptions</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>- identify critical furbearer habitat and incorporate into landscape level plans</td>
<td>- ha (%) of planning area with critical furbearer habitat or capability 1996 vs. 2001</td>
<td>- preserve habitat will protect populations. Rare and critical habitats will require special management practices. Existing guidelines may not address cumulative impacts</td>
<td>- wildlife habitat suitability/capability mapping</td>
</tr>
<tr>
<td>- where appropriate, incorporate landscape level forest ecosystem networks (FENs) to prevent priority species habitat fragmentation and maintain areas of interior forest habitat (e.g. &gt; 600 metres wide)</td>
<td>- # of lower level (landscape unit/pre-tenure) plans completed</td>
<td>- assumes connected areas (&gt; 600m wide corridors) are better than isolated areas</td>
<td>- MOF</td>
</tr>
<tr>
<td></td>
<td># of forest ecosystem networks (FEN’s) 1996 vs. 2001</td>
<td></td>
<td>- MEI</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>- BCE</td>
</tr>
<tr>
<td>- identify and map high capability ungulate wintering areas at the landscape level 1996 vs 2001</td>
<td>- amount of high capability ungulate habitat mapped in the planning area 1996 vs 2001</td>
<td>- quantify and describe species present</td>
<td>- BCE</td>
</tr>
<tr>
<td>- incorporate the maintenance of high capability ungulate wintering habitat (e.g. thermal and escape cover, suitability of forage and browse) into landscape level plans</td>
<td>- # of WHA’s identified in 5 Year Plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- establish wildlife habitat areas (WHA’s) at the landscape level, to protect critical wintering habitat</td>
<td></td>
<td></td>
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<tr>
<td>- plan and develop new access routes that avoid direct disturbance within, or in close proximity to, high capability ungulate wintering habitat</td>
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## Appendix D Draft Monitoring Indicators by Interest

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<th>Indicator</th>
<th>Methods &amp; Assumptions</th>
<th>Data Sources</th>
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<tr>
<td>Wildlife, Cont’</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• identify and map medium and high quality grizzly bear habitat, at the landscape level, on a priority basis</td>
<td>• % of medium and high capability grizzly bear habitat mapped in the planning area 1996 vs 2001</td>
<td>• quantify and describe habitat present</td>
<td>• BCE</td>
</tr>
<tr>
<td>• plan and develop access to avoid medium and high quality habitats and/or human/bear interactions (e.g. winter access with summer deactivation, exploration and development activities supported by helicopters rather than roads)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• identify and designate critical grizzly bear habitat areas as wildlife habitat areas (WHA’s)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• incorporate medium and high quality grizzly bear habitats and connectivity corridors into landscape level plans</td>
<td>• # of FENS 1996 vs 2001</td>
<td></td>
<td>BCE</td>
</tr>
<tr>
<td>• minimize impacts on grizzly bear habitat by ensuring that critical habitat areas are linked by connectivity corridors or forest ecosystem networks (FENs) (where biologically and ecologically appropriate)</td>
<td>• # of pre-tenure and/or landscape unit plans completed 1996 vs 2001</td>
<td>• lower level plans to address conflicts</td>
<td>BCE</td>
</tr>
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<td></td>
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<tr>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource development activities with the potential to negatively effect medium and high capability grizzly bear habitat</td>
<td>• # of multi-agency signed off developments or landscape (pre-tenure) plans</td>
<td>• joint developed plans assumes all agencies support the development</td>
<td>MEI, MOF, BCE</td>
</tr>
<tr>
<td>• develop inter-agency development plans (Ministry of Environment, Lands and Parks, Ministry of Forests and Ministry of Employment and Investment) for all resource developments that may negatively affect critical medium and high capability caribou habitat</td>
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<tr>
<td>• encourage the use of silvicultural systems that minimize negative impacts on medium and high quality grizzly bear habitat</td>
<td>• % of ESSF in planning area with medium and high suitability grizzly bear habitat present after timber harvesting 1996 vs 2001</td>
<td>• quantify use of alternate silviculture systems and negative impacts to grizzly bear habitat</td>
<td>MOF, BCE</td>
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<td></td>
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<tr>
<td>April, 1997</td>
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</tbody>
</table>
### Wildlife, Cont'd
- identify and map medium and high capability caribou habitat
- identify and designate critical caribou habitat areas as wildlife habitat areas (WHA's)
- maintain connectivity (migration/travel) corridors between important seasonal habitats

<table>
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<tr>
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<th>Methods &amp; Assumptions</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>amount (ha) in planning area (1: 20 000 scale) of high and medium capability caribou habitat 1996 vs 2001</td>
<td>quantify and describe habitat</td>
<td>BCE</td>
</tr>
<tr>
<td></td>
<td>ha (%) of medium and high capability caribou habitat present after timber harvesting 1996 vs 2001</td>
<td>quantify use of alternate silvicultural systems</td>
<td>MOF, BCE</td>
</tr>
<tr>
<td></td>
<td>use (ha) of alternate silvicultural systems in medium and high capability caribou habitat areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>maintain stable wetland water levels.</td>
<td>wetland water levels/year</td>
<td>Ducks Unlimited, BCE, Water Management</td>
</tr>
</tbody>
</table>

### Biodiversity
- the general biodiversity emphasis is:
  (i) low, or
  (ii) intermediate, or
  (iii) high
- this Resource Management Zone is a high priority for the initiation of landscape level planning. Landscape level plans will identify and map a number of ecosystem attributes (e.g. rare ecosystems, habitats and plant communities, ecossection representation, biogeoclimatic zones and variants, wildlife habitat classes, critical habitats, environmentally sensitive and wildlife habitat areas for identified wildlife) and incorporate strategies to sustain these attributes.
- identify and maintain existing predator-prey systems through the identification and establishment of connectivity corridors at the landscape level

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<tr>
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<th>Data Sources</th>
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</thead>
<tbody>
<tr>
<td></td>
<td># of landscape units with approved biodiversity emphasis 1996 vs 2001</td>
<td></td>
<td>BCE, MEI, MOF, BC Lands</td>
</tr>
<tr>
<td></td>
<td># of landscape/pre-tenure plans completed 1996 vs 2001</td>
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</table>
### Appendix D Draft Monitoring Indicators by Interest

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Biodiversity, Cont</strong></td>
<td><strong># of FRBC watershed restoration proposals/completions 1996 vs 2001</strong></td>
<td>Watershed Restoration projects to restore ecosystems</td>
<td>MOF, BCE</td>
</tr>
<tr>
<td><strong>Culture and Heritage</strong></td>
<td>% of planning area mapped at 1:20,000 scale 1996 vs 2001</td>
<td></td>
<td>MOF, MEI, First Nations, Ministry of Tourism</td>
</tr>
<tr>
<td><strong>Minerals</strong></td>
<td><strong>application of permit conditions as required</strong></td>
<td>field inspections as required</td>
<td>MEI, MELP</td>
</tr>
<tr>
<td></td>
<td><strong># of inputs into lower level planning</strong></td>
<td></td>
<td>MEI</td>
</tr>
<tr>
<td></td>
<td><strong># of reports of aggregate resource sites</strong></td>
<td></td>
<td>MEI, MELP</td>
</tr>
<tr>
<td></td>
<td><strong># of potential maps produced</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong># of sites identified</strong></td>
<td></td>
<td>MEI, MOF, MELP</td>
</tr>
<tr>
<td></td>
<td><strong># of reclamation projects completed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong># of new roads built into currently unroaded areas</strong></td>
<td></td>
<td>MEI</td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td><strong># of stream and rivers with mapped habitat information 1996 vs 2001</strong></td>
<td>Quantify mapped fish inventory information</td>
<td>BCE</td>
</tr>
</tbody>
</table>

April, 1997
### Appendix D Draft Monitoring Indicators by Interest

<table>
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</thead>
<tbody>
<tr>
<td><strong>Fish, Cont’</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• incorporate the protection of fish and fish habitat into landscape level plans</td>
<td>• # of landscape level or pre-tenure plans completed in the planning area 1996 vs 2001</td>
<td>• BCE</td>
<td></td>
</tr>
<tr>
<td>• incorporate ‘Managing Identified Wildlife Guidebook’ habitat protection criteria for bull trout into landscape and stand level plans (as these criteria are developed)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• determine equivalent clearcut area (ECA) threshold levels for streams with bull trout and incorporate into landscape level plans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• identify priority watersheds for Level I and/or II watershed assessments to determine potential negative impacts to fish habitat, riparian areas and water quality from land development activities</td>
<td>• # of Level I or Level II watershed assessments completed 1996 vs 2001</td>
<td>• quantify and describe the # of and aerial location of Level I and II assessments</td>
<td>• BCE</td>
</tr>
<tr>
<td>• minimize permanent access to remote lakes, streams and rivers with high quality fisheries</td>
<td></td>
<td>• quantify trends in the improvement or restriction of access to remote lakes</td>
<td>• BCE</td>
</tr>
<tr>
<td></td>
<td>• number or % of streams and lakes classified as wilderness, walk-in, and road inaccessible 1996 vs 2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• establish instream flow requirements, lake volumes and stage, wetland levels and determine water quality baseline information for high priority streams, rivers, lakes and wetlands</td>
<td>• # of lower level plans (landscape and pre-tenure plans) completed 1996 vs 2001</td>
<td>• a lower level plans should address any conflicts</td>
<td>• BCE - Water Management</td>
</tr>
<tr>
<td>• incorporate licensed water use data and instream flow/lake level needs for fish and aquatic organisms into landscape level plans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• implement an appropriate level of watershed assessment to determine potential negative impacts to water quality</td>
<td>• # of watershed assessments completed</td>
<td>• # of watershed assessments are used to identify problem areas</td>
<td>• BCE</td>
</tr>
<tr>
<td>• identify and designate water bodies with significant licensed withdrawals of potable water as Forest Practices Code designated Community Watersheds (where appropriate)</td>
<td>• # of Forest Practices Code designated Community Watersheds 1996 vs 2001</td>
<td>• the application of FPC Community Watershed protection criteria will protect water supply</td>
<td>• BCE</td>
</tr>
</tbody>
</table>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Water, Cont.</strong></td>
<td>• identify sensitive groundwater recharge areas</td>
<td>• # of sensitive groundwater recharge areas identified and mapped 1996 vs 2001</td>
<td>• quantify and locate groundwater sensitive (FPC designation) areas</td>
</tr>
<tr>
<td></td>
<td>• manage resource development within sensitive groundwater recharge areas to minimize negative effects on groundwater quality and quantity</td>
<td>• # of landscape level pre-tenure plans completed in the planning area 1996 vs 2001</td>
<td>• quantify trends in managing development around and in areas designated as sensitive groundwater recharge areas</td>
</tr>
<tr>
<td><strong>Protected Areas</strong></td>
<td>• ensure that (future) management plans for the Protected Area respect the natural, cultural, heritage and recreation values identified by the LRMP Table. The values include...(insert relevant values identified by the Table)</td>
<td>• # of high value Goal 2 local biological, geological, hydrological and cultural features with Protected Areas 1996 vs 2001</td>
<td>• the Table identifies high value features for their area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• # of Park Master plans completed for PA's in the planning area 1996 vs 2001</td>
<td>• meant to cover features not covered in other indicators such as high valued fish and wildlife habitat features and high valued recreation and cultural features</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• all agencies</td>
</tr>
<tr>
<td><strong>Visual Quality</strong></td>
<td>• follow Ministry of Forests and other agencies processes' for visual landscape inventories, and setting Visual Quality Objectives in identified scenic areas</td>
<td>• # of, area (ha), and description of VQO's in planning area</td>
<td>• visual quality assessments help identify and protect VQOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• identified scenic areas will have their site specific Visual Quality Objectives reviewed and approved in lower level plans in accordance with the Forest Practices Code</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• a visual landscape inventory will be carried out by Ministry of Forests to determine the visual sensitivity of the scenic areas. Visual Quality Objectives will be established in accordance with the Ministry of Forests visual landscape management system. Forest practices proposed in those scenic areas will be designed and carried out in the field consistent with achieving the Visual Quality Objectives</td>
<td></td>
</tr>
</tbody>
</table>
### Visual Quality, Coa't

- Review existing openings and structures to rehabilitate to a less obtrusive impact e.g. modify openings, use of low visibility colours on structures or install tree breaks.
- Manage visual quality from both river and highway viewpoints.
- Manage visual quality in areas adjacent to designated Protected Areas, maintaining the values identified in the Protected Areas Strategy or significance, to be managed for lower level planning stages.

<table>
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SCHEDULE 6
LOCAL STRATEGIC PLANS

Park Management Plans
Liard River Hot Springs Provincial Park Master Plan
Muncho Lake Provincial Park Master Plan
Stone Mountain Provincial Park Master Plan
Wokkpash Recreation Area Interim Management Statement

Pre-tenure Plans
Upper Sikanni Management Plan
LIARD RIVER HOTSPRINGS PROVINCIAL PARK

MASTER PLAN

APRIL, 1990
LIARD RIVER HOTSPRINGS PROVINCIAL PARK

MASTER PLAN

MINISTRY OF PARKS, BRITISH COLUMBIA

April, 1990

Prepared for the Peace-Liard District by

J.S. PEEPRE AND ASSOCIATES

with

Peter Jordan, Hydrologist and Geomorphologist
Jennifer Nathan, Botanist and Naturalist
LIARD RIVER HOTSPRINGS
PROVINCIAL PARK
MASTER PLAN

May 7, 1990

Recommended:  
District Manager
Peace Liard District

Date:  May 11/90

Approved:  
Assistant Deputy Minister

Date:  Oct 28/90
<table>
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<tr>
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<tr>
<td><strong>Plan Highlights</strong></td>
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<td>1.0 INTRODUCTION</td>
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<tr>
<td>1.1 PARK ROLE AND GOALS</td>
</tr>
<tr>
<td>1.1.1 Regional and Provincial Context</td>
</tr>
<tr>
<td>1.1.2 Park Role and Management Goals</td>
</tr>
<tr>
<td>1.2 SUMMARY OF RESOURCES, FACILITIES, AND USE</td>
</tr>
<tr>
<td>1.3 ZONING</td>
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<tr>
<td>1.4 PARK MANAGEMENT</td>
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<tr>
<td>1.4.1 Natural and Cultural Resources Management</td>
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<td>1.4.2 Visitor Services and Marketing</td>
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<td>1.4.3 Park Management Services</td>
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<td>1.5 PLAN IMPLEMENTATION</td>
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<thead>
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<th>PART 2: MASTER PLAN BACKGROUND INFORMATION</th>
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<tbody>
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<td>2.0 INTRODUCTION</td>
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<td>2.1 REGIONAL AND PROVINCIAL CONTEXT</td>
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<tr>
<td>2.2 PARK RESOURCES</td>
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<tr>
<td>2.2.1 Natural Resources</td>
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<tr>
<td>2.2.1.1 Physiography</td>
</tr>
<tr>
<td>2.2.1.2 Climate</td>
</tr>
<tr>
<td>2.2.1.3 Flora and Fauna</td>
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<tr>
<td>2.2.2 Cultural Resources</td>
</tr>
<tr>
<td>2.2.3 Visual Resources</td>
</tr>
<tr>
<td>2.3 RESOURCE ANALYSIS</td>
</tr>
<tr>
<td>2.3.1 Liard Hotsprings Ecosystem</td>
</tr>
<tr>
<td>2.3.2 Terrain and Soils</td>
</tr>
<tr>
<td>2.3.3 Vegetation Resources</td>
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<td>2.3.4 Wildlife Resources</td>
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<tr>
<td>2.4 LAND TENURES</td>
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</tbody>
</table>
2.5 EXISTING FACILITIES

2.5.1 In the Park
2.5.2 Outside the Park

2.6 MARKET ANALYSIS

2.6.1 Park Use
2.6.2 Visitor Origins, Mode of Travel
2.6.3 Visitor Profile
2.6.4 Existing Information
2.6.5 Changing Travel Patterns
2.6.6 Changing Activity Preferences
2.6.7 Visitor Satisfaction

2.7 PLANNING ISSUES

BIBLIOGRAPHY

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APPENDIX II PUBLIC INVOLVEMENT PROCESS

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1. Park Location
2. Regional Setting
3. Park Resources
4. Zoning Plan
5. Park Boundaries and Land Tenure
6. Park Visitor Facilities
7. Land Tenure and Facilities

LIST OF GRAPHS

1. Visitor Origins
2. Percent Occupancy of Campground
3. Campground Use by Season, 1983-1989
4. Total Campground Use, 1983-1989
This plan was prepared in cooperation with Ministry of Parks, Peace Liard District staff in Ft. St. John, and regional staff in Prince George. Conservation Services in Victoria also reviewed the draft plan. Their helpful guidance and comments were appreciated.

Many members of the public, area residents, and local government officials provided ideas and comments on the draft plan. A list of participants is included in the Appendix. People from Fort St. John and Fort Nelson also attended the public meetings.

Mr. Grant McPherson, District Manager, Peace Liard, was the project manager. Additional Ministry of Parks contributors and reviewers were:

Mike Murtha, Prince George
Dan Adamson
Gail Ross
Rick Heathman

Bill Woodhouse, Ft. St. John
Mike Gall
Derek Connelly
Abbey Simpson, Liard Hotsprings Park
Map #1 LIARD HOTSPRINGS PROVINCIAL PARK
PARK LOCATION
Llandrindod Wells Park entrance. Summer views are mainly Welsh. Elevation Travellers.

Llano River Hot Springs.

Visions using Alpaca Pool. With the lush and unusual vegetation around the hot springs.
Liard Hotsprings Provincial Park lies adjacent to the Alaska Highway on the Liard-Rabbit Plateau in northeastern British Columbia. The popularity of the park continues to grow resulting in increased pressure on sensitive natural resources as well as on developed facilities. This document is the updated Master Plan for the park, replacing an earlier plan in place since 1980. Residents of the park area, Fort Nelson and Prince George have contributed to the plans for how best to develop and manage this park.

Liard Hotsprings Provincial Park protects a nationally significant hotsprings ecosystem. The park also provides one of the most popular campgrounds for travellers on the Alaska Highway, serving both regional residents and tourists.

The park management goals are:

- to preserve the outstanding natural hotsprings and warm swamp ecosystem,
- to provide an educational and interpretive opportunity focussed on the hotsprings environment,
- to provide a unique recreational experience in a natural hotsprings environment,
- to provide camping facilities,
- to provide day use recreational opportunities.

The park will be managed in three zones. All of the hotsprings and warm ponded swamps are in the Special Feature Zone where the emphasis will be on preserving the unique natural resources. A small part of the park is in the Intensive Recreation Zone, the majority of the forested area in the Natural Environment Zone.

Resource management will preserve remaining natural areas and protect the integrity of the hotsprings ecosystem. Development will be limited to the areas already used for recreation, including Alpha and Beta pool, the boardwalks and the decks at the Hanging Gardens. A hydrological study will determine optimum pool use levels from a health point of view, as well as assess human impacts on the ecosystem. The study will determine the carrying capacity of the park to help govern use levels and any future development of facilities.

The park boundaries will be expanded to ensure compatible land uses surrounding the sensitive hotsprings environment. Further commercial or residential development immediately adjacent to the park could encourage more use than the natural resources or facilities could accommodate.

Interpretation and information in Liard Hotsprings Park will encourage visitor awareness and appreciation of the hotsprings and ponded warm swamp environment, and show how the park protects these unique resources. Information on appropriate use, behaviour, or alternative recreation activities will be provided. Promotion of Liard Hotsprings Park will be minimal since the park is already at or near capacity. Park promotion by the Ministry of Parks will be directed at the shoulder season, and better information will be provided for those who visit the park.

The park campground will not be expanded. Park managers will encourage the private sector to meet the excess demand by providing compatible planned facilities nearby. The Ministry of Parks will co-operate with the private sector in facility planning to ensure that increased accommodation does not result in unmanageable use pressures on the park.
PART 1: THE PLAN

1.0 INTRODUCTION

Liard Hotsprings Provincial Park lies adjacent to the Alaska Highway on the Liard-Rabbit Plateau in northeastern British Columbia. This document is the updated Master Plan for the park, replacing an earlier plan in place since 1980. The plan is divided into two sections. Part 1 contains the Master Plan, based on a comprehensive review of park resources and use. Part 2 contains a summary of background resource and use information, as well as a discussion of planning issues and options for management.

The popularity of the park continues to grow resulting in increased pressure on sensitive natural resources as well as on developed facilities. New management challenges are emerging and this plan will balance the Ministry of Parks' conservation and recreation mandates as they apply to Liard Hotsprings Park.

The key issues in the Master Plan focus on the ability of the park and its hotsprings ecosystem to handle increased use. These issues include future campground and other facility development options, park boundaries, resource management, the need for more information and interpretation, and the role of the private sector.

1.1 ROLE OF THE PARK AND MANAGEMENT GOALS

1.1.1 Regional and Provincial Context

The park protects the hotsprings and ponded warm swamps along with associated flora and fauna. The hotsprings are of national ecological significance, and have been ranked among the top five in Canada, based on a range of criteria applied to hundreds of springs across the country (Tera Environmental Consultants, 1984).

Within the region, where many of the best springs in Canada are found, the Liard Hotsprings are among the most important springs, highly rated for their aesthetic quality, diversity of flora and fauna, and for the springs formations themselves. The Liard Hotsprings are the only easily accessible developed springs along the Alaska Highway that still retain their natural character. The Provincial Park plays an important tourism and recreation role for regional residents and tourists travelling the Alaska Highway.

Other major parks in the region include Muncho Lake and Stone Mountain to the south. These parks are large wilderness destination parks, but most Alaska bound travellers pass through and do not spend more than a few hours visiting. More visitor services are now available in these latter parks with lake boat tours operational in 1989. These parks offer views of the northern Rocky Mountains, wilderness travel, and provide superb wildlife viewing opportunities.

Liard Hotsprings Park protects an important resource unique within the park system and provides a distinctive recreation experience not found elsewhere along the Alaska Highway.
The day use parking area is usually full with overflow campers during the summer months. The plan encourages development of campsites outside the park.

Beta Pool in quiet moment. This pool is more remote and receives less use than Alpha Pool. The proposed hydrological study will help identify the carrying capacity of this pool and determine its future use.
1.1.2 Park Role and Management Goals

The role of Liard Hotsprings Provincial Park is balanced between the conservation and recreation mandates of the Ministry of Parks.

The conservation role of Liard Hotsprings Provincial Park is to protect a nationally significant hotsprings ecosystem. The recreation role is to allow for a unique hotsprings experience for park visitors. The park also provides one of the most popular campgrounds for travellers on the Alaska Highway, serving both regional residents and tourists.

The park management goals are:

- to preserve the outstanding natural hotsprings and warm swamp ecosystem,
- to provide an educational and interpretive opportunity focused on the hotsprings environment,
- to provide a unique recreational experience in a natural hotsprings environment,
- to provide camping facilities,
- to provide day use recreational opportunities.

Warm ponded swamp ecosystem adjacent to boardwalk; interpretive features include plants, birds, and fish
Liard Hotsprings Park protects a large complex of hotsprings and ponded warm swamps along with associated flora and fauna. The hotsprings are of national ecological significance, and have been ranked among the top five in Canada, based on a range of criteria applied to hundreds of springs across the country (Tera Environmental Consultants, 1984).

Unlike most other thermal springs in Canada, the Liard Hot Springs do not flow directly into a nearby river or creek, but flow into an intricate system of swamps. These warm swamps are among the most unique features of the Park. The ecosystem is fragile and many species of both plants and animals depend on a narrow range of habitat conditions related to water level, temperature, and chemistry.

The park lies within the Boreal White and Black Spruce Biogeoclimatic Zone (Krajina and Brooke, 1970). Although the majority of species in the park are of the boreal variety, there is also an occurrence of 14 thermally influenced species; only the effects of the hotsprings account for their presence in the north. The hotsprings vegetation is striking compared to outlying areas in species composition, in the large diversity of species (including 14 species of orchids) and the luxuriance of their growth and the early-blooming growth pattern.

Farther away from the springs, are the shallow swamps which never freeze in winter due to the continually warm inflowing water. The vegetation here is quite interesting and often overlooked. Aquatic plants include the bladderworts, which are carnivorous plants. Chara, a lime-secreting algae, grows in abundance and often dies encrusted with lime deposits. It is an important tufa-forming mechanism (Reid, 1978).

Wildlife and their habitat are an integral part of the Liard Hotsprings ecology and provide a recreational experience through viewing and interpretation opportunities. A total of 135 species were recorded by 1978, with 28 of these mammals and 104 birds (St. Pierre 1980). Moose are year round residents and provide the most consistent viewing opportunities.

Seven species of waterfowl have been recorded, with the mallard and Canada Goose known to breed in the park. The remaining waterfowl are transients, migrating through the area in the spring and fall (St. Pierre, 1980). St. Pierre observed 11 species of shore birds, of which the solitary sandpiper and common snipe are known to breed in the swamps. Gulls, swallows, blackbirds, kingfishers and nighthawks may be frequently observed near the swamps.

Of particular interest to visitors are the numerous small fish swimming in pools alongside the boardwalk to Alpha pool. These are Lake Chub, a very adaptable species commonly encountered throughout Canada (Scott and Crossman, 1973). The only amphibian inhabiting the park is the Northwestern Boreal Toad, commonly observed at the edges of the hot springs swamps.

Cultural themes at Liard River include native use of the area, the fur trade, Geological Survey exploration, pioneers construction of the Alaska Highway, and early use of the hotsprings pools.
LIARD HOTSPRINGS PROVINCIAL PARK

Map #3 PARK RESOURCES

Scale: 1cm = 250m, or 1" = 2,000'
The majority of the park area is undeveloped. Two of the three main hotsprings pools, (named Alpha and Beta Pools), and access to these have been developed since the construction of the Alaska Highway. Access to the pools is by a single boardwalk with one rest area between the parking lot and the pools. A boardwalk provides access to the new viewing decks at the Hanging Gardens.

The developed part of the park includes a 53 unit campground and day use area with parking for 60 vehicles. A maintenance yard with summer staff residences is located near the day use area. The campground was used at 150% capacity during the peak 1989 summer season. The day use area was used for overflow camping until the summer of 1990. This level of campground and day use visitation means the hotsprings pools are already used at their maximum carrying capacity.

Liard Hotsprings Park receives the heaviest use of any park in the northern region. Although the park itself is not a final destination for the majority of highway travellers, most prefer to use the campground and hotsprings facilities en route. Five year statistics indicate a steady growth in campground and day use indicating that the park is becoming better known and is the camping destination of choice for many Alaska Highway travellers.

1.3 ZONING (Refer to Map #4)

Although Liard Hotsprings Park is a relatively small park, its resources are unique in the park system and a zoning plan will ensure appropriate management. The zones are management prescriptions to indicate appropriate activities for an area.

The park will be managed using three zones described below:

*Special Feature Zone*
*Intensive Recreation Zone*
*Natural Environment Zone*

**Special Feature Zone**

**Objective:**

*To preserve and present significant natural or cultural resources, features, or processes because of their special character, fragility and heritage value.*

The Special Feature Zone in Liard Hotsprings Park includes all lands and waters directly associated with the hotsprings ecosystem. This includes the sensitive hotsprings and ponded warm swamp ecosystem and the unique flora and fauna associated with this hotsprings environment. This zone will receive a high level of management protection with on-going monitoring. Management actions will be oriented to maintaining the natural resources and, as appropriate, a high quality recreational and interpretive experience. Use levels will be maintained within the carrying capacity of the hotsprings and ponded warm swamp ecosystem.

Development will be limited to the areas already used for recreation, including Alpha and Beta pool, the boardwalks and the decks at the Hanging Gardens. Water flow, temperature and vegetation in the area will not be altered without careful study and only if the environmental impacts are minimized.
flow, temperature and vegetation in the area will not be altered without careful study and only if the environmental impacts are minimized.

The Special Feature Zone also includes all those areas within the hot springs ecosystem not designated for development and includes several undeveloped hot springs, large expanses of ponded warm swamp and associated successional meadows and forest, as well as all warm and cool creeks flowing through the park. No facilities or services will be provided in this portion of the Special Feature Zone.

Activities include walking, guided interpretation or wildlife viewing, scientific study, photography and nature appreciation. This zone may be subject to temporary closures or permanently restricted access in order to preserve natural resources.

Intensive Recreation Zone

Objective:

To provide for a variety of readily accessible, facility oriented outdoor recreation opportunities.

The Intensive Recreation Zone in Liard Hotsprings Park includes the area of high facility development such as the campground, day use parking and related facilities. Improvements within this zone may include those facilities compatible with the Visitor Services Plan, such as an interpretive centre or kiosk. No further facilities or services are required in the Intensive Recreation Zone in the northern segment of the park. The Intensive Recreation Zone provides for park operations facilities which expedite efficient management of the park. This is a small area adjacent to the campground reserved for park maintenance, staff housing and other operations facilities.

Management will be oriented toward maintaining a high quality recreation experience. Operational facilities will be designed for efficient operation while remaining unobtrusive to the park visitor.

Activities include vehicle camping, picnicking, nature appreciation, and day use recreation such as horseshoes and children’s play.

An Intensive Recreation Zone in the southern part of the park may be used in the future for expansion of visitor services. These uses may include day use parking and picnicking, and a campground if future conditions warrant such facilities.

Natural Environment Zone

Objective:

To protect scenic values and to provide for backcountry recreation opportunities in a largely undisturbed natural environment.

The Natural Environment Zone in Liard Hotsprings Park includes the forested and open meadow areas of the park not lying within the special feature zone outlined above. The Natural Environment Zone includes existing access trails and the unmaintained narrow four wheel drive road along the Liard River in the southern
part of the park. This route is used as an access lane by residents living to the east of the park.

Moderate development may be considered for user convenience, for example trails. Activities include, walking, wildlife viewing, guided interpretation activities, photography and nature appreciation. Cross-country skiing and other non-mechanized winter sports are also allowed in this zone. Access by motorized vehicle will be permitted on existing roads.

Visitors on guided interpretive walk. The plan emphasizes nature appreciation and interpretive facilities as part of the hot springs experience.
1.4 PARK MANAGEMENT

1.4.1 Natural and Cultural Resources Management

Natural and cultural resource management is intended to protect the unique park features while allowing for compatible recreation uses. The analysis of resources, carrying capacity, and existing park boundaries indicated that further extensive facility development in the northern part of the park would be unsuitable except for those related to interpretation or information. The overall strategy for resource management will be to preserve remaining natural areas and protect the integrity of the hotsprings ecosystem. The management strategy will accommodate recreational uses within the existing developed facilities. It will minimize environmental impacts by providing information and compatible alternative sites and activities for visitors.

A hydrological study will be completed to determine optimum pool use levels from a health point of view, as well as assess human impacts on the ecosystem. Such a study will accurately determine the carrying capacity of the park and govern use levels and any future development of facilities.

1.4.1.1 Natural Resources Management

Forest and Vegetation

The overall management objective will be to maintain forested areas in their natural state and to allow natural processes to occur without interference. Vegetation dependent on the thermal springs will be managed as part of the springs ecosystem, with the objective of retaining existing natural features.

Management actions will include:

- **Suppress fires if existing park or recreation facilities are threatened, or if area in immediate vicinity of hotsprings is threatened,**
- **Control disease if park or recreation facilities are threatened, and only after evaluation of control impacts,**
- **Remove hazardous trees in campground or day use areas,**
- **Manage vegetation only outside of areas with unique plant communities associated with the hotsprings or ponded warm swamp environment,**
- **Co-operate with other government agencies managing forests and fires outside of the park boundaries,**
- **Complete a vegetation and forest resource inventory to determine the location of rare species,**
- **Prepare a vegetation management plan.**
Wildlife

Wildlife resources in the park are not well understood. An inventory is required, as well as an evaluation of the importance of the hotsprings and warm swamps to wildlife. The management objective will be to retain wildlife habitat and species populations in their natural state and to minimize impacts from human activities. Wildlife habitat enhancement will not be considered unless a species population is threatened, particularly by mans' activities in the park. Hunting or trapping will not be permitted in the park due to the high recreational use levels and the importance of wildlife viewing.

The strategy on bear management will be to educate visitors and to minimize potential human-wildlife conflicts through the provision of information and the proper storage and removal of garbage.

Management actions will include:

- Conduct research on wildlife use of the hotsprings environment.
- Monitor wildlife populations in the park.
- Maintain existing hydrological conditions to sustain wildlife, in particular the Lake Chub, Northwestern Boreal Toad and the warm water snail.
- Include Liard Hotsprings Park in the provincial wildlife viewing program.
- Provide public information on wildlife viewing and interpretation.
- Provide wildlife viewing points and trails where appropriate.
- Co-operate with government agencies managing wildlife outside the park boundaries.

Water Management, Water Quality

The overall objective is to allow natural processes to occur without interference and to ensure that any management actions do not adversely affect the sensitive park ecosystem. Existing water quality will be maintained.

Management actions will include:

- Assess the water quality, hydrology, and human use of the hotsprings, to accurately determine the carrying capacity.
- Monitor water quality, and manage visitors to ensure that the carrying capacity of the hotsprings pools is not exceeded.
- Monitor public comment on the quality of their hotsprings experience.
• Maintain maximum use of pools at present levels, suggested as 50 persons at a time,

• Maintain existing downstream water flows by a policy of non intervention in the hotsprings hydrology

Hotsprings and Warm Ponded Swamps

The overall objective will be to retain all existing undeveloped hotsprings and swamp areas in their natural state and to allow natural processes to occur without interference. Management actions will include:

• Avoid interference in water flow or channeling, or in plant or animal habitat without an evaluation of environmental impacts, and only if essential to protect the hotsprings environment.

The objective for the developed hotsprings will be to keep their appearance as natural as possible, and to minimize interference with water flow, temperature, or the vegetation surrounding the springs. The optimum carrying capacity has been tentatively established at approximately 35-50 persons bathing at a time (See Resource Analysis). Management actions to sustain current recreation use of the pools will be undertaken as required and may include:

• Redesign the cooling water system at Alpha Pool to create less impact on the hotsprings ecology (see Resource Analysis section)

• Intervene in ongoing cool water creek migration if pools are threatened, but only after evaluation of alternatives and environmental impacts

• Avoid annual vegetation removal by maintenance staff in plant communities surrounding the hotsprings

• Increase supervision of pool during peak hours

• Monitor pool use, water temperature and flow on a regular basis

• Undertake any additional management actions as required to rehabilitate disturbed sites and to ensure minimum impact on the ecosystem by visitors

1.4.1.2 Cultural Resources Management

The objective of cultural resources management will be two-fold, to gain a better understanding of the cultural resources and; to protect known sites from disturbance.

Management actions will include:

• Conduct research into native (as the highest priority) and then European history of the hotsprings area to gain a better understanding of park cultural resources,

• Interpret the native heritage aspects of hotsprings use.
1.4.1.3 Land

(See Land Tenure Map, p. 14)

The land management objective will be to expand the park boundaries to ensure appropriate land uses surrounding the sensitive hot springs environment. The park is already at or near its carrying capacity. Further commercial or residential development immediately adjacent to the park would encourage more use than the natural resources or facilities could accommodate.

Crown lands to the west of the Alaska Highway, and particularly the three UREP sites (UREPs are lands reserved for recreation and enjoyment by the public) in the Ministry of Parks name should be included in the park. No further releases of land for commercial or residential development to the west of the Alaska Highway should be considered.

No hunting guiding licenses will be issued for the park area since no hunting is permitted. No new trapping licences will be issued.

The existing flood reserve and proposed pipeline right-of-way were established by the government and will remain in place until such time as they are no longer needed. Mitigation and or compensation for loss of park resources resulting from flooding or pipeline construction will be negotiated with the project proponents.

Mineral exploration or development will not be permitted in the park.

1.4.2 Visitor Services and Marketing

Liard Hot springs Park will accommodate visitors and provide for recreation activities compatible with the unique hot springs environment. The objective will be to respond to the market demands wherever possible, while minimizing environmental impacts. The potential role of the private sector in providing services in and outside the park boundaries will be considered.

The main approach to visitor services will be to confine facilities to existing areas, and improve the opportunity to provide information and interpretation. The plan will encourage different activities in the park and region, and could if necessary, modify pool use patterns by encouraging shorter duration use, use during off peak hours, or improved supervision.
Liard River Hotsprings Park will provide the following recreation opportunities:

<table>
<thead>
<tr>
<th><strong>Resource Appreciation</strong></th>
<th>Unique hotsprings and vegetation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Warm ponded swamp vegetation and</td>
</tr>
<tr>
<td></td>
<td>wildlife</td>
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<tr>
<td></td>
<td>Wildlife viewing, large mammals,</td>
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<td></td>
<td>birds and warm swamp fish.</td>
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<tr>
<td><strong>Beach/Waterplay</strong></td>
<td>Hotsprings swimming, rest stop</td>
</tr>
<tr>
<td><strong>Picnicking</strong></td>
<td>Day use picnicking for Alaska</td>
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<td></td>
<td>Highway travellers</td>
</tr>
<tr>
<td><strong>Camping</strong></td>
<td>Single and multi-day family</td>
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<tr>
<td></td>
<td>camping for Alaska Highway</td>
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<tr>
<td></td>
<td>travellers and local residents</td>
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<tr>
<td><strong>Hiking</strong></td>
<td>Short day use trail or route</td>
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<tr>
<td></td>
<td>hiking</td>
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<tr>
<td><strong>Winter/Snow Play</strong></td>
<td>Cross-country skiing and winter</td>
</tr>
<tr>
<td></td>
<td>hotsprings swimming</td>
</tr>
</tbody>
</table>

The present visitor services are appropriate for the park except for the lack of adequate information and interpretation. Virtually all recent surveys and studies have shown that the travelling public want more information and interpretive facilities. While the existing interpretive programs in the park provide a valuable service, neither of these market demands are fully met in the park. The conservation mandate of the park is not sufficiently explained to the visitor, nor is the interpretation and information available adequate to reflect the nationally significant feature of the hotsprings.

1.4.2.1 Interpretation and Information (Refer to Map#6)

The objective for interpretation and information in Liard Hotsprings Park will be to encourage visitor awareness and appreciation of the hotsprings and ponded warm swamp environment, and to show how the park protects these unique resources. A second objective will be to provide information on appropriate use, behaviour or alternative recreation activities to reduce impacts on the park's sensitive resources.

The appropriate means to enhance interpretation and information are:

- Develop a small interpretive centre or multi-sided covered kiosk at the entrance to the boardwalk,
- Produce an information and interpretation brochure on the park environment, including information on how to minimize environmental impacts through appropriate behaviour,
• continue to provide interpretive services through a naturalist and focus on the themes and storylines established for the park,

• develop one short access route to a wildlife viewing site and provide appropriate interpretive signs

• develop interpretive signs at the hot springs or hanging gardens to reinforce the interpretive messages given at the boardwalk entrance centre or kiosk

• develop a short looped walking and interpretive trail as a second priority in the eastern warm ponded swamp area to portray a full range of habitats and species;

• develop a trail, (as a very low priority), in the Mt. Ole area to provide an additional wildlife viewing and hiking opportunity.

1.4.2.2 Interpretation Programming

Interpretation programming will focus on conveying the distinctive themes and storylines about Liard Hotsprings Park. Natural resources such as the springs and wildlife will be emphasized, while incorporating stories on human use of the area. Interpretation programming also will be used to help orient visitors to other park opportunities in the region.

Park interpretation should link the brochure, information kiosk or interpretive centre, signs, trails and naturalist programs into one coordinated series of messages. It is recommended that to reflect park resources the interpretive themes and stories include:

**Natural**: Hotspring and ponded warm swamp ecology
Wildlife Viewing

**Cultural**: Native Use of Hotsprings and Area
Use of Hotsprings During Exploration Period
Use of Hotsprings During Construction of Alaska Highway
Local History

**Promotion**: Promote Circle Four Tour
Promote Northern B.C. Parks, emphasize Muncho Lake, Stone Mountain,

Suggested features to emphasize in interpretation programming are:

- geology and geography of area
- formation and mechanics of hot springs themselves
- microclimate associated with hot springs
- tufa formation, hanging gardens, slope formation, dikes in swamps
- the many species of plants found here only because area is thermally influenced
- rare animals such as *Ischnuridae* damula, dragonfly not found elsewhere in north, and *Physa*, the snails related to southern cousins.
- carnivorous plants found in swamps
- moose habitat and viewing
- lake chub, adaptable species
- diverse resident bird population, migrating birds including shore birds
- the importance of protecting the rare hotsprings habitat to ensure that unusual wildlife and vegetation are protected

1.4.2.3 Promotion

Promotion of Liard Hotsprings Park will be minimal since the park is already at or near capacity. Park promotion by the Ministry of Parks will be directed at the shoulder season, and better information will be provided for those who visit the park. Information on campground and private facility services and vacancies will be provided to northbound and southbound travellers. The Ministry of Parks will cooperate with the Peace River Tourist Association to provide the appropriate level of park information.

1.4.2.4 Campground and Day Use Facilities

The objective of campground and day use facilities in the park will be to provide a high quality camping and recreation experience in a natural setting. The day use facilities will focus on providing improved walking or interpretive opportunities, and for providing access to the hotsprings.

The campground occupancy exceeds capacity throughout the summer and the day use area functions as an overflow camping area. Greater campground capacity will increase use pressure on the hotsprings, and the day use area may still be required for overflow. Power is not available in the campground, and there is no suitable waste disposal site to service increased facilities. There is unused camping and accommodation capacity in the private sector enterprises nearby (See Background Section 2.5.2). The private sector can meet the demand for campsites near Liard Hotsprings.

The management actions will be:

- Forego campground expansion in the park; encourage the private sector to meet the excess demand by improving existing services and providing compatible planned facilities nearby,
- Co-operate with, and assist the private sector in facility planning to ensure that increased accommodation does not result in unmanageable use pressures on the park,
- Forego addition of service facilities such as showers or a sani-dump to encourage the provision of these facilities by the private sector,
- Provide better information on accommodation alternatives in the Liard Region, in Fort St. John, Fort Nelson, and at Muncho Lake; investigate the feasibility of providing vacancy information on the Liard Hotsprings area at Muncho Lake to allow travellers the option of using facilities at Muncho Lake,
Campground management actions cont’d.

- There is no overflow camping allowed in the park. When the park is full, visitors will be informed that private campgrounds are available.

Additional day use facilities will include only those identified for interpretive purposes or for walking and wildlife viewing needs. These are identified in the Interpretation Section.

1.4.3 Park Management Services

The park management services, with certain maintenance tasks provided in part by private contractors, will continue to include:

- maintenance of facilities and structures,
- wood supply, hand water pumps, pit or container toilets,
- sanitation services needed for toilets, campground and site,
- periodic winter ploughing of boardwalk,
- campground fee collection,
- interpretation programming,
- distribution of public information.

1.5 PLAN IMPLEMENTATION

The highest priorities for plan implementation will be:

- conduct hydrological study of the hotsprings pools and the ponded warm swamp ecosystem,
- produce park information/interpretive brochure,
- design and construct an interpretive centre or multi-sided interpretive kiosk,
- select optimum site and construct access trail to a wildlife viewing point,
- investigate ways to provide better information to travellers on accommodation vacancies and alternatives in Liard Hotsprings area,
- develop ways to provide better supervision of hotsprings pools and spread use out more evenly over time and between the two pools,
- undertake actions necessary to designate existing public lands to west of Alaska Highway as part of Liard Hotsprings Park,
- prepare forest and wildlife resource inventories of the park.

Secondary priorities for plan implementation will be:

- conduct detailed assessment to determine best location, then develop looped walking and interpretive trail on east side of boardwalk in the warm ponded swamp area,
- develop day use trail to open ridge of Mt. Ole,
- conduct wildlife research to determine the importance of the springs area to wildlife.
2.0 INTRODUCTION

The plan is divided into two sections. Part 1 contains the Master Plan, based on a comprehensive review of park resources and use. Part 2 contains a summary of background resource and use information, as well as a discussion of planning issues and options for management.

2.1 REGIONAL AND PROVINCIAL CONTEXT

Liard Hotsprings Provincial Park lies adjacent to the Alaska Highway on the Liard-Rabbit Plateau in northeastern British Columbia. The park protects the hotsprings and ponded warm swamps along with associated flora and fauna. The hotsprings are of national ecological significance, and have been ranked among the top 5 in Canada, based on a range of criteria applied to hundreds of springs across the country (Tera Environmental Consultants, 1984).

Within the region, where many of the best springs in Canada are found, the Liard Hotsprings are among the most important springs, highly rated for their aesthetic quality, diversity of flora and fauna, and for the springs formations themselves. The Liard Hotsprings are the only easily accessible developed springs along the Alaska Highway that still retain their natural character. The Provincial Park plays an important tourism and recreation role for regional residents and tourists travelling the Alaska Highway.

2.2 PARK RESOURCES

2.2.1 Natural Resources

2.2.1.1 Physiography

Bedrock Geology

The Liard River Hot Springs area is underlain by folded, faulted, Paleozoic sedimentary rocks typical of the Liard Plateau region. The Liard River forms the boundary between the Rocky Mountains and Liard Plateau physiographic regions. The same bedrock formations are found north and south of the river; however, the rocks of the Liard Plateau to the north are more gently folded and less faulted, and the topography is more subdued, than in the Rocky Mountains.

The rock outcropping in the Park is shale, argillite, siltstone, and sandstone of upper Devonian and Mississippian age (Gabrielse, 1962). It overlies middle Devonian limestone, which is exposed in a north-trending anticlinal structure just north of the Hot Springs. The springs may be related to a major fault system which parallels the valley on the south side of the Liard River, or to other unmapped structures on the north side of the river. The chemical similarity of the spring water to that of the hot springs at Banff, and the similar bedrock geology, suggests that the geological origin
of the two spring complexes might be similar. At Banff, the springs occur as a result
of deep circulation of groundwater through thrust faults.

The bedrock in the immediate vicinity of the Hot Springs is concealed by drift.
However, the sandstone and shale are well exposed on Mt Ole in the southeast part
of the Park, as well as on the river bank near the highway bridge.

Geomorphology and soils

The Park includes small areas of landscapes representative of the Liard Plateau and
the Liard River Valley, such as the late Pleistocene outwash terraces and sand
dunes, the river bank, and the steep ridge of Mt Ole.

No systematic terrain mapping was attempted as part of this planning work;
however, observations were made of terrain conditions in the vicinity of the Hot
Springs during field work. The surficial geology of the area has been mapped by

The hill behind the Hot Springs slopes at an angle of about 12 to 24 degrees, and is
probably mantled with till and possibly other glacial deposits, and colluvial deposits
on some steeper slopes. Where observed, it was covered with old tufa deposits from
Fern Creek or from earlier spring locations. No bedrock outcrops were noticed in
the area of the springs. The Hot Springs emerge where the hillslope meets an
extensive glaciofluvial outwash terrace which fills most of the width of the river
valley. The gravel and sand of this terrace are veneered with loess; this consists of
silt and fine sand, and is typically 30 cm to a metre or more in thickness. In the
southeast part of the park, thicker sand dune deposits cover part of the terrace. The
surface elevation of the terrace varies slightly, reflecting the former course of the
Liard River. Lower lying areas adjacent to the hillside at the Hot Springs have led
to the formation of the warm swamps.

In the area of the warm swamps, the gravel and loess of the terrace have been
covered with a thin layer of tufa and organic deposits. A shallow pit at the edge of
the swamp adjacent to the campsite showed this layer to be only about 20 cm thick;
however, elsewhere in the swamps it may be much deeper. The tufa in the pit was
of loose, sandy texture, and contained organic fragments and snail shells. At the
base of the hillside in the spring source area, the tufa forms hard, porous deposits
with a thin soil developed on top, or occurs as large blocks mixed with the soil. It is
presumably at least several metres thick. Along the trail leading to Beta pool, the
tufa is covered in places with a silty, non-calcareous soil which may be loess.

Reid (1978) describes the soils in the Hot Springs area, but does not provide a soils
map. Generally, Brunisols are found in most well to imperfectly drained areas, both
on old tufa deposits and on the non-calcareous outwash terrace. Regosols occur on
younger tufa deposits, and on steep colluvial material on the slopes of Mt Ole. The
poorly drained swamp areas have Organic soils or, less commonly, Gleysols.

A landslide deposit covers part of the terrace at the foot of the steep south-facing
nose of Mt. Ole (Thurber, 1981). This feature is probably very old, possibly
reflecting more unstable conditions during deglaciation. This area is not believed to
have any significant landslide hazard at present, apart from local rockfall on the
steep slopes of the mountain.
Hotsprings Hydrology

In the discussion below, the definitions given by Souther and Halstead (1973) are used. These are:

- Thermal spring - a spring which is more than 5 degrees C warmer than the mean annual air temperature.

- Hot spring - A thermal spring warmer than 32 degrees C. Thermal springs below 32 degrees C are called warm springs.

- Mineral spring - a spring with total dissolved solids concentration greater than 1000 parts per million.

Sources and flow volumes

The locations of the various source springs in the Hot Springs complex have been mapped, and given Greek alphabetic names, by Pavlick (1974). During field work, the various spring sources, outflow streams, and swamps were inspected in an attempt to understand the flow network, temperatures were taken, and some flow volumes were estimated. The outflows from the Alpha and Beta pools were estimated by measuring surface velocity and average cross-sectional area through a channel segment. At several other locations, less precise estimates were made by observing velocity and channel dimensions.

Pavlick quotes a flow measurement of 649 gallons per minute, or 49 litres per second (l/s) for the combined flow of the Alpha spring and the inflow from the Hanging Gardens; the latter was estimated to be less than 8 l/s. St. Pierre (1980) reports estimates of 43 to 70 l/s, from several sources, for the flow into the Alpha pool, and one estimate of 30 l/s for flow from the Hanging Gardens. B.C. Hydro estimated the flow of the Alpha stream below the pools to be 80 l/s. The measured flow (this study) was 81 l/s. This includes the inflow from Psi spring and lower Fern Creek.

The measured flow in the outlet stream of Beta pool was 15 l/s; this compares with an estimate of 12 l/s by B.C. Hydro (St. Pierre, 1980).

The flow of Fern Creek where it crosses the trail is estimated, very roughly, to be about 30 to 40 l/s. This creek is a slightly warm mineral stream, presumably spring-fed. The flow at the trail is in several channels, and its position seems to be migrating gradually to the east as it builds up its tufa fan. Most of the flow is now in the easternmost channel, which is rapidly forming tufa deposits. (It was not clear during field work where the "Omega" spring mapped by Pavlick is. It may be covered by the east branch of Fern Creek, or it may be a separate spring source which was mistaken for a branch of Fern Creek.)

The flows from Gamma, Delta, and Epsilon springs were not estimated, but are probably small compared to Alpha and Beta springs. An additional small warm spring, previously unreported, feeds the easternmost swamp. It is possible that other small spring sources exist in the swamp complex.

The minimum estimated flow of the Liard River Hot Springs complex, considering all the known sources, is about 120 to 135 l/s. This would make it the second largest known thermal spring system in Canada (comparing with flow volumes given by...

Temperature

In general, temperatures measured during this study agree well with those reported by Pavlick and by St. Pierre, indicating that the temperatures of the springs do not vary much over time.

The temperature of the Alpha spring source was 53 degrees C. The average temperature of the main Alpha pool was 40 degrees C. This is slightly lower than previously reported measurements because of the diversion of Psi spring water into the pool to cool it. This diversion causes the water to be noticeably stratified; temperature in the pool varied from 26 to 49 degrees C. Some other temperatures are:

- **Beta spring**: 42 degrees C
- **Gamma spring**: 33 C
- **Delta spring**: 39 C
- **Epsilon spring**: 47 C
- **Hanging Gardens**: 21-23 C
- **Psi spring**: 22 C
- **Fern Creek at trail**: 14 C
- **Lower Alpha pool**: 26-38 C
- **Alpha stream below pools**: 37 C
- **Alpha warm swamp**: 18-28 C
- **Epsilon warm swamp (near springs)**: 25-32 C
- **Eastern spring and swamp**: 17-22 C

Water quality

Numerous analyses have been made of the chemical water quality of the Hot Springs. These are reviewed by St. Pierre (1980). The waters are slightly alkaline (pH of about 7.2 to 8.2), and of Calcium sulphate character. Total dissolved solids has been measured at concentrations of about 1100 ppm in Alpha spring, and about 1000 ppm in Beta spring. About 3/4 of this concentration is accounted for by Ca$^{++}$ and SO$_4^{2-}$ ions, with lesser amounts of Mg$^{++}$, Na$^+$, K$^+$, HCO$_3^-$, Cl$^-$, and SiO$_2$. Numerous trace metals are also present. Some sulfur in the water may be given off as H$_2$S gas.

