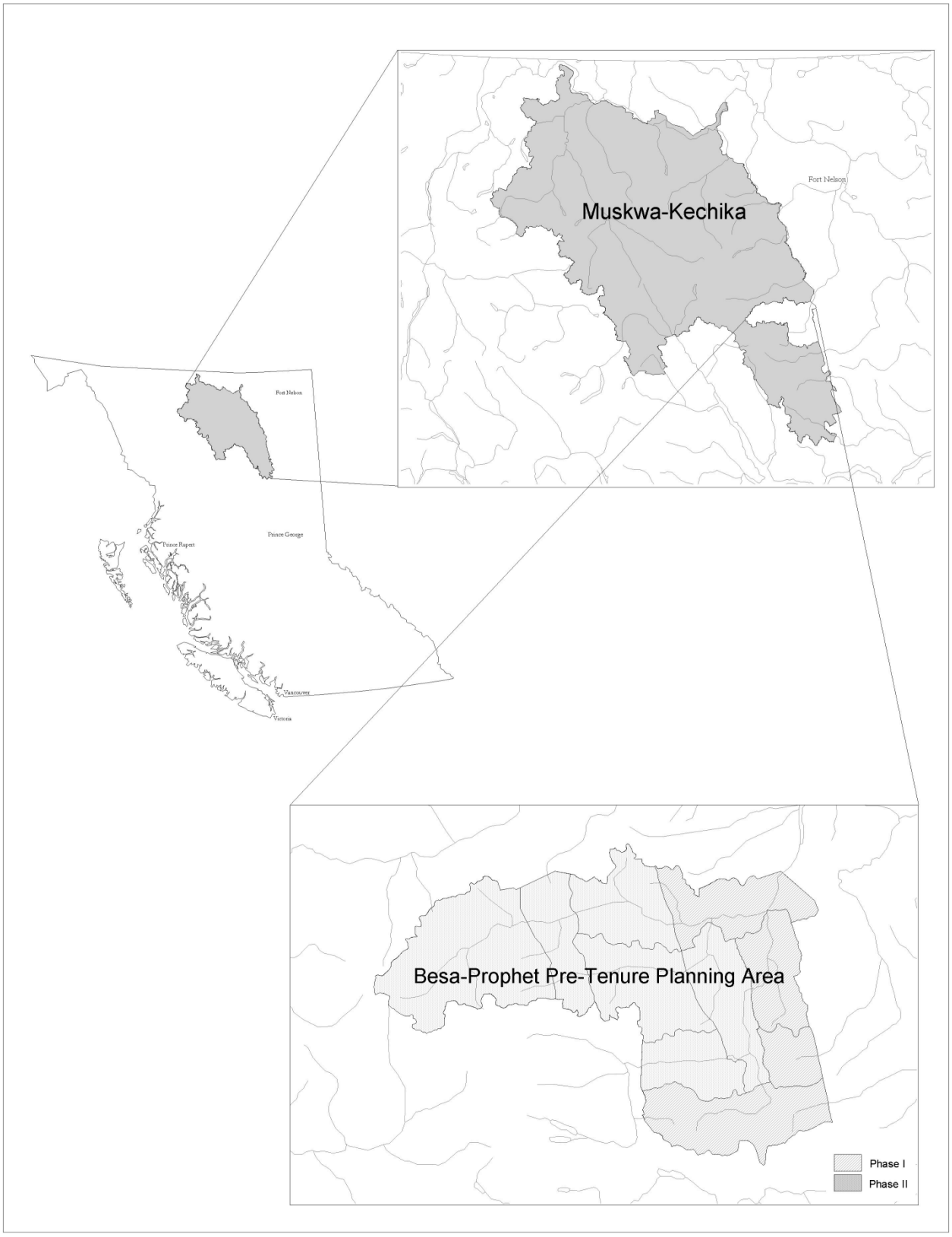
Besa-Prophet Pre-Tenure Plan Phase I

Ministry of Sustainable Resource Management

Consultation Draft, March 31, 2002

Figure 1: Map of Besa-Prophet Pre Tenure Plan Area



PREFACE

The Muskwa-Kechika Management Area (M-KMA) in the northeast region of the province, is a remote and relatively undeveloped area of bountiful resources. It is a globally significant wildlife area and supports a diverse range and sizeable populations of large mammals. Beneath the mountains and valleys geologists project a high to very high potential for major accumulations of natural gas. The area is remote and it is this wilderness condition that has helped to preserve intact wildlife habitat systems. The inaccessibility of the area has also limited the exploration for subsurface resource.

Based on recommendations from the Fort Nelson, Fort St. John and Mackenzie Land and Resource Management Plans (LRMPs), the province enacted the *Muskwa-Kechika Management Area Act*, which outlines the management intent for the area "to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing resource development and use in parts of the M-KMA designated for those purposes including recreation, hunting, trapping, timber harvesting, mineral exploration and mining, oil and gas exploration and development to ensure that environmentally-responsible resource development occurs in the M-KMA." The legislation requires that prior to the issuance of oil and gas tenures, pre-tenure plans must be developed that identify objectives and strategies for development activities within the plan area. Pre-tenure plans will provide greater certainty and guidance to the oil and gas industry on where and how oil and gas operations are conducted. The Besa-Prophet pre-tenure plan (BPPTP) has been developed with input from government agencies, First Nations, local government, stakeholders and the general public. A glossary is included in the appendices of the plan to explain key terms used throughout the document. The first use of each term explained in the glossary appears in bold letters in the text of the plan.

Consultation Draft of the Besa-Prophet Pre-Tenure Plan

Broad review and comment on the BPPTP is being sought through a public consultation process, using this "consultation draft" of the plan. This document is available on the internet at:
http://srmrpdwww.env.gov.bc.ca/ecdev/mog/

Written public comments are welcomed on this consultation draft of the plan. Please forward comments using the forms available through the website, or send your comments to the address below. Comments must be received by April 30, 2002 to be considered in the final draft of the plan.

Forward comments to:

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1. INTRODUCTION

1.1 Purpose of the Besa-Prophet Pre Tenure Plan

The *Muskwa-Kechika Management Area Act* (the *Act*) establishes the requirement for pre-tenure planning for oil and gas exploration and development in the M-KMA prior to the disposition of petroleum and natural gas rights. The purpose of the Besa-Prophet **Pre-tenure plan** (BPPTP) is to guide environmentally-responsible development of oil and gas resources by providing results-oriented management **objectives** and **strategies** that ensure oil and gas activities are consistent with the intent of the *Act*.

The objectives and strategies in the main body of the plan document (Sections 5 and 6) represent binding requirements that must be achieved in oil and gas activities; the appendices to the plan provide additional guidance intended to assist interpretation of the plan by developers and to guide implementation by government.

It is acknowledged that this BPPTP is without prejudice to First Nations' rights.

1.2 Plan Area

The BPPTP area (Figure 1) is located in northeast British Columbia within the M-KMA. It is approximately 204,245 hectares in size and includes portions of the Besa and Prophet River drainages. The plan area is comprised of the Prophet Resource Management Zone (RMZ) and the portion of the Besa-Halfway-Chowade RMZ north of the Sikanni drainage. It incorporates Ministry of Forests, Fort St. John Forest District Landscape Unit 41 and Fort Nelson Forest District Landscape Units 29 and 30. The southern boundary of the BPPTP area abuts the northern boundary of the area covered by the Upper Sikanni Management Plan (1995).

To assist oil and gas planning, the BPPTP area is delineated into ten "Planning Units". Planning Units (PU) were determined by topographical features and anticipated oil and gas surface access opportunities. As part of the analysis of biophysical and environmental values, eleven zone types have also been identified across the entire BPPTP area. (Figure 2 illustrates the distinction between PU and zones). Each zone represents a unique set of biophysical criteria including: critical wildlife habitat, site and soil sensitivity and ecosystem rarity. (Refer to section 3.2 for additional information on how zones where derived).

There is continuing field and non-field research in the plan area reflecting the provincial government's commitment to science-based decision-making. However, the province also has a significant interest in generating economic benefits from oil and gas development. To avoid compromising ongoing research while allowing oil and gas activity in the short term, the Besa Prophet pre-tenure planning process has adopted a Phase I and II approach, as shown on Figure 1. **This planning document applies only to the four Phase I Planning Units located in the eastern and southern portion of the BPPTP area - Nevis, Pocketknife, Lower Besa and Lower Prophet**. Initial posting of oil and gas tenure will be restricted to these four PU's. By the spring of 2003, subsequent to analysis of research results, Phase II of the plan will be completed for the remaining six PU's. (Refer to Section 7 for additional information on the Phase I and II approach).

1.3 Structure of this Report - A Readers Guide

This plan provides information on regulatory requirements for oil and gas development in the BPPTP area, as well as relevant background information for proponents, regulators, and other interested parties. The plan document also provides overview information on the planning process, resource values and uses in the BPPTP area. Additional information on these topics is included in the Appendices.

An oil and gas company proposing activities in Phase I areas within the BPPTP area should be familiar with all parts of this document.

- Sections 1-4 provide an overview of pre-tenure planning, methodology used to guide the creation of resource management direction and a description of the BPPTP area.
- Sections 5 provides a set of management objectives and strategies for oil and gas activities that apply to all areas located in Phase I.
- Section 6 provides additional management objectives and strategies that reflect varying zone sensitivities by Planning Unit.
- Section 7 provides additional detail on the BPPTP Phase I and II approach.
- The remaining sections address how the plan will be monitored; how to obtain variances to the plan and how the plan can be amended in the future.
- The Appendices provide additional background information.

Figure 2: Planning Units and Zones

2. LEGISLATIVE FRAMEWORK FOR PRE TENURE PLANNING

Pre-tenure planning in the M-KMA takes direction from the *Muskwa-Kechika Management Area Act* (the *Act);* legislation and policy that is directly or indirectly related to the allocation, exploration, production and transmission of oil and natural gas; and, other land use plans and initiatives undertaken by provincial agencies. Pre-tenure planning is a relatively new and evolving process and the BPPTP reflects refinements based on experiences learned from the development and implementation of the Upper Sikanni Management Plan (1995).

Pre-tenure plans apply only to oil and gas activities. As such the management **goal**s, objectives and strategies in this plan are not legally binding on other resource development activities (such as mineral exploration and mining, forest development, etc.). Authorizations for those activities will be issued in accordance with the relevant legislation and in recognition that those activities may have very different needs (in development planning or access requirements for example). However, it is expected that the resource values and the management approaches for oil and gas activities identified in this plan will provide important contextual information for other resource developers and statutory decision makers.

2.1 Legal Framework

The *Act* establishes the requirement for pre-tenure planning for oil and gas exploration and development in the M-KMA prior to the disposition of petroleum and natural gas rights. Pre-tenure plans are considered a local strategic plan under Section 7(2)(b) of the *Act*. Local strategic plans must be consistent with the Muskwa-Kechika Management Plan (M-KMP), which was enabled as a higher level plan through the *Act*.

The *Act* identifies the M-KMA as being a unique wilderness area of global significance and outlines the following vision for the M-KMA:

> *"... the management intent for the Muskwa-Kechika Management Area is to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing resource development and use in parts of the Muskwa-Kechika Management Area designated for those purposes including recreation, hunting, trapping, timber harvesting, mineral exploration and mining, oil and gas exploration and development ..."*

In addition, the Act identifies the integration of management activities especially related to the management of road accesses as being central to achieving the management intent of the M-KMA with the long-term objective of the M-KMA being to return lands to their natural state once development activities are completed.

In addition to pre-tenure planning, the Act also outlines the provision for the development of other local strategic plans within the M-KMA, such as the recreation management plan, wildlife management plan, parks management plans, and landscape unit objectives.

2.1.1 Relationship to other Legislation and Regulation

The disposition of tenures is governed by the *Petroleum and Natural Gas Act* and is administered by the Ministry of Energy and Mines. After tenure in the BPPTP area, or any other area in the M-KMA with a pre-tenure plan, has been purchased, any petroleum and natural gas activities and pipelines will be regulated by the Oil and Gas Commission (OGC) through the *Oil and Gas Commission Act*, *Petroleum and Natural Gas Act*, *Pipeline Act* and associated regulations. All applicable statutes and regulations will also apply to those activities. Some of the relevant acts include the *Waste Management Act*, *Water Act*, *Forest Practices Code of British Columbia Act*, *Forest Act*, *Heritage Conservation Act* and *Land Act*.

2.2 Relationship to Land Use Planning

The Fort Nelson and Fort St. John Land and Resource Management Plans (LRMPs) are the strategic land use plans that set out a vision for environmental conservation, land-use certainty and economic diversity and stability.

Both LRMPs provide direction and assurance for the recognition, accommodation and protection of important environmental values while allowing for resource development. The LRMPs are framed in terms of objectives and strategies within various Resource Management Zones (RMZs). LRMPs provide the strategic direction that supports more detailed planning. (Refer to Figure 3 for an illustration of how strategic land use plans link with local level plans).

Through the approval of the Fort Nelson and Fort St. John LRMPs (both plans approved October 1997), the M-KMA was established. In 2001, a portion of the Mackenzie LRMP was adjoined to the MKMA. The management direction for the BPPTP comes from the relevant portions of the Fort St. John and Fort Nelson LRMPs.

2.2.1 Muskwa-Kechika Management Area Recreation Management Plan

The M-KMA Recreation Management Plan (approved by government in January, 2001) is a local strategic plan legislated under the *Act*. This plan provides an overview assessment of recreation resources in the M-KMA and general management direction regarding appropriate recreation uses and access modes, a process for evaluating commercial recreation applications and specific management direction for five recreation categories comprised of the RMZs that make up the M-KMA. These five recreation categories include: category I - small provincial parks, category II - large remote RMZs primarily in the northern portion of the M-KMA, category III - major river corridors, category IV - large RMZs primarily in the southern portion of the M-KMA and category V - the Alaska Highway Corridor.

The M-KMA Recreation Management Plan does not provide direction to industrial activity. The Prophet RMZ portion of the BPPTP area falls within recreation category II, while the Besa-Halfway-Chowade RMZ lies within category III. From a commercial recreation management perspective, both categories are to be managed to maintain unmodified environment (category III can experience more modification), with few facilities and developed trails. Motorized use is high in category III along river ways and designated routes during summer and fall, while infrequent year round in category II. The chance of human encounters is higher in category III than II.

The objectives and strategies described in the "Management Direction for Plan Area" and the "Management Direction By Planning Unit" sections of this pre-tenure plan have been developed in consideration of the M-KMA Recreation Management Plan's objectives. For example, oil and gas developments will be planned to **minimize** impacts on recreation users by screening campsites and trails from development activities, where feasible. Through such strategies, impacts on the recreation visitor's opportunities for solitude and isolation can be minimized.

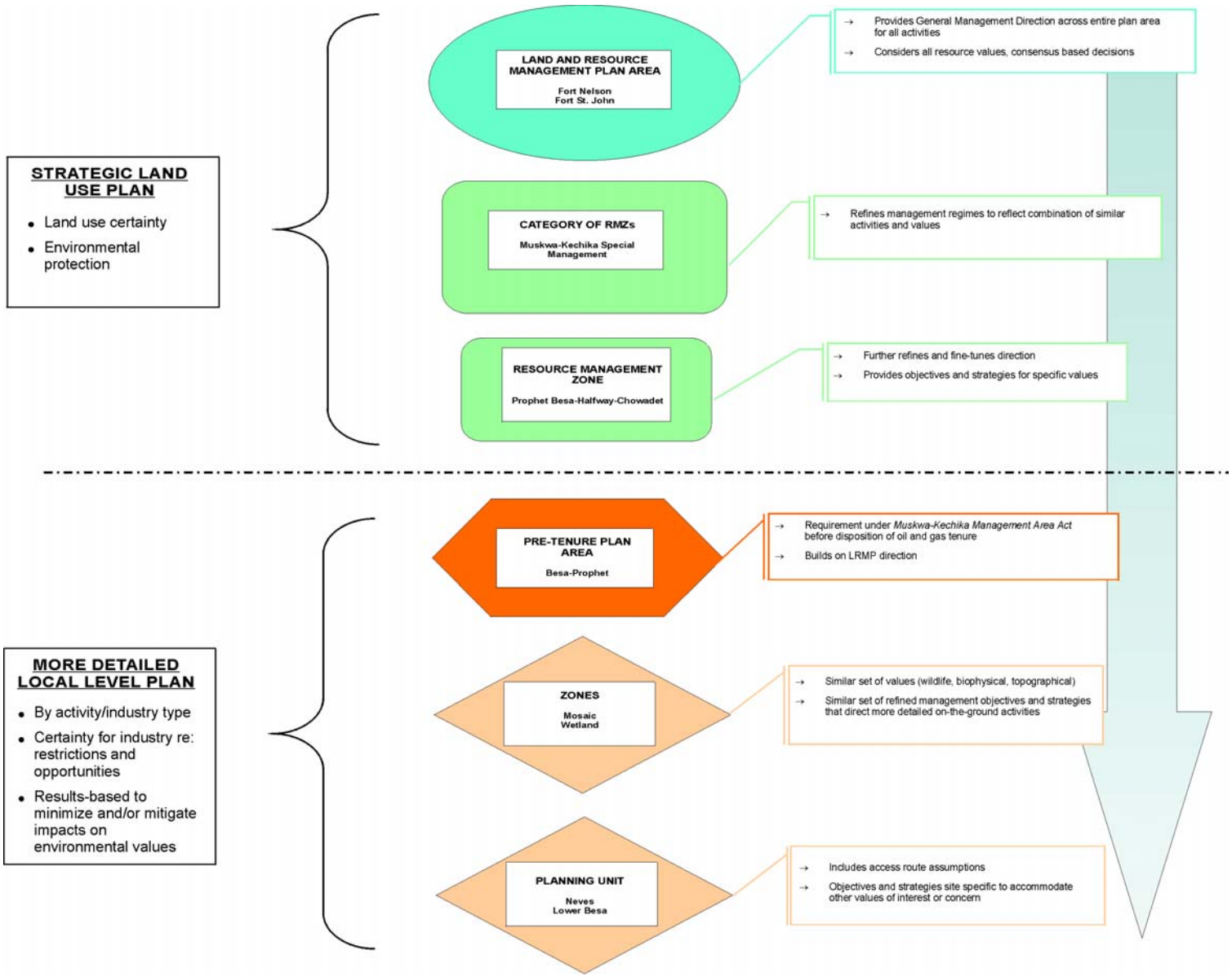
2.2.2 Muskwa-Keckika Management Area Wildlife Management Plan

The M-KMA Wildlife Management Plan (M-KWMP) is another local strategic plan legislated under the *Act*. The general purpose of the M-KWMP is to encourage appreciation of the diverse values of wildlife while ensuring that the Muskwa-Kechika's wildlife heritage is passed on in undiminished splendour and value to future generations. The ultimate goal of the M-KWMP is to ensure that the M-KMA's wilderness characteristics, wildlife and their habitat will be maintained over time. The M-KWMP aims to include and perpetuate examples of representative or special wildlife populations, habitats, and the associated ecological processes, which characterize the Muskwa-Kechika. To achieve this goal, the M-KWMP provides wildlife resource managers and users, tenure holders, and the general public with comprehensive and long-term guidance for the management of wildlife resources in the M-KMA.

Like other local strategic plans for the M-KMA, the M-KWMP does not provide specific direction for industrial activities like oil and gas development. However, objectives and strategies in the BPPTP must be consistent with the M-KWMP direction. While the M-KWMP specifically addresses wildlife management issues within the M-KMA, it recognizes that wildlife populations are not limited to administrative boundaries, and their management will require co-operation with neighbouring jurisdictions and planning initiatives such as pre-tenure plans for oil and gas activities.

The Wildlife Management Plan is currently under development, and is expected to be completed and approved by the end of 2002.

Figure 3: Links between Strategic Land Use and Local Level Plans



3. PLANNING METHODOLOGY

The BPPTP was developed by a planning team comprised of provincial government representatives, First Nations and a number of stakeholders (see Appendix E Terms of Reference). The initial stages of the planning process were overseen by the Peace Managers Oil and Gas Committee, whose membership included (at that time) senior staff from the Ministries of Energy and Mines; Environment, Lands and Parks; and Forests. Responsibility for the planning process was transferred to the Ministry of Sustainable Resource Management (MSRM) following its creation in the summer of 2001.

3.1 Planning Process and Timeline

Plan development was guided by a Terms of Reference (see Appendix E) that was agreed to by the Planning Team at a meeting held on May 25, 2001. Meetings with the Planning Team were initiated in February 2001, with the final meeting scheduled for May 9-10, 2002. The role and responsibilities of the Technical Team and Planning Team are outlined below:

- The Technical Team was responsible for drafting the Terms of Reference to present to the Planning Team, coordinating agency and Planning Team activities and meetings; preparation of the plan and other planning documents; and the compilation and presentation of data.
- The Planning Team was responsible for assisting in completing the Terms of Reference; developing and recommending a draft plan for public review; and preparing the final plan for submission to MSRM incorporating the results of the public review as appropriate.

3.2 Technical Analysis Methodology

The BPPTP builds on direction from management objectives and strategies identified in the Fort Nelson and Fort St. John LRMPs. This direction, along with input from the Planning Team, was used to identify values of concern, interests and sensitivities in the plan area. The Technical Team then used the best information available to develop value layers for analysis. Existing inventory information used in the technical analysis included: terrestrial ecosystem mapping (TEM), wildlife habitat capability mapping, forest cover information, existing tenures (trapping, range, guide outfitting, forestry), petroleum and natural gas and mineral potential, wildlife, fisheries and habitat inventories, and existing developments (e.g., trails, wellsites). The specific biophysical value layers developed and used in the planning process are:

- Mountain Goat winter range capability
- Rocky Mountain Elk winter range capability
- Moose winter range capability
- Martin capability
- Sensitive Site series
- Geomorphological Processes
- Slope Classifications
- Seral Stage Distribution
- Recreation Opportunity Spectrum
- Stone's Sheep winter range capability
- Caribou winter range capability
- Grizzly bear spring capability
- Reconnaissance Fish Inventory
- Rare/Uncommon Site Series
- Slope stability
- Old Growth forests
- Visual Land Inventory
- Existing Tenures

Values without a biophysical component, such as wilderness and cultural features/values, were not mapped or discussed in detail during the initial values review.

Draft objectives and strategies were developed for each value layer. The Planning Team then reviewed, refined and validated the maps and guidelines on a layer by layer basis. Once the Planning Team was comfortable that all the biophysical values were adequately addressed, a "roll-up" map was developed that delineated zones based on areas where a similar set of values and management guidelines was anticipated. The biophysical zones delineated in the final roll-up map are:

- Major River Floodplain
- Wetlands - Low Elevation
- Mosaic Habitat
- Cool Aspect Forest
- Steep Slope Warm Aspect
- Glacier
- Incised Stream
- Wetlands - High Elevation
- Warm Aspect Forest
- Steep Slope Cool Aspect
- High Elevation Plateau

4. BIOPHYSICAL AND RESOURCE VALUES AND USES

4.1 Biophysical

The biophysical description of the BPPTP area used for this planning process was primarily derived from a TEM project conducted over the PPPTP area from 1997-1999. The following sections highlight some of the key values and uses. A more detailed description is included in Appendix G. Figure 4 shows the physiography within the plan area.

4.2 Resource Values and Uses

Resource values for the plan area are summarized below.

4.2.1 Wilderness

The BPPTP area is widely recognized as having very high wilderness values. The great majority of the area is in a primitive, undeveloped state, accessible on the ground only on foot or by horseback. The BC Ministry of Forests' Recreation Opportunity Spectrum can be used to classify the plan area: 64 percent in primitive, 26 percent in semi-primitive non-motorized and 10 percent in semi-primitive motorized (see Appendix G for definitions of these categories).

4.2.2 Wildlife

Wildlife values are high throughout the BPPTP area and include the highest habitat ratings in the province for Stone's sheep and Rocky Mountain elk as well as some of the highest rated habitat for moose and woodland caribou. Mountain goat, mule deer and white-tailed deer are also found in the plan area, but at much lower densities. Major habitat types within the plan area are the boreal, sub-alpine, (lower and upper) and the alpine.

4.2.3 Fish

A description of fishery values is derived from information gathered from a 1:50,000 Overview Fish and Fish Habitat Inventory conducted in the BPPTP area in September, 2000. Fish species found throughout the plan include Arctic grayling, bull trout[1] and mountain whitefish, with slimy sculpin existing as local populations in certain drainages; however a large portion of the plan area is inaccessible to fish movement due to impassable barriers (waterfalls and chutes).

4.2.4 Ecosystems

The BPPTP area falls within the Northern Boreal Mountains Ecoprovince and in the Northern Canadian Rocky Mountains Ecoregion. It is represented within two Ecosections: the Muskwa Foothills in the east and the Eastern Muskwa Ranges to the west. Three biogeoclimatic zones cover the area: Boreal White and Black Spruce, Spruce Willow Birch and Alpine Tundra.

[1] The B.C. Conservation Data Centre currently ranks bull trout as a blue-listed species (blue-listed species are considered to be provincially vulnerable).

4.2.5 Oil and Gas

Gas potential is rated as "very high" to "high". The BPPTP area is not oil prone due to thermal maturation of the rocks. Currently, there are no established oil or gas reserves in the plan area, although two gas fields (Sikanni and Pocketknife) are located 10 kilometres to the east. Portions of five active gas tenures, issued under the Upper Sikanni Management Plan (1995), extend into the Besa-Prophet area. There has been no drilling on these three active tenures within the plan area to date.

4.2.6 Mineral

The BPPTP area is generally ranked as having low to moderate metallic mineral potential; however this ranking is based on limited information. The known metallic potential is mainly for carbonate hosted lead-zinc deposits (with germanium and gallium), with a number of occurrences in the Richards Creek valley. Industrial minerals of potential interest include barium and phosphate. A group of 14 small mineral tenures is present near the northern boundary of the area, in the mid to upper Prophet valley. There are no producing or past producing mines in the plan area.

4.2.7 Geothermal

The BPPTP area is rated as having high geothermal potential. The Prophet River Hot Springs, which is located in the northwest portion of the plan area, but is excluded from this planning process, demonstrates this potential. This spring is small with a flow rate of less than one litre per second.

4.2.8 Forestry

The BPPTP area overlaps the Fort Nelson and Fort St. John forest districts. Harvestable tree stands include coniferous species, such as white spruce and lodgepole pine and deciduous species such as aspen and cottonwood. There has not been any significant commercial timber harvesting activity within the area. Forest development plans do not show any proposed activity in the area during the short term as the stands within the area are considered to be uneconomical to harvest at this time, due to stand types, total volumes produced and tree size.

4.2.9 Recreation

Year-round recreational activity occurs in the BPPTP area, with the majority of the use during August to October. Hunting is the most common activity, and other uses include camping, fishing, trail riding, hiking, snowmobiling, wildlife viewing and photography. There are currently three registered guide outfitters operating in the area. As a part of their operations, they have developed a number of small base camps, cabins, outbuildings and corrals on specific sites. Scenic landscapes are an important public resource and are closely linked to public viewing (tourism, recreation, etc). Viewpoints identified within the plan area include guide outfitter base camps, cabins and scattered campsites.

4.2.10 Range

Range users in the BPPTP area include commercial horse operators, non-commercial hunters, guide/outfitters, First Nations, wildlife enthusiasts, recreationists and trappers. Range tenures for domestic livestock management in the area provide forage for horses required by the guide outfitting industry.