The occurrence of bicarbonate ions in the water, and the precipitation of calcium carbonate (CaCO$_3$), is a result of a set of equilibrium reactions between CaCO$_3$, HCO$_3^-$, and CO$_2$ in solution and in the atmosphere. These depend on temperature, pH, and the action of vegetation and decay organisms, amongst other factors. The reactions, and the process of tufa formation, are discussed by Pavlick (1974). Generally, precipitation of CaCO$_3$ in the form of tufa occurs most readily at breaks in slope, where the flow of water becomes faster and more agitated. This explains the formation of tufa terraces, such as the Hanging Gardens, and of tufa dams in the warm swamps.

Unlike most other thermal springs in Canada, the Liard River Hot Springs do not flow directly into a nearby river or creek, but flow into an intricate system of swamps. These warm swamps are the most unique feature of the Park. Their large extent is due partly to the topography of the outwash terrace, but is also due to the
high discharge of the Hot Springs, which are amongst the largest in Canada. Although not unique, the temperature of the spring water (suitable for bathing), and the tufa formations, make the Hot Springs a feature of high recreational interest.

2.2.1.2 Climate

The climate in the Liard Hotsprings region is typical of northern boreal zones, experiencing cold dry conditions. The annual total precipitation is 465mm, with May through September typically frost-free. There are 6 hours of sunlight at winter solstice and 20 hours in summer (B.C. Hydro).

These climatic conditions, when modified by the hot springs, allow for an ideal recreation setting.

2.2.1.3 Flora and Fauna

Flora

Liard Hotsprings is located in an area where the vegetation is expected to consist of boreal forest species, (e.g., *Pinus contorta*, *Picea glauca*, *Picea mariana*) The park lies within the Boreal White and Black Spruce Biogeoclimatic Zone (Krajina and Brooke, 1970). Although the majority of species in the park are indeed of this wide-ranging boreal variety, there is also an occurrence of 14 thermally influenced species; only the effects of the hot springs account for their presence in the north.

The hot spring vegetation is striking compared to outlying areas in species composition, in the large diversity of species (including 14 species of orchids) and the luxuriance of their growth and the early-blooming growth pattern. The reason for the difference is the obvious thermal effect of the hot springs. There is at least a 2 degrees Celsius difference in annual temperature range, the hot spring vicinity remains frost free, the soils unfrozen and the relative humidity may be higher (Reid, 1978).

Thus, the hot springs create a microclimate within the boreal forest, with conditions that are favorable for a unique vegetative community. In fact, in the early part of the century, the hot springs were known as the Liard Tropical Valley. Many species could possibly be relicts from the warmer Hypsithermal interval which occurred 6,000 to 4,000 years ago (Porsild and Crum, 1961).

There are several plant communities in the park which show thermal effects. Obviously the pools themselves create a rich environment for lush growth. There is a large variety of species forming a dense growth of vegetation because of the immediate influence of the thermal waters. Ostrich ferns (*Matteuccia struthiopteris*) give these areas a tropical look, while cow parsnip (*Heracleum lanatum*) grows extremely tall and begins its growing season at least two weeks earlier than surrounding areas. Thermally influenced species that would not normally occur in the north but thrive near the springs include black snakeroot (*Sanicula marililanda*) and Lyall’s nettle (*Urtica lyallii*). Yellow monkey flower (*Mimulus guttatus*) is a colourful addition on the edges of the pools.

An important factor in the hot springs vegetation pattern is the occurrence of tufa (the calcium deposits precipitated from hot springs waters), and it is the tufa terrace
of the hanging gardens which provides the base for the spectacular greenery and flowers that grow there. The variety of species found at the hanging gardens is similar to those which occur near the springs. On the slopes behind the springs, the ground is underlain with tufa deposits and there is a thick and luxurious and undergrowth.

Farther away from the springs, are the swamps which, although being extremely shallow, will never freeze in winter due to the continually warm inflowing water. This is a bonus from the hot springs pools, for warm swamps are not common features in association with springs. The vegetation here is quite interesting and often overlooked. Aquatic plants include the bladderworts, which are carnivorous plants. Chara (Chara vulgaris), an important lime-secreting algae, grows in abundance and often dies encrusted with lime deposits. It is an important tufa-forming mechanism (Reid, 1978).

Among the many species found on the tufa islands are several species of orchids, the uncommon Kalms lobelia (Lobelia kalmii L.) and two more carnivorous plants, the sundew (Drosera spp.) and the butterwort (Pinguicula vulgaris). The carnivorous plants are likely here due to the low nitrogen content of the spring water. There is quite a variety of smaller communities in the transition from the forest to the swamp, and on the different islands in the swamp itself. Successional meadows supporting cinquefoil (Potentilla fruticosa) shrubs occur in previous ponded swamp areas.

Mt. Ole supports species of the alpine and sub-arctic variety. Open south facing slopes support stands of native grasses, rose (Rosa spp.), and aspen (Populus tremuloides). This habitat is favoured by elk.

Fauna

Wildlife and their habitat are a critical part of the Liard Hot Springs ecology and provide a recreational experience through viewing and interpretation opportunities.

Numerous studies in the park have included a wildlife component, but no comprehensive investigation of all species has been undertaken. There has not been adequate study of the wildlife ecology related to the springs. A total of 135 species were recorded by 1978, with 28 of these mammals and 104 birds (St. Pierre 1980). Moose are year round residents and provide the most consistent viewing opportunities. During the summer months bulls, cows and calves have been observed feeding on aquatic vegetation in the swamps. The presence of moose summer droppings and beds in the black spruce forest also indicate day-time use of the park (St. Pierre 1980). The park has been described as prime moose habitat (Woodhouse, pers. comm.). Moose are not plentiful in the park during the winter months, however, due to the lack of shrubs and saplings in the mature forest.

Rand (1944) reported that mule deer overwintered on the slopes of Mt. Ole, and sightings have been made in the vicinity of the hot springs (Reid 1975). Elk are also known to use the Mt. Ole area (Woodhouse, pers. comm.).

Fresh bear droppings are commonly seen in the park and there have been occasional sightings of sows and cubs over the years. A number of black bears have been taken from the park and relocated, and some habitual problem bears have been destroyed for safety reasons. Grizzly bear have also been recorded in the past, with one encounter in the southern segment of the park resulting in a fatal mauling. Grizzly bear are seldom seen in the park, and there have been no sightings in the campground or pool area in recent years.
Seven species of waterfowl have been recorded, with the mallard and Canada Goose known to breed in the park. The remaining waterfowl are transients, migrating through the area in the spring and fall (St. Pierre, 1980). There are several other types of bird species in the park. St. Pierre observed 11 species of shore birds, of which the solitary sandpiper and common snipe are known to breed in the swamps. Gulls, swallows, blackbirds, kingfishers and nighthawks may be frequently observed near the swamps, while flocks of bohemian waxwings use black spruce perches around the edges of the swamp. There are no known raptor nests in the park, although St. Pierre (1980) observed seven species flying over the park.

Many species of woodpeckers, thrushes, warblers and sparrows have been observed in the park but no thorough investigation has been undertaken (St. Pierre 1980). In winter, the gray jay, raven, chickadees and juncos are residents, while Reid (1974) observed one pair of mallards attempting to overwinter in the hot pools.

Of particular interest to visitors are the numerous small fish swimming in pools alongside the boardwalk to Alpha pool. These are Lake Chub (Couesius plumbeus), a very adaptable species commonly encountered throughout Canada (Scott and Crossman, 1973).

The only amphibian inhabiting the park is the Northwestern Boreal Toad (Bufo boreas), commonly observed at the edges of the hot springs swamps.

A small warm water snail, identified by Dr. Arthur Clarke of the Smithsonian Institution, occurs in the park but has not been studied in detail. It is not known whether this species still survives in the park, or whether its habitat has been modified. Clarke described the species as follows:

*The Liard Hot Springs Physa is a distinct species and, as far as is now known, it occurs nowhere else. I collected it in 1973 in the outlet of Liard Hot Springs... in 19 degrees Celsius water on grass and moss at a depth of 1 to 4 inches. I presume that it lives only in moderately cool water at the edge of the warm water but not in it, and it therefore can be expected to have a very limited range.*

*This is a primitive Physa which shows relationships... to other relict North American Species. It is probably a glacial relict species... (Clarke 1978)*

In summary, all species are important to the ecology of the park, while moose, waterfowl, and songbirds offer the greatest potential for wildlife viewing. For many visitors, the opportunity to view moose at close range from the boardwalk is a highlight of their trip. The songbirds of the park are not recognized by most visitors, yet the park provides an ideal setting for observation of these species.

### 2.2.2 Cultural Resources

Cultural themes at Liard River include native use of the area, the fur trade, Geological Survey exploration, pioneers and construction of the Alaska Highway. The overview of regional history is largely adapted from a Heritage Branch unpublished paper by Tarasoff and from *The History of the Northern Interior of British Columbia*, by A.G Morice (1978).
Native Use

The recorded knowledge of early native use of the site is very limited, although the potential for spiritual stories or legends relating to the springs may be high. There have been no oral histories done in the area to determine if such stories exist, or if the springs were used at all.

The Liard region was home to people speaking the Athapaskan and Kaska tongues, with original groups including Beaver, Sikanni, Nahanni and the Dog Rib (Young, The Fort Nelson Story). Moose was a mainstay of these peoples and they travelled the rivers of the region by canoe. Following arrival of the white man, the native use of the region was closely linked to the fur trade and exploration themes.

Heritage Branch records indicate sites with obsidian flakes and lithic scatter indicating early native hunting. Circular depressions near Beta pool suggest the presence of dug-out houses near the springs. These notations have not been thoroughly investigated and their significance is unknown.

Fur Trade

The rivalry for control of the fur trade in the Pacific Northwest led to exploration and the consolidation of trading interests with the erection of trading posts. The major trading influences in the Liard Region were the conflict between the Hudsons Bay Company and the Northwest Company, the amalgamation of the Hudsons Bay Company and the Northwest Company in 1821, and the western rivalry between the Hudsons Bay Company and the Russian American Company. The latter competition had the effect of impelling the Hudsons Bay Company to explore the Mackenzie River drainage before 1850.

Several posts were built including Fort Simpson at the confluence of the Liard and Mackenzie Rivers, Fort Liard at the junction of the eastern and western branches of the Liard River, and Fort Halkett at the confluence of the Smith and Liard Rivers. Fur trading was the reason for these posts, but they were important as centres for agriculture as well, with potatoes, turnips, cabbage and barley grown.

The first mention of the hot springs on the Liard River allegedly occurs in the diary of Robert Campbell, the HBC Factor at Fort Liard in 1835 and at Fort Halkett after 1839. Unfortunately, the diary is not extant. Further mention is not made until Camsell and Ogilvie's reconnaissance of 1898. It is likely that the springs were known to local trappers and prospectors.

Robert Campbell established a post at Dease Lake, and reached the headwaters of the Stikine River. In 1840 he explored the north branch of the Liard River, discovering Lake Frances, Finlayson's River and the Pelly River.

Following Campbell's exploration of the Liard Plateau, the Liard River was used as a trading route to the Yukon. It was abandoned in 1870 when it was found that supplies could be taken in from Wrangell, Alaska to Telegraph Creek and on to Dease Lake. Although the Stikine River route involved a 150 mile portage, it was deemed preferable to the risks on the upper Liard River, for example those encountered at Devils Portage and Grand Canyon. Disaster were so frequent that the Teslin and other Indians believed that an evil spirit brooded over these waters.
Two Roman Catholic missionaries, Gascon and Petitot, published accounts of their trips up the Liard between 1861 and 1865. Billy Hill, a trapper, was apparently a local source of knowledge about the river. Gold was discovered near Fort Halkert by prospectors Henry Thibert and Angus McCullough. A small rush started but these two men's discovery of gold in the Cassiar Mountains two years later dwarfed the smaller strike on the Liard.

**Geological Survey Explorations**

The first scientific exploration of the Liard region was undertaken in 1887 by R.C. McConnell for the Geological Survey of Canada. With G.M. Dawson he entered the Liard Valley via Dease Lake. While Dawson followed Campbell's route to the Yukon, McConnell explored from Lower Post to Fort Simpson. He apparently did not visit the springs.

William Ogilvie accompanied George Dawson on the Yukon River in 1887, and accompanied by Charles Camsell explored the Liard in 1888 and 1889. The two men camped at Liard Hot Springs on both expeditions.

**Pioneers**

One of the first white men to live at the Hot Springs was Tom Smith, a prospector in the Klondike Gold Rush, who built a cabin on the site in the early 1920's. His wife died and he apparently arrived with his daughter Jane to live at the hot springs. After two years of trapping they decided to travel to Fort Liard with a large cache of furs. Tom was drowned in Devils Canyon, while his daughter was rescued by Indians who sent her to the Anglican mission at Hay River. Jane died at Hay River in 1934 at the age of 27. Early stories suggest that there were gardens in the vicinity of the hot springs, presumably tilled by Smith. (Young, *The Fort Nelson Story*). Early stories about the springs suggested "tales of a tropical valley with tropical fruit" (Young, *The Fort Nelson Story*). These stories may be attributed to Lt. Col J. Scott Williams who was making a reconnaissance of the area and found Smith's note about leaving for Fort Liard. Williams reported on the lush vegetation, perhaps the overgrown gardens of Smith, and hence the tropical valley myth was started. Charles Camsell, on his later geological work, refuted the myth, but it survived until construction of the Alaska Highway.

**Alaska Highway Construction**

Plans for a northern highway through British Columbia to Alaska were discussed as early as 1929. Various studies were commissioned, and fears about benefits and control expressed by politicians led to slow negotiations throughout the 1930's. It was the Japanese thrust to Alaska and the allied commitment to supply war materials to the Soviet Union that finally led to the construction of the Alcan Military Highway between Dawson Creek and Fairbanks, Alaska. A cat train preceded construction of the highway. From March until November, 1942, less than seven months, 10,000 American Army Engineers and 6,000 civilians constructed the 1,600 miles of highway. Of this length, 1,221 miles were in Canada. It came under Canadian military authority in 1946, and was opened to the public in 1947. According to Young in *The Fort Nelson Story*, there was early interest in leasing the hot springs site for resort use.

Liard River Hot Springs, was a bathing place for soldiers and was called Theresa Hot Springs by the Americans. The present day park area was near the site of a
construction camp located at the Liard River. At the hot springs, a rough boardwalk was constructed to the first pool and plank floats extended onto the water for bathing. At the second pool, sometimes called Trappers Pool, Tom Smith’s cabin was destroyed and two frame buildings were constructed, "one over a small pool... and one alongside for a dressing room." Considerable hay was also cut from farm land near the Hotsprings in 1943. (Tarasoff, in Pavlick, 1975) Another author suggested that a covered ramp went down to the pool, the pool had a floor in it, and the building covering the pool was screened (Remley, 1976).

Tom and Rose Mould had gardens between the two springs... "and they had potatoes and carrots, and they could leave them there all winter and dig them out as they needed them...as soon as the tourists started coming through they couldn’t maintain their garden... had to abandon it... there’s part of an old fence there." (George Nelms, as quoted in Remley, 1976)

There are remains of a log structure north of the road along the Liard River, and the clearings from the old highway construction camp may be seen just outside the park boundary on the route to the original river crossing.

Early travellers on the Alaska Highway refer to the springs as a place to exchange experiences with other visitors (Trout, 1972) This use of the springs as a gathering place to exchange stories and meet fellow travellers is still an important and uncommon cultural aspect of the park.

2.2.3 Visual Resources

The visual resources of the park are highlighted by the relatively pristine setting of the wetlands and springs associated with the undeveloped parts of the park. The hanging gardens and the lower undeveloped pools are the most striking of these sites.

Views in the park are gained from Beta pool where brush clearing has provided attractive vistas to the slopes on the south bank of the Liard River. Limited views are gained from the two viewing decks at the hanging gardens. Although no formal trail exists, limited views of the Liard valley would be possible along the ridge northeast of the pools.

In the southern part of the park, superb views of the Liard River valley and the characteristics of the Liard Plateau are gained from the approach ridge and summit of Mount Ole. Pleasant views from the old Alaska Highway crossing sites reveal the Trout River confluence and the cobble beach of the Liard River. These places are seldom visited because no information or trail facilities exist.

Views of the park are also experienced travelling northbound on the Alaska Highway. The forested slopes of the Liard River valley and the rivers edge is seen approaching the bridge and while crossing it.
The carrying capacity of the Liard River Hotsprings Park ecosystem is a major component of resource and visitor management. Carrying capacity can refer to biological or social factors. It is defined as the ability of a site to absorb human use without unacceptably altering the natural environment or reducing the recreational or interpretive experience. The carrying capacity of Liard River Hotsprings Park has not been measured precisely. The determination of carrying capacity is approximate at best and should be applied as a management tool rather than an exact scientific measure.

2.3.1 The Liard Hotsprings Ecosystem

The Hotsprings ecosystem is defined as the community of plants and animals dependent on the physical environment created by the hotsprings and associated hydrological and terrestrial features. Although parts of this ecosystem have been studied, there is no detailed information on the relationship of the plant and animal community to the hotsprings and ponded warm swamp environment (Reid, 1975, Porsild and Crum, 1961, St. Pierre, 1980).

There is sufficient information to state that the ecosystem is fragile and that many species of both plants and animals depend on a narrow range of habitat conditions related to water level, temperature, and chemistry. Small variations occur naturally over time, but man induced changes could have a devastating affect on any species. Small changes in water quality or levels could have significant detrimental affects throughout the ecosystem. Since plant and animal species are all linked in some way within the ecosystem, the best management approach is a conservative one where modifications to the natural environment are minimized or curtailed altogether.

A practical example of an ecosystem relationship in Liard Hotsprings Park is illustrated by water flow levels in the ponded warm swamp areas. Lowered water levels in any of the swamps can impact on fish and plant species by depriving them of the required environmental conditions for survival. Changes in water temperature through the reduction of water levels can also eliminate some species.

Hotsprings Pools: Physical and Environmental Aspects

The hotsprings pools themselves are a complex part of the overall ecosystem. The resource analysis will focus on the undeveloped and developed pools separately since each requires a special management approach. A detailed resource analysis of the Hotsprings is beyond the scope of this plan and details on the springs can be found elsewhere (St. Pierre, 1980, Reid, 1978, Pavlick, 1974).

The main limitations on the use of the Hot Springs for bathing are the need to maintain the volume and quality of hot water to feed the warm swamps, and the necessity of maintaining adequate water quality in the bathing pools for health reasons.

Warm Swamps and Hydrology

Although the flow volume is large compared to other hot springs which are heavily used for recreation, the uniqueness and sensitivity of the warm swamps precludes the diversion of hot water away to bathing pools elsewhere, or the expansion of pools to the point where water temperature or quality deteriorates. If the
temperature or the volume of water draining into either of the warm swamps is substantially decreased, or if the water is seriously polluted, then plant and animal communities in the warm swamps are likely to suffer.

The warm swamps appear to be highly sensitive to disruption of the flow patterns through them. Changes to the flow patterns occur naturally, although slowly. Rapid changes due to breaching the tufa dams in the ponded warm swamps, or artificially deepening channels, can result in lower water levels or temperatures in parts of the swamps, with impacts on plant and animal communities.

Continued eastward migration of Fern Creek as it builds up its tufa fan, is allowing some creek water to spill over into Psi Spring, lowering its temperature and possibly threatening the "fern garden". There is some possibility that it could eventually spill further east into the Alpha pool source itself. Intervention in this natural process by keeping Fern Creek from migrating further east could help ensure that the recreational qualities of alpha Pool are not changed, and that the existing fern garden would remain in place.

**Alpha Pool**

Diversion of cool water from the Psi Spring into the Alpha source area to cool the bathing pool interferes with the hot source spring, with possible impacts on any unique biota and geological phenomena which might exist in this hottest part of the spring complex. If this cooling diversion is required, it would be preferable from an ecological perspective, to empty the cool water into the Alpha pool downstream of the hot source area.

There is no obvious solution to the problem of temperature stratification in the Alpha bathing pool which the introduction of cooler water creates. One long term possibility would be to lower the level of the main Alpha bathing pool by 10-20 cm, to isolate the main hot source from the bathing pool and recreate a more natural situation where the hot water cascades downstream from its source. The man-made modifications in the pool area do not appear to have resulted in changes to flow volumes or to any spring source. Plant and animal habitat has been altered or lost, but the effects of this are unknown. At present, visitors clearly prefer Alpha pool for its clear water and attractive setting.

**Beta Pool**

Beta Pool has a low flowthrough and modest use churns up the muddy bottom, creating an unaesthetic bathing experience and limiting carrying capacity. The risk of contamination by bacteria is increased since bacteria flourish in silty water. Enhanced flow and aesthetic conditions could result in a higher carrying capacity for the Beta pool thereby relieving potential future overcrowding of Alpha Pool.

Complete redesign or drastic intervention in the Beta spring hydrology could be the only way to solve the problem in the long run, short of rehabilitating the site to its original natural condition.

Groundwater contamination from the pit toilet at Beta Pool could be a problem since flow through the very porous tufa deposits underneath the entire springs area may be very rapid. The hydrological engineering evaluation recently completed for the Ministry of Parks in this regard was inconclusive with respect to pit toilet.
Alpha Pool viewed from deck across the hot source pool; cooler water is added to the hot pool to moderate water temperature for swimming.

Beta Pool, looking south; this pool has a lower level of water flow and the water is turbid after use due to a muddy bottom.
effluent. Replacement of the pit toilet with a chemical or other alternate system may be required in the future.

There is no "excess" hot water available for diversion or expansion of bathing pools from either the Alpha or Beta pools. The prospect of piping water to a location outside the park or elsewhere in the park is not environmentally sound due to the dependence of the warm swamp plant and animal species on the hotsprings water. Diversion of hotsprings water could have a catastrophic effect on the park ecosystem.

Hotsprings Pools and Carrying Capacity: Recreation and Health Aspects

Alpha and Beta pools are a major recreation resource of Liard Hotsprings Park. The recreational carrying capacity of these pools is an important aspect of park management.

With current campground and day use levels, the pools are likely used by as many as 75 people per hour, assuming steady visitation during peak hours. Most of these people would swim in the Alpha pool with few travelling to the more distant and frequently muddy Beta pool. Beta Pool was closed due to high choliform counts from the mid-1970's until 2-3 years ago.

The carrying capacity of the pools can be measured in a number of different ways. Health and safety considerations can, in theory, produce a fairly firm number of acceptable users, while a figure for recreational carrying capacity related to the quality of the recreational experience is more difficult to determine.

Health

The Liard Hotsprings are currently defined as a public beach with specific water quality requirements (District Health Office, pers. comm.). The fecal choliform count can not exceed 200 parts per 100ml, nor can any 10% water sample exceed 400 parts per 100ml (Health Act, B.C. Reg.282/72). The carrying capacity of the pools from a health perspective, is any amount of use which results in water quality standards within the above limits. The high rate of flow through Alpha Pool results in flushing of fecal matter and urine, thereby allowing more people to use it. The lower rate of flow through Beta pool limits the use capacity of the pool. It is not known how much additional through flow would be required to increase the use capacity of Beta pool.

In both pools, chemical water treatment could have disastrous effects on the hotsprings and ponded warm swamp ecosystem. This means that to remain within the health carrying capacity of the pools there are only two options for future consideration: regulate use when choliform counts move upwards, and/or modify pool designs as required to allow a more suitable water flow.

The Health Act regulations also stipulate carrying capacity for swimming pools according to water area and volume. Although the Liard Hotsprings are defined as a public beach, their characteristics may be compared to wading or swimming pools to help with this evaluation of appropriate use levels. This comparison is made only to provide an additional guideline for consideration; there are many differences between swimming or wading pools and the hotsprings. Note that the figures in the Health Act regulations apply to treated swimming pools, so that in the Liard
situation a smaller load capacity may be appropriate even if flow through volumes are taken into account. The B.C. regulations define bathing load as:

\[
\text{Bathing Load} = \frac{D}{27} + \frac{S}{10}
\]

Where \( D \) = area of pool in square feet where depth is over 5 feet, and where \( S \) = area of pool in feet squared where water is less than 5 feet deep.

Applying this formula to Alpha and Beta pool results in a bathing load of about 40 for Beta pool and 45 for Alpha pool, for a total of 85 bathers at any one time. These figures are intended to reflect suitable bathing loads in treated pools and are only used as a guideline here. If the lower flow rate of Beta pool is taken into account then the bathing load should clearly be reduced, to perhaps 20-25 at any given time. Alpha Pool can theoretically accommodate 45 bathers without health effects, as shown by both the formula and the lack of health problems in the past. Both pools naturally flush over night to a clear state, thus helping to avoid accumulations of fecal matter or other contaminants.

Recreation

Recreational carrying capacity is an important consideration in Liard Hotsprings Park. Swimming in the pools has always been a social experience, where visitors relax and perhaps trade stories about their travel adventures. The pools are restful places to soothe the mind and body in a natural setting. Overcrowding will reduce the satisfaction of many pool users; what constitutes overcrowding can not be easily determined. Visitors recreation experience will be positive as long as they perceive conditions to their liking. Research on carrying capacity suggests that as use reaches an overcrowded state, visitor satisfaction declines and finally visitors will alter their behaviour to either not enter the pools or come back at off peak hours to avoid the crowds (Shelby and Heberlein, 1986). Visitors also migrate to Beta Pool if Alpha is too crowded. In this way use of the pools is self-regulating, but not necessarily in an optimum way.

The 1987 July park use statistics indicate that 134 people per day camped at Liard Hotsprings, while there appear to have been about 185 vehicles per day using the day use facilities. This vehicle count translates into approximately 425 day users per day for a total daily use of about 560 individuals, when added to the camping total. If use of the pools were evenly distributed, this total means that over a 15 hour day, 37 people per hour could be using the pools, a figure within the capacity of the pools. If, however, it is assumed that use patterns are irregular and most people would use the pools at peak after supper hours, then a figure of almost 75 people per hour is evident. Such a number of users at any given time would be at the upper limit or exceed the pools' carrying capacity. Use of the pools extends to midnight during the summer months, while many visitors leave early in the morning.

Anecdotal evidence suggests that the Alpha pool is considered crowded when it reaches its bathing load of 45, while a number of 10-20 bathers seems to be a pleasant and tolerable level. Those people seeking a quieter experience will walk the extra distance to Beta Pool even though the water quality is less attractive. The recreational carrying capacity of Beta Pool is likely less than Alpha Pool since it is less broken up by partitions, the water is murky, and the attitudes of users may be
different. A use level of 10-12 bathers in Beta Pool is a reasonable optimum number.

Health and Recreation

The combination of health and recreational carrying capacity considerations provides sufficient insight to identify optimum pool use levels. The maximum number of people using both pools should never exceed 85, since this would exceed health and safety guidelines. The sensitive environmental conditions, the untreated water and the special recreational quality of the springs, however, suggests that the optimum carrying capacity should be set at a lower level. A range of 35-50 pool users at any given time is suggested as the maximum carrying capacity that would balance visitor demand with health, safety and environmental conditions. This means that presently, during peak hours, the pools will not sustain additional numbers of bathers without a reduction in water quality and user satisfaction.

Methods of managing use by providing alternate park activities, more information and interpretation of park resources, and better supervision or control of use would help maintain use levels within the carrying capacity of the pools. Improvements to Beta Pool may also serve to increase the overall carrying capacity of the pools.

In summary, the Liard Hotsprings Pools are already used to their carrying capacity during much of the summer season. Park management strategies may help maintain use at reasonable levels. The development of additional accommodation and services in the park, or an over-development of private facilities would result in increased use pressures on the sensitive pools environment.

2.3.2 Terrain and Soils

Although the Park and adjacent areas have large areas with few constraints to development (such as campsites, buildings, and roads), much of the Hot Springs area has quite sensitive soil conditions. The sensitivity of soils can be summarized as follows:

**Extremely sensitive** - Active tufa terraces, such as the Hanging Gardens and the area of Beta pool; the tufa ponded warm swamps; spring sources.

**Very sensitive** - Flooded and wet areas of the warm swamps; tufa-derived soils on slopes in the spring source area.

**Somewhat sensitive** - Organic soils (bogs) adjacent to the warm swamps; tufa-derived soils in flat areas; sand dune deposits.

**Not sensitive** - Outwash terraces; drift-covered hillsides.

The recent tufa deposits can be very fragile, and subject to damage as a result of repeated foot traffic. All the tufa-derived soils are porous and subject to compaction. This can lead to trenching of trails, as is occurring on the trail to Beta pool, with the resulting risk of erosion by running water. Peat soils are likewise subject to compaction. When building trails on these soils, crushed rock fill can be used in well-drained areas, and boardwalks in poorly drained areas, to prevent compaction and erosion.
The tufa deposits are extremely porous, and as a result are unsuitable for the construction of pit toilets.

The loess-covered outwash terraces are, in general, highly suitable for campsite, building, and road construction, and reasonably suitable for pit toilets and septic tank fields. Roads must be gravelled in silty areas. In many areas, highly permeable, coarse gravel layers may lie at a shallow depth below sandy layers or loess deposits. In these areas, pit toilets could contaminate well water if the toilet pits lie close to the water table. Therefore, pit toilets should not be built near wells, or where the water table is near the surface. The water quality of the existing campsite pump wells should be inspected.

Suitable areas for campsite expansion or building are the well-drained terrace areas between the highway and Epsilon warm swamp, across the highway from the present campsite, and along the dirt road in the southeast part of the Park.

2.3.3 Vegetation Resources

Vegetation in the hot springs and warm ponded swamp areas is closely linked to water levels, temperature and soil chemistry. The aquatic and emergent vegetation in the swamp areas occupies a habitat with specific environmental conditions. The vegetation community and several interesting plants are one of the main ecological features of note in the park, and loss or change of habitat conditions will reduce the interpretive, educational and scientific value of the park.

The vegetation in the hot springs or hanging gardens area is easily damaged by trampling, but these impacts have been controlled by providing boardwalks and the recent viewing decks at the hanging gardens. Impacts on vegetation could result from management activities such as water temperature and flow changes, or removal of vegetation for maintenance purposes.

2.3.4 Wildlife Resources

Wildlife are the least understood park resource. Their relationship to the hot springs and ponded warm swamp environment has not been well documented. There is a diversity of species using the park for nesting, resting, browsing, or possibly as a mineral lick. Species that require aquatic or emergent vegetation for food, such as the moose, obviously depend on the continued water levels to ensure the existence of their food source. The Lake Chub depend on warm water temperature to survive the winter, while the elk on Mount Ole use south facing slopes for grazing.

Wildlife viewing points could alter animal behaviour patterns or cause them to move out of the park, thus reducing this opportunity. Each species responds differently to human presence, and may behave in various ways depending on season. A clear understanding of mating, nesting, feeding and other habits of each species to be viewed will help reduce negative impacts. If the wildlife leave the area, they have already exceeded the point where they feel comfortable. If nesting or breeding habits change, then human presence may also be responsible.

Wildlife viewing is best done under guided supervision to ensure that habitat and species are not disturbed in a negative way. Small groups are more suitable for wildlife viewing. Public education is crucial to low impact wildlife viewing.
Boardwalk with rest area on way to Alpha Pool; this rest area could be extended into wildlife viewing platform

Cow moose in swamp area, viewed from near Beta Pool
Liard Hot springs Provincial Park, at mile 496 of the Alaska Highway, was established on April 26, 1957 as a Class A Provincial Park. The park includes 668 acres to the east of the highway and north from the banks of the Liard River. There are no in-holdings or tenures in the park, although there are several lots immediately adjacent to the park boundary. There is a proposed gas pipeline Right-of-Way along the Alaska Highway and through the southern part of the park. This route is one of several alternatives being considered in the event of an Alaska Highway gas pipeline. The potential effects on the park, should such a pipeline be built are unknown, but access to the southern part of the park could be improved.

DL 6803, Blocks A and B are privately owned and a restaurant and gas station are operated on the site.

DL 6339, 3937 and 3938 are crown owned and reserved as U.R.E.P. sites.

DL 6862 and 3935 at the Liard River bridge are privately owned and Liard River Lodge is operated on the site.

The Department of National Defense hold DL 6340, 6385, and 6386 encompassing lands at both ends of the Liard River bridge.

The existing park road along the Liard River is used as private access by persons living to the east of the park. The Ministry of Crown Lands has considered the possibility of developing recreational or residential lots to the west of the park, between the Alaska Highway and the Liard River. These plans have not materialized, and are one of the planning issues addressed in this report. The lands in question are flat forested terraces adjacent to the Liard River and are suitable for recreational or other development. Potential recreational values on these lands include camping, Liard River frontage and cobble beach, views of Liard River Valley, wildlife viewing, and access to the Liard River for riverboat tours.

Orders-in Council have been passed to create a water reserve over the park (622/56 and 365/70), a mineral and placer reserve (922/77), and exclusion from the Liard Provincial Forest (1376/82).

There are three archaeological sites identified within the park boundary, including obsidian flakes and lithic scatter in the vicinity of the road beside the Liard River (coded as IIIm by Heritage Branch), circular cultural depressions in the vicinity of Beta Pool and a log structure c.1900 north of the road parallel to the Liard River.

Mining claims to the north of the park are active, while claims to the south are defunct.
2.5  EXISTING FACILITIES  (Refer to Map #7)

2.5.1  In the Park

The majority of the park area is undeveloped. Two of the three main hot springs pools and access to these have been developed since the construction of the Alaska Highway. Alpha pool facilities include change rooms, new decking and a series of natural and artificially created pools of various temperatures. There are two container toilets at Alpha Pool, with removable sanitary drums for cleaning. Beta pool has been altered to accommodate decking, change rooms and views South. A pit toilet is located north of the pool.

Access to the pools is by a single boardwalk with one rest area between the parking lot and the pools. A boardwalk connects the trail between Alpha and Beta Pools to the new viewing decks at the Hanging Gardens.

The developed part of the park includes a 53 unit campground and day use area with toilets, playground and parking for 60 vehicles. A maintenance yard with summer residences is located near the day use area. The campground was used at 150% capacity during the peak 1989 summer season. The day use area is regularly used for overflow camping, with 22 tables and fire circles provided. This level of campground and day use visitation means the hot springs pools are already used at their maximum carrying capacity.

There are no formal hiking trails or established routes in the park, nor are there any interpretive structures, signs or permanent displays, other than the day use area park information signs. Game trails and old cut lines have been used in the past for recreational access and by park interpreters.

2.5.2  Outside the Park

The services and facilities provided by private enterprise outside the park boundaries are an important link in the service infrastructure for the region. These outside services could influence the types of facilities and services that are most appropriate within the park. For example, showers and sani-dumps are now provided by the private sector.

Liard River Crossing

There are two restaurants and gas stations operating near the park, one immediately opposite the park entrance, the other at the Liard River bridge. The Liard River Lodge provides accommodation with 17 rooms and advertises 50 campsites. Liard River Lodge also has a sani-dump station.

The Boardwalk Cafe and Trapper Rays gas station, directly opposite the park entrance, advertise a cabin and an unspecified number of campsites. Both private enterprises at the Liard River offer camping, although at present these facilities have not been fully developed and neither are used to capacity.
"J and H Wilderness" provides 8 rooms and 50 camping sites. Muncho Lake Lodge provides 12 rooms and 17 trailer hook-ups. Highland Glen has 4 rooms, 10 cabins and 15 campsites, 8 with full services. Muncho Lake Park also has 30 campsites. Park use statistics and interviews with managers suggest that the private and public camping facilities are not used to capacity. These figures indicate that within one half hour of Liard Hotsprings Park there are 51 private rooms or cabins, 82 developed private campsites with at least 25 fully serviced units, and an additional 50 rustic camping sites. Muncho Lake Park provides an additional 30 public campsites.

On any given summer night, the private sector can provide 133 rooms or campsites in the vicinity of Liard Hotsprings Park. These facilities are not used to capacity.

2.6 MARKET ANALYSIS

2.6.1 Park use

Liard Hotsprings Park is the best known provincial park in northern British Columbia. Stone Mountain and Muncho Lake parks, although larger with impressive scenery, are not as famous as the Liard Hotsprings, and do not attract the same level of overnight or day use. The circle tour combining the Alaska Highway parks and the Stikine, Spatzizi and Edziza parks adjacent to the Cassiar Highway offers an attractive route for travellers, but few will venture into these wilderness parks. Liard Hotsprings is often the sole representative provincial park that many travellers will visit in the region. It is both a symbolic gateway to British Columbia from the north, and the last stop prior to heading north to the Yukon and Alaska.

The Yukon Visitor Exit Survey (1987) indicated that almost 100,000 visitors used the Alaska Highway travelling either both ways or north or south. The average party size on the Highway was 2.2. Approximately 2,000 visitors entering the Yukon travelled the Alaska Highway to Watson Lake and then down the Cassiar Highway to complete the circle tour. These latter visitors were primarily residents of British Columbia.

The Stone Mountain and Muncho Lake park experiences will likely increase in importance as the demand for wildlife viewing grows, and the use of Liard Hotsprings increases to capacity. There are few, if any, points along the entire Alaska Highway in the Yukon that offer virtually guaranteed quality wildlife viewing such as that provided at Stone Mountain. The importance of Liard Hotsprings for wildlife viewing, in particular moose and bird species, should be recognized.

Liard Hotsprings Park receives the heaviest use of any park in the northern region. Although the park itself is not a final destination for the majority of highway travellers, most prefer to use the campground and hotsprings facilities en route. The campground has operated at 110% of capacity during the summer since the mid-1980's, culminating in 150% occupancy in 1989 (See Graph #2). The pools are frequently crowded during peak hours of the summer months. The seasonal campground use shown in Graph #3 indicates that the park campground is not used to capacity during the months of May, September and October.
Five year statistics indicate a steady, if uneven, growth in campground and day use indicating that the park is becoming better known and is the camping destination of choice for many Alaska Highway travellers (See Graph #3&4). The total number of Alaska Highway travellers has not increased at the same rate as campground users. Weather and flood events have affected park visitation, for example in 1988 when the Alaska Highway was closed for several days due to landslides.

Total annual campground use has been between 10,000 to 15,000 in recent years, while between 30,000 and 40,000 visit the hot springs on a day use basis. An informal 1980 Ministry of Parks survey indicated that almost 50% of Alaska Highway travellers turned in to Liard Hotsprings Park. This figure is dated but total park use statistics indicate that the percentage of highway travellers stopping at Liard Hotsprings is still very high. Graph #4 indicates the campground use statistics for the periods 1974-1977 and 1983-1988.

The "rubber tire" market is expected to expand at 15% per annum in the 1990's (McLaren Plansearch 1988). The 1992 Anniversary will no doubt attract much greater numbers of visitors to the region and the composition of travellers may change. Whether use declines for a period after 1992 or continues to increase remains to be seen, but few private operators indicate a willingness to invest a great deal for one season's expected influx of tourists.

2.6.2 Visitor Origins, Mode of Travel

Use of the park during the summer months is primarily by tourists on the Alaska Highway, while year round use by residents and truckers is also considerable. The campground use reflects the type of traveller on the Alaska Highway with 50-60% from the United States, and 40% from Canada, with 20% of these Canadians from British Columbia (See Graph #1). The number of Europeans is increasing to 6-8% of total visitation (VES, 1987).

Most visitors arrive with campers, trailers or motorhomes, but as many as 20% use their car and tent for camping. The majority of bus passengers are retired, whereas those travelling by car, camper or truck, are employed. The majority of park visitors are retired, and most travel in family groups. More of the American visitors are retired than Canadians. These trends are likely to continue although Yukon statistics for the Alaska Highway suggest that the percentage of Canadian travellers is increasing significantly.

Many day users are on bus tours en route to or from Alaska, with very limited time in the park. Few of these visitors have time to use the pools, but many are spectators at poolside. Most would have some time to read interpretive information.

Graph 1

2.6.3 Visitor Profile

The visitors to the Liard Hotsprings Provincial Park are diverse yet they share some common characteristics. The Yukon Visitor Exit Survey (1987) revealed many of these characteristics of Alaska Highway Travellers. The outline below was derived from an evaluation of the VES responses. The typical or most frequent summer visitor to Liard Provincial Park is likely to:
Origins and Planning

- be an American from the Pacific Northwest. If Canadian, then from B.C. or Alberta; if European, then a German or Swiss,

- have made the decision to come to the area before leaving home, probably within the last year,

- have found out about the park by reading about it in a magazine or other source; many will have heard about it through friends and may travel with them; less than 10% will have heard about it through direct advertising,

- be travelling primarily in R.V.’s and to a lesser extent car, truck, or camperized vehicle,

- be travelling in a party of 2.2-2.8, in other words with family or friends, motivated 'to see and do',

Age and Occupation

- be retired,

- be a professional, or skilled worker, if employed,

- have a higher than average income, and be well educated,

Destination

- be travelling to or from Alaska if an American, to the Yukon if a Canadian

Activities and Interests

- come to see the scenery and wilderness, with an interest in flora and fauna,

- go fishing as an incidental activity,

- not hike unless they are part of the 10% minority; more likely to hike if short 15 min.-25 min. loop trails provided,

- take lots of photographs,

- appreciate the wildflowers,

- want more information and interpretation on landscape, people, flora and fauna,

- want personal contact with staff or interpreters,

- be generally satisfied with the trip and consider coming back to see and do more, or at least recommend trip to others,
Note: There were 21 camping sites from 1983-1985, and 53 sites from 1986 until 1989.
2.6.4 Existing Information and Marketing

Many travellers learn about the Liard Hotsprings by word of mouth from previous visitors or incidentally along the highway at campgrounds and other facilities. The park is first promoted in Fort Nelson, where the "Welcome Visitor" program describes the park and encourages visitors to stop. The interpretive program offered at the park is also well advertised in Fort Nelson, at the museum and various hotels. Visitors to the Muncho Lake area are encouraged to visit the hotsprings on a day use basis.

There is no formal advertising for the park, except in the popular Alaska Highway travel guides such as "Milepost". There is no promotional brochure, and many travellers would only become aware of the park by reading a road map.

2.6.5 Changing Travel Patterns

As destination areas in northern B.C. and the Yukon become developed and better known, the traditional 'pass-through' traveller segment will likely decline in importance and be replaced in part by vacationers, or those on package tours, with northern B.C. or the Yukon as a final destination. This means that more roadside opportunities for recreation and interpretation will likely be demanded in the future.

2.6.6 Changing Activity Preferences

Numerous reports have concluded there is a large number of visitors wanting to view and interpret wildlife (VES, 1987). This conclusion is based on worldwide trends, such as the proliferation of commercial services offering wildlife viewing as a prime attraction. Bird-watching has been noted as the fastest growing recreation activity in Canada. Visitors will take advantage of interpretive opportunities in northern B.C., where these facilities are available.

A recent wildlife viewing study in British Columbia, also concluded that wildlife viewing is rapidly increasing in popularity. In British Columbia up to 20% of the population take trips for observing wildlife, while 10% participate in hunting (B.C. Tourism 1988). These projections are significant to Liard Hotsprings Park and other parks in the region since wildlife viewing is cited as a major travel motivation by most travellers on the Alaska Highway.

Thorne, Stevenson, Kellog, (1982) and others, have indicated there is a trend toward self-awareness with an increase in demand for educational, interpretive, and experiential travel. The visitors of the future will often be sophisticated and seek high quality information about the natural and cultural landscape they are passing through. This trend means emphasis should be placed on ensuring that facilities are easily found, information readily interpreted and a variety of programs offered to satisfy an increasingly segmented and specialized travelling public. Senior citizens may seek nature interpretation, while families with young children may seek short duration walks; all will be looking for opportunities that meet their particular demand.
2.6.7 Visitor Satisfaction

The most recent information on visitor satisfaction in Liard Provincial Park is from the comment cards distributed in 1988. The responses indicated that most visitors were very satisfied with the park, citing cleanliness and helpful staff. Most visitors wanted the park to remain natural. There were several requests for improved camping facilities including showers and laundry, while many people requested more information, interpretation, or walking opportunities.

These comments raise several issues focusing on the need to satisfy park visitors yet also protect the environment. The public's immediate wants may not always be consistent with wise stewardship of park resources over the long term.

Public Perception about Liard Hotsprings Park

The public were asked to comment on the park in 1987, providing a good insight for planning. Most visitors found the park to be clean with friendly and helpful attendants. The vast majority of visitors liked to see the park left in its natural state. The most common needs identified were:

- want information on hotsprings, flora, history
- install showers
- install sani-station
- keep dogs and bikes off the boardwalk
- build roof over wood sheds (now done)

Less frequent requests were:

- provide more hiking trails,
- install laundry facilities,
- improve access for elderly and handicapped,
- install more water hand pumps,
- enforce noise and behaviour standards at pools,

Interest Group Perception About the Liard Hotsprings Park

During the preparation of this plan several interest groups and private facility operators were consulted. Their information and views have a bearing on the plan and are summarized here:

- people who visit Muncho Lake take side trips to Liard Hotsprings,
- leave the springs in their natural state, do not commercialize,
- government should advertise what services are available along the highway,
- place park vacancy signs at Muncho Lake,
- the park should not have improved services, let private sector provide services,
- visitors want more interpretive information,
- the wildness of Liard Hotsprings is one of its greatest assets,
- the pools should be free of charge,
- need improved ski trails for winter use.
Planning issues are addressed in the plan to ensure that park objectives are met and that the dual conservation and recreation mandates for park management are realized. Issues have been identified by the public and interest groups, by park staff or during the research for the plan. These issues and alternative approaches to solving the problems are outlined below. Note that many of these issues are closely related to one another, with similar courses of action for handling them.

Planning Issues Summary

1. **Do the park resources have the capacity to accommodate more use?**

   The northern half of the park is already developed to near its maximum extent without further affecting the hotsprings ecosystem. There is modest potential to increase use of the pools by improved people management. There is limited potential to increase passive uses of the wooded areas around the swamps, for example wildlife viewing points, trails or interpretive stations. These opportunities, if carefully planned and implemented, would not result in unacceptable impacts on the natural resources. These opportunities are linked more to redistributing and managing existing use levels rather than providing for increased total use.

   The southern half of the park is an integral part of the landscape and ecological features which the park protects. This area is suitable for development of day use or overnight facilities and could be used for hiking or viewing. Should there be a demand for future campground space, such development could be considered either in this southern part of the park, or on lands outside the present park boundaries, to the west of the Alaska Highway.(See other planning issues below)

   In summary, the range of options are:

   - redistribute and manage existing use, provide for new recreation activities such as wildlife viewing,
   - provide for camping facilities and day use in the southern part of park,
   - discourage all development which would result in levels of pool use beyond their natural carrying capacity.

2. **Is expansion of camping or development of other facilities such as an interpretive centre, showers or sani-dump, appropriate?**

   Increased campground facilities in the park would encourage greater use of the hotsprings which are already at or near capacity during the summer months. On the otherhand the existing use of the day use area for overflow camping is unsatisfactory since it provides a substandard camping experience, places a heavy burden on sanitation facilities, may displace day users wishing to picnic and swim in the pools, and discourages use of existing private facilities outside the park.
The options for solving this problem are:

- *expand campground facilities in some other part of the existing park to relieve use of the overflow parking lot,*
- *encourage development of private campgrounds outside the park and forego any such development in the park,*
- *discontinue use of the day use area for camping and encourage use of existing under used capacity of private facilities along the Alaska Highway.*

The provision of showers and a sani-dump in the park would not necessarily result in negative environmental impacts, provided planning and design were well executed. The problem is more a question of attracting additional use with improved facilities, resulting in overuse of the hotsprings pools. On the other hand, provision of showers could reduce the use of the hotsprings as a bathtub, thereby reducing environmental impacts and health risks.

The options for resolving this question are:

- *to forego any campground facility improvements in the park and encourage the private sector to meet the demand for showers and a sani-dump outside the park. This option would separate the private and public market clearly, and provide choice in the type of services,*
- *to develop shower and sani-dump facilities in the park to meet the customer demand for this type of service*
- *forego development of showers in the existing campground, but include them in any plans for a new or expanded campground.*

An interpretive centre or kiosk is very appropriate for the park and would be a focus for interpreting natural and cultural resources as well as providing the means to inform the visitor about the benefits of minimizing impacts on the sensitive hotsprings ecosystem. The analysis of tourism trends supports this position by suggesting that people desire more interpretive opportunities in general. The public has also commented that they would like more information on the park. Adding an interpretive component to the park facilities will help to educate the public about the parks conservation role. The conservation aspect of the park is presently not visible to the public, or is available only at certain times through interpretive programs.

3. **Should there be more opportunities for visitors to participate in a wider variety of activities?**

More opportunities for a wider variety of activities could help reduce pressure on the hotsprings pools. Such activities should be environmentally sound and appropriate for the park setting. Interpretation and hiking activities are both suitable for the park and would help reinforce the reasons for protecting the hotsprings ecosystem. Increased interpretation opportunities provided through information brochures, wildlife viewing points, guided walks, or short trails are appropriate. Further development of recreation facilities such as playgrounds or...
games are not needed in the park since such facilities are available elsewhere and do not contribute to the appreciation of the unique hotsprings environment.

The options are:

- **spread out use by increasing interpretation and offering more hiking and wildlife viewing opportunities,**
- **maintain the status quo of activities, but influence pool use and behaviour with better information on the conservation mandate of the park.**

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### 4. How much of the hotsprings area should be developed and which areas should be left natural?

The northern half of the park, where the hotsprings are located, is already fully developed with a campground, day use and pool facilities. Two of the three larger hotsprings are developed, leaving one major spring and three minor ones in their natural state. The remaining natural hotsprings and surrounding vegetation are very fragile, and would be easily damaged by trampling or bathing.

All warm ponded swamps and the remaining forest in the park are important wildlife habitat contributing to the wildlife viewing opportunities in the park. Further erosion of this habitat through additional development could threaten the natural quality of the park.

The range of options are:

- **leave the remaining springs in their natural state in perpetuity, with virtually no human use,**
- **allow for occasional guided interpretive walks to some of these pools provided this did not create a demand for improved access and development,**
- **develop trails to viewpoints overlooking one of these pools to provide an opportunity for the public to appreciate a representative hotspring in its natural state.**

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### 5. Can the role of the private sector be enhanced, and how would this affect the park?

The private sector could play a positive role in meeting the demand for accommodation and services in the Liard Hotsprings area. Further development outside the park could result in increased use of the hotsprings, yet the provision of services outside the park could also help achieve park management objectives by reducing development pressures in the park.

A clear division between the types of accommodation and services provided in the park and by the private sector outside the park will aid the private sector and provide the public with clear alternatives. At present the lack of information on alternative camping or service opportunities likely contributes to the crowding at
Liard Hotsprings Park. This master plan, by setting a direction for development in the park, could help provide the private sector with the assurances necessary to invest in improved facilities and services. A greater number of visitors would be attracted to improved private facilities.

The options are:

- rely on the private sector to meet camping and services demands not met in the park,
- maintain existing crown lands to west of Alaska Highway in crown ownership and monitor effects of existing private facilities as they expand and improve. Only release land for further commercial development if there is proven demand and the park is able to accommodate the increased use such developments would induce.
- expand the park area to include lands to west of Alaska Highway to ensure the integrity of the park resources is protected in perpetuity. If the private sector is unable to meet the demand, develop additional campground in expanded park area,

Hanging Gardens in full summer bloom. This cascading springs area is now protected with a viewing deck to prevent trampling of the fragile tufa deposits.


Marktrend Marketing Research Inc. 1985. *Alberta Resident Travel Study*, BC Ministry of Tourism,


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List of Contacts

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Baytalan, Greg. Health Inspector, Peace River Region.
Beitz, Anne and Gene. Liard River Lodge.
Bennett, Trudy. Peace River Tourist Association.
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Gunness, Jack. Muncho Lake Tours.
Heathman, Rick. Ministry of Parks, Prince George.
Lansdell, Jane. Boardwalk Cafe.
Nishio, David. Muncho Lake Lodge.
Peace Liard Regional District, Board Members.
   Frank Parker, Chairman
   Louis Carew, Director
   Grace Bumstead, Director
   Bob Price, Director
   Cliff Ashdown, Director
   Dave Doman, Director
   Harry DeHaan, Director
   Don Edwards, Director
Murtha, Mike. Ministry of Parks, Prince George.
Ross, Gail. Ministry of Parks, Prince George.
Sadlier, Paul. P.S. Logging. (Park Maintenance Contractor)
Schildknecht, Urs. Highland Glen.
Tauers, Mary. Muncho Lake Lodge.
Woodhouse, Bill. Ministry of Parks, Fort St. John.
Liard River Hotsprings Park Master Plan Public Involvement Process and Newsletter

1989

June to August
- Contract awarded for master plan project.
- Contractor met with Ministry of Parks regional and district staff, interest groups and local businesses which may be affected by the plan.

September to October
- Preliminary draft master plan produced for review and revision.

November
- Final draft produced and circulated for public review and comment.
- Personal letters and news release sent to individuals and businesses to ensure they were aware of public review process.
- Public meetings held in Fort Nelson and Fort St. John with a total of 33 people registering.

1989/90

December to February
- Opportunity for public input (A long period of time to allow input from people in remote areas).
- Thirteen (13) written submissions received as a result of public review process.

March to April
- Master plan revised and final plan produced.
Introduction

The Ministry of Parks is preparing an updated Master Plan for Liard Hotsprings Provincial Park, replacing an earlier plan in place since 1980. Public review of the proposed park management options is invited at two public information sessions to be held in Fort Nelson and Fort St. John. These drop-in meetings will be held on Wednesday evening, November 15 in Fort Nelson and Thursday evening November 16 in Fort St. John.

PARK RESOURCES

Liard Hotsprings Provincial Park lies adjacent to the Alaska Highway on the Liard-Rabbit Plateau in northeastern British Columbia. The park protects a complex of hotsprings and warm swamps along with associated flora and fauna. These hotsprings are of national ecological significance, and have been ranked among the top five in Canada. The ecosystem is fragile and many species of both plants and animals depend on a narrow range of habitat conditions related to water level, temperature, and chemistry.

The Liard Hotsprings are the only easily accessible developed springs along the Alaska Highway that still retain their natural character. The Provincial Park plays an important tourism and recreation role for regional residents and tourists travelling the Alaska Highway.

The majority of the park area is undeveloped. Two of the hotsprings pools named Alpha and Beta have been developed since the construction of the Alaska Highway. Access to the pools is by a single boardwalk with one rest area between the parking lot and the pools. A boardwalk provides access to the new viewing decks at the Hanging Gardens.

The developed part of the park includes a 53 unit campground and day use area with parking for 60 vehicles. A maintenance yard with summer staff residences is located near the day use area.

PARK USE

Liard Hotsprings Park receives the heaviest use of any park in the northern region. The popularity of the park continues to grow resulting in increased pressure on sensitive natural resources as well as on developed facilities. The campground was used at 150% capacity during the 1989 summer season. The day use area is regularly used for overflow camping, with 22 tables and fire circles provided. This level of campground and day use visitation means the hotsprings pools are already used at their maximum carrying capacity.
The role of Liard Hotsprings Provincial Park is balanced between the conservation and recreation mandates of the Ministry of Parks. The conservation role of Liard Hotsprings Provincial Park is to protect a nationally significant hotsprings ecosystem. The recreation role is to allow for a unique hotsprings experience for park visitors. The park also provides one of the most popular campgrounds for travellers on the Alaska Highway, serving both regional residents and tourists. New management challenges are emerging and the proposed plan will address these.

PARK MANAGEMENT

The key issues in the Master Plan focus on the ability of the park and its hotsprings ecosystem to handle increased use. These issues include future campground and other facility development options, park boundaries, resource management, the need for more information and interpretation, and the role of the private sector.

Objectives

The park management objectives are:

- to preserve the outstanding natural hotsprings and warm swamp ecosystem,
- to provide an educational and interpretive opportunity focussed on the hotsprings environment,
- to provide a unique recreational experience in a natural hotsprings environment,
- to provide camping facilities,
- to provide day use recreational opportunities,

Natural Resource Management

The overall strategy for resource management will be to preserve remaining natural areas and protect the hotsprings ecosystem. The management strategy will accommodate recreational uses within the existing developed facilities. The objective for the developed hotsprings will be to keep their appearance as natural as possible, and to minimize interference with water flow, temperature, or the vegetation surrounding the springs. Detailed studies will be undertaken to assess the hydrology of the hotsprings and the health aspects of Beta pool.

Park Boundaries

The plan proposes an addition to the park to ensure compatible land uses surrounding the sensitive hotsprings environment. Crown lands to the west of the Alaska Highway could be included in the park if this plan is adopted. If the park boundaries are expanded, this additional area would be left in a natural state.
Visitor Services

The main approach to visitor services will be to confine facilities to existing areas, and improve information and interpretation services. The plan will encourage different activities in the park, such as wildlife viewing, and could if necessary, help reduce the impacts of heavy pool use by encouraging shorter duration visits, use during off peak hours, or improved supervision.

There will be no active park promotion by the Ministry of Parks, but better information would be provided for those who visit the park.

Campground

The park campground occupancy exceeds capacity throughout the summer and the day use area functions as an overflow camping area. Greater campground capacity in the park would increase use of the hot springs, and the day use area may still be required for overflow. There is unused camping and accommodation capacity in the private sector enterprises nearby. In the proposed plan, the private sector will be encouraged to meet the demand for campsites near Liard Hot Springs.

Implementation

The highest priorities for plan implementation will be:

- produce park information/interpretive brochure,
- design and construct an interpretive centre or multi-sided interpretive kiosk,
- conduct detailed hydrological and health assessments of hot springs and pools,
- select optimum site and construct a short access trail to a wildlife viewing point,
- investigate ways to provide better information to travellers on accommodation vacancies and alternatives in Liard Hot Springs area,
- develop ways to provide better supervision of hot springs pools and spread use out more evenly over time and between the two pools,
- undertake actions necessary to designate existing public lands to west of Alaska Highway as part of Liard Hot Springs Park.

PLANNING ISSUES SUMMARY

1. Do the park resources have the capacity to accommodate more use?

The northern half of the park is already developed to near its maximum extent without further affecting the hot springs ecosystem. There are health concerns relating to the use of Beta Pool since this spring has a lower flow rate than Alpha Pool. A detailed evaluation of hydrology and health aspects in the hot springs area would help determine the best course of action.

The southern half of the park is an integral part of the landscape and ecological features which the park protects. This area is suitable for development of day use or overnight facilities and could be used for hiking or viewing. Should there be a demand for future campground space, such development could be considered either in this southern part of
the park, or on lands outside the present park boundaries, to the west of the Alaska Highway.

In summary, the range of options are:

- redistribute and manage existing use, provide for new recreation activities such as wildlife viewing,
- assess the hydrological and health aspects of the hotsprings area to determine the best option for public use
- provide for camping facilities and day use in the southern part of park,
- discourage all development which would result in levels of pool use beyond their natural carrying capacity.
- undertake discussions to expand the park area to the west of Alaska Highway to ensure the integrity of the park resources is protected in perpetuity. If the private sector is unable to meet the demand, develop additional campground in expanded park area,

2. Is expansion of camping or development of other facilities such as an interpretive centre, showers or sani-dump, appropriate?

Increased campground facilities in the park would encourage greater use of the hotsprings which are already at or near capacity during the summer months. On the otherhand the existing use of the day use area for overflow camping is unsatisfactory since it provides a substandard camping experience, places a heavy burden on sanitation facilities, may displace day users wishing to picnic and swim in the pools, and discourages use of existing private facilities outside the park.

The private sector could play a positive role in meeting the demand for accommodation and services in the Liard Hotsprings area. A clear division between the types of accommodation and services provided in the park and by the private sector outside the park would aid the private sector and provide the public with clear alternatives. A greater number of visitors could be attracted to improved private facilities.

The options for solving this problem are:

- expand campground facilities in some other part of the existing park to relieve use of the overflow parking lot,
- encourage development of private campgrounds outside the park and forego any such development in the park,
- accommodate overflow camping only if there is no alternative or in an emergency. Campers would have to leave by 10.00 A.M. the following day,
- discontinue use of the day use area for camping and encourage use of existing under used capacity of private facilities along the Alaska Highway.
The provision of showers and a sani-dump in the park would not necessarily result in negative environmental impacts, provided planning and design were well executed. The problem is a question of attracting additional use with improved facilities, resulting in overuse of the hotsprings pools. On the other hand, provision of showers could reduce the use of the hotsprings as a bathtub, thereby reducing environmental impacts and health risks.

The options for resolving this question are:

- to forego any campground facility improvements in the park and encourage the private sector to meet the demand for showers and a sani-dump outside the park. This option would separate the private and public market clearly, and provide choice in the type of services,

- to develop shower and sani-dump facilities in the park to meet the customer demand for this type of service

- forego development of showers in the existing campground, but include them in any plans for a new or expanded campground.

An interpretive centre or kiosk is appropriate for the park and would be a focus for interpreting natural and cultural resources as well as providing the means to inform the visitor about the benefits of minimizing impacts on the sensitive hotsprings ecosystem. Adding an interpretive facility to the park would help to educate the public about the park's conservation role. The conservation aspect of the park is presently not visible to the public, or is available only at certain times through interpretive programs.

---

3. **Should there be more opportunities for visitors to participate in a wider variety of activities?**

More opportunities for a wider variety of activities could help reduce pressure on the hotsprings pools. Such activities should be environmentally sound and appropriate for the park setting. Interpretation and hiking activities are both suitable for the park and would help reinforce the reasons for protecting the hotsprings ecosystem. Increased interpretation opportunities provided through information brochures, wildlife viewing points, guided walks, or short trails are appropriate.

All warm ponded swamps and the remaining forest in the park are important wildlife habitat contributing to the wildlife viewing opportunities in the park. Further erosion of this habitat through additional development could threaten the natural quality of the park.

The options are:

- spread out use by increasing interpretation and offering more hiking and wildlife viewing opportunities,

- maintain the status quo of activities, but influence pool use and behaviour with better information on the conservation mandate of the park.

- leave the remaining springs in their natural state in perpetuity, with virtually no human use,
MEETING TIMES AND PLACES

Your comments are requested on this draft plan. You are invited to participate by attending one of the meetings listed below, or by writing to the District Manager, Ministry of Parks.

<table>
<thead>
<tr>
<th>Meetings:</th>
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<tr>
<td><strong>Fort Nelson:</strong> 7-9 p.m., November 15, Raven Room, Town Hall</td>
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<tr>
<td><strong>Fort St. John:</strong> 7-9 p.m., November 16, Beatton Room, Pioneer Inn</td>
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<th>Write:</th>
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<tbody>
<tr>
<td>Mr. Grant MacPherson,</td>
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<tr>
<td>District Manager, Peace Liard District,</td>
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<tr>
<td>Ministry of Parks,</td>
</tr>
<tr>
<td>S.S. #2, Comp. 39, Site 12,</td>
</tr>
<tr>
<td>Fort St. John, B.C.,</td>
</tr>
<tr>
<td>V1J 4M7</td>
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</table>

Phone: (604)-787-3407
Muncho Lake
Provincial Park
MASTER PLAN

Summer 1984
To: V. Collins  
Executive Director  
Parks and Outdoor Recreation Division  

Date: November 14, 1984  
File: 2-4-6-2

I am pleased to forward the attached document to you and recommend that it be approved as the Muncho Lake Provincial Park Master Plan.

[Signature]

I.O. Moore  
Regional Director  
Northern B.C. Region  

APPROVED:  
EXECUTIVE DIRECTOR  

1. Rocky Mountains Natural Region
2. Canada Land Inventory, Capability for Wildlife ratings
3. Known Archaeological Sites
4. Provincial Park Zoning System
5. Legal Description - Muncho Lake Provincial Park
6. Highway Scenic Improvement Act and B.C. Regulation 261/70
7. Boundary Revision - Nonda Creek
8. Suggested Design Schemes
9. Photographs

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In this document, reference is made to four P.O.R.D. campgrounds at Muncho Lake available free of charge to park visitors. It has been a traditional concern of private operators within the Park that too many camping opportunities have been provided to Alaska Highway tourists at too little cost. Although government sites are unstructured and rustic, they are felt to be in direct competition with private enterprise.

Recently, several proposals contained within this plan have been implemented. This has served to address the above issue as well as reduce the flood hazard at several sites within the Park.

a) Wildrose and Rocky Mountain campsites have been closed.

b) MacDonald Campsite, south end, has been closed.

c) MacDonald Campsite, north end, and Strawberry Flats Campsite have been improved and formalized.

d) A fee has been introduced for camping at Muncho Lake.
PLAN SUMMARY

-Muncho Lake Provincial Park provides partial representation of the northern Rocky Mountains, Muskwa Ranges regional landscape. Contained within its boundaries are geological and geographic phenomena which rival most of the southern Rocky Mountain parks. Some of the more prominent and important features of the landscape include dipped limestone bedding, thrust faults, rolling alpine, extensive alluvial fan formations and water surfaces. Important mineral licks located at the north end of the Park attract Stone's sheep to the roadside where they become a significant tourist attraction.

-Within the boundaries of Muncho Lake Park exist several vacant, privately-held lots as well as developed lodges and service centres. The Plan recognizes the contribution made by private sector developments to park tourism and stresses cooperation and further encouragement to these facilities. Other private lots within the Park are assessed and prioritized for future acquisition, however none are required at this time to achieve Park objectives.

-Commercial guides provide hunting services throughout the Park; others access outlying territories via Muncho Lake Park. Areas closed to hunting within the Park include the highway buffer strip and an enlarged area surrounding the mineral licks. The plan recommends an extension of the no-shooting zone to height of land in the north-easterly portion of the Park.

-Other than for tourist camping, opportunities for non-consumptive recreational activity are extremely limited in the scenic Muskwa
Ranges. The plan recognizes that such activities as hiking, viewing and interpretation would increase tourist appreciation and attractiveness along the highway corridor. Current camping facilities provided by the Division are of inadequate standard and too profuse to meet park objectives. Greater opportunities exist to promote private enterprise in the Park through the formalization of P.O.R.D. campgrounds and with a reduction in the total number of available campsites. Short hiking trails and viewpoints will be developed at several locations, and a wildlife viewing area will be provided near the mineral licks.

-An area of particular beauty and relatively effortless access exists at the head of Nonda Creek. Presently the Park boundary lies at valley bottom thus creating an uncertain and unnatural border on which to base permit enforcement and wildlife management. It is recommended that the only boundary amendment to Muncho Lake Park be in this vicinity.

-The Park will be zoned predominately as Natural Environment with recognized Development areas along the Alaska Highway. A parkway sub-zone has been designated along the highway right-of-way in recognition of visual quality objectives set for the corridor. An area of the Park between the Toad River and Nonda Creek has been zoned as wilderness.

-It is recommended that Resources Management and Visitor Services plans be formulated for Muncho Lake Park which address such management issues as wildlife, fire, fisheries, park marketing, promotion and interpretation.
PART 1

1.0 INTRODUCTION

Within the context of modern history and exploration there are certain areas of the country which have remained essentially unexplored until only recent times. In British Columbia, the rapid development of most southern Interior towns and villages centred around mineral wealth, whereas on the coast, the expansion of commercial fishing and logging led to the establishment of coastal communities. The Peace River Block, situated in the northeastern corner of the Province, was settled during the late 1800's and introduced a Euro-American farming population to the B.C. prairie. This settlement remained the most northerly populated area of the Province for several years. Except for the ramblings of prospectors and adventure seekers, the mountains which separated the Peace River country from the rest of B.C. remained unexplored wilderness until the 1940's and 50's. A lack of official nomenclature for all but the most distinct features of the northern Rockies indicates the relative lack of exploration and settlement in the Muncho Lake area prior to its "discovery" in 1942.

Muncho Lake is situated on the 59th parallel aside the backbone of the northern Rocky Mountains (figure 1). At this point the Continental Divide is located well west of the Rockies; the Peace and Liard Rivers having cut through the barrier to drain regions within the Rocky Mountain Trench and Liard plateau. Within Muncho Lake Park, the Toad River flows out of the southern portion of the Park while the Trout River flows northward through Muncho Lake; both joining the Liard River on its way to the Arctic Ocean.

During route reconnaissance for the Alaska Military Highway it was decided that the upper Toad and Trout Rivers could be followed as a short-cut to the Liard, avoiding costly construction through the "Grand Canyon" of the Liard. The new route would cross a divide between the two rivers, skirt the eastern shoreline of Muncho Lake and descend the Trout River to cross the Liard above the canyon.
It became apparent to all who travelled the completed highway that Muncho Lake provided the most scenic section of the project. Recognizing the attraction of the northern Rocky Mountains, the Province established a Liard River Reserve in 1944. This reserve extended over most of the Liard Hotsprings, Muncho Lake and Summit Lake (Stone Mountain Park) areas. The huge tract was eventually split into separate reserves with the Muncho Lake Protective Strip occupying most of the present Park area. In 1955, a 260,000 acre U.R.E.P. reserve was established as further protection of the scenic terrain adjacent to the Muncho Lake corridor. During the following year, a study was completed by the Parks and Recreation Division (Forest Service) recommending that the area be designated a Class B Provincial Park. In May, 1957 the park was established with boundaries much as they remain today.

Since the vast area of the northern Rockies has been realized, many of the extensive valley systems and mountain ranges have been explored, however the territory remains rugged wilderness. Few roads branch from the Alaska Highway, thus leaving foot or horseback as the sole means of truly exploring the hinterland. Nevertheless the Highway itself permits thousands to experience the character of the northern terrain. Improvements to the route and its service centres continue to attract tourist travel to northern B.C. and Muncho Lake Provincial Park will continue to be a scenic highlight of the journey.

This Master Plan not only contains information pertaining to the resource base of the Park but also presents and addresses the complex issues which effect park management today. It suggests policy objectives and development proposals that will guide effective management of the Park and its resources. The plan will be reviewed in accordance with Division policy in five years time, although due to the character of northern development it is expected that no major revisions will be required.
MUNCHO LAKE PROVINCIAL PARK

FIGURE 1
PROVINCIAL PERSPECTIVE

- LARGE PARKS
- LARGE RECREATION AREAS
- SMALL PARKS AND RECREATION AREAS
- P.Q.R.D. REGIONAL BOUNDARY

MUNCHO LAKE PROVINCIAL PARK
1.1 REGIONAL AND PROVINCIAL CONTEXT

Centred only 115 kilometres south of the B.C.-Yukon border on Mile 456 of the Alaska Highway (Highway 97), Muncho Lake Provincial Park is one of the more remote Parks in the Province. Here the Rocky Mountains near their northern terminus adjacent the Liard Plateau which extends into the Yukon Territory north of 60 degrees (Figure 2).

Muncho Lake Park provides the Provincial Park system with partial representation of the Rocky Mountains Natural Region's Muskwa Ranges (P.O.R.D., 1982). (Figure 3) These Ranges lie north of the Peace River and extend to the Rockies' northern extreme at the Liard River. In general, summit elevations increase northward from the Peace River area, the highest peak in the Range being Mt. Churchill at 3500 metres (south of Stone Mtn. Park). The Muskwa Range has been strongly eroded by alpine and valley glaciation with complex folding quite evident on some faces. As opposed to some of the southern Rocky Mountain ranges, the Muskwa Range contains many more areas of true alpine terrain. The Regional Landscape is currently represented by Muncho Lake, Stone Mountain and Kwadacha Wilderness Provincial Parks (Appendix 1).

Within Muncho Lake Park elevations do not exceed 2300 metres (7600'), however the attractive block mountains appear higher due to the low tree line and generally low valley corridors. Certainly the drive along the valley of the Toad River provides scenic views comparable to any mountain landscape found elsewhere in the Province. Of the 1000 kilometre portion of the Alaska Highway within B.C., it is the drive through the Rockies which highlights the trip.

Muncho Lake Park is one of the very few Provincial Parks which is home to a number of residents. The population in and around Muncho Lake located to the area following completion of the Alaska Highway. Some depend on the land and its resources for their livelihood however more rely on the attractiveness of the scenery and provide services to the thousands of tourists that pass through the Park annually. The "community" of Muncho Lake contains between twelve and sixteen permanent residents, generally
FIGURE 2
MUNCHO LAKE PROVINCIAL PARK
- REGIONAL PERSPECTIVE -

LEGEND

LARGE PARKS

SMALL PARKS/RECREATION AREAS

SCALE IN KILOMETERS

1:2,500,000
aligned with the four gas stations, three restaurants and three lodges in the Park. Others are more seasonal, usually residing in the Park during the summer and fall months only.

Fort Nelson (pop. 7500) is located 250 km. east of the Park on the Alaska Highway. It is a community of resource and service industry workers who often spend long weekends and holidays in the mountain Parks of Muncho Lake and Stone Mountain. As with many northerners, much of their recreational activity depends on the outdoors; fishing, hunting, camping, trail driving and riding. The vast wilderness presented by their northern locale offers a variety of opportunities to pursue these activities in relative seclusion.
1.2 PARK RESOURCES

1.2.1 Natural Resources

a) Geology and Topography

As with all ranges of the Rocky Mountains, the Muskwas present a series of northwest-southeast trending valleys and ridges. They contain complex folds, wide U-shaped valleys and rugged peaks of Palaeozoic limestone and quartzites. The mountains within Muncho Lake Park are further divided into two sub-ranges: the Terminal Range west of the Trout River valley and the Sentinel Range to the east.

In comparison to the southern Rockies, the Muskwa Ranges show evidence of a more complex, tectonic deformation during their uplifting and development. The Toad River valley unit of the Park shows evidence of intricate patterns of folded and faulted sedimentary strata. The east side of the Trout River valley strikingly illustrates the castellated, southwesterly-dipped limestone peaks typical of the northern ranges. Thick Silurian and Devonian limestones have been thrust up and over younger rocks in westerly dipping blocks. The view gives the impression of a tilted table-top.

It has been estimated that at the height of glaciation the Muncho Lake region was covered in ice to the 2500 metre level. The most prominent evidence of glacial landscape modification is found within the Trout River valley which was a major escape route for the Rocky Mountain (Ice) Lobe. During this time many temporary lakes formed near the melting ice fronts, depositing boulder clay, sand, gravel and varved clays at these locations. Matthews (1980) has identified a major Ice-edge meltwater channel along the eastern slope above Peterson Creek (figure 4).

Rocky Mountain Ice extended only as far north as the (present) northern shore of Muncho Lake where it met the larger Cordilleran Ice Sheet extending south from the Liard River. A pro-glacial lake was formed within the valley, which then drained eastwards toward the Mackenzie Basin.
MUNCHO LAKE PROVINCIAL PARK

FIGURE 4
GLACIATION

Abandoned Meltwater Channel
Sand & Gravel Outwash
Ice Dammed Lake
Glacial Grooves in Drift Material
Kame & Marne Deposits

SOURCE: G.S.C. #331 MATTHEWS 1960

SCALE IN KILOMETERS
slopes of carbonates and quartzite combined with allow tree-line, introduces extreme runoff conditions during periods of heavy rainfall. Most tributary creeks flow within steeply enclosed valleys where there is little or no soil cover to limit the absorption capabilities of the land. The creeks enter the main valley under deep piles of rubble formerly eroded from the mountain slopes. With each subsequent floods, more debris is deposited on the floor of the main valley and is distributed in a fan-shaped formation. Over the last several centuries, this continuing process has created several large fans throughout the Muncho Lake valley, many of them having merged with the debris fans of neighbouring creeks. Creeks originating in the Terminal Range do not develop alluvial fans due to a more subdued grade as well as a heavier vegetation cover.

d) Vegetation

Three biogeoclimatic zones can be identified within the Park. (Figure 5) In the valley bottoms and rising to an elevation of 880m, the Boreal White/Black Spruce Zone is found, while above this level (generally between the elevations of 950m and 1550m) lies the subalpine Spruce/Willow/Birch Zone. Throughout Muncho Park the subalpine is at or slightly above the level of the Alaska Highway. Within both of the zones, harsh conditions limit tree growth and large stands of trees with commercial value are rare. Above 1500 m lies the high altitude Alpine Tundra Zone. This is a cold, wind swept, snowy environment with a very short frost free period. Several extensive alpine meadows and ridges characterize this zone within the Park.

There are several interesting vegetation features found in the vicinity of Muncho Lake. In several areas the forest is in various stages of succession; most evident along Peterson Creek where fire has destroyed a large area of forested land. Over twenty years later, the land has yielded a seral cover of lodgepole pine and aspen.

On the alluvial fans, riparian plant species also grow in various successional stages. Some of the more stable fans have experienced a full vegetative cycle: a shrub cover of willow and birch eventually establishing into forests of white and black spruce. Others achieve only a partial cycle before recurring floods displace all vegetation from the fans.
Subsequent glaciofluvial runoff from ice stagnating near the north end of Muncho Lake created an outwash plain of sand and gravel overlying lacustrine sediments within this outwash zone. At the north end of Muncho Lake, the site of the present viewpoint marks the ice contact face. Muncho Lake was thus formed as the drainage of the retreating Rocky Mountain Ice was impeded by previously deposited material.

In addition to evidence of continental glaciation, alpine glaciers have also helped shape the landscape within Muncho Lake Park. Cirques, moraine ridges and glacial drift can be found throughout the area, especially in the high country adjacent Park boundaries.

In general, the topography of Muncho Lake Park is steep, with elevations ranging from 646 m to 2122 metres. Only the valleys of the Trout and Toad Rivers provide flat terrain suited to development. A number of alpine plateaux and basins present exceptional hiking opportunity, however access to these areas is extremely difficult.

b) Climate

According to the Koppen-Geizer classification system, the climate of Muncho Lake Park is described as "Humid Continental-Cool Summers". Such areas characteristically experience short, cool summers and long, cold winters. Two major factors influence the climate of the Northern Rockies: the northern latitude and the dominance of Arctic air masses which result in relatively heavy summer precipitation. Table 1 illustrates specific weather recordings for Muncho Lake. An indication of general seasons and their length is shown in Table 2.

During winter, long periods of intense cold are common. Snowfall is generally light and infrequent, but rarely does a melt occur before the spring. As experienced by many northern climates, shoulder seasons (spring and fall) are usually quite short. During summer, Arctic air is largely replaced by cool, moist Pacific air producing showery conditions. Under certain circumstances a weather system will develop, usually in the first part of summer, that will produce prolonged, severe rainfall. This situation is known to develop in mixed-air zones (where warm, humid air
TABLE 1 MUNCHO LAKE CLIMATE DATA

<table>
<thead>
<tr>
<th>MUNCHO LAKE</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
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TABLE 2 GENERAL SEASONS - FORT NELSON/SMITH RIVER

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<td>May 28</td>
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</tr>
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<td>Winter Ends</td>
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<tr>
<td>Ft. Nel.: 170 Days</td>
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Source: Climatic Suitability for Recreation in B.C.; M.O.E., 1977

1 daytime max. temp. = 18°C
2 daytime avg. temp. > 18°C
3 daytime min. temp. = 0°C
4 daytime avg. temp. < 0°C
moves against colder mountain air) producing up to 25mm of rain over a five hour period. In Muncho Lake Park, this excessive rainfall, combined with snowmelt from the upper levels, has contributed to the formation of extensive alluvial fans along the eastern slopes of the Sentinel Range and has resulted flooding along portions of the main valley.

In general, winds blow from the southwest during summer months and from the northwest during the winter. Morning periods of calm are usually replaced by gusts during mid or late afternoon. Windy conditions are most evident on Muncho Lake where vegetation does not impede their force.

c) Hydrology

Hydrologic features and processes play a dynamic role in the development of landscapes. Within the Park, Muncho Lake (Kaskan for "Big Lake") represents one of the few large bodies of water in the northern Rocky Mountains. The lake is over twelve kilometres long, varies in width between one and six kilometres and maintains a maximum depth of over two hundred metres. Its waters are jade green in colour due to the presence of copper oxides leached from the bedrock. The average summer water surface temperature is a cool ten degrees (C).

Other hydrological features of the Park include waterfalls, canyons and karst; small lakes are often found in alpine areas. At the south end of Muncho Lake, the inflow of the Trout River has created a bouldery delta approximately three kilometres in length. At valley bottom, both north and south of the lake, the Trout is shallow and fast flowing over a rough gravel bed. The Toad River, deep and swift, splits in several places to provide a good example of a braided channel. Many of the bars are vegetated, while others are constantly being eroded and shifted. Both rivers experience high water levels during the spring freshet (mid-June) causing further erosion and channel fluctuation.

The most dramatic, and potentially dangerous, hydrological process which occurs in the Park is the on-going development of major alluvial fans along the western flanks of the Sentinel Range. This range, with its steep
slopes of carbonates and quartzite combined with low tree-line, introduces extreme runoff conditions during periods of heavy rainfall. Most tributary creeks flow within steeply enclosed valleys where there is little or no soil cover to limit the absorption capabilities of the land. The creeks enter the main valley under deep piles of rubble formerly eroded from the mountain slopes. With each subsequent floods, more debris is deposited on the floor of the main valley and is distributed in a fan-shaped formation. Over the last several centuries, this continuing process has created several large fans throughout the Muncho Lake valley, many of them having merged with the debris fans of neighboring creeks. Creeks originating in the Terminal Range do not develop alluvial fans due to a more subdued grade as well as a heavier vegetation cover.

d) Vegetation

Three biogeoclimatic zones can be identified within the Park. (Figure 5) In the valley bottoms and rising to an elevation of 880m, the Boreal White/Black Spruce Zone is found, while above this level (generally between the elevations of 950m and 1550m) lies the subalpine Spruce/Willow/Birch Zone. Throughout Muncho Park the subalpine is at or slightly above the level of the Alaska Highway. Within both of the zones, harsh conditions limit tree growth and large stands of trees with commercial value are rare. Above 1500 m lies the high altitude Alpine Tundra Zone. This is a cold, wind swept, snowy environment with a very short frost free period. Several extensive alpine meadows and ridges characterize this zone within the Park.

There are several interesting vegetation features found in the vicinity of Muncho Lake. In several areas the forest is in various stages of succession; most evident along Peterson Creek where fire has destroyed a large area of forested land. Over twenty years later, the land has yielded a seral cover of lodgepole pine and aspen.

On the alluvial fans, riparian plant species also grow in various successional stages. Some of the more stable fans have experienced a full vegetative cycle; a shrub cover of willow and birch eventually establishing into forests of white and black spruce. Others achieve only a partial cycle before recurring floods displace all vegetation from the fans.
MUNCHEN LAKE PROVINCIAL PARK

FIGURE 5

- VEGETATION ZONES -

- boreal white/black spruce zone < 880 m
- subalpine spruce/willow/birch zone 880-1596
- alpine tundra zone >1590 m
- burned area
- boundary between vegetation zones

SCALE IN KILOMETERS
<table>
<thead>
<tr>
<th>Common Plant Species of Muncho Lake Park</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lichens:</strong></td>
</tr>
<tr>
<td>Cetraria tilesii (common golden lichen)</td>
</tr>
<tr>
<td>Cetraria nivalis (common white lichen)</td>
</tr>
<tr>
<td><strong>Higher Plants:</strong></td>
</tr>
<tr>
<td>Horse tail</td>
</tr>
<tr>
<td>Common Mtn. Juniper</td>
</tr>
<tr>
<td>Creeping Juniper</td>
</tr>
<tr>
<td>False Asphodel</td>
</tr>
<tr>
<td>Death Camass</td>
</tr>
<tr>
<td>Yellow Lady’s Slipper</td>
</tr>
<tr>
<td>Bog orchis</td>
</tr>
<tr>
<td>Toad-Flax</td>
</tr>
<tr>
<td>Wild Strawberry</td>
</tr>
<tr>
<td>Yellow Dryas</td>
</tr>
<tr>
<td>Wild Rose</td>
</tr>
<tr>
<td>Fireweed</td>
</tr>
<tr>
<td>Lapland Rosebay</td>
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<tr>
<td>Kinnikinnick</td>
</tr>
<tr>
<td>Indian Paintbrush</td>
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<tr>
<td><strong>Trees:</strong></td>
</tr>
<tr>
<td>Lodgepole Pine</td>
</tr>
<tr>
<td>White Spruce</td>
</tr>
<tr>
<td>Balsam Poplar</td>
</tr>
<tr>
<td>Cottonwood</td>
</tr>
<tr>
<td>Trembling Aspen</td>
</tr>
<tr>
<td>Mountain Alder</td>
</tr>
<tr>
<td>Shrub Birch</td>
</tr>
</tbody>
</table>

Source: Ted Underhill, P.O.R.D., 1980
Near Moose Lake, in the southern portion of the Park, rare bog orchids have been identified and documented. Access to these sensitive plants is hampered by the wetland environment. In the extensive alpine areas within the Terminal Range, vegetation is often found growing in distinctive bands which appear to follow the contours of the land. Processes of soil creep have created undulations on the landscape resulting in deeper soils, thus permitting the establishment of higher-level vegetation species than might normally occur.

Table 3 presents a partial list of vegetation species found in the Park.

Soils around Muncho Lake Park are typical of those throughout the northern mountain region. Humo-Ferric Podzols are dominant within elevations of 1100m to 1500 metres; between 1500m and 1700 metres the podzols blend with Melanic/Dystric Brunisols; to the 1900m elevation soils of the Brunisol and Regosol types dominate until rock and scree constrain soil establishment in the alpine environment. Very few pockets of deep soil occur in the Park. In most of the developable areas, only a thin veneer of soil covers the underlying glacial drift.

The process of alluvial fan formation consistently disrupts the establishment of soil within the path of flood waters and debris torrents. On several lots adjacent to identified, active fans, excavations have unearthed standing timber buried by previous torrents. This serves to illustrate the vehement forces associated with these flows as well as the slow process of soil formation under such environmental conditions.

e) Wildlife

Observations on wildlife in northeastern B.C. are described in the 1980 TIDSA study.

In the northern Rocky Mountains, large ungulates (except caribou and moose) are approaching the northern limits of their range and are under constant physiological stress due to cold winter temperatures, the short growing season and a limited food supply. Hence, overall
numbers and population densities are relatively low. Animals often concentrate in specific areas with favourable habitat, particularly in winter, and they are very susceptible to disturbance.

Figure 7 indicates preferred habitat areas for various species at Muncho Lake Park.

Although Canada Land Inventory mapping has not been completed for the Muncho Lake area, ratings for the Alaska Travel Corridor are found in Dooling, 1974. East of the Park, the Toad and Racing River confluence is an important area of Class 2 (see appendix 2), winter range for sheep, moose and deer. Moose Lake, actually an ox-bow lake formed along the Toad River, is an excellent location for viewing moose. At most times a cow, calf or both are visible to the travelling public. A small, local Class 3 wintering area for caribou and moose exists on the east side of Muncho Lake. Areas of past forest fires are important vegetation edge habitat for ungulates.

Excellent caribou range is found in the alpine west of Muncho-Peterson Pass and the flatlands south of Muncho Lake are important as year round caribou habitat and winter moose range. Above a mineral lick at Milepost 438, an area of Class 3 winter range for sheep and goat was found. Mineral licks north of Muncho Lake are also important for attracting Stone's sheep, and the slopes adjacent to the mineral licks are classified as Class 3 and 4 range. On the red bluffs west of Muncho Lake is one of the few mountain goat concentration areas along the Alaska Highway.

Other wildlife species in the Park include grizzly and black bear, wolf, coyote, lynx, martin, marmot and fisher and beaver. Avian species which may be observed in the vicinity of Muncho Lake is generally dependent on the time of year. Muncho Lake, and to a lesser degree, Drogheda Lake, are common congregation areas for migrating bird populations. The beaches at the south end of Muncho Lake are preferred by Canada Geese, a variety of ducks, as well as gulls, grebes, mergansers and loon, which are a common sight on the lake itself.
Probably the highest quality sport fishery along the B.C. Alaska Highway can be found at Muncho Lake; numerous Lake trout (char) over 30 pounds have been taken from the cold, clear waters. Concentrations of trout are particularly common at in-flowing creek mouths and in shallow bays on the west side of Muncho Lake. Other species include Dolly Varden char, mountain whitefish, Arctic grayling, white and longnose suckers. This latter variety has become increasingly common in the lake, to the detriment of more favourable species.

Like many other northern lakes, source waters of Muncho Lake originate high in the mountains and glaciers of the vicinity. As a result, low nutrient levels are maintained in its waters. This oligotrophic condition contributes to the slow growth and late maturation of fish, making the various species susceptible to overfishing. Nonetheless, the Park's main attraction for regional residents is the fishing.

Both the Trout and Toad Rivers host Arctic grayling and Dolly Varden char. Access points to the rivers include crossings of the Alaska Highway as well as from a few lanes which leave the road at various points. Drogheda Lake was a popular fishing spot for travellers prior to relocation of the Highway in 1981. Now, few persons take advantage of the reported opportunity presented by the outflowing creek.

Located at such a northern latitude, Muncho Lake park is plagued by the annual onslaught of nuisance insects. Mosquitoes and blackflies can impair the best of plans for outdoor recreation. Usually most common in June and early July, the mosquito population continues to multiply until hot, dry weather begins to dry up their habitat. It is in August that the blackflies then begin to torment the Park visitor and the ungulate population in the Park. Only after the first frost can one be ensured of an insect-free experience.
f) Visual Resources

Four visually distinct zones occur within Muncho Lake Park. These zones are illustrated in Figure 6, as well as specific visual features referred to in the following descriptions.

i) Toad River Unit:

This unit provides the most impressive mountain scenery found in the Park. Of particular significance to Highway travellers is Folded Mountain located on the north side of the Toad. Northbound tourists get an extended opportunity for full-face viewing of this feature as they approach the Park’s southern portal. The mountain presents striking patterns of twisted and overturned sedimentary strata. Forefront to the mountain itself is a high cliff of exposed stratified bedrock, similarly folded and faulted. Along some portions of the highway, vertical walls line the right-of-way to create a visual tunnel which focuses the viewers attention on the attractive river/mountain interface of the Toad River valley. Beyond the narrow confines of the southern portal, the Toad valley broadens into a wide, U-shaped valley containing features which are common in many mountain river systems.

Ox-bow lakes, tortuous meanders, point bars and islands, against a backdrop of snow-clad peaks, create visual variety which is very appealing to drivers who have travelled many miles through the largely uniform landscape of the Alberta and Yukon plateaux. Only at the extreme western end of the highway corridor has human development impaired the visual quality of the unit. Abandoned buildings on private lots remind viewers of an unsuccessful business which once served the Highway.

ii) Peterson Pass Unit:

This unit represents the connector between the Toad and Muncho Lake visual units. Here, the highway traverses the drainage divide of the Toad and Trout Rivers. To the east lie the dipped mountains of the Sentinel
Range, while the western view is dominated by the foreslopes of the Terminal Range. Open space, created by the forest fire which destroyed much of the unit's tree cover, provides impressive opportunities for viewing the saw-toothed mountains to the east. A highway pullout serves as a viewpoint for Alaska Highway travellers. Near the north end of the unit significant views of Peterson Mountain become more frequent. It is on the north side of the pass, near the Muncho Creek crossing, that the valley provides a glimpse of the Trout River valley to the west. Southbound drivers are treated to oblique views of the Toad River and adjacent mountain ranges as they descend Peterson Pass. A large gravel pit at Peterson Creek crossing (Toad R. unit), detracts from an otherwise unobtrusive scene, otherwise few man-made features within the unit degrade the visual landscape. Specific visual features within this unit include Peterson Creek canyon, waterfalls, fossils and small water bodies such as Drogheda Lake.

iii) Muncho Lake Unit:

Through this unit the Alaska Highway follows along the eastern shore of Muncho Lake providing excellent viewing opportunities both across to the Terminal Range and northward down the Trout River valley.

Views to the east are somewhat limited by the close proximity of the Sentinel Range, except where the highway crosses the large, open alluvial fans. These locations permit an unencumbered view to the summit of the adjacent mountain slopes. Along these tributary valleys canyons, hoo-doos and interesting sedimentary rock exposures lie only a short distance from the highway. At Mile 456, an un-named creek wash extends several hundred metres back into the mountains where it abuts an especially scenic backdrop. North of this location, the highway travels adjacent to dolomite cliffs exposed during construction of the route. From selected viewpoints, rock pillars can be seen towering along the cliffs above the highway. To the west, the forested slopes of the Terminal Range rise steeply from the Muncho Lake shoreline. A narrow, incised channel of debris can be seen, tracing the path of recurrent mudslides and snow avalanches. Exposed red
bedrock opposite Mile 462 indicates the copper oxide intrusions common to the Terminal Range. Few rocky peaks can be seen to the west from the valley bottom, although hints of the extensive alpine country are evident at several locations.

At the north end of Muncho Lake and sitting on the remains of a former ice dam, a developed viewpoint presents tourists with a commanding view over the entire lake. Beautiful blue waters frame a small spit and island which stand out from the otherwise uniform alignment of the western shoreline. From here, many of the features described previously can be identified.

The Muncho Lake unit contains very impressive scenery, especially the pristine lake/Terminal Range interface, however, several man-made features impair vistas on the east side of the lake. These include telephone lines, abandoned ramshackle buildings and a variety of signs along the highway right-of-way. Several private lots contain the relics of abandoned vehicles, service centres and residences, long since fallen into disrepair.

iv) Trout River Unit:

North of Muncho Lake, the highway travels along relatively flat terraces above the Trout River. Several alluvial fans are crossed; many having merged together because of their expanse. Views to the east are of the uniformly dipped beds of the Sentinel Range. Tributary streams, as in the Muncho Lake unit, present views up their valleys as well as down to the Trout River. In general, scenes to the west are of the forested Terminal Range and although no particular peaks or features stand out from the rest, where tributary streams enter the Trout River wide valleys run deep into the heart of the mountains, well outside outside Park boundaries.

At Mile 472, cream-coloured, silty clay deposits rise steeply above the Trout River. Erosional processes of wind and water have sculpted the cliffs into tall pillars of lacustrine material. The light colour of the hoo-doos dominates many views along the river valley. Similar formations on Prochniak Creek (northern Park boundary) present an equally striking visual feature. Exposed minerals in the silt attract many ungulate species
to their vicinity, such becoming primary visual features in themselves.

Travelling northward, several crests in the road provide good views of the narrowing Trout River valley. Immediately south of the Park boundary the Terminal and Sentinel Ranges begin to merge, creating a tight gorge in which flows the Trout River. Not far north of this point the Rocky Mountains become much more subdued until they finally reach their terminus at the Liard River.

1.2.2 Cultural Features

a) Archaeological

Although the nomadic ramblings of the Kaska-Athabaskan Indians have been documented in the northern Rocky Mountains, little evidence exists within Muncho Lake Park today. Archaeological surveys conducted during construction of the Alaska Highway (Museum of Modern Man, Washington, D.C.) yielded very few clues to the lifestyle of northern Indian bands. On Muncho Lake, assumed to be a primary encampment, only three sites have been identified in reports published by the B.C. Provincial Museum (appendix 2). Several chert flakes, indicative of primitive tool making activity, have been found scattered on the beaches at the north end of the lake. On the stony spit along the western shoreline remains of a campsite have also been identified. Chert flakes can be found along the beaches of the southern shoreline, although no further evidence suggests that the mouth of the Trout River at this location was a common camping area.

Descendants of a once dominant native population still reside in the vicinity of Muncho Lake. The MacDonald Band, now limited to less than a dozen family members, continue to maintain a self-sustaining lifestyle in the area. A family graveyard is located on the banks of the Toad River near the southwest corner of the park. Discussions with these individuals may lend more information than is presently available.
b) Historical

As previously discussed, non-native discovery of the Muncho Lake area did not really occur until the construction of the Alaska Highway in 1942. At various locations, construction camps were established to temporarily house the platoons of U.S. Army personnel used on the "Trail of '42". Within the Park, evidence of the campsites remain today; at Drogheda Lake, foundations and a 5-hole latrine can be seen amongst the trees. North of Muncho Lake, the remains of several buildings and one standing residence permit viewers to visualize the type of encampment established in this area during the construction period. Unfortunately, the quality of building standard implemented for these temporary camps precludes any opportunities for restoration.

Through Peterson Pass, an original tote-road used during construction winds through the regenerating forest. The road base remains solid and a short hike along its route illustrates the "trial and error" type of construction that characterised the original highway. At several locations, the re-aligned road reveals abandoned sections of the former route, often illustrating early construction features such as wooden culverts and corduroy.

Recent historical evidence within the Park dates from the mid-1940's. Such "artifacts" include the previously mentioned delapidated buildings and discarded piles of junk which line the Highway right-of-way.

1.2.3 Recreation Features (as prepared by D. Clarke)

A recreation feature analysis was prepared for Muncho Lake Park and is summarized in Figure 7.

Probably the most significant outdoor recreation feature is Muncho Lake which is one of the few large lakes in the Rocky Mountains. This lake provides excellent opportunities for angling, boating and canoeing, and presents a major visual feature. The best opportunities for lakeside camping and day use are found on the alluvial fans. Two good pea-gravel beaches are located at the present sites of MacDonald and Strawberry Flats.
FIGURE 7
MAJOR RECREATION FEATURES

Provincially significant recreation features

Important wildlife habitat areas

MUNCHO LAKE PROVINCIAL PARK

[Map showing various features such as Stone Sheep, Trout River, and wildlife habitats.]

SCALE IN KILOMETERS

0 2.5 5.0 7.5 10.0 12.5
campgrounds. These represent the only noteworthy beaches on the lake.

The extensive alpine plateaux on the west boundary of the park, (north and west of Muncho Lake), as well as the large alpine valley in the southeastern section of the Park, are considered to be Provincially significant recreation features. These alpine areas offer gentle topography, small scenic surface waters, interesting periglacial features, excellent hiking and viewing opportunities and wildlife habitat. Other smaller alpine areas are found at the headwaters of many tributary streams.

Another feature for which the Park has become well known is the mineral lick formations along the Trout River north of Muncho Lake. These cutbanks are found at several locations along the Trout River, the largest of which are considered Provincially significant as important visual features. Their attraction is heightened due to the likelihood of viewing Stone's sheep in their vicinity.

In Muncho Lake Park, dynamic hydrological processes cut deep, narrow canyons throughout the Sentinel Range to form massive alluvial fans on the valley floor. The largest and most active of these fans are considered provincially significant as visual features and interpretive features. Recreation opportunities on these particularly instable rock deltas are limited to hiking and viewing. Stabilized, forest covered fans are of lesser feature significance but provide the best opportunities for camping and day use in the Park. Less hazard is presented at these locations than on the more active fans.

Folded Mountain is a major visual feature for its pattern of deformed sedimentary strata and its focal point position in the Park. As possibly one of the most obvious examples of a structural rock form, this feature is considered Provincially significant for viewing and interpretation.

Opportunities for mountaineering are provided throughout the Park, however are most evident in the Toad River valley where several peaks and walls of dolomite intrusion are readily accessible from the road.

Located at the southern portal is an area suited to camping. The flat, open understory and existing laneway provide good opportunities for picnicking and R.V. parking. The site is utilized mostly by those who are familiar with its location.
The Alaska Highway presents prime illustration of a cultural recreation feature. In itself the highway conjures an image of adventure to those contemplating a holiday to northern B.C. and Yukon. From its early days as a dusty, narrow laneway to the current hard-topped road which passes through a variety of landscapes, the Alaska Highway remains one of the primary attractions of the north.
1.3 CURRENT SITUATION

Figures 8 and 9 illustrate current land status and facilities located in Muncho Lake Park.

The park presently encompasses 88,416 hectares, with boundaries set parallel to the Alaska Highway. Several private lots, reserves, leased Crown Land and permitted non-conforming facilities exist within the Park. The following chart serves to illustrate many of these tenures.

PRIVATE INHOLDINGS

-Peace River District Lots:

621, 622, 623, 624, 625, 627, 1168, 1172, 1173, 1174, 1179, 1182, 1183, 1641, 1650.

PARK USE PERMITS (land interests)

PUP 399- Stream gauge on the Toad River; PUP 400- Gravel Pit at Mile 452;
PUP 448- Access Road to private lot; PUP 535 - Road Maintenance camp at Mile 456
PUP 639- Gravel pit at Mile 456;
PUP 810- Garbage Dump at Mile 456;
PUP 1036- N.W.Tel Repeater Station at Mile 443;
PUP 1240- Gravel Pit at Mile 441;
PUP 1005 - Pine provenance test sites, Ministry of Forests.
PUP 1084-Seisometer Station at Mile 457

PUP 809 - Access Road up Nonda Creek
PUP 940 - Highway construction through Peterson Pass
PUP 1241- Gravel Pit at Mile 465.

RIGHTS OF WAY

-Alaska Highway #97, 300 feet right-of-way runs north to south through Park.
Access Road to leased land outside Park boundaries at Mile 442 (Sorenson).
Northwest Tel access road through Park at Mile 429.
Access Road to former Davis-Keays mine southwest of park, bridge crossing of the Toad is extremely dangerous.

GUIDE/OUTFITTER TERRITORIES

-PUP 957 N.B. Sorenson; Big Game guiding; southwest quarter of Park.
-PUP 1252 B.R. Southwick; Big Game guiding; southeast quarter and northern half of Park.
-PUP 1255 B.R. Southwick; Commercial Recreation Guiding; northern quarter of Park.

TRAPPING TERRITORIES

-PUP 807 M.A. Churchill; Registered Trapper; northern half of Park.

CROWN LAND LEASES

-D.L. 1552, Block 1; Mile 456. Former residence camp, now a repeater site.

CROWN LAND RESERVES

-D.L. 1645, 1646, 1647, 1648. Northwest Highway System bridge reserves at the crossing of the Toad and Trout Rivers.

TRESPASSES

-Indian cabins; southwestern portion of Park. Letter of Authority granted.
-Horse corral; Mile 456. Letter of Authority granted.
-Airstrip; Mile 456. No Authority granted. Located in Park.
-Auto Junkyard; Mile 456. No Authority granted. Located in Park.
-Private campground; Mile 463; D.L. 1178 Former leased lot, now Park.
**PARK FACILITIES**

- Park headquarters, Mile 462:
- Campgrounds: Strawberry Flats - 23 sites (undesignated)
  (Type II)
  - 3 toilets
  - Rocky Mountain - 14 sites
  - 2 toilets
  - MacDonald - 15 sites
  - 3 toilets
  - boat launch (undesignated)
  - capped well
  - Wildrose - 8 sites
  - 2 toilets

- Trails: Trails of type III standard are located at various locations in the park. Most trails are associated with guide-outfitting operations in the vicinity of Muncho Lake.

- Park Information:
  - Mile 448/Km 715 Viewpoint (Peterson Pass)
  - Mile 476/Km 762.5 Pullout

- Scenic Viewpoints:
  - Mile 448/Km 715 Viewpoint (Peterson Pass)
  - Mile 464.5/Km 744 Muncho Lake Viewpoint

- Pullouts:
  - Various locations as on Figure 9, most with litter barrels, maintained by Public Works Canada.
1.4 MARKET ANALYSIS

As could be expected for any remote section of the Province, market demand analyses for the Alaska Highway region are quite scant. The 1980 T.I.D.S.A. (Travel Industry Development Subsidiary Agreement; BC-Canada) analysis of the Peace River-Alaska Highway tourism industry presented one of the few compilations of information regarding travel and tourism in northeastern British Columbia. Its purpose was to examine and assess tourism opportunities in the region, especially those along the Alaska Highway. The report provides insight to present and future demand for facilities in the Muncho Lake area, and when analysed with P.O.R.D. statistics, suggests future trends which may impact on outdoor recreation management.

The Alaska Highway forms a portion of a tourist circuit known as the "Golden Circle". The more recently constructed Cassiar-Stewart Highway #37 presents an option of returning to or from Alaska over a different, highly scenic route. Surprisingly, the attraction of more aesthetic surroundings does not seem to surmount the attraction of driving the "long, dusty trail". Many tourists opt to retrace their earlier route, solely for the purpose of travelling to and from the north along the fabled Alaska Highway. In general, the most frequent tourists around Muncho Lake are Americans on their way to or from Alaska. Clearly 50% of summer passenger traffic on the Highway is of U.S. origin (PWC correspondence; PORD campsite surveys) and over three-quarters of Alaska Highway tourists use campground facilities according to a 1975 tourism study by Menzies and Associates. The majority of these tourists travel in their own self-equipped recreation vehicles. Second to the U.S. market, B.C., Yukon and Alberta residents form a large proportion of tourist traffic on the highway. Representation of other Provinces is generally in inverse proportion to their distance from British Columbia.

Bus tours would appear to be becoming increasingly popular on the
highway; most are of U.S. origin and utilize the services of the lodges within the Park. Information displays and viewpoints encourage these entourages to stop and benefit from opportunities presented in the Park.

Although Muncho Lake is not regarded as a major tourist destination point, the Peace-Liard District does host B.C.'s largest proportion of non-resident, big game hunters, as well as being the home of the second largest resident hunter population in the Province (TIDSA). During the hunting season, which generally commences on August 1, many local and international hunters arrive in Muncho Lake and vicinity to participate in the sport hunting of Stone's sheep, moose and grizzly bear. Lodge owners rely heavily on business generated by the lucrative hunting industry; most importantly, they benefit from resident hunters who do not require the services and provisions of a licenced guide. The majority of guided hunts attract an international clientele, predominantly American and West German, most of whom fly directly to Fort Nelson where they are picked up and chauffeured to Muncho Lake. As a result, mental images and impressions of British Columbia are, for many, concocted based on experiences achieved in the Park and surrounds. Therefore, the maintenance of a quality environment not only benefits international impressions of the Park, but also those of the Province and of the entire country.