4.3 First Nations and Cultural Values

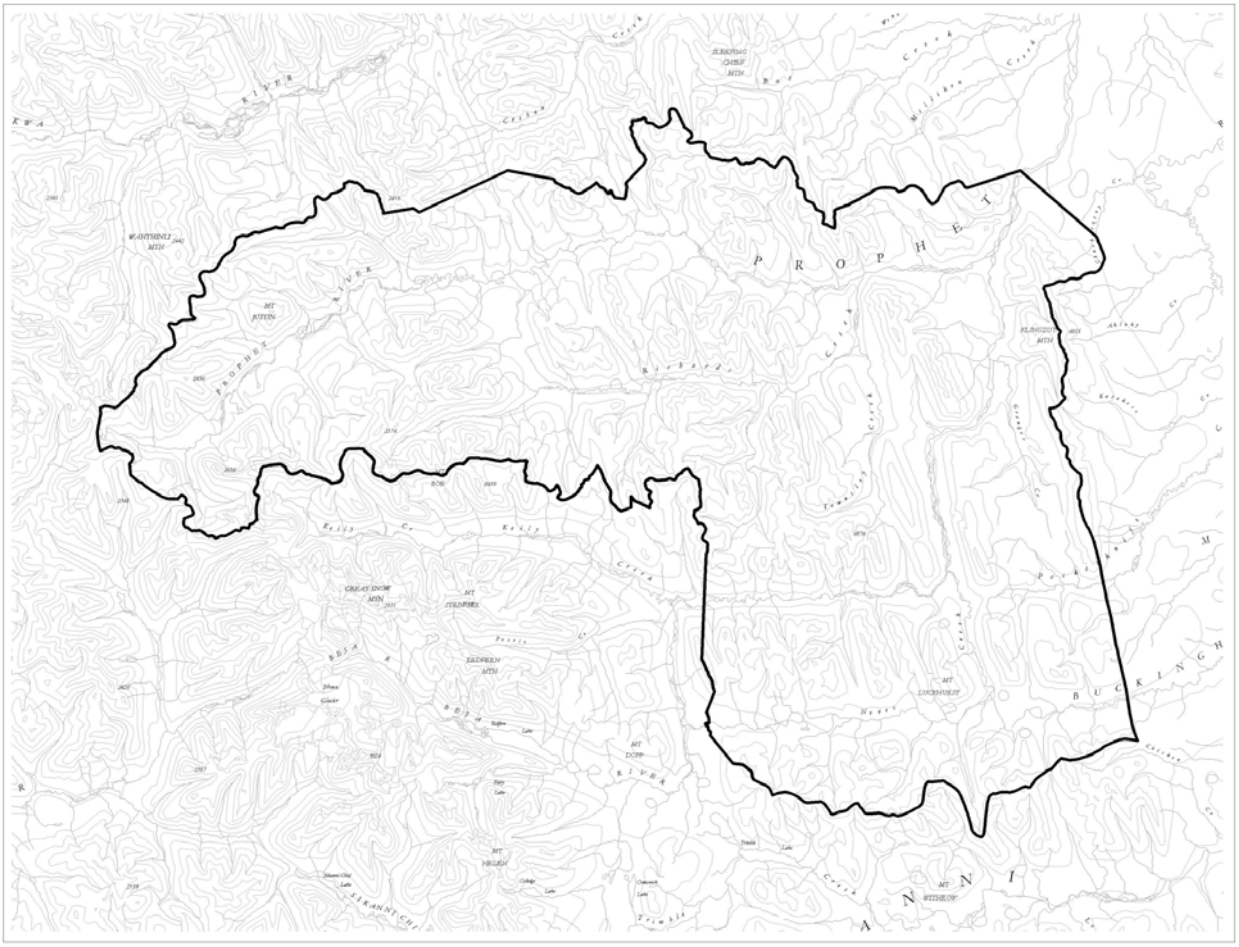
The BPPTP area has historic and current use by the Sekani, Cree and Beaver cultures of the Halfway River and Prophet River First Nations. Areas of importance for traditional practices and archaeological and cultural sites exist within the plan area. The plan area falls within Treaty 8 and the two First Nations are signatories to the treaty.

The plan area contains values and resources of importance to these First Nations including sacred, spiritual, camping, gathering, berry-picking, hunting and burial sites. Oral history indicates that the plan area was well used and mentions spiritual sites where the 'Prophets' went to pray and fast. Appendix G contains further background about the First Nations who use this area.

Both the Eastern Rockies High Trail, a traditional route for horse travel, and the Bedeaux Trail cross the BPPTP area. It was in 1934 that the Bedeaux expedition passed through this area in their attempt to establish an east-west route through the Northern Rocky Mountains. The expedition was trying to find a tractor route from Edmonton via Fort St. John to Telegraph Creek. They were forced to abandon their tractors and proceed on horseback.

The portion of the Prophet River that flows through the BPPTP area contains the headwaters. In 1998, the Prophet River was proclaimed as one of B.C. Heritage Rivers. Designation as a heritage river is commemorative rather than regulatory. It provides an opportunity for greater focus and profile for key rivers, and exists entirely with existing legislation, intergovernmental agreements, policies and planning processes. Government's approved vision and management guidelines for the Prophet River are intended as input and guidance and are detailed in Appendix G.

Figure 4: Physiography of Besa-Prophet Pre-tenure Plan Area



5. MANAGEMENT DIRECTION FOR PLAN AREA

As outlined in Section 2.2, strategic direction for the BPPTP is taken from the Fort Nelson and Fort St. John LRMPs.

The BPPTP area lies within the Special Management Category for both LRMPs; and specifically in the Prophet RMZ in the Fort Nelson LRMP and in the Besa-Halfway-Chowade RMZ in the Fort St. John LRMP.

This plan identifies goals, objectives and strategies designed to minimize impacts on **wilderness conditions** and wildlife values from oil and gas activities in a unique portion of the M-KMA. (See Appendix B, Glossary, for definitions of "goals", "objectives" and "strategies".)

5.1 Goals

Goal 1: The M-KMA is recognized as an area "…to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing for resource development…" The regulators and the industry use, promote and develop innovative management practices to meet the intent of the *Muskwa-Kechika Management Act*.

Goal 2: Oil and gas development proposals are guided by wilderness, wildlife, environmental, physical, First Nations' interests, cultural/heritage and recreation values, and interests of other users and tenure holders in balance with economic considerations.

Goal 3: Oil and gas development proposals are well planned and properly coordinated to minimize the footprint in the BPPTP area, while maintaining ecosystem health and creating economic savings.

Goal 4: Development activities are planned to **avoid** impacts on First Nations' interests, other users, interests and tenure holders where **practicable** and include measures to **mitigate** unavoidable impacts.

Goal 5: Restoration of resource values over time to a state similar to initial conditions is achieved though progressive reclamation of surface disturbances. For oil and gas activities, the long-term goal is that wilderness conditions are returned to the landscape, recognizing that each operator would be responsible for only their portion of impacts.

Goal 6: All workers involved in oil and gas development activities are informed about the intent of the BPPTP in relation to the M-KMA in order to facilitate successful implementation of the BPPTP.

Goal 7: Adaptive management approaches are encouraged in oil and gas development proposals and outcomes are incorporated into future development activities.

5.2 General Management Direction

General management direction applies to oil and gas activities throughout the plan area.

5.2.1 Proponent Requirements

Overview Assessment

An Overview Assessment (OA) will be required to be submitted to the OGC after the purchase of petroleum tenure. The information compiled for the OA will provide both the proponent and the OGC with detailed information on the resources, values and interests within the tenure area. In addition, the compilation of the required information for the OA will identify any concerns and potential conflicts with other tenure holders (e.g., commercial backcountry operators, trappers, forest industry) within the petroleum tenure area. Specific requirements for an OA are listed in Appendix C.

Objectives: Overview Assessment	Strategies: Overview Assessment
(A) To identify and assess the location, size and importance of all the values contained within a petroleum tenure area.	(a) Assess the biophysical setting for, climate, physiology, geology, hydrology, vegetation, aquatic systems, and wildlife.
(B) To coordinate development activities with other operators and tenure holders to reduce area impacts and create cost savings.	(b) Assess other tenure holders and users of the area within the petroleum tenure.
	(c) Make general recommendations that would facilitate environmentally sensitive planning and development in the petroleum tenure.
	(d) Consult with other operating companies, users, interests and tenure holders in the Plan Area prior to submitting **development plans** to the OGC (See Section on Consultation, below).
	(e) Contact the OGC regarding First Nation consultation protocols and contact the First Nation(s) regarding areas of traditional practices.

Development Plan

Proponents will be required to submit a Development Plan that outlines proposed access options, exploration drilling, production and pipeline scenarios and options to the OGC before approval of any activity. The Development Plan will indicate where efforts to pool resources and coordinate roads, and utility rights-of-way with other industrial (and commercial) users can be identified. The Development Plan will be amended as required after each stage of development, to reflect the information gathered and any new development proposals that result from completion of the phase of the project. Requirements for the timing of submission and content of the Development Plan are outlined in Appendix C.

Objectives: Development Plan	Strategies: Development Plan
(A) Provide the best estimate of the overall extent of development proposals at each stage of the project to identify the overall project scope and potential impacts. Efforts would be aimed at minimizing surface impacts and disturbances. (B) Plan development activities to avoid impacts on other users, interests and tenure holders where practicable and provide measures to mitigate unavoidable impacts.	(a) Incorporate plans for deactivation and rehabilitation of roads and trails at the end of each phase of development. (b) Scenarios for well licenses and other surface disturbances, such as pipelines and facilities, will be submitted with as much information as is practicable at the development plan stage. (c) Development plans are to identify the different zone types that must be traversed to access a lease and outline implications for zone specific values for all aspects of development. (d) Initial Drilling: The development plan should identify locations for exploratory 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, to the extent practicable at this early stage of the project. (e) Pool delineation: Once a pool has been discovered, the development plan will be revised to identify: additional proposed well locations; drilling and waste management options; any more definite plans for mitigation of impacts from drilling; production scenarios, access routes, testing operations (e.g., pads, innovative testing methods) and pipeline/facility options. (f) Pool Development: Ongoing production and pool development will require an operational management plan encompassing all facilities, access routes, pipelines, and associated infrastructure.

Impact Assessment

Proponents will be required to conduct certain Impact Assessments to manage and conserve other resource values as set out in Appendix C. The type of impact assessment(s) required will be determined by the resource values present; by information gathered in an Overview Assessment; and/or through discussions regarding the development plan with staff from the OGC, Ministry of Water, Land and Air Protection or Ministry of Forests.

Objectives: Impact Assessment	Strategies: Impact Assessment
(A) Assess, using appropriate methodologies, the site specific impacts of oil and gas activities for all development stages prior to initiating any activities.	(a) Where long-term and/or cumulative impacts to values cannot be avoided or mitigated on site, the assessment should provide other options to mitigate these impacts.

Project Monitoring

Proponents will be required to provide Monitoring Report(s) to the OGC that describe the project progress, the achievement of expected results, and identify any implementation issues and/or constraints.

Objectives: Project Monitoring	Strategies: Project Monitoring
(A) Monitor and report on each phase of oil and gas activities to enable verification of compliance with the BPPTP and development plans, the subsequent Development Plan and any recommendations from relevant Impact Assessment(s). (B) Identify and respond to unforeseen impacts and problems that may arise from development activities. (C) Report on overall assessment of impacts and the effectiveness of mitigation measures implemented during development activities.	(a) Develop a monitoring plan that includes a reporting timetable for proponent's activities using identified indicators and standards to monitor conditions. (b) Unforeseen impacts and problems that may arise from development activities will be identified by qualified **environmental monitors** and communicated to operators for a timely and appropriate response. (c) Provide a report on the monitor(s) overall assessment of impacts and the effectiveness of mitigation measures implemented during development activities according to the reporting timetable. (d) After projects are completed and as required by the OGC, an independent environmental monitor will assess exploratory, production development and reclamation activities and provide OGC with an audit of overall impacts and the effectiveness of mitigation measures undertaken.

Consultation

Objectives: Consultation	Strategies: Consultation
(A) Undertake adequate consultation with other operating companies, users and interests and tenure holders prior to exploratory, production, pipeline and access development and reclamation in the plan area as defined and described in the OGC's *Oil and Gas Activity Public Consultation Policy and* Guidelines (http://www.ogc.gov.bc.ca/documents/guidelines/final draft.pdf.	(a) Provide a record of consultations, including issues identified and mitigation actions taken, to the OGC as part of the project application.

5.2.2 Access

Context:

Access management is probably the most critical element in achieving the plan's goals for oil and gas activities in the M-KMA. Clearly, the intent of both the Fort Nelson and Fort St. John LRMPs was for industry to have the opportunity and ability to access oil and gas reserves. But at the same time, the land use plans were clear that with access opportunities comes the responsibility to protect the M-KMA's wilderness and ecological values and to minimize negative impacts on other resource values, tenure holders and users.

LRMP direction for industrial access was also clear that access would be co-ordinated and that oil and gas tenure holders were responsible for: minimizing new access development; deactivating access routes when no longer needed; and reclaiming access routes consistent with government regulations.

The strategic direction for oil and gas access management in the M-KMA did not identify "allowable" types of access (i.e., the means of approach such as "winter only" roads.) However, the intent was that industry should use only the minimum type of access necessary to develop the resource economically and safely in a way that is sensitive to the non-extractive resources.

The objectives and strategies for access in the following table were developed to meet the intent for access management contained in the two LRMPs.

Refer to the description of access types (Appendix B) when reading this section.

Note: In most cases, the contents of this document and the wording of specific management objectives and strategies have been agreed to by members of the BPPTP Planning Team. However, in the following table there is an outstanding difference of opinion regarding wording and intent for seasonality of roaded access. Where this occurs, the government Technical Team's recommended strategy is clearly marked with an asterisk (*). Strategies proposed by other Planning Team members are also included, but are shown in *italics* for information.

Objectives: Access	Strategies: Access
Access (Planning)	
(A) Plan resource development access to minimize or mitigate adverse long-term effects to wilderness, wildlife, First Nations' interests, cultural/heritage, vegetation, soil, fish and recreation values, and other users, interests and tenure holders. Use, develop and promote innovative or **best management practices** in access development, while considering economic constraints.	(a) Impact assessments for access development will be conducted to identify significant fish and wildlife and their habitats (e.g., critical winter ungulate habitat, sensitive habitats), other resource values (e.g., slope stability, recreation use and patterns, visual quality, areas of First Nations' traditional practices and cultural/heritage features), and permanency of impacts.
(B) Demonstrate that the access option with the lowest impact practicable will be used.	(b) Where roaded access is required, proponents will **evaluate** a variety of access options, including seasonal versus year round access and the need for minimal or low impact roads, bladed roads or multi-year roads as appropriate to the activity and to other objectives/strategies in this plan.
	(c) Evaluate to the satisfaction of the OGC the practicability of minimal impact access options.

Objectives: Access	Strategies: Access
Roaded Access (General Impacts)	
(A) Minimize or mitigate overall impacts of roaded access use. (B) Minimize new roaded access development. (C) Manage new access developments to maintain the pre-existing levels of public motorized access.	(a) Use existing access routes if this option has the least overall impact. (b) Minimize the width of right-of-ways for any new access development. (c) Evaluate the use of low impact vehicles to reduce overall environmental impacts (e.g., lower ground pressure vehicles). (d) Where blading is required, a rationale must be provided to the OGC prior to construction, conclusively demonstrating the need for blading. (e) End-haul fill during road construction when bladed roads requiring cut and fill are used. (f) Do not use roads during spring thaw where there are potential impacts to water quality. (g) Conduct interim erosion and sediment control measures to minimize soil erosion and the visual impact of roads during ongoing operations. (h) Construct frequent escape breaks in the bermed snow when snow plowing is required to allow animals to exit the road to avoid vehicular traffic. (i) Plan and manage road traffic (e.g., low speed limits) to decrease flight responses from wildlife and reduce wildlife-vehicle collisions. Evaluate busing employees to worksites to reduce vehicle traffic. (j) Screen access routes and lease sites behind vegetative cover and topographic features where practicable to create sight and noise barriers and to maintain hiding cover for wildlife species. (k) Design road alignment to reduce line of sight distances and feather edges of disturbances to reduce the visibility of linear edge effects.
Roaded Access (Fish and Water)	
(A) Minimize impacts on fish and water from access development and use.	(a) Limit the number of stream crossings required to access a worksite unless this results in a greater overall environmental impact. (b) All new or reconstructed crossings of fish bearing streams will be designed and built so that natural patterns and timing of fish passage are assured for fish species present and their respective life stages (e.g., bottomless structures such as clear span bridge or arch culvert). A design and implementation plan will be developed for each affected stream crossing and will be reviewed by OGC and Department of Fisheries and Oceans, where applicable. (c) Where practicable, locate stream crossings at right angles to the water flow.

Objectives: Access	Strategies: Access
Roaded Access (Seasonality) * (A) Use winter season roads for exploration and production phases, unless a need for access in other seasons is conclusively demonstrated.	(a) Except under exceptional circumstances, use winter season access for exploration. In those cases where multi-season access is proposed for exploration purposes, a rationale will be provided to the OGC for their consideration by the proponent to demonstrate conclusively that winter only access using best practices is not sufficient, including the following information: ▪ Technical factors (e.g., uncertainties of stratigraphy, potential for sour well characteristics, drilling time required); ▪ safety factors; ▪ economic factors; ▪ type of multi-season access; ▪ topographic constraints limiting winter access options; ▪ scope and permanence of additional impacts from access outside of the winter season. (b) Where practicable, use winter season roads when creating access for production and pipeline development. In those cases where all season access is proposed for production and/or pipeline development, a rationale will be provided to the OGC for their consideration by the proponent to demonstrate conclusively that winter only access using best practices is not sufficient, including the following information: ▪ technical factors (e.g., servicing requirements, fluid handling); ▪ safety factors; ▪ economic factors; ▪ type of multi-season access; ▪ topographic constraints limiting winter access; ▪ scope and permanence of additional impacts from access outside of the winter season.
Roaded Access (Seasonality): **<u>Other Option proposed by Planning Team members;</u>** (A) *Use winter season roads for exploration and production phases..*	*(a) Use winter season, minimal impact or low impact roads when creating access for exploration and production. (Note: ATV use is permitted on the Redfern Trail).* *(b) If remote production techniques or air access is insufficient for production activities in other seasons use non-mechanical access or operate wells on a seasonal basis only using winter access.*

Objectives: Access	Strategies: Access
Roaded Access (Coordination)	
(A) Coordinate access for all phases of oil and gas development and between all industrial tenure holders to minimize or mitigate long-term negative effects on wilderness, wildlife, First Nations' interests, cultural/heritage and recreation values, and other users and interests and tenure holders.	(a) Different operators are required to share access roads to the greatest extent practicable when developing a field. (b) When a road is constructed for oil and gas purposes in an area where timber harvesting is planned, the road alignment should be coordinated so that forest activity is able to use the same access corridor where practicable.
Roaded Access (Access Controls)	
(A) Consistent with the access management provisions established under the M-KMP, avoid impacts on values or uses within the plan area from recreational use of industrial access.	(a) Prohibit off-site recreational use by industrial workers under an industrial permit. Prohibit use of vehicles by industrial workers for recreational purposes on oil and gas access roads. (b) **Access Control Measures** to prohibit new public motorized access will be installed at the boundary of the M-KMA or other critical points on any new access routes.[2]

5.2.3 Phase-Specific

This plan is intended to minimizes short-term impacts from exploration activities, such as seismic and exploration drilling, required to identify resource potential. The plan recognizes that a larger "footprint" with longer-term impacts may result from the production of proven resources under even the most sensitive development scenarios, but provides objectives and strategies to minimize and mitigate these impacts. The plan also recognizes that oil and gas resources are finite and production scenarios should result in impacts that are not permanent in nature. The plan therefore envisions the full restoration of wilderness conditions and wildlife values and identifies objectives and strategies that are appropriate to achieve this over time.

Geophysical Activities:
Under Section (8) (2) of the *Muskwa-Kechika Management Area Act,* a pre-tenure plan is not a pre-requisite for the approval and conduct of **geophysical activity** in the M-KMA, and therefore geophysical activity can be carried out without a pre-tenure plan. The OGC is undertaking a project to compile management guidelines for geophysical activities applicable across the entire M-KMA. For these reasons guidelines for geophysical work are not included in the BPPTP; further information on this topic should be sought from the OGC.

[2] This is consistent with the *Wildlife Act* Access Management Area regulation for the M-KMA. Public motorized access is allowed where oil/gas roads are built on designated Access Management Area routes.

Exploratory Development, Production Development and Pipelines

Objectives: Phase-Specific	Strategies: Phase-Specific
Exploratory Development	
(A) Minimize or mitigate impacts specific to **exploratory development**	(a) Plan exploratory activities (lease site, road and other associated ground facilities) that use innovative or best management practices and minimize overall environmental impacts. (b) Where practicable, locate development away from sensitive habitats such as shallow soils, permafrost, steep slopes, unstable slopes, landslides, alpine meadows, wetlands and high water tables unless options to access these areas can be demonstrated to have less overall environmental impact. (c) Plan the timing of exploratory activities to avoid or minimize impacts on other users and tenure holders. (d) Limit roaded access for exploratory wells to winter season roads that create the least environmental impact where practicable. (e) Locate lease sites and other surface disturbances to minimize cut and fill. (f) Do not construct lease sites or create surface disturbances when the soil is saturated to prevent soil erosion and compaction, where practicable. (g) Where practicable, use technological solutions (e.g., including but not limited to extended reach **directional drilling** and multi-well pads) to minimize footprint, unless alternatives can be demonstrated to have less overall environmental impact. (h) Evaluate technical options (e.g., including but not limited to directional drilling) for avoiding sensitive habitats while taking into account both environmental and economic considerations. (i) Sumpless systems will be used, wherever practicable. Where sumpless systems are not practicable, evaluate remote sump and on-site sump options to recommend the alternative that has the least overall environmental impact. (j) If sumps are required, then fence sumps until reclamation activities commence to prevent wildlife from accessing sumps. (k) Minimize surface disturbance and removal of topsoil on lease sites through the use of best technology practices (e.g., including but not limited to methods such as fill, accumulations/platforms, geotextile materials and swamp mats).

Objectives: Phase-Specific	Strategies: Phase-Specific
Production Development (A) Minimize or mitigate impacts specific to production development.	(a) Minimize surface disturbance and overall impacts through the use of innovative or best management practices when planning production activities. (b) Use **remote operation and monitoring** of wellsites where practicable. (c) Locate **processing plant**s and waste processing facilities outside of the BPPTP area. (d) Where practicable, locate production facilities outside of the M-KMA unless a need for facilities in the M-KMA can be conclusively demonstrated. (e) Identify options for locating production facilities in consideration of environmental, social and economic values as part of development planning. (f) Minimize the extent of above ground facilities.
Pipeline Development (A) Minimize or mitigate impacts specific to pipeline development, construction and maintenance	(a) Minimize surface disturbance and overall impacts through the use of innovative or best management practices when planning pipeline development (access, construction and maintenance). (b) Impact assessments for pipeline development proposals will describe and evaluate alternate routes and construction methods, taking into consideration ecological, economic and social values. Minimize potential for new non-**industrial motorized access**. (c) In forested areas, minimize human and predator use to the greatest extent practicable (e.g. use revegetation, rollback or other methods as appropriate). (d) Pipeline proposals will make every effort to avoid sensitive habitat areas such as shallow soils, unstable slopes, landslides, alpine meadows, wetlands and high water tables. Where such areas cannot be avoided, evaluate construction methods (e.g., directional drill, **horizontal bore**) that demonstrate minimal impact to these habitat types and associated wildlife. (e) Pipeline proposals will identify technically practicable options for stream crossings and will assess and minimize up- and down stream impacts to fish values, fish migration and stream flows. Wherever practicable, use technologies that have least impact on water quality, quantity, timing of flow, fisheries values and vegetation complexes. (f) Minimize corridor widths to the extent practicable, in order to minimize environmental impacts.

Objectives: Phase-Specific	Strategies: Phase-Specific
Pipeline Development (Cont'd.)	(g) Where uncertainty exists on which pipeline methodology to use, encourage adaptive management approaches specifically designed to provide better information for future proposals. (See Section 11.4 on Adaptive Management) (h) Plan pipeline developments to explore opportunities for sharing pipeline facilities and to reduce the need for additional pipelines, where practicable. (i) Design pipeline corridors to reduce line of sight distances and feather edges of disturbances to reduce the visibility of linear edge effects.

Reclamation

An outline of how and when the proponent will reclaim both disturbed areas not required for operations and disturbed sites and access routes required for specific phase(s) of operations must be included as a part of the Development Plan (Sections 5.2.1 and 11.3.2). The following objectives and strategies are minimum requirements, and depending on the nature of the exploration activity and the environmental sensitivity of the area, increased standards may be required.

Objectives: Reclamation	Strategies: Reclamation
(A) Develop and implement a plan for progressively reclaiming surface disturbances with short and long-term objectives for each site prior to first growing season after disturbance. Where subsidence of sumps is a concern, determine the timing of reclamation to minimize overall environmental impacts. (B) Restore wildlife and fish habitat capability to a state similar to initial conditions. (C) Maintain original range of ecosystem types and **seral stages** over time. (D) Minimize erosion of disturbed sites to ensure reclamation is successful and restore natural drainage patterns similar to initial conditions. (E) Re-vegetate disturbed areas with native species (or in the case of grass communities, native species or species (e.g., fall rye) that will not prevent native species from establishing) to establish self-sustaining vegetation similar to initial conditions. (F) Restore recreation opportunities and visual values to their initial condition to the extent practicable over time.	***Interim Reclamation:*** (a) Interim reclamation activities are to be implemented following each phase of a project on lands no longer needed for ongoing development. (b) Remove waste materials and fill pits, sumps and holes. (c) Mound sumps above the original soil level. Monitor and correct for subsidence. (d) De-compact soils in disturbed areas. (e) Dry drilling pits and backfill by restoring soil layers. (f) Restore slopes to natural gradient and re-contour cuts to blend into the surrounding landscape to the extent practicable. (g) Restore natural slopes, contours and drainage patterns to the extent practicable. (h) Return borrow pit material ***Final reclamation after oil and gas wells/ pipelines are abandoned:*** (a) Remove production equipment (including above ground pipelines) and debris. Remove or treat waste materials. (b) Restore coarse woody debris and surface topography that approximates initial conditions where this doesn't inhibit other reclamation objectives.

Objectives: Reclamation	Strategies: Reclamation
(G) Restore topsoil layers to the level of soil productivity similar to pre-existing conditions. (H) When re-vegetating disturbed areas, prevent erosion until vegetation is established.	(c) Restore natural drainage patterns to the extent practicable. (d) Correct subsidence over closed pits and abandoned pipelines. (e) Re-grade and re-contour well sites, access roads and pipelines ***Salvaging Topsoil and other Above Ground Debris:*** (a) Conduct soil assessments prior to disturbance to determine depth and distribution and to enable re-establishing soil conditions. (b) Segregate **topsoil** horizons when removing and stockpile in separate areas away from traffic on the lease. (c) Protect stockpiled soils from compaction and erosion (e.g. seed with species outlined in the objectives) (d) Stockpile any above ground debris removed from a site for redistribution to mimic original conditions. ***Re-vegetation:*** (a) Re-seed disturbed areas within provincial range agreement areas consistent with approved Range Use Plans. (b) Re-establish topsoil comparable to pre-existing depths and conditions to enable seeding, planting and re-vegetation that mimics original conditions. (c) Seed mixes and mulch used in re-vegetation should be free of noxious and annual weeds and should promote re-establishment of native species. (d) Replanted tree and shrub species will be from the appropriate ecotype. Planting stock will conform to the seedling transfer guidelines as outlined in the **Forest Practices Code**'s (FPC) "Seed and Vegetation Materials Guidebook." (e) Monitor stocking success to ensure re-vegetation comparable to undisturbed adjacent areas and as described in the stocking guidelines contained in the FPC "Establishment to Free to Grow Guidebook, Prince George Region." (f) Re-vegetation should be carried out during optimum periods for germination. (g) Where fertilization is required, apply in a manner that prevents entry into streams

Objectives: Reclamation	Strategies: Reclamation
	Road and Bridge Reclamation (a) Return roads to natural grade to the extent practicable and replant with species similar to initial conditions. (b) Build cross ditches, water bars or other erosion control measures to prevent soil erosion and sedimentation. (c) Remove bridge structures and unstabilized fill and restore stream banks to as near original shape as practicable. (d) Decompact roadways and in finer textured soils, incorporate mulch to assist re-vegetation. (e) Use more intensive stabilization measures to hold soil in place until vegetation is re-established where needed (e.g. on steep, dry or south-facing slopes with soil instability) (f) Use reclamation methods that restore motorized access opportunities to a state similar to initial conditions (i.e. where designated motorized access routes previously existed in the M-K Access Management Area, restore any disruption to this access; elsewhere, do not create new motorized access corridors)

5.2.4 Activity-Specific

Objectives: Activity-Specific	Strategies: Activity-Specific
Aerial (A) Avoid critical wildlife habitat to the greatest extent practicable and reduce disturbance of wildlife when flying within the plan area. (B) Coordinate flight plans with industrial and other aircraft use to reduce impacts and create cost savings, to the extent practicable. (C) Plan aircraft activity to minimize impacts on other users (e.g. guide outfitters, hunters) where practicable.	(a) The proponent will establish a flight plan for all aerial activities. The plan will identify the number of flights required, staging areas and altitudinal, temporal and spatial flight parameters. (b) Avoid high quality habitat to the greatest extent practicable and maintain adequate terrain separation to prevent disturbance to wildlife or other users as identified in provincial guidelines when designing **coordinated flight plans**. (c) Flight paths are not to follow contours and/or landscape features. (d) Select aircraft types that produce less noise impact (e.g., lower decibels and sound patterns that are less disturbing to wildlife) where practicable.