For many Fort Nelson residents (pop. 7500) Muncho Lake Park presents a mountain environment in which to spend leisurely long weekends and holidays. At most of these times the usual predominance of foreign tourists in the Park is displaced by an increase in regional residents. The main attraction for these users is the fishing opportunity presented in Muncho Lake; several families spend their annual vacations in the Park where camping, scenic surrounds and a relaxed atmosphere enhance their stay. Local campers generally use the less crowded campgrounds of MacDonald and Wildrose. At other sites, their camperized light trucks can easily be distinguished from the fully-equipped behemoths generally associated with the Alaska-bound tourist. North of Fort Nelson the Division intends to develop a provincial park at Maxhamish Lake. A resultant decrease in regional use of Muncho Lake Park is not expected however, since Maxhamish
Lake will attract only those interested in the active, beachside recreational activities in closer proximity to Fort Nelson.

Until recently, B.C. Hydro plans were to flood a portion of the Liard River north of Muncho Lake for hydro-electric power. The influx of temporary workers, combined with the possible flooding of Liard Hotsprings Provincial Park, would have significantly altered the role of Muncho Lake Park. For the meantime however, this project has been abandoned and it is not expected that a Liard Reservoir will be created in the next 20 years.

In many of the southern parks, adventure recreational activities have become increasingly popular. Whitewater canoeing, mountaineering, hang-gliding and wilderness skiing are all activities which require a large land base for support. The TIDSA study reports that there is "considerable appeal for adventure recreation" in the Peace River-Alaska Highway vicinity. Although demands for adventure recreation are definitely increasing and opportunities exist in Muncho Lake Park to undertake any of these sports, constraints imposed by the Park's limited size, comparative absence of significant recreation resources and distance from major markets, its short summers and long, cold winters impair the attractiveness of Muncho Lake as a destination adventure recreation area.

Camping and day use opportunities at Muncho Lake are provided by both the public and private sectors; all commercial establishments in the Park offer campgrounds to the touring public. Given the proper information, Park visitors are presented with a complete range of camping opportunities at Muncho Lake. Owners of recreation vehicles often prefer the hook-ups available from the private sites; others may be attracted to the hot showers and laundry facilities. However, given the choice of how to spend their camping dollar, most elect to camp on the lakeshore at the government sites. Except during the spring Fishing Derby, or when tourist caravans arrive in the Park, private campgrounds rarely achieve full capacity. Only on long weekends do P.O.R.D. campgrounds reach over 60% occupancy.

Muncho Lake represents one of ten provincial parks strategically located along the northern Alaska Highway (north of Wonowon). Of these
however, only two formally offer much more than a place to park for the
evening. Liard Hotsprings Park presents to touring recreationists a unique
bathing and interpretive experience. Andy Bailey Park, south of Fort
Nelson, provides outdoor recreation opportunities to residents of that
northeastern B.C. community. Both Muncho Lake and Stone Mountain Parks
offer potential beyond which they are currently developed, as significant
suppliers of diverse recreational opportunities in a Rocky Mountain
setting.

Table 4 summarizes occupancy statistics as derived from the Park Data
handbook series, local knowledge and detailed observations made during the
high tourist season of July and August. Analysis of the data reveals that,
occupancy at the four public campgrounds rarely exceeds capacity. Compared
with Liard Hotsprings Provincial Park, use levels at Muncho Lake can be
considered moderately low. The relatively few campers that stay overnight
generally spread themselves uniformly among the campgrounds.

Figure 10 presents a schematic analysis of traffic volumes on the Alaska
Highway in northern B.C. and the southern Yukon. From this it can be seen
that a fairly consistent number of vehicles travel between Fort Nelson and
Watson Lake, Yukon, with an expected increase in traffic on the highway
south of Fort Nelson. Recent studies (Peepre, 1983) indicate that 31% of
traffic volumes in the Peace-Liard Region are comprised of pass-through
visitors. For the northern B.C. section of the Alaska Highway, this figure
could very well be doubled although even at the recorded level, the
percentage "passing through" is the highest of any region in B.C.

Marketing of parks and tourism features in Yukon and Alaska have a
significant affect on Northern B.C. park visitation. As new parks and
tourist facilities attract more visitors north of 60° it can be expected
that visitation at Muncho Lake Park will increase proportionally.
<table>
<thead>
<tr>
<th>Year</th>
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<th>Site</th>
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<td>726</td>
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<td></td>
<td></td>
<td>Lake</td>
<td>820</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(60 sites)</td>
<td>Aug.</td>
</tr>
<tr>
<td>1981</td>
<td>June</td>
<td>Liard</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HtSpr.</td>
<td>400</td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
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<td>Lake</td>
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<tr>
<td></td>
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<td>771</td>
</tr>
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Table 4 (continued)

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</table>

1 number of developed campsites
2 "xxx" = contractor afternoon recordings; "---" = PORD evening recordings
1.5 PLANNING ISSUES

Muncho Lake Provincial Park presents a complex range of issues relating to recreation and resource management. To maintain uniformity in the decision-making process, this plan outlines some of the current conditions which impact on park policy and future management strategy.

a) Land Management

As stated previously, the Park contains a composite of land tenure, including private inholdings, reserves, leases and vacant Crown Land. Although it is relatively easy to distinguish between public and private property, different public land tenures can present confusion and irregularity. Examples of such include designated district lots now contained in the Park, Crown land leases on lots surrounded by parkland, and federal land reserves protecting "future" bridge sites (actually having been constructed several years ago).

Of the private inholdings, only a few (Table 5) represent desireable acquisitions at this time. Most others are associated with the service industry which operates within the Park, or are abandoned service centres and residences. Two lots at Drogheda Lake have been identified as potential acquisitions by the Division. Since commencement of this Plan however, the lots have changed ownership with no prior notification being given to the Ministry (albeit unobligated). This serves to illustrate that more formal processes may be required to establish the Division's approved intent to acquire key inholdings.

For the southbound tourist travelling the Alaska Highway, Muncho Lake is the first Rocky Mountain park encountered during their travels. The Highway Scenic Improvement Act, under which has been designated the Alaska
Highway (B.C. Reg. 261/70), provides an avenue to enforce improvements to premises and properties deemed "unsightly or offensive to any part of the (travelling) public". In the past, some commercial operators have complained about several unsightly private developments at Muncho Lake. Given the objectives of provincial parklands, justification exists to investigate options which may obligate property owners within the Park to maintain tidy grounds. In order to implement the Scenic Improvement Act, cooperation must be attained with Public Works Canada, the B.C. Ministry of Transportation and Highways as well as the Regional District of Peace-Liard. Throughout the Park are other examples of distracting obtrusions. Abandoned telephone poles line the highway right-of-way south of Mile 456. Several have toppled, while others have wires hanging from their broken cross-members. North of Mile 456, telephone poles still in use are often set at bizarre angles disrupting the continuity of the visual corridor. Several signs within the Park indicating nearby services have become redundant following implementation of the Provincial sign programme. These hand-lettered boards no longer serve a purpose to the public and detract from the park setting.

The MacDonald Indian band has been resident in the vicinity of Muncho Lake for several generations. Their inherent nomadic lifestyle has required the maintenance of several temporary homes in the valleys of the Toad and West Toad Rivers. Although no formal Permit has been granted to the Indians, the band recognizes the intent of the provincial park and has cooperated with the Division. Letters of Authority have given the band permission to maintain a relatively unencumbered lifestyle in the Park. It is expected that the band will dissolve as the present generation passes.

Although there are very few roads which branch from the Alaska Highway, abandoned roadways, by-passes and private access lanes are located within the Park. The Alaska Highway has now been re-routed above scenic Peterson Canyon thereby avoiding recurrent debris torrents and flooding. Unfortunately
several interesting natural features which occur in the canyon have also been by-passed, features which remain accessible to those who hike up the old road bed.

At the south portal an access road leaves the Park and climbs gently to an alpine meadow (NorthWest Tel microwave tower). This area is not only popular with local hunters, but also provides beautiful scenery and hiking opportunities to non-consumptive recreationists. The road and bridge across the Toad River are considered private property, however the upper Nonda Creek headwater areas of the Park is accessible on foot or horseback from this road.

At Mile 440, the former Davis-Keays mining road leaves the highway and parallels the south side of the Toad River valley, eventually leaving the Park at the southwestern boundary. Shut-down of the mine in 1976 reverted land tenure over the area back to the Crown. The abandoned, delapidated steel bridge crossing of the Toad River has therefore become a park facility. This potentially dangerous crossing is used quite regularly by hunters, local guide-outfitters and a resident who lives outside the Park boundary; should the bridge collapse, liability may rest on the Parks and Outdoor Recreation Division.

An access road to a hunting lodge located just outside of the Park boundary at Mile 441 has created a similar situation. However, so long as a permit is maintained by the user, he will maintain liability for the dangerous bridge crossing at Otelsas Creek.

Located on parkland at Mile 456 is an unlicenced airstrip. Although not a popular landing strip, it is used quite regularly by private pilots who maintain residential lots in the park. Emergency airstrips such as this are often required in remote mountain environments where unpredictable weather patterns change rapidly. Since the Alaska Highway right-of-way forms a portion of the airstrip, discussions with Public Works Canada are required before the Division decides whether to request removal of the runway from the Park or alternately, delete that portion of the Park under the runway.

Announcements made recently by B.C. Hydro indicate that plans for the
construction of the Liard River Hydroelectric Project immediately north of Muncho Lake Park have been indefinitely suspended. The proposed dam would have created a reservoir through the Liard Canyon, continuing northwesterly to the B.C.-Yukon border; Liard River Hotsprings Park would be inundated as a result of the project. Although commencement is not foreseen within the time frame of this plan, it must be borne in mind that the role of Muncho Lake Provincial Park may change considerably should the scheme be resurrected in the future.

Since the commencement of this document the Division has received a request for boundary information in relation to proposed mineral exploration west of Muncho Lake. Access to this particular area is very remote and quite possibly limited to a route through the park. Monitoring of future development must be maintained.

b) Park Image

Muncho Lake Park lies adjacent 55 miles of the Alaska Highway; tourists enter the south portal at Mile 425/Km 680 and leave at Mile 480/Km 770. It has clearly been identified that across this distance there is a significant lack of Park identity. Entrance portal information is quickly forgotten as drivers travel through the Park, encountering a range of facility standards, pull-outs, viewpoints, campsites and litter barrels. These facilities are maintained by different public agencies including Public Works, their contractors, the Parks Division and its contractors. Only at developed campgrounds is the P.O.R.D. identity evident and it has been noted that frequently tourists consider only the campgrounds as parkland. This lack of information and identity means that many of the different geological and biological phenomena of the Park go unnoticed by through traffic. The "Alaska Milepost", published in New York, represents the most positive promotion and attention given to the Park.
c) Commercial Inholdings

For the few residents who live at Muncho Lake, services that they provide to tourists represent their livelihood. For many, a year's existence often depends on the summer tourist season. The dilapidated remains of former businesses are testimony to the fickle nature of the tourist industry. A symbiotic relationship is maintained by the Park and the private facilities which it surrounds. At present, it is the Park which benefits most from the information which is disseminated at the lodges and service centres. It is there that tourists learn where to watch for the sheep, what fish are in the lake, what the winters are like, how the mountains were formed and why the waters of Muncho Lake are such a pretty blue colour. Although the Division recognizes the importance of the private sector at Muncho Lake, yet to be fully recognized are the benefits to each which exists through cooperative effort. Both the business community and the Division have similar objectives at Muncho Lake, to attract the travelling public and encourage them to stay a little longer in the Park.

To complement, not compete, with the private sector is a recognized policy of the Parks and Outdoor Recreation Division. At Muncho Lake, the public campgrounds offer camping opportunities to Park visitors. These rustic facilities do not compete directly with the full-service campsites located on private land, however they often discourage selection of the private campgrounds. Occupancy figures indicate that the Division is providing so many campsites at Muncho Lake that it may be unrealistic to expect tourists to select alternatives supplied by the private sector. Concentration on the development of trails and day-use facilities as well as campgrounds would provide increased attraction and the necessary encouragement to promote longer stays in the Park, thus presenting more of an opportunity for business to attract clientele.
d) Natural Hazards

It has been documented that the fans on which Division campgrounds have been developed are recognized flood hazard areas. For a short period each year, campers are exposed to danger from high lake levels and debris torrents. Rocky Mountain campground presents the most serious hazard: constantly shifting stream channels, a lack of vegetation other than scattered, half buried cottonwood trees, and a boulder strewn roadbed are evidence of the potential flood situation which exists at this location. At Wildrose campground, a debris torrent from 1979 has buried much of the original site. Only a thin veneer of soil supports the mature spruce cover which predominates over much of the remainder. The MacDonald campground is felt to be quite safe at its north end, however quite hazardous at the south. It is here that a dilemma confronts the park manager since located at the south end of MacDonald campground is the most significant beach along the shore of Muncho Lake. A 50 metre stretch of pea-gravel beach presents a rare opportunity to enjoy lakeside recreation opportunities found nowhere else along the Alaska Highway. On a sunny, warm day in late July or August it would be very hard to justify the closure of adjacent campsites based on potential flood hazard; many Fort Nelson residents regularly spend summer vacations in this area. Strawberry Flats campsite, the first encountered by northbound travellers, provides safe camping on its southern end but an increased hazard potential exists on the central and northern portions of the site. A relatively established tree cover indicates the limit of the recognized safe area. In an attempt to protect the Alaska Highway from further damage, the bouldery channels of the identified creek beds have been excavated into dikes which deflect flood waters through bridges and culverts. However, it has been pointed out by Eisbacher (1980,, C.S.C.) that the use of surface material to deflect a debris flow provides insignificant protection.
Due to the natural attraction of the alluvial fans, it is unrealistic to expect visitors to avoid them: presented are opportunities for viewing, camping and lake access. Moreover, they are important for their inherent interpretive values; the alluvial fans maintain a natural balance of erosion and deposition. Examples that they provide for the roadside study of vegetational succession and topographic transition are unparalleled in the northern Rocky Mountain natural region. Although the Division must recognize that protection of the Alaska Highway is paramount, indiscriminate removal of the gravel resource should not be allowed to impair the scenic and interpretive value of the fans, nor conflict with the objectives of a Class A Provincial Park.

The porous gravel base on which has been developed many of the public and private facilities presents serious waste management problems. In the campgrounds, subterranean runoff can leach wastes from pit toilets and transport them into Muncho Lake. Lodge owners must also ensure that their waste products are properly stored, treated and released. Drinking water supplies maintained by several of the lodges originate directly from the lake.

e) Visitor Data

As highlighted within Table 4, use figures obtained at Muncho Lake Park must often be extrapolated from a vague data base. Several methods have been used to determine occupancy rates in the past; the most accurate of these are evening counts taken by on-site staff, while the least dependable data is collected by contractors who visit the campsites at late morning or afternoon.
f) Resources Management

Much of the northern B.C. landscape has been altered by wildfire. Thousands of burned hectares now line the highway between the park and Yukon. Fires play a dominant role in the ecological succession of vegetation species; the interruption of these processes has often been considered unnatural. Within the Park, the scenic resource presented by the forests, lakes and mountains create a high level of viewer pleasure. Compared to the relatively stagnant visual landscape of burnt areas, the preservation of diverse images such as those presented at Muncho Lake becomes very important. The aesthetic value of a mature forest cover within the relatively small land area covered by the Park must be weighed carefully against the value of an undisturbed ecological cycle. In this analysis it would appear that some areas of the Park are more visually sensitive than others and for this reason should be protected from wildfire. Moreover, the existence of permanent structures and private dwellings necessitates an intensified fire control responsibility.

Although there is a basic knowledge of wildlife species, their habitats and general population levels in the Park, there has traditionally been a lack of consistent supporting data on which to base wildlife management decisions. In a Region where the guide-outfitting industry provides such a dependable economic base, detailed study of the renewable wildlife resource is of paramount importance. Only with more detailed information can managers accurately determine the significance that quotas, possession limits, viewing and added hunter pressure have on wildlife populations in the vicinity of the park. Such studies have now commenced with the implementation of a wildlife survey in 1983.

Current hunting regulations have established no-shooting zones along the Alaska Highway and areas which maintain a natural attraction to wildlife (e.g. Mile 472 mineral licks). Muncho Lake Park boundaries lie
parallel to the Alaska Highway at a distance of three miles. North of the lake, this relatively narrow corridor (which does not delineate natural topographic boundaries) creates a very slim hunting zone between the restricted area and the park boundary. Although no problems present themselves in the southern half of the Park, any expansion of non-consumptive recreation opportunities north of Mile 456, in combination with opening dates set at the height of the outdoor recreation season (Aug. 1), could create unavoidable conflict between hikers and hunters within this limited area.

The Division has recently requested (through the Wildlife Branch) that quotas be placed on Stone's sheep hunted in the Park. Although game populations recognize no administrative boundary, adherence by hunters to a parkland quota may be difficult to enforce in locations where park boundaries are not based on significant topographic features. At one particular area this situation certainly arises. The upper Nonda Creek headwaters lie in an exquisitely scenic alpine basin where a quota has been allotted to the operating guide. However, the park boundary lies at valley bottom (Nonda Creek) thus bisecting the natural basin and management jurisdiction. To effectively manage both the natural and recreational resources of this valley, a boundary revision is required (see Appendix 7).

In an attempt to reduce the numbers of road kill along the Alaska Highway, the Division has experimented with strategic saltblock placements in adjoining drainages. This appears to have been an effective solution since sheep have been seen congregating in these areas, however, an increased opportunity for poaching may result in cases where the blocks are placed out of direct sight from the highway.

Over the past several years it has been proposed that a major viewing platform be constructed above the mineral hoodoos located at Mile 472. With the absence of specific wildlife studies to address such proposals, it has
been suggested that the introduction of people to this feature may impact slightly on the behavior patterns of the Stone's sheep. However, given the few number of times that sheep have actually been observed at this unique erosional feature, benefits derived from public interpretation of the hoodoos justify any minor disturbance created by such activity.

As has been indicated earlier in the plan, the fisheries value of Muncho Lake has reportedly decreased over the past few years. Although no formal documentation substantiates the decrease, local residents and Ministry of Environment biologists verbally confirm the situation. At the annual Muncho Lake Fishing Derby as many as 200 persons have been known to enter with winning fish weighing in excess of thirty pounds. However, winners from the recent past have recorded far smaller specimens and Fish and Wildlife managers have become increasingly concerned about the depletion of trout in Muncho Lake due to overfishing. Because of the lake's oligotrophic character, the waters sustain little food for resident populations. Current regulations may not adequately reflect this environmental condition, however amendments are difficult to introduce without a reliable data base. To provide this information, it has been suggested that a program of fish head collection be implemented in cooperation with local lodge owners and the Ministry of Environment. From the collected data, an accurate assessment of restrictions could be made by fisheries biologists. It is also recognized that enforcement of regulations has been exceedingly difficult at Muncho Lake and that non-compliance has been a major contributor to over-depletion. According to the local Conservation Officer, tourists generally do not contribute to this problem; most often it is local and regional residents who exceed possession limits.

Most conversations with a Guide-Outfitter invariably lead to a discussion of "packers" and the competition that they introduce to the guiding industry. Unregulated packers operate in much the same manner as a licenced guide; the exception being that the packer cannot legally lead his client to an animal. Enforcement of the Wildlife Act in these situations is obviously difficult, and this fact has caused an acute increase in packing
services throughout the north. Although the Ministry of Environment is ultimately responsible for the impact that these operations have on the guide-outfitting industry, Park managers must exercise utmost discretion when authorizing packer activity in the Park.

Commercial recreation guiding opportunities have been identified throughout Muncho Lake Park. Horse-back photography expeditions are most marketable during the months of July and August and could contribute significantly to the visitor’s experience as well as economic stability of the Park’s tourist industry. Although the short season precludes establishment of a separate commercial guide operation, given an adequate market assessment, existing guides in the park may be encouraged to expand their services to this activity.

Since the popular introduction of off-road recreation vehicles such as the all-terrain cycle, park managers have been faced with increased enforcement problems. Muncho Lake Park has been no exception; the alluvial fans, campgrounds, park headquarters and abandoned roadways have proved to be popular areas to engage in off-road activities. Certainly it is not realistic to dispell the popularity of these vehicles; suitable areas within the Park may be identified in order to reduce conflicts which arise in more sensitive locations. Alternatively, stricter enforcement of a ban may be required.
2.1 PARK PURPOSE AND OBJECTIVES

As an important element of the B.C. Park System, Muncho Lake represents an integral unit in a series of provincial Parks along the Alaska Highway. In combination with its partial representation of the Rocky Mountains Natural Region, the Park contributes significantly to the system's conservation, outdoor recreation and tourism goals. The scenic splendor of the Muskwa Ranges has the capability to attract a variety of outdoor recreation enthusiasts; well over 100,000 tourists pass through the Park annually. The Park affords good fishing and wildlife viewing opportunities while the numerous side valleys, access points and low vegetation levels encourage backcountry hiking, riding and hunting. A significant contribution to the northern tourist economy is provided by the Park and the services located at Muncho Lake.

The following objectives reflect the purpose of Muncho Lake Park and indicate management direction for the achievement of Division goals.

**Conservation:** To conserve a partially representative, accessible example of the Muskwa Ranges natural landscape with biophysical and historical elements associated with the northern Rocky Mountains natural region. Muncho Lake Park contains many of these elements including the scenic geological and glaciofluvial landscape, the natural wildlife resource and the historic attributes of the Alaska Highway.

**Outdoor Recreation and Tourism:** To provide Regional residents and tourists to the highly scenic Rocky mountain landscape a continued opportunity for consumptive recreational use of Park resources, while expanding opportunities for a variety of non-consumptive outdoor recreational activities in close proximity to the Alaska Highway.
2.2 ZONING

Muncho Lake Provincial Park will be zoned to reflect the diversity of land use within its boundaries. Future developments will recognize this zoning plan and adhere to the configurations illustrated in Figure 11. The scheme reflects zoning of existing parkland as well as those lots recommended for acquisition.

Lands traditionally held under private ownership, along with developable parkland located along Muncho Lake, have been included in the Development Zone. This zone extends the length of the Park, recognizing the Alaska Highway corridor. Within the zone, a Parkway sub-zone has been designated in recognition of the scenic parklands which front the Alaska Highway through most of Muncho Lake Park.

That portion of the Park lying between the Toad River and Nonda Creek has been zoned as wilderness. Although fairly proximate to secondary road access (via Nonda Creek), the unit presents characteristic elements of the Muskwa Range wilderness. Narrow creek valleys restrict foot and horse access to all but a few identifiable locations. A wide alpine bowl surrounded by majestic mountain ridges offers exceptional opportunities for wilderness hiking, camping and hunting.

The remainder of the Park is zoned as Natural Environment.

Within each zone and sub-zone, general statements direct appropriate management intensity. At Muncho Lake Park lands within each zone will be managed in accordance with the following objectives:

**Development Zone:** To provide for a variety of facility-oriented recreational opportunities which reflect the needs of park visitors.

**Natural Environment Zone:** To provide for intermediate levels of outdoor recreational opportunities and use in a natural setting.
Wilderness Zone: To protect and preserve landscapes and resource processes while allowing for low levels of recreational use.

Additionally, the Parkway sub-zone will provide intensified protection to the inherent scenic quality of lands adjacent to the Alaska Highway. Developed facilities and resource operations will not be permitted within the sub-zone, giving managers an opportunity to further direct future activities in the Park. However, if after careful consideration specific lots or areas are required for development, they may be re-designated for such use.
FIGURE 11
-ZONING-
- DEVELOPMENT ZONE/PARKWAY SUB-
- NATURAL ENVIRONMENT ZONE
- WILDERNESS ZONE
2.3 MANAGEMENT PLAN

2.3.1 Natural Resource Management

a) Land Management

Muncho Lake Park presents a unique blend of land use within its boundaries. Visitors do not generally consider the scenic surroundings to be parkland owing to the lack of park image and the apparent dominance of private service facilities. Throughout the Development Zone a diverse variety of land tenure in the Park has caused some management confusion with regard to permitting and regulation enforcement; an attempt will be made to rationalize incongruous forms of tenure. The overall intent is to give the Division management responsibility for all public lands within the boundaries of Muncho Lake Park. Tighter control may then be implemented to ensure that all uses conform with the goals and objectives of a Class A Park.

Objective: To manage the land base of Muncho Lake Provincial Park in a manner which best achieves the Division's goals for conservation of the regional landscape and provision of outdoor recreation opportunities.

- The Park will be managed to ensure that adequate area is maintained to achieve conservation and outdoor recreation goals.
- Land use within the Park will strictly adhere to the approved Zoning Scheme.
- Land reserves at Trout River Crossing will be cancelled and added to the park as they are no longer required by Public Works Canada.
- The Lands lease for the repeater station at Lot 1552, Block A, will be cancelled and the property absorbed into the Park. The repeater is scheduled for removal in the near future.
- Gravel pits currently recognized by P.U.P., yet outside Park boundaries (according to OIC 3436/69) will be acquired and managed in accordance with Park objectives.
- In order to absolve the Division from potential liability, land containing the unofficial Mile 456 airstrip will be removed from the Park. Resultant vacant Crown land status more definitively implies that all liability rests with the user (Lands Branch correspondence).
- All trespasses within the Park (as indicated in Section 1.5) will be investigated and remedied.
- Key private lots within the Park (as in Table 5) will be acquired as they become available; the Division should record its intent to secure high priority properties through First Right for Refusal.
- The Division recognizes the designation of the Alaska Highway through Muncho Lake Provincial Park as a scenic highway pursuant to the Highways Scenic Improvement Act and will co-operate with other agencies and property owners to encourage roadside property cleanup through the Park.
- Relocated Alaska Highway Right-of-Way Mile 442-450 will be removed from Muncho Lake Park upon completion of legal surveys. At that time the former right-of-way following Peterson Canyon will be added to the Park.
- A co-operative effort between the Division and Public Works Canada will minimize impairment to park resources and its natural scenic quality potentially resulting from Alaska Highway operation and improvement, including removal of gravel from the Parkway sub-zone.
- Existing gravel pits will be rehabilitated as they expire. New pits will be discouraged within the Park, however if determined as necessary, future operations will not be permitted within the scenic Parkway sub-zone.
- The Division will recognize traditions of the MacDonald Indian Band within Muncho Lake Park and maintain the existing authorization process to deal with their activities.
- Legal opinion will be sought with regard to the Davis-Keays Road bridge. The bridge will be signed as a hazard and the road closed to public traffic at that point. Access beyond Park boundaries along the road is impassible except by foot, horseback or four wheel drive vehicle.
- It is desirable to expand the Park boundary to include the headwaters of Nonda Creek. This will permit the Division to manage the natural and recreational resources within the Nonda Creek valley in a more rational
TABLE 5 PROPERTY ACQUISITION PRIORITIES (Refer to Figure 8):

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<tr>
<td>1650 (Drogheda Lake)</td>
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</table>
manner. In comparison with other boundary points in the park (which do not bisect areas of recreational significance), revision in the Nonda Creek valley reflects its greater accessibility to Park visitors. (Figure 12).

b) Wildlife Management

Much of the recreational use of parkland in Northern B.C. is associated with the wildlife resource. Abundant wildlife populations in the northern Rocky Mountains have traditionally attracted resident and international hunters to commercial camps throughout the region. Muncho Lake Park attracts hunters in pursuit of Stone’s sheep, one of four species of wild sheep sought by trophy enthusiasts. Management of big game in Muncho Lake Park has been limited to permitting operations and road-kill reduction programs. Few studies have been undertaken on which to base sound management methods; Park managers have traditionally relied on the advice of Fish and Wildlife Branch biologists. Increased non-consumptive recreational use will require a re-evaluation of existing management regulations.

Muncho Lake hosts a sport fishery that has achieved wide-spread recognition in the northern Rockies; overfishing has reportedly reduced populations of lake char (trout) and other sport species. Annual fishing derbys held in the park seem to indicate a decline of large, mature stocks. Detailed studies are required to discern the legitimacy of these reports. Results should be incorporated into formulation of a Wildlife Management Plan for the Park.

Objective: To manage fish and wildlife populations in Muncho Lake Park by methods which best achieve a balance between the Division’s goals for conservation of the resource and provision of consumptive and non-consumptive recreation opportunities.

- A study of big game populations, especially Stone’s sheep, within Muncho Lake Park will be conducted jointly between the Division and the Ministry
of Environment. This study will address issues relating to potential conflicts arising from the consumptive and non-consumptive use of wildlife in the Park, sensitivity of habitat areas, user pressure on the resource (hunting use and other recreational uses), legitimacy of current regulations, impacts of domestic grazing on natural populations and recommend methods of ensuring on-going renewal of the resource.

- Trapping is a non-recreational extractive activity and is therefore inconsistent with Park objectives. The existing trapline in the Park will be phased out in accordance with the Division Wildlife Management Policy.

- It is desirable that the no shooting zone be extended to height of land on the east side of the Muncho Lake valley north of Muncho Creek crossing (mile 454.5). This change reflects the narrow highway corridor area within this portion of Muncho Lake Park, the wildlife viewing objective of the Trout River planning unit and the potential for day-use recreation which exists in this most developed area.

- Consideration will be given to the adjustment of opening dates for (sheep) hunting from August 1 to August 15 to provide a greater opportunity for non-consumptive enjoyment of the resource during the height of the outdoor recreation season.

- Existing permits for Big Game guiding within the Park shall be managed in accordance with an approved Division Wildlife Policy and Park Resource Management Plan.

- No developments will be permitted to seriously disrupt or impair the use of natural mineral licks within the Park.

- The Division will encourage further study of fish populations in Muncho Lake with the objective to formulate a management plan which will ensure adequate stocks for the achievement of park goals.

- A stocking program of introduced sport fish species may be implemented at the request of the Fish and Wildlife Branch, objectives of which would be to increase the quality of fishing experience offered at Muncho Lake.
c) Vegetation Management

The Park maintains little diversity of vegetation within its boundaries. The Boreal forests are of uniform age with the exception of the area at Peterson Pass. Only on the bouldery fans adjacent to the Alaska Highway are vegetation communities and ecological processes most apparent.

Objective: To conserve the natural, scenic vegetation cover within Muncho Lake Park.

- Owing to the scenic corridor through which the Alaska Highway traverses the Northern Rockies, all wildfire threatens the visual resource of Muncho Lake Park. A Fire Management Plan will be formulated for the Park which considers conservation objectives.
- Horse grazing within the Park will be closely monitored and studied as part of wildlife surveys to determine its impact on natural forage supplies. Grazing quotas will be applied consistent with the recommendations of Division and Ministry of Environment habitat biologists. Domestic grazing will not be permitted adjacent to public rights-of-way.
- The introduction of exotic forage species within the Park will be minimized through existing conditions which limit feeding of domestic stock to concentrated feed pellets.
- The reported wild orchid community near Moose Lake (km705) will be investigated and reported on within a visitor services plan for Muncho Lake Park.
- Firewood cutting will only be from approved areas within the Park.
- To ensure the conservation of natural successional vegetation on the fans, extraction of gravel for purposes other than emergency protection of the Highway will not be permitted. No gravel will be removed from the Park except from areas under Park Use Permit.
- All-terrain vehicles will not be permitted in the Park except on areas designated for such use.
d) Water Management

Presently, northern watersheds are relatively unspoiled by human development and activity. The potential exists at Muncho Lake to ensure that abundant fresh water supplies continue for the benefit of private and public water users in the Park.

Flooding of Park developments has resulted in loss of facilities during previous seasons. Since the Alaska Highway opened in 1942 sections have been damaged on several occasions by debris torrents which sweep mud and boulders over this vital northern connector.

Objective: To conserve the quality of fresh water supplies and the natural hydrological processes which occur in Muncho Lake Park.

- Park developments will be relocated as to minimize risk to Park visitors resulting from sudden, severe flood and debris advances. Established paths of the torrents will be completely avoided by all development.
- The Division will seek co-operation with Public Works Canada to ensure that:
  - flood control projects do not impair Park values;
  - excavations or other activities do not impair the dynamic process of alluvial fan development in the Park.
- Toilet design at park developments will ensure that effluent is not leached into the lake by subterranean drainage.
- The Peace-Liard Health Unit will be encouraged to ensure that sewage treatment on private lakeshore properties at Muncho Lake does not impair lake water quality.
2.3.2 Cultural Resource Management

a) Historical Resources

Evidence of early native exploration and activity exist in the Park although an assessment of their significance is not available. Most of these sites relate to fishing and hunting campsites which existed prior to 1940.

Historical evidence of Alaska Highway construction exists in the form of old building foundations, telegraph lines, abandoned rights-of-way and junk piles scattered along the valley floor. Several commercial developments associated with the early Alaska Highway now stand derelict.

Objective: To assess and protect significant historical resources in Muncho Lake Park.

- Known archeological sites and artifacts will remain undisturbed.
- Only select remnants of the early Highway construction period will be preserved; these to be determined by an Interpretation Plan for Muncho Lake Park.
- A section of the former Alaska Highway through Petersen Pass will be protected as a hiking trail.
- Activities of the MacDonald Indian Band will be considered in management plans formulated in Muncho Lake Park.

b) Visual Resources

The attractive nature of Muncho Lake Park is a reflection of the various visual landscapes presented to the Highway traveller. The dramatically rugged southern Toad River corridor, the subdued rolling terrain of Peterson Pass, the impressive interface of Muncho Lake and the terminal Range, and the tapering corridor of the upper Trout River valley
combine to present a diverse visual treat to north and southbound tourists. Muncho Lake Park is one of the scenic highlights on a trip to or from Alaska. Unfortunately, certain elements along the highway right-of-way detract from the picturesque backdrops of mountains, forest and water.

Objective: To conserve the high scenic quality of Muncho Lake Park with particular emphasis on maintaining an attractive visual corridor adjacent to the Alaska Highway.

- Park developments, especially those in lakeshore areas, will be designed to enhance the visual quality of their setting.
- Permitted resource activity in the Park will be screened from view and rehabilitated upon expiration.
- A maximum degree of visual quality standard will be maintained along the highly visible corridor of the Alaska Highway. A Parkway sub-zone will delineate those areas where intensified management will enhance the visual resource objective.
- The Division will attempt to rid the Park of abandoned, dilapidated buildings and offensive visual distractions.
- The Division will request that P.W.C. or N.W. Tel remove abandoned telephone poles within the highway right-of-way and have others repaired and realigned.
- The Division will co-operate with Ministry of Highways signing policy to clear the parkway of non-standard signs.
- Park signs will be used to denote interesting features such as major peaks, rivers, valleys and services.
- The Division will develop additional viewpoints at interesting natural and cultural features throughout the Park to encourage travellers to stop and safely enjoy the scenery. (Appendix 6)
2.3.3 Recreation Resources

Muncho Lake Park has not traditionally experienced use of its recreation resources for other than consumptive activity. Besides stop-over automobile camping, hunting and fishing represent the most popular recreational pursuits associated with the area. However, potential exists to expand these horizons through the identification and promotion of additional activities and opportunities in the Park. The Alaska Highway continues to deliver potentially receptive outdoor recreationists to Muncho Lake.

Objective: To expand and develop opportunities for non-consumptive recreational activity in Muncho Lake Park which are compatible with the traditional activities of hunting and fishing, and which do not promote direct competition to existing services offered by the private sector.

- The Division will encourage lengthened stays within the Park through the development of short hiking trails and attractive facilities to entice and serve highway travellers.
- The Division will identify and provide information on potential hikes along the alluvial fans and valleys in the Sentinel Range.
- Commercial proprieters will be encouraged to provide outdoor recreation services within the Park. A Visitor Services plan will be formulated for the Park which gives consideration to such activities as horse back trips, boat and equipment rentals, campsites, guided hiking and photography trips.
- Hunting is recognized as a traditional and legitimate use of the Park's wildlife resource. However, season adjustments and minor regulation revisions may be required to accommodate other outdoor recreation activities promoted in this plan.
- Viewing of wildlife will be encouraged, especially in the northern section of the Park.
- Recreation activities which impair Park objectives will not be encouraged. Of particular concern are the increased numbers of all-terrain cycles and vehicles in use near the public camping areas. The Division will enforce regulations.
- The Division will not develop facilities in direct competition with established private entrepreneurs.
2.4 DEVELOPMENT PLAN

Figure 12

2.4.1 Recreation Services

i) Campgrounds: To provide campgrounds located away from natural hazards which in combination with private facilities located in the Park, meet the demands of regional residents and tourists.

- Rocky Mountain campsite will be closed, its roads blocked and all evidence of facilities removed. This site is highly vulnerable to flood and debris torrents.

- Wildrose campsite will be closed and its access road blocked and all evidence of facilities removed. This site is highly vulnerable to flood and debris torrents.

- Strawberry Flats campsite will be redesigned and formalized to meet stated objectives. Fifteen sites are required at this location.

- MacDonald campsite will be redesigned and formalized to accommodate fifteen units concentrated at the north end of the site only.

- Sealed vault toilets will be standard at all campsites.

ii) Day-Use Recreation: To permit short-duration opportunities for hiking, fishing and picnicking in the Park.

- A walking trail will be maintained along Peterson Canyon (south end) leading to the waterfall and side canyon features of this former Highway route. Parking for five vehicles will be provided.
- A trail will be developed along the former tote road behind Strawberry Flats. This trail will lead to a lookout point above Muncho Lake. Where views can be attained of Muncho Lake, the Trout River valley and the Terminal Range. A small pullout will serve as parking.

- A boat launch area will be maintained at MacDonald campsite.

- The southern approach to the former Trout River crossing (km 765.5/Mile 476) will be retained as a day-use fishing spot. The existing laneway may need slight improvement.

- A short lane access to the Trout River will be retained for day use fishing at km 766.5/Mile 477.

iii) Roadside Attractions: To present interesting natural and cultural features of Muncho Lake Park to travellers on the Alaska Highway.

- A southbound pullout will be provided at Km 687.5/Mile 431 to accommodate viewing of Folded Mountain (All pullouts require a co-operative effort with Public Works Canada).

- The pullout at Km 696/Mile 435.5 will be signed and improved for viewing of the alluvial fan and two scenic waterfalls along the south valley wall. (Centennial Falls)

- The pullout at KM 702.5/Mile 439.5 will be signed and improved for viewing the steep canyons of the north ridges as well as the Toad River valley southwest of the Park.
- Brush will be cleared from the Moose Lake pullout to improve viewing opportunities at this location.

- The existing viewpoint at Peterson Pass will be maintained.

- A pullout will be constructed for southbound travellers at Km 728/Mile 456.5 to allow viewing and photography of the scenic mountain valley to the east.

- The existing Muncho Lake viewpoint will be maintained at Km 744.5/Mile 464.5.

- At Km 758.5/Mile 472, the existing litter barrel pullout will be developed to include a small viewpoint overlooking the Trout River valley. Benches on the adjacent terrace will provide a convenient rest area. (see Appendix 7)

- At Km 759/Mile 472, the road will be widened slightly to permit shoulder parking and viewing of Stone's sheep at this popular mineral lick. A caution sign will warn on-coming traffic of the hazard presented by stopped vehicles.

(NB. The above proposals require the co-operation of Public Works Canada as most lie in the established Alaska Highway right-of-way).

- A type II walking trail will provide access to a safe viewing platform overlooking the Trout River Hoodoos at Km 760/Mile 472.5. Restricted access along the valley rim will ensure the integrity and continued use of the licks by Stone's Sheep (see Appendix 7).
2.4.2 Visitor Services:

To promote Muncho Lake Park and to ensure that both visitors and potential visitors are provided with information regarding the Park's natural and cultural features, as well as the opportunities available to them for outdoor recreation. A Visitor Services Plan will be formulated which provides interpretive information about the natural and cultural themes presented by the Park, and which gives consideration to the following proposals.

- development of a Park Information/Facilities display and Folded Mountain viewing point at the Park's southern portal;
- signs at several locations throughout the Park which point out interesting topographic features and opportunities for informal day hiking;
- a self-interpreting loop walking trail to link Petersen Pass viewpoint with the original 1942 Alaska Highway just below. A lookout could be located on the burned knoll adjacent to this historic route;
- a pullout along the rock fan at (former) Rocky Mountain campsite with information regarding alluvial fan formation and vegetative succession;
- at the former gravel pit near Km 760/Mile 472.5, redevelopment as a Stone's sheep interpretive display;
- the existing southbound Park information pullout be expanded at Km 762.5/Mile 474.5. Proper signs should be erected to direct use to this facility;
- a roving interpretive programme be implemented using Liard Hotsprings staff to present scheduled interpretive programmes at the lodges in Muncho Lake Park.

The plan will further consider marketing and promotional methods in an attempt to intice increased visitation to Muncho Lake. Co-operation with local lodges and tourist associations will be required; much potential exists for the private sector to become significantly involved in marketing at Muncho Lake. A variety of commercial services could be provided to potential park visitors. These possibilities should form a significant portion of the Visitor Services Plan.
2.5 Future Development

The following developments are regarded as non-essential within the current planning time frame, however consideration should be given to these facilities when increased use levels and demands for expanded outdoor recreation opportunities become evident.

- A picnic site may be constructed at Drogheda Lake with interpretive information available regarding the construction of the Alaska Highway. This site could be joined to Peterson Pass lookout via the original 1942 Highway trail.

- Development of a Type III day-use trail with parking at Km 750/Mile 465.5. An existing lane leads up the flood wash to the mountain edge where an easy hike leads to sheep habitat, scenic canyons and interesting geological formations.

- A highway rest area may be developed at Peterson Canyon Km 707/Mile 442.5.

- Potential continuation of the historic Highway trail through Peterson Pass exists between Km 708/Mile 443 and Km 713/Mile 446 (just south of Peterson Pass Viewpoint).

2.5.1 Winter Recreation

During the winter months, a marked decrease in traffic on the Alaska Highway results in very few visitors to Muncho Lake Park. Those who remain speak of excellent cross-country and snowmobiling opportunities available in the valleys of the Park. However, two factors limit winter recreation at this latitude: daylight hours are extremely short and daytime temperatures can be bitterly cold (mid-winter months offer as few as six hours of daylight and average daytime high temperatures of between \(-20^\circ\) and \(-30^\circ\)). March and April are the preferred months for winter recreation.
No proposals are presented here for formally accommodating winter activity at Muncho Lake. Use levels are too low and unstructured to warrant consideration at this time. However, the future holds potential for an increase in late-winter activity of a public or commercial nature.

Objective: To recognize the potential for winter recreational activity at Muncho Lake and collect pertinent data about the resource for presentation in a Visitor Services Plan.
2.6 MARKETING PLAN

Muncho Lake Provincial Park is, of course, final destination for very few of the many who travel the Alaska Highway; a vast majority of park use is by the transient tourists of the northwest highway system. The long distance and relative cost of travelling to Muncho Lake indicates that marketing of the Park is directly associated with marketing of the entire Alaska Highway, northern British Columbia and the Yukon. Once committed to the journey Muncho Lake Park is but one of several attractions presented to the tourist along the route.

Expanded traffic volumes on the Alaska Highway will have an impact on recorded visits to Muncho Lake, however will not by themselves contribute to promotion of the Park or its facilities. Only by increasing the length of stay in the Park can recreation and tourism objectives be realized. Proposals have been presented in this plan which are intended to slow traffic through the Park, thereby increasing the potential for overnight or multi-night stays at Muncho Lake. They are also intended to foster a lasting impression on tourists and encourage word-of-mouth promotion of the Park amongst tourists who meet at other locations.

Private commercial operators within the Park can do much to promote the area and increase the satisfaction of those visiting Muncho Lake. By providing private business with information about the Park, its facilities and attractions, this information can then be disseminated to customers throughout the vicinity.

The development and promotion of Maxhamish Lake Park northeast Fort Nelson is not expected to reduce the number of local resident visits to Muncho Lake - both parks are quite different in both purpose and attractiveness. However, Liard Hotsprings Park will continue to present a significant competitor for camping dollars along the Northern B.C. section of the Alaska Highway.
Muncho Lake Park shall be promoted and marketed through an approved visitor services plan which will consider:

- encouragement of private sector involvement in park promotion;

- establishment of a marketing strategy for Alaska Highway provincial parks including Muncho Lake, Stone Mountain and Liard Hotsprings Parks.

- expansion of tourist attractions in the Park which may encourage visits of longer duration;

- submission of material to national and international tourist guides covering northern B.C.;

- media coverage of northern parks and their attractions and;

- the publication of a Northern B.C. Region Provincial Parks map.
2.7 PLAN IMPLEMENTATION

Policies presented in this Master Plan will become effective upon approval of the document. High priority is given to:

- reconstruction of park campgrounds;
- development of viewpoints;
- establishment of a Trout River Hoodoos interpretive area;
- entrance portal information displays;

as well as the implementation of policies regarding:

- the Highway Scenic Improvement Act;
- Land designations;
- boundary revisions;
- hunting regulation amendments

The formulation of Resources Management and Visitor Services Plans for Muncho Lake Park will ensure that management of the Park continues in accordance with this Master Plan.
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APPENDICES

1. Rocky Mountains Natural Region
2. Canada Land Inventory. Capability for Wildlife Ratings
3. Known Archaeological Site
4. Provincial Park Zoning System
5. Highways Scenic Improvement Act and B.C. Reg. 261/70
6. Legal Description, Muncho Lake Park
7. Boundary Revision - Nonda Creek
8. Suggested Design Schemes
9. Photographs
APPENDIX 1 - ROCKY MOUNTAINS NATURAL REGION

1. ENVIRONMENTAL CHARACTERISTICS

1. Location, Size and Climate
   - Situated in eastern British Columbia, extending in a northwesterly direction from the southern international boundary almost to the B.C. - Yukon boundary.
   - General Climate:
     mean annual precip. - Muskwa Ranges:
               40-100 cm (higher in the core of the mountain area)

     mean daily temp. January - north of Peace River: less than 20°C
     mean daily temp. July - 14°C to 16°C throughout

2. Physiographic Characteristics
   - Consists of four major groups of ranges from south to north: Border Ranges Continental Ranges (coincident with most of the southern half of the length of the Rockies), Hart Ranges (extend from the Kakwa area to the Peace River) and the Muskwa Ranges (north of the Peace River).
   - Western boundary of the physiographic region is the eastern side of the rocky Mountain Trench.
   - Rocky Mountain are largely underlain by sedimentary and metaphoric ranges.
   - The predominant rocks are Palaeozoic and Proterozoic limestones, quartzites, schists and slates.
   - The Rocky Mountains, despite the age of the rocks, display relative youth as a mountain system (uplifted about 75 million ago).
   - Pleistocene continental glaciation covered the ranges to heights to 2,300 to 2,600 metres.
   - The Rockies characteristically display distinct stratification.

3. Hydrologic Characteristics
   - There are only modest numbers of lakes, none of which exceed 20-30 sq. km.
   - The streams and rivers drain in a structurally controlled trellis pattern.
Numerous glaciers (alpine and valley types) and icefield, especially in the Continental and Muskwa Ranges. The only river which flows through the Rocky Mountains is the Peace.

4. **Biotic Characteristics**

- Particularly in the Border, Continental and Muskwa Ranges, the treeline is often controlled by typography rather than by climate.

**Biogeoclimatic patterns:**

1) **Alpine Tundra**
   - S.E.S.-S.F.
   - Sub-Boreal Spruce

2) **Alpine Tundra (extensive)**
   - Spruce-Willow-Birch
   - Boreal W.+B. Spruce

- **Bioclimatic Regions:**

1) **Subalpine Forest**
   - Border Ranges
   - Western Continental Ranges
   - Western fringe of Hart Ranges
   - Southwestern fringe of Muskwa Ranges

2) **Alpine**
   - the central core of the Continental Ranges, between 50° and 54°N latitude
   - a central portion in the southern Hart Ranges
   - A large area in the Muskwa Ranges, south of the Toad River and north of the Akie River.

3) **Boreal Forest**
   - northern and southeastern Muskwa Ranges
   - eastern Hart Ranges
Muskwa Ranges

- Located north of the Peace River
- Summit elevations increase northward from the Peace
- Highest peak: Mt. Churchill (3,500 metres)
- Elevation range: 3,000/3,200 metres down to 800/1,000 metres a.s.l.
- Quartzites and limestone underlie many of the high peaks.
- Area has been strongly eroded by alpine and valley glaciation.
- Complex folding is common.
- Many peaks are castellated or flat-topped if strata are horizontal.
- Longitudinal valleys of considerable width and length and prominent features.
- Glaciation was uneven in intensity; some areas show little evidence of glacial erosion despite a veneer of drift throughout the ranges.
- Rugged, majestic ranges similar to the Continental Ranges in geology, glaciation and appearances.
- Much more extensive alpine than southern ranges.
- Biogeoclimatic pattern:
  - Alpine Tundra
  - Spruce-Willow-Birch
  - Boreal W&B Spruce
  - (Sub-Boreal Spruce) - southwest periphery
- Biotic areas: Northern Alplands
  - Boreal Forest
- Current representation (1982):
  - Kwadacha Wilderness Park: satisfactory
  - Muncho Lake Park: partial
  - Stone Mountain Park: partial
APPENDIX 2 C.L.I. CAPABILITY FOR WILDLIFE (UNGULATES)

Class 1: Lands with no significant limitations to the production of ungulates.

Class 1w: Class 1 lands that are winter range.

Class 2: Lands with very slight limitations to the production of ungulates.

Class 2w: Class 2 lands that are winter range.

Class 3: Lands with slight limitations to the production of ungulates.

Class 3w: Class 3 lands that are winter range.

Class 4: Lands with moderate limitations to the production of ungulates.

Class 5: Lands with moderately severe limitations to the production of ungulates.

Class 6: Lands with severe limitations to the production of ungulates.

Class 7: Lands with no ungulate production.
**BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM**

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<td>4. Location (a) Plan</td>
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<td>4. Location (b)</td>
<td>The site is located 103 meters due south of Muncho Lake and 132° West (300 m) Trout River mouth (South). The cabin is just north (but due west) of mile 457 of the Alaska highway.</td>
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<td>5. Access Accessibility</td>
<td>Access is most readily available by boat. Travelling by boat towards the south-west corner of Muncho Lake stop at the mouth of Trout River. From this point travel south-southwest at 172° for a distance of 300 meters arriving at the cabin.</td>
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<td>12. Drainage (a) minor</td>
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BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

2. Previous designation(s).............. IfSk T2.............. 3. Site name(s)..............

4. Location (a) Sec. .............................. Lot. 1650 .............. Plan. ......................
(b) Just before mile post 450 on Alaska Hwy, SW side of Hwy. On NW end of Drogheda Lake, 26 m. down outlet creek (Muncho Creek). Cross creek onto left (SW) bank. Follow old road cut s. up to terrace 22 m. Site is here on terrace centred between remains of two old buildings (probably dating to building of Alaska Hwy. - rumour was that they were US army buildings.

5. Access...Drive to N. end of Drogheda Lake (approx. mile 450 on Alaska Hwy.)
Here there is a parking lot. Park and walk 26 m. N. along outlet creek.
(Muncho Cr.) Cross on plank (Corner post for lot 1650 is here). Walk 22 m. up (roughly south) to terrace. Site extends from here to far side of terrace (roughly 42 m. WNW).

6. Province and districts............. B.C. ....................... (a) Regional District.................. Peace-River Liard (b) Forest and Grazing District........ Prince George (c) Highways District........... Fort St. John (d) Provincial Park.............. Omineca-Peace (e) Resource Management Region........ Omineca-Peace (Liard)

7. Lat. 58° 50' 40" N. Long. 125° 43' 30" W. 9. UTM. ......................

10. Air photo...BC 5509:031-033 ..................... 11. Map (a)...94K/13E, Muncho Lake

12. Drainage (a) minor...Muncho Creek, Trout River (b) major...32, Liard

13. Elevation (a) ca...3500 ft. a.s.l. or 1067 m. a.s.l. (b) 4-5 m. above Drogheda Lake

14. Cultural affiliation (a)...Kaska...Athapaskan (b) ......................

15. Site type...general activity

16. Dimensions (a) exact...42.311 m. x 22 m. NNE (b) estimated...50 x 25 m. (c) original...50 x 25 m.?

17. Condition (a) present...90% (b) future...doubtful, if so by hwy.?
1. **Location and access**

   Esker at north end of Muncho Lake

2. **Site name**

3. **Previous designations**

4. **Type**

5. **Dimensions**

6. **Depth of deposit**

7. **Elevation**

8. **Water**

9. **Vegetation on site**

10. **Surrounding vegetation**

11. **Fill of site**

12. **Subsoil and surrounding soil**

13. **Burials**

14. **Habitations**

15. **Other features**

16. **Present condition**

17. **Possibility of future disturbance**

18. **Known finds and present location**

   1 point frag., detritus

   NATIONAL MUSEUM

19. **Owner(s)/tenant(s) past and present**

20. **Attitude to excavation**

21. **Camping facilities**

22. **Historically territory of**

   TlSnMAnA Indians

23. **Site was/was not occupied by Indians in historic times until**

24. **Informants**

25. **Map**

26. **Air photo**

27. **Photographs**

28. **Published references**

29. **Remarks and recommendations**

30. **Reported by**

   R. S. Macleish, 1957

31. **Observed by**

32. **Recorded by**

33. **Date**

(Continue or expand on back if necessary. Sketch map is desirable.)
1. Site No.: IgSk 2

### BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

2. Previous designation(s):  

3. Site name(s):  

4. Location (a) Sec. Lot Plan  
   (b) "Found chips on the shore below high water mark in cove between mile 462 and 463. Possibly these had been washed out of low terrace some foot or so above high water."  