Objectives: Activity-Specific	Strategies: Activity-Specific
Aerial (Cont'd.)	(e) Following and circling of wildlife is prohibited. (f) To protect sensitive wildlife from inadvertent impacts of aircraft overflights, the following protocols apply for aircraft activity unless environmental overview assessments or development planning provides more specific information on wildlife use areas[3]: ▪ Mountain Goat: Maintain seasonal no-fly zones for helicopters and fixed-wing aircraft that are a minimum 2000 m horizontal and vertical distance from mountain goat habitats in steep slope warm aspect zones year round and steep slope cool aspect zones in summer, unless goats are separated by a physical barrier that would minimize disturbance levels (e.g., mountain ridges or terrain block). ▪ Thinhorn Sheep: Limit helicopter and fixed-wing flight altitudes to a minimum 500 m over mountain sheep habitat in steep slope warm aspect zones year round and steep slope cool aspect zones in summer, and a minimum 1000 m horizontal distance from sheep habitat in steep slope warm aspect zones year round and steep slope cool aspect zones in summer. For highly sensitive sites (e.g., natal areas) maintain a 2000 m separation from helicopters and fixed-wing flights. ▪ Caribou: Limit helicopter and fixed-wing flight altitudes to a minimum of 300 m over caribou habitats in high elevation plateau zones in winter.
Camps (A) Minimize or mitigate impacts associated specific to campsite management.	(a) Refer to zone specific objectives and strategies to confirm whether camps can be located within a specific zone. (b) Minimize surface disturbances by using existing clearings/openings and hardened sites for rig, construction and seismic camps.

[3] Digital coverage delineating species habitat available from Ministry of Water, Land and Air Protection, Fort St. John, upon request http://wlapwww.gov.bc.ca:8000/dr_pub_prod/owa/drwp_homepage.display

5.2.5 Environmental Values

Objectives: Environmental Values	Strategies: Environmental Values
Wildlife (A) Minimize impacts to wildlife and wildlife habitat through avoidance and mitigation measures during all phases of oil and gas development.	(a) Establish specifications for garbage, food handling and disposal to prevent wildlife attraction. (b) Create or maintain sight barriers, noise barriers and hiding cover between development and critical ungulate winter range, rearing and birthing areas for Stone's sheep, mountain goat and caribou and other critical **wildlife habitat feature**s (e.g., nest sites, dens, licks, etc.). (c) Oil and gas workers are not to be accompanied by dogs, other pets and domestic livestock while accessing the plan area for industrial purposes. Horse transportation for industrial purposes is permitted. (d) Proponents will ensure that all their workers and contractors do not use firearms, hunt or fish while accessing the plan area for industrial purposes. Carrying firearms for safety purposes is permitted. (e) Implement measures to avoid bear/human conflicts and minimize risk of bear/human encounters. (f) Minimize the need for relocating or destroying bears due to human encounters through a bear emergency plan and a bear reporting and monitoring plan. (g) Train oil and gas workers on responsible behaviour near grizzly and black bears. (h) Restrict human access and travel to construction zones, right of ways and workplaces to prevent human disturbance to wildlife and ecosystem impacts on sensitive areas adjacent to projects.
Non-Indigenous Plants (A) Prevent the introduction of invasive **non-indigenous** plants from oil and gas activities into the plan area.	(a) Proponents are to conduct inventory, control and monitoring of all regionally significant noxious weeds and invasive non-indigenous plant species during and after exploration and production activities in their operating area. (b) Proponents to submit a noxious weed and invasive non-indigenous plant prevention plan as part of the application process. (c) Avoid the spread of noxious weeds and invasive non-indigenous plant materials at all times by keeping all equipment and vehicles used in oil and gas activities clean (e.g., steam clean vehicles/construction equipment/tracked equipment/etc. prior to entering the plan area.)

Objectives: Environmental Values	Strategies: Environmental Values
Air	
(A) Help maintain air quality in the BPPTP area.	(a) Use innovative or best management practices to reduce impacts from all aspects of industrial emissions (e.g., well flaring, vehicle and equipment dust and exhaust, fugitive emissions)
Fisheries	
(A) Minimize impacts to fish and fish habitat through avoidance and mitigation measures during all phases of oil and gas development.	(a) Conduct fish / habitat surveys to determine if sensitive species habitat or individuals are present in streams potentially impacted by development activities. (b) Use identified **least-risk work window**s to conduct work in and about a stream to reduce risk to fish: ▧ Spring spawners (e.g., Arctic Grayling, Rainbow Trout) - July 15 - March 31 ▧ Fall spawners (e.g., Bull Trout, Mountain Whitefish) – June 15 - August 15 ▧ Both spring and fall spawners - July 15 - August 15 ▧ Work outside these windows only when the work results in reduced overall environmental impact (c) Halt construction activities during spring runoff or during spawning periods for bull trout, mountain whitefish and arctic grayling when there is a risk of impact to these species. (d) Plan operations to minimize upstream and upslope impacts to prevent siltation, and temperature and hydrological changes. (e) Where practicable, locate lease sites, access and pipelines away from important bull trout spawning and over-wintering congregation areas, consistent with guidelines in the FPC Identified Wildlife Management Strategy. Similarly, avoid mountain whitefish and arctic grayling habitat areas. (f) Avoid fragmentation of bull trout habitats through changes to up- and downstream habitats (e.g., water temperatures and pool depths) or in-stream structures such as culverts. (g) Minimize the number of stream crossings required to access the BPPTP area. Evaluate technical options, such as directional drilling from multi-well pads, in lieu of further road development or stream crossings.

Objectives: Environmental Values	Strategies: Environmental Values
Water and Sediment Control (A) Minimize or mitigate negative effects to water quality and quantity during all phases of oil and gas activity. (B) Minimize or prevent changes to drainage patterns.	(a) Locate lease sites and access routes away from watercourses, steep slopes (>45%) and landslides to the greatest extent practicable. (b) Construct and maintain sedimentation and erosion control measures, where required. (c) Divert surface runoff in a controlled manner away from areas of surface disturbance to avoid erosion. Contain runoff and sediment produced on site. (d) Containment pits to be lined with a non-permeable liner to prevent contamination of the ground water system. (e) Use the most benign mud system compatible with the drilling situation and objectives. (f) Use innovative or best management practices to contain hazardous materials, install leak detection systems and monitor surface and groundwater quality.

Objectives: Site-Specific Features	Strategies: Site-Specific Features
For all Site Specific Features: (A) Locate and identify any identified site specific features as part of development planning, including during site specific assessments or during consultations with affected stakeholders. (B) Where a previously unidentified site specific feature is encountered during oil and gas activities, the appropriate objectives and strategies must be adhered to.	[See strategies outlined under Overview Assessment, Development Plan and Consultation, Section 5.2.1]
Campsites/airstrips associated with commercial/non-commercial recreational activities: (A) Avoid or mitigate adverse impacts to recreational campsites and airstrips.	(a) If adverse impacts will occur, locate oil and gas activities on existing campsites in the season(s) when there is no recreational use of these sites. (b) Ensure an adequate buffer width is maintained to establish site barriers or screens between recreational campsites and oil and gas activities (e.g., industrial camps, access/pipeline routes, lease sites). Width of buffer is dependent on topography and vegetative cover. (c) During periods of high recreational use of campsites (July 1 to October 15), minimize noise associated with oil and gas activities in the vicinity to the extent practicable.

Objectives: Site-Specific Features	Strategies: Site-Specific Features
Wildlife Mineral Licks and Wallows: (A) Avoid adverse impacts to wildlife mineral licks and wallows.	(a) Create or maintain site/noise barriers, hiding cover and an adequate buffer (at least 300 metres where practicable) between oil and gas activities and mineral licks, wallows and natal areas. (b) Avoid traversing animal approach corridor(s) to a wildlife feature, where practicable. (c) During use of these features (April 1 to October 31), minimize disturbance associated with oil and gas activity, particularly construction activities, in the vicinity to the extent practicable.
Wildlife Dens - Bear, Wolf, Furbearers: (A) Avoid adverse impacts to wildlife dens and develop a mitigation strategy for known den sites and denning habitats.	(a) Create or maintain site/noise barriers and hiding cover between oil and gas activities and bear dens. (b) Locate oil and gas activities away from wildlife dens. Buffer widths will vary according to wildlife species sensitivity, topography and vegetative cover. (e.g., Wolverine; 2000 meter buffer on known denning habitats from January to May). (c) During den use, minimize disturbance associated with oil and gas activity, particularly construction activities, in the vicinity of the den to the extent practicable. Timing of den use will vary by wildlife species. (e.g., Wolverine: January - May; Wolves: April 15 - July 15).
Raptor Nests: (A) Avoid adverse impacts to raptor nests.	(a) Determine the locations of existing raptor nests (determined by site specific assessments) in the operating area as part of development planning. (b) To the extent practicable, observe the following buffers around raptor nest sites: - Prevent industrial development within 100 m of nest trees. - Minimize human activity within 100 m of active nests between February and July. - Maintain all existing habitat components within 100 m of nest trees. - For Northern Goshawk, prevent industrial development within a 240 ha post-fledging area centred on known nest tree.

Objectives: Site-Specific Features	Strategies: Site-Specific Features
Human Created Trails: (A) Avoid adverse impacts to trails. **Note:** the term "human created trail" includes actively used horse/foot trails by commercial and non-commercial recreational users and historic First Nation trails.	(a) Determine the location of trails (determined by site specific assessments or consultation with user groups) in the operating area as part of development planning. (b) Create or maintain site/noise barriers and hiding cover between oil and gas activities and trails. (c) Locate oil and gas activities a minimum of 100m (horizontal distance) from a trail except where access roads are required to traverse trails or where locating further away would result in greater overall environmental impact. Buffer width may change due to topography and vegetative cover.
Bull Trout Spawning Sites (A) Avoid impacts to Bull Trout staging, spawning and over-wintering sites.	(a) Maintain stream channel integrity, surface and subsurface waterflow, substrate composition, riparian vegetation and natural water column temperature regimes. (b) No surface disturbances from oil and gas activity within 500 m of these sites (changes to this will be consistent with the FPC Identified Wildlife Management Strategy).

5.2.6 Socio-Economic and Cultural Values

Objectives: Socio-Economic and Cultural Values	Strategies: Socio-Economic and Cultural Values
Areas of Importance for First Nations (A) Avoid unlawful infringement of treaty rights. (B) Minimize impacts to traditional practices.	(a) Locate lease sites, roads and pipelines away from First Nations' areas of importance (distance may vary depending on the feature). (b) Incorporate timing of First Nations' traditional practices within the plan area into Development Plans (see Section 5.2.1).
Other Cultural Heritage Features (A) Minimize impacts to cultural heritage features, including the Bedeaux Trail and the Prophet River (designated as one of B.C.'s Heritage Rivers).	(a) Locate lease sites, roads and pipelines away from identified cultural heritage features to the extent practicable.

Objectives: Socio-Economic and Cultural Values	Strategies: Socio-Economic and Cultural Values
Visual	
(A) Maintain visual quality along travel corridors and campsites, and adjacent to Redfern-Keily Park and Northern Rocky Mountains Park.	(a) Screen lease sites and related infrastructure from recreation trails, campsites and popular areas to the extent practicable during all phases of a project unless this option results in an overall greater longer term environmental impact. (b) Minimize cutting of forests for lease development to reduce visual impacts (c) Design lease sites to mimic natural openings to the extent practicable. (d) Implement measures/options that reduce the visibility of any utilities traversing the plan area, while minimizing environmental impacts. (e) Design above ground facilities to minimize visibility (e.g., non-reflective surfaces, utilize native materials and surface colours and patterns that blend in with the immediate surroundings). (f) Minimize use and visibility of lighting on equipment to the extent practicable. (g) Shape soil and ground debris stockpiled for longer term use to blend with the natural surroundings and allow for sedimentation and erosion control. (h) Where practicable, locate development away from height of lands (such as ridgelines) unless a need is demonstrated. (i) Develop and implement a plan to remove visual evidence of operations (e.g. signs, infrastructure, ribbons, etc.) as soon as possible after use. (j) Use materials that visually blend with surroundings in construction of bridges, traffic control devices, guard rails, retaining walls and culverts, etc.
Noise	
(A) Minimize noise and its impacts from all phases of oil and gas activity on wildlife, other users and tenure holders in the plan area.	a) Use natural barriers (e.g., topography, vegetation, etc.) or innovative or best management practices to reduce the effects of noise disturbance.

Objectives: Socio-Economic and Cultural Values	Strategies: Socio-Economic and Cultural Values
Recreation and Guide Outfitting	
(A) Plan oil and gas development to minimize and mitigate impacts on recreation and guide outfitting values and users.	(a) Where practicable, create or maintain sight or noise barriers between recreation or guide outfitting use sites, campsites, trails or features and oil and gas development, unless this option results in overall long-term environmental impact. (b) Where practicable, locate lease sites, roads and pipelines away from grazing areas. Mitigate impacts in a timely manner. (c) Oil and gas operations will be sensitive to and minimize activities during desirable recreation activity periods. (d) Consult with guide outfitters and other commercial tenured users to minimize impacts to the extent practicable through timing and spatial planning.
Trapping	
(A) Plan oil and gas development to minimize impacts to trapping operations.	(a) Where practicable, locate lease sites, roads and pipeline activities away from important trapping areas from December 1 - March 31.

5.3 General Objectives and Strategies by Zone

The following sections outline management requirements for oil and gas activity that apply to specific zones wherever they occur across the plan area. These objectives and strategies outlined below reflect the particular biophysical conditions found in each of these zones.

Note: In most cases, the contents of this document and the wording of specific management objectives and strategies have been agreed to by members of the BPPTP Planning Team. However, in the following section there are several outstanding differences of opinion regarding wording and intent. Where these occur, the government Technical Team's recommended strategy is clearly marked with an asterisk (*). Strategies proposed by other Planning Team members are also included, but are shown in *italics* for information.

5.3.1 Major River Floodplain Zone (Blue)

Zone Description

A low elevation zone characterized by braided streams bordered by a multi-layered forest canopy and understory. Waterflow varies throughout the year with peak flows generally occurring late spring and early summer. Year to year, the active water channel can change location within the floodplain. The zone provides foraging, security and thermal cover for a diverse range of wildlife, including: elk, moose, bear, furbearers, raptors, and songbirds. High fisheries values exist in this zone. Both commercial and non-commercial recreation occurs in this zone. Any proposed oil and gas activity within the floodplain will likely be referred to the federal Department of Fisheries and Oceans for review.

Management Objectives

Minimize impacts to: ungulate security, thermal and foraging habitat, other noted wildlife, their habitat and fisheries values, water quality and quantity, highwater/seasonal channels, and other resource users, particularly the guide and outfitting industry and public recreation.

Oil and Gas Activity	Major River Floodplain Zone General Strategies
Access: Exploration and Development	Low impact stand avoidance road permitted. Likelihood that some blading is required due to topography, refer to section 5.2.2 (Roaded Access - General) regarding referral requirements to OGC for their consideration.
Lease Location	Not permitted.
Pipeline Development/ Access	Use deep burial pipeline technology (either conventional installation and/or directional drill) through the entire zone due to the potential stream channel movement within this zone while ensuring maintenance of water quality and fish habitat. Pipeline access is the same as Access: Exploration and Development.
Camps	Not permitted.
Reclamation	Recognize the high visibility of potential impacts in this zone. Maintain stream bank integrity. Minimize displacement of large organic debris during oil and gas activities.
Monitoring, Implementation and Reporting	Emphasize wildlife habitat sensitivity, water quality, fish habitat, other resource users, and visual quality.

5.3.2 Incised Stream Zone (Blue-Grey)

Zone Description

This zone consists of steep-sloped stream-banks with flat upland areas. Important values include riparian habitat, fish, wildlife movement corridor and water quality and quantity. A mixture of ungulate security and foraging cover primarily on the uplands with a minor component on the steep slopes. Critical moose and elk winter habitat on the upland region. Soils are generally unstable and a terrain stability assessment will be required to determine the feasibility of locating sites or routes for oil and gas activity in this zone.

Management Objectives

Minimize impacts of **ground disturbance** on: steep slopes, water quality and quantity, fish and fish habitat and, critical moose and elk winter habitat.

Oil and Gas Activity	Incised Stream Zone General Strategies
Access: Exploration and Development	Determine level of risk and impact from any development activity through a terrain stability assessment. Low impact cleared corridor road permitted.
Lease Location	Determine level of risk and impact from any development activity through a terrain stability assessment.
Pipeline Development/ Access	Minimize risk of erosion and visual disturbance by avoiding surface-cut right-of-ways to the greatest extent practicable. From a stable location (e.g. upland area), directional drilling on steep slopes may be permitted. Determine level of risk and impact from any development activity through a terrain stability assessment. Low impact cleared corridor road permitted.
Camps	Not permitted.
Monitoring, Implementation and Reporting	Emphasize water quality, fish and fish habitat and terrain stability.

5.3.3 Wetlands - Low Elevation Zone (Yellow)

Zone Description

This zone consists of wetlands, streams and both forested and meadow vegetation. It contains summer and critical winter habitat for moose, critical winter caribou habitat, high fishery values in streams found within this zone type and is important in maintaining water quality and quantity. In addition, various other wildlife species such as raptors, migratory birds, songbirds, and rodents use this zone. In several areas of the BPPTP area, this zone contains existing recreational and commercial tourism trails. Visual quality is important.

Management Objectives
Minimize impacts to: substrate and vegetation, water quality and quantity, critical ungulate winter range, fisheries values, and visual quality.

Oil and Gas Activity	Wetlands - Low Elevation Zone General Strategies
Access: Exploration and Development	Low impact stand avoidance road permitted. Site assessment may allow multi-season access, refer to section 5.2.2 (Roaded Access - Seasonality) regarding referral requirements to OGC for their consideration.
Lease Location	Locate leases on dry ground or other suitable areas identified through a site-specific assessment.
Pipeline Development/ Access	Use technologies that have the least impact on water quality, quantity and timing of flow and on vegetation complexes (e.g. directional drill or horizontal bore flowing streams, lakes, bogs and wetland complexes wherever practicable).
Camps	Locate camps on dry, stable, soil areas and where practicable use pre-existing open, hardened areas.
Reclamation	In reclamation plans recognize that recovery time frames are slower in wetland habitats.
Monitoring, Implementation and Reporting	Emphasize water values (quality, quantity and timing of flow), vegetation management, and critical ungulate habitat.

5.3.4 Mosaic Habitat Zone (Purple)

Zone Description
This zone contains a mixture of forested and open habitats interspersed with wetlands, meadows, and forested lowlands and hills. The zone provides a mixture of foraging and security cover for ungulates. It contains critical winter habitat for moose and caribou, as well the older forested stands provide habitat for furbearer species.

Management Objectives
Minimize impacts to: ungulate foraging and security habitat, critical moose and caribou winter habitat, furbearer habitat, wildlife habitat connectivity corridors and, visual quality.

Oil and Gas Activity	Mosaic Habitat Zone General Strategies
Access: Exploration and Development	Winter low impact stand avoidance permitted. Site assessment may allow multi-season access, refer to section 5.2.2 (Roaded Access - Seasonality) regarding referral requirements to OGC for their consideration.
Lease Location	Locate leases on dry ground or other suitable areas identified through a site-specific assessment. Avoid leases in forested areas unless it can be demonstrated that it will not have a significant impact to wildlife habitat.
Pipeline Development/ Access	Where practicable, directional drill/horizontal bore streams, lakes, bogs, wetland complexes and hilled terrain and use open areas to eliminate right-of-way impacts.
Camps	Permitted only in open areas with little/no new disturbance.
Reclamation	Recognize that recovery timeframes are very slow in wetlands.
Monitoring, Implementation and Reporting	Emphasize critical ungulate habitat.

5.3.5 Warm Aspect Forest Zone (Dark Green)

Zone Description

This zone consists of open forested habitat on south-west aspect slopes of gentle to moderate sloped terrain and contains area of old growth. Slopes have low snow depths and provide critical winter elk habitat. Older forested stands are important year round habitat for furbearer species, while younger willow stands provide critical winter moose habitat. Spring grizzly bear habitat is found on steeper slopes that experience early snowmelt. This zone is often the main location of existing trails used by guide outfitters and other recreationalists.

Management Objectives

Minimize impacts to: wintering elk and moose habitat, Stone's sheep habitat in adjacent steep terrain and, spring grizzly bear, furbearer habitat, visual quality and, interior forest conditions.

Oil and Gas Activity	Warm Aspect Forest Zone General Strategies
Access: Exploration and Development	*Bladed road cleared corridor permitted but minimize blading to the greatest extent practicable. Other options proposed by Planning Team members: ▧ *Low impact cleared corridor road permitted. Possibility that more than minimal blading may be required;* ▧ *Low impact cleared corridor road permitted. Possibility that more than minimal blading may be required in specific areas.*
Lease Location	Leases permitted but: a) locate on open, flat areas away from forested stands where practicable or; b) mimic natural openings and minimize impact to interior forest conditions.
Camps	Camps permitted but: a) locate on open, flat areas away from forested stands where practicable or; b) mimic natural openings and minimize impact to interior forest conditions.
Reclamation	Outline options to mitigate adverse long-term impacts to critical winter elk and adjacent Stone's sheep habitat.
Monitoring, Implementation and Reporting	Emphasize elk and/or Stone's sheep behavior and movement.

5.3.6 Cool Aspect Forest Zone (Light Green)

Zone Description

This zone consists of wet and cool forests that occur on gentle to moderately sloped terrain. Older forested stands contain critical winter caribou habitat and important year round habitat for furbearer species, while shrub areas provide critical moose habitat. Pockets of permafrost are found on north slopes in this habitat type. Visual values are important and this zone is a wildlife movement corridor.

Management Objectives

Minimize impacts on: habitat fragmentation particularly critical caribou and moose habitat, terrain stability due to presence of permafrost in the zone, visual impacts and interior forest conditions.

Oil and Gas Activity	Cool Aspect Forest Zone General Strategies
Access: Exploration and Development	*Bladed road cleared corridor permitted but minimize blading to the greatest extent practicable. Other options proposed by Planning Team Members: - *Low impact cleared corridor road permitted. Possibility that more than minimal blading may be required;* - *Low impact cleared corridor road permitted. Possibility that more than minimal blading may be required in specific areas.*
Lease Location	Leases permitted but: a) locate on open, flat areas away from forested stands where practicable or; b) mimic natural openings and minimize impact to interior forest conditions.
Camps	Camps permitted but: a) locate on open, flat areas away from forested stands where practicable or; b) mimic natural openings and minimize impact to interior forest conditions.
Monitoring, Implementation and Reporting	Emphasize terrain stability and permafrost as well as potential impacts to critical caribou and moose habitat.

5.3.7 Steep Slope Cool Aspect Zone (Light Brown)

Zone Description

This zone consists of open and forested habitat on steep, northeast facing slopes and pockets of permafrost are found on north slopes. The terrain generally precludes leases in this zone. A variety of terrain features and habitat types are found in this zone including: alpine meadows, old growth forests, parkland, young forests, cliffs, rock outcrops and talus slopes. This zone is primarily mountainous terrain, highly visible throughout the plan area and, critical winter Stone's sheep habitat borders a large portion of this zone. Steep slopes offer security habitat for caribou, elk and moose. This zone is important as a wildlife movement corridor and for Grizzly bear denning habitat. Higher zone elevations have lower biological productivity.

Management Objectives

Minimize impacts to: Stone's sheep population behavior and critical winter habitat within this zone and the adjacent pink zone, wildlife habitat fragmentation, terrain stability, ungulate security cover, bear denning and furbearer habitat, and visual quality.

Oil and Gas Activity	Steep Slope Cool Aspect Zone General Strategies
Access: Exploration and Development	Minimal impact access permitted with no blading. A site specific assessment may allow short sections of bladed access to small benches.
Lease Location	Not permitted unless the risk and level of impact can be shown to be acceptable through a site specific assessment.
Pipeline Development/ Access	Minimize visual quality impacts and wildlife habitat disturbance. Avoid surface cut right-of-ways using natural openings and where practicable, directional drill pipeline.
Camps	Not permitted.
Reclamation	Recognize the high visibility of impacts and the long duration of vegetation regeneration. Give a priority to reclamation of disturbances that adversely impact critical Stone's sheep and mountain goat habitats.
Monitoring, Implementation and Reporting	Emphasize wildlife sensitivity to oil and gas activities, particularly Stone's sheep.

5.3.8 Steep Slope Warm Aspect Zone (Pink)

Zone Description

This zone consists of open and forested habitat on steep, southwest facing slopes. A variety of terrain features and habitat types are found in this zone including: alpine meadows, old growth forested stands, parkland, young forests, cliffs, rock outcrops and talus slopes. Steeper slopes are primarily open and provide critical winter Stone's sheep habitat and important year round habitat for mountain goat. This zone also provides elk and moose winter habitat and, birthing and rearing areas for Stone's sheep, mountain goat and caribou. Due to year round big game populations in this zone, it is the focus of the guide and outfitting industry. The high visibility of steep slopes provides high visual values for this zone.

Management Objectives

Minimize impacts to: wintering Stone's sheep and critical winter habitat, birthing and rearing areas of Stone's sheep, mountain goat and caribou, moose and elk winter habitat, wildlife connectivity corridors, and visual quality.

Oil and Gas Activity	Steep Slope Warm Aspect Zone General Strategies
Access: Exploration and Development	No surface disturbance
Lease Location	No surface disturbance. If practicable, directional drill from an adjacent zone and avoid adverse impact to wildlife behavior and habitat, particularly Stone's sheep.
Pipeline Development/ Access	No surface disturbance. If practicable, directional drill from an adjacent zone and avoid adverse impact to wildlife behavior and habitat, particularly Stone's sheep.
Camps	Not permitted.
Reclamation	As there is no surface disturbance permitted in this zone, reclamation activities are not required. However if surface disturbance does occur (e.g., emergency activities, technical problems encountered during directional drilling operations), reclaim as soon as practicable.
Monitoring, Implementation and Reporting	Emphasize wildlife sensitivity to oil and gas activities particularly Stone's sheep and mountain goat population behavior and habitats.

5.3.9 High Elevation Plateau Zone (Dark Brown)

Zone Description

This zone consists of high elevation plateaus surrounded by steep open and treed terrain. The plateaus are primarily open and consist of vegetation types that are particularly sensitive to disturbance due low biological productivity, shallow soils, and low soil moisture and nutrient conditions. These areas provide critical winter caribou habitat especially during years of high snowfall. These zones are highly visible and forested terrain is found on some of the higher plateaus.

Management Objectives

Minimize impacts to: critical winter caribou habitat and wintering caribou, visual quality, sensitive/uncommon habitats and where applicable identified ungulate values in the adjacent steep slope warm aspect zone. Due to slow vegetation recovery time frames, surface disturbance must be minimized.

Oil and Gas Activity	High Elevation Plateau Zone General Strategies
Access: Exploration and Development	Minimal impact access permitted. Site specific assessment may allow very short sections of bladed access
Lease Location	*Based on a site specific assessment, limit blading and vegetation removal to the greatest extent practicable. Other options proposed by Planning Team members: ▧ ***Low impact lease** permitted;* ▧ Low impact lease permitted. Site specific assessment may allow limited blading.
Pipeline Development/ Access	Use open areas to minimize right-of-way impacts. Minimize surface disturbance (e.g., above ground and/or directional drill). Accommodate wildlife movement (e.g., burial at key locations).
Camps	Not permitted.
Reclamation	Recognize the high visibility of impacts and the long duration of vegetation regeneration.
Monitoring, Implementation and Reporting	Monitor caribou behavior during exploratory and production phases.

6. MANAGEMENT DIRECTION BY PLANNING UNIT

The following section describes management direction by PU and where required, management objectives and strategies by zone for each PU.

Additionally, in the fall of 2001, a preliminary non-field access assessment entitled *Geotechnical Assessment of Access Constraints* was completed for the whole BPPTP area (Appendix F). Due to topographical features, namely steep slopes adjacent to watercourses, specific areas were identified ("choke points") that may require extensive site modification to allow surface access. To assist proponents identify Phase I access opportunities, this choke point information is noted.

Note: In most cases, the contents of this document and the wording of specific management objectives and strategies have been agreed to by members of the Besa-Prophet Pre-tenure Planning Team. However, in the following section there are several outstanding differences of opinion regarding wording and intent. Where these occur, the government Technical Team's recommended strategy is clearly marked with an asterisk (*). Strategies proposed by other Planning Team members are also included, but are shown in *italics* for information.

6.1 Nevis Planning Unit

6.1.1 Management Intent

The Nevis PU is located in southern most area of the BPPTP area (see Figure 5). This PU is characterized by the Redfern Trail, a designated recreation trail as per Section 6(1) of the *Forest Practices Code of British Columbia Act* and the only designated motorized route under the Muskwa-Kechika Access Management Area in the BPPTP area. The trail traverses the length of this PU and parallels the main drainage system; Nevis Creek in the west and Buckinghorse River in the east. Due to the trail, this PU has the highest non-commercial recreational use in the BPPTP area and the trail can seasonally accommodate horse, **ATV**'s and snow mobiles. Commercial activities are permitted on the trail provided the recreation resource is maintained and the public has trail access in all seasons throughout the PU.

The main valley bottom is characterized by the Wetland Low Elevation Zone. The zone is wider in the western portion of the PU providing larger areas of open and non-forested habitat. Environmental sensitivity in the western portion of this zone is higher than the east because of the greater distance to escape and thermal cover.

Guide outfitting is an important commercial enterprise in this PU, and permanent camp facilities and campsites associated with this activity are located in this PU. This PU has the highest use by non-commercial recreation in the BPPTP area, particularly on or in close proximity to the Redfern Trail. The maintenance of wildlife values and visual quality is critical and visual impact assessments will be required for a number of sites in the Nevis corridor.

Zone	Oil and Gas Activity	Objective	Strategy	Notes
Incised Stream	Access: Exp & Dev			Choke Point #7: portion of Nevis Creek drainage steep and potentially unstable.
Wetland - Low Elev.	Access: Exp & Dev	Minimize impact to Redfern Trail. Ensure public is aware of industrial use of the route during periods of oil and gas activity.	Permitted to use existing motorized route and upgrade to a low impact stand avoidance road. Where required, permitted to deviate from existing route location. Secondary access permitted but use existing openings and use low impact stand avoidance roads.	
Warm Aspect Forest Cool Aspect Forest	Access: Exp & Dev	Minimize impact to Redfern Trail. Ensure public is aware of industrial use of the route during periods of oil and gas activity.	*Permitted to use existing motorized route and upgrade to a bladed road cleared corridor but minimize blading to the greatest extent practicable. Other Options proposed by Planning Team members: *Permitted to use existing motorized route and upgrade to a low impact cleared corridor. Possibility that blading may be required;* *Permitted to use existing motorized route and upgrade to a low impact cleared corridor. Possibility that blading may be required in specific areas.*	

6.2 PocketKnife Planning Unit

6.2.1 Management Intent

The Pocketknife PU is located in southeast portion of the BPPTP area (see Figure 6). The main watercourse is Pocketknife Creek, which originates at the western PU boundary and flows eastward. Similar to the Nevis PU, backcountry recreation, including guide outfitting enterprises, is an important activity. The maintenance of wildlife values and visual quality is critical and visual impact assessments will be required for a number of sites in this PU.

6.3 Lower Besa Planning Unit

6.3.1 Management Intent

The Lower Besa PU is located in the eastern area of the BPPTP area, and includes a portion of the Besa River and Granger Creek drainages (see Figure 7). A guide outfitter camp is located in both the Warm Aspect and Cool Aspect Zones.

Maintain interior forest conditions and visual quality in the forests in close proximity to the lower reaches of the Besa River. The Granger Creek corridor has significant habitat for moose, elk and caribou and, visual quality is also significant. To protect these values, surface access preference is within the Besa River floodplain and minimize road length through the Warm Aspect Zone by orientating well site access perpendicular to the Besa River floodplain.

Zones	Oil and Gas Activity	Strategy	Notes
Major River Floodplain Warm Aspect Forest	Access: Exp & Dev	If a higher level of impact is required to achieve surface access past this choke point, a site specific assessment must provide methods to minimize environmental impact to the greatest extent practicable.	Choke Point #6: at the confluence of Besa River and Granger Creek there are steep slope(s) that are potentially unstable.

6.4 Lower Prophet Planning Unit

6.4.1 Management Intent

The Lower Prophet PU is located in northeast corner of the BPPTP area, and includes a portion of the Prophet River drainage (see Figure 8). Preference for major access corridors is within the Floodplain Zone. The 5km Floodplain Zone portion upstream of the intersection of the Prophet River and the eastern PU boundary is constricted in several places by steep slopes including the Steep Slope Cool Aspect Zone. North of Klingzut Mountain, the Steep Slope Cool Aspect Zone is important goat and sheep habitat and visual quality should be maintained.

Zones	Strategy	Notes
Major River Floodplain		This zone may extend further upstream than currently mapped.
Major River Floodplain Cool Aspect Forest Steep Slope Cool Aspect	A site specific assessment should identify the lowest environmental impact to achieve access through these locations.	Choke Point #13: In the lower section of the Prophet River, the Major Floodplain Zone is constricted at several locations.

Figure 5: Nevis Planning Unit

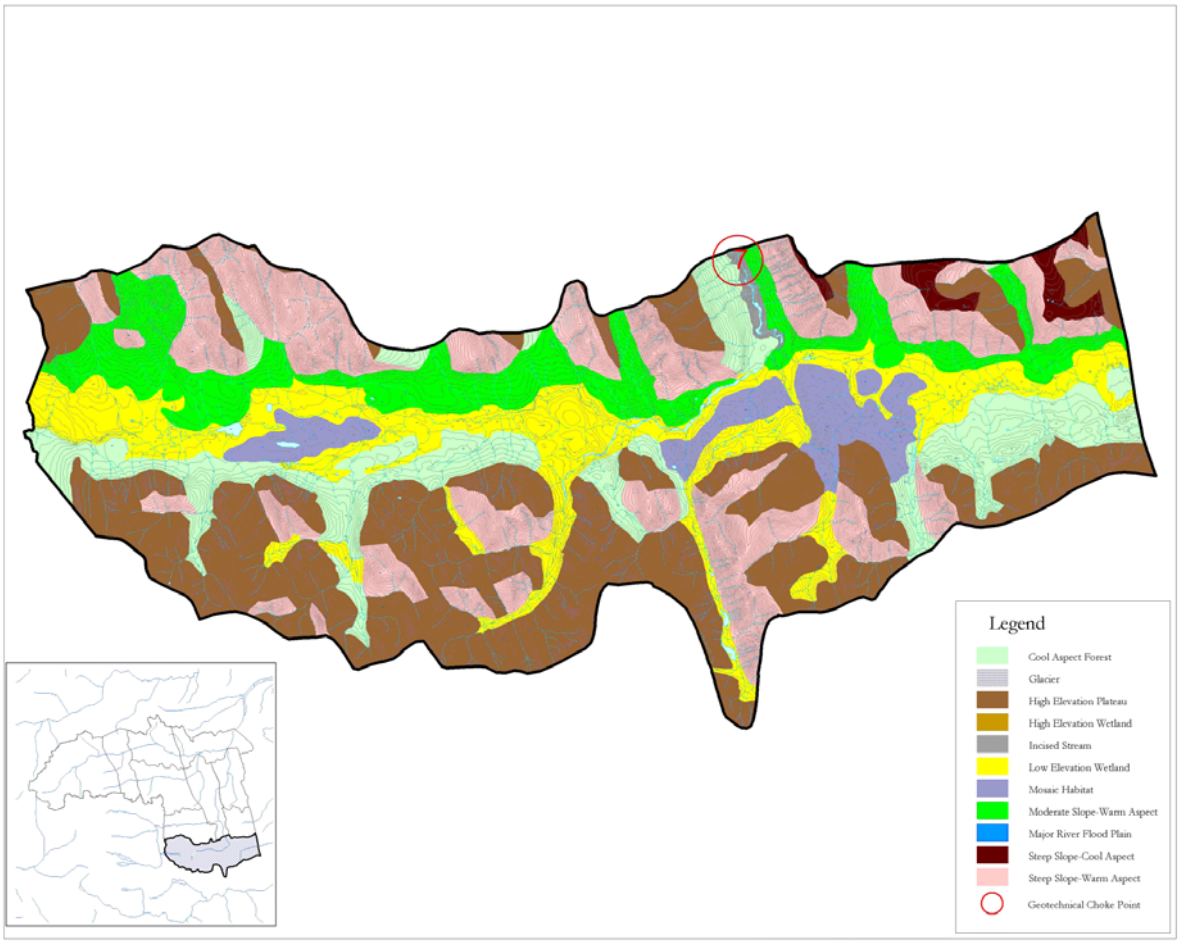


Figure 6: Pocketknife Planning Unit

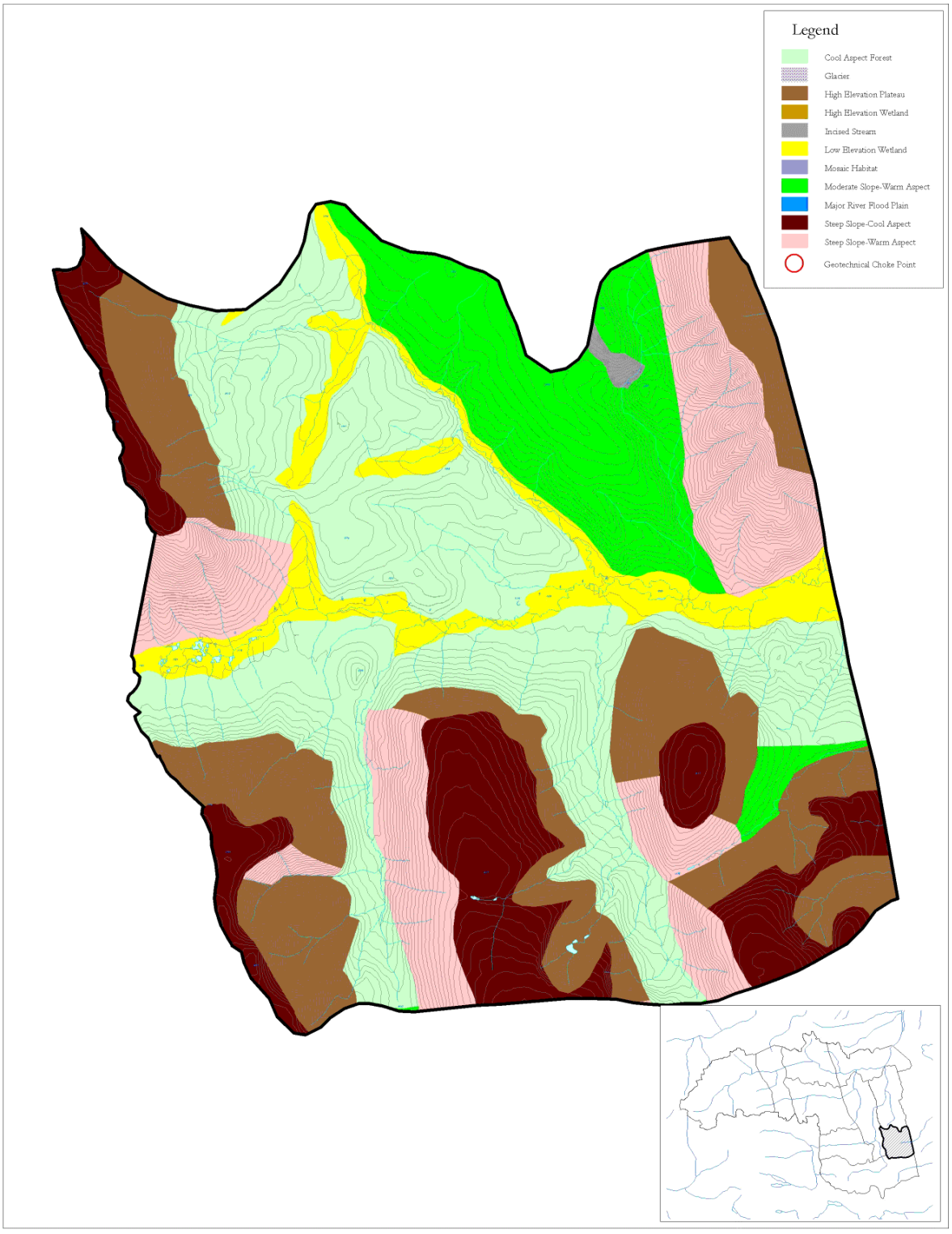


Figure 7: Lower Besa Planning Unit

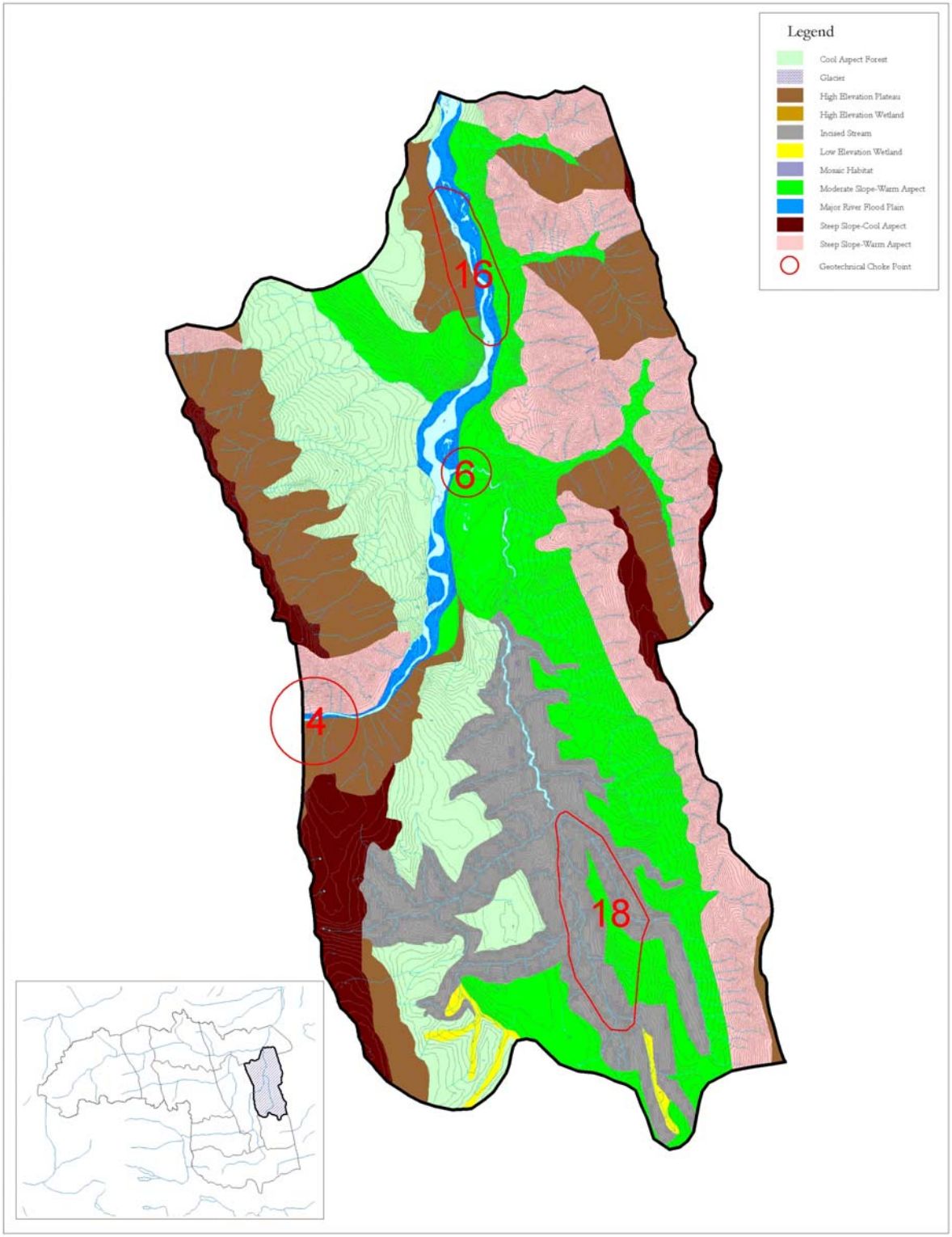
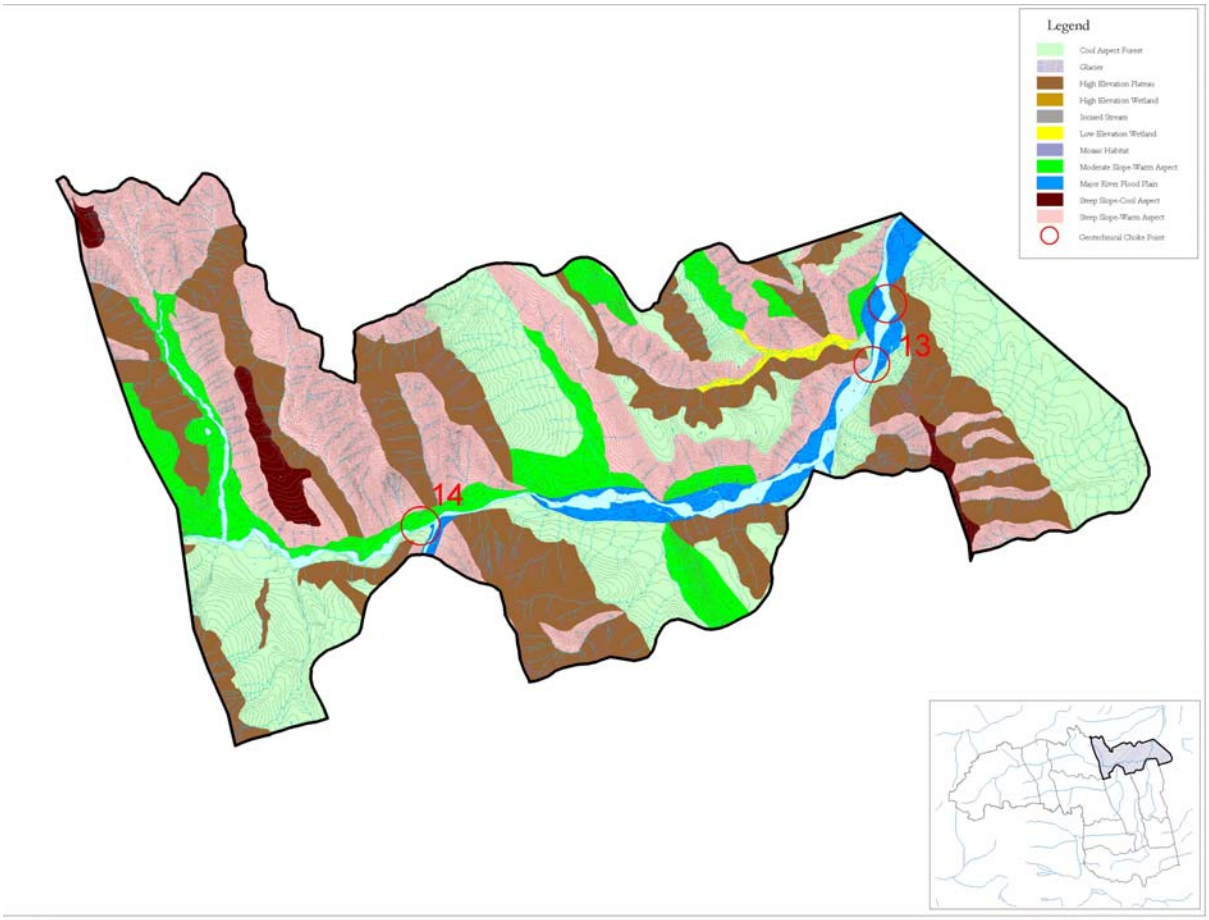


Figure 8: Lower Prophet Planning Unit



7. PLAN IMPLEMENTATION

The "Phase I and II" approach to pre-tenure planning in the BPPTP area is supported by the Planning Team as a way of effectively implementing the intent of the *Muskwa-Kechika Management Area Act*.

The following PU's are included in Phase I and will be available for tenure posting soon after approval date of this plan: Nevis, Pocketknife, Lower Besa, and Lower Prophet.

These planning units were selected as they:

- are in the more accessible eastern and southern portions of the BPPTP area and where exploratory work is anticipated to be more likely;
- will not compromise ongoing field research in the western portion of the BPPTP area; and,
- provide more time to incorporate input from several on-going non-field research projects including a Conservation Area Design (CAD) and a Cumulative Effect Assessment Management Framework (CEAM).

For Planning Team stakeholders, the remaining six PU's in Phase II present significantly greater access development concerns including a number of unresolved issues that would eventually benefit from the above noted items. Work to complete Phase II of the plan is underway and it is anticipated that it will be finalized along with a number of other pre-tenure plans in the spring of 2003. At that time a single plan that contains management direction for the entire BPPTP area will be issued.

Plan amendments introduced in Phase II will not apply to oil and gas tenures issued under Phase I of the plan. Therefore, oil and gas tenures issued under Phase I will be subject only to the management direction contained in Phase I of the plan.

Statement from BPPTP Planning Team regarding Phase II Planning Process:

It is the shared understanding of the Planning Team that objectives and strategies for the Phase II plan document will be developed under the following conditions:

- To avoid revisiting contentious issues unnecessarily, it is suggested that the objectives and strategies contained in the General Management Direction (GMD) within the Phase I plan will form the foundation for GMD in the Phase II plan unless:
  - information from relevant studies (e.g., MK Trust Fund projects: CAD, heli-portable feasibility study, CEAM framework, University of Northern BC ecosystem research studies or other credible sources) suggests that the zonation or the objectives and strategies need to be revised; and/or;
  - experience from the implementation of adaptive management at the project level under the Phase I plan suggests that alternative approaches should be encouraged that are currently precluded by Phase I objectives and strategies.
- Where agreement has already been reached on the management intent reflected in draft material for zone-specific objectives and strategies for planning units not included in Phase I, this material will form the basis of discussions for the development of zone-specific objectives and strategies applicable to these planning units in Phase II.

8. MONITORING

The framework for monitoring local strategic land use plans in the M-KMA is currently under development. Furthermore, the proposed approach to monitoring the BPPTP is expected to evolve, based on experience, advice and recommendations from various government agencies and stakeholders. Monitoring of the BPPTP is to provide an assessment of progress towards implementing the plan as well as an assessment of the effectiveness of the plan's management objectives and strategies in achieving the intent of the *Muskwa-Kechika Management Area Act.*

Industrial proponents are required to provide monitoring reports on each phase of oil and gas activities to the OGC to enable verification of compliance with the BPPTP (as identified in Section 5.2.1). The MSRM will work with the OGC to compile these reports into an overall summary on the implementation of the plan.

The MSRM will coordinate monitoring of plan implementation and report the results to the Muskwa-Kechika Advisory Board or to annual Fort St. John and Fort Nelson LRMP Implementation meetings. This reporting cycle will require close liaison with the OGC to determine what oil and gas activities are proposed, underway or completed in the BPPTP area.

A framework for monitoring the BPPTP 'effectiveness' will be developed in conjunction with the overall monitoring framework for the M-KMA. It is expected the effectiveness of the BPPTP will be measured by assessing performance indicators for a set of results anticipated by the plan objectives. The indicators will aid in determining whether the plan implementation has resulted in positive, negative or neutral effect on the M-KMA values.

9. VARIANCE

The BPPTP has been prepared and approved in light of the best available information, expert opinion and accepted practices of the day. Over the course of implementing the plan, situations may arise that have not been foreseen or fully addressed within the plan. A range of possible oil and gas development projects may be proposed, each with it's own array of impacts, costs and benefits. In time, new information or new practices may become relevant for a particular project. An important issue for public confidence in implementing the plan is that there will be an overall superior environmental outcome achieved if a variance to the plan is granted. As such, it is necessary to define a framework for allowing a variance from specific conditions of the plan for those exceptional circumstances where it is needed.

Variances to the plan are expected to be exceptional, rather than common, events. A variance allows a project in a defined area to proceed under specified terms and conditions that are different from the approved requirements of the plan. Variances are specific to an individual project, both in space and time. A variance provides relief from specific elements of the BPPTP that would otherwise prevent a project from proceeding. Therefore, variances do not result in a permanent change to the approved plan; any permanent changes to a plan are created through the plan amendment process described in Section 10.

The Ministry of Sustainable Resource Management (MSRM) is responsible for assessing and deciding on applications for a variance to the BPPTP. The following principles and process will guide a decision on whether to allow a variance.

Plan Variance Principles:

1. MSRM has the responsibility for delivering and approving the BPPTP as a local strategic plan under the *Muskwa-Kechika Management Area Act (*the *Act)*. MSRM is also responsible for approving variances to the plan.

2. The mandate of the Oil and Gas Commission focuses on regulation of oil and gas operational activities within government's policy framework. The OGC is not a decision-maker for granting a variance to a pre-tenure plan.

3. A proponent may request any variance to the BPPTP through the OGC to MSRM for consideration.

4. A variance leaves the BPPTP unchanged in all other respects; each variance proposal will be judged on it's own merits.

5. Each proposal will be considered in the context of the relevant LRMP, the *Act* and other local strategic plans.

6. First Nation, stakeholder and public consultation will be a key component of reviewing a proposed plan variance.

7. A variance will be considered for approval by MSRM if the proponent(s) demonstrate that the proposal:

7.1 fully considers for the environmental, social and economic values of the affected area and the management objectives and strategies, spirit, and intent of all applicable plans and legislation, other than the BPPTP;

7.2 has clearly superior environmental outcomes overall compared to the best project alternative that accesses the same petroleum reservoir and has the best environmental, social and economic outcome. Both the variance proposal and the best project alternative must be deemed viable by the OGC based on environmental, social and economic criteria.

8. The proponent will provide appropriate information for all activities affected by the variance. In determining whether to grant a variance, MSRM will, in consultation with other government agencies (including the Peace Managers Committee and potentially including the federal Department of Fisheries and Oceans), assess the impact of all wells/developments in the area of the plan requiring the variance that the proponent may reasonably be expected to propose. For example, more than one well may be proposed or pipelines and production facilities may be required if a well is successful.

9. Proponents will develop variance proposals at their own cost. This includes creating and/or assembling the ecological information needed to show the clear environmental advantage of their proposal.

10. MSRM will advise the proponent and the OGC of variance decisions in a rationale statement (see Figure 9: Variance Process for timelines); other affected government agencies, the M-K Advisory Board and affected First Nations and stakeholders will also be notified.

Plan Variance Process:

1. The application for a variance, complete with technical information from the company supporting the variance, will be forwarded as part of a project proposal to the OGC; the OGC will then forward the variance with any supporting material and comments to the Regional Director of MSRM for review. The application will include an analysis of how the proposal:

1.1 has clearly superior overall environmental outcomes compared to the best project alternative, consistent with the Variance Principles (above).

1.2 addresses the results of the proponents public consultation program.

2. Following this initial OGC/MSRM assessment (up to 20 calendar days), if the Regional Director feels that the variance application should proceed, the proponent will carry out a consultation process with all affected government (including Peace Managers Committee) and non-government parties on the variance and will advertise the application for variance in the local newspapers. The advertising period will be for 30 calendar days.

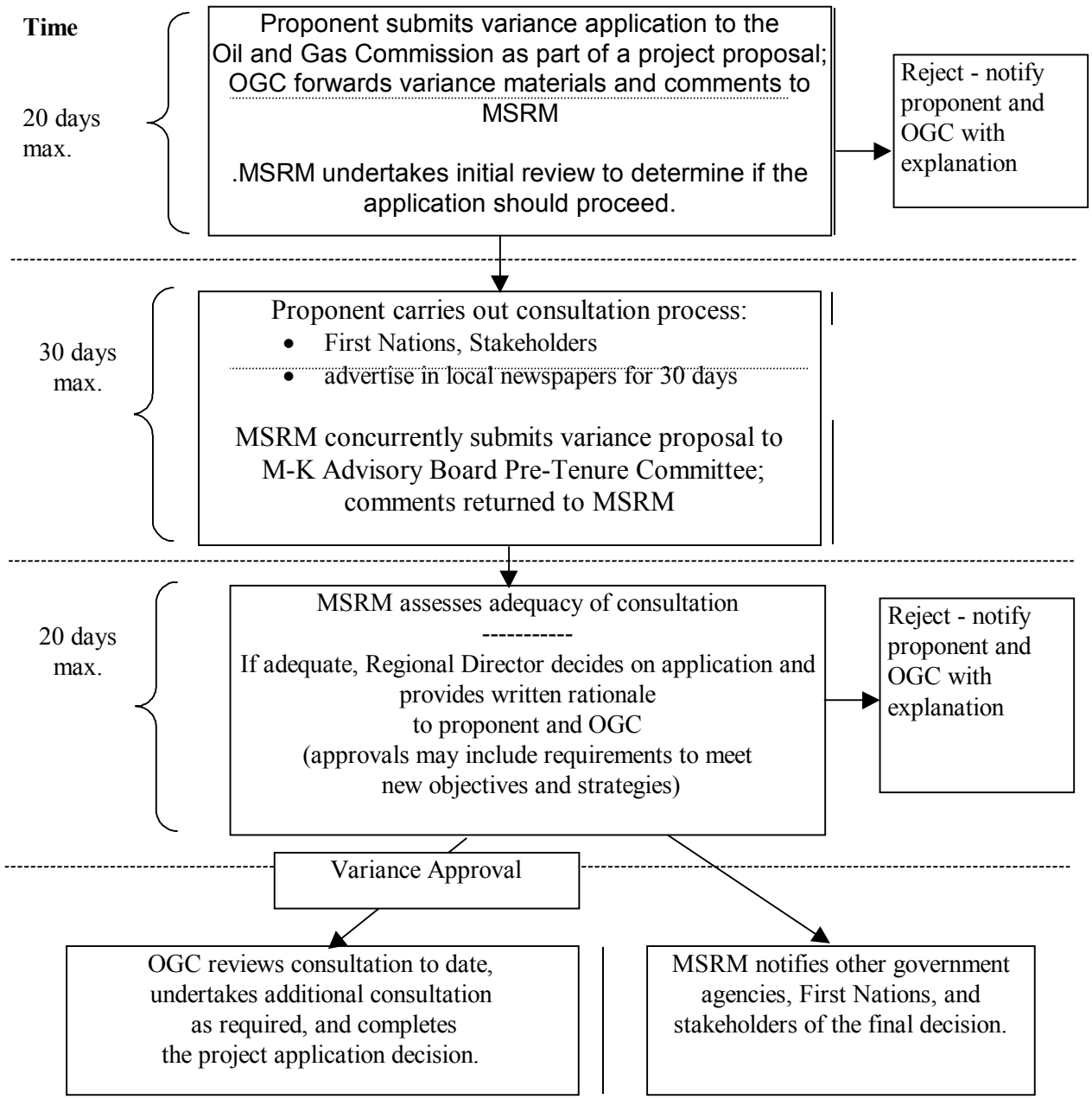
3. MSRM will submit the variance proposal to the MK Board or a sub committee of the Board to consider and provide advice back to MSRM in a timely manner (concurrent with the 30 day advertising period).