5. Access: Drive along Alaska Hwy. Either park truck and hike to water's edge or possibly better park at water's edge via one of the lodges at mile 463 and walk or canoe down (SOUTH) the lake to whereever the site may be.  

6. Province and districts: B.C.  
   (a) Regional District: Peace River - Liard  
   (b) Forest and Grazing District: Prince George  
   (c) Highways District: Ft. St. John  
   (d) Provincial Park: Omineca-Peace, Liard  
   (e) Resource Management Region: Omineca-Peace  

7. Lat.: ° "N. 8. Long.: ° "W. 9. UTM:  

8. Air photo:  

9. Drainage (a) minor: Muncho Lake, Trout R.  
   (b) major: 32, Liard R.  

10. Elevation (a) ca. 2681' or 817.2 m. asl  
    (b) 1 foot below high water mark  

11. Cultural affiliation (a) Kaska, Athapaskan  

12. Site type: general activity?  

13. Dimensions (a) exact?  
    (b) estimated  
    (c) original  

14. Condition (a) present?  
    (b) future?
BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

1. Site No. IgSk 1

2. Previous designation(s) IgSk T3

3. Site name(s)

4. Location
   (a) Sec. 
   (b) Lot 
   (c) Plan 
   (d) Approximately mile 464 Alaska Hwy. N. end Muncho Lake on E. side. Ca.
   (e) 35 m. N. of point formed where long finger-shaped bay starts. Here there
   (f) is a cat cut leading down to lake. On N. side of cat cut 27m up from lake
   (g) high water mark there is an overturned tree where there was 2 flakes of grey
   (h) chert.

5. Access
   (a) It may be possible to drive off the Alaska Hwy. via a side road and/or
   (b) cat cut right to the site. We drove down to lake via sideroad at UTM grid.
   (c) ref. 407474 (good places to camp here!) and canoed up.

6. Province and districts
   (a) Regional District Peace River - Liard
   (b) Forest and Grazing District Prince George
   (c) Highways District Fort St. John 4-6
   (d) Provincial Park Ominaca Peace (Liard) (e) Resource Management Region Omineca Peace

7. Lat. 59° 02’ 35” N. 8. Long. 125° 47’ 40” W. 9. UTM 10VCA 397480

8. Air photo BC 5476: 195-197, 251-253

9. Map (a) 94N/4, Trout R.

10. Drainage
    (a) minor Muncho Lake, Trout River (b) major 32, Liard River

11. Elevation
    (a) 2700' asl 823 m. asl
    (b) 3 m. above level of Muncho Lake

12. Cultural affiliation
    (a) Kaska, Athapaskan
    (b) 

13. Site type
    (a) random find/possible general activity

14. Dimensions
    (a) exact 1 x 1 m.
    (b) estimated ?
    (c) original

15. Condition
    (a) present
    (b) future disturbed by cat cut, if ther
I'LLASL LOP( 'L I ALLAJIMF'AN 1

2. Previous designation(s) IgSk T4
3. Site name(s)

4. Location (a) Sec. Lot Plan
(b) Approximately mile 464. Alaska Hwy at NW corner of small circular bay

5. Access... At ca. mile 463.5 Alaska Hwy... you can see the bay which is the first time for about 4 kilometers that you are close to the lake. There is a large culvert draining under the road into the bay. Approximately 0.1 km N past this is the access road on the left which goes down to the unorganized camping areas along the N side of the bay and to the N of the bay itself. Right at the (continued on page 4)

6. Province and districts. B.C. (a) Regional District Peace River-Liard (b) Forest and Grazing District Prince George. (c) Highways District A4 - Fort St. John (d) Provincial Park 4-6. (e) Resource Management Region. Omiska-Peace Region. Liard

7. Lat. 59° 02' 47"N. Long. 125° 46' 43"W. 9. UTM 10VCA 406474

8. Air photo. BC5476: 196-197, 251-252

10. Map (a) 94N/4, Trout River

12. Drainage (a) minor Trout River (b) major 32Liard

13. Elevation (a) 2681' asl or 817.2 m asl (b) 0-30 cm above July level of Muncho

14. Cultural affiliation (a) Kaska. Athapaskan (b)

15. Site type general activity

16. Dimensions (a) exact 16 x 3 m. (b) estimated ?
(c) original ?

17. Condition (a) present ? (b) future disturbed by ice and wave action. Possible expansion by Parks 18. Priority Br.
PLEASE COMPLETE LT ACCOMPANYING GUIDE BEFORE COMPLETING

BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

1. Site No. IgSk. 6

2. Previous designation(s) .......... IgSk. T6

3. Site name(s)

4. Location (a) Sec. Lot. Plan

(b) ... on a 2.5 m. terrace at the place where the peninsula on the westerly shore of Muncho Lake joins the mainland.

5. Access Alaska Highway to Mile 463 then by boat southwesterly across Muncho Lake to the peninsula, then along the peninsula to its base. Disembark and proceed up the slope of the terrace on the Northeasterly side of a small pond about 20 meters.

6. Province and districts........... (a) Regional District Peace River-Liard

(b) Forest and Grazing District Prince George

(c) Highways District 44 Ft. St. John

(d) Provincial Park 4 Ominica-Peace, 6 Liard

(e) Resource Management Region Ominica-Peace

7. Lat. 59° 00' 53" N. 8. Long. 125° 47' 32" W. 9. UTM 10YCA 397.44

10. Air photo BC. 5476:195-196

11. Map (a) 944/4, Trout River

12. Drainage (a) minor Muncho Lake, Trout River (b) major 32 Liard River

13. Elevation (a) 2700' a.s.l, 823 m. aal (b) 2.5 m. above Muncho Lake

14. Cultural affiliation (a) Kaska, Athapaskan (b)

15. Site type general activity

16. Dimensions (a) exact 20 m. x 10 m. (b) estimated 20 x 20 m. (c) original

17. Condition (a) present 100% intact (b) future low probability of future...
1. Site No...IgSk.5...

2. Previous designation(s)........IgSk.T5
3. Site name(s)..................

4. Location (a) Sec..................Lot..........................Plan..........................
   (b) Near mile 465 Alaska Hwy at N end Muncho Lake just before outlet for Trout River on west side of lake just before point where current for Trout River starts to become noticeable.}

5. Access. Drive to approximately mile 464 on Alaska Hwy and turn left (W) onto side road (first road past bay seen from Hwy.) which turns first S, then W, then N. Follow to the end and launch boat. Paddle, row, or motor whatever you got to very N end of lake on west side just before the current is noticeable. Here there are two opposing points which could be considered the start of the river. On the west side (see page 4)

6. Province and districts........B.C. (a) Regional District......Peace River - Liard
   (b) Forest and Grazing District.........Prince George
   (c) Highways District........44-Ft. St. John
   (d) Provincial Park........4-6 Omineca-Peace (Liard)
   (e) Resource Management Region........Omineca-Peace

7. Lat. 59° 03' 02" N. Long. 125° 48' 03" W. 9. UTM 10VCA 394487.5

8. Air photo. BC 5476: 251-253

9. Map (a)........94N/4 Trout River

10. Drainage (a) minor Muncho Lake Trout River (b) major Liard River

11. Elevation (a) 2684 ft. asl or 818 m. asl (b) ca. 75 - 1.00 m. above July lake level

12. Cultural affiliation (a) Kaska (b) ......................................

13. Site type general activity, possible workshop and/or campsite

14. Dimensions (a) exact 5 m. radius (b) estimated ...?

15. Dimensions (c) original ...?

16. Condition (a) present good (b) future minimal

17. Priority

...
BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

1. Site No. IgSk 7

2. Previous designation(s) IgSk 17

3. Site name(s) IgSk 7

4. Location (a) Sec. 1175 (b) on a high terrace above a small shallow and swampy cove on the east shore of Muncho Lake, north of a small creek that crosses the Alaska Highway at approximately mile 462.5.

5. Access. From the Alaska Highway, walk westerly down an unnamed creek at approximately Mile 462.5, to Muncho Lake, then follow a trail, northerly up the side of the bluff. At the bluff edge, turn westerly and continue about 20 m.

6. Province and districts (a) Regional District Peace River - Liard

7. Lat....59° 01' 27" N. 8. Long...125° 46' 27" W. 9. UTM. 10VGA 408458

8. Air photo

9. Map (a) 94 N/4, Trout River

10. Drainage (a) minor Muncho Lake - Trout River

11. Major 32, Liard R.

12. Elevation (a) 2715' or 827.5 m. asl

13. (b) approx. 10 m. above Muncho Lake

14. Cultural affiliation (a) Kaska, Athapaskan

15. Site type general activity

16. Dimensions (a) exact 17 m. EW x 30 m. NS

17. Condition (a) present undisturbed (b) future little chance of future disturbance

18. Priority
BRITISH COLUMBIA ARCHÆOLOGICAL SITE INVENTORY FORM

1. Site No. IgSk 7

2. Previous designation(s) IgSk T7

3. Site name(s)

4. Location (a) Sec. 1175. Lot. Plan.

(b) On a high terrace above a small shallow and swampy cove on the east shore of Muncho Lake, north of a small creek that crosses the Alaska Highway at approximately mile 462.5.

5. Access. From the Alaska Highway, walk westerly down an unnamed creek at approximately Mile 462.5, to Muncho Lake, then follow a trail, northerly up the side of the bluff. At the bluff edge, turn westerly and continue about 20 m.

6. Province and districts (a) Regional District Peace River - Liard

(b) Forest and Grazing District Prince George

(c) Highways District 44, Ft. St. John

(d) Provincial Park Omimica-Peace

(e) Resource Management Region Omimica-Peace

7. Lat. 59° 01' 27" N. Long. 125° 46' 27" W.

8. UTM 10YCA 408458

9. Air photo

10. Map (a) 94 N/4, Trout River

11. Map (b)

12. Drainage (a) minor Muncho Lake, Trout River

(b) major 32, Liard R.

13. Elevation (a) 2715' or 827.5 m. asl

(b) approx. 10 m. above Muncho Lake

14. Cultural affiliation (a) Kaska, Athapaskan

(b)

15. Site type general activity

16. Dimensions (a) exact 17 m. EW x 30 m. NS

(b) estimated

(c) original

17. Condition (a) present undisturbed

(b) future little chance of future disturbance...
1. Site No. IgSk - 8

**BRITISH COLUMBIA ARCH/EHOLOGICAL SITE INVENTORY FORM**

2. Previous designation(s) ... IgSk T.W.H.  
3. Site name(s) ...  

4. Location (a) Sec.  Lot.  Plan.  
   (b) The site is located within lot # 1189 on the East shore of Kuncho Lake at approx. mile 462.3 of the Alaska Highway. Within this lot there is a step rise towards the North side of the lot, the site is located on top of this rise.  

5. Access ... From mile 462.3 of the Alaska Highway proceed westward by foot towards the Lake. At this point (i.e. the shore line) a noticeable step rise will appear to the North of your location which should be at the beach just in front of a small cabin. Proceed Northward to the top of the rise and one reaches the location of the site.  

6. Province and districts ... British Columbia ... (a) Regional District Peace River - Liard  
   (b) Forest and Grazing District Prince George ... (c) Highways District Fort St. John  
   (d) Provincial Park Omineca - Peace ... (e) Resource Management Region Omineca - Peace  

7. Lat ... 59°.0'44"N  8. Long ... 125°.16'31"W  9. UTM ... 407  10. Air photo  11. Map (a) ... 94 N / h Trout River  
   (b) ...  

12. Drainage (a) minor ... Kuncho Lake  
   (b) major ... 32  

13. Elevation (a) ... 2700 Ft.  
   (b) ... 400 above Kuncho Lk.  

14. Cultural affiliation (a) ... Kaska  
   (b) ...  

15. Site type ... General Activity  

16. Dimensions (a) exact ... 30 m. x 19 m.  
   (b) estimated ... unknown  
   (c) original ... unknown but a cut through part of the site made, erosion  

17. Condition (a) present ... Disturbed & eroding  
   (b) future ...  

18. Priority ...
tifinAttT UF LUNINts Yr)ItM

OBJECTIVES

ZONE

Development

To provide for a variety of
facility-oriented recreational
opportunities.

MANAREMENT

Goincims

-oriented toward maintaining high quality
recreation and interpretive experience.
-intensive management may be required to
ensure that high quality recreation and
interpretive npportunities are maintained.
-special design consideration generally
required.
-intensity of developments and standard

FAf IIIilFSfACT IVITIiS
-intensive recreational facilities such
as auto campgrounds, cabins, lodges.
picnic areas, beach and swimming areas,
nature housws, information buildings, downhill ski facilities. walk-in campgrounds.
-ancillkry facilities sucn as wring,
sanitation, picnic tables, re:taurants,
may lw inrIuded in this ?fine.

of facilities are variable and will relate
to the objectives for the Park.
-private motorized vehicles may he

restricted.

Natural
Environment

To provide for Intermediate
levels of outdoor recreational
opportunities/use In a natural
setting.

.management will be oriented toward maintenance or restoration of the natural
environment.
-visitor access may be restricted to
preserve the recreational experience or
to limit impaCt on the area.
-designation of transportation modes may
be necessary to avoid potential conflicts.
(e.g. horse trails, cycle paths, hiking
trails)

- private

motorized vehicles may be

permitted.
-intensity or management and development
will be consistent with moderate levels

of recreational use.
-visitor support facilities will be
limited. and directed toward providing
for public safety and minimizing user
impact.

Wilderness

-To protect and preserve landscapes and resource processes.

- To

provide for low levels of
recreational use in an environment where natural
processeS occur with a minimum
of human interference.

-oriented toward the protection and p'reservation oe the area's atmosphere, environment or ecology, while optimizing
recreational opportunities associated
with the "wilderness experience".
-unstructured visitor mobility.
-visitor support facilities will not be
provided, except where absolutely .
necessary to provide for public safety
or minimizing user impact.
-transportation limited to foot access,

and non- motorized boats.

-Development and use are consistent with
the maintenance of natural conditions.
Activities consistent with this zone
would be: hiking, camping. canoeing,
kayaking, snowshoeing, cross country
Skiing, nature observation, horse back
riding, picnicking, swimming, fishing,
interpretation programs.
-minimal facilities Such as trails, shelters, hikers campsites, portages. horse
corrals, observation blinds, may be
developed to compliment these activities,
but the emphasis of the development will
ertlne
li ve
be toward public safety rather
enCouranement of more in
of use.
-visitor facilities will he of a Primitive
nature.

-only minimal primitive facilities would
be developed consistent with low intensity uses. Activities consistent with
this zone include. camping, hiking/
mountaineering. canoeing, kayaking. crossCOuntry skiing and snowshoeing, fishing,
nature observation. In some areas.
hunting may be considered an appropriate
use. In some cases, it will be necessary
to allow the limited use of aircraft,
motorboats. snowmobiles. etc. as important
means of access for management or to permit
reasonable public access into extremely
normttc
C.1,-tnninn AnA
rftmnin Awn..


Commencing at a point on the southern limit of the right-of-way of the Alaska Highway and being 91.44 m due South of a standard post and mound referenced as number 92 and shown on Plan 3, Township 406, by A.C. Pollard, B.C.I.C., and being due South for 4.83 km:

thence due West along the northerly limit of the Alaska Highway to an intersection with the center line of the Alaska Highway.

thence due West along the left hand bank of the Toad River; and

thence due South for 4.23 km:

thence due East along the southerly limit of the Alaska Highway to an intersection with the center line of the Toad River;

thence due East to the southerly limit of the Trout River drainage;

thence due South for 4.83 km along the easterly drainage limit of Trout River and Huncho Lake to a point being the headwaters of the main stream of Trout Creek;

thence in an easterly direction along the left hand bank of said Trout River to the point of commencement.

All Crown land described as:

1. District Lots 621, 622, 623, 624, 625, 627, 1168, 1172, 1173, 1174, 1179, 1182, 1183, 1161, 1162:

2. Commencing at a point 30.48m N 23° 42' 30" W of a point marked R. 70 P.

thence N 23° 42' 30" W 182.88 m;

thence S 49° 00' 00" E 121.92 m, more or less, to the point of commencement and containing approximately 4.73 ha.

3. Commencing at a point 30.48 m S 27° 44' 00" E of the northwest corner of Lot 568:

thence S 27° 44' 00" W 30.48 m, more or less, to the south boundary of Lot 568;

thence Northwesterly along the southerly boundary to the northeast corner of Lot 568;

thence S 49° 00' 00" E 486.72 m;

thence S 27° 44' 00" E 449.58 m;

thence N 23° 42' 30" W to the west boundary of Lot 622;

thence Northwesterly along the southerly boundary of Lots 622 and 621 to the northeast corner of Lot 621;

thence Northwesterly along the easterly boundary of Lot 621 to a point 30.48 m southerly of the northeast corner of Lot 621;

thence N 23° 42' 30" W 30.48 m, more or less, to the southerly boundary of the highway right-of-way;

thence Northwesterly 30.48 m along the southerly boundary of the highway right-of-way;

thence S 72° 42' 30" E 30.48 m, more or less, to the point of commencement and containing approximately 19.43 ha.

4. Commencing at a point which lies 121.92 m S 27° 45' 15" W and 22.86 m N 10° 45' E of a point marked W1, P.T.M. 96 located on the easterly boundary of the Alaska Highway right-of-way at Mile 453:

thence S 49° 00' 00" E 226.60 m;

thence N 23° 42' 30" W 30.48 m, more or less, to the southerly boundary of the highway right-of-way;

thence S 72° 42' 30" E 15° 15" W 152.40 m;

thence N 23° 42' 30" W 45.72 m;

thence N 23° 42' 30" W 15° 15" W 304.80 m;

thence S 72° 42' 30" E 15° 15" W 152.40 m, more or less, to the point of commencement and containing approximately 6.73 ha.

5. Commencing at a point 121.92 m N 23° 45' 00" W of a point marked W1, P.T.M. 106 located on the easterly boundary of the Alaska Highway right-of-way at Mile 464.3;

thence N 23° 45' 00" W 426.72 m;

thence N 49° 00' 00" W 281.94 m;

thence Southeasterly 35.28 m parallel to and 30.48 m perpendicularly distant from said westerly boundary of the highway right-of-way;

thence N 23° 45' 00" W 30.48 m, more or less, to the said westerly boundary of the highway right-of-way;

thence Northwesterly 30.48 m along said boundary;

thence N 23° 45' 00" W 30.48 m, more or less, to the point of commencement and containing approximately 17.12 ha.

6. Commencing at a point which lies 121.92 m S 27° 45' 30" W and 15.24 m N 23° 45' 30" W of a point marked W1, P.T.M. 144, located on the easterly boundary of the Alaska Highway right-of-way at Mile 477;

thence S 49° 00' 00" E 274.32 m;

thence S 72° 42' 30" E 292.61 m;

thence N 23° 45' 30" W 304.80 m, more or less, to the westerly boundary of the highway right-of-way;

thence Northwesterly 30.48 m along said boundary;

thence N 23° 45' 30" W 30.48 m, more or less, to the point of commencement and containing approximately 17.12 ha.

All of Peace River District and containing 8415.02 hectares more or less.
BACKGROUND DETAILS TO THE ESTABLISHMENT OF MUNCHO LAKE PARK

1955 - August 15: Crown lands adjacent to the Alaska Hwy. and known as Muncho Lake Protective Strip were reserved as a U.R.E.P. by O.I.C. 2021 (103,603.20 ha).

1957 - May 31: Muncho Lake Park was established as a Class "B" Provincial Park by O.I.C. 1294 (88,467.42 ha).

- December 6: L. 623, Peace River Dist. (0.40 ha) was deleted from park & Ls. 1643 & 1644, Peace River Dist. (1.37 ha) were added to park by O.I.C. 3006.

1969 - October 30: 56.82 was deleted from park for gravel pits required by the Ministry of Highways by O.I.C. 3436.

HIGHWAY SCENIC IMPROVEMENT ACT
CHAPTER 169
Interpretations
1. In this Act,
(a) 'Crown land' means land of the Crown in right of the Province;
(b) 'designated highway' means a highway or part of a designated by the minister under section 5;
(c) 'highway' has the same meaning as in the Highway Act;
(d) 'municipality' includes the City of Vancouver;
(e) 'roadside premises' means land within 150 m of the center line of a designated highway;
(f) 'vehicle' has the same meaning as in the Motor Vehicle Act and includes the removal of a vehicle.

Designation of highways
2. The minister may designate a highway or part of it and shall give notice of it in the Gazette and in a newspaper circulating in the area in which the highway is situated or, if there is no newspaper, in a newspaper circulating generally in the Province.

Notice to remove unsightly accumulations
3. (1) Where, for premises
(a) not within a municipality, the minister, or
(b) within a municipality, the council
is satisfied that there is on roadside premises an accumulation of rubbish, garbage, ashes, filth, discarded materials, or the bodies or parts of vehicles or machinery, or all or any of them, causing the premises to be unsightly or offensive to any part of the public travelling or a designated highway, the minister or the council may serve notice on the owner or the occupier of the roadside premises requiring him to remove the accumulation or to take remedial measures the notice specifies.

(2) A notice under this section shall be served on the owner or occupier, either personally or by leaving it for him with an adult at his place of ordinary residence.

(3) Where a notice is served on the owner of premises occupied by another, the owner shall within 7 days of the service of notice notify the occupier. If a notice is served on an occupier who does not own the premises, the occupier shall at once notify the owner.

Removal of unsightly accumulations
4. (1) Whether or not any change not containing compliance with the requirements of the notice has been made, if, within 30 days of notice being served on the owner or occupier of the notice have not been complied with, and.

in the opinion of a person authorized by the minister or the council, the premises, because of the accumulation remains unsightly or offensive to any part of the public travelling on a designated highway, the person authorized may carry out the requirements of the notice at the expense of the owner, and the costs, with interest at 6% per year and the costs of recovery, may be recovered in the same manner as
(a) delinquent taxes under the Taxation (Rural Areas) Act where the premises are not within a municipality; or,
(b) municipal taxes which are in arrears, where the premises are within a municipality.

(2) A person authorized, and persons acting under his direction for carrying out the requirements of the notice, may enter the premises and carry out the requirements of the notice on production of a copy of the notice and the written authority referred to in subsection (1).

(3) Where the minister or the council, or any person to whom subsection (2) refers, or any person who receives any notice removed on a dispensation under this section, are liable or accountable to the owner or occupier of the premises, or to any person having any right or title to all or part of the accumulation, for the removal from the premises of it in accordance with the requirements of the notice or for any matter removed, or for the proceeds, if any, of the disposal of it.

Appeal
5. (1) An appeal from the notice of the minister or of a council under this Act to the County Court of the county in which the premises are situated, and the court may, for good cause, stay or quash the notice, or may dismiss the appeal. Where a notice is varied, it is effective and enforceable as varied, and the determination of the County Court is final.

(2) Notice of an intention to appeal shall be given to the court and to the minister or council within 14 days of the service of notice appealed against, or at the expiry of the period of 14 days and, where notice is given to the minister or council, they shall not carry out the requirements of the notice until after 30 days have expired since the determination of the court dismissing the appeal or varying the notice, as the appeal is withdrawn.

Dispute between owners and occupiers
6. Where the requirements of a notice served under section 3 have been carried out by a person authorized by the minister or council, and the expenses of it have been paid by the owner or occupier, or by any other person having an interest in the premises, or recovered under section 4 (1), the owner or the owner, as the case may be, may apply to the County Court in the county in which the premises are situated for an order that he be reimbursed in whole or part by some other person, being the owner or occupier, or having some other interest in the premises, who was responsible for the accumulation or for failure to notify the claimant as required by section 4 (2). On an application, the court shall give relief, just and equitable, due regard being given to the relations, and any agreement, between the parties.

Abandoned vehicles
7. (1) No person shall abandon a vehicle on a highway or public right of way, or on Crown land.

(2) Where, for an area
(a) outside a municipality, the minister, or any person authorized by him, or
(b) within a municipality, the council or any person authorized by the council, either generally or individually, in writing,
it is satisfied that a vehicle has been abandoned, the minister, council, or authorized person, at the case may, may remove and dispose of the vehicle and, subject to subsection (3), where a vehicle is removed or disposed of under this subsection, that the minister or the council, or any person authorized or acting on the directions of a person authorized, or any person who receives the vehicle on a dispensation under this section, is liable or accountable to a person having right or title to the vehicle for the removal, for the vehicle, or for the proceeds, if any, of the disposal.

(3) A vehicle removed under subsection (2) shall not be disposed of
(a) if there is a record of the vehicle in the records of the superintendent of motor vehicles, or there is other evidence of ownership or in the vehicle, unless
(b) notice in writing is given by registered mail to the last owner on the records of the superintendents of motor vehicles, or to the person whose apparent ownership is evidenced; and
(c) 14 days have elapsed since the mailing of the notice, or
(d) in any other case, unless 7 days have elapsed since the removal, and no person has appeared who has established his claim to the vehicle, the costs of removal, and the proceeds of any sale.

(4) The expenses incurred in the removal or disposal of a vehicle under this section, less the proceeds, if any, of disposal, are recoverable as a debt due to the Crown or the municipality from the person who abandoned or authorized the removal or disposal of the vehicle in conservation of subsection (1), and, in the absence of proof to the contrary, the last person whose name appears as owner of the vehicle in the records of the Superintendent of Motor Vehicles is deemed to have authorized the removal or disposal of the vehicle from which it was removed.

(5) Nothing in this section applies to a vehicle left abandoned temporarily by reason of any mechanical defect or as of adverse road conditions; but where a vehicle is left temporarily abandoned on a highway or public right of way, or, without authority, on Crown land, for a period exceeding 12 hours at any accessible place, the burden of proving that the vehicle was not abandoned is on the person who alleges it was not abandoned.

Offence and penalty
8. (1) A person who interferes with a person referred to in section 4 (2) in carrying premises to carry out the requirements of the notice commits an offence and is liable on conviction to a fine not exceeding $500.

(2) A person who abandons a vehicle in contravention of section 7 (1) commits an offence and is liable on conviction to a fine not exceeding $300.
HIGHWAYS (SCENIC IMPROVEMENT) ACT, 1968

DESIGNATION MADE NOVEMBER 6, 1970, BY MINISTER

Pursuant to section 3 of the Highways (Scenic Improvement) Act, 1968, those highways, or parts thereof, numbered 2, 29, and 97 lying within the boundaries of the Peace River-Liard Regional District but not within the boundaries of any incorporated municipality, on the request of the Board by resolution, are designated for the purposes of that Act.
APPENDIX 7 BOUNDARY REVISION - NONDA CREEK

Existing Status: Currently, the park boundary within the vicinity of the Nonda Creek headwaters is described as "the main channel" of the creek. At this location however, it is difficult to determine the actual main stream; various maps illustrate the boundary differently. With the recent guide-outfitting quotas placed within the park, management and enforcement of P.U.P.s will become difficult when only a small stream separates parkland from vacant Crown land. In addition, many hectares of very scenic, easily traversable land within the Nonda Creek basin is excluded from the park although within the same valley.

Proposal: There are no apparent encumbrances which would prevent the extension of parkland to include all of the Nonda Creek as illustrated below. The seasonal private residence located in the vicinity lies outside of the proposed extension and is related to the Park only in that its occupant maintains a P.U.P. and quota for commercial guide-outfitting in the area. Because of the proximity to this base camp, management of the park's wildlife resource would be more effective if the basin became the jurisdiction of one agency. The boundary revision follows natural topographic features associated with a watershed, adding 1295 hectares to the park.
UNNAMED PEAK - MILE 456

ROCKY MOUNTAIN ALLUVIAL FAN
ABANDONED TELEPHONE POLES
Stone Mountain Provincial Park
MASTER PLAN

Summer 1984
To: Vince Collins  
Assistant Deputy Minister  
Parks & Outdoor Recreation Division  
1019 Wharf Street  
Victoria, B.C.

Date: May 10/85
File: 2-4-6-3

I am pleased to forward the attached document to you and recommend that it be approved as the Stone Mountain Provincial Park Master Plan.

T.O. Moore  
Regional Director  
Northern B.C. Region

APPROVED: [Signature]  
Assistant Deputy Minister  
DATE 15/8/85
STONE MOUNTAIN PROVINCIAL PARK
Master Plan

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PROVINCIAL PERSPECTIVE

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STONE MOUNTAIN PARK
STONE MOUNTAIN PROVINCIAL PARK

Master Plan

PLAN SUMMARY

- For northbound Alaska Highway travellers, Stone Mountain Provincial Park represents an introduction to the Rocky Mountains. The Alaska Highway attains its highest elevation through the Park.
- Most of the Park cannot be seen from the highway; the road follows a relatively narrow corridor through the fifteen kilometre breadth of parkland.
- Stone Mountain Park provides partial representation of the Rocky Mountain Natural Region, Muskwa Ranges regional landscape; valuable representative areas lie south of the park along Wokkpbash Creek.
- The Park offers exceptional backcountry recreation opportunities in close proximity to the Alaska Highway for residents of Fort Nelson and other communities in northeastern British Columbia.
- The Park represents a destination area for very few persons; most visitation is from casual pass-through traffic.
- The Park supports big game species with hunting currently the most popular recreation pursuit.
- Existing highway commercial operations do not enhance the Park image or achieve the management objectives determined by this plan.
- The Park will be zoned to accommodate various types of land use with an overall intent to remove most resource extraction and highway commercial activity from the limited parkway corridor.
- The Plan recommends expansion of the Park southward to include the Wokkpbash Park study area.
- Changes to hunting regulations are recommended in the North Tetsa River headwaters and the MacDonald Creek valley.
- The Division will co-operatively attempt to achieve scenic improvement to all lands along the Alaska Highway using the Highway Scenic Improvement Act.
- A touring campground will be developed on the east edge of Summit Lake.
- Expanded picnicking facilities will be added to the Park.
- Day hike trails into alpine basins which lie in close proximity to the highway will encourage longer stays at Stone Mountain Park.
- The Plan recommends that Resources Management and Visitor Services plans be formulated for Stone Mountain Park.
PART 1

1.0 INTRODUCTION

Within the context of modern history and exploration there are certain areas of the country which have remained essentially unexplored until only recent times. The Peace River Block, situated in the northeastern corner of the Province, was settled during the late 1800's and introduced a Euro-American farming population to the B.C. prairie. This settlement remained the most northerly populated area of the province for several years. Except for the ramblings of prospectors and adventure seekers, the mountains which separated the Peace River country from the rest of B.C. remained unexplored wilderness until the 1940's and 50's.

Stone Mountain Park is situated near the 58th parallel aside the backbone of the northern Rocky Mountains (Figure 1). At this point the Continental Divide is located well west of the Rockies; the Peace and Liard Rivers having cut through the barrier to drain regions within the Rocky Mountain Trench and Liard plateau. Summit Lake, within Stone Mountain Park, marks the divide between the watersheds of the Muskwa/Fort Nelson River systems and the Racing/Liard River system. These major drainages eventually meet the Mackenzie and flow northward to the Arctic Ocean.

Within the Park lie the headwaters of the east-flowing North Tetsa River and northwest flowing MacDonald Creek. Summit Pass was attained during construction of the Alaska Highway in 1942; the pass still represents the highest point on the route (1,275 m) and presents northbound travellers their first view of the Rocky Mountains.

Recognizing the attraction of the northern Rockies, the province established a Liard River Reserve in 1944. This reserve extended over most of the Liard Hotsprings, Muncho Lake and Summit Lake scenic areas. The huge tract was eventually split into smaller separate reserves and in 1957 lands surrounding Summit Lake were established as Class B Stone Mountain Park with boundaries much as they remain today.
Although a vast area of the northern Rockies' valley systems and mountain ranges have been explored, most of the territory nonetheless remains rugged wilderness. Few roads branch from the Alaska Highway, thus leaving foot or horseback as the sole means of truly exploring the hinterland. In contrast however, the Highway does permit thousands to experience the character of the northern terrain; improvements to the route and its service centres continue to attract tourist travel to northern B.C. and through the Provincial parks of the Alaska Highway system.

This Master Plan not only contains information pertaining to the resource base of the Park but also presents and addresses the complex issues which affect park management today. It suggests policy objectives and development proposals that will guide those responsible for continued effective management of the Park and its resources. The plan will be reviewed in accordance with Division policy whenever required.
1.1 REGIONAL AND PROVINCIAL CONTEXT

Centered only 160 kilometres south of the B.C./Yukon border on Mile 400 of the Alaska Highway (Highway 97), Stone Mountain Provincial Park is one of the more remote parks in the province. Here the Rocky Mountains near their northern terminus adjacent the Liard Plateau which extends into the Yukon Territory north of 60 degrees (Figure 2).

Stone Mountain Park provides the provincial park system with partial representation of the Rocky Mountains Natural Region's Muskwa Ranges (P.O.R.D. 1982). Lacking are the representative icefields and timbered glacial valleys typical of the Rocky Mountain landscape. The Muskwas lie north of the Peace River and extend to the Rockies' northern extreme at the Liard River. In general, summit elevations increase northward from the Peace River area, the highest peak in the range being Mount Churchill at 3,500 metres (south of Stone Mountain Park).

The Muskwa Range has been strongly eroded by alpine and valley glaciation with complex folding quite evident on some faces. As opposed to some of the southern Rocky Mountain ranges where the treeline extends to a higher elevation, the Muskwa Range contains many more areas of true alpine terrain. The Regional Landscape is currently represented in the Provincial Park system by Muncho Lake, Stone Mountain and Kwadacha Wilderness Provincial Parks (Appendix 1).

In general, elevations within the Park exceed 2,300 metres (7,600') only in the southern portion of the MacDonald Creek headquarters. Mt. St. Magnus (2,550 m) serves as a southern boundary marker and represents the highest mountain in the Park. Peaks through Summit Pass do not appear as formidable since elevation differences between the highway and adjacent mountains average only 900 metres. Only a relatively small area of Stone Mountain Park is visible from the Highway as it traverses the northern portion. Nonetheless, of the 1,000 kilometre portion of the Alaska Highway within B.C., it is the drive through the Rockies which highlights the trip.

A commercial lodge, service centre and restaurant is located at Summit Lake. The operation is family-run and therefore introduces a resident
NATURAL REGIONS AND REGIONAL LANDSCAPES IN NORTHERN B.C.

SCALE IN KILOMETERS

FIGURE 3
population to the Park throughout the year.

Fort Nelson (pop. 7500) is located only 160 km east of the Park on the Alaska Highway. It is a community of resource and service industry workers who often spend long weekends and holidays in the mountain Parks of Muncho Lake and Stone Mountain. As with many northerners, much of their recreational activity depends on the outdoors: fishing, hunting, camping, trail driving and riding. The vast wilderness presented by their northern locale offers a variety of opportunities to pursue these activities in relative seclusion.
1.2 PARK RESOURCES

1.2.1 Natural Resources

a) Geology and Topography

As with all ranges of the Rocky Mountains, the Muskwas present a series of northwest-southeast trending valleys and ridges. They contain complex folds, wide U-shaped valleys and rugged peaks of Palaeozoic limestone and quartzite. In comparison to the southern Rockies, the older Muskwa Ranges generally show evidence of more complex, tectonic deformation during their uplifting and development over 50 million years ago. Throughout Stone Mountain Park are examples of tilted sedimentary strata, folds, faults and synclines. Valley bottoms in the headwaters of MacDonald Creek are characterised by vertical beds which protrude through their lesser resistant erosional scree. Many small lakes have formed in the resultant basins.

In general, the topography of Stone Mountain Park is steep, with elevations ranging from 1200 m to 2550 metres. All of the bare mountain slopes are covered with the fragmented rubble of sedimentary strata, a result of ground water and frost action. Only in the broad valley of MacDonald Creek are large, flat areas of developable land.

A more localized sub-range of the Muskwas, the Stone Range, represents a heavily eroded, relatively horizontal-bedded landscape typical in the northern portion of the Park. The sedimentary strata of the bare mountains provide a clear profile of mesozoic deposition over a period of at least 60 million years. Although the dynamic processes of weathering and erosion seem to change the face of the landscape ever so slightly, such processes have successfully removed all records of paleozoic deposition from these same mountains.

Glaciation has been most responsible for forming the present-day landscape of the Muskwa Range. A large centre of ice accumulation was situated just south of the park in the upper Wokkpash Creek valley. This Rocky Mountain Ice Sheet extended northward over the park area at an elevation of 2200 m, thus scouring the lower peaks of the Stone Range.
The U-shaped MacDonald Creek valley illustrates one of the many major ice valleys located in the vicinity of Stone Mountain Park. Just a few kilometres east of the Park the Rocky Mountain Ice Sheet abutted the Laurentide Ice Sheet (originating from Hudson's Bay). This boundary is well marked by drift deposits which have accumulated in the vicinity of the North Tetsa - Tetsa River confluence.

As glacial ice melted, Summit Lake and its vicinity received an immense deposition of gravel and boulders followed by an intense period of fluvial erosion. Major outwash plains were formed in the headwaters of North Tetsa River. Five distinct terrace levels indicate the intensity of fluvial action which scoured this particular part of the Park.

In addition to evidence of continental glaciation, alpine glaciers have greatly shaped the landscape within the Park. Cirques, moraine ridges and glacial drift can be found throughout the area, especially in the high country adjacent to the southern Park boundaries. Only one small icefield remains in the Park today.

b) Climate

According to the Koppen-Geizer classification system, the climate of Stone Mountain Park is described as "Humid Continental-Cool Summers". Such areas characteristically experience short, cool summers and long, cold winters. Two major factors influence the climate of the Northern Rockies: the northern latitude and the dominance of Arctic air masses which result in relatively heavy precipitation. In addition, the high elevation of Stone Mountain Park contributes significantly to its local climate. Table 1 shows weather recordings for Fort Nelson which cannot accurately reflect patterns for Summit Lake but nonetheless create a general impression of seasonal length and temperature extreme.

During winter, long periods of intense cold are common. Snowfall is generally quite heavy in the vicinity of the Pass although high winds keep many of the exposed slopes quite free from accumulation. Although no records have been maintained for Summit Lake, it is a general assumption that the snow-free recreation season is quite short compared with other locations along the B.C. Alaska Highway. The alpine bowls surrounding Summit Pass do not clear until late June or early July and receive their
As experienced by many northern climates, shoulder seasons (spring and fall) are usually quite short. During summer, Arctic air is largely replaced by cool, moist Pacific air producing showery conditions. Under certain circumstances a weather system will develop, usually in the first part of summer, that will produce prolonged, severe rainfall. This situation is known to develop in mixed-air zones where warm, humid air moves against colder mountain air. Situated on the eastern edge of the Rocky Mountains, Stone Mountain Park is very susceptible to these frontal conditions. Summer storms through the Pass can be quite severe, and have been known to create flash flooding along the valley of the North Tetsa River. If coupled with the spring freshet (late June, early July) flood conditions become more pronounced as meltwaters combine with precipitation.

As can be expected through many mountain passes, winds are quite dominant in the vicinity of Summit Pass. Summer winds tend to originate from the west, flowing up the MacDonald Creek Valley and through Summit Pass. During high-summer these winds can be strong enough to significantly lower daytime maximum temperatures, thus creating cool conditions through most of the outdoor recreation season. Winter winds are of arctic origin and are capable of producing sub-zero windchill factors making extended
outdoor activity nearly impossible.

c) Hydrology

Within the Park, fluvial action is dominant due to steep slopes and the amount of precipitation which falls annually in the vicinity of Summit Pass. A variety of water bodies and kettle holes scattered throughout the Park are recharged by spring meltwater and summer rains. Deep canyons trace the flow of intermittent creeks and in valley bottoms, glacial deposits have been channelized and transported by water action. The MacDonald Creek valley illustrates many of these hydrological and glacio-fluvial features; its bed meanders from side to side along the valley, creating new channels as gravel bars are created and shifted. At low flow, abandoned channels lie exposed throughout most of the valley, however following major storms water levels rise rapidly. This pattern is typical of many mountain creeks and rivers.

Summit Lake is the largest water body in the Park. Although its colour does not reflect glacial origin, the deep blue waters are recharged annually by snow melt and precipitation. The shoreline is steep and rocky, thus quite limiting to recreational access except from its eastern end. West of the pass, Rocky Crest Lake is a small sub-alpine lake with a shallow, gravel-covered bottom. The shoreline ranges from muck to gravel and is of gentle grade. Between the two lakes, in the pass itself, a broad wetland marks the divide between the watersheds of the Tetsa-Muskwa and Racing-Toad River systems. Both rivers ultimately drain into the Arctic Ocean via the Liard and Mackenzie Rivers.

Situated in the Park is an example of an outwash plain formation thought to be unique to the provincial park system (Weston, P.O.R.D. 1980). In the headwaters of the North Tetsa River, southeast of Mount St. George, a series of stepped terraces record the catastrophic drainage pattern which occurred during the later stages of glacial retreat from the area. Blocked by ice and debris at Summit Lake, outwash from the retreating MacDonald valley glacier escaped south of Mount St. George carrying glacial drift down the valley of the North Tetsa. Further erosion provided by the melting ice-front in the Tetsa headwaters quickly carved a variety of channels through the newly deposited till. This intricate landform
pattern is clearly visible from the NorthwesTel tower ridge. The North Tetsa headwaters originate from stepped, pater-noster lakes which lie deep in the flanks of a rugged mountain ridge.

Water quality in the park is reported to be good for domestic and contact recreational use (Dooling, 1974). Although time has passed since tests were made, conditions remain much the same today. One exception however, is the outflow from a small creek draining the private lots at Summit Lake. Here a warning sign identifies the water course as contaminated and unfit for consumption. Investigations have concluded that sewage has been seeping from the Lodge; a problem to be rectified by the owner and the Regional Health Unit in the near future.

(d) Vegetation and Soils

Although three biogeoclimatic zones can be identified within the northern Rocky Mountain Natural Region, relative elevations in Stone Mountain Park support only two. From the point of lowest elevation along the MacDonald Creek valley (1,080 m) to the 1,550 m contour lies the subalpine Spruce/Willow/Birch zone. Surrounding Summit Pass (1,275 m), treeless alpine meadows hover just above the sparse forest cover which lines the highway; harsh conditions limit tree growth and large stands are rare. Only on sheltered sites containing pockets of mineral rich soil do forests achieve significant size, in most other areas scree slopes preclude the establishment of all higher forms of vegetative cover. Above 1,500 m lies the high altitude Alpine Tundra Zone. This is a cold, wind-swept, snowy environment with a very short frost-free period. Dwarf birch and willow are riparian species which can be found in the North Tetsa and MacDonald Creek valleys.

There are several interesting vegetative features found in the Park. Surrounding Summit Pass a seral stand of lodgepole pine has established on the well drained, south-facing slopes which characterize this location. The forest indicates an area once burned by wildfire, which probably occurred during or shortly following construction of the Alaska Highway. The extensive wetland which occupies Summit Pass contains species including black spruce, sedge, bulrush and native grasses. On shady sites in upland locations, permafrost extrusions have encouraged small basins of alpine
muskeg to form on their surface. These "bogs" are actually accumulations of mosses which have grown in multiple layers over glacial till. When walked on, the ground feels spongy underfoot; these areas are particularly sensitive to trampling and major disturbance. Reports compiled for the Golden Circle recreation study (Dooling, 1974) indicate the presence of the Lapland Rosebay shrub species in the park. Samples can be found in the vicinity of Summit Pass; the Park represents the species southern range extremity.

Table 3 presents a partial list of vegetation species found in the Park.

Soils around Stone Mountain Park are typical of those throughout the northern mountain region. Humo-Ferric Podzols are dominant within elevations of 1100m to 1500 metres; between 1500m and 1700 metres the podzols blend with Melanic/Dystric Brunisols; to the 1900m elevation soils of the Brunisol and Regosol types dominate until the dominance of rock and scree prohibit soil establishment in the alpine environment. Very few pockets of deep soil occur in the Park. In most of the developable areas, only a thin veneer of soil covers the underlying glacial drift. In Summit Pass, the soils are very wet and poorly drained.

e) Wildlife

Observations on wildlife in northeastern B.C. are described in the 1980 TIDSA study.

In the northern Rocky Mountains, large ungulates (except caribou and moose) are approaching the northern limits of their range and are under constant physiological stress due to cold winter temperatures, the short growing season and a limited food supply. Hence, overall numbers and population densities are relatively low. Animals often concentrate in specific areas with favourable habitat, particularly in winter, and they are very susceptible to disturbance.

Although Canada Land Inventory mapping has not been completed for the Summit Lake area, ratings for the Alaska Travel Corridor are found in Dooling, 1974 (appendix 2) along with descriptions of the Summit Pass area.
<table>
<thead>
<tr>
<th>Table 2</th>
<th><strong>Common Plant Species of Stone Mountain Park</strong></th>
</tr>
</thead>
</table>
| **Lichens:** | Cetraria tilesii (common golden lichen)  
Cetraria nivalis (common white lichen) |
| **Higher Plants:** | Horse tail  
Common Mtn. Juniper  
Creeping Juniper  
False Asphodel  
Death Camass  
Yellow Lady's Slipper  
Bog orchis  
Toad-Flax  
Wild Strawberry  
Yellow Dryas  
Wild Rose  
Fireweed  
Lapland Rosebay  
Kinnikinnick  
Indian Paintbrush |
| **Trees:** | Lodgepole Pine  
White Spruce  
Balsam Poplar  
Cottonwood  
Trembling Aspen  
Mountain Alder  
Shrub Birch |

Source: Ted Underhill, P.O.R.D., 1980
Wild ungulates are well represented here by six different species. Moose are to be found along the mountain slopes above Summit Lake and along MacDonald Creek. Mule deer venture up MacDonald Creek in the summer from their range further north. Elk sign on the north side of Summit Pass indicates that they at least pass through here from time to time. Caribou are known to winter in the Pass itself and migration by this species here is an annual event. Stone sheep also migrate from one side of the Pass to the other and have been observed in the rock cut of the Alaska Highway when they do so. Mountain goat have also been observed in the Pass area and pellet groups of this species were recorded on the climb to Mt. St. George from MacDonald Creek.

Few furbearing mammals inhabit the Park; high elevations and harsh winter conditions limit the range of many of the familiar species. Squirrel, Columbia marmot and chipmunk represent most of the existing species, although grizzly and black bear, wolf, coyote, lynx, martin, fisher and beaver have been observed. Migrating waterfowl utilize Summit and Rocky Crest Lakes, raptors can often be seen circling the skies (golden eagle especially); avian species, which may be observed in the vicinity of Summit Lake, are generally dependent on the time of year. Ptarmigan is a common sight above treeline.

At Summit Lake, lake trout have been planted (from Muncho Lake) for several years by the Fish and Wildlife Branch. Coarse fish (such as the black sucker) and whitefish are also present in the lake. Like most other mountain lakes, source waters of Summit Lake originate from mountains and streams in the vicinity. As a result, little nutrient level is maintained in its waters. This oligotrophic condition contributes to the slow growth and late maturation of fish, making the various species susceptible to overfishing. MacDonald Creek, due to its exposed waters with little or no food production probably does not contain species of significance to sport fishing, although Arctic Grayling have been caught occasionally by locals.

Located at such a northern latitude, Stone Mountain Park is plagued by the annual onslaught of nuisance insects. Mosquitos and blackflies can impair the best of plans for outdoor recreation. Usually most common in June and early July, the mosquito population continues to multiply until
hot, dry weather begins to dry up their habitat. It is in August that the blackflies then begin to torment the Park visitor and the ungulate population. It is in forested areas where prevailing winds do not penetrate that the insect population particularly prospers. As a result, open subalpine/alpine environments present the most enjoyable experiences.

f) Visual Resources

As stated previously, Stone Mountain Park represents the northbound tourist's first encounter with the Rocky Mountains. Unlike many of the southern approaches to the Rockies, the Alaska Highway suddenly emerges from the gentle, vegetated terrain of the Foothills to the steep, bare slopes of the Stone Range.

The park's eastern portal is contained within the limited viewshed created by the glacial deposits which once dammed Summit Lake. The North Tetsa River has carved a valley through these deposits and at one point the highway parallels a recognizable canyon; the river is contained within limestone walls about ten metres in height. Once in the area of Summit Lake "community" a wide panorama opens which permits viewing of the surrounding peaks and valleys. To the north a sparsely vegetated ridge faces the viewer while to the west towers a magnificent example of geological history. "Stepped Mountain" presents five distinct vertical sedimentary layers of varying ages; these bands represent over 60 million years of deposition under the great seas which once covered most of North America. From the eastern end of Summit Lake the park visitor can view the kame deposits which contain the waterbody. A sharp slope defines the southern shore of the lake, limiting views to the relatively confined basin created by the borderline terraces. The lake itself maintains a deep blue colour which is most often covered with white-capped waves; a result of the prevailing easterly wind. Amongst these scenic features however visual blight has become a part of the Summit Lake vicinity. Derelict vehicles and gaudy development characterize the commercial facility located here. In addition, the remains of a former Federal Government maintenance yard has left the site at the east end of Summit Lake in a very unappealing
condition. Along the narrow right-of-way between the lakeshore and the Alaska Highway, telephone poles unfortunately detract from an otherwise unencumbered view of Summit Lake and its southern shoreline.

Through Summit Pass views are quite limited and concentrated on the wetland terrain which divides the Tetsa/MacDonald watersheds. At various times of the year, moose can be seen wading in the shallow pools of the Pass. Lodgepole pine forest lines the northern slope immediately adjacent to the roadway. As the divide is crossed, the eastern extreme of the MacDonald Creek valley widens. Created in the vicinity of Rocky Crest Lake is an identifiable basin which envelopes the viewer with a foreground of forested slopes and a background of bare, grey peaks. Within this basin is a variety of visual features. Rocky Crest Lake is a scenic pool which often reflects the spruce forest which defines its southern shore; the erosion pillars (for which the park has been recognized in early planning reports and popular tourist travelogues) are visible on the north side of the bowl. Negative impact is introduced in the zone by a large gravel pit which dominates the view from the parkway. This expansive pit is currently used (and signed) as a vantage point for viewing the hoodoos. A small berm has been left along the side of the road which has eroded and deteriorated, creating less of a screen than an unnatural landscape feature.

Rocky Crest Canyon provides the highway traveller with a scenic display of landscape and biotic features. Over a relatively short distance, the road quickly changes elevation as it passes through the canyon. On the north side bare walls of dolomite rise steeply while to the south an expansive panorama is presented over the MacDonald Creek valley which rises to its headwaters on the southern boundary of the Park. To many viewers, this scene is one of the most impressive along the entire length of the highway. The braided, light-coloured gravel channel of the creek, bounded by dark green forests and exposed rocky summits creates a picturesque mountain landscape, especially when viewed from the elevation attained by the highway. Adding to the enjoyment of the view is the likely opportunity of seeing Stone's sheep as they cross the right-of-way at the top end of the canyon. Tourists especially perceive the opportunity to view wildlife as one of the highlights of any journey.

The western portion of the parkway parallels MacDonald Creek and affords good views of the valley at several pullouts and highway grade
Two abandoned commercial ventures have fallen into disrepair and detract from an otherwise attractive scene. Along the floodplain of the Creek, former gravel extraction operations have also had a negative impact on the landscape, however the passage of time and the distance from which the facilities are seen lessen this impact. At Mile 396/ km 630 the operation of a Public Works quarry has removed the rock walls which border a scenic canyon; one of the few proximate features in this portion of the Park. This draw contains a unique bedrock pillar several metres high and crowned with immature spruce trees. Other forms of vegetation cling to its sides while below a clear, boulder-strewn creek descends from the flanks of Mt. St. Paul. Between this point and the western portal of the Park, the visual landscape is a continuum of sparse forest cover and grassy slopes overlooking the wide MacDonald Creek valley to densely forested mountain flanks.

Outstanding scenery is also available to those who venture into the backcountry. The North Tetsa River headwaters, with its outwash terraces, aquamarine tarn and rugged mountain backdrop is a scenic gem. As one ascends the MacDonald Creek valley, the mountains become more rugged and steep, contrasting brightly with the green alpine meadows which line the sides of the creek. North of the Alaska Highway, highly accessible bare alpine bowls surround Mount St. Paul. The light grey talus of the Stone Range creates a barren, desolate landscape not replicated elsewhere in the Park. From a low pass, views can be attained northeast from the Park into the Dunedin River Valley.

1.2.2 Cultural Features

a) Archaeological

Although the nomadic ramblings of the Kaska-Athabaskan Indians have been documented in the northern Rocky Mountains, little evidence exists within Stone Mountain Park today. Archeological surveys conducted during construction of the Alaska Highway (Museum of Modern Man; Washington, D.C.) yielded very few clues to the lifestyle of northern Indian bands. At Summit Pass, assumed to be a primary encampment, three sites have been identified in reports published by the B.C. Provincial Museum (appendix 3). Several
chert flakes, indicative of primitive tool making activity, have been found scattered on the beaches at Rocky Crest Lake. Chert flakes can also be found on the raised terraces adjacent MacDonald Creek along with remains of a small Indian brush shelter. It has been reported that most archaeological evidence has been destroyed by construction of the highway through Summit Pass and by the related resource activities such as gravel extraction and camp development.

b) Historical

As previously discussed, modern man's exploration of the Summit Lake area did not really occur until the construction of the Alaska Highway in 1942. At various locations, construction camps were established to temporarily house the platoons of U.S. Army personnel used on the "Trail of '42". The former government maintenance camp at the east end of Summit Lake is actually an original U.S. construction camp. West of the Pass, the site of two motels indicate the location of two other construction camps, these relating to the upgrading of the Highway immediately following its original construction. Unfortunately, the quality of building standard implemented for these temporary camps precludes any opportunities for restoration.

Above Summit Pass, an original tote-road used during construction winds through the lodgepole/spruce forest. The road base remains solid and a short hike along its route illustrates the "trial and error" type of construction that characterised the original highway; at several locations the re-aligned road reveals abandoned sections of the former route. This section is presently impassable except to ATV's and horses. It is used as access to alpine areas north of the highway.

Recent historical evidence within the Park dates from the mid-1940's. Such "artifacts" include the previously mentioned delapidated buildings and discarded piles of junk located throughout the corridor.
1.2.3 Recreation Features

A recreation feature analysis was prepared for Stone Mountain Park and is summarized in Figure 7.

Probably the most significant recreation feature of the Park is the expanse of rolling alpine terrain which characterizes the northern half of the Park. This landscape permits superb hiking and wildlife observation opportunities within close proximity to the Alaska Highway. From access points immediately adjacent to the road, the hiker can surmount the sparse forest in short order, thus enabling him to roam at will over vast areas of scenic mountain terrain. North of the highway, short drainages lead to the fragmented slopes of Mt. St. Paul and its connecting ridges. Stone's sheep abound in this area. From the NorthwesTel repeater station south of Summit Lake, the hiker is treated to excellent views of the MacDonald Creek valley and southward to one of the passes which separates Stone Mountain Park from the Wokkpash Valley. Of provincial outdoor recreational significance are the outwash terraces accessible from the headwater area of the North Tetsa River. Here Jade Spring tarn is nestled amongst towering rugged peaks which seem to block further access to the south where two pater-noster lakes lie in their flanks. This area abounds in hiking, climbing and backcountry camping opportunities.

Along the Highway corridor, wildlife viewing opportunities at Rocky Crest Canyon rate as provincially significant. Stone's sheep often graze along the sides of the highway where they become a centre of attention.

Several flat, dry camping areas exist along the parkway. East of Summit Lake, the former highways maintenance campsite offers good vehicle parking, however, in its present state, a combination of visual detraction, environmental conditions and lack of vegetation makes this area unappealing for recreation activity. At Rocky Crest Lake, the dry lodgepole pine forest offers good camping opportunity with southern sun exposure. This location also offers hiking, fishing and viewing opportunities for those who wish to explore during their stay. Hoodoos situated behind the flat site, although not provincially significant, are important as a regional...
STONE MOUNTAIN PROVINCIAL PARK

-GLACIATION-

- Extent of Laurentide Ice Sheet
- Extent of Rocky Mtn. Ice Sheet
- Advancement Direction
- Major Glacial Feature
- Meltwater Channel
- Former Glacial Lake

FIGURE: 5

PROVINCIAL PARK

- Extent of Lourentide Ice Sheet
- Extent of Rocky Mtn. Ice Sheet
- Advancement Direction
- Major Glacial Feature
- Meltwater Channel
- Former Glacial Lake

SCALE IN KILOMETRES

Alaska Highway
ONE CREEK
Drumlins
Hoodos
SUMMIT LAKE
Kame Terrace
Moorain Dammed Lake
Outwash Plain
Peters-Notter Lakes
Matterhorn Peaks
MpnDonald
Glacial Trough
Rim购物中心
Braided Outwash Channels
Cirques and Horn Peaks

Rocky Mt. Ice

SCALE IN KILOMETRES
landscape feature primarily due to their close proximity to the travel corridor. Further west, the raised beaches adjacent MacDonald Creek provide suitable camping opportunities; the gravelly soils maintain high tolerance to trampling and campground construction activity. However, the likelihood of flood occurrence is great in this reach of the creek and this area holds little attraction for recreational activity other than overnight camping.

Several other outstanding features of regional importance occur in the Park. "Stepped" Mountain north of Summit Lake presents a topographic pattern of regional significance. Vertical banding evident in its structural form is indicative of the geological history of the Rocky Mountains. The peak is a dominant landscape feature in the Park, especially as viewed by traffic approaching from the east. On the opposite side of the valley, the forested kame terrace which overlooks Summit Lake offers an impression of the glacial history of the area. Its significance to the impoundment of Summit Lake indicates the depositional characteristics of the last glacial period. On this terrace, a lodgepole pine forest provides significant camping opportunity which is accessible to vehicles via NorthwesTel's access road. In open areas, shallow pockets of alpine muskog present an unusual interpretive feature. These areas are particularly sensitive to abuse, especially that created by all-terrain vehicles and four-wheel drives.

Flowing northwards from its headwaters, MacDonald Creek and its characteristic U-shaped glacial valley provide foot access to the southern extremity of Stone Mountain Park. The valley is characterized by a low vegetation cover and broad gravel outwash areas. Hiking opportunities are of high quality and many outstanding areas can be viewed from valley bottom; steep mountain flanks line the route and opportunities for wildlife viewing are great. The long, arduous route culminates at a pass overlooking the Wokkpash valley where many other outstanding outdoor recreation features exist. The southern boundary of Stone Mountain Park is formed by numerous mountain ridges which connect peaks of local topographic significance. Opportunities exist here for mountaineering, viewing and wildlife observation. More importantly, this area provides foot access to the Wokkpash Park proposal area, itself an outdoor recreation feature of outstanding quality.
1.5 CURRENT SITUATION

Figure 8 illustrates current land status and facilities located in Stone Mountain Park. The park presently encompasses 25,906 hectares, with boundaries being the headwater areas of MacDonald Creek and the N. Tetsa River. Several private lots, reserves, leased crown land and permitted non-conforming facilities exist within the Park. The following chart serves to illustrate many of these tenures.

PRIVATE INHOLDINGS

-Peace River District Lots:
1625, 1627, Mineral Claims: 2198, 7507, 7510, 7511, 7512, 8219, 8220, 7097, 7098, 7099, 7100 (located near the western boundary of the Park)

PARK USE PERMITS (land interests)

PUP 496- Quarry -Public Works Canada
PUP 986- Snow course -Ministry of Environment
PUP 1149- Repeater Station and Access Road -NorthwestTel
PUP 1155- Permafrost Test Site -Energy, Mines and Petroleum Resources
PUP 1239- Gravel Pit -Public Works Canada

RIGHTS OF WAY

- Alaska Highway #97, 300 foot right-of-way runs north to south through the park, also containing a communications pole line.
- Access Road to former canyon by-pass, used by trespass ATV's.
- PUP 1149, 66' Right-of-way to repeater tower at elevation 1675 m.

GUIDE/OUTFITTER TERRITORIES

- PUP 1251 -Ed. Wiens; Big Game Guiding, portion of the Park north of Alaska Highway and the North Tetsa River headwater area
STONE MOUNTAIN PROVINCIAL PARK

RECREATION FEATURES

As adapted from Recreation Features Analysis Mapping; P.O.R.D. 1982
TRAPPING TERRITORIES

- 3 un-permitted traplines exist within the park.

CROWN LAND LEASES

- D.L. 1562, Block A; Mile 391 Repeater Station, NorthwesTel

CROWN LAND RESERVES

- D.L. 607, 608, 609; Public Works Canada, gravel reserves; excepted from Park by Order-in-Council 991/80.

TRESPASSES

- illegal ATV use, North Tetsa River headwaters and north of Alaska Highway.

PARK FACILITIES

- Day Use: Rocky Crest Lake - four picnic tables, 2 toilets, litter barrels
- Pullouts: Various locations as on Figure 8, some with litter barrels, maintained by Public Works Canada.
1.6 MARKET ANALYSIS

As could be expected for any remote section of the Province, market demand analyses for the Alaska Highway region are quite scant. The 1980 T.I.D.S.A. (Travel Industry Development Subsidiary Agreement; BC-Canada) analysis of the Peace River-Alaska Highway tourism industry presented one of the few compilations of information regarding travel and tourism in northeastern British Columbia. Its purpose was to examine and assess tourism opportunities in the region, especially those along the Alaska Highway. The report provides insight to present and future demand for facilities in northern British Columbia and when analysed with P.O.R.D. statistics and other data, suggests future trends which may impact on outdoor recreation management.

The Alaska Highway forms a portion of a tourist circuit known as the "Golden Circle". The majority of highway use is by pass-through traffic; the highway is an important link between southern Canada/U.S.A. and Yukon, Northwest Territories and Alaska. The more recently constructed Cassiar-Stewart Highway #37 presents an option of returning to or from the north over a different, highly scenic route. Surprisingly, the attraction of more aesthetic surroundings does not seem to surmount the attraction of driving the "long, dusty trail". Many tourists opt to retrace their earlier route, solely for the purpose of travelling to and from the north along the fabled Alaska Highway. In general, the most frequent tourists around Summit Lake are Americans on their way to or from Alaska. Clearly 50% of summer passenger traffic on the Highway is of U.S. origin (PWC correspondence; PORD campsite surveys) with over three-quarters of Alaska Highway tourists using campground facilities along the route (according to a 1975 tourism study by Menzies and Associates). The majority of tourists travel in their own self-equipped recreation vehicles.

Figure 9 presents a schematic analysis of traffic volumes on the Alaska Highway in northern B.C. and the southern Yukon. From this it can be seen that a fairly consistent number of vehicles travel between Fort Nelson and Watson Lake, Yukon. This flow appears to be slightly lower than that on the Cassiar-Stewart Highway, indicating less truck traffic along the Alaska Highway (PWC pers. conv.). Analysis of the A.A.D.T. figures (Avg. Ann. Daily Traffic) shows that summer traffic increases by approximately
150% over winter traffic along all routes. These figures are most representative of tourist use. Second to the U.S. market, B.C., Yukon and Alberta residents form a large proportion of tourist traffic on the highway. Representation of other provinces is generally in inverse proportion to their distance from British Columbia. Bus tours would appear to becoming increasingly popular on the highway; most are of U.S. origin and utilize the services of the lodge within the Park.

Although the area is not regarded as a major tourist destination point, the Peace-Liard District does host the Province's largest proportion of non-resident, big game hunters. During the hunting season, which generally commences on August 1st, many local and international hunters arrive in the Muskwa Range to participate in the sport hunting of Stone sheep, moose and grizzly bear. The majority of guided hunts attract an international clientele, predominantly American and West German, most of whom fly directly to Fort Nelson where they are picked up and chauffeured to various camps. As a result, mental images and impressions of British Columbia are for many, based on experiences achieved in the Park and surroundings. Therefore, the maintenance of a quality environment not only benefits international impressions of the Park, but also those of the Province and of Canada.

The Peace-Liard District is home to the second largest resident hunter population in the Province (TIDSA). Local proprietors rely heavily on business generated by the lucrative hunting industry; most importantly, they benefit from resident hunters who do not require the services and provisions of a licensed guide.

For many Fort Nelson residents (pop. 7500) Stone Mountain Park presents a mountain environment in which to spend long weekends and short holidays. The main attraction for local users is the hunting opportunity presented in the Stone Range. Several sportsmen spend their annual vacations in and around the Park where scenic surrounds and a relaxed atmosphere enhance their stay. Access to sheep habitat is made by the C.N. road and the old pass road north of the highway.

Stone Mountain Park represents one of ten provincial parks strategically located along the northern Alaska Highway (north of Wonowon). Of these only Liard Hotsprings, and Andy Bailey offer much more than a place to park for the evening. Both Stone Mountain and Muncho
Lake Parks offer potential, beyond which they are currently developed, as significant suppliers of diverse outdoor recreational opportunities in a Rocky Mountain setting.

North of Fort Nelson the Division intends to develop a provincial park at Maxhamish Lake. A resultant decrease in regional use of Stone Mountain Park is not expected however, since Maxhamish Lake will attract only those interested in active beachside recreational activities in close proximity to Fort Nelson.

Camping and day use opportunities in Stone Mountain Park are provided by the public sector; the commercial establishment at Summit Lake offers motel accommodation to the touring public. No records are maintained as to how many overnight in the park near Rocky Crest Lake although user statistics for 115 Creek Wayside Park, only fifteen minutes west, often include figures from Stone Mountain Park (Table 4). Tetsa River Park, twenty minutes east of Stone Mountain is more formal than 115 Wayside, however offers no additional information other than camping and fishing opportunities. Its setting is that of the subdued Rocky Mountain Foothills Natural Region. Both 115 Wayside and Tetsa River Parks play an important role in the touring park system of the Alaska Highway.

In many of the southern parks, adventure recreational activities have become increasingly popular. Whitewater canoeing, mountaineering, hang-gliding and wilderness skiing are all activities which require a large land base for support. The TIDSA study reports that there is "considerable appeal for adventure recreation" in the Peace River-Alaska Highway vicinity. Although demands for adventure recreation are increasing throughout the province, and opportunities exist in Stone Mountain Park to undertake many of these sports, constraints imposed by the Park's limited expanse, short summers and long cold winters slightly impair the attractiveness of the area as a destination adventure recreation area. However, with increased visitation expected as a result of major park designations in the Northwest Territories and Yukon (Kluane and Nahanni for example), and potential expansion of Stone Mountain Park to include the internationally significant Wokkpash Valley, the provincial parks of the northern Rocky Mountains may become more attractive as wilderness designations.
### TABLE 3  OCCUPANCY RATES - MUNCHO LAKE, 115 CREEK & TETSA RIVER PARKS

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1 number of developed campsites
2 includes recordings of undeveloped Stone Mtn. overnight parking (10)
3 estimate only
4 "xxx"=Contractor afternoon recording; "---"=Park staff evening recording
1.7 PLANNING ISSUES

Stone Mountain Park presents a complex range of issues relating to recreation and resource management. This section outlines some of the current conditions which impact on park policy and future management strategy.

a) Land Management

As stated previously, the Park contains a composite of land tenure through its relatively narrow fifteen kilometre breadth. Private inholdings, mineral claims, reserves, leases and vacant Crown Land lots are spaced randomly along the Alaska Highway corridor. Of the private inholdings, all are associated with either the service industry which operates within the Park, or abandoned service centres and residences. Although there is a definite and recognized need for service facilities and rest stops along the Alaska Highway, the Peace-Liard Regional District Official Plan (1975) does not recognize Summit Lake as a preferred roadside service location. Spaced 80 kilometres apart, centres at Tetsa River (east of the park) and at Toad River (to the west) adequately serve the Highway through this section and as further improvements are made to the Alaska Highway, distance between necessary service stops will increase. Motel accommodation is available at Fort Nelson and Toad River, a distance of 200 kilometres. The main attraction of Summit Pass is the scenic location, not necessarily the commercial enterprise that is situated there. All park inholdings are desirable parkland acquisitions at some time in the future.

The Highway Scenic Improvement Act, under which has been designated the Alaska Highway (B.C.Reg. 261/70), provides an avenue to make visual improvement to premises and properties deemed "unsightly or offensive to any part of the (travelling) public". Given the objectives of Class A provincial parklands and the scenic appeal of the Alaska Highway through this Rocky Mountain Park, justification exists to investigate options which may now obligate property owners surrounded by the Park to maintain tidy grounds. In order to implement the Scenic Improvement Act, cooperation must be attained with Public Works Canada, the B.C. Ministry of Transportation
and Highways as well as the Regional District of Peace-Liard. Throughout the Park are other examples of distracting obtrusions; wrecked vehicles (Tetsa Canyon), refuse piles and unscreened aggregate operations impose on the enjoyment potential of the Park visitor. Several signs within the Park indicating nearby services have become redundant following implementation of the Provincial Park sign programme. These hand-lettered boards no longer serve a purpose to the public and also detract from the park setting.

A 1977 Order-in-Council removed from the Park an area of eleven mineral claims located adjacent to the west boundary. It was felt that this area could not be managed as parkland and would be best retained as vacant Crown land; although once the claims are forfeited, the area can revert back to the park. As a result, the claims have been faithfully renewed although work has never commenced on the properties (Ministry M.P.R. pers. comm.). They are due to expire and be forfeited in 1985. As the claims lie adjacent to the highway near the west portal, the land will be reabsorbed into the Park when they lapse.

Within the confined parkway corridor followed by the Alaska Highway are two active resource extraction operations. Public Works Canada currently utilizes both a large gravel pit and a rock quarry for purposes of highway development and maintenance. These permitted activities reduce the recreational value of adjacent parkland. Located immediately behind the gravel pit are erosional hoodoo features which were identified in the original Stone Mountain Park proposal as being one of several significant recreation features in the study area. Moreover, removal of bedrock from the quarry has eroded the scenic value of a prime canyon feature in close proximity to the highway. Presently, neither of these unscreened operations conform with visual quality or recreation objectives suitable for a tourist corridor through a Rocky Mountain Park.

b) Park Image

Stone Mountain Park lies adjacent 15 kilometres of the Alaska Highway; tourists enter the south portal at Km 619 and leave at Km 634. It has clearly been identified that across this distance there is a significant lack of park identity. Entrance portals are quickly forgotten as drivers travel through the Park. Only on the developed recreation site at Rocky
Crest Lake is the P.O.R.D. identity evident. This lack of information and identity means that many of the different geological and biological phenomena of the Park go unnoticed by through traffic. The "Alaska Milepost", published in New York, represents the most positive promotion and attention given to the Park.

c) Recreation Opportunities

For those northbound recreationists who wish to camp in the scenic landscape of the Rocky Mountains, there are no campgrounds along the Alaska Highway between the park and Toad River. Currently the only suitable areas for overnight parking at Stone Mountain are the abandoned Highway maintenance site at the east end of Summit Lake, the highway pullout along the north shore of the lake and the day-use picnic site at Rocky Crest Lake. The restrictive area of Summit Lake Lodge does not permit expansion to include a private campground. A short distance east of the park boundary, in the rolling Rocky Mountain Foothills landscape of the Tetsa River, a private operator maintains a small campground and motel.

Public recreation facilities have been constructed adjacent to Rocky Crest Lake west of Summit Lake. Unlike developable areas along Summit Lake, the west side of the Pass has not been so totally degraded by historical land uses associated with construction and operation of the Alaska Highway. The micro-climate of this area also compares more favourable than at other locations along the parkway. An open, dry forest cover and protection from prevailing easterly winds make the Rocky Crest area most suitable for nodal recreation facility development.

Overlooking the valley of Summit Pass is a telecommunications tower operated and maintained by NorthwesTel. A five kilometre road winds up to the site from which commanding views of the MacDonald and North Tetsa valleys can be obtained. The road has traditionally permitted vehicles easy access to the open alpine meadows of the upper North Tetsa headwaters. This type of opportunity is extremely rare in the province and is further enhanced at Stone Mountain Park by low vegetation levels and the relative elevation of the Alaska Highway through Summit Pass. Unfortunately, abusive
use by four wheel drives and more recently all-terrain vehicles has resulted in substantial damage to sensitive soil and vegetation types. Signs have done little to combat the mounting problem. A serious park management conflict is therefore presented in this location; outdoor recreation objectives must be carefully considered with respect to conservation and preservation objectives.

Commercial recreation guiding opportunities have been identified throughout Stone Mountain Park. Hiking and photography expeditions are most marketable during the months of July and August and could contribute significantly to the visitor’s outdoor recreation experience as well as to the economic stability of the northern tourist industry. The addition of Wokkpash valley to Stone Mountain Park will significantly enhance the feasibility of adventure recreation activity and do much to promote the park as a destination point.

d) Resources Management

Much of the northern B.C. landscape has been altered by wildfire. Thousands of burned hectares now line the Alaska Highway between Wonowan and the Yukon Territory. Fires play a dominant role in the ecological succession of vegetation species; the interruption of these processes has often been considered unnatural. Within the Park, very little land area is forested; steep slopes and severe conditions impair the establishment of most vegetation types. It is only in the vicinity of Summit Pass and MacDonald Creek that significant stands of spruce and pine are found. There, the scenic resource presented by forest, lakes and mountains create a high level of viewer pleasure. Compared to the relatively stagnant visual landscape of burnt areas, the preservation of diverse images such as those presented along the Highway in Stone Mountain Park becomes very important. The aesthetic value of a forest cover within the relatively small land area traversed by touring recreationists must be weighed carefully against the value of an undisturbed ecological cycle. In this analysis it would appear that some areas of the Park are more visually sensitive than others and for this reason should be protected from wildfire. Moreover, the existence of permanent structures and private dwellings further necessitates the Division’s fire control responsibility.
As previously mentioned, hunting is the primary recreational activity undertaken in the park. Basins north of the highway as well as the North Tetsa River headwaters are available for guided hunts while all other areas of the park are restricted to resident hunting. A significant portion of the reported abusive use of alpine areas is attributable to irresponsible resident hunting practice; stricter access control and public awareness may help to amend the problem.

Successful blending of consumptive and non-consumptive recreation activity (e.g., day hikes) is difficult in the limited confines of parkland adjacent to the travel corridor. The season opening date for mountain sheep is August 1st in Wildlife Management Unit 7-50, 51 and 54. Given that the recognized height of the hiking season coincides with the opening of the hunting season, potential conflict may arise amongst recreation groups if areas of the park are promoted for hiking and backcountry camping. This issue can however be resolved in various ways, from radically amending hunting regulations throughout the Park, to zoning appropriate areas for non-conflicting uses.

Although there is a basic knowledge of wildlife species, their habitats and general population levels in the Park, there is a consistent lack of supporting data on which to base wildlife management decisions. Population surveys have been a high priority for several years, however have only been implemented in the recent past. Management decision-making has therefore been based on speculative data and advice furnished by the Fish and Wildlife Branch. As it has been argued in the past, in a Region where the Guide-Outfitting industry provides such a dependable economic base, detailed study of the renewable wildlife resource is of paramount importance. Only with more detailed information can managers accurately determine the significance that quotas, possession limits, viewing and added hunter pressure have on wildlife populations in the vicinity of the park.

In an attempt to reduce the numbers of road kill along the Alaska Highway, the Division has experimented with strategic saltblock placements in adjoining drainages. This appears to have been an effective solution since sheep have been seen congregating in these areas. The programme should be carefully evaluated however, to ensure that the practice is not unknowingly conditioning animals to rely on an unnatural mineral supply, or bait sheep to areas from which they may be poached.
PART 2

2.1 PARK PURPOSE AND OBJECTIVES

As an important element of the B.C. Park System, Stone Mountain represents an integral unit in a series of provincial Parks along the Alaska Highway. Partially representative of the Rocky Mountains Natural Region, the Park contributes significantly to the system's conservation, outdoor recreation and tourism goals. The accessible scenic splendor of the Muskwa Ranges has the capability to attract a variety of outdoor recreation enthusiasts; well over 100,000 tourists pass through the Park annually. The Park affords good scenery and wildlife viewing opportunities while the side valleys, access points and low vegetation levels encourage backcountry hiking, riding and hunting.

The following objectives reflect the purpose of Stone Mountain Park and indicate management direction for the achievement of Division goals.

Conservation: To conserve a partially representative, and accessible example of the Muskwa Ranges natural landscape with biophysical and historical elements associated with the northern Rocky Mountains natural region. Within the Park these elements include the scenic geological and glaciofluvial landscape as well as the natural wildlife resource.

Outdoor Recreation and Tourism: To provide Regional residents and tourists to the highly scenic Rocky Mountain landscape a continued opportunity for consumptive recreational use of Park resources, while expanding opportunities for a variety of non-consumptive outdoor recreational activities in close proximity to the Alaska Highway.
2.2 ZONING

Stone Mountain Provincial Park will be zoned to reflect the diversity of land use within its boundaries. Future developments will recognize this zoning plan and adhere to the configurations illustrated in Figure 12. Developable parkland associated with the Alaska Highway has been included into the Development Zone. This zone extends the length of the Park, recognizing the Alaska Highway corridor. Within the zone, a Parkway sub-zone has been designated in recognition of the scenic parklands which front the highway through most of the Park.

Those portions of the MacDonald Creek valley which lie beyond the highway viewshed (Figure 6) or the distance of a day hike have been zoned as wilderness. The valley presents characteristic elements of the Muskwa Range and offers exceptional opportunities for wilderness hiking, camping and hunting. The remainder of the Park, those areas north of the Highway and the valley of the upper North Tetsa River, has been zoned as Natural Environment.

Within each zone and subzone, general statements direct appropriate management intensity. At Stone Mountain Park, lands within each zone will be managed in accordance with the following objectives:

**Development Zone:** To provide for a variety of facility-oriented recreational opportunities which reflect the needs of park visitors.

**Natural Environment Zone:** To provide for intermediate levels of outdoor recreational opportunities and use in a natural setting.

**Wilderness Zone:** To protect and preserve landscapes and resources processes while allowing for low levels of recreational use.
The Parkway sub-zone will provide intensified protection to the inherent scenic quality of lands adjacent to the Alaska Highway. Developed facilities and resource operations will not be permitted within the sub-zone, giving managers an opportunity to further direct future activities in the Park. However, if after careful consideration specific lots or areas are required for development, they may be re-designated for such use.
2.3 MANAGEMENT PLAN

2.3.1 Natural Resource Management

a) Land Management

Stone Mountain Park presents a unique blend of land use within its boundaries. Visitors do not generally consider the scenic surroundings to be parkland owing to the lack of park image and the apparent dominance of private service facilities.

The Park area presented at Stone Mountain is not sufficient to fully present the northern Rocky Mountains Natural Region. Exquisite areas lie south of the park along the Wokkpash Creek valley. These areas contain several outstanding natural features as well as the high peaks and glaciers of the central Muskwa Range.

Objective: To manage the land base of Stone Mountain Provincial Park in a manner which best achieves the Division's goal for conservation of the scenic regional landscape and the provision of outdoor recreation opportunities.

- The Park will be managed to ensure that an adequate area is protected to achieve outdoor recreation and conservation objectives.
- A boundary revision is encouraged which will include the headwaters of Wokkpash Creek. This park study area, if approved, will be added to Stone Mountain Park and the area managed as part of the wilderness zone.
- Land use within the park will conform to the approved zoning scheme.
- All private lots within the Park will be acquired if made available to the Division. Of highest priority are those which currently offer no service to the Park visitor.
- In an attempt to rid the parkway sub-zone of unsightly accumulations, the Division will recognize the designation of the Alaska Highway through Stone Mountain Provincial Park as a scenic highway pursuant to the Highways Scenic Improvement Act. This will enable a co-operative effort between the Division, the Ministry of Highways and the Regional District to encourage roadside property clean-up.
- The reserve and lease for the repeater station at Lot 1562, Block A, will be cancelled in co-operation with the Lands Division and the property absorbed into the Park. A P.U.P. will be issued for the repeater area only.

- Mineral claims which are currently inholdings surrounded by parkland will be incorporated into Stone Mountain Park.

- Public Works Canada will be encouraged to minimize impairment to park resources potentially resulting from Alaska Highway operation and improvement.

- The Division will encourage Public Works Canada to find alternate areas outside of the park for gravel and quarry operations. Existing operations will be rehabilitated to acceptable standards in keeping with the visual quality objectives of the parkway sub-zone. New pits will be discouraged within the Park, however if determined as necessary, future operations will not be permitted within the scenic Parkway sub-zone.

- The former canyon bypass road lying north of the existing highway will be blocked to all motor vehicles to ensure the conservation of fragile alpine environments.

b) Wildlife Management

Much of the recreational use of parkland in northern B.C. is associated with the fish and wildlife resource. Abundant wildlife populations in the northern Rocky Mountains have traditionally attracted resident and international hunters to commercial camps throughout the Region. Stone Mountain Park attracts resident and international hunters in pursuit of Stone's sheep, (one of four species of wild sheep sought by trophy enthusiasts) as well as for Osborne caribou and grizzly bear. At present there is limited knowledge of habitat or the condition of fish and wildlife populations inhabiting the Park. Studies must be undertaken in conjunction with Fish and Wildlife Branch in advance of formulating a wildlife management plan to consider such management issues as amendment to hunting regulations and fish stocking programs.
Objective: To manage fish and wildlife populations in Stone Mountain Park by methods which will increase observability of the resource for non-consumptive recreational use while still accommodating consumptive recreational hunting.

-A study of big game populations, especially Stone's sheep, within Stone Mountain Park will be conducted jointly between the Division and the Ministry of Environment. This study will be given high priority and used to supply baseline data for the formulation of a wildlife management plan for the Park.

-A wildlife management plan will address issues such as the role of hunting in Stone Mountain Park, guide-outfitters' quotas, potential conflicts between consumptive and non-consumptive park users, sensitivity of the wildlife resource to outdoor recreational use and it will recommend methods to ensure on-going renewal of the resource.

-The Division will continue to use salt blocks as a method of reducing road-kill and hazard along the Alaska Highway; however, salt blocks will not be placed in locations which tempt illegal hunting practices. If attempts to reduce road-kill by this manner prove to be insignificant, the project will be discontinued or amended in accordance with the wildlife management plan.

-Trapping is a non-recreational extractive activity and is therefore inconsistent with Park objectives. Existing traplines will be recognized; however the eventual intent is to remove these rights in accordance with the Division's Wildlife Policy.

-Existing permits for big game guiding within the Park shall be managed in accordance with the Wildlife Policy and park resources management plan.

-To promote non-consumptive recreation opportunities, the no-shooting area of the Park will be extended to include the entire North Tetsa River headwater area (including portions north of the Alaska Highway) which has greater potential for non-consumptive recreational use. One year prior to expiration of the current Park Use Permit (1251), notification will be made to the permittee of the Division's intent to close a portion of his territory (see PUP 1251, condition 16).

-The MacDonald Valley will be opened to guide-outfitting activity.

-The stocking program of introduced sport fish species will be continued at the request of the Fish and Wildlife Branch, objectives of which would be to increase the quality of fishing experience offered at Summit Lake.
c) Vegetation Management

The Park maintains little diversity of vegetation within its boundaries. Substantially forested portions of the Park are limited to the Summit Pass corridor. Elsewhere loose scree and severe climatic conditions impair the establishment of forest cover.

Sensitive alpine vegetation has been severely damaged by the indiscriminate use four wheel drive vehicles and A.T.V.'s in the Park. Many years will be necessary to restore these areas to their natural state.

Objective: To conserve the natural, scenic vegetation cover within Stone Mountain Park.

- Owing to the scenic corridor through which the Alaska Highway traverses the Northern Rockies, all wildfire threatens the visual resource of Stone Mountain Park. A Fire Management Plan will be formulated for the Park which considers conservation objectives and the protection of public and private facilities in the Park.
- To ensure the conservation of natural alpine vegetation, no vehicle access (excepting maintenance vehicles) will be permitted beyond a point to be determined on the telecommunications tower road. The former bypass road north of Rocky Crest Canyon will also be blocked to all vehicle use.

d) Water Management

Presently, northern watersheds are relatively unspoiled by human development and activity. The potential exists at Summit Pass to ensure that abundant fresh water supplies continue for the benefit of private and public water users in the Park. The reported tainted source at the commercial lodge has created unpotable conditions in a tributary of the North Tetsa River adjacent to the highway.

Seasonal flooding occurs along MacDonald Creek each spring. Several floodwater channels and shifting gravel banks indicate potentially dangerous locations to development.
Objective: To conserve the quality of fresh water supplies and the natural hydrological processes which occur in Stone Mountain Park.

- Toilets erected in the Park will incorporate a design which ensures that effluent is not leached into water courses by subterranean drainage.

- The Peace-Liard Health Units will be encouraged to ensure that adequate standards are maintained for sewage disposal on private properties in the Park.

- No development will be permitted on identifiable flood plains within the Park.
2.3.2 Cultural Resource Management

a) Historical Resources

Evidence of early native exploration and activity exist in the Park although an assessment of their significance is not available. Most of these sites relate to fishing and hunting campsites on Summit Lake and MacDonald Creek which existed prior to 1940.

Historical evidence of Alaska Highway construction exists in the form of old building foundations, telegraph lines, abandoned rights-of-way and junk piles scattered along the valley floor. Commercial developments and former camps associated with an earlier period of the Alaska Highway now stand derelict.

Objective: To assess and protect significant historical resources in Stone Mountain Park.

- Known archeological sites and artifacts will remain undisturbed.
- Other than the significance of Summit Pass as the highest point on the Alaska Highway, no other historical features in the Park are worthy of special protection.

b) Visual Resources

The attractive nature of Stone Mountain Park is a reflection of the various visual landscapes presented to the Park visitor. The dramatically rugged southern section is contrasted by the more gentle terrain of Summit Pass and the confined corridor presented in Rocky Crest Canyon.

For those northbound travellers, the sudden transition to a Rocky Mountain landscape from over 600 kilometres of prairie and foothills is extremely refreshing and invites a relaxing stop in a park setting.

Objective: To conserve the high scenic quality of Stone Mountain Park with particular emphasis on maintaining an attractive visual corridor adjacent to the highway.
- Park developments will be designed to enhance the visual quality of their setting.
- Existing permitted resource activities will be screened from view during the operation period and rehabilitated to high visual standards upon expiration.
- A maximum degree of visual quality standard will be maintained along the highly visible corridor of the Alaska Highway. A parkway sub-zone will delineate those areas where intensified management will enhance the visual resource objective.
- The Division will attempt to rid the Park of dilapidated buildings and offensive visual distractions in cooperation with the Regional District and Ministry of Highways, through the Highway Scenic Improvement Act. In addition, the formulation and implementation of Regional District building design controls over new construction within the Parkway sub-zone will be encouraged.
- The Division will seek the cooperation of Public Works Canada and NorthwestTel to have telephone poles removed or alternatively, relocated to the north side of the Alaska Highway along Summit Lake, thus eliminating these distractions from the lakeshore.
- The Division will develop additional viewpoints at interesting natural features throughout the Park to encourage travellers to stop and safely enjoy the scenery.
- The Division will encourage the removal of non-standard signs from the Highway right-of-way in accordance with government policy.
- Park signs will be used to denote interesting features such as major peaks, rivers, valleys and services.
2.3.3 Recreation Resources

Stone Mountain Park has not traditionally experienced use of its recreation resources for much other than consumptive activity. Hunting and fishing represent the most popular outdoor recreational pursuits associated with the area. However, the potential exists to expand these horizons through the identification and promotion of additional activities and opportunities in the Park. The Alaska Highway continues to deliver potentially receptive outdoor recreationists to Stone Mountain Park.

Objective: To expand and develop opportunities for non-consumptive recreational activity in Stone Mountain Park which are compatible with the traditional activities of hunting and fishing, and which do not promote direct competition to existing services offered by the private sector presently located in or around the Park.

- The Division will encourage lengthened stays within the Park through the development of hiking trails and attractive facilities to entice and serve highway travellers.
- The Division will identify and provide information on potential hikes along the major creek valleys and basins in the Park.
- Commercial operators will be encouraged to provide outdoor recreation services within the Park. A Visitor Services Plan will be formulated for Stone Mountain Park which gives consideration to such activities as guided hiking and photography trips. These activities would effectively present the Park's natural features to the public; the inclusion of the Wokkpash valley will significantly increase the attractiveness of these pursuits.
- Hunting is recognized as a traditional and legitimate use of the Park's wildlife resource. However, season adjustments and regulation revisions are required to accommodate other outdoor recreation activities promoted in this plan.
- Opportunities for the viewing of wildlife will be encouraged, especially in the parkway sub-zone.
- The North Tetsa River headwaters, north and south of the Alaska Highway will be closed to the discharge of firearms. The benefits for non-consumptive
recreation opportunities in this vicinity outweigh those for consumptive use. The limited area of the basin does not promote compatibility between the two uses.

- Recreation activities which impair Park objectives will not be encouraged. Of particular concern are the increased numbers of all-terrain cycles and vehicles in use within the sensitive alpine environment of the Park. The Division will continue to enforce regulations.
2.4 DEVELOPMENT PLAN
(Figure 11)

2.4.1 Recreation Services

i) Campgrounds: The objective is to provide campground facilities within the scenic Rocky Mountain Natural Region which will meet the demands of regional residents and tourists along the Alaska Highway.

-Land at the immediate east end of Summit Lake will be rehabilitated and improved to provide overnight parking opportunities for twenty vehicles. Shoreline berming may reduce wind disturbance at the site.

ii) Day Use Recreation: The objective is to provide opportunities for short-duration hiking, fishing, viewing and picnicking in the Park. Emphasis will be placed on developing facilities which take advantage of the scenic alpine terrain of the Park.

-Picnic sites at Rocky Crest Lake will be expanded to provide facilities for ten groups. A vegetative screen planted along the road right-of-way will screen the highway from tables placed along north beach of the lake. The site will also serve as overflow parking for the adjacent campground.

-A Type II trail will link the Rocky Crest day use area to the hoodoos which are visible from the Alaska Highway.

-The site at the east end of Summit Lake will also permit car-top boat launching, fishing and picnicking by park visitors.

-A Type III day hiking trail will be constructed to the North Tetsa River basin south of Summit Lake. Trailhead parking will be provided from a
point on the telecommunications tower road.

-The existing highway day-use site on the north shore of Summit Lake will be retained as a highway pullout. No further facilities will be added and overnight parking will be discouraged.

-A short hiking trail and point-of-interest may be identified at the picturesque canyon located at Mile 396.4/Km 633.5.

iii) Roadside Attractions: The objective is to safely present interesting natural and cultural features of Stone Mountain Park to travellers on the Alaska Highway.

-A northbound pulloff, viewpoint and park information display will be constructed near the east portal at Mile 390.2/Km. 620 (All pullouts require the co-operative effort of Public Works Canada).

-A pullout will be provided for viewing the hoodoo formations along the north side of the Alaska Highway at Mile 394.5/Km. 625.5.

-Existing pullouts will be maintained through Rocky Crest Canyon.

-At Km. 629/Mile 396 a viewpoint overlooking MacDonald Creek will be selectively cleared to replace the existing dangerous pullout .5 Km east of this point.

-A west portal pulloff, viewpoint and park information display will be developed at Mile 398.5/Km. 633 overlooking the MacDonald Creek valley.

2.4.2 Information Services

A Visitor Services Plan will be formulated for the Park which will have as its objective: to promote Stone Mountain Park and to ensure that both visitors and potential visitors are provided with information regarding the park's natural and cultural features, as well as opportunities available to them for outdoor recreational pursuit.

-Signs at several locations throughout the Park can point out interesting topographic features;

-Interpretive displays may be developed at Rocky Crest Lake regarding Stone's sheep and other wildlife of the Park, as well as photographic displays of unaccessed portions of Stone Mountain Park and the Wokkpash Creek Valley.
Information displays at Summit Lake could describe vegetation communities in the Park.

The Plan will further consider marketing and promotional methods in an attempt to attract increased destination-visitation to the Stone Mountain/Wokkpash area. Co-operation with other agencies and tourist associations may be required.
2.5 FUTURE DEVELOPMENT

The following developments are considered unnecessary during the current planning time frame, however warrant consideration when increased use levels and demands for expanded outdoor recreation opportunities become evident.

-Delineation of a trail along MacDonald Creek to the (proposed) Wokkpash extension.

-Further site evaluation conducted in the Rocky Crest Lake vicinity and the North Tetsa subalpine basin to determine the feasibility of future campground development.

-Delineation of a trail north of the Alaska Highway to alpine basins at the base of Mount St. Paul.

2.5.2 Winter Recreation

During the winter months, a marked decrease in traffic on the Alaska Highway results in very few visitors to Stone Mountain Park. Two factors limit winter recreation at this latitude: daylight hours are extremely short and daytime temperatures can be bitterly cold. (Mid-winter months offer as few as six hours of daylight and average daytime high temperature of between -20 and -30) March and April are the preferred months for such winter recreation activities as ski touring and mountaineering. No proposals are presented here for formally accommodating winter activity at Stone Mountain Park. Use levels are too low and unstructured to warrant consideration at this time. However, the future holds potential for an increase in late-winter activity of a public or commercial nature.

Objective: To recognize the potential for winter recreational activity in Stone Mountain Park and collect pertinent data about the resource for presentation in a Visitor Services Plan.
2.6 MARKETING

Stone Mountain Provincial Park is, of course, final destination for very few of the many who travel the Alaska Highway; a vast majority of park use is by the transient tourists of the northwest highway system. The long distance and relative cost of travelling to the northern Rockies indicates that marketing of the Park is directly associated with marketing of the entire Alaska Highway, northern British Columbia and the Yukon. Once committed to the journey Stone Mountain Park is but one of several attractions presented to the tourist along the route.

Expanded traffic volume on the Alaska Highway will have an impact on recorded visits to Stone Mountain, however will not by themselves contribute to promotion of the Park or its facilities. Only by increasing the length of stay in the Park can recreation and tourism objectives be realized. Proposals have been presented in this plan which are intended to slow traffic through the Park, thereby increasing the potential for a longer stay. They are also intended to foster a lasting impression on tourists and encourage word-of-mouth promotion of the Park amongst tourists who meet at other locations. In addition, by providing private business with information about the Park, its facilities and attractions, this information can then be disseminated to customers throughout the vicinity.

The development and promotion of Maxhamish Lake Park northeast Fort Nelson is not expected to reduce the number of local resident visits to Stone Mountain - both parks are quite different in both purpose and attractiveness. The addition of Wokkpash Lake and surrounds to Stone Mountain Park will further enhance the outdoor recreation and scenic attractiveness of the park, and further encourage regional, national and international visitors to the northern B.C. Rocky Mountains.

Stone Mountain Park shall be promoted and marketed through on approved Visitor Services plan which will consider:

- encouragement of private sector involvement in park promotion;
- establishment of a marketing strategy for Alaska Highway provincial parks including Stone Mountain, Muncho Lake, Liard Hotsprings and (proposed) Wokkpash Parks.

- expansion of tourist attractions in the Park which may encourage visits of longer duration;

- submission of material to national and international tourist guides covering northern B.C.;

- media coverage of northern parks and their attractions and;

- the publication of a Northern B.C. Region Provincial Parks map.
2.7 PLAN IMPLEMENTATION

Direction given in this Master Plan will become effective upon approval of the document. High priority is given to:

- construction of a park campground;
- development of viewpoints;
- entrance portal information displays;

as well as the implementation of policies regarding:

- the Highway Scenic Improvement Act;
- Land designations;
- hunting regulation amendments.

The formulation of Resources Management and Visitor Services Plans for Stone Mountain Park will ensure that management of the Park continues in accordance with this Master Plan.
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APPENDICES

1. Rocky Mountains Natural Region
2. Canada Land Inventory. Capability for Wildlife Ratings
3. Known Archaeological Sites
4. Provincial Park Zoning System
5. Highways Scenic Improvement Act and B.C. Reg. 261/70
6. Legal Description, Stone Mtn. Park
7. Photographs
APPENDIX 1 - ROCKY MOUNTAINS NATURAL REGION

1. ENVIRONMENTAL CHARACTERISTICS

1. Location, Size and Climate
   - Situated in eastern British Columbia, extending in a northwesterly direction from the southern international boundary almost to the B.C.-Yukon boundary.
   - General Climate:
     - Mean annual precip. - Muskwa Ranges: 40-100 cm (higher in the core of the mountain area)
     - Mean daily temp. January - north of Peace River: less than 20°C
     - Mean daily temp. July - 14°C to 16°C throughout

2. Physiographic Characteristics
   - Consists of four major groups of ranges from south to north: Border Ranges Continental Ranges (coincident with most of the southern half of the length of the Rockies), Hart Ranges (extend from the Kakwa area to the Peace River) and the Muskwa Ranges (north of the Peace River).
   - Western boundary of the physiographic region is the eastern side of the rocky Mountain Trench.
   - Rocky Mountain are largely underlain by sedimentary and metaphoric ranges.
   - The predominant rocks are Palaeozoic and Proterozoic limestones, quartzites, schists and slates.
   - The Rocky Mountains, despite the age of the rocks, display relative youth as a mountain system (uplifted about 75 million ago).
   - Pleistocene continental glaciation covered the ranges to heights to 2,300 to 2,600 metres.
   - The Rockies characteristically display distinct stratification.

3. Hydrologic Characteristics
   - There are only modest numbers of lakes, none of which exceed 20-30 sq. km.
   - The streams and rivers drain in a structurally controlled trellis pattern.
Numerous glaciers (alpine and valley types) and icefield, especially in the Continental and Muskwa Ranges.

The only river which flows through the Rocky Mountains is the Peace.

4. **Biotic Characteristics**

- Particularly in the Border, Continental and Muskwa Ranges, the treeline is often controlled by typography rather than by climate.

**Biogeoclimatic patterns:**

1) **Alpine Tundra**
   - **S.E.S.-S.F.**
   - **Sub-Boreal Spruce**
     
   )Western Hart Ranges
   )and Southwestern
   )Muskwa Ranges

2) **Alpine Tundra (extensive)**
   - **Spruce-Willow-Birch**
     - **Boreal W.+B. Spruce**
     
   )Muskwa Ranges (except SW)
   and Eastern Hart Ranges
   (Alpine is minor)

**Biotic Regions:**

1) **Subalpine Forest**
   - Border Ranges
   - Western Continental Ranges
   - Western fringe of Hart Ranges
   - Southwestern fringe of Muskwa Ranges

2) **Alpine**
   - the central core of the Continental Ranges, between 50° and 54°N latitude
   - a central portion in the southern Hart Ranges
   - A large area in the Muskwa Ranges, south of the Toad River and north of the Akie River.

3) **Boreal Forest**
   - northern and southeastern Muskwa Ranges
   - eastern Hart Ranges
Muskwa Ranges

- located north of the Peace River
- summit elevations increase northward from the Peace
- highest peak: Mt. Churchill (3,500 metres)
- elevation range: 3,000/3,200 metres down to 800/1,000 metres a.s.l.
- quartzites and limestone underlie many of the high peaks.
- area has been strongly eroded by alpine and valley glaciation.
- complex folding is common.
- many peaks are castellated or flat-topped if strata are horizontal.
- longitudinal valleys of considerable width and length and prominent features.
- glaciation was uneven in intensity; some areas show little evidence of glacial erosion despite a veneer of drift throughout the ranges.
- rugged, majestic ranges similar to the Continental Ranges in geology, glaciation and appearances.
- much more extensive alpine than southern ranges.
- biogeoclimatic pattern:
  Alpine Tundra
  Spruce-Willow-Birch
  Boreal W&B Spruce
  (Sub-Boreal Spruce) - southwest periphery
- biotic areas: Northern Alplands
  Boreal Forest
- Current representation (1982):
  Kwadacha Wilderness Park: satisfactory
  Muncho Lake Park: partial
  Stone Mountain Park: partial
APPENDIX 2 C.L.I. CAPABILITY FOR WILDLIFE (UNGULATES)

Class 1: Lands with no significant limitations to the production of ungulates.

Class 1w: Class 1 lands that are winter range.

Class 2: Lands with very slight limitations to the production of ungulates.

Class 2w: Class 2 lands that are winter range.

Class 3: Lands with slight limitations to the production of ungulates.

Class 3w: Class 3 lands that are winter range.

Class 4: Lands with moderate limitations to the production of ungulates.

Class 5: Lands with moderately severe limitations to the production of ungulates.

Class 6: Lands with severe limitations to the production of ungulates.

Class 7: Lands with no ungulate production.
# BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

1. **Site No.** IdSd. 1

2. **Previous designation(s).** IdSd. Tl

3. **Site name(s).**

4. **Location**
   
   (a) **Sec.**
   (b) **Lot.** 1562
   
   **Plan.**
   
   **(b)** approximately mile 392 on Alaska Hwy. at E. end of Summit Lake. In Hwy. maintenance yard on flat disturbed area approximately 20-35 m. from lake edge.
   
   On S. side of E. end of lake as far from road as is possible before sloping area on S. side of lake.

5. **Access**
   
   Drive to maintenance camp (mi. 392 Alaska Hwy.), ....Park near road at E. end of Summit Lake and walk S. towards creek outlet. Site is approximately 20-35 m. N. of Creek and 20-35 m. E. of lake. Half of observed site is on roadway and half in a less disturbed area with only 2 remaining trees (alpine fir).

6. **Province and districts**
   
   (a) **Regional District.** Peace River — Liard
   (b) **Forest and Grazing District.** Prince George
   (c) **Highways District.** Fort St. John
   (d) **Provincial Park.** Ominica-Peace
   (e) **Resource Management Region.** Ominica-Peace

7. **Lat.** 58° 39' 03" N. **Long.** 124° 39' 03" W.
   **UTM.**

8. **Air photo** BC5508:138-140
   **Map (a).** 94 K/10E MacDonald Creek

9. **Drainage**
   
   (a) minor Tetsa River, Nelson River
   (b) major 32 Liard

10. **Elevation**
    
    (a) 4150' asl or 1265 m. asl
    (b)

11. **Cultural affiliation**
    
    (a) Slave or Kaska
    (b)

12. **Site type**
    
    general activity

13. **Dimensions**
    
    (a) exact 15 m. x 15 m.
    (b) estimated
    
    (c) original

14. **Condition**
    
    (a) present 0%
    (b) future a cataclysmic disembowelment
    (c) more damage.

15. **Priority**

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**Note:** The document contains additional information that is not fully transcribed here. Further details can be obtained by referring to the original text or by reviewing the full document.
PLEASE COMPLETE ACCOMPANYING GUIDE BEFORE COMPLETING

BRITISH COLUMBIA ARCHAEOLOGICAL SITE INVENTORY FORM

1. Site No...IdSe.1

2. Previous designation(s) None

3. Site name(s) None

4. Location (a) Sec. Lot Plan
   (b) Summit Pass, Mile 393-394 on Alaska Hwy. From the SE shore of the small lake west of Summit Lake, along the divide separating the two lakes, and including the area N. of the lake at the SE end of Summit Lake.

5. Access Drive via Alaska Hwy. Park anywhere and walk

6. Province and districts B.C. (a) Regional District Peace River - Liard
   (b) Forest and Grazing District Prince George (c) Highways District 44 Fort St. John
   (d) Provincial Park Omineca-Peace, Liard (e) Resource Management Region Omineca-Peace

7. Lat...58 ° 38 ' 37 "N 8. Long...124 ° 42 ' 13 "W 9. UTM

10. Air photo B.C. 5508: 137 - 140

11. Map (a) 94X/10E

12. Drainage (a) minor Tetsa River, Ft. Nelson R. (b) major 32, Liard

13. Elevation (a) 4200' asl or 1280 m. asl

14. Cultural affiliation (a) Slave (possibly Kaska) (b)

15. Site type general activity?, trail

16. Dimensions (a) exact (b) estimated 1500 m. E-W x ?

(c) original

17. Condition (a) present ? (b) future road work & ground water have disturbed area and will continue. Priority
## British Columbia Archaeological Site Inventory Form

2. Previous designation(s): 

3. Site name(s): 

4. Location (a) Sec. Lot Plan
   
   (b) heading NW, exactly at mile 397 on the Alaska highway turn left (W) down side road for (0.3 m. on speedometer) 474 m. then left again (SE) onto a smaller side road approximately (0.1 m.) 178 m. past a gravel pit. The site is located on a river terrace about 3 m. above the road and on a point created by yet another road (washed out) that runs back to the highway. On the right bank of MacDonald Creek.

5. Access: Drive to mile 397 on the Alaska Highway, turn left on an abandoned section of the highway for 474 m. then left again about 178 m. to a gravel pit. Flake scatter will be found on the slope of a terrace at the top of the gravel pit - a brush shelter will be found about 10 m, across a washed out road at the edge of a terrace.