4 . After being satisfied that adequate consultation and advertising has taken place, the Regional Director will consider the application and make a decision within 20 calendar days.

5. The Regional Director will notify the proponent and the OGC of the decision on the application for variance and provide a written rationale for that decision. Specific requirements for management objectives and strategies to be achieved by an approved variance may be attached. MSRM will notify other government agencies, affected First Nations and stakeholders of their decision.

6. If the Regional Director recommends that the variance be approved, the OGC will review the consultation undertaken and if the consultation is found to meet their needs, the OGC will proceed with the request for approval of the project. If OGC finds that adequate consultation was not undertaken, the OGC will complete the consultation before a final decision on the application for the project is considered. The OGC will ensure any management objectives and strategies required by the approved plan variance are addressed in a project review and approval.

Figure 9: Variance Process for the Besa-Prophet Pre-Tenure Plan



Note: all time frames are in calendar days.

10. AMENDMENTS

It is expected that the overall intent of the BPPTP will remain consistent with the intent of the *Muskwa-Kechika Management Area Act* over time. However changes in technology, improvements in information or other variables may lead to consideration of different approaches for achieving the desired results identified in the plan. As such the BPPTP will be open to future amendments at the discretion of the Regional Director of MSRM.

Ongoing monitoring will identify issues pertaining to implementation of the BPPTP and to the effectiveness of the plan in meeting the *Act*. Where the monitoring results demonstrate a need to change the plan, MSRM will undertake a process to make such changes. Additionally, MSRM will be open to receiving proposals for a plan amendment from other parties or from other planning processes.

It is anticipated that recommendations for plan amendments will largely be identified through the regular monitoring process. Plan amendments are generally significant because the plan must be considered a complex inter-connected set of conditions and changes to one part of the plan can affect other parts of the plan. As such, a systematic and rational process for amending the plan is preferred over "one-off" recommendations from individual stakeholders. Where there is general agreement from a range of stakeholders and government agencies that there is a serious problem with part of the plan, MSRM will take this as a serious indication of a need to act on an amendment process.

MSRM will assess proposals for plan amendments and in consultation with other government agencies, First Nations and/or stakeholders, may revise the proposals to achieve the desired results. The degree of consultation will be consistent with the magnitude/significance of the amendment proposed.

Pre-tenure planning in the M-KMA is expected to be completed by December of 2003. There is no set timeframe for a scheduled review of pre-tenure plans, however it is anticipated that an assessment of these plans will be undertaken as part of overall M-KMA monitoring and management framework. MSRM will lead any such review and amendment process. It will be consistent with current legislation, regulations and policies and will involve First Nation, stakeholder and public consultation.

Interpretation of the Besa-Prophet Pre-Tenure Plan

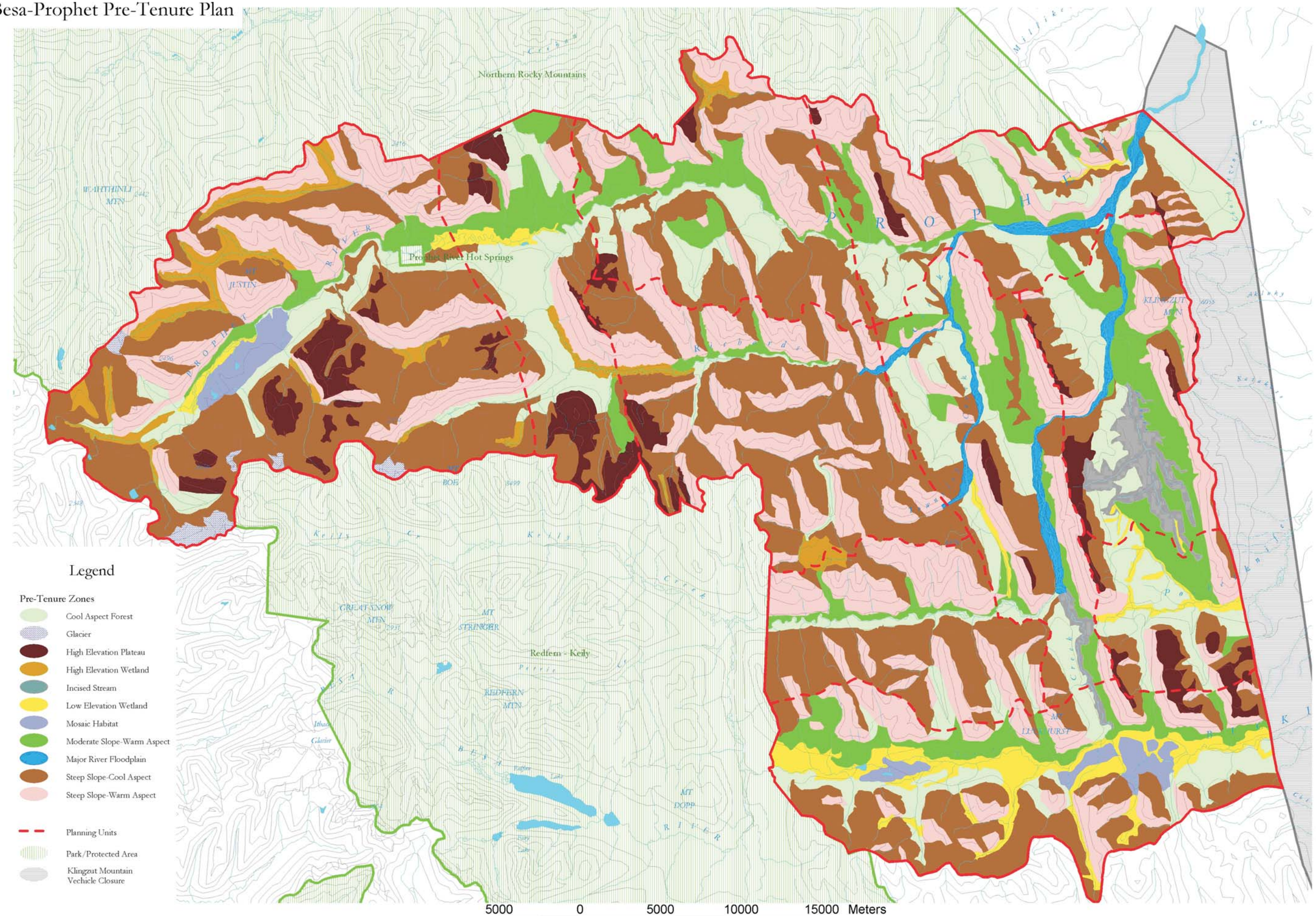
Where a concern is raised over the implementation of approved management objectives and strategies in the BPPTP, the concern is to be addressed directly to the affected agency(s). The responsible manager(s) will be expected to respond to the concern in writing. If the matter is not satisfactorily resolved, the concern is to be forwarded to the Regional Director of MSRM for resolution recommendations.

List of Acronyms

Act:	*Muskwa-Keckika Management Area Act*
BPPTP	Besa-Prophet Pre-tenure Plan
BPPTP area	Besa-Prophet Pre-tenure Plan area
CAD	Conservation Area Design
CEAM	Cumulative Effects Assessment Management
DFO	Department of Fisheries and Oceans
FPC	Forest Practices Code
LRMPs	Land and Resource Management Plans
M-KMA	Muskwa-Kechika Management Area
M-KMP	Muskwa-Kechika Management Plan
MSRM	Ministry of Sustainable Resource Management
OA	Overview Assessment
OGC	Oil and Gas Commission
PU	Planning Unit
RMZ	Resource Management Zone
ROS	Recreation Opportunity Spectrum
TEM	Terrestrial Ecosystem Mapping

APPENDIX A: ZONE MAP

Besa-Prophet Pre-Tenure Plan



Legend

Pre-Tenure Zones

- Cool Aspect Forest
- Glacier
- High Elevation Plateau
- High Elevation Wetland
- Incised Stream
- Low Elevation Wetland
- Mosaic Habitat
- Moderate Slope-Warm Aspect
- Major River Floodplain
- Steep Slope-Cool Aspect
- Steep Slope-Warm Aspect

- Planning Units
- Park/Protected Area
- Klingzut Mountain Vechicle Closure

N

5000 0 5000 10000 15000 Meters

Ministry of Sustainable Resource Management
Peace Sub-Region, Fort St. John
March 22, 2002

1:230,000

APPENDIX B: GLOSSARY

ACCESS:

Primary Access: Routes used to access major river valleys in the plan area, and possibly maintained for more than one season. Access may be used by multiple industrial users.

Secondary Access: Routes that originate off primary access routes, and possibly maintained for more than one season. Access may be used by multiple industrial users.

Minimal impact access:

- No ground disturbance visible or discernible in growing season after construction/deactivation.
- Minimal or no vegetation removal or damage visible or discernible in the growing season after construction/deactivation.

Four main road types (when crossing watercourses, use approved methods):

- Low impact, stand avoidance:
  - minimal or no blading of ground surface (refer to Section 5.2.2, Roaded Access (General Impacts), Strategy (d);
  - minimal or no vegetation removal
  - not be visible in the growing season after construction/deactivation;

- Low impact, cleared corridor:
  - minimal or no blading of ground surface (refer to Section 5.2.2, Roaded Access (General Impacts), Strategy (d);
  - vegetation removal permitted;
  - minimize corridor width;
  - right of way could be visible the season after construction/deactivation;

- Bladed Road, stand avoidance:
  - blading of ground surface, including cut and fill, permitted;
  - minimal or no vegetation removal;
  - can be used one season or year round.

- Bladed Road, cleared corridor:
  - blading of ground surface, including cut and fill, permitted;
  - vegetation removal permitted;
  - minimize corridor width;
  - can be used one season or year round.

Multi-year access: Access that is used for a season(s) repetitively.

Multi-season: More than one season, including all season.

ACCESS CONTROL MEASURES: Legislated and/or physical barriers to prevent both mechanized and non-mechanized access into a particular geographic area for various reasons including protection of wildlife and wildlife habitat; prevent resource road deterioration; retain the wilderness experience; and public safety.

ATV: All-terrain-vehicle or "ATV" means a wheeled or tracked vehicle propelled by motorized power, and capable of travel on or off a highway, including a motorcycle but not including:

(a) a snowmobile, or
(b) a motor vehicle that is licensed for highway travel under the Motor Vehicle Act.

AVOID: to keep away from or withdraw from.

BEST MANAGEMENT PRACTICES: accepted industrial methods for minimizing impacts to the environment, including wildlife populations, wildlife habitat, air, water, and vegetation, to comply with designated objectives and strategies.

COORDINATED FLIGHT PLAN: is a plan that identifies all aircraft use required for specific project (e.g., seismic program, well drilling, pipeline, etc.). This plan establishes the flight path and flight frequency with the intent of minimizing impacts on wildlife and recreational values. Flight plans are to be coordinated with all other industrial aircraft usage occurring within the same season in the Besa-Prophet Pre-tenure Plan area.

DEVELOPMENT PLANS: after completion of a successful well and/or the discovery of a designated oil or gas pool, plans for identifying the location of additional wells required to delineate the oil and gas pool, together with location of infrastructure required to produce the well(s), such as gathering or transmission pipelines, roads, batteries, conditioning equipment and processing facilities.

DIRECTIONAL DRILLING:
Oil and Gas Wells: due to surface constraints and/or subsurface geological conditions, wells are drilled vertically to a predetermined depth then are gradually curved to penetrate the reservoir at one or several different points. Direction and depth of the well bore is controlled from the surface. If required, a horizontal direction in the substrata can be achieved.

Oil and Gas Pipelines: a trenchless technology whereby a hole is bored (using specialized equipment - size and complexity dependent on diameter of bore and desired length of hole) from a surface location to the subsurface and subsequently back to the surface. Bore hole diameter and distance achieved dependent on subsurface geological conditions. Technology used in areas of environmental sensitivity (e.g., watercourses, critical wildlife habitat) and to address visual quality concerns but still allows for the installation of pipelines and/or utility conduits.

ENVIRONMENTAL MONITOR: a qualified individual who is onsite during industrial activities to ensure compliance with contractual and legislative requirements relating to environmental protection and may recommend strategies to mitigate adverse environmental impacts.

EVALUATE: to determine the significance or worth of by careful appraisal and study.

EXPLORATORY DEVELOPMENT: this phase includes both on-the-ground geophysical activities and the location and drilling of exploratory wells as defined by the *Petroleum and Natural Gas Act*, Drilling and Production Regulation. Generally, classification as an exploratory outpost well occurs when it is location at a distance which is greater than one spacing area and less than 7 kilometres from a designated oil or gas pool. Exploratory wildcat wells are those located not nearer than 7 kilometres to a designated oil or gas pool.

FOREST PRACTICES CODE: the legislation, regulations and guidebooks that govern forest practices and planning, with a focus on ensuring management of all forest values.

FOREST LAND BASE: all Crown land supporting productive forest types including areas in tree farm licence land, provincial parks, ecological reserves and federal parks. This land base supports the biodiversity elements identified for landscape unit planning.

GEOPHYSICAL ACTIVITY: is investigation of the subsurface by seismic, gravimetric, magnetic, electric and geochemical operations, and by any other method approved by the OGC, to develop a geophysical "picture" of the underground rock formations. In a seismic operation, sensitive receivers, called geophones, are placed on the ground to record sound waves reflected back from rock layers after controlled explosions or mechanical vibrations area created on the surface.

GROSS LAND BASE: the entire area with a plan boundary including areas considered to be non-forested, non-productive, non-productive forest and non-commercial forest. Includes lakes, rivers, swamps, and glaciers.

GOAL: broad statements that describe a future vision with respect to a particular subject.

GROUND DISTURBANCE: compaction and/or movement of soil, surficial materials or bedrock.

GUIDELINE: a preferred or advisable course of action. Guidelines imply a degree of flexibility, based on administrative judgment or feasibility to apply the guideline.

HORIZONTAL BORE:
Oil and Gas Wells: well makes a right angle turn to reach a larger portion of the producing formation.

Oil and Gas Pipelines: trenchless technology whereby a hole is bored from one pit excavated on one side of a stream to another pit excavated on the other side of the stream to allow the installation of a pipeline or other utility conduits. This method is usually used for short distances.

INDUSTRIAL MOTORIZED ACCESS: Right or means approach for routes identified for industrial use equipped with a motor or motor vehicle. May include the following modes of transport: two- or four-wheeled drive cars, trucks, and **All-Terrain-Vehicle**s, snowmobiles and motor driven boats and aircraft.

KNOWN INFORMATION: wildlife and fisheries habitat features that have been identified, including **Wildlife Habitat Area**s and Wildlife habitat features.

LEAST-RISK WORK WINDOW:
Aquatic: periods of time when work in and about a stream can be conducted with reduced risk to fish and when there are no known fish eggs or alevins (pre-emergent fry) present in the substrate of watercourses scheduled for work.

Terrestrial: periods of time when industrial activities on certain areas of the landbase can be conducted with reduced risk to wildlife populations. At different times of the year, identified topographic areas are vitally important to various wildlife populations and sensitive to disturbance by industrial activities (e.g., ungulate calving and rearing areas, critical winter ungulate habitat areas).

LOW IMPACT LEASE: no blading of ground surface; some vegetation removal permitted; lease site may be visible season after construction/deactivation.

MINIMIZE: to reduce to a minimum

MITIGATE: to make seem less serious or severe.

NON-INDIGENOUS: not born, growing, or originating in the locality but imported.

OBJECTIVE: a concise, measurable statement of a desirable future condition (result) for a resource or resource use that is attainable through management action.

PRACTICABLE: capable of being done, effected or put into practice with available means; feasible. Synonyms: workable, possible, viable.

PRE-TENURE PLAN: is an local strategic plan that provides guidance and direction for oil and gas exploration and development activities within a defined area to ensure that impacts to sensitive wildlife and habitat are minimized or mitigated.

PROCESSING PLANT: means a plant for the extraction from gas of hydrogen sulfide, carbon dioxide, helium ethane, natural gas liquids or other substances but does not include a production facility.

PRODUCTION FACILITY: means a battery, oil treater, pumping station, compressor station, dehydrator, gas injection station, line heater, water disposal facility, water injection station or, on designation of an authorized commission employee, any other system of vessels and equipment designed to accommodate production or disposal, or both production and disposal, of well effluent products and byproducts, but does not include a gas processing plant.

REMOTE OPERATION AND MONITORING: only possible on producing wells as they are being monitored for pressure and flow. A shut in well needs to be checked once a year or once every 3 years (depending on what method was used to shut it in). This may be done using unroaded methods.

SERAL STAGES: the stages of ecological succession of a plan community, for example, from young stage to old stage; the characteristic sequence of biotic communities that successively occupy and replace each other, altering in the process some components of the physical environment over time.

SOIL BIOENGINEERING: the use of living plants to provide engineering solutions to mitigate slope stability and erosion research.

STAND AVOIDANCE: the practice of minimizing the cutting of trees and/or other vegetation when locating an access route, pipeline right-of-way, seismic line or lease location by either altering line of sight for linear developments or adjusting the lease location to the degree possible.

STRATEGY: a means of achieving an objective.

TOPSOIL: the litter, fermented humus (LFH) layer, A and B horizons.

WILDLIFE HABITAT AREA: defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as a mapped area of land that the Deputy Minister of Environment, Lands and Parks, or a person authorized by that deputy minister, and the chief forester, have determined is necessary to meet the habitat requirements of one or more species of identified wildlife.

WILDLIFE HABITAT FEATURES: defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as a significant mineral lick or wallow, an active nest of a bald eagle, osprey or great blue heron, or any other feature agreed to by the district manager and a designated environment official.

WILDERNESS CONDITIONS*: are defined such that to a knowledgeable observer, landscapes are natural or natural appearing, and any industrial disturbance has been designed to blend into the landscape to the extent practicable; in the long term, there are no industrial facilities or other infrastructure visible; levels and patterns of access structures are similar to initial conditions; and, ecological conditions and processes are similar to initial conditions and are within the range of natural variation.

* As per note at start of Section 5.3 regarding different opinions on wording, this definition is proposed by the government Technical Team. Another option proposed is to delete the words “to the extent practicable”.

APPENDIX C: ASSESSMENTS

Overview Assessment

An environmental overview assessment is required from a proponent after the purchase of tenure and before any exploratory drilling is approved.

This assessment is intended to assist the proponent to responsibly plan a drilling and development program. The study area for the assessment will be the petroleum tenure boundary, potential access corridors from the boundary of the M-KMA, and if necessary, portions of prominent neighbouring zones (such as Steep Slope Warm Aspect or Steep Slope Cool Aspect).

The environmental overview assessment must include:

- Project description
- Methods used to gather information and key references
- Biophysical setting including descriptions and the significance of
  - climate
  - physiography and geology
  - bedrock geology (including surficial deposits, soils and earth processes)
  - hydrology (including water quality)
  - vegetation (including plant species with special conservation status)
  - aquatic ecosystems (including fish populations inventory and benthic invertebrates)
  - wildlife (including high sensitivity zones, species with special conservation status, wildlife movement corridors, mineral licks, wildlife dens, raptor nests, critical wintering and core wildlife areas and lambing and rutting areas)
- Land use including description of direction from Fort Nelson or Fort St. John LRMPs, and other activities (such as hunting, guide outfitting, fishing, commercial back country recreations, trapping, etc.)
- Information on First Nations' areas of traditional practices, heritage and cultural resources.
- Recommendations that would facilitate environmentally sensitive planning and development in the petroleum tenure area.

A development plan should be submitted to both the OGC and Ministry of Water, Land and Air Protection (WLAP) as a part of the environmental overview assessment.

Development Plan

Development plans must be submitted to the OGC at least 60 days before any required permits are to be approved. While recognizing the issues of confidentiality and competitive requirements, tenure holders or their representatives will be required to meet with OGC and WLAP staff as a committee to ensure that opportunities for cooperative and coordinated access occurs. This can involve pooling efforts and resources; use of common roads, pipeline and utility right of ways, and general infrastructure. Plans for deactivation and rehabilitation of all roads and trails at the end of each permitted phase of development must be incorporated in the development plan.

Applications for well licenses and other surface disturbances such as pipelines and facilities must be submitted as part of the development plan, as well as project scenarios and development infrastructure options.

Development plans will be amendment and resubmitted, as additional information becomes available through exploratory and testing activities.

The development plan will be based on the baseline environmental information for the area of operations from the Overview Assessment (OA). It will identify where 'Impact Assessment(s)' will be required to assess specific sensitivities of a given area. In addition, Impact Assessment(s) will proved a broader assessment of access routes and potential development and evaluate mitigation options.

Impact Assessments

The Impact Assessment will contain the level of detail required to evaluate the impacts of a proposed activity or development on a specific sensitive resource value. 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 officials from the OGC and WLAP to identify site specific issues prior to submission.

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.

A habitat impact assessment must include:

- Introduction
- Methods
  - Project consultation
- Analysis of site and access selection
  - Effective drilling radius (if applicable)
  - Well site alternatives
  - Access alternatives
- Project infrastructure
  - Construction and drilling camp
  - Remote sump
  - Borrow pit
- Baseline environmental conditions
  - Terrestrial environment including current status, habitat use and behavior of wildlife, critical wintering habitat, critical lambing, calving and rutting grounds, wetlands and riparian areas.
  - Fish and aquatic ecosystems
- Land use descriptions of management direction from approved strategic and local plans and other activities such as hunting, fishing, recreation use, trapping, etc.

- Specific resource impact assessment (such as visual impact assessment, archaeological impact assessment, or other)
- Potential for impact to resources of concern
- Coordination measures which could reduce impacts
- Plans to mitigate impacts
- Monitoring and reporting
- Reclamation plans
- Future development

The following is a description of suggested methodologies and content for resource specific assessments

Visual Impact Assessment

Site specific assessment driven by the Visual Quality Objective identified or the Visual Landscape Inventory information available regarding existing visual conditions. The purpose is to assess the impact of proposed activity or development on visual and scenic resources within and adjacent to the sire and access route locations.

The Visual Impact Assessment will provide information that can be used to refine the size, shape and position of the development site on the landscape.

The basic procedures for conducting a Visual Impact Assessment are:

- Planning and pre-field trip preparation (gather all known information, identify locations proposed site will be visible from, transfer know visual sensitivity information onto maps, along with any existing landscape alterations).
- Fieldwork - conduct assessment using means and route of travel most often used by visitor; select viewpoint(s) that provides best view of proposed operations.
- Develop Options – develop one or more design options exhibiting elements of good visual design, use appropriate method to prepare a visual simulation of each option (the simulation will demonstrate what the proposed operation will look like from the viewpoint(s).
- Assess Simulations to ensure proposed activity will achieve the desired visual quality.

More detailed information regarding Visual Impact Assessments can be found in FPC Visual Impact Assessment Guidebook Second edition January 2001.

Archaeological Impact Assessment

An Archaeological Impact Assessment will be required when the proposed development will disturb or alter the landscape and potentially endanger archaeological sites.

The archaeological assessment process is comprised of two principal components: assessment and impact management. Assessment is primarily concerned with the location and evaluation of archaeological resources, and the assessment of impacts during the initial stages of project planning. Impact management follows directly from assessment and is primarily concerned with managing unavoidable adverse impacts as well as unanticipated impacts.

The assessment may require an inventory study involving a program of in-field identification and recording of any archaeological resources within a proposed development area. The nature and scope of the study will be defined primarily by information gathered from local First Nations and known archaeological sites.

In areas where potential conflicts have been identified between archaeological resources and a proposed development an impact study will be required. These studies require an evaluation of the significant archaeological resource to be adversely affected, as well as an assessment of the nature and extent of the impacts expected. The purpose of the assessment is to provide recommendations as to the most appropriate manner in which the resource may be managed in light of the identified impacts. Management options may include: alteration of proposed development plans to avoid resource impact, or mitigative studies directed at retrieving resource values prior to impact.

Riparian Assessment

May not be required, as the topic is covered under the general and planning unit specific management direction.

Terrain Stability

To provide a careful evaluation of the landslide and erosion hazards and risks in any proposed development. Assessment procedures include:

- Detailed terrain stability maps that provide a comprehensive assessment of terrain stability hazards. These maps help to more narrowly define where terrain stability field assessments are required.
- Terrain Stability Field Assessments focus on specific areas of concern for a proposed lease or road location.

More detailed information and procedures for completing both detailed terrain stability maps and terrain stability field assessments can be found in the FPC Mapping and Assessing Terrain Stability Guidebook – 1999.

Vegetation

The Vegetation Assessment is the process for assess the quantity and quality of the various vegetation types within the Wetland and Mosaic zones.

The vegetation assessment will add information to the knowledge of the BPPTP area. Ground sampling will collect information about the specific vegetation types that make up the wetland and mosaic zones. Recommendations regarding development activity can be made based on the results of vegetation assessment.

Vegetation assessments use:

- Photo interpretation
- Ground-sample measurements.

Other

APPENDIX D: ADAPTIVE MANAGEMENT DISCUSSION PAPER

ADAPTIVE MANAGEMENT
IN THE BESA-PROPHET PRE-TENURE PLANNING AREA
(Including an Example Project)

INTRODUCTION

Issues surrounding natural resource management are ecologically, socially and economically complex. This complexity, together with limited understanding of natural systems and the unpredictable nature of many natural events and the inherent inability to undertake long term planning for "hidden" subsurface resources, contributes to uncertainty about outcomes of management decisions. Changing social values and goals further increase uncertainty and contribute to controversy. Faced with these issues, people are asking questions such as: What is the best way of meeting management objectives? Are these objectives consistent with societal goals? How can we adapt management practices and plans to accommodate changes in values and goals?

Increasingly, adaptive management is suggested as a strategy for answering these and other questions. It is an approach to management that explicitly acknowledges uncertainty about the outcomes of management policies, and deals with this uncertainty by treating management activities as opportunities for learning how to manage better.

WHAT IS ADAPTIVE MANAGEMENT?

Adaptive management is a formal process for continually improving management policies and practices by leaning from their outcomes. It is a systematic, rigorous approach to "learning by doing." It is a more efficient way of learning than haphazard, "trial-and-error" approaches. While information about what works and what doesn't can be gained through trial and error, the efficacy of this approach is limited in terms of the knowledge gained (e.g., causal relationships). In addition, because adaptive management requires documentation of objectives, assumptions, decisions, and outcomes, it increases the chances that knowledge gained through experience will be passed on to others.

With adaptive management, policies are deliberately designed to increase understanding about the effect of management activities on the systems (including both environmental or economic systems) being managed. Increased understanding about how the system responds can lead to more efficient and effective management, and can allow managers to accommodate changes in social values and goals. Learning is most rapid when management activities are designed as controlled replicated experiments that test alternative hypotheses about the response of the system to management activities. This form of adaptive management is often referred to as "active' adaptive management.

However, where powerful experiments are impossible or impractical, the "passive" form of adaptive management can be used. With passive approaches, managers assume that a single model is correct (based on existing data), implement the policy that this "best" model predicts will have the desired outcome, and then monitor and evaluate actual outcomes.