6. Province and districts: B.C.
   
   (a) Regional District Peace River - Liard
   
   (b) Forest and Grazing District Prince George
   
   (c) Highways District 44 Ft. St. John
   
   (d) Provincial Park Ominica Peace-Liard
   
   (e) Resource Management Region Ominica Peace


10. Air photo: BC 5508:15-16, 138-137

11. Map (a) 94K/10W

12. Drainage (a) minor MacDonald Creek, Racing R. (b) major 32, Liard River

13. Elevation (a) 3500' asl, 1050 m, asl (b) 5 m. above MacDonald Creek

14. Cultural affiliation (a) Slave or Kaska (b)

15. Site type: Resource utilization, land mammal hunting (ethnographic style brush shelter hunting camp)

16. Dimensions (a) exact 50 x 20 meters (b) estimated
   
   (c) original

17. Condition (a) present 20% intact - brush shelter (b) future low 100% intact

18. Priority
<table>
<thead>
<tr>
<th>ZONE</th>
<th>OBJECTIVES</th>
<th>MANAGEMENT GUIDELINES</th>
<th>FACILITIES/ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>To provide for a variety of facility-oriented recreational opportunities.</td>
<td>-oriented toward maintaining high quality recreation and interpretive experience.</td>
<td>-intensive recreational facilities such as auto campgrounds, cabins, lodges, picnic areas, beach and swimming areas, nature houses, information buildings, downhill ski facilities, walk-in campgrounds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-intensive management may be required to ensure that high quality recreation and interpretive opportunities are maintained.</td>
<td>-ancillary facilities such as parking, sanitation, picnic tables, restaurants, may be included in this zone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-special design consideration generally required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-intensity of developments and standard of facilities are variable and will relate to the objectives for the Park.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-private motorized vehicles may be restricted.</td>
<td></td>
</tr>
<tr>
<td>Natural Environment</td>
<td>To provide for intermediate levels of outdoor recreational opportunities/use in a natural setting.</td>
<td>management will be oriented toward maintenance or restoration of the natural environment.</td>
<td>-Development and use are consistent with the maintenance of natural conditions. Activities consistent with this zone would be: hiking, camping, canoeing, kayaking, snowshoeing, cross-country skiing, nature observation, horseback riding, picnicking, swimming, fishing, interpretation programs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-visitor access may be restricted to preserve the recreational experience or to limit impact on the area.</td>
<td>-minimal facilities such as trails, shelters, hikers' campsites, portages, horse corrals, observation blinds, may be developed to complement these activities, but the emphasis of the development will be toward public safety rather than the encouragement of more intensive levels of use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-designation of transportation modes may be necessary to avoid potential conflicts. (e.g. horse trails, cycle paths, hiking trails)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-private motorized vehicles may be permitted.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-intensity of management and development will be consistent with moderate levels of recreational use.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-visitor support facilities will be limited, and directed toward providing for public safety and minimizing user impact.</td>
<td></td>
</tr>
<tr>
<td>Wilderness</td>
<td>-To protect and preserve landscapes and resource processes.</td>
<td>oriented toward the protection and preservation of the area's atmosphere, environment or ecology, while optimizing recreational opportunities associated with the &quot;wilderness experience&quot;.</td>
<td>-only minimal primitive facilities would be developed consistent with low intensity uses. Activities consistent with this zone include: camping, hiking/mountaineering, canoeing, kayaking, cross-country skiing and snowshoeing, fishing, nature observation. In some areas, hunting may be considered an appropriate use. In some cases, it will be necessary to allow the limited use of aircraft, motorboats, snowmobiles, etc. as important means of access for management or to permit reasonable public access into extremely remote areas. Sub-zoning and use permits</td>
</tr>
<tr>
<td></td>
<td>-To provide for low levels of recreational use in an environment where natural processes occur with a minimum of human interference.</td>
<td>unstructured visitor mobility.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-visitor support facilities will not be provided, except where absolutely necessary to provide for public safety or minimizing user impact.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-transportation limited to foot access, and non-motorized boats.</td>
<td></td>
</tr>
</tbody>
</table>
Commencing at a standard pipe post and cairn number 231 set on the northerly limit of the Alaska Highway at the said highway as shown on a plan of survey made by A.C. Pellow, B.C.I.S., dated the 2nd of February, 1954, and filed in the Department of Lands and Forests under number 7 June 1954, the said post being in the vicinity of Mile 389.6, Peace River Land District; thence due north to the northerly boundary of the watershed of North Tetsa River; thence in a general westerly direction along the northerly boundaries of the watersheds of North Tetsa River and MacDonald Creek to the headwaters of an unnamed creek which flows into said MacDonald Creek to the north of the mouth of One Ten Creek; thence southerly to and along the right bank of the main stream of the said unnamed creek flowing into MacDonald Creek to the north of One Ten Creek to the right bank of said MacDonald Creek; thence in a general westerly direction along the said right bank of MacDonald Creek to a point due north of the intersection of the left bank of aforesaid One Ten Creek with the left bank of said MacDonald Creek; thence south to the said intersection and continuing in a general southerly direction along the said left bank of One Ten Creek to the headwaters thereof, being a point on the westerly boundary of the watershed of the main stream of aforesaid MacDonald Creek; thence in a general southerly and easterly direction along the westerly and southerly boundaries the watershed of the said main stream of MacDonald Creek to the easterly boundary of the said watershed of MacDonald Creek; thence in a general northerly direction along the said easterly boundary of the watershed of MacDonald Creek and the westerly boundary of the watershed of the main southerly tributary of North Tetsa River to a point due south of aforesaid pipe post and cairn number 231 set on the northerly limit of the Alaska Highway; thence north to said pipe post and cairn number 231, being the point of commencement except thereout Lots 606, 607, 608, 609, 610, 1562, 1625, 1626, 1627, and 1652, and containing approximately 64,000 acres.

AND FURTHER TO RECOMMEND THAT under the provisions of Section 14 of the "Department of Recreation and Conservation Act" being Chapter 53, Statutes of British Columbia, 1957, the said Stone Mountain Park be of Class "B".

AND FURTHER TO RECOMMEND THAT a certified copy of this minute if approved be forwarded to the Superintendent of Lands, Parliament Buildings, Victoria, B.C.

DATED this 25th day of June, 1957, A.D.

[Signature]
 Minister of Recreation and Conservation

APPROVED this 25th day of June, 1957, A.D.
BACKGROUND DETAILS TO THE ESTABLISHMENT OF STONE MOUNTAIN PARK

1951 - Feb. 6 - O.I.C. 282/51 - L. 1562 North of Alaska Hwy. reserved as a repeater site for Dept. of Transport, Canada.


1965 - Mar. 2 - O.I.C. 581/65 - reserve established by O.I.C. 283/51 over Blk. A, D.L. 1562 is cancelled and lot reserved instead for Dept. of Transport, Canada as a microwave site.


1968 - Apr. 11 - O.I.C. 1150/68 - reserve over L. 1562, South of Alaska Hwy. established by O.I.C. 283/51 was cancelled except thereout Blk. A.


1976 - Jan. 30 - O.I.C. 371/76 - reserve over L. 610 established by O.I.C. 892/55 was cancelled.

1977 - Oct. 12 - O.I.C. 3158/77 - excluded the following mineral claims from the park:- Min. Lease 1 (L. 2198); 7507; 7510; 7511; 7512; 8219; 8220; 7097; 7098; 7099; 7100.


HIGHWAY SCENIC IMPROVEMENT ACT
CHAPTER 169

Interpretation

1. In this Act

"Crown land" means land of the Crown in right of the Province.

designated highways" means a highway or part of a designated highway.

"highway" has the same meaning as in the Highway Act.

"municipality" includes the City of Vancouver.

"motor vehicle" means a motor vehicle as defined in the Motor Vehicle Act.

"vehicle" has the same meaning as in the Motor Vehicle Act and includes the remains of a vehicle.

Designation of highways

2. The minister may designate a highway or part of it and shall give notice of it in the Gazette and in a newspaper circulating in the area in which the highway is

appeal to the Court of Queen's Bench for the Province.

Notice to remove unsightly accumulations

3. (1) Where, for premises

(a) not within a municipality, the minister, or

(b) within a municipality, the council, is satisfied that there is an unsightly accumulation of rubbish, garbage, ashes, flotsam, discards, materials, or the blocking or partials of vehicles or machinery, or any other unsightly matter, causing the premises to be unsightly or offensive to any part of the public travelling on a designated highway, the minister or the council may serve notice on the owner or the occupier of the unsightly accumulation to remove the unsightly accumulation or to take other remedial measures to eliminate the unsightliness.

(2) A notice under this section shall be served on the owner or occupier, either personally or by leaving it at his or her place of ordinary residence.

Removal of unsightly accumulations

4. (1) Where, for premises

(a) not within a municipality, the minister, or

(b) within a municipality, the council, is satisfied that there is an unsightly accumulation of rubbish, garbage, ashes, flotsam, discards, materials, or the blocking or partials of vehicles or machinery, or any other unsightly matter, causing the premises to be unsightly or offensive to any part of the public travelling on a designated highway, the minister or the council may serve notice on the owner or the occupier of the unsightly accumulation to remove the unsightly accumulation or to take other remedial measures to eliminate the unsightliness.

(2) A notice under this section shall be served on the owner or occupier, either personally or by leaving it at his or her place of ordinary residence.

Appeal

5. (1) An appeal lies from the notice of the minister or of a council under this Act to the Court of Queen's Bench for the Province or, as the case may be, the court may, for good cause, vary or quash the notice, or may dismiss the appeal, Where a notice is varied, it is effective and enforceable as varied, and the determination of the court is final.

Removal of unsightly accumulations

6. (1) Where, for premises

(a) not within a municipality, the minister, or

(b) within a municipality, the council, is satisfied that there is an unsightly accumulation of rubbish, garbage, ashes, flotsam, discards, materials, or the blocking or partials of vehicles or machinery, or any other unsightly matter, causing the premises to be unsightly or offensive to any part of the public travelling on a designated highway, the minister or the council may serve notice on the owner or the occupier of the unsightly accumulation to remove the unsightly accumulation or to take other remedial measures to eliminate the unsightliness.

(2) A notice under this section shall be served on the owner or occupier, either personally or by leaving it at his or her place of ordinary residence.

Dispute between owners and occupiers

7. Where the requirements of section 2 have been carried out by a person authorized by the minister or a council, and the expenses of a person who has been paid by the occupier, or any other person having an interest in the premises, or recovered under subsection (1), the court shall give relief as it deems just and equitable, due regard being given to the interests, and any agreement, between the parties.

Penalties

8. (1) A person who is in possession of the premises for the purpose of making any repairs or alterations to the premises shall, on conviction, be liable to a fine not exceeding $500.

(2) A person who is in possession of the premises for the purpose of making any repairs or alterations to the premises shall, on conviction, be liable to a fine not exceeding $500.
Pursuant to section 3 of the Highways (Scenic Improvement) Act, 1968, those highways, or parts thereof, numbered 2, 29, and 97 lying within the boundaries of the Peace River-Liard Regional District but not within the boundaries of any incorporated municipality, on the request of the Board by resolution, are designated for the purposes of that Act.
APPENDIX 7 PHOTOGRAPHS
N. TETSA RIVER "CANYON" - MILE 390
PROPOSED INFORMATION STOP

"STEPPE MOUNTAIN" NORTHBOUND VIEW
SUMMIT LAKE PRIVATE DEVELOPMENT

EAST END - SUMMIT LAKE
NORTH TETSA OUTWASH TERRACES
VIEW SOUTH

SUB-ALPINE MEADOWS-MICROWAVE TOWER ROAD
GOOD HIKING NORTH OF ALASKA HWY
MT. ST. PAUL

TYPICAL FRAGMENTED SLOPES
MACDONALD CREEK VALLEY

PROPOSED MACDONALD CREEK VIEWPOINT
THRUST PEAKS - MACDONALD CREEK VALLEY

GLACIAL TROUGH - MACDONALD CREEK
SCENIC CANYON - MILE 396

PROPOSED VIEWPOINT AND PARK INFORMATION
MILE 398.5
WOKKPASH RECREATION AREA

INTERIM MANAGEMENT STATEMENT

(EFFECTIVE 1991 - 1994)

MINISTRY OF PARKS
NORTHERN B.C. REGION

JANUARY 1991
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I. BACKGROUND

A. Setting

1. Designation
   - Park Act Recreation Area established by O.I.C. 2212, 86.10.12.

2. Location
   - 160 km west of Fort Nelson on the Alaska Highway then 20 km south
     via Churchill Mine Road (Mine Road is suitable only for 4 x 4 vehicles)
   - adjacent to the southwest boundary of Stone Mountain Park (Fig. 1).

3. Area
   - 37,800 ha (adjacent Stone Mountain Park is 25,906 ha).

4. Access
   - by foot/horse via present trail from Churchill Mine Road to Wokkpash
     Lake
   - by foot/horse via McDonald Creek trail in Stone Mountain Park
   - by air charter to Wokkpash Lake.

B. Natural and Cultural Features

1. The most outstanding display of hoodoos (erosion pillars) in B.C. They
   are up to 300’ high and line Wokkpash Gorge below the lake for 5 km.
   (Fig. 2).

2. Forlorn Gorge - a deep, very narrow and twisting canyon, cut several
   hundred feet into the limestone.

3. Several groups of stepped lakes.

4. Superb northern Rocky Mountain scenery, including glaciers, waterfalls
   and alpine basins.

5. Wokkpash Lake, rock glaciers, ephemeral lakes, a large rock slide.

6. Dolly Varden char in Wokkpash Lake and Creek.

7. Moose, stone sheep, mountain goat, caribou, grizzly bears, as well as
   smaller mammals and rodents. A few bird species inhabit the area and
   some waterfowl can be found on the lakes in summer months.
C. Encumbrances

1. Northernmost part in the vicinity of the Churchill Mining Road is in the Liard Provincial Forest.


5. Parks/Mines inter-ministry protocol.

D. Outdoor Recreation Opportunities

1. Wokkpash Recreation Area provides a complementary wilderness component to Stone Mountain Park. Together they form the nucleus of a potential destination area in northeastern B.C.

2. Wokkpash is unusual in providing a northern wilderness which is accessible on foot from a major highway; most such areas require an expensive air charter.

3. An existing 65 km loop trail through Wokkpash Recreation Area and Stone Mountain Park is an added benefit, providing scenic variety. Side trips into tributary areas are possible. There is also the potential for a longer route from Plug Creek, returning to the Alaska Highway via the Tetsa Valley.

4. The main recreation opportunities are:
   - hiking, camping, nature appreciation, riding, climbing
   - guided hunting and fishing

E. Current Recreation Use

1. Use is low at present as the area is generally unknown.

2. The main use is guided hunting. Some fishing charters are also starting to visit the area. Hiking is limited to a few local groups. Occasional climbing expeditions have visited the area in the past.
II. PROVINCIAL PARK SYSTEM CONTEXT

A. Conservation Role
1. Ensures protection for the Special Natural Features of the hoodoos and gorges and the outstanding scenic and wildland recreation resources.
2. Provides enhanced representation of the Northern Rocky Mountains (Muskwa Ranges) Regional Landscape.

B. Recreation Role
1. Protects a northern wilderness destination which is accessible without the use of aircraft.
2. In conjunction with Stone Mountain Park provides a tourism focal point in northeastern B.C.

III. RECREATION AREA ZONING

The Wokkpash Recreation Area is zoned Wilderness. In addition, a Special Feature Sub-Zone applies to Wokkpash Gorge, Forlorn Gorge and Wokkpash Lake to highlight the significance of these features and to emphasize the need for sensitive management. (Fig. 3)

IV. NATURAL AND CULTURAL RESOURCE MANAGEMENT

A. Land
1. Objective
   - to manage the land so that the wilderness character of the recreation area is maintained.
2. Management Actions
   - arrange with the Ministry of Forests to remove the northern most portion of the Recreation Area from Liard Provincial Forest
   - start the process for reclassification to Class A Park status, since a mineral assessment has been completed with negative results
   - limit the development of facilities such as trails and campsites to the minimum required for safety and to control environmental impacts
- investigate the upper Tetsa and Chischa Valleys, which are contiguous with the east boundary of Wokkpash, as a potential park area providing representation of the Foothills landscape. If they were also added to the park system, the result would be a major and diverse destination park with highway access.

B. Water

1. Objective

- to maintain the natural condition and quality of all water bodies in Wokkpash Recreation Area.

2. Management Actions

- ensure satisfactory sewage disposal by the guide-outfitter camp
- freshwater resources will not be used for purposes other than domestic water supply.

C. Vegetation

1. Objective

- to retain the vegetation of this recreation area in a natural state.

2. Management Actions

- no removal or manipulation of vegetation will be permitted except as required for range enhancement as part of a wildlife management plan to maintain/recreate natural conditions
- the wildlife management plan will determine whether fire management is needed
- a bio-physical assessment may be required to develop a wildlife management plan and assessment of vegetation. This should be done prior to or as part of any habitat enhancement. Any assessment would include Stone Mountain Park.

D. Fish

1. Objective

- to retain natural conditions so that present fish populations are maintained.
2. Management Actions

- guided and resident fishing will continue as a legitimate activity in the recreation area
- though existing provincial fishing regulations do not reflect the suspect low productivity of glacial Wokkpash Lake, B.C. Parks will pursue conservative regulations for the Recreation Area
- a lake survey has already been completed; a creel census is not warranted at present use levels. However, the guide is required to keep records of angling activity as a condition of his permit. This, in conjunction with anecdotal information and staff observations, will provide adequate information for the present. If use pressures increase or population declines are suspected, more specific action, such as a creel census, may be undertaken.

E. Wildlife

1. Objective

- to retain natural conditions in the recreation area so that present wildlife populations are maintained in a largely natural state for hunting and viewing.

2. Management Actions

- hunting by residents and guided non-residents will continue
- wildlife surveys will be conducted on a regular basis to determine populations and set hunting regulations
- a wildlife management plan will be prepared for Wokkpash Recreation Area/Stone Mountain Park. The objective will be to maintain the natural species diversity and to maintain the populations required to meet demand for wildlife. Predator populations may be controlled if necessary to prevent loss of many major prey species. Habitat manipulation will be guided by this principle (e.g. the management plan may prescribe fire to compensate for past fire suppression, but not to artificially boost
- trapping is a non-recreational activity which is incompatible with the objectives for the area. The trapline will be acquired when possible. In the meantime, the activity will continue under permit.

F. Geological Resources

1. Objective

- to honour the Mines/Parks inter-ministry protocol regarding exploration
- to minimize disturbance from such activities
- to eventually eliminate all mineral activity in order to permit reclassification to Class A Park.

2. Management Actions

- as a mineral evaluation has already been undertaken, the conditions of the protocol appear to have been satisfied. B.C. Parks will start the process of reclassifying the area
- the nb staking reserve (OIC 1011/1977) which covers the key features will be maintained until reclassification to Class A Park (Fig. 4)
- in the event that reclassification does not proceed at this time, the inter-ministry protocol will continue in effect and will apply to any mineral activity

G. Cultural Resources

1. Objective

- to minimize disturbance of any sites which may be discovered.

2. Management Actions

- there are no known sites and the potential for any is low. No archaeological work will be undertaken.

H. Outdoor Recreation Features and Visual Resources

1. Objective

- to protect the outstanding recreation and scenic features from disturbance.

2. Management Actions

- the protection of recreation features and views will take precedence over resource activities
- establish firm guidelines for the protection of outdoor recreation features and visual resources from disturbance by potential resource development. Controls will be enforced by Resource Use Permits.
- the development of facilities such as trails and campsites will be kept to the minimum required for safety and to control environmental impacts.
V. VISITOR SERVICES MANAGEMENT

A. Recreation Opportunities

1. Objective

- to encourage enjoyment of Wokkpash Recreation Area as the wilderness component of the combined park area
- to promote the opportunity for a wilderness circle hike, starting directly from the Alaska Highway.

2. Management Actions

- in keeping with the wilderness objective, facilities will be kept to an absolute minimum
- campsites will be grubbed out only when continued use of specific sites necessitates some remedial action
- as the circle trail is well established, work will be limited to a few locations where the trail has been eroded by the rivers (e.g. lower McDonald)
- no additional trail development will be undertaken; visitors interested in visiting upper Wokkpash Valley or tributary basins can easily find a route through the open alpine
- B.C. Parks will investigate the feasibility of a route from upper Plug Creek into the headwaters of the Tetsa River
- there will be no on-site interpretation of features in the Recreation Area
- B.C. Parks will not request or encourage any upgrading of the Churchill Mine Road
- the informal trailhead parking area at the road crossing of Wokkpash Creek is adequate for the next few years. A suitable trailhead for the McDonald Valley should be located and signed in Stone Mountain Park. Trailhead maps and information at both locations will be useful
- the guide’s existing hunting cabin will remain. Any request to enlarge the camp (e.g. additional cabins, small fishing lodge, boats, rough airstrip on the gravel bar) will only be considered on the basis of a business development plan, to avoid incremental growth. Any development will be kept very limited in recognition of the lake’s probable low productivity, the confined nature of the valley and the sensitivity of the northern wilderness. The preferred option is no additional development
- one Resource Use Permit will be made available for float plane charter service to and from Wokkpash Lake. No ancillary services or facilities will be authorized (e.g. angling guiding, boats, camps). Instead, the permittee must make arrangements with the present guide for the provision of these services
any applications for recreational guiding (other than hunting and fishing) will be judged on the basis of their compatibility with the wilderness objectives for the area.

B. Management Services

1. Objective

- to provide a management presence in the new recreation area.

2. Management Actions

- no management facilities are required
- periodic backcountry ranger patrols will be undertaken to familiarize park staff with the recreation area and establish a presence
- staff will work closely with the present guide-outfitter in gathering information and establishing a presence in the recreation area.

C. Promotion and Information Program

1. Objectives

- to increase awareness of Wokkpash Recreation Area
- to provide information to potential users
- to provide off-site interpretation of the special features

2. Management Actions

- visitors will be informed of the nature of the area and particularly the potential difficulty of some river crossings. The wide, braided channels of Wokkpash Creek and McDonald River make footbridges impractical
- information about the park's location and opportunities will be provided through the usual methods such as maps and brochures
- a brochure for Stone Mountain Park/Wokkpash Recreation Area will be considered
- B.C. Parks will work closely with the Peace River Alaska Highway Tourist Association to market the area as a major wilderness destination in northeastern B.C.
- outdoor writers and photographers will be encouraged and assisted to prepare articles about the area
- information will stress that the area is adjacent to and accessible from the Alaska Highway
- information will emphasize that the area is the wilderness component of a larger park unit. Potential users will be alerted, in particular, to the need to ford rivers.
- trailhead information will be provided
- the guide-outfitter will be kept informed of the Division's objectives and plans for the area
- interpretation of the hoodoos and gorges will occur off-site. In particular, there should be a display at the Summit Lake campground in Stone Mountain Park for highway travellers who are unable to visit the area in person.

VI. INTERIM MANAGEMENT STATEMENT IMPLEMENTATION

The priorities for 1991-94 are:

- develop a management presence through periodic patrols and close contact with permit holders (guide-outfitter, air charter company)
- work with the Tourist Association, outdoor writers and others to increase awareness of the area as a prime wilderness destination in northeastern B.C.
- locate a trailhead for the McDonald Valley trail in Stone Mountain Park; sign both trailheads for the loop trail; restrict trail work to the one or two sections which require relocation; inform hikers of the need to ford rivers
- start the process for reclassifying the Recreation Area to a class A Park
- have the northern end of the Recreation Area removed from Liard Provincial Forest
- provide off-site interpretation of the special features at Summit Lake Campground in Stone Mountain Park; consider a joint Stone Mountain/Wokkpash brochure
- ensure that all commercial activities operate under permit
- continue wildlife surveys; start work on a wildlife management plan; apply conservative hunting and fishing regulations
- attempt to acquire the trapline
- honour the Mines/Parks protocol, as necessary, for Mineral exploration; maintain the no-staking reserve until Class A Park status is achieved
- investigate the upper Tetsa and Chischa Valleys for their potential to represent the Foothills landscape; reconnoitre a trail link between Wokkpash Recreation Area and the Tetsa Valley
- by 1994, prepare a master plan, with public involvement, for the combined unit of Stone Mountain Park/Wokkpash Recreation Area.
UPPER SIKANNI MANAGEMENT PLAN

Ministry of Environment, Lands and Parks
and
Ministry of Energy, Mines and Petroleum Resources

November 1995
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PREFACE

The Ministry of Environment, Lands and Parks (MELP) recently completed wildlife capability mapping for the Muskwa-Kechika region of northeastern British Columbia. This mapping exercise confirmed the provincial and international importance of the Northern Rocky Mountains and eastern foothills for wildlife and wilderness values. Because of the abundance and diversity of large mammal species, this area is one of the highest priority areas in the province for the protection and management of wildlife species. The following wildlife species have been included in this mapping exercise: grizzly bear, Stone sheep, elk, black bear, moose, caribou, Plains bison, mountain goat, mule deer and white-tail deer. Recent overview inventories of the Upper Sikanni River and its tributaries, have demonstrated that viable populations of sportfish species including rainbow trout, Arctic grayling, and mountain whitefish exist within the watershed.

The Muskwa-Kechika region contains some of the province’s greatest potential for large accumulations of natural gas. Natural gas exploration and development is expected to intensify over the next few years, particularly along the eastern slopes. Industry operations and activities include low impact seismic explorations, and the construction of roads, wellsites, pipeline rights-of-way, power lines and compressor facilities, and establishes precedent for additional activity within an area. Although some petroleum and natural gas development activities may be small in scale, they can have cumulative environmental impacts, particularly in areas with high wildlife and wilderness values. It is important that the location, nature and extent of petroleum and natural gas exploration activities in sensitive areas be carefully managed to sustain environmental resource values while insuring that opportunities for continued economic benefits from a healthy oil and gas industry are maintained.

The Muskwa-Kechika region also contains timber and mining values and provides exceptional recreation opportunities. Although at this time recreation usage is low and there are no immediate timber and mining plans for the Upper Sikanni, the potential for future usage and extraction is recognized. Current mineral deposits in the area, taken from the Revised Minerals Inventory Maps, show mineral deposits such as copper, zinc, barite and barium.

The Ministry of Energy, Mines and Petroleum Resources (MEMPR) has received a number of requests for oil and gas tenure in the Upper Sikanni Chief river drainage and has deferred offering the tenures for competitive bid for two years to provide MELP with sufficient time to complete initial wildlife and habitat assessments in the area. There are a number of existing oil and gas tenures in the area and some preliminary geophysical exploration and drilling has occurred. The Upper Sikanni Management Plan (USMP) has been developed to provide guidance and direction for the continued exploration and potential development of natural gas in this sensitive area.
Until such time as the Fort St. John Land and Resource Management Planning (LRMP) processes define land use zoning and protected areas under the Protected Areas Strategy, the USMP will provide interim working guidelines. The USMP will be considered as a pilot project for the further development in the Muskwa-Kechika, and may also be of use to the northeast LRMP tables as they address special management zoning issues. The USMP will assist both MELP and MEMPR in ensuring that important environmental resource values are sustained, and that opportunities for environmentally responsible resource development are maintained.
INTRODUCTION

The USMP has been developed primarily to ensure that impacts to sensitive wildlife and habitat from oil and gas exploration and resource developments are minimized. The plan consists of: a description of broad habitat types, guidelines for works within the Upper Sikanni drainage derived from habitat descriptions, a list of wildlife species, an annotated map identifying areas subject to specific management and operational terms included as conditions of tenure. The plan will apply to petroleum and natural gas tenures issued in the Upper Sikanni drainage as provided for in the protocol agreement between MEMPR and MELP. Both agencies recognize both the high potential for natural gas development and the high wildlife habitat values in the Upper Sikanni drainage.

The Ministry of Environment, Lands and Parks has determined that the Upper Sikanni drainage should be managed on an ecosystem based approach, as the optimal method of accommodating both human use and resource extraction, while sustaining a long term, strong wildlife population. This plan calls for the issues of connectivity and biodiversity to be applied in all stages of development and to apply to all species.

Access development for the oil and gas industry has major impacts on elk, moose, Stone sheep, mountain goat, caribou, Plains bison, grizzly bear, wolverine, gyrfalcons, wolves, and all fish species of the Sikanni River and watercourses. Access development increases variety of uses which can fragment wildlife ranges, increase hunting/fishing pressure, and ultimately reduce habitat suitability. Impact mitigation strategies will require monitoring and adjusting to insure they are compatible with the objectives of the plan.

The primary habitat management objectives of the plan are consistent with the Biodiversity Guidebook, 1995, developed for the Forest Practices Code and include:

- maintenance of connectivity of ecosystems in such a manner as to ensure the continued dispersal and movement of forest/alpine dwelling organisms across the landscape. Linkage corridors between protected areas and sensitive development zones. These areas are critical in that they provide for seasonal migration, escape cover and gene pool exchange.
- maintenance of a variety of patch sizes, seral stages, forest stand attributes and structures, across a variety of ecosystems and landscapes. Maintaining a full range and appropriate distribution of habitat types across the landscape, emphasizing rare habitats (such as grasslands and riparian habitats).
- provision of un-harvested areas of sufficient size to maintain forest interior habitat conditions, as well as prevent the formation of excessive edge habitat (Biodiversity Guidebook 1995).

While this plan may not meet all objectives of all sectors, it represents the best opportunity to demonstrate that a balanced approach to resource management can be achieved through inter-agency cooperation and sound development practices.
The Fort St. John LRMP process is currently developing strategic objectives and strategies that encompass the USMP management area. Until such time as this process defines land use zoning the USMP will provide direction for resource development.

**PLAN AREA**

Situated in the northeastern part of British Columbia, the USMP encompasses approximately 1832 sq. km. Located where the extensive boreal plains and muskeg of the east meet the Rocky Mountains, the Upper Sikatu.i Chief River watershed is significant in terms of wildlife species groupings, remoteness, minimal development, low human population and supports a wide ranging predator-prey system.

The most westerly edge of this area consists of varied terrain which includes jagged peaks, cliffs, talus slopes and sparsely vegetated alpine slopes. The mid to eastern end of the subject area, the habitat changes from alpine to longer, wider valley habitat, with a varied forest canopy. Grassland habitat occurs in the eastern edge. Windward slopes and exposed ridge crests remain free of snow for extensive periods during the winter. Due to its northern latitude, inland location, and high elevation, the climate is severe and the growing season short. This is the northernmost known occurrence of Englemann spruce in the Rocky Mountains.

The plan area lies within the Fort St. John Forest District and is comprised of the following biogeoclimatic zones (forest types):

**Alpine Tundra - (AT)**

The alpine tundra, essentially a treeless region characterized by a harsh climate, is dominated by dwarf shrubs, herbs, mosses and lichens. This zone has high recreational appeal. It also provides important range for caribou, mountain goats and mountain sheep. Due to the severe climate it is extremely sensitive to use. Disturbed landscapes require decades, or even centuries, to recover to their natural states. The AT zone occurs above approximately 1400 m in northeastern British Columbia. The most common krummholz species are subalpine fir, Engelmann spruce and white spruce. A krummholz is typically a high elevation, stunted tree, open habitat, characterized by islands of the above species, intermixed with a dense shrub cover of willows and scrub birch.

**Spruce-Willow-Birch - (SWBmk)**

The SWBmk zone is the most northerly subalpine zone in British Columbia. Elevations range between 1000 and 1700 m, and is commonly the subalpine zone above the Boreal White and Black Spruce zone in northern British Columbia. At lower elevations, the zone is characterized by open forests of primarily white spruce.
and subalpine fir; upper elevations are dominated by deciduous shrubs including scrub birch and willow. In some high wide valleys, cold air collects resulting in a mosaic of scrub, grassland and wetlands on valley floors below a band of forest on the valley sides. This zone provides extensive moose, caribou and, in the east, elk habitat.

Boreal White and Black Spruce - (BWBSmw2)

The BWBSmw2 biogeoclimatic zone occurs at elevations ranging from approximately 350 to 1100 m. The regional climate is relatively moist and warm with a longer growing season than the higher elevation BWBSwk. The following applies to both the BWBSmw2 and the BWBSwk2. The forests are dominated by white spruce or aspen. Forest fires are frequent throughout the zone, maintaining most of the forests in various successional stages. Forest harvesting in BWBS is relatively active and will continue to grow with the increased use of trembling aspen and balsam poplar. The Upper Sikanni has, at this time, no harvesting of the BWBS zone. The BWBS zone has the least snowfall of all the northern zones and consequently is very important for wintering ungulates. The zone provides prime habitat for fur-bearing mammals.

Boreal White and Black Spruce - (BWBSwk2)

The BWBSwk2 biogeoclimatic zone occurs at elevations ranging from approximately 900 to 1300m. The climate is wetter and cooler with a shorter growing season than the BWBSmw. The forests are dominated by white spruce or lodgepole pine.

Historically the Upper Sikanni Chief River has accommodated a variety of uses by both First Nation and settler communities, such as: trapping, guiding and outfitting, hunting, fishing and small scale mining operations. This region is within the ethnolinguistic area of the Athapaskan; Sekani/Beaver (Halfway River Indian Band and Prophet River Indian Band - Treaty 8). Both of these First Nations communities rely extensively on fish and wildlife for sustenance, and trapping is an important component of their way of life. There are known First Nations’ grave sites in the subject area.
METHODS

The information depicted on the annotated map, as with all information within this report, was derived from a variety of sources. The main source of information was from the Upper Sikanni Chief River Watershed (Muskwa Foothills Project 1994) broad level biophysical habitat mapping, which was completed by MELP. As a secondary source of information MELP utilized the knowledge of its own staff, trappers and First Nations, as well as the guide and outfitter which occupied the area at the time. MELP wishes to acknowledge how useful and crucial these contributors have been in molding this project. Their knowledge of the area and of certain species has proven an invaluable resource.

Research was conducted on whether any known archeological sites are within the USMP. Ongoing archeological studies are being conducted by the Halfway Band at this time; several sites have been identified. It is evident that there is a need for further archeological studies before any development occurs.

Recreation issues have been identified by the Peace River Alaska Highway Tourist Association and the Ministry of Forests. Interviews were conducted to bring forth areas of interest and areas of concern, with respect to recreation and tourism, within the USMP. However, the main focus of this plan is wildlife habitat management.

The annotated map was constructed from both a 1:250,000 and 1:20,000 TRIM mapping base. Tenure information was derived from current records from Energy, Mines and Petroleum Resources. McElhanney Associates of Fort St. John completed the manual digitizing of information from the 1:50,000 map base.

The generalized broad habitat classes were derived from satellite imagery, aerial photographs, forest cover maps and existing wildlife knowledge. This information is useful for providing general procedures and restrictions in terms of oil and gas development. However, more detailed information is required to properly address site specific issues and to more precisely assess local wildlife and fisheries needs. The current data only provides this habitat plan with baseline information on distribution and range. Development plans (pre/post assessment and monitoring) must focus on identifying the impacts of oil and gas operations on wildlife within the Upper Sikanni. Some of this information may have to be gathered by the proponent prior to development approval. Ongoing telemetry studies on the Plains bison, and further wildlife and fisheries inventories conducted by BC Environment will continue to help to fill some information gaps.
MAPPING

The mapping consists of an Upper Sikanni base map and a broad habitat map for the Upper Sikanni. These maps have been produced at a 1:50,000 and 1:100,000 scale, and both maps are in large formats and accordingly cannot be attached to the plan; report sized versions have been attached to the plan but should only be used to obtain a general overview of the plan area and broad habitat locations.

The Upper Sikanni Base Map contains the following data: water drainages, contours, trails, high fishery value sites, grazing leases, privately owned property, roads, seismic lines, wellsites, recreational reserves, bridges, cabins, airstrips, ecological reserves, archeological sites, existing and proposed tenures, 1300m elevation, proposed Protected Areas, and pipelines.

The Broad Habitat Map, in addition to containing all data on the base map, illustrates the approximate borders of all zones and habitats discussed in Broad Habitat Types. The map shows the approximate borders of the two sensitive zones: in pink and green. The map indicates the approximate locations of each habitat, using symbols. These habitats and their designations are explained in greater detail in the Broad Habitat Type section.
GENERALIZED BROAD HABITAT TYPES,
DESCRIPTIONS AND MANAGEMENT STRATEGIES

1. Closed Forest Type

DEFINITION/DESCRIPTION:

The Closed Forest Type consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Cool Aspect, Well Drained, Boreal, Closed Subalpine and Warm Aspect.

Typically, a closed canopy dense coniferous forest consists of varying components of spruce, black spruce, lodgepole pine, subalpine fir and small intrusions of deciduous species such as aspen, balsam poplar and birch. The forest understory generally consists of moss, labrador tea, some alder willow and various shrub and herb species. This habitat is found in the valley bottoms and lower slopes with gentle to moderate gradient. The closed forest habitat in this area is within the BWBS and SWB biogeoclimatic zones. The closed forest provides the best thermal and hiding cover for many species of birds and mammals.

Many species use this habitat for escape cover, perching, nesting and some species utilize the area year-round. This habitat is most valuable where there are natural openings or waterbodies as it then increases the diversity of habitat and allows for use by a greater number and variety of species. Large continuous areas of closed forest are important for species such as fisher, martin, squirrels and boreal owls.

The greatest attributes of the closed forest type from a wildlife perspective are: snow interception capabilities; the security provided by the closed canopy to small mammals for protection from avian predators; escape cover for prey species from land predators; its temperature moderating abilities which provide relief during period of temperature extremes; and, its effectiveness in isolating and minimizing human disturbance by shielding it from view by its natural revegetating abilities.

There are four blue listed species that utilize this habitat: grizzly bear, wolverine, fisher and bald eagle

DISTRIBUTION:

The closed forest habitat is extensive on a regional basis but in the Sikanni watershed, it occurs mostly in the immediate Upper Sikanni River valley and in the eastern half of the project.
MANAGEMENT STRATEGIES:

Low Sensitive - This habitat type has been developed extensively by the petroleum and forest industries east of the USMP. It is readily reclaimed and small to moderate disturbances tend to be screened by this forest. Due to its linear nature, oil and gas development can generally be practiced here with fewer negative effects on wildlife than in other adjacent habitat types. Pre-planning must be done to minimize disturbances and proper reclamation must be undertaken after development. Development can occur within this habitat type but the following practices to minimize negative impacts on species utilizing this habitat are expected:

- Minimize clearing sizes for pipelines, roads, wellsites, other development;
- Distribute coarse woody debris on disturbed sites during reclamation;
- Vary the shape of clearings to mimic natural forest openings and increase edge effects;
- Prompt revegetation of disturbed areas using original tree and bush species;
- Dogleg linear openings to minimize site disturbances;
- Consideration of visual impacts from all distances and discretion when locating development; and,
- Maintain short sight distances in corridor developments.

Notes:

1. Some warm aspect forested habitats constitute Class 1 grizzly bear range. Warm aspect forests also have the potential to provide ungulate winter range. Where warm aspect forests provides both ungulate winter range and grizzly bear habitat, development will be restricted. This will be determined on a site specific basis, when more detailed development plans and field data have been collected.

2. Some portions of this habitat may be required as wildlife travel corridors, managed as a buffer for more sensitive open habitats (meadow complexes and mineral licks) or lakes and streams.

2. Open Forest Type

DEFINITION/DESCRIPTION:

The Open Forest Type consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Forest Wetland and Open Subalpine Forest.

This forest type is similar in composition to the closed forest type but the canopy closure and understory layer differ significantly. This forest canopy is more open, allowing more light to reach the forest floor, enhancing shrub and herbaceous growth and terrestrial lichens. The open canopy is a result of a lower density of mature trees caused by marsh climatic conditions, nutrient poor soils, poor drainage
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and/or fire history. Open forest dominates the higher elevation forest types and often is the transition zone from closed forest type to the subalpine meadow/parkland and alpine. Although this habitat provides less security than closed forest in terms of hiding cover for larger animals, it plays an important role in providing escape cover from the adjacent open habitats such as alpine or warm aspect grassland. Open forest is noted for:

- Shrub/herb and lichen producing understory providing important winter/summer forage for large and small mammals and birds;
- Providing hiding/escape cover for animals utilizing adjacent open habitats; and,
- Moderating visual impacts of development and disturbance.

It is important winter range for moose, Plains bison and caribou. Other species that utilize this habitat include the following blue listed animals: grizzly bear, wolverine, fisher, Smith’s Long Spur and bald eagle. The shrub/herb understory provides a home for numerous birds and small mammals.

**DISTRIBUTION:**

The open forest habitat is extensive in the Upper Sikanni watershed. It is generally concentrated along the valley bottoms but also occurs on the upper slopes of these valleys and in draws of the mountain ranges. A large percentage of this habitat is in the western half of the project area, running north/south from Cranswick Lake area to the headwaters of Sidenius Creek.

**MANAGEMENT STRATEGIES:**

Low Sensitive - The effects of oil and gas development on this habitat type are predicted to be similar to those of the closed forest type and this habitat type will be managed with the same objectives as the closed forest type. Given the more open nature and the cumulative detrimental visual effects created by development, planning must address minimizing visual impacts. Development buffers will be required where this habitat is adjacent to open habitat types of lakes, streams and grasslands.

3. **Shrub/Grass Lowland - (Coloured pink on map)**

**DEFINITION/DESCRIPTION:**

The Shrub/Grass Lowland consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Wetland and Cold Air Drainage/Grassland.

This habitat type is found in low elevation wet areas and is characterized by low dense shrubs, scrub birch, willow, grasses and sedges. These areas remain treeless due to low nutrient soils, poor drainage and cold air drainage. Meadows occur and create a mosaic
of natural openings within the forest types, providing edge habitats which promote abundance and diversity of animal species.

Many raptors, including the Peregrine falcon (red listed), forage in open areas such as the shrub/grass lowland where small birds and mammals are abundant. Large mammals such as moose, caribou and elk also forage in these meadows and Plains bison utilize them extensively in winter in lower snowfall areas. Where shrub/grass lowlands occur adjacent to streams or lakes, it provides nesting habitat for waterfowl. There are five blue listed species that occur in this habitat: Plains bison, grizzly bear, wolverine, Smith’s Long Spur and bald eagle.

**DISTRIBUTION:**

Shrub/grass Lowland occur in only a small percentage of the total area and therefore preservation of the habitat is critical. It is generally found in the wetter sections of the valley bottoms. A large portion of this habitat is pocketed along the Sikanni River at Jesson Creek and Sidenius Creek.

**MANAGEMENT STRATEGIES:**

High Sensitive: The siting of wells and related processing facilities is prohibited. Access through these areas for geophysical exploration, pipelines and roads will be permitted but should be avoided; any activity will require site specific management.

The openness of this habitat, promotes species diversity and development should be avoided. Meadows require treed, visual buffers to isolate them from development activities and in areas where the shrub/grass lowlands create a complex of meadows and interchanging forested areas. They must be managed as a complete unit that prevents habitat fragmentation. Any unavoidable development must be sufficiently buffered to prevent disturbances to wildlife utilizing this open habitat.

It is a critical winter range for Plains bison.

4. **Warm Aspect Grassland - (Coloured pink on map)**

**DEFINITION/DESCRIPTION:**

The Warm Aspect Grassland consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Warm Aspect Grassland.

Typically this is dry grassland habitat dominated by perennial grasses and forbes. In the Upper Sikanni watershed, this habitat is limited to steep, south facing slopes or alpine ridges. This ecosystem can be initiated and perpetuated by fire, either natural or human-caused. Extensive grazing by ungulates help maintain this early seral habitat. Mule deer, Plains bison, Stone sheep and elk depend heavily on these area for foraging in winter months as they can easily access suitable forage species in low snow or even
snow-free conditions. Falcons, hawks and eagles use this open terrain for hunting. Mountain bluebirds, voles and grouse are also found here. This is one of the few habitat types where several large ungulate species will occur together in significant numbers to create a unique wildlife viewing opportunity. These areas also tend to green up in the early spring providing an important food source for ungulates and for recently emerged black and grizzly bears.

**DISTRIBUTION:**

The Warm Aspect Grassland habitat is very limited in the Upper Sikanni watershed. The majority of the habitat occurs in the easterly end of the subject area, along the south facing slopes of the Upper Sikanni River.

**MANAGEMENT STRATEGIES:**

High Sensitive: The siting of wells and related processing facilities is prohibited. Access through these areas for geophysical exploration, pipelines and roads will be permitted but should be avoided if possible.

This habitat is limited and is very important to several species for winter range. The openness and location of these areas on steep slopes make them very sensitive to activity not only within the habitat itself but also in adjacent habitats directly below. The steepness of these slopes increases the chance of slumping and erosion. For animals utilizing this habitat, adjacent escape cover/terrain is essential, therefore suitable habitat adjacent to the warm aspect grasslands must be preserved to provide an avenue of escape. For most animals this constitutes a forested area where they can find visual shelter and thermal retreat during temperature extremes. For Stone sheep or mountain goats adjacent alpine or rocky habitats will provide the best avenue of escape and should be avoided.

5. **Riparian - (Coloured pink on map)**

**DEFINITION/DESCRIPTION:**

The Riparian zone consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Riparian.

Riparian habitats are identified by the presence of vegetation requiring large amounts of free or unbound water and are typically a dense moist forested area, with shrub and forbes dominated understories, affected by seasonal flooding or high water tables associated with streams, rivers or small creeks. Riparian zones along a watercourse, typically consist of a wet/saturated habitat with emergent herbaceous species, sedges and rushes and shrubs, to a moist deciduous forest of aspen, balsam poplar, willow, dogwood, and further up the river bank a coniferous forest habitat with of Engelmann spruce, pine, with a shrub and forbes understory. This habitat is affected by seasonal flooding or high water tables. The large mature deciduous and coniferous trees along a
streambank provide a future source of large organic debris in the aquatic environment; fallen dead trees and snags, eroded root structure and logs are the large organic debris that provide stream bed stability, cover and habitat for young fish. Disturbance and destruction of the riparian zone can have serious impacts to both the short and long-term viability and productivity of fish and fish habitat. The microclimate of riparian zones is different from that of the surrounding coniferous forest because of increased humidity, a higher rate of transpiration, more shade, and increased air movement. Riparian habitats also provide migration routes and travel corridors between summer and winter ranges.

There are five blue listed species that utilize this habitat: Plains bison, grizzly bear, western wolverine, fisher and bald eagle. As well, the Peregrine falcon, which is red listed, occur here. This area is used for breeding, nesting, feeding, and thermal and hiding cover, as well as providing food sources and natural streambank stabilization for fisheries values.

**DISTRIBUTION:**

This habitat type occurs in only a small percentage of the subject area, and is very critical habitat for almost all of the species noted in Appendix A. It is mainly situated along the banks of the Upper Sikanni River and is in scattered locations elsewhere along other drainages.

**MANAGEMENT STRATEGIES:**

High Sensitive: Riparian and wetland habitats play a critical role in maintaining biodiversity, and therefore must be managed with great care. The siting of wells and related processing facilities is prohibited. Access through these areas for geophysical exploration, pipelines and roads will be permitted but should be avoided if possible.

Despite the low occurrence, this habitat is important for numerous species. The habitat tends to be linear in nature, following the rivers and streams and bordering lakes. The situation may arise where access development is required through a riparian area, and in that situation strict guidelines must be followed and efforts to determine the shortest route, with the least disturbance must be made. Proposed crossings through riparian areas will be considered on a site specific basis. The objective is to maintain the natural habitat.

6. **Avalanche Chute - (Coloured pink on map)**

**DEFINITION/DESCRIPTION:**

The Avalanche Chute Zone consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Avalanche Chute.
This is, as the name suggests, an avalanche maintained habitat. Repeated avalanches prevent forest development and perpetuate an early seral habitat of shrub species such as alder and willow and in catchment areas, rich herbaceous growth. The lush vegetation found in these areas in summer is of prime importance to grizzly bears and is utilized by mountain goats, Stone sheep, black bears, ptarmigan, hoary marmots and numerous other species. In the Upper Sikanni drainage avalanche chutes are concentrated in the west end near the height of land on north and east facing slopes where snow accumulations are greatest. The chutes occur in rugged terrain, occur in narrow valleys and feature very steep slopes. These conditions create open exposure to any activity that may take place in valley bottoms or on opposite valley walls. There are four blue listed species that utilize this habitat: Stone sheep, grizzly bear, western wolverine and gyrfalcon.

**DISTRIBUTION:**

There are nine notable avalanche chutes in the Upper Sikanni, and they occur west of Mount Bertha and run north/south. The lower portion of the chute is directed towards valley bottoms or watercourses.

**MANAGEMENT STRATEGIES:**

High Sensitive: The siting of wells and related processing facilities is prohibited. Access through these areas for geophysical exploration, pipelines and roads will be permitted but should be avoided if possible.

If development adjacent to or nearby avalanche chutes is to occur, site specific planning will be required to ensure that avalanche habitats are not disturbed.

7. **Subalpine Meadow Parkland**

**DEFINITION/DESCRIPTION:**

The Subalpine Meadow Parkland consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Subalpine Meadow Parkland.

This habitat can best be described as the transition zone between the open or closed forest habitats and the unforested alpine habitats. By nature, it incorporates a mixture of both habitat types, but can be characterized as a open forest type with stunted subalpine fir and low growing shrubs. Ground cover is dominated by herbaceous species such as grasses, forbes, sedges and terrestrial lichens. Large open meadows occur and tree cover is interspersed in patches or clumps. This habitat often occupies mid to upper slope locations and contain tree densities so low as to have little influence on understory cover and ground moisture. The vegetation tends to be open due to the low productivity of these sites. These areas may provide significant winter range for caribou as there is extensive terrestrial lichen cover and low snow conditions. This
combination of alpine vegetation and sparse forest cover provides a unique habitat important to blue listed species like the Smith's long spur, grizzly bear, Stone sheep, Plains bison and gyrfalcon and the red listed Peregrine falcon.

**DISTRIBUTION:**

This habitat is extensive in the Upper Sikanni and is mainly found in the eastern half of the watershed. It lies between the vegetated alpine and the open subalpine.

**MANAGEMENT STRATEGIES:**

Medium Sensitive - Some areas of subalpine meadow/parkland are rated as class 1 grizzly bear and caribou habitat. Based on degree of sensitivity, siting of access, wellsites and and facilities should be avoided however it is recognized that terrain may limit alternate options. These areas will be tied to high sensitive habitats to create a more complete and diverse habitat.

In this open habitat, disturbances tend to have greater impact than in forested types, however, short term disturbance is acceptable and careful reclamation can be successful when the project is complete. Buffer zones to protect adjacent alpine and attention to minimizing visual impacts on wildlife and the public will be conditions.

8. **Vegetated Alpine** - (Coloured green on map)

**DEFINITION/DESCRIPTION:**

The Vegetated Alpine consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Alpine Plateau, Vegetated Alpine.

This is a high elevation, non-forested habitat dominated by grasses, sedges, forbes and terrestrial lichens. In depressions and wetter sites, lush herbaceous vegetation occurs; low shrubs, heather, avens and juniper will be prevalent. This habitat occurs on mountain and ridge tops or in high elevation basins above ~1300m. The terrain varies from very steep, with rock outcrops, to gently rolling or flat plateau areas. Windward slopes and exposed ridge crests remain free of snow for extensive periods during the winter. They tend to be dry during the growing season, which limits plant growth. The vegetation tends to be scattered due to the low productivity of these sites and the dry conditions favour a high proportion of deep-rooted cushion and rosette plants. Snow often forms deep drifts; forbes, bunchgrass and dwarf evergreens occur.

Vegetated alpine areas represent critical winter and summer range for ungulate species like Stone sheep, caribou and mountain goat. Gyrfalcons, Peregrine falcons and bald eagles also occur. Wetter, more lush areas of alpine provide foraging areas for grizzly bears and hoary marmots. An abundance of ungulates also means scavengers like wolverines, and predators like wolves, will also use this habitat. To a lesser extent
moose, elk and Plains bison use alpine for foraging. More rugged areas of alpine provide calving areas

**DISTRIBUTION:**

This habitat exists throughout the subject area, but at times occurs in isolation from other vegetated alpine habitats. Connectivity of these isolated areas is a management objective.

**MANAGEMENT STRATEGIES:**

High Sensitive:

Alpine areas are a result of extreme climatic conditions. It is difficult to successfully reclaim these areas, particularly with natural vegetation such as lichen. Developments in the alpine can remain visible for a long time due to the openness of this habitat. Disturbance to animals at times such as late winter/early spring, calving or lambing periods, or during fly season, can have serious impacts on wildlife. Changes in habitat, interrupted feeding, and blocking travel and migration routes can create added stress and induce fear responses such as running and general nervousness thereby negatively affecting overall condition. It is critical that impacts to these areas be minimized as winter range for alpine species is very limited in the Sikanni watershed.

9. **Sparsely Vegetated Alpine - (Coloured green on map)**

**DEFINITION/DESCRIPTION:**

The Sparsely Vegetated Alpine consists of the following broad habitat classes, which are shown on the 1:250,000 GIS map: Sparsely Vegetated Alpine, Warm Aspect Alpine and Rock.