Regardless of whether active or passive approaches are used, for learning to occur, actual outcomes must be compared to objectives and to predicted outcomes. Feedback loops for using information to modify

management must be built into the plan from the outset. Outcomes that are unexpected or that differ from predictions then become opportunities to learn and improve, rather than management "failures."

Adaptive management involves:

- Explicitly recognizing that there is uncertainty about the outcome of management activities;
- Deliberately designing management policies or plans to increase understanding about the systems, and reveal the best way of meeting objectives;
- Carefully implementing the policy or plan;
- Monitoring the outcomes, considering the objectives and predictions and incorporating results into future decisions.

Adaptive management requires managers and decision-makers who are willing to "learn by doing," and who acknowledge that making mistakes is part of learning.

KEY ELEMENTS OF ADAPTIVE MANAGEMENT

Certain interlinked elements are necessary for managing adaptively. These include: defining problem boundaries, identifying key questions, generating alternative hypotheses about systems function, designing rigorous experiments and/or testing "best" alternative management approaches, monitoring, and then using the information to adjust activities and objectives (i.e., "feedback"). Defining measurable management objectives is a critical antecedent to effective adaptive management. Applying these elements with creativity and imagination is integral to dealing effectively with uncertainty and change.

BENEFITS OF ADAPTIVE MANAGEMENT

Proponents argue that we can learn to manage more effectively by designing and implementing management activities so that they: (i) can be evaluated reliably, and (ii) can improve understanding of the relationships that underlie measured responses. Key benefits mentioned in the literature include:

- Well-designed experiments allow managers to evaluate reliably the effectiveness of alternative management actions;
- Adaptive management increases understanding of how natural and economic systems function;
- Adaptive management allows managers to proceed systematically and responsibly in the face of uncertainty, gaps in understanding and disagreement;
- Management experiments may provide the only opportunity for learning about large-scale, ecosystem-level relationships;
- Adaptive management encourages more efficient and effective monitoring;
- Adaptive management helps to define the boundaries between activities that are ecologically sustainable and activities that are not; and
- Adaptive management affords an opportunity to respond to discoveries of previously unknown petroleum resources and to accommodate responsible development of those resources.

CONCLUSION

Adaptive management requires a shift in the way both institutions and individuals operate. We must be willing to acknowledge uncertainty, encourage innovation and value the learning that can come from making mistakes. Developing strategies for overcoming or minimizing these potential obstacles will be crucial to the success of adaptive management. Just as we can learn from mistakes made in managing natural systems, we must strive to learn from the mistakes we will make in implementing adaptive management.

To assist the Planning Team in seeing how Adaptive Management can be used to address uncertainty in the context of the Besa-Prophet Pre-tenure Plan (BPPTP), the following hypothetical example of the "active" approach has been developed. The example uses draft objectives, strategies and guidelines discussed by the Planning Team.

ADAPTIVE MANAGEMENT EXAMPLE

1.0 Background

The general objective or result for exploratory development in the BPPTP area is to minimize or mitigate impacts on the area's resource values. One general strategy developed to minimize surface disturbance to soils, vegetation, water quality and natural drainage patterns in the sensitive low elevation wetlands/meadows portion of the Nevis planning unit is to use "low impact, stand avoidance" winter roads for primary and secondary access to lease sites. Road construction options (guidelines) include using snow, wood chips or shale for fill material. Due to uncertainty regarding the relative effectiveness of these different materials in achieving the desired results, the following management experiment is proposed. After results of the experiment have been evaluated, the management strategy for fill material may be adjusted.

2.0 Project Outline

Problem Assessment

Problem Statement

We do not know what type of fill material should be used on "low impact, stand avoidance" winter roads for primary and secondary access roads in the exploratory development phase of oil/gas activities in the BPPTP area.

Scope

The project will take place in the low elevation wetlands/meadows portion of the Nevis planning unit during the winter use season.

Management Objective

The primary objective is to minimize or mitigate impacts on the plan area's resource values.

Management Strategy

One means of achieving the management objective is to minimize surface disturbance to soils, vegetation, water quality and natural drainage patterns in the plan area.

Management Guideline

Preferred types of fill material include snow, wood chips or shale.

Key Uncertainty

The key uncertainty is the relative effectiveness of the three different types of fill material in achieving the management objective and strategy.

Study Hypotheses

Ho: There is no difference between snow, wood chips and shale fill on study variables.

Ha: There is a difference between snow, wood chips and shale fill on study variables.

Project Design

Study Location

The study will be conducted between kms 0 to 6 along the access route to Big Rigs exploratory lease site C-51-J, 94G6 in the Nevis planning unit.

Study Variables/Indicators

Variables	**Indicators**
1. Soil compaction levels conductivity	Bulk density, aeration porosity, water
Vegetation:	
2. Species diversity	Simpson's Index
3. Intro of non-native species	Presence/type
Water:	
4. Changes in water quality	Biological oxygen demand
5. Changes in nat.drainage patterns	Amount/duration of flooding/ponding

Treatments/Management Actions

Ensure sites for controls and treatments have similar topography, soil and water characteristics and plant communities.

Control: No fill

Treatment A: Snow fill

Treatment B: Wood chip fill

Treatment C: Shale fill

Forecasted Outcomes on Study Variables

Variable 1 (soil compaction levels): Treatment C > Treatment B > Treatment A

Variable 2 (species diversity): Treatment A> Treatment B> Treatment C

Variable 3 (intro of non-native species): Treatment C> Treatment B > Treatment A

Variable 4 (changes in water quality): Treatment B>Treatment C>Treatment A

Variable 5 (changes in nat.drainage patterns): Treatment C>Treatment B> Treatment A

Experimental Design

To be determined

Monitoring Design

Pre-treatment baseline monitoring of indicators before freeze-up conditions.

Post-treatment monitoring of indicators after spring thaw.

Implementation

Qualified third-party consultant chosen through a Request For Proposal will conduct implementation of the project.

Evaluation

Appropriate statistical analysis will be used to analyze data, test hypotheses and forecasted outcomes. The BPPTP Implementation Group will review interpretations of results.

Adjustment

Project results/interpretation will be used to revise the management strategy

Logistics

Project Participants

BPPTP Implementation Group

Big Rigs (Exploratory Proponent)

Implementation consultant

Budget

Funding partners/levels to be determined.

APPENDIX E: TERMS OF REFERENCE: BESA-PROPHET PRE-TENURE PLAN

Approved: May 25th, 2001

The preamble to the Muskwa-Kechika Management Area Act states that:

> *WHEREAS the Muskwa-Kechika Management Area is an area of unique wilderness in northeastern British Columbia that is endowed with a globally significant abundance and diversity of wildlife;*
>
> *AND WHEREAS the management intent for the Muskwa-Kechika Management Area is to maintain in perpetuity the wilderness quality, and the diversity and abundance of wildlife and the ecosystems on which it depends while allowing resource development and use in parts of the Muskwa-Kechika Management Area designated for those purposes including recreation, hunting, trapping, timber harvesting, mineral exploration and mining, oil and gas exploration and development;*
>
> *AND WHEREAS the long-term maintenance of wilderness characteristics, wildlife and its habitat is critical to the social and cultural well-being of First Nations and other people in the area;*
>
> *AND WHEREAS 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 and the long-term objective is to return lands to their natural state as development activities are completed;*

1. Purpose of the Plan

The purpose of this pre-tenure plan is to ensure environmentally responsible and timely development of oil and gas resources by providing results-oriented management guidelines, and where appropriate specific prescriptions, that ensure oil and gas activities are consistent with the intent of the Muskwa-Kechika Management Area Act.

It is acknowledged that the product of the planning process is without prejudice to First Nations rights.

2. Planning Area

The Besa-Prophet Pre-Tenure Plan will be developed for an area which lies in the southwest portion of the Fort Nelson Land and Resource Management Plan (LRMP) and the Northwest portion of the Fort St. John LRMP. This area includes portions of the Rocky Mountains and the foothills, and comprises parts of the Besa and Prophet Rivers, and Nevis and Keily creek drainages.

The LRMP Resource Management Zones (RMZs) include Prophet (Fort Nelson) and the portion of the Besa-Halfway-Chowade north of the Sikanni drainage (Fort St. John). The plan area also contains portions of three landscape units. These are:

- LU 29 - Richards (Fort Nelson Forest District)
- LU 30 - Hewer (Fort Nelson Forest District)
- LU 41- Keily Creek (Fort St. John Forest District).

The plan area is approximately 203,000 hectares and is shown in Appendix 1.

The planning area is within the Muskwa-Kechika Management Area (M-KMA). The MKMA is subject to the Muskwa-Kechika Management Area Act (M-KMAA) and the Muskwa-Kechika Management Area Management Plan (M-KMP).

The general management direction for the M-KMA is as follows:

> *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, 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 access 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.*

The Besa-Prophet Pre-Tenure Plan (BPPTP) will be a local strategic plan as defined under Section 3.1 of the M-KMP, and must therefore be consistent with the MKMP.

3. Approval of the Plan

Final approval, variance or amendment for the BPPTP rests with TO BE DEFINED. The approved plan will be established as part of Schedule 6 of the Muskwa-Kechika Management Area Act.

4. Planning Framework

The BPPTP will be developed within the context of the prevailing planning framework for the M-KMA which includes but is not limited to:

- Memorandum of Understanding Respecting Operational Land Use Planning for Oil and Gas Activity in Northeast British Columbia (commonly known as the " 2005 MOU");
- Muskwa-Kechika Management Area Management Plan;
- Muskwa-Kechika Management Area Act; and,
- other MOUs developed relevant to interests in the plan area.

Pre-tenure plans are considered a local strategic plan under Section 7(2)(b) of the M-KMA Act. Local strategic plans within the M-KMA must be consistent with the MKMP and direction from LRMPs.

5. Planning Objectives

- To provide clear direction for oil and gas exploration and development in advance of awarding petroleum and natural gas tenures in the BPPTP.
- To ensure that oil and gas resource development activities in the BPPTP are managed over time in a manner that respects other important resource values including wilderness characteristics, wildlife, recreation, heritage, cultural and visual resources and in a manner that reconciles and respects other users and tenure holders.
- To consider cumulative effects and carrying capacity concerns from all activities, and incorporate management objectives for oil and gas contributions to these concerns.
- To promote adaptive management.

6. Planning Products

- Clear direction for oil and gas exploration and development.
- Definition of access constraints including, where appropriate, site-specific prescriptions.
- Identification of timing constraints for oil and gas activities.
- Ecological and biophysical descriptions with identification of sensitivities and possible mitigation options.
- Specific results-oriented operational guidelines to address both economic and ecological issues, and impacts on other users and tenure holders
- Maps depicting biophysical units and related access issues at various scales as are appropriate. These maps will be produced in digital format with control of the files by the Ministry of Sustainable Resource Management and supported by the Ministry of Water, Land and Air Protection, Fort St John and the Ministry of Energy and Mines. Appropriate controls will be put in place so as to protect the integrity and confidentiality of the master copy.
- A monitoring framework.

7. Roles and Responsibilities

7.1 Government Agencies

The Ministry of Sustainable Resource Management (MSRM) will be responsible for government agency participation in the development of the BPPTP and will lead plan development.

7.2 Technical Team

A government agency Technical Team consisting of various resource experts from MSRM, with other agency participation as required, will be responsible for all technical aspects of the planning process including:

- Drafting the BPPTP Terms of Reference for review by the Planning Team;
- Coordinating agency activities related to inventory gathering and analysis;
- Plan preparation and any planning tasks deemed necessary by the Planning Team;
- Preparing plan task schedules and identifying budget and timing issues for the PMOGC;
- Coordinating and scheduling Planning Team activities and meetings;
- Preparing planning documents and maps; and,
- Participating as members of the Planning Team.

Representatives from the Oil and Gas Commission may be invited to participate in the Technical Team in an ex-officio capacity.

7.3 Planning Team

7.3.1 Representation

Representatives of First Nations as well as interested stakeholder groups will be invited by government to participate with the government agency technical team to form the Planning Team. Participation may include but is not limited to the following sectors (see Appendix 2):

- Technical Team.
- The Canadian Association of Petroleum Producers.
- BC Wildlife Federation.
- Guide Outfitters.

- Trappers.
- Forest licencees.
- Environment and conservation groups.
- Local governments.
- Mining.
- Snowmobile Association.

Each First Nation as well as each stakeholder group may be asked to formalize their appointees and alternates to the Planning Team in writing. Any additions to the Planning Team will be by consensus agreement of team member. It is also recognized that representatives will represent their constituents and that formal decisions may require ratification.

One individual may represent a number of groups. No more than three representatives from any one sector may be present on the Planning Team.

7.3.2 Responsibilities of the Planning Team

The Planning Team will be responsible for:

- assisting in completing the Terms of Reference;
- developing and recommending a draft plan for public review
- preparing the final plan for submission to MSRM (DECISION MAKERS TO BE DETERMINED) incorporating the results of the public review as appropriate.

7.3.3 Observers

Where proprietary or sensitive information is to be discussed, portions of Planning Team meetings may be held *in camera*. With the exception of *in camera* sessions, non-Planning team members may attend Planning Team meetings as observers, under the following conditions:

- Observers will not be permitted to participate in any decisions of the Planning Team.
- Observers may be permitted to participate in discussions during the normal course of Planning Team meetings if agreed to by the full Planning Team.
- A period will be set aside at each meeting for comments or questions from observers, as needed.
- To ensure timely and efficient meetings, the Planning Team reserves the right to limit the period for comments and questions.

There will be no recording devices permitted during team meetings other than those unanimously agreed upon by the team.

8. Planning Team Decision-Making Principles

Each participant will work as part of a team.

Consensus of the Planning Team will be the basis for decision making during development of the plan.

The general guidelines around consensus are:

- i) Consensus shall mean the general agreement of all participants on a package of decisions or recommendations.
- ii) In reaching consensus, team members will follow some basic principles, namely:
  - The focus of negotiations is on interests and concerns rather than positions and demands.
  - Participants respect the concerns and goals of others and will listen carefully, ask questions, and educate themselves regarding the interests of others whether they agree with them or not.

- Participants are obliged to explain their interests and avoid stonewalling.

← iii) Consensus does not mean total concurrence on every aspect of a decision, but all participants must be willing to accept the overall package.

← iv) If a participant withholds agreement on an issue, that participant is responsible for explaining how their interests are adversely affected or how the proposed agreement fails to meet their interests. The participant withholding agreement must propose alternatives and other participants must consider how all interests may be met.

← v) It is expected that all efforts will be made to reach consensus and that this may include separate off- line meeting discussions between certain members of the committee to attempt to resolve differences of opinion before agreement is confirmed by all participants. This step will be made before the public consultation process.

← vi) Participants may need to take a proposed agreement back to their constituencies or a higher decision-making authority for on-going guidance and/or for ratification.

← vii) When consensus is reached and the agreement is ratified, it is assumed to be binding. The only exceptions to this are that all agreements are:

- "without prejudice" to First Nations rights; and,
- subject to final approval by DECISION MAKERS - TO BE DETERMINED.

← viii) If there are any unresolved issues at the end of the process, these will be clearly identified, documented, and sent to the DECISION MAKERS for their final decision.

9. Dispute Resolution

Disputes during the planning process will be addressed through the dispute resolution process as set out in Appendix 3.

10. Planning Process

10.1 Participant Funding

See Appendix 4.

10.2 Information Gathering and Analysis

Key information layers including but not limited to the following list will be documented and analyzed:

← First Nations Traditional Use, including trapline information
← Known archaeological sites.
← Wildlife and wildlife habitat including special features, winter and summer ranges, listed species, and connectivity corridors.
← Fish and fish habitat.
← Biogeoclimatic zones.
← Forest cover/vegetation cover.
← Geomorphology/topography.
← Geological potential.
← Heritage rivers.
← Location and sensitivity of values within protected areas.
← Population and habitat data for Grizzly Bears.
← Visual quality.
← Areas with special management restrictions.
← Provincial tenures.
← Recreation opportunities spectrum and features.

- Current patterns of use (e.g., timing, sensitivity).
- Range use - commercial and recreational.
- Access points (e.g. airstrips, trails).
- Other local strategic plans in the MKMA (e.g., Muskwa-Kechika Management Area Recreation Management Plan, Muskwa-Kechika Wildlife Plan).

Information will be gathered at a variety of scales referenced to NAD 83, consistent with RIC standards, as required or available, with sufficient detail to enable the planning team to identify general preferred access corridors and areas where mitigation will be required. Final products will include coloured, multi-layered maps and suggested prescriptions, etc. for consideration by the Planning Team. Appropriate mechanisms will be developed by the Technical Team to manage confidential and sensitive data.

10.3 Planning Schedule

See Appendix 5.

10.4 Draft and Final Plan Review

The Technical Team will develop a review process for both the draft and final plans for the Planning team to consider. This will include the designated officials referring the final plan and any significant or substantive changes which they may propose to the consensus plan to the Planning Team for timely comment prior to final approval by the DECISION MAKERS.

10.5 Consultation

10.5.1 First Nations Consultation

First Nations will be invited to participate in the planning process according to present protocols**.** Should any First Nation or group choose not to participate in the development of the BPPTP as a Planning Team member, the Ministry of Sustainable Resource Management will act as lead agency with respect to First Nations consultation. MSRM will ensure that First Nations are provided with appropriate information and opportunities to comment and to contribute information to the plan. MSRM will report back to the Planning Team on the results of consultation efforts on a regular basis.

10.5.2 Public Consultation

Once the draft plan document is completed, it will be made available to the M-K Advisory Board, interest groups, and stakeholders and the public for review and comment. A schedule to allow for meaningful consultation will be developed by the Planning Team (See Appendix 6).

11. Communications

All government media communications will be forwarded through MSRM.

Besa-Prophet Pre-Tenure Plan

Date: _____

Decision Maker(s) to be determined.

_____ _____

_____ _____

Appendix 1:

Besa-Prophet Pre-Tenure Plan Area

(map)

Appendix 2:

Planning Team Participants by Sector

Sector	Participant
Environmental Conservation	Wayne Sawchuck
Forest Industry	Stephen Hewitt
	Kevin Kuhn
Guide Outfitting	Paul Gillis
	Kevin Olmstead
	Brian Churchill
Halfway River First Nation	Bobbie Jackson
Ministry of Sustainable Resource Management	Graeme McLaren
	Susan Jones
	Ron Rutledge
	Graham Suther
Ministry of Forests	Mary Viszlai-Beale
Muskwa-Kechika Program Manager	Paul Mitchell-Banks
Non Commercial Hunters and Anglers	Barry Holland
Oil and Gas Commission	Bill Bayrak
	Richard Caesar
Oil and Gas Industry	CAPP - Shira Mulloy
	Margaret Ariss
	Dwayne Werle
Prophet River First Nation	Orest Curniski

Alternates:

Team members are welcome to identify alternates to take their place at the planning table if the member is unable to attend a meeting. It is the responsibility of the member to keep the alternate informed of the status of the planning process, information provided, issues discussed and any agreements, tentative or otherwise, reached to date. While efforts will be made to accommodate alternates, the planning team will not revisit discussions to bring the alternate up to speed.

If a team member and the alternate attend at the same time, for the most part only the team member will be a spokesperson.

Alternates must be identified to the Chair of the Technical Team by September 30th to have direct access to sit at the planning table. After that date, where a member is unable to attend a meeting, they should notify the Chair of the Technical Team well in advance of the meeting and an alternate may be accepted if there is agreement of Planning Team members. The Chair of the Technical Team will be responsible for contacting Team members regarding this and informing the appropriate member/alternate of the Teams position.

Alternates Identified (as of Sept.30th, 2001):

Sector	Alternate
Oil and Gas Industry	
For Margaret Ariss: Murphy Oil Company Ltd.	Ross Mackenzie

Appendix 3:

Dispute Resolution Process for the Besa-Prophet Pre-Tenure Planning Process

Background

The following material outlines procedures to be followed in the event that a dispute arises within the Besa Prophet Pre-Tenure (BPPT) planning process.

The dispute resolution process shall apply for the duration of the BPPT process only, and is intended to deal only with disputes arising among those parties with representation in the Planning Team. Disputes arising after the completion of the pre-tenure plan, or involving parties not represented on the Planning Team shall be addressed via either:

- the procedures and timeframes set out in the *Memorandum of Understanding Respecting Operational Land Use Planning for Oil and Gas Activity in Northeast British Columbia* (2005 MOU); and/or
- other approaches determined by the Minister of Sustainable Resource Management (MSRM).

Guiding Principles

As agreed by the Planning Team, the dispute resolution process shall be guided by the following principles:

- The dispute resolution process shall complement the decision-making approach set out in the BPPT planning process *Terms of Reference*.
- The dispute resolution process is voluntary.
- The process shall be streamlined and capable of securing resolution of disputes in a timely fashion.
- The process should be structured and scheduled in such a way so as to create incentives for disputants to reach agreement.
- While clear steps should be prescribed, the dispute resolution process should be flexible so that alternative or additional approaches can be attempted where appropriate.
- To ensure that the process is handled fairly, the process Facilitator should be provided with a degree of discretion to guide the dispute resolution process.

Definition of Dispute

A dispute is defined as a point of disagreement among two or more members of the Planning Team that is, in the opinion of both the Facilitator and the Chair of the Technical Team, of sufficient significance to:

- preclude reasonable and timely progress being made by the Planning Team; and/or,
- require the immediate attention of more senior government officials.

How Will Disputes Be Resolved

The Facilitator and Chair of the Technical Team shall immediately notify the disputants that a dispute requiring resolution has been identified.

The intent is that all disputes shall be resolved within 7 calendar days following the issuance of this notification, recognizing that with the unanimous consent of all parties a longer time frame may be established.

The Technical Team shall be required to prepare an initial written summary of the nature of the dispute within a two-day time frame. All Planning Team parties involved in the dispute will also be invited to prepare a written statement. These written statements shall be circulated to all disputants in a timely fashion.

One of the following approaches shall be followed:

- If in the opinion of the Facilitator and/or the Chair of the Technical Team, the issue at hand requires policy direction, an immediate request for clarification and direction shall be made to the appropriate senior levels of Government. A written response to this request is expected within the 7-day period.
- For all other issues, an initial meeting of all parties shall be convened by the Chair of the Technical Team to discuss the issue at hand and seek resolution of the areas of disagreement. This meeting may be facilitated by an independent party. Technical information or expertise may also be provided by the Technical Team to assist in the resolution of technical issues. Additional meetings may be convened as required within the specified timeframe.

Upon completion of the 7-day dispute resolution period, a written summary of the outcome of the process shall be prepared by the Chair of the Technical Team and/or Facilitator and circulated to all Planning Team participants.

Failure to Reach Agreement

In the event that the dispute resolution process fails to resolve a dispute, a written summary shall be prepared by the Chair of the Technical Team and/or the Facilitator, and submitted to the senior Government official, that includes a request for immediate direction, and that outlines:

- the nature and scope of the area(s) of disagreement;
- the various perspectives and underlying interests of the disputants; and,
- a description of the conduct of and outcomes from the dispute resolution process.

It is expected that the senior Government official shall normally respond within 7 calendar days and shall provide direction to the Planning Team regarding how to proceed. Such direction may include, for example:

- a clear direction on the issue at hand; or, direction to include a summary of the area(s) of disagreement within the BPPT plan document submitted to document by the Planning Team.

Appendix 4:

Participant Funding Guidelines for Besa-Prophet Pre-Tenure Planning Process

Participant funding will be provided for Table members in accordance with the travel expense claim instructions for non-government persons. These instructions and the forms to claim expenses will be available at each meeting for any participant who wishes to submit a claim. Travel expenses for alternates will not be covered when the primary representative is attending the meeting. No travel/meal expenses can be paid for those residing in the same city where the meeting is held.

The most economic travel arrangement should be used. If there are any out of the ordinary travel expenses anticipated, these must be approved by the Chair of the Besa Prophet Technical Team in advance.

Travel expense forms should be completed and sent with all appropriate receipts to the Chair of the Technical Team soon after the meeting.

Appendix 5:

Planning Schedule for the Besa-Prophet

Pre-Tenure Planning Process

Planning Process Tasks	Responsibility	Schedule
Project Management	PMOGC	On-going
Data requirements	Technical Team	On-going
Data collection	Data custodian	On-going
Data analysis	Technical team	On-going
Plan outline	Technical team	Completed
Bio-unit descriptions	Technical team	March 31,2001
Management strategies	Planning team	April 6-7
"	"	May 25-26
"	"	June 15-16
ì	ì	July 13-14
"	"	Sept. 6-7
"	"	Oct. 19-20
"	"	Nov. 21-22
Draft Plan	"	Dec.14-15/01
Public Review	Planning team	Jan-Feb/2002
Issue Resolution	"	March/2002
Final Draft	"	March/2002
Sign-off & approval	TO BE DECIDED	April/2002

Appendix 6:

Consultation Process for the Besa-Prophet

Pre-Tenure Planning Process

APPENDIX F: DRAFT GEOTECHNICAL ASSESSMENT OF ACCESS CONSTRAINTS IN THE BESA-PROPHET PLANNING AREA

An overview assessment was done to determine the viability of accessing the major drainages in the Besa-Prophet Pre-tenure Planning area. The assessment consisted of an airphoto review to identify potential road corridors up the various drainages and to identify any impediments to road construction.

Terrain

The Besa–Prophet study area generally encompasses rugged mountainous terrain with deeply incised valleys. From a road location and geotechnical viewpoint the area can be divided into two general terrain types. These are the valley bottom floodplains and the hillsides.

Floodplains

The rivers that drain the study area are very active. Signs of ongoing channel migration, sometimes dramatic, are evident throughout the floodplains. These include braided channels, traces of old river channels, backchannels and fluvial terraces. This is especially true in the lower reaches of most of the drainages where, in places, the river channels take up the entire floodplain. That the rivers channels move on a regular basis is also borne out by historical airphotos.

The heavy bedloads that the rivers are transporting is evidenced by the extensive gravel bar formation found in the river channels in the lower portions of the drainages.

The river channels in the upper portions of the drainages are generally more stable. In these areas wetlands are more common and fluvial fans encroach on the floodplains.

The Buckinghorse River and upper Nevis and Pocketknife creeks have fairly stable channels in the study area.

Hillsides

The dynamic nature of the rivers resulted in the significant erosion of depositional material normally found along the lowest portions of the hillsides. This has resulted in steep hillsides abutting the floodplains. In the upper portions of the drainages where the river channels are much more stable, fluvial fans are much more evident.

Signs of instability can be found on the hillsides throughout the study area. The types of instability range from debris torrents and flows to creep and slow deeprooted gravitational bedrock failures. North-facing slopes appear to be characterized by saturated lower slopes which show signs of periodic failures.

South-facing slopes are generally drier but steep and are usually broken by gullies. Signs of past and recent instability are evident on these slopes as well.

Remnant glacio-lacustrine terraces were also noted in portions of some of the drainages. Most of these are actively failing or show signs of periodic failure.

The Buckinghorse and the upper Nevis drainages and, to a lesser extent the Pocketknife drainage, are more typical U-shaped valleys with transition zones from steep hillsides to floodplains.

Road Corridor Location

From a geotechnical standpoint, it is judged that the risk of attempting to construct roads on the steep hillsides found adjacent to the floodplains in the study area is too great. Most of the saturated north-facing slopes appear to be marginally stable to unstable. It would be extremely difficult, if not impracticable, to construct stable roads on most of these slopes. The south-facing slopes are generally so steep that full bench cuts would be extensively required. This, combined with the general broken nature of the slopes and the inherent instability of the terrain would force any road location onto the floodplain at frequent intervals. That factor would negate any advantage of attempting to construct roads on these slopes. Therefore, the only practical location for road corridors is on the valley bottoms.

Locating road corridors on the valley bottoms, and particularly the floodplains, presents major challenges. Two of the main problems are the number of river crossings which would be required due to the meandering nature of the river channels and dealing with the frequent migration of the river channels.

Permanent roads and temporary winter roads are the two main options for constructing road access into the study area. It would be feasible to overcome the challenges noted above with both types of road using standard best construction techniques. Costs and the magnitude of environmental impacts would be different for each type of road.

Permanent Roads

Permanent roads could be constructed up the drainages. However, overcoming the challenges of constructing these roads would be very expensive. Long, multispan bridges would be required to accommodate the wide river channels. The number of bridges required would also be costly. Rock causeways or berms would be needed to protect roads from the migration of river channels and there would be no guarantee that sections of roads would not be destroyed during flood events unless durable and properly sized rock was used. This would result in additional construction costs.

From an environmental perspective, permanent roads would permanently remove land from the floodplain and might alter drainage patterns.