These alpine areas occur in the west end of the watershed where the climate and terrain are more extreme. Sparsely vegetated alpine habitats tend to consist of very steep rocky areas, cliffs, windswept dry ridges and plateaus, and talus slopes; unvegetated rock habitat has been included in this habitat grouping due to its existence around the outer edges of some sparsely vegetated alpine. Lack of moisture, lack of soil and harsh climate limit vegetation cover on these areas.

Hardy drought and cold resistant grasses and forbes can be found here, as well as a few species of low shrubs. Distribution is sparse and sporadic. Windward slopes and exposed ridge crests remain free of snow for extensive periods during the winter and they are dry during the growing season. Few species utilize this habitat in winter or summer. Those which do are Stone sheep, mountain goats, hoary marmots, some raptors, like the peregrine falcon, ptarmigan. The grizzly bear may use this habitat sporadically.
DISTRIBUTION:

On a regional basis, as with the vegetated alpine habitat, there is very little sparsely vegetated alpine habitat. The majority occur along the mountainous western portions of the Upper Sikanni.

MANAGEMENT STRATEGIES:

High Sensitive: Sparsely vegetated alpine has a low to moderate importance for wildlife habitat. This habitat is most valuable for recreational potential in association with undeveloped valleys and preserved as wilderness. The sheer ruggedness of the terrain precludes much of it from development.

10. Lakes

DEFINITION/DESCRIPTION:

The fisheries inventory for Trimble, Beattie and Marion Lakes is outdated and very limited; bull trout, arctic grayling, lake chub, suckers, mountain whitefish and rainbow trout are known to occur. Other lakes in the area have no documented information, such as Cranswick, Colledge and Sikanni Chief Lake. Typically lakes in the watershed are cold and have low productivity which makes them susceptible to fishing pressure. Waterfowl and shorebird species which utilize the lakes provide a prey base for gyrfalcons, Peregrine falcons, hawks and owls, and small land predators such as mink and fox. Bald eagles utilize lakes, nesting in nearby riparian and forested areas. Emergent vegetation in lake shallows provide an important food source for moose and muskrat. Beavers occur in lakes where deciduous tree species are adjacent.

DISTRIBUTION:

There are approximately 46 lakes within the Upper Sikanni watershed area. The larger lakes occur at higher elevations, in wide alpine valleys. Smaller lakes commonly occur along the main Sikanni valley and along or at the headwaters of tributaries of the Sikanni. Lake edges usually consist of a densely vegetated, marsh habitat. Lake depths range from 5m to 34m. There is a high occurrence of alluvial fans where streams enter into lakes. The Upper Sikanni watershed in comparison to other watersheds in Northeastern British Columbia has a high amount of lake habitat. This is highlights the significance of the watershed in terms of this specific habitat type.
Management Strategies:

(See specific guidelines for fisheries, water and water crossings.) The Guidelines provide for a 1 km zone around Trimble Lake. Any other development near lakes, ponds or wetlands must adhere to stated guidelines.

11. Rivers/Streams

Definition/Description:

The rivers/streams in the Upper Sikanni watershed area provide spawning habitat for most of the species listed in the Lakes section above. Fish species inhabiting the rivers are an important food source for various wildlife species. There are four blue listed species that utilize this habitat: grizzly bear, western wolverine, gyrfalcon and bald eagle. The peregrine falcon, which is red listed, utilizes this habitat.

Distribution:

There are approximately 13 named rivers/streams and many unnamed rivers/streams within the Upper Sikanni watershed. Those named rivers/streams are: Trimble Creek, Kohler Creek, Jesson Creek, Sidenius Creek, Colledge Creek, Gorrie Creek, Millet Creek, Loranger Creek, Chicken Creek, Bartle Creek, Embree Creek, Gautschi Creek and Moose Lick Creek.

Management Strategies:

(See specific guidelines for fisheries, water and water crossings) There will only be certain points along any watercourse in the Upper Sikanni watershed area where crossings can possibly occur. Refer to the Guideline Application section and the annotated map for further guidelines. Directional drilling will be considered in lieu of further road development or any crossing. Any proposals will be addressed on a site specific basis.
OPERATIONAL GUIDELINES

PURPOSE

The purpose of the Operational Guidelines is to provide proponents and or operators with a set of operating guidelines that will be employed at all levels, from geophysical survey operations, through initial well drilling, to the abandonment and reclamation of development. Activities within the USMP are subject to the guidelines which identify mitigation requirements. Proponents and operators are encouraged to discuss any areas of concern or questions related to the interpretation of these standards with MELP and MEMPR staff.

While specific operational techniques are identified in this plan they are by no means the only procedures permitted; the proponent and operators are encouraged to use and develop techniques that will reduce environmental impacts.

The Upper Sikanni Management Plan and its operational component are to be used in conjunction with MEMPR’s Oil and Gas Handbook. It is particularly important that all sub-contractors and their employees, be made aware of the conditions and guidelines of the USMP.

These Guidelines do not alleviate the responsibility of proponents to comply with all federal and provincial legislation.
General Guidelines

Development Plans

Development plans for the Upper Sikanni drainage must be submitted to EMPR/MELP after consulting with other operating companies and tenure holders in the plan area. While recognizing the issues of confidentiality and competitive requirements, tenure holders or their representatives will be required to meet with MELP and MEMPR staff as a committee to ensure that opportunities for cooperative and coordinated access occurs. Proponents are expected to coordinate their plans and activities with other operators to the greatest degree practical to reduce area impacts. This can involve: pooling efforts and resources, and use of common roads, pipeline and utility right-of-ways, and general infrastructure; efforts should be aimed at minimizing surface impacts and disturbances. Plans for deactivation and rehabilitation of all roads and trails at the end of each permitted phase of development must be incorporated in development plan.

At each stage of development, a proponent will be required to provide the best estimate of the overall extent of development. This is required to ensure that the scope and potential impacts of the proposed total development are clearly understood and identified.

Applications for well licenses and other surface disturbances such as pipelines and facilities must be submitted as a part of the development plan so as to project scenarios and development infra-structure options.

1. Initial Drilling - It is recognized that a definitive plan is not feasible at the initial stages of development. However, it is important that with the first exploration well, some outline of the conceptual developments be provided. This information will be helpful to scope potential impacts and related issues. The development proposal should attempt to identify locations for additional wells, should address conceptual pipeline and production facility plans, identify access options, and include details of mitigation measures and options for minimizing the impacts of drilling, production, and testing operations. This phase will include baseline environmental information for the area of the potential development. This information, referred to as an “impact assessment,” is intended to assess specific sensitivities of a given area, as well provide a broader assessment of access routes and potential development, and to evaluate mitigation options.

2. Pool Delineation - Once a pool has been discovered, a more detailed delineation development plan inclusive of additional proposals and more definite plans for mitigation of impacts from drilling, production, access routes and testing operations (e.g. pads, innovative testing methods) will be required. Elaboration of pipeline/facility proposals would also be expected. Delineation proposals should include proposed well locations and associated drilling and waste management options, access, and test/short-term production scenarios.
3. Pool Development - Ongoing production and pool development will require an operational management plan encompassing all facilities, access routes, pipelines, and associated infrastructure. The overall objective is to minimize intrusion and continue to mitigate the impacts wherever possible.

**Habitat Impact Assessments**

The level of detail required to evaluate the impacts of a proposed activity or development will vary depending on which phase of the development being proposed. It may be necessary to conduct environmental baseline analysis to determine what specific sensitivities exist and to define appropriate levels of development and mitigation.

Proponents are to meet with local EMPR and MELP officials to identify site specific issues prior to plan submission. It is particularly important that all contractors, subcontractors and their employees, be made aware of the conditions and guidelines of the USMP.

The level of detail expected in any habitat impact assessment will vary with project stage, the ultimate scope of development, the relative sensitivity of the proposed development area, and the extent of other existing and potential developments (both energy and non-energy related) in the area. The detail must be sufficient to allow examination of the impact of the proposed development on the environment.

All assessments methodology and reporting must meet government and professional requirement standards and are expected to address the following issues:

1. an analysis of site and access selection and construction procedures, with options;

2. baseline environmental conditions including the current status, habitat use, behaviour of wildlife and plan communities with a specific focus on blue and red listed species, direct and indirect impacts of the project on species, coordination measures that could reduce/eliminate adverse impacts to species. This assessment should include studies on wetlands and riparian resources, critical wintering habitat, impacts on alpine habitat and fisheries, and direct impacts on specific wildlife species. Critical lambing and calving grounds and critical rutting will be verified by proponent funded assessments/inventories;

3. impact mitigation options and plans to mitigate impacts;

4. monitoring and reporting plans;

5. results of public consultation programs and details of any future programs; and,
6. plans for reclamation of all disturbed areas with the primary objective of returning the site to wildlife capability as close as possible to previous levels prior to disturbance.

A foremost concern for MELP is the sub-alpine/alpine habitat. Proponents must be prepared to provide technical justification and support for access proposals in these areas. Alternative locations and technologies must be considered and assessed and a detailed discussion of these issues included with any proposal. MEMPR/MELP will evaluate the proposals and make a decision on siting. Restricted productivity is a recognized characteristic of the alpine habitat, as is the visual impact of any development within the alpine. Many alpine habitats support migration/corridors routes which are critical to maintain. Mitigation strategies to deal with problems associated with reclamation, i.e., time to re-establish grass and plant growth and soil, erosion, climate, native species planting, visual effect, and equipment needed to properly scarify and re-seed must be included in the proposal. Connectivity between alpine habitat and the surrounding habitat must be taken into consideration. This is to ensure that escape corridors and post-calving habitats are not at risk.

**Referral Process**

The referral process will follow current procedures, however, the time frame required for each proposal will be examined on its own merits and in relation to other activity or development proposals. Each application should be submitted to MEMPR and processed quickly, as soon as it is known that an activity will take place within the Upper Sikanni. This extra time is needed in order to complete any studies that the proponent will be requested to complete prior to commencing operations.

- Initial response time will be a minimum of 30 days
- Comprehensive development plans are needed in order to properly evaluate each proposal
- Impact assessment, monitoring and evaluation plans for air, water, wildlife, fisheries, and terrestrial habitat as well as comprehensive reclamation plans must be submitted with the development plans
- Where development has the potential to disrupt fisheries habitat, a fisheries inventory must be completed prior to submitting development proposals
- Archeological overview assessments will be required
- The operating requirements in the watershed may evolve as the cumulative impacts of activities and knowledge of the area become known.

**Environmental Monitor**

Project proponents will be required to provide an environmental monitor who will be onsite for all construction activities creating surface disturbances. The monitor will report all findings to MELP, MEMPR and the proponent.
Specific Guidelines

Topsoil Salvaging

Prior to construction, all available topsoil (A and B horizon) on the well pad, gravel pit and new access road will be salvaged and stockpiled for use in reclamation. A soil assessment will be conducted to determine the total depth of the A and B horizon, which in turn will be the amount of topsoil to be removed and stockpiled. Topsoil salvaging will not occur during inclement weather or when the soil is significantly wet to cause damage or compaction. Topsoil stockpile areas will be outside traffic areas within the wellpad location. Drainage will be routed around and away from the pile. Topsoil stock piles will be signed and a berm constructed or ditched around the pile to contain all soil. Immediately after stockpiling topsoil will be seeded.

An assortment of boulders and miscellaneous woody vegetation removed from the well pad, gravel pit and access road will be stockpiled. This material will be pulled back and spread over reclaimed areas. The equivalent of 1-2 logs per acre and two or more brush piles (per acre) 10 feet across and 7 feet high will also be stockpiled and placed on reclaimed areas.

Flight Patterns/Distance

- A ‘Coordinated Flight Management Plan’ shall be completed and presented to MELP with each referral application. This shall include plans as to where staging areas will be, flight path to be used and hours of operation. The main objective of the plan is to avoid critical wildlife habitat and reduce harassment of wildlife.
- No flights shall take place over critical winter range between December 1st and May 1st.
- All fixed-wing aircraft as well as helicopters must follow the defined flight path to avoid critical habitat zones.
- All fixed-wing aircraft as well as helicopters must maintain an altitude of no less than 500m above ground, following the designated flight path. The main flight path follows the Upper Sikanni, approaching from the east (foothills) and flying directly to the area of interest, maintaining the 500m altitude.
- Following and circling of wildlife is strictly prohibited, unless wildlife studies are being conducted.

Timing/Seasonal Restrictions

These restrictions will, in most cases, apply to geophysical and pipeline programs. Where applicable, the following timing restrictions will apply also to roads and wellsite activity. These restrictions are site specific and commonly in the pink and green zone.

- Critical ungulate winter range - No activity between December 1st to May 1st.
- Critical lambing and calving grounds - No activity between May 15th to July 1st.

Proponent will be required to conduct inventories to define the critical lambing and calving grounds.
• Critical rutting - No activity between October 15th to December 31st. *Proponent will be required to conduct inventories to establish these areas as above.*

Restrictions in the watershed may evolve as the cumulative effects of activity and knowledge of the area become known.

**Note:** Management of timing constraints is essential if plan objectives are to be achieved. Flight paths will be assessed in relation to each species as to where and when lambing and calving take place. Much of conditions 1 - 4 (timing constraints), and most critical winter ranges, coincide with the High Sensitivity Habitats which are shown on the attached map. Restraints such as critical rutting areas cannot be mapped as they are not necessarily habitat related and site specific ground truthing will be required.

**Fisheries**

• Where there may be an impact to fishery resource and habitat, a site specific fisheries inventory and habitat assessment must be completed prior to submitting development proposals.

• Two specific zones exist along all rivers/streams. The first coincides with the riparian habitats along all rivers/streams. The second is the critical instream habitat zones which are marked on the annotated map. These critical fishery habitat zones were identified using fishery maps and locating Class 3 LODs (Large Organic Debris) and Class 3 pools.

• Crossings of the rivers will be determined by habitat and terrain. The proponent is expected to produce an assessment showing various crossing options, so that with the aid of site specific investigation, the most appropriate crossing can be determined.

**Water and Water Crossings**

• Access to and use of the water sources will be examined on a site specific basis and must be approved by MELP.

• All 'significant stream' crossings must be made with clearspan removable bridges. Significant streams are: Sikanni Chief River, Trimble Creek, Kohler Creek, Jesson Creek, Sidenius Creek, Colledge Creek, Gorrie Creek, Millet Creek, Loranger Creek, Chicken Creek, Bartle Creek, Embree Creek, Gautschi Creek and Moose Lick Creek. Where smaller or unnamed crossings are involved, clean snowfills may be accepted.

• No development within 500m of Marion Lake, Beattie Lake, Cranswick Lake, Colledge Lake and The Sikanni Chief Lakes (Pass Lakes). A variable width disturbance buffer will be employed around all other lakes and ponds. The width of the buffer will be determined by site specific factors such as visual impacts, erosion potential, surrounding habitat class, fisheries values and type of development. Access for geophysical exploration, pipelines and roads will be permitted but should be avoided if possible.
• No development within 500m of the following rivers and creeks: Sikanni Chief River, Trimble Creek, Kohler Creek, Jesson Creek, Sidenius Creek, Colledge Creek, Gorrie Creek, Millet Creek, Loranger Creek, Chicken Creek, Bartle Creek, Embree Creek, Gaultschi Creek and Moose Lick Creek. Access for geophysical exploration, pipelines and roads will be permitted but should be avoided if possible.

Geophysical Operations

• Seismic operations will be heliportable only, with avoidance/handcut lines not to exceed 1.5 meters width. Avoidance handcut methods should be used, where possible, to provide line-of-sight, rather than cutting trees down.
• Conventional operations may be approved where there are existing conventional lines.
• Seasonal restrictions on all seismic operations will apply between May 15th and July 1st. Where critical ungulate winter range and critical rutting areas are verified the following restrictions will apply:
  - Winter range: No activity between December 1st and May 1st.
  - Rutting range: No activity between October 15th and December 31st.
• Adjustment may be required to seismic programs that propose lines that run directly through or alongside critical habitat.
• Coordination of seismic programs must be demonstrated where possible. Use of existing lines must occur where appropriate. There is recognition that technical and competitive limitations need to be addressed when sharing data and is dependent on where the below ground structures lie. Where existing seismic information is available, the proponent is expected to attain this data.
• Ensure that all slashers are equipped with anti-spill spouts and absorbent pads when they arrive at the job-site.
• Trees near major rock faces do not impede line-of-sight and should be left standing.
• Lines should not be closer than 400m of each other or existing lines (existing lines defined as being those lines where regeneration does not exceed 2m). Where any seismic line intersects a point of access (i.e. a road, trail, another seismic line, etc.) the line is to be dog-legged.
• Reclamation plans for blowouts are to be in place before recording begins. If a blowout occurs, reclamation of the blowout will occur the next day.
• Any seismic line which progresses into the subalpine and alpine habitats will be expected to leave no trace of their activities within these habitats.
• Length of lines will be examined as to whether shorter lines could be possible without jeopardizing the end results; it is realized that rock structure and depth of possible zone are determining factors and that ‘the shorter the line the shallower the zone’
• Where the use of vibrosies or airgun techniques are possible they may be requested as an alternative to dynamite.
• A reclamation plan must be submitted with each seismic program that includes:
  * Trash removal. (eg. flagging tap, containers and debris)
  * Felled trees will be bucked to lie flat to the ground.
  * Any damage to the duff layer will be repaired to prevent erosion
  * Access from either end of the line must be blocked; where ATV access is not possible or where next years growth will provide some screening abilities, this may not be required.

As information and activity evolves, requirements and conditions may vary.

**Roads (access/closure)**

Access management and control is key to achieving the objectives of the USMP. Access control measures will be required to minimize or eliminate vehicular traffic not related to development activity. It should be noted that recreational trails already exist in the Upper Sikanni. Oil and gas industry vehicles, may be subject to weight restrictions, limits on daily number of vehicles using the access. Measures may include:

• A coordinated access route developed using the concept of a single mainstream road, and a single pipeline route to minimize access. This route must be used by all operators to access the Upper Sikanni drainage.
• Measures such as controlled access and/or access closures may apply to other corridors, where there is a demonstrated need. This may include a variety of measures such as: gates, berms, excavation and slash placement. An effective measure for permanent access closure in this watershed, where it is agreed that closure is needed, will include steep slope recontouring coupled with the distribution of large scattered rollback material, bridge/culvert removal, surface diversion berms for erosion control and vigorous regrowth for screening.
• Access for exploratory wells, will be limited to temporary, winter-use roads only. Exceptional circumstances may warrant change and specific approval must be granted by the Assistant Deputy Minister, Energy Resources Division, and Petroleum Resources, (ADME), in consultation with MELP.
• Travel on temporary roads is restricted to the period between November 1st and March 31st. No vehicular equipment is to be moved on or after March 31st unless specifically approved by the ADME, in consultation with MELP.
• Coordination of use of main road must be demonstrated.
• A maximum vehicle use restriction may apply to all access routes.
• All significant stream crossings must be made with clearspan removable bridges.
• Long, direct line of site situations must be avoided.
• Any road widening could be accomplished by lowering the existing road and not by cutting into backslopes.
• Where steep cutslopes exist, they will be serrated, roughened or benched to allow catchment areas for broadcasted seed.
• Seeding of roadsides must be done using plant/grass species unpalatable to wildlife, to reduce wildlife-vehicle collisions and conditions that promote poaching.
• Traffic speeds may need to be posted and adhered to. The objective is to reduce dust and reduce the potential for animal-vehicle collisions.
• Several options for pipeline and access corridors/crossings will be developed. These routes may not be the most economical routes, as other factors will be considered. These corridors/crossings may change as field studies and data acquired from proponent impact assessments are interpreted and increase knowledge.
• All gravel sources are to be authorized by BC Lands, and similar to the well pad, any gravel pit will have the topsoil stripped and stockpiled for use in reclamation.

Exploratory Wells/Drilling/Well Pads

• Directional drilling must be considered, if technically feasible, in lieu of further road development or further critical habitat alteration. The use of extended reach directional drilling and multiwell pads is recommended where possible.
• Remote sumps or sumpless systems are to be used.
• The monitoring of wellsites remotely is recommended within the Upper Sikanni.
• Geotextile matting to reduce lease disturbances and conserve natural vegetation/topsoil is recommended.
• The use of benign mud systems is recommended.
• Initial drilling start up date is November 1st and breakup date is March 31st. No equipment to be moved before or after that period (unless otherwise agreed upon).
• Wellsites may be required to have fencing installed around the perimeter of each site. Sumps/tailing ponds will be fenced.
• All noise sources must be insulated.
• A closed drilling system is to be used in all drilling operations within the Upper Sikanni unless otherwise approved by MEMPR. Use of a closed system greatly reduces the size of reserve pits associated with drilling activities, further reducing well size. Use of the closed system significantly reduces the potential for contamination of shallow groundwater aquifers with drilling fluids.
• All wellsite locations should be located where cut and fill slopes could be minimized.

The well pad design should incorporate berms and a containment pit should be constructed to retain all runoff and sediment produced on site. The pad will have diversion channels on its perimeter to keep runoff from undisturbed areas from draining onto the pad (these will be rip-rapped). Energy dispersion
structures will be installed to ensure that diverted runoff is adequately controlled and erosion at discharge points is minimized. Each pit will be lined with a non-permeable synthetic liner to isolate fluids in the pit from shallow groundwater. The small reserve pits would be similarly lined.

- If the wellsite is successful, areas on the well pad not required for future production will be reclaimed. This would involve bringing all slopes back to their original grade and seeding the disturbed areas. It may also be necessary to install silt barriers at selected locations to control off-site sedimentation until vegetation is reestablished on the disturbed areas. The well pad will be fenced.
- All gravel sources are to be authorized by BC Lands, and similar to the well pad, any gravel pit will have the topsoil stripped and stockpiled for use in reclamation.

Pipelines

- A single mainstream pipeline route has been defined in the plan. This route must be used by all operators.
- Separate pipeline corridors/crossings will be defined; these routes may not be the most economical route, as other factors will be considered. These corridors/crossings may change as field studies and surface/sub-surface data acquired from proponent impact assessments are provided.
- Routes will consider ecological as well as economic issues and be assessed on a site specific basis. Any route chosen will have taken into consideration several variables and will have been developed through consultation with the proponent.
- To utilize any pipeline route to its full potential certain factors of construction will be assessed: eg. pipe size - large enough to eliminate the need for more pipelines, the laying of several pipelines within one corridor and width of right-of-ways (18m - 20m maximum).
- If pipeline access can be drilled to a wellsite which is situated in critical habitat such as alpine, then this method will be the preferred method.
- The proponent will be required to produce an impact assessment describing alternative routes possible, which may or may not include identified routes.

Waste

- Where vehicular traffic is used, efforts should be made to minimize vehicular traffic in disposing of waste water and other by-products.
- A closed mud system will be utilized, however a reserve pit may be required for cuttings and produced fluids, the mud being circulated for reuse. The pit will be lined with a 18 mil synthetic liner, depending on site characteristics. It will be fenced with a stock tight wire mesh fence. Following drilling, the liquid waste may be evaporated, trucked out injected down the wellbore or irrigated on the surface, and the pit will be backfilled and returned to natural grade and reclamation will then take place.
- Refer to the Waste Management Act for daily camp waste disposal.
Facilities/Power Lines

- All petroleum and gas processing facilities will be located outside the USMP area.
- Where feasible dehydration facilities will be situated outside the boundaries of the USMP area.
- Alternatives to running overhead lines will be considered where right-of-way crosses through wetlands, marshes.

Personnel/Camp Management

The following conditions are intended to reduce any negative impacts of human habitation:
- Company housing and/or camp facilities must be located outside the USMP area.
- MELP maintains authority to limit firearms in USMP.
- Refer to the Waste Management Act for daily camp waste disposal.
Reclamation plans must be submitted and approved as part of the construction permitting and approval process. Objectives of reclamation in the Upper Sikanni is to return the site to a condition where self-sustaining native vegetation provides:

1. Wildlife habitat capabilities equal to or greater than initial conditions.
2. Erosion control equal to or greater than conditions found on adjacent undisturbed sites.

Immediately following completion of a pipeline, abandonment of a wellsite, or the abandonment of any road, a complete reclamation of the subject lands will take place. Where seasonal barriers prevent the reclamation of any site, the proponent must begin reclamation as soon as seasonal barriers have changed.

If the wellsite is successful all areas on the well pad not necessary for eventual production will be reclaimed. This would involve bringing all slopes back to their original grade and seeding the disturbed areas. It may also be necessary to install silt barriers at selected locations to control off-site sedimentation until vegetation is reestablished on the disturbed areas. The well pad will be fenced.

Recontouring

All cuts that are made in steep or rolling terrain will be regraded and recontoured to blend into the surrounding landscape and to reestablish the natural drainage patterns. Emphasis during recontouring should be to return the disturbed areas to its original contour, to stabilize slopes, control surface drainage and to provide a more aesthetic appearance. Ruts and other scars should also be filled.

Scarification

Prior to re-spreading topsoil, disturbed areas will be scarified to loosen areas compacted by equipment traffic. Scarifying by ripping would promote water infiltration, better soil aeration and root penetration. In sloping areas scarification would also be important to provide a roughened interface between the topsoil and subsoil which would reduce the potential for soil slippage.

Ripping should be at least 12 inches deep and spaced no more than 16 inches apart. Scarification equipment may be required to make multiple passes over the same area to adequately relieve compaction. Ripping should be conducted when materials are dry to improve shattering of compacted layers. Every effort should be made to scarify along the contour to reduce erosion.
Topsoil

Prior to construction, all available topsoil (A and B horizon) on the well pad, gravel pit and new access road will be salvaged and stockpiled for use in reclamation. A soil assessment will be conducted to determine the total depth of the A and B horizon, which in turn will be the amount of topsoil to be removed and stockpiled. Topsoil salvaging will not occur during inclement weather or when the soil is significantly wet to cause damage or compaction. Topsoil stockpile areas will be outside traffic areas within the wellpad location. Drainage will be routed around and away from the pile. Topsoil stock piles will be signed and a berm constructed or ditched around the pile to contain all soil. Immediately after stockpiling topsoil will be seeded.

An assortment of boulders and miscellaneous woody vegetation removed from the well pad, gravel pit and access road will be stockpiled. This material will be pulled back and spread over reclaimed areas. The equivalent of 1-2 logs per acre and two or more brush piles (per acre) 10 feet across and 7 feet high will also be stockpiled and placed on reclaimed areas.

Salvaged topsoil should be spread uniformly over the disturbed areas. If compaction occurs during topsoil spreading, scarification would be necessary unless it could be relieved by equipment used for seedbed preparation. Topsoil spreading should not occur during wet periods when soils are easily compacted. Travel over newly topsoiled areas would be restricted. A trackhoe should be used to spread topsoil (approximately 2 inches depth) on steep cut and fill slopes wherever feasible.

Seeding

Immediately after stockpiling, topsoil of any disturbed area will be seeded with a mixture that is in accordance with the guidelines set out in the Oil and Gas Handbook; consultation with B.C. Environment is recommended.

Maintenance/Monitoring

Long-term monitoring is required to assure that revegetation is successful and erosion from disturbed areas is controlled. In the late spring or early summer in the first year after seeding a determination would be made by the proponent and MELP as to the need to fertilize seeded sites for improved establishment. Maintenance/monitoring is required until entire site is revegetated with native species and erosion potential is equivalent to the surrounding undisturbed areas.

ROADS - RECLAMATION

1. All precautionary measures, such as cross ditches and water bars, to prevent soil erosion and sedimentation to streams must be taken immediately after the road is put to bed.
2. All stockpiles from disturbed areas are to be seeded.

This prevents loss of soils due to erosion, as seeding will stabilize soils and provide vegetative cover until reclamation begins.

3. Seeding requirements to meet reclamation objectives will be done in consultation with Ministry of Forests and BC Environment.

Seed mixes which allow re-establishment of native species should be used in reclaiming disturbed areas.

Seed mixes must possess the following characteristics: fast growing, self-sustaining, little to no maintenance requirements and create limited fire hazard.

It is critical that certified seed be used and does not contain noxious weed seeds. The seed types and species are prescribed by the Ministry of Forests.

When seeding newly cleared areas to prevent erosion, avoid species attractive to bears. Benefits to a bear from roadside forage rarely outweigh the disadvantages of being close to roads.

All road construction within provincial grazing reserves must be seeded as specified by the Ministry of Forests.

4. Seeding should be done after the spring thaw or in late fall.

Soil moisture levels are most favorable for seed germination and seedling survival during the spring and early summer.

5. Where seeding cannot be carried out during the optimum period for germination, increased seeding rates and fertilizer applications must be employed to ensure successful revegetation.

6. Apply fertilizers prior to or during the seeding of disturbed areas.

The objective is to provide sufficient nutrient concentrations in the topsoil. The nutrients most commonly found lacking in the soils are nitrogen, phosphorus and sulfur. If soil conditions are unknown a soil analysis may be necessary to determine the type and amount of fertilizer required. No fertilizers to be applied within 10m of any stream.

7. Disturbed sites should be contoured as closely as possible to naturally appearing topography and an appropriate soil profile.
Specific site prescriptions will detail proposed end use and activities necessary to meet this use. Roads on environmentally sensitive areas will require complete recontouring.

8. Soil profile compaction on disturbed areas may have to be loosened to assist root penetration and soil moisture penetration.

9. On sites where erosion control problems are identified mulch may be required to hold seed in place. On disturbed slopes this will control erosion until vegetative cover is established, improves moisture retention and prevents surface crusting of the soil.

Where biodegradable straw mulch is used it should be covered with natural fibre netting held in place by wooden pegs. Cellulose fiber mulches should be used to hold seed in place on very steep slopes.

Asphalt mulch will not be used as it tends to seal soil and contribute to excessive heat absorption.

Where brush mulch is used, limbs and small stems should be mechanically crushed after disposal. Properly deposited slash will assist in erosion control and revegetation by providing microsites for seed germination and plant growth; decomposition will provide additional nutrients thus improving reclamation capability. Mats are cost-effective in areas where sites would otherwise require regrooming and reseeding several times before they are stabilized.

Chemical binders or soil stabilants are applied in aqueous solution for the purpose of penetrating the soil surface and reducing erosion by physically binding soil particles.

Chemical soil binders should be used to protect disturbed soil from wind and water erosion during delays in grading operations and also during hot and dry periods after final grading.

10. Slopes that are steep, dry or south-facing, characterized by sensitive soils or where vegetation establishment would be difficult, may require more intensive efforts to hold soil in place until vegetation is re-established.

11. Fertilizer and chemical binder/soil stabilizers application methods must prevent entry of these products into streams.

12. Abandoned pits should be stabilized by recontouring where possible and revegetating.

They must be replaced in the proper sequence over the recontoured pit area. Topsoil is to be salvaged from all over burden and aggregate stockpile sites.
BRIDGES - (Please also refer to Road Reclamation guidelines)

1. Procedures for abandonment:
   - Remove all structures, block maintenance roads and remove culverts.
   - Remove all the unstabilized fill material from the site and reslope and seed all unstable areas. Where erosion has occurred, contour the streambanks to as near original shape as possible.
   - Take measures to prevent vehicular access across streams.

2. Restore all disturbed areas adjacent to the stream to finished, stable slopes using appropriate methods such as seeding, planting, mulching, placing mat binders, soil binders, rock or gravel blankets or terracing on long slopes.

3. Apply slow release fertilizers prior to or during the seeding of disturbed areas.

   Conduct a soil analysis to determine the type and amount of fertilizers required. The objective is to provide sufficient nutrient concentrations in the topsoil; the nutrients most commonly found lacking in the soils are nitrogen, phosphorus and sulfur. If non slow release fertilizers are used, fertilizing should be done after germination.

DRILLING - (Please also refer to Road Reclamation guidelines)

1. Additional backfilling and recontouring may be required to make allowances for settlement and establishment of the appropriate grade. Stockpiled topsoil and overburden shall be spread in an appropriate profile over the site. The entire site should be revegetated.

2. After completion of all initial cleanups, sumps should be mounded up above the original level (extremely important during the winter months).

3. Surface drainage shall be diverted around disturbed areas; where this is not possible, erodible material must be protected by rip-rap or some other acceptable means.

4. Restore any natural drainage, volume and route, as near as possible to its original state.
APPENDIX A
CONDITIONS OF TENURE

Existing Oil and Gas Tenure

There are number of existing tenures located within the USMP. Those tenures will be subject to the general guidelines section of the USMP.

Oil and Gas Tenures proposed for disposition on December 13, 1995

1. All oil and gas exploration and development activities must conform with the operational guidelines set out in the Upper Sikanni Management Plan.

2. Flight management plans will be required to address wildlife concerns.

3. No development will be permitted within 1 Km of Trimble Lake.

4. Where significant impact to fishery resource and habitat is anticipated, site specific fisheries inventories must be completed prior to submitting development proposals.

5. Directional drilling should be considered in lieu of further road development.

6. Development proposals must include plans for deactivation and rehabilitation of all new roads and trails.

7. All significant road stream crossings of those streams identified in the Upper Sikanni management Plan, are to be made with clearspan removable bridges.

8. Efforts should be made to minimize vehicular traffic in disposing of waste water and other by-products.

9. Major gas processing facilities should be sited outside the Upper Sikanni Chief River drainage.

10. Seismic operations will be heli-portable with hand cut lines not to exceed 1.5 meters width. Use of existing lines must be considered where appropriate. Conventional operations may be approved where there are existing conventional lines. Efforts must be made to co-ordinate geophysical exploration surveys.

11. Site specific restrictions will apply to all geophysical exploration surveys and pipeline construction as follows unless special circumstances warrant and prior approval is obtained:
   a) Operations will be prohibited in areas of critical ungulate winter range from December 1 to May 1.
   b) Operations will be prohibited in critical lambing and calving grounds from May 15 to July 1.
   c) Operations will be prohibited in critical rutting areas from, October 15 to December 31.

12. Habitat impact assessments will be required for all exploration and development proposals. (Define activities in detail)

13. Existing designated routes must be used to access the Upper Sikanni Chief River drainage.

14. Co-ordination of use of main access road must be demonstrated. Gating and additional physical control measures may be required.
15. a) Access for exploratory wells will be limited to temporary, winter-use roads only unless exceptional circumstances warrant and specific approval is granted by the Assistant Deputy Minister, Energy Resources Division (ADME).

b) Travel on temporary roads is restricted to the period between November 1 and March 31. No vehicular equipment is to be moved on or after March 31 unless specifically approved by the ADME.

c) Should exploratory drilling confirm the presence of commercially viable quantities of natural gas, proposals for all season roads will be accepted and evaluated.

16. **Access Requirements in Sensitive Habitat Areas.**
   (Shaded pink and green on the Upper Sikanni Management Plan USMP map)

   a) Well sites and related facilities (define) will not be approved in areas shaded pink on USMP map inclusive of riparian areas, cold air drainage, shrub grassland, avalanche chutes, warm aspect grassland and warm aspect forest. Access routes through these areas should be avoided if possible.

   b) In Green areas alternate exploration technologies such as directional drilling should be considered and evaluated before proposing new access in sensitive green areas. Proposals for access in sensitive areas defined in the Upper Sikanni Management plan must include detailed plans describing exploration efforts to date, and a detailed justification of the need to construct the access and for the location of a wellsite. The proposal must include potential development scenarios and infrastructure requirements, together with a detailed description of impact mitigation strategies which are consistent with the habitat plan.

17. Existing recreation trails in area; related access and site restrictions may apply.

18. Sensitive visual quality area; visual impact assessment may be required.

19. Potential for archaeological resources exists; overview assessment may be required.

20. Parcel is located in an area traditionally used by the Halfway River First Nation; Consultation with the Nation may be required.

21. **Special caveat for parcel 951059 re buffalo calving area.**
   Access and wellsite location will be prohibited in buffalo calving area delineated on USMP map.

22. **Special caveat for parcel 951055, 951060B, 951060C**
   Parcel contains traditional use site of significance to the Prophet River First Nation; consultation with the Nation may be required.

23. **Special caveat for parcel 951060B**
   Potential for macro-paleontological resources may exist in the Chicken creek area; for more detailed information on possible site location contact Prophet River First Nation
## APPENDIX B
### HABITAT USE BY LISTED SPECIES

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moose</td>
<td>Associated with early seral, shrubby habitat. Riparian areas and emergent vegetation in lakes important summer food sources.</td>
</tr>
<tr>
<td>Plains bison</td>
<td>Shrub/Grass Lowland provides critical winter range. Some subalpine/alpine areas are important calving habitat.</td>
</tr>
<tr>
<td>Rocky Mountain elk</td>
<td>Depend on open, grassy habitats for foraging; may include alpine. Forested types needed for thermal and hiding cover.</td>
</tr>
<tr>
<td>Caribou</td>
<td>Alpine important for winter range. Open pine/spruce forest with significant terrestrial lichen cover may also provide important winter range. Calving may occur in high elevation, rocky, forested areas.</td>
</tr>
<tr>
<td>Stone's sheep</td>
<td>Closely associated with alpine habitats. Sensitive to disturbance particularly during lambing time and in winter. Winter range limited. Low elevation mineral licks may be used extensively.</td>
</tr>
<tr>
<td>Mountain goat</td>
<td>Requires rocky terrain for escape cover. Normally associated with alpine but not uncommon in rocky canyons of rivers or forest types near rock bluffs and talus slopes. Associated with south aspects of these habitats in winter.</td>
</tr>
<tr>
<td>Mule deer</td>
<td>Warm aspect grassland critical for winter range. Forest openings and alpine may provide summer habitat.</td>
</tr>
<tr>
<td>White-tailed deer</td>
<td>Dependent on snow intercepting forest cover with herb/shrub understory for winter use. Uncommon in Upper Sikanni area.</td>
</tr>
<tr>
<td>Black bear</td>
<td>Warm aspects and road/pipeline right-of-ways heavily used in spring. Riparian and early seral habitats important. Den in rock crevices or at base of large spruce or cottonwood.</td>
</tr>
<tr>
<td>Grizzly bear</td>
<td>Riparian and avalanche chutes used extensively for foraging. Burned areas may provide important berrying habitat. Den in high elevation, high snowfall locations. Sensitive to human activity.</td>
</tr>
<tr>
<td>Western wolverine</td>
<td>Depend on ungulate carrion. Availability and diversity of large mammals underlies the distribution, survival and reproductive success of wolverines. Sensitive to human activity and development.</td>
</tr>
<tr>
<td>River otter</td>
<td>Restricted to river and stream corridors but utilizes adjacent forest for denning purposes.</td>
</tr>
<tr>
<td>Beaver</td>
<td>Limited to watercourses where there is an adequate supply of adjacent deciduous forest.</td>
</tr>
<tr>
<td>Marten</td>
<td>Requires mature coniferous forests with abundant small mammal prey populations. Coarse woody, debris is an important habitat feature. Closed canopy forests are preferred habitat type. Large forest openings limit martin use.</td>
</tr>
<tr>
<td>Common Name</td>
<td>Comments</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fisher</td>
<td>Follow hare and porcupine distribution. Limited to deep snow, requires closed canopied mature forests for winter habitat in heavy snowfall areas. Wildlife trees used for denning. Large forest openings are avoided.</td>
</tr>
<tr>
<td>Lynx</td>
<td>Follow hare abundance and distribution almost exclusively. Seral forest stages important for maintaining hare populations.</td>
</tr>
<tr>
<td>Mink</td>
<td>Limited to streams, lakes and other wetland areas. Dependent on riparian habitat and associated prey species.</td>
</tr>
<tr>
<td>Long-tailed weasel</td>
<td>Use a variety of habitats with abundant small prey. Coarse woody debris and cover from aerial predators important.</td>
</tr>
<tr>
<td>Northern Flying squirrel</td>
<td>Use extensive forest lands with some trees 17m or more in height. Declines in population could indicate fragmentation of habitat.</td>
</tr>
<tr>
<td>Red squirrel</td>
<td>Dependent conifer forests where it feeds on conifer seeds and mushrooms. Nests in tree cavities.</td>
</tr>
<tr>
<td>Red fox</td>
<td>Prefer edge habitat such as that bordering the shrub/grassland meadows and warm aspect grasslands. Also use early seral stages of forests with openings such as might be created by fire.</td>
</tr>
<tr>
<td>Coyote</td>
<td>An adaptable predator utilizing a wide range of habitat types but preferring open habitats and edge habitats.</td>
</tr>
<tr>
<td>Gray wolf</td>
<td>Use seismic lines, other Right-of-ways and frozen lakes and rivers as travel corridors. Distribution dependent on ungulate prey populations and distribution.</td>
</tr>
<tr>
<td>Smith's Long-Spur</td>
<td>Breed in alpine and subalpine habitats. Also use forest openings such as shrub/grassland meadows and man-made openings.</td>
</tr>
<tr>
<td>Mountain bluebird</td>
<td>Found mainly in semi-open habitats such as subalpine parkland areas and early second growth forests. Nests in cavities in trees, rock and soil. Feeds mainly on insects.</td>
</tr>
<tr>
<td>Purple finch</td>
<td>Arboreal nester (3-6m above ground). Coniferous and deciduous forest. Feed on buds and seeds in winter.</td>
</tr>
<tr>
<td>Pileated woodpecker</td>
<td>Prefers closed canopy coniferous forest where intrusions of deciduous growth such as aspen occur. Create cavities that may be used later by cavity nesting animals.</td>
</tr>
<tr>
<td>Boreal chickadee</td>
<td>Inhabits northern coniferous forests. Insect feeder. Nest in small cavities usually close to the ground.</td>
</tr>
<tr>
<td>Northern flicker</td>
<td>Use open forests and other sparsely treed habitats and other forest openings. Create cavities for nesting, preferring aspen or pine with varying stages of decay. Abandoned cavities utilized by numerous other cavity nesting species.</td>
</tr>
<tr>
<td>Blue grouse</td>
<td>Occupy a variety of forested habitats. Tend to breed in forests adjacent to open habitats such as burned or logged areas, meadows and alpine.</td>
</tr>
<tr>
<td>Common Name</td>
<td>Comments</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>White-tailed ptarmigan</td>
<td>Use highest, least vegetated mountainous habitat. They may also occur in logged or burned subalpine areas. Tend to winter at lower elevations.</td>
</tr>
<tr>
<td>Northern shrike</td>
<td>Use open habitat with a perching site such as a snag. Breed in subalpine shrubland habitat.</td>
</tr>
<tr>
<td>Peregrine falcon</td>
<td>Nests on cliffs above lakes or river canyons. Very rare in the BC Interior.</td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>Primarily a forest bird. Hunts in open areas such as grasslands, meadows, marshes, etc.. Usually breed in interior of large tracts of coniferous forests; heavily impacted by logging.</td>
</tr>
<tr>
<td>Bald eagle</td>
<td>Usually associated with water but may be found almost anywhere. May utilize carrion where available. Nest in tall snags or old growth trees near water.</td>
</tr>
<tr>
<td>Golden eagle</td>
<td>Forage over any open habitat with abundant prey. May nest in trees but more often on cliff edges. May utilize carrion where available.</td>
</tr>
<tr>
<td>Boreal owl</td>
<td>Cavity nester, preferring closed, mixed forest types. May breed at isolated locations at high elevations.</td>
</tr>
<tr>
<td>Great Grey owl</td>
<td>Found in all types of timbered habitats, and also frequents river valleys, lakeshores and agricultural areas. Nest in old hawk nests in trees, holes in cliffs, clay banks and man-made structures.</td>
</tr>
<tr>
<td>Barrows goldeneye</td>
<td>Nest in large natural cavities or cavity made by pileated woodpecker in conifer or deciduous trees. Will readily use a nest box. Nests must be near rivers, lakes and wetlands.</td>
</tr>
<tr>
<td>Harlequin duck</td>
<td>Use fast running, turbulent streams and nest on the ground immediately adjacent.</td>
</tr>
<tr>
<td>Northern pintail</td>
<td>Usually nest near water but may be found in grassland areas, meadows, forests and subalpine bogs.</td>
</tr>
<tr>
<td>Green-winged teal</td>
<td>Use emergent vegetation associated with marshes and lakes.</td>
</tr>
<tr>
<td>Common loon</td>
<td>Breeds on large and small lakes, in forested and open areas, and occasionally on marshes and rivers. Nest on shore on islands or partially submerged debris close to shore.</td>
</tr>
<tr>
<td>Hoary marmot</td>
<td>Inhabits alpine tundra, denning on rocky or talus slopes often under large boulders. Feed heavily on grasses and forbs from late April to late August. Hibernate for eight months of the year.</td>
</tr>
<tr>
<td>Northern Bog lemming</td>
<td>Frequents black spruce bogs but may also be found in deep mossy spruce woods, wet subalpine meadows and alpine tundra.</td>
</tr>
<tr>
<td>Common Name</td>
<td>Comments</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Meadow vole</td>
<td>Usually inhabits wet meadows where there is a protective carpet of grasses or mosses. It avoids deep forests and high, dry grassland.</td>
</tr>
<tr>
<td>Gappers Red-backed vole</td>
<td>Prefer conifer forest habitats, utilizing coarse woody debris for cover. Is an important prey species for many raptors and mammalian predators.</td>
</tr>
<tr>
<td>Pygmy shrew</td>
<td>Found most often in forest openings and grassy meadows; also in sphagnum bogs or in the shrubby borders of bogs and wet meadows. Smallest mammal in North America. Feed on insects and young mice.</td>
</tr>
<tr>
<td>Little Brown bat</td>
<td>Exploits a wide range of habitats. Hunt over lakes and streams and in forest openings. Summer roost in tree cavities, rock crevices, caves and under the bark of trees. Hibernate in caves and abandoned mines.</td>
</tr>
<tr>
<td>Northern Long-eared myotis</td>
<td>Occurrence noted at Hudson’s Hope. May occur in the boreal forest type in Sikani watershed.</td>
</tr>
</tbody>
</table>
## APPENDIX C
### HABITAT USE BY WILDLIFE SPECIES EVALUATION LIST

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Red</th>
<th>Blue</th>
<th>Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Forest</td>
<td>5</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Open Forest</td>
<td>6</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Shrub/Grass Lowland</td>
<td>1</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td>Warm Aspect Grassland</td>
<td>1</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>Riparian</td>
<td>1</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Avalanche Chute</td>
<td>4</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Subalpine Meadow Park</td>
<td>1</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Vegetated Alpine</td>
<td>6</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Sparsely Vegetated Alpine</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Lakes</td>
<td>1</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Streams</td>
<td>1</td>
<td>4</td>
<td>19</td>
</tr>
</tbody>
</table>
# APPENDIX D

## COMMON AND SCIENTIFIC NAMES OF ANIMALS AND PLANTS WITHIN THE UPPER SIKANNI WATERSHED

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fishes</strong></td>
<td></td>
</tr>
<tr>
<td>Arctic grayling</td>
<td>Thymallus arcticus</td>
</tr>
<tr>
<td>Burbot</td>
<td>Lota lota</td>
</tr>
<tr>
<td>Dolly Varden</td>
<td>Salvelinus malma</td>
</tr>
<tr>
<td>(includes Bull trout)</td>
<td>Salvelinus confluentus</td>
</tr>
<tr>
<td>Mountain whitefish</td>
<td>Prosopium coulteri</td>
</tr>
<tr>
<td>Rainbow trout</td>
<td>Oncorhynchus mykiss</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
</tr>
<tr>
<td>Beaver</td>
<td>Castor canadensis</td>
</tr>
<tr>
<td>Black bear</td>
<td>Ursus americanus</td>
</tr>
<tr>
<td>Caribou</td>
<td>Rangifer tarandus</td>
</tr>
<tr>
<td>Coyote</td>
<td>Canis latrans</td>
</tr>
<tr>
<td>Gappers Red-backed vole</td>
<td>Clethrionomys gapperi</td>
</tr>
<tr>
<td>Gray wolf</td>
<td>Canis lupus</td>
</tr>
<tr>
<td>Grizzly bear</td>
<td>Ursus arctos</td>
</tr>
<tr>
<td>Fisher</td>
<td>Martes pennanti</td>
</tr>
<tr>
<td>Hoary marmot</td>
<td>Marmota caligata</td>
</tr>
<tr>
<td>Little Brown bat</td>
<td>Myotis lucifugus</td>
</tr>
<tr>
<td>Long-tailed weasel</td>
<td>Mustela frenata</td>
</tr>
<tr>
<td>Lynx</td>
<td>Felis lynx</td>
</tr>
<tr>
<td>Marten</td>
<td>Martes americana</td>
</tr>
<tr>
<td>Meadow vole</td>
<td>Microtus pennsylvanicus</td>
</tr>
<tr>
<td>Mink</td>
<td>Mustela vison</td>
</tr>
<tr>
<td>Moose</td>
<td>Alces alces</td>
</tr>
<tr>
<td>Mountain goat</td>
<td>Oreamnos americanus</td>
</tr>
<tr>
<td>Mule deer</td>
<td>Odocoileus hemionus</td>
</tr>
<tr>
<td>Northern Bog lemming</td>
<td>Synaptomys borealis</td>
</tr>
<tr>
<td>Northern Flying squirrel</td>
<td>Glaucomys sabrinus</td>
</tr>
<tr>
<td>Northern Long-eared myotis</td>
<td>Myotis septentrionalis</td>
</tr>
<tr>
<td>Plains bison</td>
<td>Bison bison</td>
</tr>
<tr>
<td>Pygmy shrew</td>
<td>Microsorex boyi</td>
</tr>
<tr>
<td>Red fox</td>
<td>Vulpes vulpes</td>
</tr>
<tr>
<td>Red squirrel</td>
<td>Tamiasciurus hudsonicus</td>
</tr>
<tr>
<td>River otter</td>
<td>Lutra canadensis</td>
</tr>
<tr>
<td>Rocky Mountain elk</td>
<td>Cervus elaphus</td>
</tr>
<tr>
<td>Stone sheep</td>
<td>Ovis dalli</td>
</tr>
<tr>
<td>Western wolverine</td>
<td>Gulo gulo</td>
</tr>
<tr>
<td>White-tailed deer</td>
<td>Odocoileus virginianus</td>
</tr>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
</tr>
<tr>
<td>Bald eagle</td>
<td>Haliaeetus leucocephalus</td>
</tr>
<tr>
<td>Barrows goldeneye</td>
<td>Bucephala islandica</td>
</tr>
<tr>
<td>Blue grouse</td>
<td>Dendragapus obscurus</td>
</tr>
<tr>
<td>Boreal chickadee</td>
<td>Parus hudsonicus</td>
</tr>
<tr>
<td>Boreal owl</td>
<td>Aegolius funereus</td>
</tr>
<tr>
<td>Common loon</td>
<td>Gavia immer</td>
</tr>
<tr>
<td>Golden eagle</td>
<td>Aquila chrysaetos</td>
</tr>
<tr>
<td>Great Grey owl</td>
<td>Strix nebulosa</td>
</tr>
<tr>
<td>Green-winged teal</td>
<td>Anas crecca</td>
</tr>
<tr>
<td>Gyrfalcon</td>
<td>Falco rusticolus</td>
</tr>
<tr>
<td>Harlequin duck</td>
<td>Histrionicus histrionicus</td>
</tr>
<tr>
<td>Mountain bluebird</td>
<td>Sialia currucoides</td>
</tr>
<tr>
<td>Northern flicker</td>
<td>Colaptes auratus</td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>Accipiter gentilis</td>
</tr>
<tr>
<td>Northern shrike</td>
<td>Lanius excubitor</td>
</tr>
<tr>
<td>Peregrine falcon</td>
<td>Falco peregrinus</td>
</tr>
<tr>
<td>Pileated woodpecker</td>
<td>Dryocopus pileatus</td>
</tr>
<tr>
<td>Purple finch</td>
<td>Carpodacus purpureus</td>
</tr>
<tr>
<td>Smith's Long Spur</td>
<td>N/A</td>
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<tr>
<td>White-tailed ptarmigan</td>
<td>Lagopus leucurus</td>
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<tr>
<td><strong>Trees</strong></td>
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</tr>
<tr>
<td>Alder</td>
<td>Alnus spp.</td>
</tr>
<tr>
<td>Aspen</td>
<td>Populus spp.</td>
</tr>
<tr>
<td>Balsam poplar</td>
<td>Populus balsamifera</td>
</tr>
<tr>
<td>Birch</td>
<td>Betula spp.</td>
</tr>
<tr>
<td>Black spruce</td>
<td>Picea mariana</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>Populus spp.</td>
</tr>
<tr>
<td>Red-Osier dogwood</td>
<td>Cornus stolonifera</td>
</tr>
<tr>
<td>Lodgepole pine</td>
<td>Pinus contorta</td>
</tr>
<tr>
<td>Subalpine fir</td>
<td>Aqbies lasiocarpa</td>
</tr>
<tr>
<td>White spruce</td>
<td>Picea glau</td>
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