Temporary Winter Roads

Temporary winter roads would be less costly and create less environmental impact. Historical streamflow summaries show that for rivers draining and adjacent to the study area there is a dramatic reduction of streamflow during the winter months. Reductions in streamflow range from 11 to 35 fold. Therefore, problems related to high streamflow, such as washouts and migrating river channels, would be unlikely to be encountered during the winter months. Further, the low water levels would permit the installation of short span low level portable bridges. These could be placed on sill logs, the approaches could be constructed from snow or local material easily washed away by high water when the bridges are removed at the end of the season. Also, the road locations could be tailored to produce a lighter environmental footprint by utilizing the extensive gravel bars that would be exposed by the low water levels. Another environmental advantage would be that no permanent roaded access would be created.

Choke Points

For the purposes of this report, choke points are defined as those areas where the terrain presented physical, stability or environmental concerns and that could not be circumvented with alternate routes. The methodology used to identify these choke points was to airphoto-locate possible road locations up the drainages in the study areas. Areas that could be traversed by a road, albeit with some difficulty, using common road construction techniques were not considered choke points. This included, for permanent road construction, using rock causeways abutting hillsides and located on gravel bars that would only be flooded during peak flows.

The choke points identified and described below have been shown on the attached map (see Figure 11).

Prophet River

Point 1 : an 800m section of road through a rock canyon. There is a steep colluvial slope/ tallus fan adjacent to the eastern side of the river which could accommodate a road. A full bench cut would be required. Rock falls from the upslope rock face would present an ongoing hazard and would have to be monitored. Environmental impacts of any slope failures would be minor because of the coarse nature of the slope material. Cost: $ 200,000 – 300,000.

Point 2: a 200m section of road through a tight constriction. The river spans the passage from steep hillside to steep hillside. A gravel bar on the south side of the river is evident on the airphotos. This gravel bar could be utilized for winter road access. A permanent road would require a rock causeway abutting the hillside. Cost: $ 5,000 – 50,000.

Point 3: there is an abrupt 100m elevation rise of the valley floor at this location. Switchbacking up the slope on the south side of the river is possible. However, there are stability concerns on a portion of this route. An alternative route traversing the hillside on the north side of the river would be possible but the route would cross several avalanche tracks. Cost: $ 50,000 – 100,000.

Note: no analysis of the top 10km of the Prophet River drainage was possible due to the lack of airphoto coverage.

Besa River

Point 4: the river is constricted into a narrow canyon at this point. Narrow intermittent benches are situated adjacent to the river. Low water gravel bars are evident in portions of the canyon. To provide room for a road on some of the narrower benches (+/- 700m) low retaining walls might be required. Cost: $ 250,000.

Point 5: along a 500m section, the river splits into two main channels with vegetated islands between them. A temporary winter road, utilizing low level bridges and gravel bars, would be able to traverse this section without difficulty. A permanent road would require at least two bridges and a rock causeway. Cost: $ 150,000 – 1,300,000.

Granger Creek

Point 6: at this point, the proposed road location to access Granger Creek climbs a slope onto a bench. While this slope appears stable, adjacent slopes are actively failing. A geotechnical field assessment would have to be done to determine the stability of this 300m section of road location. Cost: $ 50,000 – 150,000.
Note: access up the side drainages is possible but each has a 100 – 200m section where 3-4 small bridges would be required because of narrow valleys and the meandering nature of the creeks.

It is possible to access the ridges found in the uppermost part of the drainage from the Pocketknife drainage. However, extreme care would have to be taken to avoid areas of existing and potential instability.

There are signs of instability even at high elevation on the ridges to the north of this area that would restrict access to the ridge tops further north. Also, signs of slow deeprooted bedrock failures were noted at elevation.

Nevis Creek

Point 7: the first 8km of Nevis Creek flows through a deeply incised canyon which has steep unstable slopes. It is not possible to construct a road through this canyon since, in places, the canyon is too narrow to accommodate both a road and the creek. On the eastern side and above the canyon, there appears to be a viable location for a road from Buckinghorse Pass to Pocketknife Creek and then north to the Besa River.

For the section between the Buckinghorse and Pocketknife passes, the southern section of the location would traverse a steep hillside and several deep gullies.

On the northern section, care would have to be taken to avoid, by staying above, potentially unstable ground. Cost : $ 400,000 – 800,000.

For the section between Pocketknife Pass and the Besa River, care would have to be taken to avoid the potentially unstable ground just north of the pass and along the Besa River sections. Some steep ground and a number of deep gullies would also be encountered. Cost: $ 400,000 – 800,000.

Note: since a corridor through the upper Nevis and the Buckinghorse drainages has already been delineated, these areas were not airphoto-reviewed.

Richards Creek

Point 8: this point is a 1300m long narrow rock canyon with sections of vertical rock and areas of instability. No feasible road locations were found through this section. However, an alternative route, identified as point 9, was found which allowed access to the upper portions of the drainage.

Point 9: a location to access the upper portions of the Richards drainage. Of concern is a section located at the northern end of the route. This section skirts some unstable ground. Although there appears to be sufficient stable ground to locate a road, a geotechnical field assessment would be required to verify this. Cost: $ 450,000 – 850,000.

Townsley Creek

Point 10: this point, about 1600m long, is a narrow valley with the creek channel taking up most of the valley bottom during high water. Up to six small bridges (and a rock causeway for a permanent road) would be required to traverse this section. Cost: $ 300,000 – 1,700,000.

Duffield and Hewer Creeks

Points 11 and 12: no feasible road locations could be found through the points indicated.

Closing Comments:

The above analysis was done using airphotos only. No fieldwork was done. All proposed routes should be field verified for feasibility and stability before any development begins.
Costs were rough estimates only and the ranges given correspond to temporary winter versus permanent roads and the inherent uncertainty of estimating costs from an airphoto analysis.

Additional Notes:

An additional six "choke points" were identified for consideration in this assessment. No report was provided on them because they were not considered to be impediments to road construction for the following reasons:

Point 13, Prophet River at the Eastern Boundary of the M-KMA:
There are two areas about 2km apart where the river is active and where the valley walls are constrictive. For both of these locations, there appears to be enough room on the flood plain to construct a road. The river does not take up the entire flood plain but the channel does migrate periodically during flood events and back channels and old channels are present. The engineering challenges are how to deal with the periodic migration of the channel and the types of structures to construct over the back channels. Some possible solutions would be long multispan bridges or bridge and rock causeway combinations.

Point 14, Prophet River just West of the Mouth of Richards Creek:
For a 200m section, the river has cut into a fluvial fan on the north side. This area is now stable. To traverse this area, a retaining wall structure on the slope could be used or a road could avoid the steep area by climbing onto the fan.

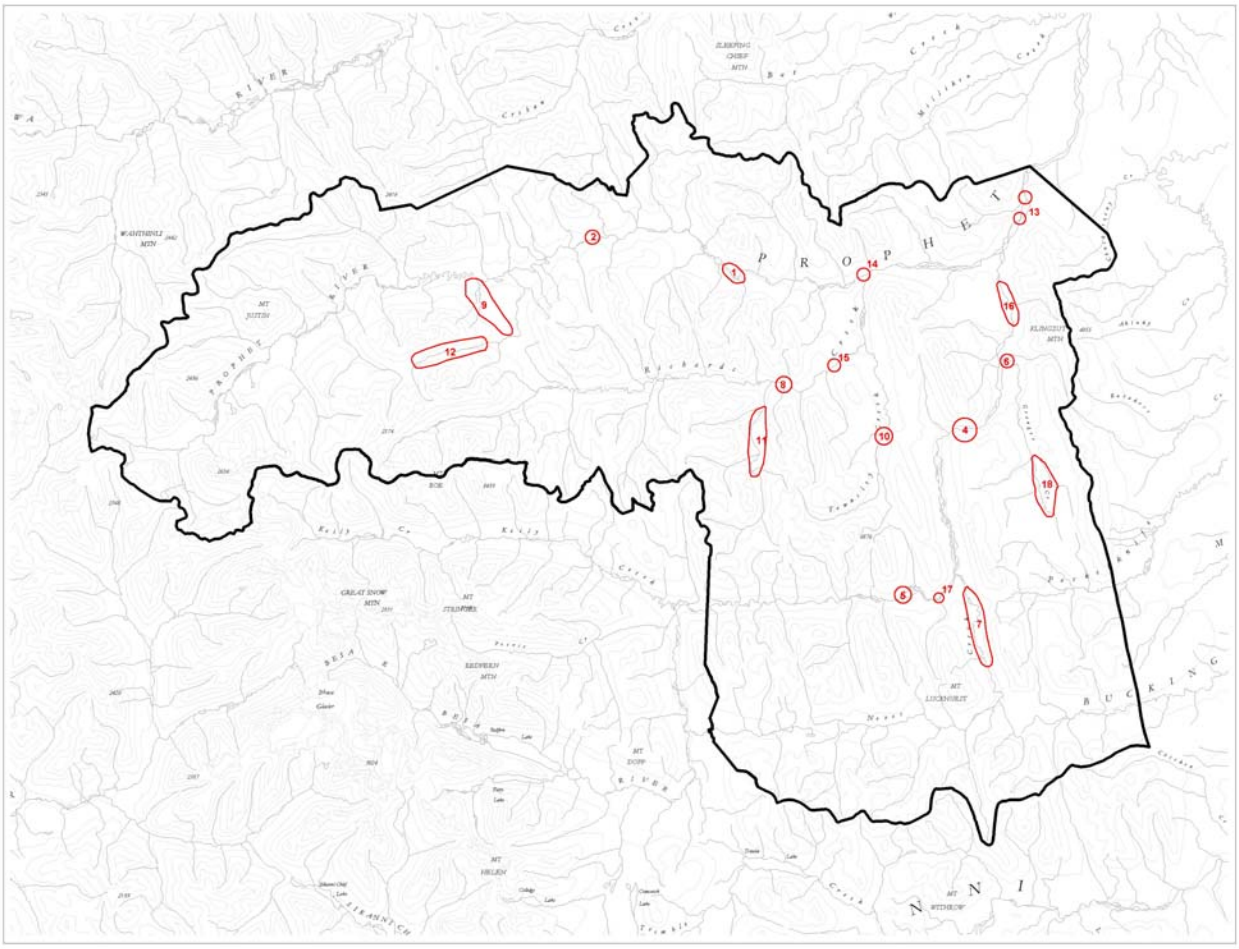
Point 15, Richards Creek About 3km West of the Mouth of Townsley Creek:
There are intermittent benches on either side of the river through this section. By utilizing bridges and the benches, a road could be built through the area.

Point 16, Along the Besa River Between its Mouth and Granger Creek:
A series of fans and high benches on the east side permits a road to avoid the flood plain and the steep potentially unstable slopes next to the flood plain.

Point 17, Besa River About 3km West of the Mouth of Nevis Creek:
In this section the river is braided and there is a major back channel. A road could be constructed through this section without encroaching on the river by using wooded portions of the flood plain, bridges and rock causeways.

Point 18, Upper Granger Creek:
A road could be constructed up the main drainage (except as stated in the report for a possible choke point near the mouth of the creek) without major difficulty. Multiple creek crossings would be required over short sections in two of the side drainages.

Figure 11: Choke Points in Besa-Prophet Pre-Tenure Plan Area



APPENDIX G: BIOPHYSICAL RESOURCES, VALUES AND USES

Biophysical Description

The following description of the BPPTP area is primarily derived from information gathered from a Terrain Ecosystem Mapping (TEM) project conducted over the plan area from 1997-1999.

Location

The plan area is located northwest of Fort St. John, and southwest of Fort Nelson. It covers an area of approximately 204,245 ha and is bounded by the Northern Rocky Mountains Park to the north, the Upper Sikanni Management Plan to the south, Redfern-Keily Park to the southwest, and the M-KMA boundary to the east (see Section 1.2).

Portions of eight 1:50,000 National Topographic Series (NTS) mapsheets (94F/8 and 9, and 94G/5, 6, 11, 12, and 13) span the plan area. The Besa-Prophet pre-tenure plan area contains the lower and upper portions of the Besa River and Prophet River watersheds, respectively and the drainages of Richards, Townsley and Nevis Creeks.

Access

The BPPTP area is accessible by air (mainly helicopter) and on ground by horseback, snow machine, all terrain vehicle or foot. Currently, no roads cross into the plan area. The closest major roads to the plan area are the Alaska Highway, a road that exists along the Sikanni Chief River, as well as a few dirt-topped roads. A few seismic lines extend into the plan area from the east, but are not identified under the *Access Management Area Regulation* for motorised use. There are approximately 6 airstrips within the plan area.

The Redfern Lake trail provides important access to the BPPTP area and is the only route designated under the *Access Management Area Regulation* in the plan area for all terrain vehicular use. The Redfern Lake trail follows Nevis Creek and the Besa River to Redfern Lake, located in Redfern Keily Park. All terrain vehicles are restricted to within 400 metres of this route. Horse trails are also found along the majority of the rivers and creeks in the plan area.

Adjacent Parks

The plan area abuts Northern Rocky Mountains Park to the north and Redfern-Keily Park along the plan area's southwest boundary. Prophet River Hot Springs Park, although not part of the BPPTP area, is situated within the plan area. Prophet River Hot Springs Park comprises an area of 180 ha that lies adjacent to the upper reaches of the Prophet River in the Western regions of the BPPTP area. The area delineated as the park has been excluded from the plan area and is not subject to the plan. This park is an important mineral lick for ungulates in the plan area, while Redfern-Keily and Northern Rocky Mountains Parks likely play important roles as wildlife corridors and recruitment areas for surrounding wildlife populations.

Redfern-Keily Park and Northern Rocky Mountains Park are important areas for recreation activities such as hunting, horseback riding, hiking, fishing, wildlife viewing, camping and snowmobiling. As mentioned above, the designated motorized Redfern Lake trail and other non-designated routes provide access into these areas. The parks are also recognised as traditional use areas for First Nations, and continue to support First Nation's cultural values.

Physiography

The BPPTP area is highly variable in terms of relief, and ranges in elevation from approximately 900 m to 2600 m. The area is characterised by two physiographic zones, the Muskwa Ranges and the Northern Rocky Mountain Foothills.

The Muskwa Ranges extend from the Peace River north to the Liard River and from the Rocky Mountain Trench in the west to the Rocky Mountain Foothills in the east. The present landscape of the Muskwa Ranges was sculpted by glacial activity and is characterised by longitudinal valleys of great length and width. This pattern of parallel valleys found in the plan area is the result of erosion parallel to the structural trend along lines of faulting or along belts of softer, more easily eroded rock. On their eastern side, the Muskwa Ranges are primarily composed of Devonian and Permo-Carboniferous limestones, which are highly eroded, and unlike the western side, have undergone minimal change through glaciation. The Northern Rocky Mountain Foothills rise approximately 900 metres above the Prophet River; summit elevations range from 1350 m to 1650 m. The rocks of the foothills are entirely underlain by sedimentary rocks that are largely of Mesozoic age. The rocks are folded in a north to northwest direction, which results in prominent longitudinal ridges. Valleys are eroded along belts of soft rock and fault zones, and are generally wide and flaring.

Terrain and Surficial Materials

The plan area encompasses diverse terrain features. Morainal and colluvial sediments are the most common surficial materials. Morainal deposits result from materials being transported directly by glacier ice, while colluvial deposits accumulate from direct, gravity-induced movement of sediments. Other surficial materials found in the plan area include glaciofluvial (deposited by glacial meltwater streams), glaciolacustrine (deposited in or along margins of glacial lakes), fluvial (deposited by streams and rivers), several types of bare bedrock, and shallow layers of unconsolidated material. Weathered bedrock occurs in the plan area, but is found in extents that are too small to be mapped at 1:50 000 scale.

Fluvial processes have helped to shape the surficial materials, floodplains and terraces found along the Besa and Prophet Rivers. Classification of fluvial processes is based primarily on channel patterns, as these provide a useful basis for interpreting river hazards and other river features. River characteristics along the Besa and Prophet Rivers range from braided channels, typified by many diverging and converging channels separated by unvegetated bars to an anastamosing channels, which refers to channels that diverge and converge around many islands that are usually vegetated and typically lie above the flood line. Much of these two rivers are comprised of an intergrade between these two channel types. The terraces associated with braided and anastomosing channels are typically comprised of sand, pebbles and cobbles and are well or rapidly drained. Floodplains with gravel bars near these terraces are similar but usually have <20% sand and are imperfectly drained.

Red granite from the Canadian Shield has been found at two locations on the west side of the outer foothills, which signifies that Continental Ice Sheets brought rocks from the Canadian Shield into the area.

Soils

Following the Canadian System of Soil Classification, the most commonly sampled Soil Order in the plan area is the Brunisolic Order, in particular, the Great Groups Melanic Brunisols, Dystric Brunisols and Eutric Brunisols. In general, brunisols are poorly-developed soils that typically occur under forest vegetation, but have sufficient soil development to exclude them from the Regosolic Order. Other commonly-encountered Soil Subgroups included Typic Fibrisols (organic soils), Gleyed Humic Regosols (weakly-developed soils with organic layer), Orthic Regosols (thin, weakly-developed soils), Orthic Humic Gleysols (soils subject to continuous or prolonged water saturation), Brown Chernozems (well-decomposed

organic soil layer), Orthic Turbic Cryosols (mineral soils that exhibit features of freezing and thawing) and Static Cryosols (mineral soils that do not exhibit features of freezing and thawing).

Field work undertaken as part of the Besa-Prophet TEM project confirmed that permafrost soils (Cryosols) are more widespread within the plan area than had been previously acknowledged. During their field sampling, Cryosols were regularly encountered on north-facing slopes that displayed organic layers.

A wide range of soil textures is found in the plan area. Soils on morainal, colluvial and floodplain landforms comprise a range of mainly coarser-textured soils, while lacustrine, fluvial and most other lower-relief surficial features are mainly associated with finer-textured soils. Clay textures are localized and infrequent within the area. Generally, soils range from imperfectly, to moderately well and rapidly drained, with very rapidly drained and poorly drained sites occurring less frequently.

Climate

The plan area is dominated by Polar Continental and Polar Pacific air and experiences long, cold winters and short, warm summers. The climate is cool continental, with moderate rain and snowfall, and on average, moderately warm summers. The plan area experiences one of the most continental climates occurring within BC, with annual summer temperatures occasionally in excess of 26º C, and temperatures that may fall below –45º C for short periods during most winters.

The Rocky Mountains create a rainshadow effect throughout the year. Snow may persist well into late spring, but most valleys are free of snow by June. Although some snow may be present at higher elevations during part or all of the summer, it does not normally begin to accumulate until October. In the winter months, snow depths are not deep and extremely cold temperatures are not constant, as cold spells are broken by Chinook winds.

Snowpacks within the plan area are influenced by two main factors: 1) the amount of snow that actually falls and 2) an area's exposure to Chinook winds that periodically affect the region. South-facing and southwest-facing slopes within more mountainous regions are generally more affected by the influences of Chinook winds and solar radiation. Southerly exposures tend to experience the least amount of snow; north-facing aspects tend to have deeper and more persistent snowpacks, while east and west experience intermediate conditions.

The BPPTP area experiences a generally more moderate climate then areas that occur to the immediate west. This results in the provision of some particularly favourable all-year living and wintering habitat for many wildlife species, especially ungulate species such as elk, caribou and moose. Year-to-year climatic variation is also a key determinant of shifts and dynamics in wildlife movements and habitat use. For example, during warmer winters, moose have been observed at high elevations instead of their normal lowland preferences. Similarly, during winters of deep snow, caribou have been observed shifting their usage patterns and aggregating in the Muskwa Foothills and Plateau.

Vegetation

The plan area contains pockets of commercially-viable timber, which are mainly restricted to lower-elevation valleys. In general, mature forest stands are poorly developed and many of them resemble a "tall shrub" structural stage. White spruce is the predominant forest tree species in the area. Scrub birch and willow species are also very common throughout the area.

Wetlands and other non-forested conditions are scattered throughout the area. Wetlands are particularly common in the valley bottoms, especially along rivers such as the Besa and Prophet. A variety of alpine ecosystems occur, however, alpine fir krummholz is relatively rare.

The vascular and non-vascular plant diversity within the area is notable. Many berry-producing plants such as lingonberry and other Vaccinium species are scattered throughout the area. Flowering plants such as fireweed, tall larkspur and tall bluebell occur from valley bottom to mountain top. Graminoids such as Altai fescue, Poa spp. and Carex spp. are likewise encountered from low elevation valleys to alpine areas. Bryophytes and lichens are widespread throughout the area; step moss, other feathermosses, and Cladina spp are especially common.

A "Rare Element Occurrence" report for the BPPTP area from the British Columbia Conservation Data Centre (CDC) includes all individual, verified occurrences of rare vascular plants (http://srmwww.gov.bc.ca/cdc/index.htm.) Table 1 summarises the rare plan element occurrence data for the plan area, as well as the general vicinity. Only one rare plant species, the large-flowered cryptantha, has been identified in the plan area; in BC, it is only recently known from Nevis Creek. Other rare vascular plant species listed in Table 1 were found in Redfern-Keily Park, which abuts the western boundary of the plan area. As the vegetation has not been extensively inventoried, these species and others not previously identified may occur in the plan area.

Table 1: Vascular plants reported by BC's Conservation Data Centre as being rare or threatened in the general vicinity of the plan area

Vascular Plant	Common Name	Rank	Location	Eco Section[1]	BGC[2]	Last Observed	UTM NAD83
Cryptantha intermedia var *grandiflora*	Large-flowered cryptantha	Red listed	Nevis Creek south slope.	MUF	SWBmk	1970/07/05	10 477010 63555
Draba glabella var *glabella*	Smooth draba / whitlow grass	Blue listed	Fairy Lake, very common on open talus slopes below peaks.	EMR	SWBmk	1960/07/19	10 443310 63548
Draba porsildii	Porsild's draba / whitlow grass	Blue listed	Fairy Lake, rare on steep open talus slope below mountains.	EMR	SWBmk	1960/07/19	10 443310 63548
Epilobium hornemannii ssp *bemringianum*	Hornemann's willowherb	Blue listed	Fairy Lake, moist alpine slope.	EMR	SWBmk	1977/07/25	10 443310 63548
Epilobium leptocarpum	Small-flowered willowherb	Blue listed	Fairy Lake, near stream in white spruce-subalpine fir forest.	EMR	SWBmk	1977/07/28	10 443210 63548
Lomatogonium rotatum	Marsh felwort	Blue listed	Fairy Lake, gravel stream edge, flat, scattered low vegetation.	EMR	SWBmk	1991/07/13	10 445810 63564
Oxytropis jordalii spp *davisii*	Jordall's locoweed	Blue listed	Fairy lake, very rare noted below east facing rock cliffs at 1524 m at one spot.	EMR	SWBmk	1960/07/19	10 443310 63548

[1] MUF (Muskwa Foothills Ecosection), EMR (Eastern Muskwa Ranges Ecosection)
[2] Biogeoclimatic Subzone: SWBmk (Spruce-Willow-Birch moist, cool)

Disturbances

The following "broad categories" of natural site disturbances have widely affected vegetation and soil characteristics within the plan area:

- *Fire*: Widespread in the plan area. Fires have originated from both natural causes and human ignition. Prescribed fire was initiated in the 1950's and has been used as a wildlife management tool to enhance ungulate habitat. The fires have resulted in herbaceous vegetation layer in these areas. Generally, areas that are frequently burned will only reach an edaphic condition of shrub and herbs or to an aspen seral stage. Recent wildfires have burned intensely and extensively. Wildfires in excess of >200 ha in size are common throughout the plan area, especially on south and east facing slopes where drier and warmer conditions prevail. Some burned sections will be extremely slow to return to their natural climax of old coniferous due to the repeated severe fires that have destroyed seed sources and humus forms. If prescribed burning continues at the current rate in the area, white spruce stands will eventually be eliminated entirely. Frequent fires have already had visible effects on the landscape. Where fires have been less frequent and less severe, conifer dominant stands are being replaced by mixed forest of aspen, lodgepole pine and white spruce. Where the impacts have been more severe, deciduous stands predominate.
- *Extreme cold:* In particular, the effects of snow compaction, and cold air drainage.
- *Natural terrain failures:* Slumps, observed on northern slopes, occur in association with permafrost soils. *Other:* The effects of insect infestations or animal foraging/overgrazing are not extensive within the plan area.

Resource Values and Uses

Wilderness Conditions

Today, wilderness is recognized as a valuable natural resource in its own right. This value may range from experiential (e.g. recreational, spiritual and therapeutic values) to scientific (e.g. environmental baseline, genetic diversity and medicinal values). Wilderness settings can be described as:

- having substantially natural ecological conditions,
- areas where facilities are limited in both areal extent and function (facilities, if present at all, are more likely to enhance visitor safety and resource protection, rather than visitor comfort and convenience),
- sizeable and distant from urban populations,
- relatively difficult to access as there are generally no roads and trails may not be present or are rough,
- areas where use tends to be dispersed and social interactions takes place in small groups, with little inter-party contact, and
- Management of formally recognized wilderness settings strives to maintain the natural appearance and the above characteristics over time.

The BPPTP area fits the above description. The great majority of the area is in a pristine, undeveloped state accessible on the ground only on foot or by horseback. The Ministry of Forests uses the Recreation Opportunity Spectrum (ROS) to classify and manage lands for recreation opportunities based on the remoteness, size and evidence of humans. The ROS delineation for the BPPTP area at present is as follows:

	Hectares	Percent
Primitive	131,244	64.3
Semi-primitive Non-motorized	53,167	26.0
Semi-primitive Motorized	19,834	9.7
Total	204,245	100.0

Standards for delineation of these categories are as follows:

Primitive: greater than 8 km from road; greater than 5000 ha, occasional air access, otherwise no motorized access or use in the area; very high degree of naturalness, structures are extremely rare and generally no site modification, little on-the-ground evidence of other people, evidence of primitive trails; very high opportunity to experience solitude, closeness to nature, self-reliance and challenge; very low interaction with other people and very small party sizes.

Semi-primitive Non-motorized: greater than or 1 km from road; greater than or equal to 1000 ha; generally very low or no motorized access or use may include primitive roads and trails if usually closed to motorized use; very high degree of naturalness, structures are rare and isolated except where required for safety or sanitation, minimal or no site modification, little on-the-ground evidence of other people; high opportunity to experience solitude, closeness to nature, self reliance and challenge; low interaction with other people and very small party sizes.

Semi-primitive Motorized: greater than or 1 km from road, greater than or equal to 1000 ha; a low degree of motorized access or use; high degree of naturalness in the surrounding area as viewed from access route, structures are rare and isolated, minimal site modification, some on-the-ground evidence of other people, evidence of motorized use; high opportunity to experience solitude, closeness to nature, self-reliance and challenge; low interaction with other people and small party sizes.

Wildlife

Wildlife values are high throughout the plan area and include the highest habitat ratings in the province for Stone's sheep and Rocky Mountain elk as well some of the highest rated habitat for moose and woodland caribou. Mountain goat, mule deer and white-tailed deer are also found in the plan area, but at much lower densities. The prescribed fire history of the area has resulted in a mosaic of seral stages and habitat types that support a diversity of ungulate, carnivore, bird, small mammal and furbearer species. A moderate climate with frequent Chinooks results in overall low snow depths in the plan area, especially on windblown and south aspect areas.

Wildlife values are described for the major broad habitat types that are found within the plan area: the boreal, subalpine (lower and upper) and the alpine.

Wildlife Values in the Boreal

Boreal habitat in the plan areas is found in the relatively wide valley bottoms of the eastern portions of the Besa River and Prophet River, with a variety of wetlands, riparian areas and forest types. Mature conifer forests in proximity to sedge wetlands are important winter range and habitat for caribou, and for smaller numbers of mule and white-tailed deer (although deer are not abundant). Moose forage year round on willow species that are abundant throughout this zone. Stone's sheep and mountain goat utilize mineral licks located in the bottom of these valleys. Snowshoe hares, lynx, American marten, deer mice, ermine, black and grizzly bears, and red squirrels are also commonly found throughout these areas. South-facing slopes provide warm, relatively snow-free habitats for the ungulate species and thus for many predators like wolves, grizzly bear and wolverine.

In areas upland of the major valley bottoms, forest fires have created a mosaic of uneven-aged stands. Conifers are often slow to re-establish in many burned areas and aspen and willow deciduous forests are common. These deciduous forests are very productive habitats for ungulates, birds and small mammals. Mature coniferous forests provide both security and good thermal protection in harsh winters.

Floodplains, riparian areas and wetlands are prevalent in the lowlands. These productive habitats play important roles for a variety of wildlife, including moose that forage for winter browse. The large number of snags associated with wet areas provide habitat for cavity-nesting/denning birds and small mammals such as three-toed woodpecker, red-breasted nuthatch, black-capped chickadee, boreal owl, boreal chickadee, red squirrel, American marten, fisher and lynx.

There is a high population of passerines during the spring, summer and fall, and birds-of-prey, such as great horned owl, boreal owl, northern goshawk and northern harrier are also numerous.

Wildlife Values in the Lower Subalpine

The lower subalpine area of the Besa-Prophet pre-tenure plan area is composed of a mosaic of mostly open-canopied coniferous and mixed forests, willow-birch shrublands, grasslands, rugged, steep slopes, some wetlands, riparian areas and floodplains. This subalpine habitat occurs at higher elevations above the boreal forest and below the scrubby forests characteristic of the upper subalpine. Lower subalpine habitat is capable of supporting the highest diversity and density of ungulates in the plan area.

Natural and prescribed burning has been widespread throughout this habitat type. On many sites, especially those that have burned repeatedly, conifers have been slow to return creating extensive grasslands and young stands of trembling aspen or willow. These areas provide high quality winter food for many ungulates, especially elk, moose and Stone's sheep.

High elevation grassy southern aspects are utilised by Stone's sheep and mountain goats year-round and by grizzly bear, deer, elk and caribou in the growing season. In winter, they are windswept and heated by the sun reducing snow levels and exposing food during this critical time of year. Steep, rocky upper slopes are important escape terrain for both Stone's sheep and mountain goats. Golden eagles also use this type of habitat for hunting.

Wetlands, riparian habitats and floodplains are not as abundant or as productive as in the boreal forest, but are used extensively by moose, bears, voles, ducks, songbirds, beaver, muskrat, various raptors like eagles and northern harriers. Cold-air drainage and pooling create open, shrubby valley bottoms in many areas. These habitats provide abundant browse year round and are not usually limited by snow depth in winter.

Coniferous and mixed forests provide foraging and nesting habitat for species such as northern goshawk, northern hawk-owl, spruce grouse and three-toed woodpecker. Forested areas also provide important security and thermal protection in winter for ungulate and large carnivore species.

Wildlife Values in the Upper Subalpine
The upper subalpine shrub habitat occupies the intergrading area between the lower usually forested subalpine area and the non-forested alpine. It is sparsely forested and much of this habitat is characterised by herb, shrub and dwarf-shrub communities and by rugged, steep slopes. This habitat type is common on mountain-tops and high elevation plateaus in the foothills portion of the plan area. These windblown mountain tops and plateaus provide important winter habitat for Stone's sheep, mountain goat and caribou. These areas are especially important to caribou in years when snow depths are high at lower elevations. The high elevation wetlands found in upper subalpine basins of the foothills also provide high capability moose winter range as shrub production is high and snow depths are low.

Wildlife Values in the Alpine
Alpine habitat occurs throughout the plan area and is dominant in the Eastern Muskwa Ranges Ecosection. The harsh climate, rugged topography and low plant productivity result in lower wildlife diversity and density. However, some wildlife species, such as mountain goat, caribou, Stone's sheep, pika, hoary marmot, willow and white-tailed ptarmigan, American pipits, and rosy finch are well adapted to the conditions found here.

Elk, moose, Stone's sheep, mountain goat and caribou use grassland and scrub areas extensively during the summer months. In winter, range for goats, caribou, moose and Stone's sheep is concentrated to areas of forage production where wind and solar radiation result in reduced snow depth. These alpine winter ranges are primarily found in the foothills portion of the plan area and are less common in the more rugged mountains to the west.

Other wildlife found in the alpine of the plan area includes snowshoe hare, voles, black bear, wolverine, golden eagle, white-tailed ptarmigan, horned lark, golden eagle and golden-crowned sparrow. Grizzly bears use alpine meadows for food from late spring to fall.

Species at Risk
The British Columbia Conservation Data Centre (CDC), which is a component of the Ministry of Water, Land and Air Protection, systematically collects and disseminates information on the rare and endangered plants, animals and plant communities of British Columbia. The CDC designates a red or blue-listing status for identified species that are at risk in BC. Red-listed species includes any indigenous species or subspecies (taxa) considered to be Extirpated, Endangered, or Threatened in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Red-listed taxa include those that have been, or are being, evaluated for these designations. Blue-listed species include any indigenous species or subspecies (taxa) considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

Grizzly bear, wolverine, fisher and bull trout are blue-listed species that are known to occur in the plan area. Another blue-listed species that may occur in the plan area, but has not been recorded includes the northern long-eared myotis. Although not documented, the plan area may contain habitat along the valley bottom of the lower Prophet River for several red-listed warbler and a vireo species.

Fish

The description of fishery values in the Besa-Prophet pre-tenure plan area is derived from information gathered from a 1:50 000 Overview Fish and Fish Habitat Inventory conducted over the plan area in September of 2000. {clarify if report is available and if so where }

A significant portion of the plan area, especially the western portion, was found to be inaccessible to fish movement due to the presence of impassable barriers (waterfalls and chutes). Barriers are relatively common on both mainstem and tributary drainages and exclude fish from a significant proportion of suitable habitat in some drainages including the Prophet River, Besa River, Richards Creek, Keily Creek, Hewer Creek and Petrie Creek. Non fish-bearing status is assumed above impassable barriers due to low habitat complexity, lack of over-wintering potential for mature fish and the presence of multiple barriers.

Sport fish species such as Arctic grayling, bull trout and mountain whitefish were found to be common throughout the plan area. It is assumed that all stream reaches accessible from the Prophet or Besa River mainstems support these species. The CDC, currently ranks bull trout as a blue-listed species; blue-listed species are considered to be provincially vulnerable and are of special concern because of characteristics that make the sensitive to human activities or natural events. No other rare or endangered fish species are known to occur in the plan area. Slimy sculpin was the only other fish captured; however, additional species, including burbot and longnose sucker are assumed to be present in the lower portions of the Prophet and Besa Rivers.

Bull trout populations within the plan area are likely to be migratory, with adults over-wintering in the lower Prophet River mainstem and moving upstream to spawning habitats by late summer. Three bull trout spawning locations were found on Petrie Creek, Duffield Creek and upper Richards Creek and were identified through the presence of mature, spawning fish and/or moderate to high densities of the young-of-the-year juveniles and yearling juveniles. Bull trout spawning activity may occur in other streams such as Nevis Creek, Keily Creek and Townsely Creek, but spawning would be limited by relatively low abundance of quality habitat in these reaches.

Arctic grayling appear to use mainstem and large tributary habitats within the plan area for adult summering. There is little evidence of spawning or juvenile rearing. Data from comparable watersheds in the Halfway River and Sukunka River systems suggest that Arctic grayling may spawn in warmer, more turbid tributaries in the lower portion of large systems and then move upstream to cooler, less turbid reaches for the summer. Adults are assumed to migrate out of the plan area by early October, as water temperatures drop.

Mountain whitefish appear to spawn in the Prophet and Besa River mainstems within the plan area, as indicated by relatively high densities of young-of-the-year juveniles. Post yearling juveniles, sub-adults and adults were widely distributed throughout mainstream and tributary habitats.

Rainbow trout, introduced into Redfern and Fairy Lakes in 1984, have a limited fluvial population in the Besa River mainstem that extends 15 km downstream from Redfern Lake. As rainbow trout were not sampled further downstream along the Besa River, it is assumed that they do not range into the plan area. Slimy sculpin appears to exist as local populations in all accessible portions of the mainstem and tributary drainages where suitable over-wintering capability exists.

Ecosystems

The plan area falls within the Northern Boreal Mountains Ecoprovince and in the Northern Canadian Rocky Mountains Ecoregion. The area is represented within two Ecosections, the Muskwa Foothills (MUF), in the east and the Eastern Muskwa Ranges (EMR), to the west. The MUF is an area of subdued mountains, isolated by wide valleys. It is in the rainshadow of the Muskwa Ranges, and is commonly influenced by cold Arctic winter air. The EMR includes some of the highest, most rugged mountains in northern BC, including those found at the western edge of the plan area. This ecosection receives more snowfall than the MUF. Glaciers still exist on some of the higher mountains.

Three biogeoclimatic (BEC) zones cover the plan area (Table 2): the Boreal White and Black Spruce (BWBS), Spruce Willow Birch (SWB) and Alpine Tundra (AT).

Table 2: Brief descriptions of BEC zones within the Besa-Prophet Pre-Tenure Plan Area.

BEC Zone	Subzone/ Variant	Elevation (m)	Description
BWBS	mw2 – Fort Nelson moist warm	900 to 1000	Zonal climax forests are comprised of white spruce and aspen with a dominantly stepmoss forest floor. Seral stands containing pine and aspen are very common.
SWB	mk – moist cool	900 to 1600	Zonal climax forests consist of mixed white spruce and sub-alpine fir forests, with bog birch and shrub willow present in the understory.
SWB	mks – moist cool scrub	1500 to 1800	Zonal vegetation is dominated by lush forb-alpine grass communities, in association with shrubby willow, scrub birch and krummholz vegetation (mostly Sub-alpine fir).
AT	AT	Above 1750	An upper-elevation treeless area characterised by a harsh climate and a very short growing season. Zonal vegetation is dominated at lower elevations by lush mixed forbs and alpine grasses. At higher elevations, conditions for growth are more limiting and support a less vigorous mix of sedges, dwarf shrubs, forbs and alpine grasses.

The Boreal White and Black Spruce zone (BWBS) occurs as an extension of the Great Plains (Alberta Plateau) into the northeastern corner of BC. The zone occupies the lower elevations of the main valleys east of the northern Rocky Mountains. The climate of this zone is characterised by short growing seasons and long, very cold winters. Annual precipitation averages between 330 and 570 mm with 35-55% of this falling as snow. The ground freezes deeply for a large part of the year and discontinuous permafrost is common in the northeastern parts of the zone. White spruce, trembling aspen, lodgepole pine, black spruce, balsam poplar, tamarack, subalpine fir and paper birch are major tree species found in the BWBS. Forest fires are frequent, maintaining most of the forests in various structural stages. True climax forests are uncommon in the BWBS as few stands have escaped fire for several hundred years.

The Fort Nelson Moist Warm BWBS variant (BWBSmw2) occurs between 300 and 1050 m within the BWBS zone and features aspen-white spruce forest on well-drained sites and black spruce forests (with

some tamarack) commonly on very wet sites. Lodgepole pine is relatively common, especially on wetter sites with black spruce or on well-drained, higher elevation sites. Balsam poplar, white spruce and often, trembling aspen and paper birch are common along the floodplains of the major watercourses. Winter snow depths for this zone are approximately 185 cm.

The Spruce–Willow–Birch zone (SWB) is the subalpine zone above the BWBS over most of its range and within the plan area. The SWB is the most northerly subalpine zone in BC. The climate is characterised by long, cold winters and brief, cool summers. Winter cold spells can be broken by Chinook winds. Mean annual precipitation is 460 to 700 mm, with 35-60% occurring as snowfall.

Lower-elevation conditions of the SWB are generally forested, consisting mainly of white spruce and some subalpine fir. On mid-slopes, spruce is the dominant tree species, especially on northern and eastern exposures, while fir is more limited in distribution, mainly falling within the EMR on southerly aspects. Black spruce, lodgepole pine and trembling aspen are relatively minor species, although all can be locally abundant. At high elevations, the SWB is characterised by a scrub/parkland zone dominated by scrub birch and several species of willow. Subzones of the SWB have not been well studied. The plan area contains the Moist Cool and the Moist Cool Scrub subzones (SWBmk and SWBmks, respectively).

Generally, Alpine Tundra (AT) occurs above 1800 m. The climate in this zone is cold, windy, snowy and characterised by low growing season temperatures and a very short frost-free period. Most precipitation falls as snow. By definition, the AT is treeless. Alpine vegetation is dominated by shrubs, herbs, bryophytes, and lichens. Many areas in the AT are dominated by rock, snow and ice. Common shrubs in the plan area consist of scrub birch and various willow species.

Oil and Gas

There are no established oil or gas reserves or production in the plan area. Two gas fields, known as the Sikanni and Pocketknife gas fields, are located 10 kilometres to the east of the plan area and contain infrastructure such as roads, pipelines and gas processing facilities. There has been a recent gas discovery in the Upper Sikanni Management Plan area immediately south.

Gas potential in the plan area is considered "very high" (gas potential greater than 100,000 m^3/ha) to "high" (between 40,000 m^3/ha and 100,000 m^3/ha). Based on previous work completed by the Ministry of Energy and Mines and the Geological Survey of Canada, nine gas play trends (prospective zones) intersect the Besa-Prophet area. Some of these prospective zones are extensions of geologic formations that have produced considerable quantities of gas elsewhere (e.g. the Sikanni and Pocketknife gas fields) and are estimated to still contain large quantities of undiscovered gas reserves. In addition, geologic interpretations indicate that some very rich play trends that are much deeper extend into the planning area. While there have been no discoveries to date on these conceptual zones, the individual pool sizes and total volume of gas that may potentially be discovered are very large.

The plan area is likely not oil-prone due to the thermal maturation of the rocks.

The following table identifies the play trends present in the Besa-Prophet planning area. The numbers reflect amounts present in the entire geologic formation across north-eastern BC (not what is expected within the planning area) and provide a measure of the exploration targets being sought in the Besa-Prophet area.

Play Trend	Discovered Gas	Estimated Gas remaining to be discovered	Largest single pool remaining to be discovered
Blairmore – Bluesky, Gething, Cadomin Fms.	219 BCF in 19 pools	480 BCF in 381 pools	74 BCF
Baldonnel Fm.	1211 BCF in 29 pools	5734 BCF in 381 pools	234 BCF
Charlie Lake Fm.	84 BCF in 13 pools	690 BCF in 537 pools	9 BCF
Halfway / Doig Fm.	817 BCF in 31 pools	486 BCF in 119 pools	79 BCF
Belloy Fm.	1411 BCF in 93 pools	2570 BCF in 814 pools	58 BCF
Permo-Carb. - Debolt, Kisk, Shunda Fms.	989 BCF in 46 pools	1457 BCF in 134 pools	175 BCF
Slave Point Fm.	687 BCF 45 pools	2107 BCF in 405 pools	160 BCF
Slave Point Barrier	3649 BCF in 49 pools	751 BCF in 376 pools	41 BCF
Conceptual Deep Zones - Devonian, Cambrian Fms.; "Blind Thrust" related structural plays	0	5 TCF	700 BCF

BCF = billion cubic feet; TCF = trillion cubic feet

Oil and Gas Tenures

Portions of five active gas tenures, issued under the Upper Sikanni Management Plan, extend into the Besa-Prophet area (Title Numbers 41891, 41892, 50621, 50105 and 46195). Two of these tenures were issued prior to the creation of the Muskwa-Kechika, while the other three were issued prior to a change in the northern boundary of the Upper Sikanni Management Plan. There has been no drilling on these three active tenures within the plan area. Well drilling history is sparse with only one gas well drilled and abandoned in the northeast portion of the plan area in 1966. Any future wells in the plan area, if approved, would be assigned an "exploratory wildcat" classification under the BC Drilling and Production Regulation (i.e. greater than seven kilometres from an existing designated pool).

Mineral
There are no producing or past producing mines in the plan area. The area is generally ranked as having low to moderate metallic mineral potential; however this ranking is based on limited information.

The known metallic potential is mainly for carbonate hosted lead-zinc deposits (with germanium and gallium), found in rocks exposed in a northerly trending belt in the west part of the plan area. Germanium and gallium are valued by the electronics industry for their use as a semi-conductor.

There are a number of carbonate hosted lead-zinc occurrences in the Richards Creek valley. Exploration for carbonate-hosted lead-zinc was also conducted in this same valley in the 1970s. Other exploration activity within the plan area has occurred more recently in a tributary valley north of the Prophet River (1987-1990); reported exploration expenditures for this program equal $789,000.

Industrial minerals of potential interest within the plan area include barium and phosphate. These industrial minerals are located in specific northerly trending belts and within these belts; the potential is ranked as low to moderately high.

Mineral Tenures
A group of 14 small mineral tenures is present near the northern boundary of the planning area, in the mid to upper Prophet valley. These tenures cover an occurrence of lead-zinc mineralization containing germanium and gallium values. Exploration work was conducted on this occurrence in the 1970's and the 1990's. The tenures are currently in good standing until April 2002 and can be maintained beyond this date if the tenure holder records additional exploration expenditures or pays cash in lieu of work.

Geothermal
The plan area is rated as having high geothermal potential. The Prophet River Hot Springs Park, which is located in the northwest portion of the plan area, but is excluded from the plan area, is characterised as a small hot spring with a flow rate of less than one litre per second.

Forestry
Administratively the plan area overlaps the Fort Nelson and the Fort St. John forest districts.

Current forest management practices follow the standards and legislation set out by the Forest Practices Code of British Columbia Act (FPC)[4]. The Fort Nelson and Fort St. John LRMPs also provide direction for forest management practices that protect environmental values.

Forest harvesting activity has occurred over only a small portion of the large forest area encompassed by the Fort Nelson and Fort St. John timber supply areas; and in only some types of stands and over a relatively short period of time compared to the rest of the province. In the Fort Nelson timber supply area the coniferous species harvested (majority of volume in white spruce, along with minor volumes of lodgepole pine) is produced into lumber, veneer and plywood by Tackama Forest Products. Deciduous species harvested (majority of volume in aspen) is produced into orientated strand board (OSB) by Slocan Forest Products. A minor volume of cottonwood has been harvest in the past for use in plywood by Tackama Forest Products. In the Fort St. John timber supply area mainly coniferous species are harvested and produced into lumber, pulp chips and specialty products by Canadian Forest Products Ltd. (Canfor).

[4] Forest Practices Code – legislation, regulations and guidebooks that govern forest practices and planning, with a focus on ensuring management for all forest values.

Fiberco Export Inc. (a division of Slocan Forest Products) the other major licencee purchases chips from Canfor and other primary wood industries to produce pulp.

There has not been any significant commercial timber harvesting activity within the plan area. This is due to a number of factors, including: the distance from the established mills in the Town of Fort Nelson and the City of Fort St. John; and the lack of an established access infrastructure. Forest development plans do not show any proposed activity in the plan area during the short term as the stands within the plan area are considered to be uneconomical to harvest at this time, due to stand types, total volumes produced and tree size. (Uneconomical due to stand types, total volumes produced and tree size.) In addition the harsher climates associated with the lower elevation SWB zone and the upper elevation BWBS make the re-establishment of a productive commercial forest stand more difficult and costly to achieve.

If access infrastructure were to be developed through oil and gas exploration and development activities the potential for forest development activities in the plan area would increase, as some stands may become economical to harvest, especially in the lower elevation river valleys.

The following is a breakdown of the plan area by **gross land base**[5], **forest land base**[6] and timber harvesting land base[7].

Gross land base	203, 242 ha
Forest land base:	49,989 ha
Timber harvesting land base:	700 ha (estimated)

Landscape Units
Landscape unit objectives are a prerequisite to forest development plans or activities in the Muskwa-Kechika Management Area under Section 2.1 of the Act.

Landscape units are areas of land and water for long-term planning of resource management activities with an initial planning priority for biodiversity conservation. They are important in creating objectives and strategies for landscape-level biodiversity and an important component of the overall system for provincial Crown land and resource planning in British Columbia. Landscape level planning builds on the biodiversity elements already identified through other planning initiatives, as well as through the specific practices laid out in the FPC. Landscape unit plans can cover all of the six elements important for full biodiversity conservation. These six elements are retention of old growth forest, seral stage distribution, landscape connectivity, stand structure, species composition; and temporal and spatial distribution of cutblocks (patch size).

The current focus of landscape unit planning is on the priority biodiversity elements: old growth retention and stand structure through wildlife tree retention. Specific biodiversity elements identified in the Fort Nelson and Fort St. John Land and Resource Management Plan objectives and/or strategies will be incorporated. In addition under the new Fort St. John Pilot Project Regulation both stand level and landscape level strategies include objectives for: patch size, riparian management, visual quality, range and

[5] Gross land base - entire area within the plan boundary including areas considered to be non-forested, non-productive, non-productive forest and non-commercial forest.
[6] Forest land base – all Crown land supporting productive forest types including areas in tree farm licence land, provincial parks, ecological reserves and federal parks. This land base contributes to old growth and wildlife tree retention targets.
[7] Timber Harvesting land base – the Crown forest land that contributes toward the Allowable Annual Cut (AAC) as defined in the Timber supply Review process; it is currently considered feasible and economical for timber harvest.

forage management, biodiversity management including habitat management for wildlife, soil management, water quality, recreation, and research and operational trails.

Three landscape units cover the plan area. These are:

- Landscape unit 29 – Richards (Fort Nelson Forest District)
- Landscape unit 30 – Hewer (Fort Nelson Forest District)
- Landscape unit 41 – Keily Creek (Fort St. John Forest District).

Recreation

Recreational activities within the plan area vary both spatially and temporally. This area is considered backcountry for its remoteness. It remains in a highly natural state with mountains, river valleys, abundant wildlife and forest cover. A critical reason for the area's popularity is the isolation, remoteness, and little evidence of human activity and development. While both commercial and non-commercial recreationalists use the area, the majority of visitors are non-commercial public recreationalists. Access for fixed wing air travel, is limited to a few gravel airstrips. Ground access is available for all-terrain vehicles (ATVs), snowmobiles, horseback and foot and is generally along limited routes that follow the valley bottoms. Water access is limited to lower portions of the Prophet River and is usually only run by experienced boaters.

Year-round recreational activity occurs in the area; the majority of the use during August to October, which coincides with the hunting seasons set out by WLAP. Although people most commonly visit the area for hunting purposes during late summer and early fall, other uses include camping, fishing, trail riding, hiking, snowmobiling, wildlife viewing and photography. Usually there are several activities associated with a single trip as a hunter may also hike, fish, camp, or take photos.

Special features in the plan area include the Eastern Rockies High Trail, a traditional route for horse travel; the Bedeaux Trail which crosses through the middle of the area; and the Redfern Lake Trail which follows the Buckinghorse River and Nevis Creek extending past the plan area boundary into Redfern-Keily Provincial Park. This last trail is the only designated route under the Muskwa-Kechika Management Area Regulation in the plan area, and a considerable amount of time and money has been spent on construction and maintenance. In addition the Redfern Trail is an established recreation trail under the FPC. The Prophet River Hot Springs Park is within the plan area.

There are several main corridors through which people travel on foot, horseback, snowmobile, or riverboat. These include the Prophet River, Richards Creek, Besa River, Pocketknife Creek, Nevis Creek and the Buckinghorse River. Between these areas are numerous trails linking to the main routes.

Commercial Range

There are currently three registered guide outfitters operating in the area. As a part of their operations, they have developed a number of small base camps, cabins, outbuildings and corrals on specific sites. All of these sites have tenure associated with them from BC Assets and Land Corporation. Some of the more locally well-know sites include the Prophet River Base Camp, Vince Prophet River Base Camp, Upper Richards Base Camp, Gillis Camp and Plywood Cabin, Ten Mile Lake Cabin, Nevis Creek Camp, Louis Farm, Keily Camp and Browns Farm. The local trapper(s) also have cabins on specific sites.

The information on commercial recreational activities described above is for historic and current use only. For strategic planning purposes, future needs and trends must also be considered. Over time, the demand

for semi-primitive and primitive recreational experiences is expected to increase. Areas that have high potential for recreation need to be identified and appropriately managed.

Visual Quality
Scenic landscapes are an important public resource and are closely linked to public viewing (tourism, recreation, etc). Visual quality objectives (VQOs) are established under the Forest Practices Code to maintain public viewing enjoyment and provide guidance on the acceptable degrees of change from natural-appearing landscapes.

Several viewpoints have been identified within the plan area and include guide outfitter base camps, cabins and scattered campsites. VQO's from these and any other identified scenic area provide guidance for resource user attributes that involve any alteration to the natural landscape.

More detailed information on the visual resources in the plan area is available in the Visual Landscape Inventory Recreation Feature Inventory and Recreation Opportunity Spectrum Inventory for Landscape Units 29 and 30 in the Fort Nelson Forest District and Landscape Unit 41 in the Fort St. John Forest District.

Range
Range activities on Crown land are managed to promote stewardship, management and the sustained development of range-land resources. Range-lands are lands suitable for grazing and browsing by livestock and wildlife. They include natural grasslands, savannah, shrub-lands, wet meadows and forests. These ecosystems are generally complexes of grass, interspersed with forests.

Range users in the plan area include commercial horse operators, non-commercial hunters, guide/outfitters, First Nations, wildlife enthusiasts, recreationists and trappers. Range tenures for domestic livestock management in the plan area provide forage for horses required by the guide outfitting industry.

Management for range resources and values involves the maintenance and enhancement of the wildlife habitat using sound ecological principles and the management of Crown range for both commercial and recreation horse operators. In order to maintain opportunities for commercial/non-commercial livestock grazing associated with recreation, the Fort St. John LRMP recommended that a grazing plan be developed for the southern portion of the plan area, to address issues of forage allocation among tenured users, residents and wildlife.

First Nations and Cultural Values

The plan area has historic and current use by the Sekani, Cree and Beaver cultures of the Halfway River and Prophet River First Nations. The plan area falls within Treaty 8 and the two First Nations are signatories to the treaty. Areas of importance for traditional practices and archaeological and cultural sites exist within the plan area.

The two First Nations within the plan area belong to the Athapaskan linguistic group, who occupied northeastern BC at the time of and prior to European contact. Known as the Beaver, they were seasonally mobile, traveling through out their home territory to use locally available resources. Although the Beaver did not maintain permanent villages, there are references to semi-annual gatherings, (Goddard, 1916, Ridington 1988). At these gatherings, small family units would form large hunting or fishing parties and practice ceremonial beliefs. Fish, birds and plant resources also contributed to the traditional economy (Lands End Archaeology, 1996).

The plan area contains values and resources of importance to these First Nations including sacred, spiritual, camping, gathering, berry-picking, hunting and burial sites. Oral history indicates that the plan area was well used and mentions spiritual sites where the 'Prophets' went to pray and fast. There are stories regarding a number of unmarked graves alongside most of the larger watercourses. Past traditional use studies have located graves and other sites throughout the plan area.

Traditionally these First Nations were mobile people traveling to use locally available resources, such as specific plant communities for medicinal purposes, in addition to features such as mineral licks, ungulate calving areas and hot springs for hunting wildlife. Trails within the plan area were traditionally used to access semi-annual gathering sites.

Dene Tsaa Tse K'Nai First Nations, Prophet River Indian Band

At the time of signing Treaty 8, the Department of Indian Affairs amalgamated the Prophet River Band with a Slavey Band (Fort Nelson). In 1974, the Prophet River First Nation and the Fort Nelson First Nation split into two Bands. The Prophet River First Nation is part of the Nahanni linguistic group and has Slavey, Beaver and Cree cultures within its membership. The Beaver 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 community is located on one 374-hectare reserve just off the Alaska Highway, approximately 100 kilometres south of the Town of Fort Nelson. Currently, there are approximately 190 band members, and slightly less than half live on the reserve.

Halfway River First Nation

The Beaver of the Fort St. John region signed Treaty No. 8 in 1900. In 1975 the Hudson Hope Band was divided into the Halfway River First Nation and the West Moberly First Nation. The Halfway River community is located on one 3,989-hectare reserve approximately 100 km northwest of Fort St. John. The First Nation has approximately 210 band members, and about two-thirds of its members live on the reserve.

Members of the First Nation still use the plan area for traditional hunting/gathering and other activities.

Cultural Values

Both the Eastern Rockies High Trail, a traditional route for horse travel, and the Bedeaux Trail cross the Besa-Prophet plan area. It was in 1934 that the Bedeaux expedition passed through this area in their attempt to establish an east-west route through the Northern Rocky Mountains. The expedition had hoped to find a tractor route from Edmonton via Fort St. John to Telegraph Creek. They were forced to abandon their tractors and proceed on horseback.

A portion of the Prophet River flows through the Besa-Prophet plan area. In 1998, the Prophet River was proclaimed as one of B.C. Heritage Rivers. Designation as a heritage river is commemorative rather than regulatory. It provides an opportunity for greater focus and profile for key rivers, and exists entirely with existing legislation, intergovernmental agreements, policies and planning processes. Government's approved vision and management guidelines for the Prophet River, which are outlined below, are intended as input and guidance for, not as a directive to, existing or future plans or planning processes.

Vision:

- A river managed to retain the outstanding natural qualities and wilderness character in its upper reaches, and to recognize the need to integrate riparian, recreation and industrial uses consistent with natural and cultural heritage values in its lower reaches.

Management Guidelines:

- To contribute to the conservation of wildlife habitat of the important Northern Rockies ecosystem.
- To recognise and support the continued relationship of the Prophet River First Nation to the river and its environment.
- To emphasize wilderness and wilderness recreation opportunities as a focus of public education on the values of the upper reaches of the river.
- To recognise and support the value of the lower reaches of the river to the local oil and gas and forest industries, First Nations and water-based recreation, consistent with the Fort Nelson Land and Resource Management Plan and local land use plans for the region.